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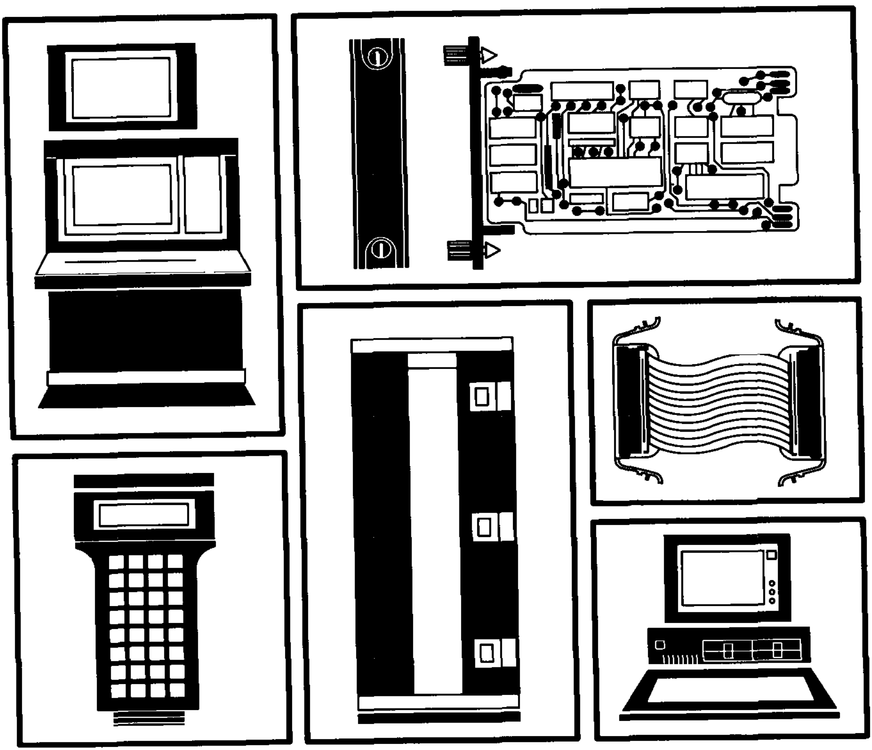
E96-100

Bailey infi 90

Instruction

Operator Interface Station (20 Series) Operation/Configuration Manual

(Software Release E)



Bailey

Process Control and Automation Solutions from Elsag Bailey Group

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WARNING

INSTRUCTION MANUALS

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NOTICE

Preface

This instruction provides both general information that overviews the IIOIS20 Operator Interface Station, and specific information necessary to operate and configure the console It consists of three parts made up of 16 sections and six appendices The parts of the instruction include

- Description and functions
- Operation
- Configuration

The information in this instruction can be used as an operations guide for operators, or a reference for system engineers or technicians responsible for configuring the console for its intended application It is not a tutorial for process control and assumes the reader has a general knowledge of video graphics based process control systems The instruction explains console interaction with the INFI 90® Strategic Process Management System only

The instruction references numerous figures to explain operation and configuration of the console Several of the figures are actual screen prints from the console itself Each display contains a date and time field in the upper left corner as a fixed part of the display Even though a screen image in this instruction may contain a date that is not current, it reflects the current version of that page

This instruction supersedes and replaces I E96-100C This instruction reflects the E 2 software release for the IIOIS20 Operator Interface Station

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List of Effective Pages

Total number of pages in this instruction is 904, consisting of the following

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through xxiii	Original
1-1 through 1-14	Original
2-1 through 2-20	Original
3-1 through 3-15	Original
4-1 through 4-11	Original
5-1 through 5-5	Original
6-1 through 6-57	Original
7-1 through 7-32	Original
8-1 through 8-21	Original
9-1 through 9-18	Original
10-1 through 10-6	Original
11-1 through 11-61	Original
12-1 through 12-30	Original
13-1 through 13-37	Original
14-1 through 14-17	Original
15-1 through 15-261	Original
16-1 through 16-74	Original
A-1	Original
B-1 through B-118	Original
C-1 through C-5	Original
D-1 through D-9	Original
E-1 through E-50	Original
F-1 through F-8	Original
Index-1 through Index-11	Original

When an update is received, insert the latest changed pages and dispose of the superseded pages

NOTE On an update page the changed text or table is indicated by a vertical bar in the outer margin of the page adjacent to the changed area A changed figure is indicated by a vertical bar in the outer margin next to the figure caption The date the update was prepared will appear beside the page number

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SECTION 1 - INTRODUCTION

OVERVIEW

This instruction contains information and instructions necessary to configure and operate the IIOIS20 Operator Interface Station The operator interface station (OIS) provides integrated operations interface, data acquisition and reporting capability in addition to process control for the INFI 90 Strategic Process Management System

The console allows total process monitoring and control through a single control point. Flexible, dynamic, interactive color graphics displays quickly and effectively communicate equipment status and process state to an operator once configured Through these displays and keyboard actions, an operator can control and acquire data from process devices distributed throughout the entire process The displays also provide a consistent method to interpret process status and a means to respond to unusual conditions, both dependent on process requirements

> **NOTE** There are additional versions of the operator interface station available each having different processing capabilities and functions In this manual, any reference to operator interface station or OIS refers to the OIS20 console

In this document, main console refers to an IIOIS201, IIOIS202, or IIOIS203 An IIOIS20A or IIOIS20D driver cabinet is also a main console, but it requires an auxiliary terminal Auxiliary terminal refers to an IIOIC201, IIOIC2021, IIOIC2022, IIOIC2023, IIOIC203, or IIOIC204 console The same operations can be done while at any one of these types of consoles

INTENDED USER

This instruction can be used as an operations guide for operators, or a reference for system engineers or technicians responsible for configuring the console for its intended application This manual is ***not*** a tutorial for process control, and assumes the reader has a general knowledge of video graphics based process control systems It explains console interaction with the INFI 90 system only

After completely reading and understanding the information presented, the system engineer or technician should have the knowledge required to tailor the operation of the console to the specific requirements of the process

DESCRIPTION

The console uses a multibus architecture to allow flexibility and expandability Figure 1 1 shows the standard console, and the

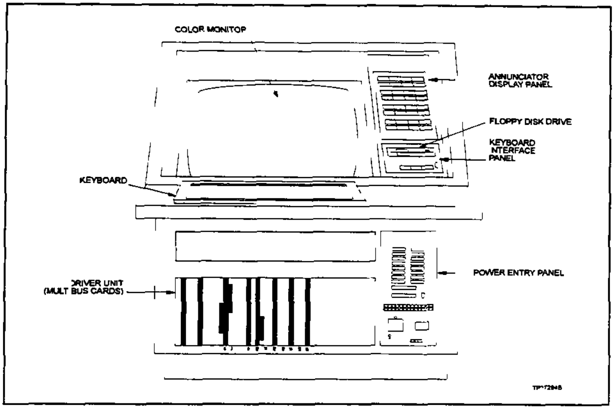

Figure 1-1 Operator Interface Station

location of primary console components Several hardware options can be added to the standard console package to enhance operation Refer to the ***Operator Interface Station, Hardware Manual*** for a detailed description and complete list of hardware options

The main components of the console are

- Driver unit
- Color monitor
- Keyboard interface panel
- Keyboard
- Annunciator display panel (ADP)
- Disk drives
- Power entry panel

This section describes the main components of the console only It is important to become familiar with their locations and general functions before configuring or operating the console

Driver Unit

The hardware of the driver unit consists mainly of multibus modules (circuit cards) The driver unit modules connect and interface the console to the communication highway These modules also execute programs controlling operation of the console, and communicate with the monitors, keyboards, printers and other supported peripherals

Access to the communication highway and communication with its peripherals give the console complete access to the entire plant system and supported devices through interactive and dynamic displays

The driver unit modular circuitry mounts in a multibus card cage located at the front, lower section of the console An access door covers and protects this circuitry during normal operation The multibus card cage provides the communication path and hard ware priority level for the multibus modules, which include

IIMCL01 Multibus Communication Loop Termination Module - terminates communication highway coaxial or twin axial cable

IIMLM01 Multibus Loop Module enables communication be tween the communication processor module and INFI 90 com munication highway through the communication termination module

IIMCP01 Multibus Communication Processor Module - executes the commands required to send data to, and receive data from plant process control units (PCU) and other operator consoles and interfaces The IIMCP01 module is part of the communications interface unit of the console

> **NOTE** The IMCL01 IMLM01 and IIMCP01 modu es compr se the communicat ons nterface unit of the conso e

IIMSM01 Multibus Serial Interface Module interfaces the various peripherals including keyboards, printers and main- tenance terminals

IIMPM01 Multibus Processor Module contains

- Microprocessor and support circuits
- Eight megabytes dynamic RAM
- 64 kilobytes ROM
- Communication port for the diagnostic/debug terminal
- SASI™ disk adapter
- SCSI port for magnetic tape or optical disk

IIMKM02 Multibus Keyboard Module interfaces the keyboards and annunciator display panels (ADP) It controls six solid state alarm output relays and six keyboard alarm tones It also inter faces the optional touch screen through a touch controller module mounted on this circuit board

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IIMGC01 Multibus Graphics Controller Module drives the monitor of the console

A second graphics controller module and touch screen controller module can also be added The touch screen controller modules mount on the multibus keyboard module

Color Monitor

The console uses a 19 inch CRT with a standard resolution of 640 × 480 to display its color graphics The screen is the primary information device It presents a variety of displays to allow the operator to perform all functions at the console The CRT supports 64 different colors

Keyboard Interface Panel

The keyboard interface panel provides connection ports for the keyboard, auxiliary engineering keyboard, mouse or trackball, and a table top annunciator display panel The TUNE/CONFIG key lock switch and floppy disk drive are located at this panel

Authorized personnel can configure and tune most PCU modules and troubleshoot the system using the keyboard A single key lock switch protects against accidental changes or data loss from unauthorized configuration and tuning The key switch restricts certain functions to only authorized personnel It is located at the keyboard interface panel

The key lock switch is labeled as TUNE (tuning) and CONFIG (configuration) The only way to change the position of the key lock switch is to insert a key and turn After changing switch position, remove the key This locks the key switch into the proper position for the desired operation

Password security also protects against unauthorized changes It is defined during console configuration Password security can be used along with key lock protection, or can disable key lock requirements

Keyboard

The operator keyboard is a flat panel covered by a mylar membrane having alphabetic, numeric and specialized function keys It connects to the KEYBOARD connector located at the keyboard interface panel The keyboard gives access to various displays, then allows operator interaction with the displayed elements Once configured, an operator can display and control any process loop or device in the INFI 90 system through keyboard keys

An auxiliary engineering keyboard is a typewriter style, QWERTY keyboard that can be used in place of the mylar keyboard This keyboard connects to the AUX KEYBOARD connector located at the keyboard interface panel Refer to Appendix A for auxiliary keyboard key mapping

NOTE When the term keyboard occurs in this manual without a qualifying mylar or auxiliary it refers to the mylar keyboard

ADP

An annunciator display panel contains 32 indicator and pushbutton pairs Process points defined as tags can be assigned an ADP lamp, and each pushbutton assigned a display or key macro Once configured, a process point that goes into an alarm condition causes the assigned ADP indicator to light. The display required to view and take action on the alarm condition can then be called by pressing its associated pushbutton A key macro assigned to an ADP pushbutton incorporates multiple keystrokes into a single key press

A single console supports two annunciator display panels The second is an optional table top type that connects at the keyboard interface panel

Disk Drives

The console has both a hard disk and floppy disk drive The floppy disk drive handles removable 5 25-inch, high density disks (1 2 megabytes) This drive can be used to save and restore PCU and OIS configurations, as well as load OIS software and archive process data The floppy disk drive is located at the keyboard interface panel

The hard disk drive provides on line storage for

- OIS operating software
- Assembled display files
- Log and trend data
- Archived data
- OIS configuration data

Power Entry Panel

The power entry panel is located behind the front access door This panel contains

- Main power connection point
- Main power on/off switch
- Power on/off indicator
- Console reset switch
- I/O and peripheral ports
- Keyboard I/O terminal block
- CRT degaussing switches

Figure 1 2 shows the power entry panel

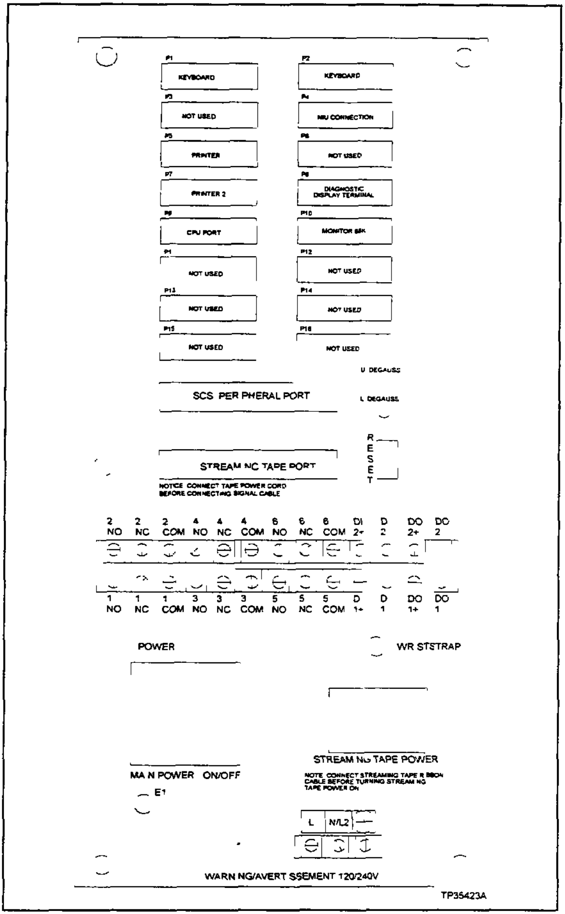

Figure 1-2 Power Entry Panel

Printers Line printers can be installed for printing hard copies of plant alarm occurrences, printing configured logs after data collection is complete, and making copies of various displays The console supports two printer ports Printers connect at the power entry panel

The printer types are either standard black and white, high speed black and white, or four color dot matrix Printer assignments for logging are set during log configuration. Printer assignments for screen printing and demand prints are made through the *ASGN PRN* option of the command line menu

An optional color video copier is available to copy any display currently on the screen using the same color scheme as the dis play itself

FEATURES

5,000-Tag Capacity. Monitors and allows operator control of up to 5,000 process variables through dynamic, interactive color graphics displays

Custom Graphics. Flexible graphics hierarchy enables the crea tion of displays tailored to specific application needs Text, shapes, lines and symbols as well as real time dynamic value fields and state fields present information in status displays or process mimics Standard device faceplate symbols and status displays are provided in the software

Full Control and Input Capability Fully supports configuration, control and tuning of process control parameters within the INFI 90 system from both standard faceplates and user designed graphics

2,000-Point Distributed Trending. Provides for distributed trending of up to 2,000 variables Trending offers a historical per spective of process conditions for analysis of operations

Logging Creates up to 300 custom logs (standard, trip or periodic type), 80 sequence of events (SOE) logs, and an events log containing up to 1,000 events These logs provide a hard copy history of process operations and customized operations summaries

Advanced Alarm Management Multilevel alarming capabilities optimize operator response through color coded prioritization and single keystroke alarm acknowledgment

Single Keystroke Display Access Display or control selects can be performed with a single operator action through a keyboard, a touch screen or an annunciator display panel A mouse or track-ball can be added to enhance operation

High Resolution Screens Supports two screens with a standard resolution of 640 × 480

Historical Data Archiving Supports data archiving to floppy disk, magnetic tape or optical disk Archival functions provide a history of process operations for subsequent analysis and process improvement Archived data 'can include tag, trend, log, system events and PCU configuration data

INFI 90 System Troubleshooting and Diagnostics Enables on line INFI 90 system troubleshooting and diagnostics through system status displays and INFI NET® diagnostics functions

INFI 90 System Tuning and Configuration Allows INFI 90 module configuration and tuning capabilities over the INFI-NET and Plant Loop communication highways

INSTRUCTION CONTENT

This instruction is set up in three main parts Description and functions, operation, and configuration It includes a Table of Contents, List of Figures, List of Tables and Index giving several options to locate specific information quickly Appendices supplement information presented in the individual sections

This instruction explains console operations and procedures referenced to standard operational displays provided with the console Flexibility in display creation allows tailoring these displays or creating user defined displays designed to meet specific requirements of any given plant All operational capabilities inherent to the console and available through displays remain the same whether using standard or user-created operational displays

Description and Functions

The description and functions part of the instruction is intended to familiarize the reader with functions and operating theory for the console, and components that provide an interface to the console functions A general understanding of the console is necessary to insure optimum use of all available features and functions The sections that make up this part of the instruction include

INFI 90 SYSTEM AND OIS OVERVIEW (Section 2) introduces the console describing its function in the INFI 90 system

KEYBOARD AND PERIPHERALS (Section 3) describes the keyboard and peripheral devices that enable interaction with the console

DISPLAY SYSTEM (Section 4) gives an explanation of the display system including fixed screen elements and user created elements

MENU STRUCTURE (Section 5) gives a tree structured view of the configuration, utility, and operation menus Provides a quick reference when accessing functions through menu selections

Operation

Operation explains the operator actions that can be taken to monitor and control a process, and explains console and INFI 90 system operations These operations discussed occur after all display creation and console configuration have been completed It

® Registered trademark of Elsag Bailey Group also explains how to record process data The sections that make up this part of the instruction include

PROCESS MONITORING (Section 6) includes start up procedures, and discusses methods of accessing displays This section also contains information on tag operations, trend operations and operator configurable displays

PROCESS CONTROL AND TUNING (Section 7) details the information presented in standard faceplate elements designed to mimic process devices, and the control operations performed through these elements The console provides these elements as part of its symbol library on hard disk The same information presented and capabilities available through each of the standard control elements can be incorporated into any user created displays

DATA ACQUISITION (Section 8) details the information presented at standard data acquisition faceplate elements The console provides these elements as part of its symbol library on hard disk The same information presented by each of the standard data acquisition elements can be incorporated into any user created displays

ALARM PROCESSING (Section 9) explains alarm indications and processing procedures, and procedures to inhibit these alarm indications It also details the information and functions performed through an alarm summary page or element

OIS OPERATIONAL INFORMATION (Section 10) describes the pages used to monitor certain functions The pages indicate the current operation being performed, and any operator actions required to continue processing of certain operations

RECORDING PROCESS DATA (Section 11) describes the logging and archiving functions These capabilities allow recording process and OIS related data as either hard copy printed logs or digitally stored archive data

UTILITIES (Section 12) explains the utilities available The utilities relate to both process operations and OIS operations

INFI 90 AND OIS DIAGNOSTICS (Section 13) describes the pages that present INFI 90 system status information and OIS peripheral device status information

Configuration

Configuration gives step by-step procedures required to configure INFI 90 modules and set up each function, component and peripheral for proper operation at the console The sections that make up this part of the instruction include

INFI 90 SYSTEM CONFIGURATION (Section 14) - explains the INFI 90 system configuration utilities available through the console These utilities can be used to configure, save, verify, load and view INFI 90 module configurations

OIS CONFIGURATION (Section 15) defines the console configuration requirements necessary to enable its operation and functions

TERMINAL UTILITIES (Section 16) - explains the commands and syntax required to perform file utilities through the diagnostic/debug terminal These include commands to perform file operations such as create, copy, delete and rename files It also includes an explanation of the elementary line editor (ELE) utility for editing display files

HOW TO USE THIS INSTRUCTION

Read this entire instruction through in sequence before attempting to configure or operate the console It is important to become familiar with the entire content of the manual prior to configuring and operating the console to attain optimum and insure maximum use of all available functions

The manual is organized in three parts, and limits the information presented in each part to only specific items required to complete the desired task The organization enables finding specific information quickly, and using this manual as a reference after becoming fully familiar with the console

Be sure to read the notes in text Notes provide

- Additional information
- Amplifying information
- Information that should be considered before performing a certain operation or function

DOCUMENT CONVENTIONS

NOTE The console is case sensitive For example entering **tagname** will not call the tag TagName they are two distinct names Take note of case when entering data into the console

This document uses standard text conventions throughout to represent keys, user data inputs and display items

Convention	*Represents*
KEY	Identifies a keyboard key Example Press ENTER
USER INPUT	Indicates a fixed input that must be entered exactly as shown Example Type **MON68K**

Display item Any item that displays on the screen appears as italic text in this document

Examples. *A OIS Configuration* (menu selection)
General Functions Menu (display title)
SELECT a Cell Item from the Menu. MSG 261 (message)
Tag name or index number (prompt)

File name Any file names and file extensions appear as bold-italic text

Examples· ***DISPL1.DU***
.DT

The document uses a specific set of text conventions for commands

Convention	***Represents***
BOLD	Identifies any part of a command line that is ***not*** optional or variable, and must be entered exactly as shown
italic	Identifies a variable parameter in a command line
[ ]	The brackets indicate a parameter is optional Text within the brackets still follows the previously described conventions

Example **ei 108,87**,*key1,key2,x-coord,y coord*

ELE *volume filename ex*

GLOSSARY OF TERMS AND ABBREVIATIONS

Table 1 1 is a glossary of terms and abbreviations used in the instruction

Table 1-1 Glossary of Terms and Abbreviations

Term	Definition
Ana og	Continuously variable as opposed to d scretely var able
B ock address	A number des gnating a specific funct on block w thin a modu e
Conf guration	The act of setting up equipment to accomplish spec fic functions or a l st of parameters associated with such a setup
Controlway	A redundant peer-to-peer commun cation path for status and po nt data transfer between ntell gent modules within a process control un t

Table 1-1. Glossary of Terms and Abbreviations (continued)

Term	Definition
Cursor	A position indicator used on a video display terminal to indicate a character to be corrected or a position in which data is to be entered.
Database	A collection of logically related information.
Digital	A discretely variable signal usually having only two states: on or off.
Digital value	The representation of a value by some number of digital bits.
Display element	A discrete component used in creating a process display. Each item that appears on a display is an element. For example, station faceplate, trend display, alarm summary, dynamic symbol, dynamic value, etc.
EUD	Engineering unit descriptor; unit of measurement associated with an analog process value.
EWS	Acronym for engineering work station.
Exception report	Information update generated when the status or value of a point changes by more than a specified significant amount; abbreviated as XR.
Function block	The occurrence of a function code at a block address of a module.
Function code	An algorithm which manipulates specific functions. These functions are linked together to form the control strategy.
INFI-NET	Advanced data communication highway.
MFC	Multi-function controller module; a multiple-loop controller with data acquisition and information processing capabilities.
MFP	Multi-function processor module; a multiple-loop controller with data acquisition and information processing capabilities.
Module address	A unique identifier of a specific device or a communication channel. Refers to Controlway or module bus address.
Module bus	Peer to peer communication link used to transfer information between intelligent modules within a process control unit.
Node	A point of interconnection to a network.
Node address	A unique identifier of a specific device or a communication channel. Refers to Plant Loop or INFI-NET address.
OIS	Operator interface station; integrated operator console with data acquisition and reporting capabilities. It provides a digital access into the process for flexible control and monitoring.
PCU	Process control unit; a node on the plant-wide communication network containing control and I/O modules.
Plant Loop	Network 90® data communication highway.
SAS	Shugart associates standard interface; defines the protocol and peripheral interconnection formats of a high speed parallel bus for use throughout the computer industry.

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Table 1-1. Glossary of Terms and Abbreviations (continued)

Term	Definition
SCSI	Small computer system interface; an I/O bus standard by the American National Standard Institute (ANSI) that defines the protocol and peripheral interconnection formats of a high speed parallel bus for use throughout the computer industry.

REFERENCE DOCUMENTS

This instruction provides operation and configuration information only for the console. Table 1-2 lists additional documents that relate to operation and configuration, and are referenced in this instruction.

Table 1-2. Related Documents

Number	Document
I-E93-917-1	Sequential Events Recorder (SER)
I-E96-105	Operator Interface Station Hardware Manual
I-E96-200	Function Code Application Manual
I-E96-703	CI Utility Program
I-E96-706	Software Logging Database Graphics (SLDG)
I-E96-825	Software Global Database Manager (SGDM)

NOMENCLATURE

The standard nomenclature convention for Bailey Controls consoles is:

NF 90 — I X X X X 0 0 (e.g., IOIS20)

- 0 0 → Current variation
- X X X → Three letter abbreviated name
- X → Equipment type: I – Operator stations; M – Modules; E – Enclosures; N – Communications
- I → Indicates NFI 90 equipment family

The standard nomenclature convention for other Bailey Controls equipment is:

- Computer hardware starts with H, followed by a three-letter abbreviated name and variation.
- Computer software starts with S.
- Termination units start with NT, followed by a two letter abbreviated name and variation.

- Termination modules start with NI, followed by a two letter abbreviated name and variation
- Cables start with NK, followed by a two letter abbreviated name and variation

On displays (e g , system status displays), the nomenclature presented will be either a three letter abbreviation and variation (e g , IIT02) or three letter abbreviation without variation (e g , MFP) In either case, the family and equipment type identifiers do not appear

CAPABILITIES SUMMARY

Table 1 3 summarizes the capabilities of the console

Table 1 3 Capabilities Summary

Software	Capability
Database	
Alarm comments	20 000
Tags	5 000
Trends	2 000
Display only	2 000
Save to disk (standard trends)	1 000
Displays (graphics)	1 000
Dynamics	
Dynamic bars per display	400
Dynamics per display	200
Tags displayed per console	800
Operator assignable trends	20
Operator configurable displays	25
Logging	
Custom logs (standard trip and periodic)	300
Events log (no of events)	1 000
SOE	
Logs	80
Recorders	16
Peripherals	
Annunciator display panels	4 (2 per IIMKM02 module)
Keyboards	2
Logical relays	12
Logical tones	10
Printers	2

NOTE Refer to the specifications in the ***Operator Interface Station, Hardware Manual*** for OIS power requirements certification and operating environment Also refer to the hardware manual for the type and number of peripherals supported by a specific type of console (e g IOS202 OS20D OC20* etc)

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SECTION 2 - INFI 90 SYSTEM AND OIS OVERVIEW

INTRODUCTION

This section introduces the operator interface station (OIS) de scribing its function in the INFI 90 system It provides a brief overview of selected INFI 90 system components, and explains OIS functions and operating theory

INFI 90 SYSTEM OVERVIEW

The INFI 90 Strategic Process Management System is a distributed process management and control system Using a series of integrated control nodes, the INFI 90 system allows monitoring and control of process variables such as flow rate, temperature and pressure according to a control configuration that the process (system) engineer or technician sets A node is any device connected for communication on the plant communication highway

Figure 2 1 shows a single communication highway system with INFI 90 nodes This figure presents only specific nodes that relate directly to the operation and configuration procedures discussed in this instruction Depending on the type of communication highway being used, a single loop can contain up to 250 individ- ual nodes Additional nodes can be other consoles, process control units, and local and remote network interface units (NIU)

Communication Highway

The INFI 90 system operates on either an INFI NET or Plant Loop communication highway The communication path established by the highways ties each system node together for

- Sharing control variables among modules in different nodes
- Monitoring operation of control schemes in control nodes.
- Performing control action at a console or a computer con nected through a network interface unit
- Configuring and maintaining PCU control schemes from a console or a computer
- Monitoring the status of system components from a console or a computer

The INFI NET communication highway supports up to 250 loops with up to 250 nodes per loop, Plant Loop communication highway a single loop with up to 63 nodes

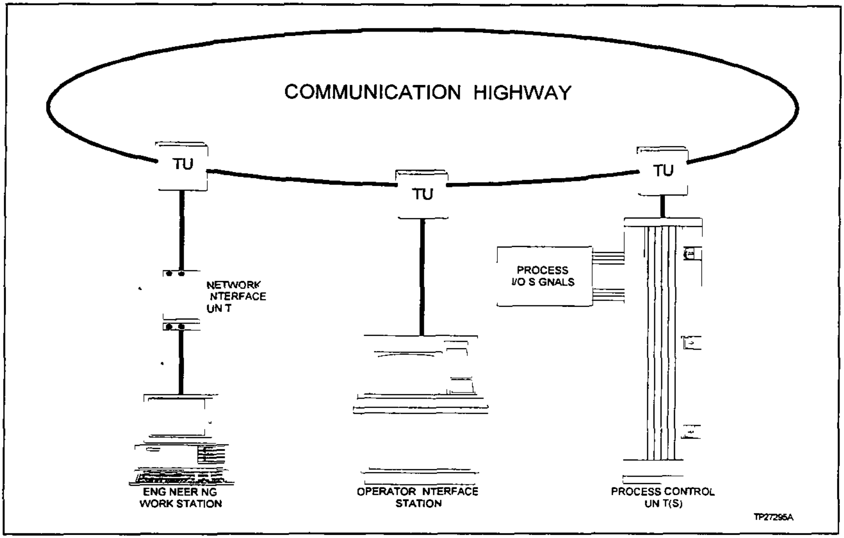

Figure 2 1 INFI 90 Communication Highway and Nodes

Process Control Unit

The process control unit (PCU) is the fundamental control node of an INFI 90 system The actual process control and management takes place at this level Predefined algorithms set in memory of a PCU control module establish parameters for process control These parameters also determine the operation of functions such as alarming, trending, logging, and process monitoring and control

PCU refers to either a group of INFI 90 control modules and their I/O modules, or any cabinet containing

- Power panels
- Configurable control modules and their I/O modules
- Termination units or modules

A single cabinet may contain several PCUs each having their own communication interface modules, and each is identified by a distinct hardware address

A PCU can be a stand alone control system containing control stations for system interfacing, and a configuration and tuning terminal (CTT) for configuring control schemes Control and indicator stations physically located on the process floor display process variables and allow process changes A configuration and tuning terminal enables local building and modifying of control schemes (i e , configurations) in PCU modules

Individual control modules store configuration data in on board, nonvolatile memory A nonvolatile memory device retains data even after removing power It is also possible to back up (store) and download stored configurations from floppy disk, or the hard disk of a computer or console

Termination units or modules directly connect process field device I/O signals to process control units in the INFI 90 system The communication highway then links all process control units together in series This enables process control units in the plant to share control functions and data from any other in the system It also lets consoles and computers communicate with any process control unit The console requires this communication to acquire process values and to put process changes into effect

Operator Interface Station

Using the console, an operator monitors and controls overall plant operation from a single point The number of consoles in a system varies depending on the overall control plan and size of a plant A console enables monitor and control of an entire plant process through its color graphic displays and pushbutton keyboard There are many other operator interface devices that the console enhances, for example analog control station, analog indicator station and digital logic station

The process engineer, technician or maintenance person can use the console to configure and maintain control schemes throughout the plant system The console is able to read and display any module configuration in the system The engineer can then modify the configuration, having the console write the modifications back to the module The module configuration can be read then saved on disk (floppy disk or hard disk), or read from disk then written back to a module

Using the console, system management personnel can list process (tag) details, change various alarm limits, affect tuning functions, lock out plant control by password, and manipulate files by various file management commands The console has on line utilities, on line documentation capabilities and diagnostics

Network Interface Unit

Network interface unit (NIU) is a general term used to describe INFI 90 modules that provide an interface or access to the com munication highway A network interface unit is a group of mod ules that provide a link between separate communication highways or an interface to the loop for a console, computer system or another network

Figure 2 1 shows an interface unit connecting an engineering work station (i e , computer) to the loop For computer interfacing, the interface unit is either an INFI NET to computer interface (ICI) or Plant Loop to computer interface (PCI) depending on the communication highway Although not shown in this figure, the console also has a dedicated communications interface unit con sisting of multibus modules

Through a network interface unit, a computer or console has ac cess to any node on the loop This connection allows gathering process information, making process decisions, and performing or recommending process changes The interface unit does not directly display any information

An interface unit is an automatically operating device A computer or console performs process monitoring and control based on internal calculations and program routines set in the interface unit The interface unit also serves as a data acquisition point for the host computer or console The console downloads its database information during start up to establish the operations of its own interface unit

The network interface unit is programmable during configuration, but the operator does not use it directly to interface with the sys tem A network interface unit reinforces INFI 90 data processing capability The console collects process data and implements op erator control actions through its interface unit

An engineering work station (EWS) supports database manage ment and display creation for the console It also provides addi tional utilities and engineering tools used in INFI 90 management

FUNCTIONS

INFI 90 control modules perform the actual process control through control schemes loaded in module memory A process engineer creates these control schemes by constructing a control configuration made up of function codes, and entering this con figuration into a PCU module Function codes are software algo rithms that define individual calculations and functions available in a module These function codes also determine and are related to all operations of the console The process engineer arranges a set of function codes in a logical order to define the control re sponsibilities of a module

Functions of the console enhance the INFI 90 system and PCU modules by providing a single point for managing and configuring process control schemes throughout the entire plant, and for processing alarms and making control changes as necessary The console receives its reports, point values and alarms in exception report messages from PCU modules An operator can initiate process control through operator actions at a console The process engineer can use the console to create or modify control schemes

Operations Interface

As an interface to the process, the console supports monitoring and control through graphic displays These displays quickly and effectively communicate equipment status and process state The displays also provide a consistent method to interpret process status and to respond to unusual conditions

The process display is configured within the display area with any of 64 available colors Each display can use dynamic elements for variables and symbols and static elements allowing considerable information to be condensed into a display Graphic elements for process dynamic data and graphic elements for static data can be combined with predefined or user created symbols to form a complete display This allows setting up detailed process schematics, faceplates, and summary displays for monitoring and control

The console does not have a set display hierarchy for user-created displays This allows creating displays to suit individual processes and applications The process engineer sets up the logical connections between displays

The operator keyboard is the main operator interface to the console and the process Optional input devices such as annunciator display panels, touch screen, and mouse or trackball can be added to enhance operation

Security Management

Security features built into the console prevent unauthorized access to console functions Key locks and password security features limit access to specific process displays, variables, control points, configurations and utilities Password security can be tailored to plant needs Security can be set up to accommodate individual personnel's responsibilities and specific types of operations

Passwords permit controlling access and operation of functions at a higher level than key lock by defining access rights for individual users Each password defines configuration, control, tuning, monitor, alarm management, log operations and screen access rights Personnel must log in at the console with the appropriate password once password security is established

Database

The tag database is the foundation for all functions supported by the console Each tag in the database enables communication with a point in the process, which is required to perform any function The database includes specific information for each process variable that the console is to allow control, or to display, monitor, trend, log and archive The database can be created or modified through console functions, or through other engineering tools

A trend list defines variables used in trending functions These tags allow the console to acquire data collected by the INFI 90 distributed trending system This database includes specific information required for proper display and logging of historical, trended data

Database summaries the console is able to search its tag and trend list for specific attributes and generate a printed listing of this data For example, all tags with hardware addresses in a specific PCU could be listed in order of their module and block address

Tag status summaries the console provides displays or printed listings of all tags with a specific operating status Tag summaries can include all tags, or only tags with

- Acknowledged alarms
- Unacknowledged alarms
- Manually inhibited alarms
- Off scan status
- Suppressed status
- Bad quality
- Suspect quality
- Alarms
- Manually substituted values
- Red tag status

Alarm Management

The console monitors alarm limits defined in each control scheme to notify an operator of abnormal conditions Extensive alarm management capabilities allow quick operator response to these conditions Alarm management sets up standard indications that help to insure proper operator response to process alarms, and minimize nuisance alarms

Acknowledgment any display can be set up to contain an alarm status field, which associates with a process value or state on that display When an alarm occurs, this field changes to identify the type or level of alarm The operator must perform keyboard actions to acknowledge the alarm This acknowledgment is the first step in alarm processing An acknowledgment stops alarm indications the console uses to notify an operator of an alarm, such as a flashing alarm group indicator, status field or dynamic symbol, and an alarm tone

Alarm acknowledgment can also be sent over the communication highway to acknowledge the alarm at other consoles Acknowl edgment can be configured to occur based on the condition of another process variable

Multiple-level alarms the INFI 90 system provides support for distributed data acquisition functions including multiple level alarms and deviation alarm levels for process variables This is a function of the control scheme set in a PCU module configuration The console monitors the alarms to present specific indications to an operator The indication identifies each alarm level as the process variable reaches a set alarm threshold

Variable alarm limits alarm limits can be configured to track automatically based on specific process changes The multiple level alarming capability still applies, and thresholds adjust ac cording to the process variable being tracked

Alarm comments an alarm comment field of up to 64 characters provides an operator with additional information for process alarms An alarm comment can be entered for each alarm level or alarm state related to a process variable The comment can de scribe, for example, the purpose of the alarm or operator actions that should be taken to correct the alarm Any display can present an alarm comment associated with a tag

Alarm groups each tag in the database can be assigned to any one of 99 alarm groups This allows arranging an area of related process points into a group for easier management When an alarm condition exists for a process point, its alarm group number appears at the top of the screen It flashes until an operator acknowledges all alarms within that alarm group The alarm group status indicator line is a fixed display attribute that appears at all displays

Alarm indications are set for each alarm group individually Each group can have a distinct alarm tone, and a specific external alarm relay The alarm tone provides an audible indication, the alarm relay can be used to trigger an external alarm annunciator

Alarm priorities there are eight priority levels that allow sorting alarm entries that appear in an alarm summary by priority level Priority can be set for each alarm level, an alarm state, return to normal condition and bad quality when used as an alarm The console also provides the ability to associate descriptive text with each priority level for easier recognition

Alarm summary display an alarm
changes in alarm state and the time of occurrence for all or specific tags depending on its configuration The entries in this summary appear arranged chronologically or by priority level A summary can contain up to 1,000 most recent alarms The total number of current outstanding alarms, and the number of unac knowledged alarms appear at this page

Single key access to a primary display for any alarming point listed in the alarm summary is a standard feature The primary display is the screen that the operator uses to initiate actions to correct the alarm

Alarm summary displays are configurable A given alarm summary can contain all alarms, unacknowledged alarms only, or acknowledged alarms only Besides the types of alarms, an alarm summary can be limited by alarm groups or alarm priorities A summary can list alarms for all or only specific alarm groups, or all or only specific alarm priorities

Alarm summary report the alarm summary report provides a snapshot printout of all alarms currently being saved for alarm summaries The printout is similar in appearance to the alarm summary display Alarm summary reports can be scheduled to print periodically or after being triggered by a process event

Alarm inhibiting - the console provides an alarm inhibiting option to manually turn off alarm indications for individual tags or entire alarm groups The console does not sound an alarm tone, trigger an alarm relay nor require acknowledgment for inhibited tags Inhibited tags are not added to the alarm summary and events log Automatic inhibiting of alarms can occur triggered by specific process conditions In this case, the inhibiting occurs based on the condition of another process variable

Process Trending

Trending at the console offers an historical perspective of process conditions for analysis of current operations The console displays this data referenced to time, or as a function of other process variables The data can also be printed

Trend Display

The console provides standard trend displays of varying sizes The standard display element supports up to five trended variables with changeable display range, time span and resolution Several functions inherent to trend displays allow moving, expanding, shrinking and magnifying the display through keyboard actions Any changes affect the display only and remain in effect only until exiting the display

Move time cursor when the time cursor is activated and moved along the trend line, the system digitally displays the historical value indicated by the position of the time cursor

Modify range the operator can change the high scale limit and low scale limit individually for each trend line displayed individually The current data segment and any other data that the cursor is moved to uses these set scale ranges

Pan a pan function shifts the display back in time to show an historical perspective of the process variables

Zoom the zoom function expands or compresses the time span of the element for easier trend analysis

Magnify a magnifying glass function expands the time scale for a limited section of the trend display to determine the exact time a process disturbance occurred

XY Graphs Trending can incorporate XY graph elements that compare up to five process variables as a function of a sixth, or five pairs of variables whose x coordinate position is determined by one proc ess variable, and y-coordinate position by another

Operator Assignable Operator assignable trends allow trending any tags in the tag da tabase, or function blocks in a PCU module control scheme not defined as tags This function is separate from trends defined in the trend list Up to 20 operator assignable trends can be config ured to help analyze specific process events The console updates these trends at two-second intervals and stores up to two hours of data

Logging

The console logging features automatically document process op-erations summaries, or specific events as they occur The console has extensive logging capabilities to create custom, sequence of events and system events records

System Events Log The system events log provides a sequential list of process and system alarms, process events, operator actions and operation notes A system events log can print continuously, periodically or on demand The console can save a maximum of 1,000 of the most recent events on the hard disk for periodic printing, and archiving for long term storage

Custom Logs Custom logging capabilities create spreadsheet format summaries of two types Periodic or system event triggered The periodic log produces operations summaries hourly, daily, weekly or yearly The event triggered log produces summaries of a particular op-eration (e.g , batch report, prefault and post fault log)

A defined time or process event, or operator demand triggers data collection and printing for each report Printing can also occur af ter the log completes a scheduled collection period The console allows saving on its hard disk a maximum of nine of the most re cent generations of each configured log Some standard custom logs include trend, trip and snapshot logs

Trend log collects and prints trend data at specified intervals for up to 20 trend tags, with up to 250 values for each trend In tervals for data collection range from one collection per minute to one collection in a 24 hour period

Trip log provides a history of up to 20 trend tags A maximum of 250 values for each tag composed of pre event and post event data can be included in a trip log

Snapshot log - collects and prints the current values of up to 250 tags at log completion time Snapshot logs can be tag event or time triggered

Sequence of Events Log

Sequence of events logs access data collected by the Bailey Controls sequential events recorder (SER) The sequence of events report generated by a recorder provides one millisecond resolution time tagging for critical event data time of occurrence Report types include scheduled standard, prefault, post fault and snapshot reports, and operator initiated summary reports

Archival Storage and Retrieval

The console provides for digital storage of trends, logs, system events, PCU configurations and tag data in any combination of information, on any supported archive media The console supports three media types Floppy disk, and optionally magnetic tape or optical disk Archived system events and log data can easily be read back into the console for printing Trend and PCU configurations can be read back into the console for display and PCU management respectively Database summaries derived from archived tag database snapshots can also be printed

Information storage the console automatically transfers archival information it temporarily stores to its hard disk to removable archive medium The console stores or indicates the necessity to force storage of data before the temporary storage area becomes full and archived data loss occurs A message displays to identify required operator actions when the archive medium is approaching capacity The period of data archived for process history depends on the amount and types of information being archived

Information retrieval archived information to be retrieved is transferred from the archive medium to hard disk The console transfers only information for a specified time period A retrieval utility searches the time tagged archive files for the required time period Retrieved trends can be displayed, manipulated and copied

INFI 90 System Status and Diagnostics

The console provides system and node status displays that show status for each device in the INFI 90 system Status is available for all control, data acquisition and communication modules, consoles and PCU power supplies in the system The console provides module problem reports used to diagnose faults down to the individual I/O level for ease of maintenance

The console also provides a set of diagnostic functions specifically designed to facilitate the diagnosis of communications related problems These functions provide diagnostics information on a system wide basis The functions help to reduce the time and effort spent diagnosing communication related faults, and to minimize the need for time consuming visual inspections of nodes and modules to determine the origin of a communications problem

INFI 90 System Tuning and Configuration

The console allows tuning and configuration of the INFI 90 modules over the communication highway Tuning displays are available for control loops The tuning display includes a manual/auto station for the loop, a trend display for fast monitoring of control output (CO), set point (SP) and process variable (PV) during tuning, and a PCU block detail display for adjusting loop tuning parameters

PCU module configuration and management utilities also support both module configuration and tuning Key lock and password security protect against unauthorized tuning and configuration changes

Display Configurator

Displays are designed on the Bailey Controls engineering work station (EWS) using an interactive, command oriented display generator called screen oriented display generator (SODG) This display generator combines free form drawing and text configuration capabilities with libraries of symbols and display elements to provide an efficient engineering tool The SODG utility is part of the software, logging, database and graphics (SLDG) software program

The console and SLDG software include a library of standard symbols most commonly used in display design These symbols are designed into displays as either static or dynamic symbols Provisions are included for separate user symbol libraries This library permits custom symbols to be established and saved for repeated use

An engineering work station running the SLDG program and connected to the INFI NET communication highway has the ability to create then transmit displays to an on line console After receiving a transmitted display, the console automatically processes the display, which is then available at the next display call up Display transmission does not interrupt normal operation, and does not require any special setup

Operator Configurable Displays

Operator definable and configurable displays allow the operator to easily group critical combinations of process variables for effective process management during abnormal circumstances. Up to 25 displays can be configured in a menu driven fashion Each operator configurable display can include standard faceplates of all tag types (e g , manual/auto station, device driver), trend display elements and alarm summary elements If desired, these displays can be made permanent for use in normal operations

Alternate Language

The console supports configurable alternate language sets and keyboards Phrases and key words used throughout the system are configured to be either English or alternate language These include such things as day of the week, station modes, operator messages, engineering units, etc Any tag descriptive attribute is selectively configured for English or alternate language

OPERATING THEORY

The console processes information from messages it receives over the communication highway, and performs control through messages it sends on the highway It does this through its multibus modules that provide the interface to the loop These modules make up the communications interface unit of the console

During start up or reset, the console downloads its database list to the interface unit The database provides information the interface unit needs to establish a communication route to individual points in the process Once downloading is complete, the interface unit both transmits and receives messages as directed by the console The interface unit also provides data storage until the console is able to process any received data Communication modules handle the data transfer between PCU modules and the communication highway

Message types include

- Data transfer
- Exception reports
- Module status
- Process control
- Trend data
- Tuning and configuration

Data transfer messages allow the console to read analog real values or digital states, and the status of these points within a process control scheme The console can then display these process variables on its screen or store them on disk for later viewing This is a request/reply message sequence The console sends a request data message to a PCU module, then the PCU module sends a reply with the requested data

Exception reports appear on the screen as dynamic values, alarms and state changes The console first generates a message to establish an exception report route between it and a PCU module Once established, exception reporting becomes automatic The console receives PCU module exception reports periodically to update values, after a process point reaches a defined alarm limit or changes state, or a significant change in value occurs There are several alarm indicators that can be communicated in exception report messages

The console generates process control messages after an operator initiates control actions through the keyboard. Control can be performed through the keyboard only, ***not*** the display (i.e , touch point) These messages allow the operator to exercise station, remote control and device driver control from the console

Trend data messages allow the console to acquire historical process information collected by the INFI 90 distributed trending system This information is necessary for process trend analysis (trending) and process evaluation A trend data message initiates a request/reply data transfer sequence The console sends a request for trend data, a PCU module replies with the requested, collected, time-stamped data

The console generates module status request messages to read then display INFI 90 module status and problem reports The status of most PCU modules can be requested A module status request from the console causes a module to reply with its status bytes and a detailed problem report

NOTE Not all PCU modules are capable of sending status byte or problem report information

The console uses tuning and configuration messages to initiate its inherent PCU module management capabilities These capabilities include reading, writing, deleting and tuning function blocks

The console permits access to the INFI 90 system for three purposes

- Control engineering
- Plant operation
- System troubleshooting

Control Engineering

The console access to PCU module configurations enables the following functions for creating and maintaining module configurations

- Change module operating mode
- Copy a configuration from module to disk (save)
- Copy a configuration from disk to module (restore)

- Verify configuration against disk
- List module configuration to printer
- Red tagging

  NOTE Red tagging s for status purposes only and does ***not*** prevent operat on of equipment Red tag status communicated to the console alerts personne to equ pment or system prob ems wh ch could cause damage or njury t appl es to spec fic function blocks def ned with controllable tags such as DADIG DANG DD MSDD RCM RMCB S‾A‾ ON, and EX I STR type tags

The CONFIG/TUNE key lock switch and password security protect against unauthorized use of these module configuration capabilities

Plant Operation

The console lets the operator monitor the process and take control action when necessary Once the system is configured, exception reports that contain the process variables for selected control scheme points travel to the console from other nodes over the communication highway The console receives this data and displays it on the screen Operator actions at the keyboard auto matically send messages to the PCU modules to initiate control action PCU modules directly interface with the process after re ceiving information entered at a console

NOTE Tak ng the console off line or a conso e fai ure n the NFI 90 system has no effect on contro scheme execut on by PCU modu es

Exception reports update process values displayed by the console The engineer determines the amount of change that is significant, maximum and minimum limits for alarming, and maximum and minimum time (in milliseconds) for exception reporting during module configuration The exception report process enables the console to display current data without continuous polling

PCU control modules can send exception reports for individual variables or a collection of variables from PID (i e , process vari able, set point and control output) and on/off control functions (e g , remote control and device drivers) A hardware address of the function block originating the report identifies each exception report This address contains the loop, PCU, module and block number

A tag configured in the console represents each exception report The engineer defines each exception report item the console monitors as a tag during configuration Tags are defined points in the INFI 90 system that the operator can monitor or control

The console provides a structured view of the plant through its operational displays Once configured, the operator initiates all monitoring and control actions through these displays and the keyboard It uses two main categories of operational (data) displays Summary and status, and process monitor and control

SUMMARY AND STATUS DISPLAYS

The summary and status displays provide a broad view of plant processes The current information relating to INFI 90 equipment and alarms, and console operations can be viewed at these displays The console provides standard summary and status pages which can be used as is or user-configured Standard displays of this type are usually in a tabular format Most are assigned dedicated keys, however, others must be assigned to keyboard assignable function keys for easy, one-key access

Alarm summary - reviews the status of up to 1,000 of the most current alarms The number of alarms that are saved and appear in a summary is configurable

Device status shows the status of each console peripheral device The console provides a standard device status display

Display summary can contain a complete list of all displays in the system This display can enable an operator to view a complete list and call each display in the list through keyboard selections

Tag summaries presents the current database status for a selected tag or group of tags These summaries can be printed or displayed

Operating parameters - identifies the current operating conditions and parameters for a selected tag It displays the tag type, hardware address and alarm limits It can be used to control reporting abilities (i e , scan on or off), inhibit alarming, substitute values and view the primary display for a tag In some cases, the page has selections for viewing the block details, tuning and module problem report page depending on the tag selected These are all console level operations In other cases, the page presents options that directly control the operation of a function block in a PCU module

Log status shows the type, configuration parameters, printing status and current collection status (i e , active or inactive) for all types of custom logs and sequence of events logs It also allows activating or deactivating log collection, and canceling queued log prints

PROCESS MONITOR AND CONTROL DISPLAYS

The operator performs process monitoring and control through graphic displays designed to represent the overall plant process, detailed process unit or area, and individual plant devices Displays can be configured as static informational pages or interactive, dynamic operational screens They provide detailed information on process variables and manual control of process points

Process overview provides live process information to support control actions through schematic format displays (i e , process mimics) These interactive displays can contain dynamic symbols, dynamic process variables, and display and control select elements

Group display provides real time process information to support control actions It consists of a group of related faceplate format elements (i e , device mimics) Each faceplate represents an actual process control point or variable This type of display is normally called from a higher level graphic display

Process detail presents a combination of graphic process mimics and faceplates This type display provides a more detailed view, and process control of specific related process points It combines the process mimic and device mimic capabilities into a single display A process detail display is also normally called from a higher level graphic

Block details display gives access to a configured block in a PCU module, and displays the specifications and operating parameters for that block Parameters affecting the operation of a PCU module control scheme can be modified through this page

Tuning display - provides a display for tuning, trending and controlling a single station element and the block details for that element Effects of any changes made through this display can be viewed at a trend graph presented as part of the display

System Troubleshooting

A series of system status pages allows monitoring the operational status of INFI 90 equipment on the communication highway Each status page level can be used to narrow a problem down to a specific module The status information presented for a particular module is in the form of module status bytes and problem reports

System overviews operational status of INFI 90 equipment on the loop, displays both normal or problem conditions

Node reviews the status of each module within a process control unit, displays both normal or problem conditions

Module gives a detailed status review of a single module Monitors and displays the status bytes and problem reports of a module

Module firmware can be used to acquire firmware levels for modules in any given process control unit This display also presents the type and current mode of each PCU module

Topology summaries - can be used to overview the communications status of a selected loop and individual nodes of the loop

TRENDING

The console provides the capability of gathering data collected by the INFI 90 distributed trending system PCU modules perform the actual data collection and storage of data The console gathers and presents the data in trend or XY plot displays, records the data in custom logs, or archives the data to storage media for later analysis of process operations

Distributed Trending

Through a trend block, a trending capable PCU module performs the initial data compression and calculations for a trended process point This, and not the attributes defined during trend database configuration, determines the actual values a module sends to the console

The console can collect data from two different trend blocks A standard trend uses function code 66 (FC 66) to perform its data collection An enhanced trend uses function code 179 (FC 179) to perform its data collection

STANDARD TRENDING (FC 66)

Any analog exception reporting function block can be trended using the standard trend block A digital point can also be trended but requires some additional setup and signal conditioning in the control scheme

A trend block determines how often the PCU module collects data for a trended point. For a standard trend, it can be gathered in two ways depending on the selected *resolution in the control* scheme of the module Resolution refers to normal or fast trending Normal trending stores values at one minute intervals, fast trending stores values at 15 second intervals

Another characteristic determined by the PCU module control scheme is the mode of collection For a standard trend block the collection modes are sample, maximum, minimum, sum or average This determines the final value that a module sends to the console based on the values seen during the resolution interval (i e , 15 seconds or one minute)

Sample mode the module saves a value every 15 seconds or one minute

Maximum or minimum mode the module saves either the maximum or minimum value seen during the time interval

Sum mode the module calculates the total of all values collected during the interval

Average mode the module calculates the average of all values collected during the interval

ENHANCED TRENDING (FC 179)

An enhanced trend provides additional capabilities beyond those available in the standard trend block It provides flexibility in both types of data that can be trended, and in sampling resolution The function blocks that the enhanced trend block allows direct trending of include

- Analog exception report (FC 30)
- Digital exception report (FC 45)
- Remote control memory (FC 62)
- Remote manual set constant (FC 68)
- Control station (FC 80)
- Device driver (FC 123)
- Multi state device driver (FC 129)
- Remote motor control (FC 136)
- Data acquisition analog (FC 177)
- Data acquisition digital (FC 211)

The enhanced trend block still determines how often the PCU module collects data, but it provides greater resolution in its collection An enhanced trend block can collect and store data at a resolution of one sample per second

Another characteristic determined by the PCU module control scheme is the mode of collection For an enhanced trend block the collection modes are sample, maximum, minimum, sum, average or range This determines the final value that a module sends to the console based on the values seen during the resolution interval

Sample mode the module saves a value based on the input sampling time set in the PCU module control scheme

Maximum or minimum mode the module saves either the maximum or minimum value seen during a specified time interval (statistical time period)

Sum mode the module calculates the total of all values collected during the interval

Average mode - the module calculates the average of all values collected during the interval

Range mode the module calculates the value as maximum mi nus minimum samples collected over the interval

NOTE Enhanced trending requires INF NET commun cat on h ghway

Trend Data Collection

The console requires a trend to be defined in its database to ac cess data collected by a PCU module trend block Performing trend definition at the console or off-line SLDG establishes a list of trends from which the console is to collect data A trend tag references the trend block in a PCU module configuration This allows the it-
self and the trend block

The console collects data from PCU modules over the communi-cation highway Once the console establishes a communication route to a trended point, it initiates and directs trend data poll messages to the PCU module to collect data The module then replies with the requested, collected, time stamped data The console establishes communication with a point during start up or reset

A PCU module capable of trending can store approximately 30 minutes of collected trend data for a standard trend The console polls the module prior to the 30 minutes to collect data and pre vent any data loss For an enhanced trend, the module sends a trend data notification message to indicate that the console needs to poll the module for trend data The console then responds to the notification by polling the module for the data In this case, there is no fixed time of collection for the console A PCU module does ***not*** send any trend data until the console requests it

The console stores the data received after polling a PCU module in a trend data file (***.TR***) on its hard disk The file can maintain up to three months of data for a standard trend For enhanced trends, the maximum number of events saved to disk as set during the definition of the trend determines the amount of data stored in a trend data file Archiving functions allow storing and retrieving this data indefinitely

NOTE *Current y enhanced trends cannot be archived*

While viewing a trended variable, the console polls the PCU module almost continuously to collect trend data It updates the display every 15 seconds or one minute for standard trends, or at the display resolution interval defined for enhanced trends

TIME-STAMP

Communication highway time synchronization establishes a common system time (absolute time) for all nodes on the loop Functions that collect and time stamp data use this system time as their time stamp reference value. PCU modules performing trending time-stamp collected data with this system time.

A node designated as the time sync master maintains system time for all nodes on a loop. The time sync master maintains the time by issuing a module time-sync message directed to the communication modules of each node on the loop. The communication modules verify then relay the time in this message to their local modules. A module processes a time sync message only while in execute mode. A communication module sends a time sync message to its modules:

- When a module first starts up.
- After a module changes from configure to execute mode.
- After it receives a new time sync message.

A module that is sent a set time command message from a communication module must reply to acknowledge receipt of the message. If the reply is not received by the communication module, the time sync sequence repeats.

The console can become the time sync master on a loop. Normally, the console becomes the master when the *Set Time and Date* function is used to set the system time to Greenwich Mean Time (GMT). If there is more than one console in the system, the consoles perform an arbitration process to establish a time sync master. This allows the console with the most accurate external clock to assume the responsibility of maintaining system time. Refer to ***SET DATE AND TIME*** in the ***Utilities*** section for further explanation.

SECTION 3 - KEYBOARD AND PERIPHERALS

INTRODUCTION

This section describes the keyboard and peripheral devices the operator interface station (OIS) uses to enable and enhance its process monitoring and control capabilities

KEYBOARDS

The keyboard is the main communication interface between the operator and the INFI 90 system During operation, the operator uses the keyboard to perform process monitoring and control It enables entering process changes and values, processing alarms, and selecting displays The process engineer or technician uses the keyboard to define operating parameters enabling console operation, and also for INFI 90 system troubleshooting and module configuration

> **NOTES** When the term keyboard appears in this instruction without a qualifying mylar or auxiliary it refers to the mylar keyboard

The console supports two types of keyboards A standard mylar keyboard and an auxiliary engineering keyboard (QWERTY style) Both types provide the same access to functions The layout of each type keyboard is different to facilitate specific kinds of operations The mylar keyboard is designed for operating ease when performing normal operation A QWERTY layout engineering keyboard is for ease of data entry and configuration

This section describes each block of the standard mylar keyboard identifying its keys and their functions Refer to Appendix A for auxiliary keyboard key mapping Figure 3 1 shows the layout of the standard mylar keyboard

KEYBOARD LAYOUT

The mylar keyboard is a flat panel divided into blocks of related overlay pushbutton keys Pressing any key provides both tactile and audible feedback. Each block of keys relates to a specific type of operation (see Figure 3 2)

This section provides a brief description of key functions intended only as a quick reference Other sections of the instruction provide more information for those keys requiring additional explanation

Display Control

The display control block keys give single key access to the different configuration and operational displays available at the console This block also provides keys for moving between the

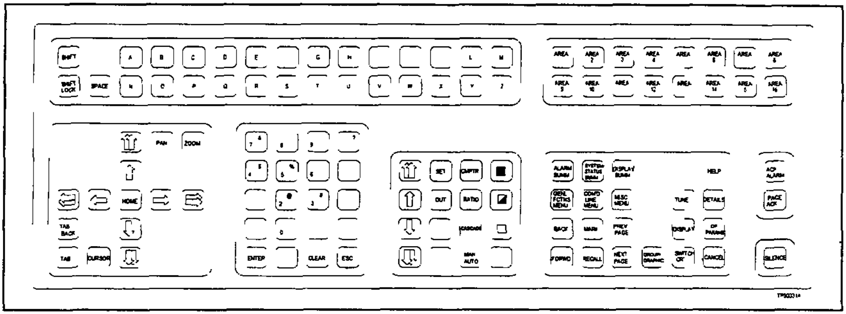

Figure 3-1. Mylar Keyboard

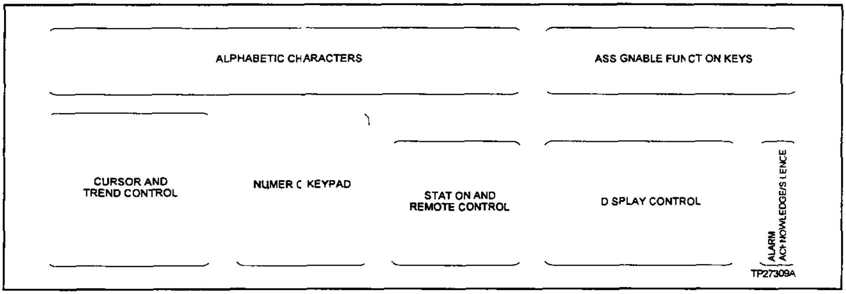

Figure 3-2. Keyboard Sections

different displays. Table 3-1 describes the function of each display control block key.

Table 3-1. Display Control Block Keys

Key	Function
ALARM SUMM	Displays a user selected alarm summary display. Usually used to call a display that lists all current process alarms. The process engineer defines tags that are to appear in the alarm summary during configuration.
BACK	Recalls the previously selected display. When pressed repeatedly, moves through the last six displays most recently called by the operator.
CANCEL	Cancels an operation. It is the first key in a two key sequence. Once pressed, the console prompts to *ENTER function to be canceled*. Use with **CURSOR** to remove the mouse or trackball cursor.

Table 3-1. Display Control Block Keys (continued)

Key	Function
COMND LINE MENU	Calls a list of options that appear at the bottom line of the screen. The command line menu options presented are: *CALC* - provides an on-line 4 function calculator to perform addition (+), subtraction ( ), multiplication (*) or division (/). An input field appears after selecting this option. The field allows entering calculations using the operators available in the numeric keypad. Press [=] after keying in the calculation to see the results of the calculation. *NOTE* - calls an input field that allows entering notes into the events log. *ASGN PRN* - initially defines or changes printer assignments. This determines, for example, where the console directs print tag list request. *PRINT* - initiates a screen print of the current display to an assigned printer. The keyboard status block shows the printer number where the printout will occur. Refer to ***PRINTER OPERATIONS*** in this section for procedures. *LOG/NAME* - gives access to the *Log by Name* function for printing configured log reports. Refer to ***Printing and Displaying Log Reports*** in the ***Recording Process Data*** section for specifics. *PASSWORD* - calls an input prompt to log in a password (user). A password dictates the functions and displays to which designated personnel have access. The user index number for the currently logged in user appears in the keyboard status block. *LOG OUT* - logs out the current password and logs in a default password.
DETAILS	Calls up the block details for a selected tag on the display. If no tag is selected, a prompt appears requesting the tag name or index number, or loop, PCU, module and block address. After selecting a tag using the input prompt or the mouse or trackball, control of that tag is automatically enabled if the *Build Select Tag Table* function has been turned on during system configuration. This provides the automatic control enable feature.
DISPLAY	Calls the primary display for a selected tag. The tag must have a primary display assigned to it before this key can function for that tag. A primary display can be assigned during tag database configuration, only one display per tag.
DISPLAY SUMM	Calls a configured display summary. The process engineer can create a summary graphic containing a list of available displays and assign this graphic to the display summary key during keyboard configuration. A display select function, if built into the display summary, allows an operator to call any display listed in the summary.
FORWD	*Provides the same function as* [BACK] *except it starts at the last of the six previously selected displays and moves forward to the most recent.*
GENL FCTNS MENU	Displays *a menu containing functions available to the operator and engineer. This* is the main menu and presents the following options: *A OIS Configuration* *B OIS Utilities* *C OIS Operation* Refer to the ***Menu Structure*** section for a tree structured view of functions accessed after selecting any of the three options presented.
GROUP GRAPH	Does not function in this software release.

Table 3 1. Display Control Block Keys (continued)

Key	Function
HELP	Can be defined to present a user configured menu of instructions related to process and OIS operation Normally calls the highest level menu in a set of defined help menus when assigned to this key during keyboard configuration
MARK	Flags the current display for later access This is similar to using a book page marker Up to ten displays can be marked To use this function press **MARK** then a numeric key (0 to 9) The display can then be recalled at any time using **RECALL** For example **MARK** 2
MISC MENU	Displays a full screen menu that allows access to the following options *Log Status* used to view the status of both custom and SOE logs The status functions also provide the ability to activate or deactivate log collections and cancel queued prints *Log by Name* initiates a printout or display of a custom SOE events or operator actions log *Display by Name* used to call a display by entering its name The name corresponds to the assembled display file name without its two-character extension This option can call any type of display including operator configurable displays
NEXT PAGE	Accesses the next page when a function uses multiple pages (e g alarm summary display summary etc) Normally used in conjunction with **PREV PAGE**
OP PARAMS	Calls the operating parameters display for a given tag This display presents information relating to the tag configuration, and allows turning scan on or off enabling or disabling alarming calling a primary display and substituting values for a tag For certain tag types, a tuning, block details and module problem report display selection is available
PREV PAGE	Accesses the previous page when a function uses multiple pages (e g alarm summary display summary etc) Normally used in conjunction with **NEXT PAGE**
RECALL	Recalls a display marked using the mark key To use this function, press **RECALL** and the number assigned previously For example **RECALL** 2
SWITCH CRT	Toggles the keyboard assignment between a primary and secondary screen The status information relating to a screen displays at the lower left corner of the screen
SYSTEM STATUS SUMM	Calls up a defined display that contains the status for selected nodes The process engineer must define N90STA tags during tag database configuration to create a system status summary display Once tags are configured they appear in the summary to allow monitoring of all nodes control modules, communications modules and power supplies Frequently, used to call the highest level system status display in a hierarchy of status displays
TUNE	Calls a tuning display for a selected STATION type tag if the key lock switch is in the correct position and tuning access is enabled through password security A tuning display allows modifying tunable parameters that affect process operation (continued)

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Table 3 1 Display Control Block Keys (continued)

Key	Function
TUNE (continued)	After selecting a tag using the input prompt or the mouse or trackball control of that tag is automatically enabled if the *Build Select Tag Table* function has been turned on during system configuration This provides the automatic control enable feature

Alphabetic Characters

The alphabetic character block keys enable the operator to enter required input character strings, or to select menu options or display elements to initiate console operations The keys in this block include the 26 letters of the English alphabet and SPACE, SHIFT and SHIFT LOCK keys Table 3 2 describes the function of each alphabetic character block key

The console is case sensitive When entering characters, make sure to take note of upper or lowercase For example, entering **tagname** will not call a tag named TagName Additionally, all file names must be entered, and menu selections must be made using uppercase letters At start up or reset, the console defaults to uppercase letters

Table 3-2 Alphabetic Character Block Keys

Key	Function
26 alphabetic keys	Enable entering required input strings Select options or initiate operations when pressing the key corresponding to a display or control select character The display or control select characters are defined during display creation
SHIFT	Enables typing lowercase alphabetic characters or upper position punctuation characters in the numeric keypad Press and hold SHIFT then press the desired character key The status of SHIFT LOCK determines if this key enables uppercase or lowercase characters
SHIFT LOCK	Locks the alphanumeric keys into either of two positions Typing all lowercase letters and upper position punctuation characters, or all uppercase letters numbers and arithmetic operators (e g + * / etc) The current toggle position of this key can be seen in the keyboard status block at the lower left corner of the screen
SPACE	Fills a character position in a field with a blank space

Numeric Keypad

The numeric keypad block has four groups of characters Numbers, punctuation, arithmetic operators and function keys Table

3.3 describes the function of each numeric keypad block key. The keypad enables:

- Entering numeric portion of an operator input.
- Entering any numeric value for operations such as tuning, function block changes, calculations, and setting set point, ratio or control output.
- Clearing data entry fields.
- Entering information into the console.
- Escaping to cancel the current operation and return to a previous operation.
- Entering arithmetic operators in calculations when using the calculator function.

Table 3.3 Numeric Keypad Block Keys

Key	Function
Numeric keys	Enable entering numeric values, punctuation and arithmetic operators.
ENTER	Inputs the value or data typed in answer to a system prompt. Press **ENTER** after keying in alphanumeric values or character strings at an input prompt or field. At some configuration pages, must be pressed after completing any and all changes to enter the changes made and update the configuration.
CLEAR	Erases any data from an input field. It can be used to clear an error made while entering data or old data from an input field. To clear data, this key must be pressed before **ENTER**.
ESC	Cancels a current operation or function at certain pages. Causes the console to exit the current display page to return to a previous display. Option presented in messages usually along with an enter option to allow aborting an input or operation.

Cursor and Trend Control

The cursor and trend control block keys have two functions: Cursor control for data input and display item selection, and trend display control.

An input cursor normally appears as a highlighted field that allows data entry. It can be positioned at any display field by using the control keys. The cursor also can be positioned using these keys to select certain elements for control and alarm acknowledgment. The cursor highlights the outline of an element to identify it as being selected.

After activating a trend element, the keys in this block perform functions inherent to all trend displays These functions allow changing the display presentation for better analysis of trended process data

Table 3 4 describes the function of each cursor and trend control block key

Table 3-4 Cursor and Trend Control Block Keys

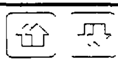
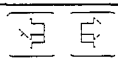
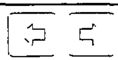
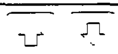
Key	Function
	***Cursor control*** - move the input cursor one field in the direction of the arrow ***Trend control*** - zoom the trend presentation This changes the display resolution to increase or decrease the amount of historical trend data displayed Perform the same function as [ZOOM] without specifying a zoom factor In addition used to zoom the trend curve inside a trend magnifying glass
	***Cursor control*** move the input cursor one field in the direction of the arrow ***Trend control*** - pan the trend presentation Depending on the key pressed each keystroke causes the display to move either forward or backward in time Press to move back to a specific time and date or move forward toward the current time and date These keys do not bring up the time and date prompt
	***Cursor control*** - move the cursor within an input field one position in the direction of the arrow ***Trend control*** move the time pointer in the direction of the arrow Using these keys places the time pointer at a specific time which is done to view historical values at the pointer location or before enabling the magnifying glass Fine tune the position of the trend magnifying glass after enabling the glass
	Move the input field one position in the direction of the arrow when at the key macro configuration page
CURSOR	Calls a cursor to the screen for using the either mouse or trackball as the selector Performs the same function as [ENTER] while the cursor is active
HOME	Resets an input field to the text string it held when the display was first called Allows an input error to be corrected but must be done before pressing [ENTER] Removes the alarm cursor when there is cursor tabbing on the screen Cursor tabbing relates to alarm acknowledgment functions Used to return to the first page of an active alarm summary element
PAN	Calls a time and date field while at a trend display The field allows entering a time and date to move the display to a specific time of historical trend data
TAB	***Cursor control*** - moves the input field to the next logical data input field determined by the console Moves between alarming tags on a display to allow acknowledging individual alarms Press [ACK ALARM] first to use this key for selecting alarming tags ***Trend control*** - moves the input field between scale limit fields of a selected trend element

Table 3-4. Cursor and Trend Control Block Keys (continued)

Key	Function
TAB BACK	***Cursor control*** - moves the input field to the previous logical data input field determined by the console. Moves between alarming tags on a display to allow acknowledging individual alarms. Press [ACK ALARM] first to use this key for selecting alarming tags. ***Trend control*** - moves the input field between scale limit fields of a selected trend element.
ZOOM	Calls a *Zoom factor* field while at a trend element. This allows increasing or decreasing the amount of displayed historical trend data by entering a zoom factor (-9 to 9). Changes the mouse or trackball from low to high speed when the cursor is on the screen and a trend element is not selected.

NOTE: To perform any trend control using these keys, a trend element must first be selected.

Station and Remote Control

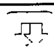
The station and remote control block keys permit changing control and operational mode of any station function block, and enable manually changing control output, set point and ratio index values. They also can change the current state of any two position or three position control device, and the operating mode for a data acquisition function block. A control element must first be selected to make any changes. The faceplate element for either a station, remote control device or data acquisition function block will reflect any changes made through the keyboard.

Table 3-5 describes the function of each station and remote control block key.

Table 3-5. Station and Remote Control Block Keys

Key	Function
CASCADE	Changes the selected tag to or from cascade mode. This key is only functional for cascade type STATION tags.
CMPTR	Changes the selected tag to or from computer mode. Selects the alternate input source mode for a DANG or DADIG tag.
MAN AUT	Toggles the selected tag between manual and automatic mode. Manual mode allows the operator to take control and change output. Automatic mode allows the control scheme in a PCU module to control operation. For a STATION tag, automatic mode allows the operator to change the set point or ratio index of a STATION tag while still under PCU module control. For a TEXTSTR tag, the mode determines how an input from the console is handled by a PCU module. Toggles between user input source mode and normal input source mode for a DANG or DADIG tag.

Table 3-5. Station and Remote Control Block Keys (continued)

Key	Function
OUT	Displays the current output value of a selected tag. Once pressed, a control output *TARGET* prompt allows the operator to change the output value.
RATIO	Displays the ratio value of a selected tag. Once pressed, a ratio index *TARGET* prompt allows the operator to change the ratio value.
SET	Displays the set point value of a selected tag. Once pressed, a set point *TARGET* prompt allows the operator to change the set point value. Calls a *SET U/IN* prompt and input field to change the user-inserted value for a DANG or DADIG tag. Calls a *TGT TEXT* prompt and input field to allow the operator to input a text string for a TEXTSTR tag.
	Changes a selected remote control memory (RCM), device driver (DD) or remote motor control block (RMCB) tag to its one state (on). It changes a multi-state device driver (MSDD) tag to its three state. Changes the user-inserted value for a DADIG tag to the one state. Sets an alarm indication to allow the operator to indicate that there is an alarm condition associated with a text string entry for a TEXTSTR tag.
	Changes a selected MSDD tag to its two state (mid state).
	Changes a selected RCM, DD or RMCB tag to its zero state (off). It also changes a selected MSDD tag to its one state. Changes the user-inserted value for a DADIG tag to the zero state. Sets a no alarm indication to allow the operator to indicate that there is not an alarm condition associated with a text string entry for a TEXTSTR tag.
 	Ramp a value 0.2% of span per keystroke. This allows the operator to effect a slow ramping set point, control output or ratio index change.
 	Ramp a value 4.0% of span per keystroke. This allows the operator to effect a fast ramping set point, control output or ratio index change.

Assignable Function Keys

The user assignable function keys can be set to provide single key access to frequently used group, graphic or summary displays. These keys can also contain defined macros to consolidate multiple operator keystrokes into a single key.

During keyboard configuration, the process engineer can assign a user created display or a defined macro to any one of 32 available function keys. Press SHIFT along with these function keys to access the 16 additional function keys (F 17 through F 32).

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Alarm Acknowledge and Silence

The alarm acknowledge and silence block keys permit acknowledging process, system or device alarms (i e , stopping a flashing alarm indicator) and silencing an alarm tone A process alarm notifies an operator that a process value has exceeded an alarm trip point set in the PCU module. A system alarm indicates a fault in the INFI 90 system, and a device alarm indicates an OIS peripheral fault In any of these situations, an alarm indicator flashes yellow in the upper right corner of the screen

An alarm indicator continues to flash until accessing its display page or an alarm summary and pressing [ACK ALARM] or [PAGE ACK] This acknowledges the alarm and stops the flashing The alarm indicator remains on all displays until the problem is corrected causing the alarm or process value to leave its alarm state (i e., return to normal)

If the process engineer assigned an alarm tone to an alarm group during configuration, [SILENCE] stops the alarm tone associated with that alarming group but does not acknowledge alarms Also, if the *Relay Hold until Silenced* field at the system configuration page is set to *YES*, [SILENCE] opens all relays that have closed due to an alarm condition

Table 3 6 describes the function of each alarm acknowledge and silence block key

Table 3 6 Alarm Acknowledge and Silence Block Keys

Key	Function
ACK ALARM	Acknowledges process and system alarms The first time it is pressed a cursor appears at the screen After tabbing the cursor to an alarming tag on the display, it acknowledges the alarm for that tag only
PAGE ACK	Acknowledges all tags in alarm on the current display
SILENCE	Turns the audible alarm tone associated with an alarm off. Pressing this key does not acknowledge an alarm Tags continue to flash on the screen until they are acknowledged Opens all relays that have closed due to an alarm condition if the *Relay Hold until Silenced* field at the system configuration page is set to *YES*

NOTE Only tags with alarm/quality fields displayed are acknowledged when an acknowledge key is pressed

DATA INPUT

In general, the console uses two types of input fields One type has a limited number of permissible entries For example, each tag type for the console is distinct, and the console does not allow variations when inputting a tag type The other type of field used by the console accepts an indeterminate input For example, a

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name field accepts any alphanumeric character string up to the maximum characters allowed by the field

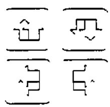
Making a Field Active

For configuration pages, the input cursor appears at the upper left most field available for entering data once the page is made active The active field always appears highlighted in reverse video

To move the input cursor and activate a field for data entry, press

TAB — Moves the input cursor to the next logical field determined by the console If there is an error, the cursor stays on the input field in error, and the system displays an error message Tabbing also enters data for the field from which the cursor was tabbed

TAB BACK — Performs the same functions as TAB, but moves to the previous logical input field



Moves the input cursor one field in the direction of the arrow Use these keys to randomly move about a display

Moves the cursor within an input field one position in the direction of the arrow

These keys are all located in the cursor and trend control block of the keyboard Refer to ***KEYBOARD LAYOUT*** in this section for its location on the keyboard

Inputting Data

As mentioned previously, an input field accepts either a limited number of choices, or it accepts an indeterminate entry Each input field is as long as the maximum number of characters allowed as input for the field An input field is highlighted (reverse video) when active Move the cursor within the active field and edit characters of the field using the cursor control keys

In either type of field, a new entry can be made by simply typing the entry The input field cursor operates in two ways

1 If the first key pressed is an alphanumeric key, the console assumes that the current information is to be replaced Any characters previously in the field clear and the entered character becomes the first character of the new entry

2 If a cursor control key is pressed first to move the cursor within the field, the console assumes that the field is to be edited

and does not clear the current entry It then operates in a character replace mode

To edit the ***first character*** in the field without clearing it, move the cursor right one space, then left one space

For those fields that have specific permissible entries, the console allows the operator to enter only enough of the entry to allow the console to distinguish the entry from other possible entries for that field For example, a field is to be defined with an RMCB tag type Keying in **RMC**, then either pressing ENTER or moving the input cursor away from the field is enough for the console to determine that the input is to be the RMCB tag type This is true for most fields of this type

Error Checking

The console performs error checking after entering data If the entry is invalid, it is not possible to leave the field until changing the entry or resetting it to its original entry HOME resets the current field to the text string it held when the display was first called

Press HOME while at a field, but before moving to the next field or pressing any other key to reset a field

Entering Alternate Language Characters

The console can be configured for an alternate language The console supports three types of character sets ASCII, extended and complex The ASCII character set is the default set This set supports English characters entered through the standard keyboards of the console

Configuration page input fields allow input from an alternate language keyboard or a standard keyboard File names, display names and numeric value fields require ASCII characters only

The console provides a character definition function that allows modifying or creating alternate language characters, refer to ***Alternate Language Substitution*** in the ***OIS Configuration*** section for specifics

EXTENDED CHARACTERS

An extended character set allows for up to 256 individual characters The console uses only characters within the first 128 characters of the default ASCII character set to allow the operator to enter, display, and print standard English characters

For extended character sets that support an alternate language, the set contains the same first 128 characters as the default ASCII character set, but provides additional characters necessary to support all of the required characters of the alternate language These characters are an extension to the default ASCII character set Most alternate languages can be supported with this type of extended character set as long as the alternate language does not require more than 128 characters

The number of extended characters required for a particular language determines the keyboard layout For some languages, the keyboard contains both the default ASCII characters and any additional characters as individual mylar keys The characters, in this case, can be entered by simply pressing the appropriate key For other languages, the keyboard contains both an alternate language character and an ASCII character on a single mylar key An alternate language shift key (ALT) allows toggling between alternate language character entry and English character entry This key is only available for those languages that require this type of functionality

Besides a keyboard that contains the alternate language characters, *the console also requires a printer that supports* the characters of the language to correctly print text Refer to the supplemental documentation provided with an alternate language kit for information specific to the alternate language

COMPLEX CHARACTERS

The complex set is for alternate languages that use numerous and intricate characters The console supports two methods of complex character input Serial input and Romanization

Serial input requires a serial input device or a personal computer that inputs the complex characters as standard encoded values, which consist of two bytes per character Using character Romanization the console translates ASCII character key presses into complex encoded characters

Complex character input is described in the supplemental documentation provided with an alternate language kit for a specific alternate language

ANNUNCIATOR DISPLAY PANEL

An annunciator display panel (ADP) extends the standard number of assignable keys An annunciator display panel provides single keystroke access to critical operating displays through pushbutton and LED pairs

The intended purpose of the annunciator display panel is to associate a display with an alarm indication, however, it can be used to call any display or function if desired Associating a display with an alarm indication allows the operator to locate a process value (tag) in alarm through a single key press

Each panel provides 32 pushbutton and LED pairs Any display generated for use at the console can be assigned to these pushbuttons Key macros defined at the console which incorporate a sequence of key presses can also be assigned A tag assigned to one of the LED indicator lamps causes that lamp to light when it enters an alarm condition

After proper configuration, an LED indicator lamp lights to notify the operator when a tag enters an alarm condition The operator can then press the pushbutton to call a display This display should be one at which the operator performs appropriate actions to correct the alarm Prior to configuration, pressing any of these pushbuttons calls a standard blank display

PRINTERS

A single console supports two printers These printers are for both automatic printing functions such as logging, and operator initiated prints The number of physical printers is defined during system configuration A device status tag (DEVSTAT) defined in the database identifies the type The printer types are

- ANSI low speed, no color
- ANSI low speed, color
- ANSI high speed, no color
- IBM®, no color
- IBM, color
- IBM, black and white, 24 pin
- IBM, color, 24 pin

PRINTER OPERATIONS

The console prints two types of reports Line by line and page oriented A line by line report outputs real time, individual line entries as they occur For the console, this includes the events and operator actions log when configured to print events or actions immediately A page oriented report does not occur until all data is collected and formatted as a complete document This applies to all periodically scheduled (or demanded) logs generated by the console It also applies for screen prints initiated through the *PRINT* option of the command line menu Although not required, the console can be set up to direct line by line reports and page oriented reports to separate printers

Printer configuration procedures explained in the ***OIS Configuration*** section set up logical printer assignments Logical printer assignments associate a physical printer to a logical printer number A logical printer number entered during log configuration directs a log printout to a specific printer

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Printer configuration procedures, specifically *Printer Assignment*, also allow selecting the desired magnification for screen prints initiated through the *PRINT* option of the command line menu. The magnification determines the size of the printed version of the screen A smaller size requires less processing time and less printer time

The *ASGN PRN* option of the command line menu assigns a printer to a screen and keyboard After making this assignment, the console directs all screen prints and some operator demanded prints (e g , tag summaries, print tag list, etc) initiated through the keyboard to the assigned printer

To assign a printer for screen printing or for a demanded print

1 Press COM'D LINE MENU

2 Press C to select the *ASGN PRN* option The console prompts with *Enter printer number*

3 Enter a physical printer number either 1 or 2 The keyboard status block should update to show the number of the selected printer Refer to ***KEYBOARD STATUS*** in the ***Display System*** section for an explanation of the keyboard status block

To initiate a screen print

1 Verify the correct printer assignment Check the keyboard status block at the lower left of the screen

2 Press COM'D LINE MENU

3 With the desired display at the screen, press D to select the *PRINT* option The screen should freeze for a moment while the console captures the display

Refer to ***Printer Assignments*** in the ***OIS Configuration*** section for procedures to set the magnification for screen printing Refer to ***CANCELING QUEUED PRINT JOBS*** in the ***Utilities*** section for procedures to cancel a screen print

> **NOTE** The console also supports a color video copier that can be used to reproduce true color prints of displays The color video copy can be initiated by assigning printer zero (*0*) to the screen then choosing the *PRINT* option from the command line menu

SECTION 4 - DISPLAY SYSTEM

INTRODUCTION

The operator interface station (OIS) presents various display formats on its screen. Each operational display aids in the monitoring and control of plant operations. This section first gives a general explanation of the display system including fixed system screen elements and user space. It then explains screen control through the keyboard, and optional touch screen and mouse or trackball.

DISPLAY SYSTEM

All operational displays are user configurable, however, the console does provide several standard symbols and text summary templates. Each operation, configuration or summary display in the console is part of the display or symbol library on hard disk. Table 4-1 lists the standard displays and symbols provided with the software. These files reside in the USN 54 directory on the hard disk.

Table 4-1. Display and Symbol Library File Listing

File (*.DT*)	Display/Element Type
ALMSUMFL	Alarm summary (full screen)
ANALOG1	Analog
ANCBOOL1	Digital annunciator
ANCREAL1	Analog annunciator
ANLGHF1	Analog (half height)
ATNKDBL	Atmospheric pressure tank (double size)
ATNKFL	Atmospheric pressure tank (full size)
ATNKHF	Atmospheric pressure tank (half size)
BOOLEAN1	Digital
BOOLHF1	Digital (half height)
DADIG1	Data acquisition digital
DADIGPOP	Data acquisition digital (pop up)
DCSFPOP	Control station (full size pop up)
DCSFULL1	Control station (full size)
DCSFULL2	Control station (full size always shows mode)
DCSHALF1	Control station (half size mode included with tracking)
DCSHPOP	Control station (half size pop up)
DEVDR1	Device driver
DEVDRPOP	Device driver (pop up)
DNGFULL1	Data acquisition analog (full size)
DNGFPOP	Data acquisition analog (full size pop up)
DNGHALF1	Data acquisition analog (half size)
MODLINE	Standard module status line for status pages
MSDEVDR1	Multi-state device driver

Table 4 1 Display and Symbol Library File Listing (continued)

File (*.DT*)	Display/Element Type
MSDEVPOP	Mu t -state dev ce driver (pop up)
N90STAT1	System status overv ew page (template)
NODL NE	Standard node status line for status pages
NODSTAXX	Node status summary page (template)
RCM1	RCM
RCMPOP	RCM (pop up)
RMCB1	RMCB
RMCBPOP	RMCB (pop up)
RMSC1	RMSC
RMSCPOP	RMSC (pop up)
TEXTSTR1	Text string
TRNDCOFL	Trend box w th control output text (full)
TRNDCOHF	Trend box with control output text (half)
TRNDDGFL	Trend box for digita (fu l)
TRNDDGHF	Trend box for dig ta (half)
TRNDPVFL	Trend box w th process var able text (fu)
TRNDPVHF	Trend box with process var able text (ha f)
TRNDR FL	Trend box w th rat o index text (fu)
TRNDR HF	Trend box w th rat o index text (ha f)
TRNDSPFL	Trend box with set point text (ful)
TRNDSPHF	Trend box w th set po nt text (ha f)
VALVEDN	Va ve down
VALVELT	Valve eft
VALVERT	Va ve right
VALVEUP	Valve up
XYAFL	XY plot ana og (ful)
XYAHF	XY p ot ana og (ha f)
XYDFL	XY plot d gita (ful)
XYDHF	XY p ot d g tal (ha f)
XYPFL5	XY plot (temp ate)

NOTE Fo trends and XY plots the ful and ha f designation does not refer to size but rather the attr butes that appear for each When us ng a ha f source fi e for a trend for examp e the tag descr ptor does not appear for the trend

The console uses standard faceplate symbols to represent certain tag types as device mimics, summary screen templates for use in system and alarm summaries, and fixed displays for menu screens These displays and symbols already have the required interactives to enable their functions Interactives are features built into displays that allow an operator to direct operations through them

> **NOTE** f standard facep ate symbols are to be mod fied to create custom faceplates t s suggested that the origina symbo f e be first copied and renamed Then perform the modifcations on the new renamed fi e Th s mainta ns the integrity of the prov ded symbol brary

Any standard symbol or template can be incorporated into any op erations in any display desired They can also be modified to customize operations Menu screens such as the *General Functions Menu* cannot be modified or be part of a user configured display

Display Characteristics

The console uses an x,y coordinate system to set up each of its different displays An x,y coordinate associated with each display element defines the position of that element on the screen An element is any item that is part of a display, and can refer to any component of the display from a simple valve to a complete faceplate symbol

The entire screen grid range is from 0,0 at the lower left corner of the screen to 10000,7500 at the upper right To maintain consistency throughout all displays, certain areas of the grid are reserved for fixed elements. The console reserves the outer segments of the entire grid for system functions (e g , date, time, interface unit status and alarm group indicators), prompts, messages and keyboard status The rest of the grid area (400,400 to 9600,7200) is available as user space for creating graphic summary and informational displays, and also for system menus

Many different elements combine to form a complete display page, but all pages share a few common features Each page uses a multicolored display scheme, and has a reserved space for a title line and bottom line prompts

The standard display screen is a 19-inch, high resolution color CRT The CRT accepts standard RGB (red, green, blue) inputs and is capable of up to 64 solid and 64 flashing colors

Figure 4-1 shows the common display features and their fixed locations that remain the same for all displays

TITLE LINE DISPLAY ELEMENTS

The top two lines of every display page are its title line. The information on these lines always has the same format regardless of which page is on display From left to right it shows

- Current time, date and day of the week (order depends on time and date format configuration)
- Display title
- Communications interface unit status
- Alarm group status indicators (system, device and process) and operator action request indicator

With standard configuration the title appears in cyan, alarm status indicators in yellow, and the remaining information in green

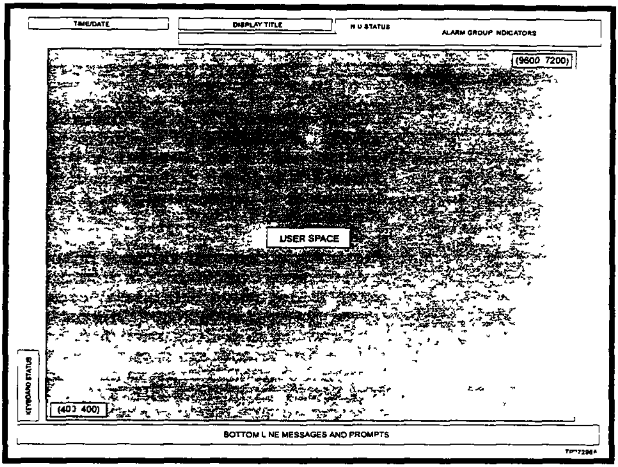

Figure 4-1 Common Display Characteristics

Time/Date The time and date are presented in military format by default. The format is hour:minute:second followed by day month year, then day of the week:

23 59 59 10 DEC 92 MONDAY

Time and date format configuration allows changing the order of appearance.

Display Title The display title is either the report title or display name. Report titles are fixed while a maximum of 25 characters can be entered for a user created display. Title position is normally above the user space starting at a coordinate of 3000,7350.

Alarm Indicators INFI 90 system, OIS peripheral, and process alarm indicators appear at the title line. If a process value exceeds its alarm trip point or a system or peripheral fault occurs, an alarm group indicator (*1* to *99*, *S* or *D*) appears to notify an operator. An alarm group number identifies the area containing a process fault. An *A* (action request) appears in this area to notify an operator that some action must be taken before the console can continue processing. If no alarms exist, this section of the screen remains blank.

Alarm group indicators display in two lines. The lowest 20 alarm groups display on the top line, right justified. When this area fills, the remaining alarm group indicators display right justified on the second line If both lines fill and there are more alarm indicators to display, an *M* (more alarms) appears right-justified on the second line

When an alarm indicator first appears it flashes to identify it as unacknowledged by the operator Once acknowledged, the alarm indicator for the group stops flashing. When the problem becomes corrected the *1* through *99*, *S*, *D* or *A* disappears

CIU Status The console indicates the status of its communications interface unit within the alarm group indicators area If the console indicates *offline*, the interface unit is not communicating on the communication highway and the console is not receiving data from the loop In this case, the console assumes that all points are in a bad quality state This does not apply to internal tag types (i e , INTANG and INTDIG) In most cases, resetting the console establishes communication with the loop

NOTE When the console comes up for the first time the *offline* message appears This is normal while the console downloads points to its interface unit

BOTTOM LINE DISPLAY ELEMENTS

Unlike the title line, the bottom line elements vary depending on the current operation being performed The following attributes are some of the items that appear as bottom line elements of the screen

Messages - all operator and error messages display at the lower right of the screen This area remains blank if there are no messages The message number (e g , *MSG 323* or *ERR 38*) appears to the right of the text string message A message may be up to 50 characters long Refer to Appendix E for a list of error messages

Operator prompts the bottom line area presents operator prompts and options available while viewing some displays Depending on configuration, a faceplate element can be set up to present its screen options in this area These prompts depend on the type of faceplate element

Input fields the console uses this area to present an input field when it needs additional input to complete a desired function For example, the appropriate prompt allows the operator to key in a name to call up a display or print a log when using the *Display by Name* and *Log by Name* options available through the miscellaneous menu

Command line menu various options display across the bottom line of the display after pressing COM'D LINE MENU An input field appears when certain options are selected from this menu

KEYBOARD STATUS

The keyboard status block appears in the lower left corner of all displays It presents from top to bottom

- User index number of the current logged in user
- Keyboard assigned to the screen
- Printer assigned to the screen
- Status of the key lock switch
- Status of SHIFT LOCK
- Status of ALT for an alternate language console

The user index number (1 through 128) identifies the last user to log in at the console Personnel log in by entering their passwords A password can be entered by selecting the *Password* option from the command line menu

A *KB* field indicates which keyboard is assigned to the screen The number following the *KB* is the physical keyboard number determined by its physical connection to the console Any display that appears at the screen can only be manipulated through key actions at the assigned keyboard When a keyboard is not currently assigned to a screen, *UNASSIGNED* appears at the keyboard status block of that screen

A *PR* field indicates which printer is assigned to the screen The number following the *PR* field is the physical printer number determined by its physical connection to the console at the power entry panel

PR 1 for the printer connected to P5

PR 2 for the printer connected to P7

The console directs any prints the operator initiates through keyboard actions to the printer shown This does not apply to printing of scheduled logs, which designate a specific printer in their configuration

When the key lock is in either the CONFIG (configure) or TUNE position, *CON* or *TUN* displays in the keyboard status block in cyan When the key lock is in the LOCK position, *con* or *tun* displays in green The key lock state shown in this block determines the operations permissible through the screen

When the SHIFT LOCK key is locked in uppercase letters, *SHF* appears in cyan When locked in lowercase, *shf* appears in green

When the [ALT] key is locked in the alternate position, *ALT* ap pears in cyan When not locked in the alternate position, *alt* appears in green This only applies for an alternate language console

USER SPACE

The user space is the area of the screen available for displaying any desired process information This area can be used to incorporate and display elements such as

- Static information and values
- Dynamic process data and symbols
- Keyboard and touch point display and control selects
- Station and control device mimics for process control
- Pop up station and control device mimics
- Alarm summaries containing current process or system alarms
- Tabular or XY graph trend elements
- Text summaries
- Menu options

COLOR SCHEME

The console has an established color scheme for its standard display pages and symbols The console displays specific types of information in the same color, regardless of the page on display, to allow quick recognition of different information by its color Standard displays present these colors against a black back ground

Cyan Static text or prompts that cannot be changed. Also, the outline of an element changes to cyan to identify it as being active

Green Dynamic items or user configured data

Red Control and display element selectors, menu item se lectors and outline of a red tagged element

Yellow Alarm conditions

Blue Display or symbol outlines A blue outline for a symbol identifies it as being inactive

Some display page element colors can be changed from this standard during configuration The foreground and background colors can be any system colors desired The process engineer is able to create any color scheme desired for user created displays, although a standard color scheme is recommended Colors are set during display creation

Display Element Escape Commands

Escape commands define each static and dynamic item presented at a display, and enable the capabilities of that display These commands, defined in a display source file, create the display presentation A display can be created to include process information and to enable process control and monitoring Some example commands are

pg 950,950;100,0;0,-100;0,-100~ draws a polygon, which can be used, for example, as the outline of a control element or entire display page

ed 42,32,1,1489,1512,124,3,0,7,1,6,2,0 references a tag with index number one to acquire the dynamic value of an analog process variable The value is for the process variable defined by the tag

ei 108,82,48,49,NODSTA01~ enables calling a display named NODSTA01 from the current display by key select The key parameters in this escape command identify the display select key combination as the 0 and 1

Refer to Appendix B for a complete list of escape commands and examples of complete display and symbol source files

Either the software oriented display generator SODG) utility or the elementary line editor (ELE) function can be used to create a display by entering these escape commands The SODG utility is part of the software logging, database and graphics (SLDG) program. The elementary line editor is available at, and accessed through, the diagnostic/debug terminal (DDT) of the console The difference between the two is that the SODG software automatically enters the required escape commands and their parameters for each created display element based on user entry The ELE function requires entering each escape command and its parameters for each element as individual line entries Refer to the ***Terminal Utilities*** section for additional information about the elementary line editor Refer to the ***Software Logging Database and Graphics (SLDG)*** instruction for additional information about SODG

Another difference in the two is that the SODG software also provides a screen presentation while creating the display Using the elementary line editor requires some prior work to map out the x,y coordinate of each element of the display One method of doing this is by drawing the display as it should appear at the screen on a grid having coordinates ranging from 400,400 to 9600,7200 The coordinates for a drawn element can then be transferred to the display source file as the x,y coordinate parameters of an escape command

Both the console and the SLDG program provide a library of standard symbols and displays One method of determining the escape commands required to create a display and present certain types of information is by referencing the provided symbols and displays The elements incorporated in these symbols and displays can be viewed using SODG, or the escape commands defining each element can be viewed through the elementary line editor (ELE)

DISPLAY AND CONTROL SELECT OPTIONS

The keyboard is the main operator input device for the console The keyboard, described earlier in the ***Keyboard and Peripherals*** section, provides the display and control element select, data in put and process control capabilities

Touch screen and mouse or trackball permit an alternate method of selecting display items instead of using the keyboard These options are available for selecting displays or activating control; however, the actual control actions can only be initiated through keyboard keys Data input also can only be done through the keyboard Any active element can be deactivated by pressing [ESC].

Any display can use key selects or touch points (mouse or track ball), or both A key select is any single alpha character or a two alphanumeric character combination The single character requires only a single key press for selection The two character combination requires pressing a two key sequence Touch points are designated areas of the screen where the operator presses or positions a cursor to initiate a display select or activate control The type of select options available for an element are determined during display creation.

> **NOTE** Standard d sp ays and menus have touch po nts already desig nated in the r configuration wh ch a ows using the touch screen and the mouse or trackball options

Refer to ***OIS System Configuration*** in the ***OIS Configuration*** section for information about attributes related to touch screen and mouse or trackball These system attributes enable and ac count for touch screen and mouse or trackball options Refer to ***Display Generation*** in the ***OIS Configuration*** section for meth ods and procedures to create displays, and Appendix B for display and control select escape commands

Touch Screen

A touch screen option uses pressure sensitive touch screen technology to select display items This option enables the operator to select a tag for control or call another display by pressing an area on the screen When a touch point is pressed, a short audible tone can be heard from the keyboard Touch screen capable CRTs are accounted for during OIS system configuration Touch point escape codes must be configured during display creation before touch screen select can be used at a particular display

Mouse or Trackball

A mouse or trackball is useful for quickly moving about a display The mouse works the same as the trackball as described in this section Trackball must be accounted for during OIS system configuration procedures A trackball cursor comes up on the screen after pressing [CURSOR] It appears as a cross hair type cursor that can be moved around the display using the trackball Once the cursor is on the screen, any display item with a defined display or control select touch point (i e , touch point escape code) can be selected with trackball

To select display items using trackball

1 Press [CURSOR], this brings the cross hair cursor on the display

2 Move the cursor with the trackball to position it over the display item to select

3 Press [CURSOR] again to enter the selection A double audible beep can be heard from the keyboard after pressing [CURSOR]

Press [CANCEL], then [CURSOR] to remove the cursor from the screen

The trackball cursor operates at two different speeds Fast and slow Initially, the trackball cursor moves at the standard slow speed Press [ZOOM] while the cursor is on the screen to toggle between fast and slow speeds

[ZOOM] does ***not*** function for trackball at trend displays once a trend element has been activated After a trend element is selected, [ZOOM] becomes part of the trend element control functions

Control Select Highlighting

To verify selection or identify a display element as being in active mode, the console uses outline or border highlighting A change in the outline of an element from a normal to a highlight color provides a visual verification of selection Standard highlighting changes an outline color from blue to cyan when used against a black background Used with other background colors brings different results The highlighting feature applies to elements such as alarm summary, faceplate and trend displays

An option available through configuration, causes a touch area border to highlight when selected through touch screen or the mouse or trackball This option is similar to outline highlighting that occurs through keyboard selection The process engineer enables touch point highlighting by setting the *Highlight Selected Touch Area* option to **YES** during OIS system configuration Once set, the outer border of a designated touch area uses the high lighting feature

A border highlight whether initiated through key or touch point selection remains on the display until

- Touching another touch area
- Selecting another touch area with the mouse or trackball
- Initiating a selection through the keyboard
- Calling a new display, causing an entire display change
- Pressing ESC

For example, after calling a group display, a single faceplate can be enabled for control by key selection, touching it, or using the mouse or trackball The border of a selected faceplate then high-lights (changes to cyan) identifying the element as active Once in the active mode, keyboard actions allow process control Selecting another element causes the previously selected element to return to its normal color scheme and condition Control for that element also disables Only one element can be selected for control at a time

Pop Up Control

The process engineer can design displays that incorporate pop up elements The symbol library provides standard pop up elements for DANG, DD, MSDD, RCM, RMCB, RMSC and STATION tags

Once selected, a pop up element comes up in the active control mode Device control can be initiated through normal keyboard actions which are dependent on the type of element The operator can deactivate pop up control by pressing ESC The element re mains on the display, and can be activated again by using key, touch point select options

SECTION 5 - MENU STRUCTURE

INTRODUCTION

The process engineer and operator access most of the operator interface station (OIS) functions through menu selections This section explains the menu structure, and provides a tree struc tured view of the menu hierarchy for the console

GENERAL FUNCTIONS MENU

The main menu used as the starting point for accessing console functions is the *General Functions Menu* (see Figure 5 1) Press GENL FCTNS MENU at any time from any other menu, or any interactive operation or configuration display, to call this menu to the screen

The menu has three separate choices, each providing access to a group of related operations, utilities or configurations Figure 5 3 shows the menu options accessed after selecting either *A OIS Configuration* or *C OIS Operation* from the menu Figure 5-4 shows the options after selecting *B OIS Utilities*

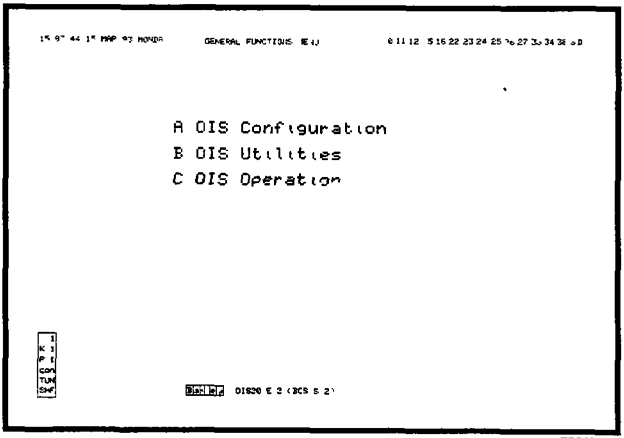

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Figure 5 1 General Functions Menu

MISCELLANEOUS MENU

The miscellaneous menu provides access to the *Log Status*, *Log by Name* and *Display by Name* functions These are explained in later sections of the instruction Press [MISC MENU] to access the *Miscellaneous Functions* page (see Figure 5-2)

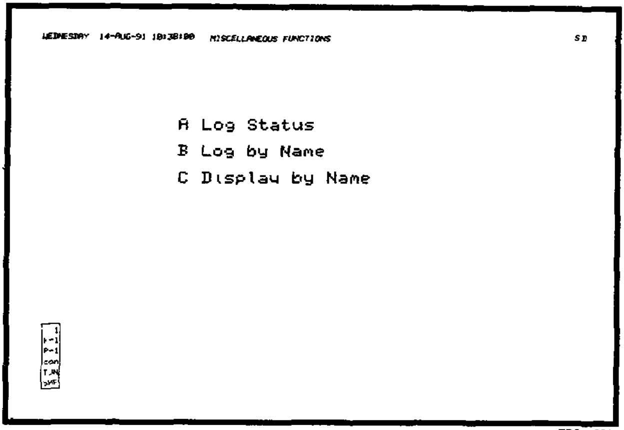

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Figure 5 2 Miscellaneous Menu

COMMAND LINE MENU

The command line menu is a bottom line menu Press [COM'D LINE MENU] to call the command line menu to the screen The menu gives access to the following functions

A CALC on line calculator

B NOTE note field for entering notes into the events log

C ASGN PRN - printer assignment function

D PRINT initiates a screen print

E LOG/NAME initiates a log printout

F PASSWORD password log in capability

G LOG OUT password log out capability

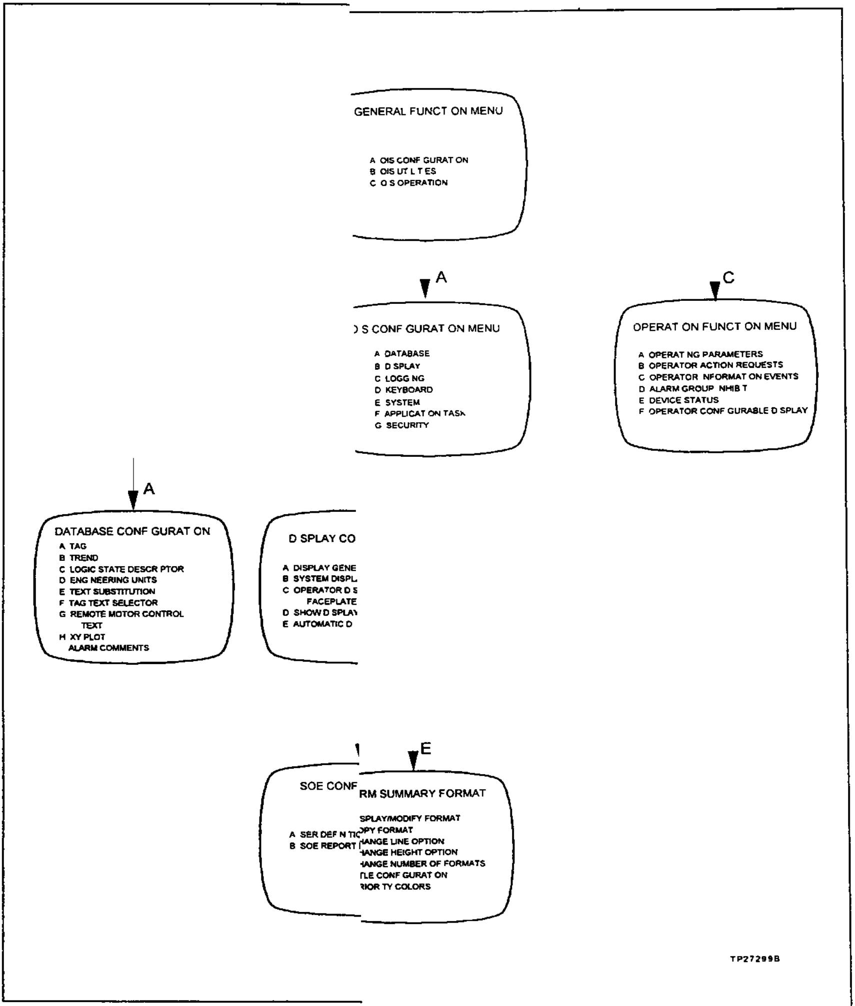

Figure 5 3 Menu Structure OIS Operation and OIS Configuration

22 31 26 04 10 07

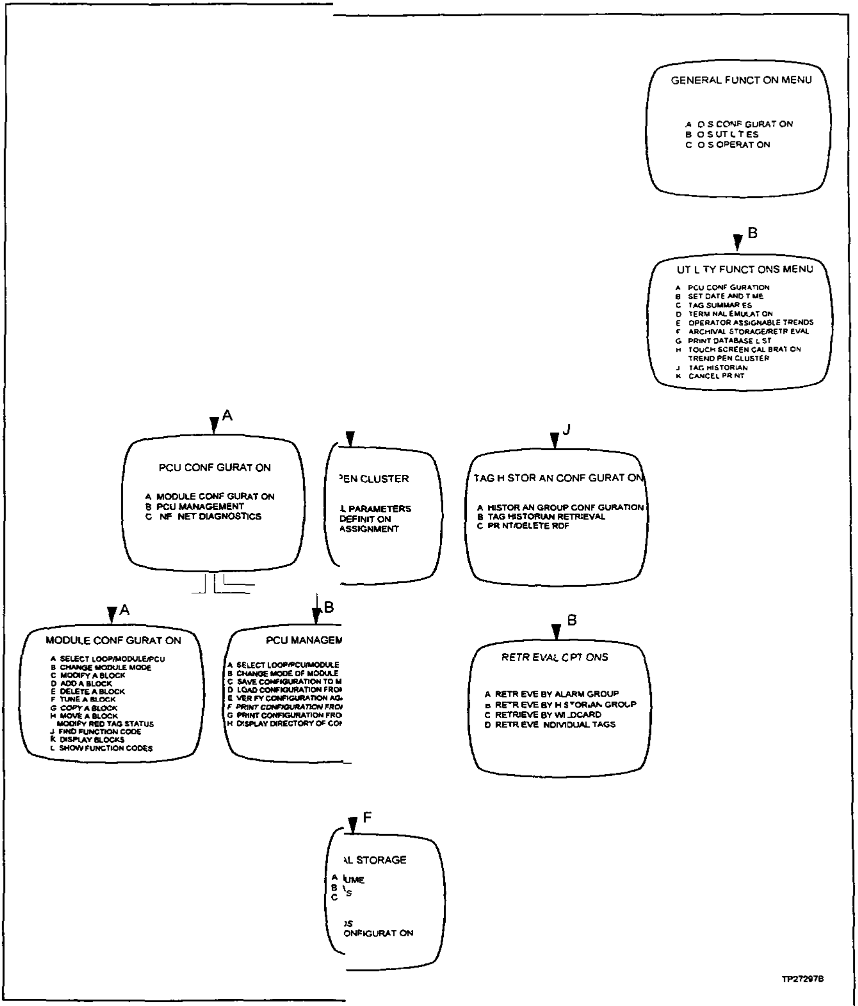

Figure 5 4 Menu Structure OIS Utilities

22 31 28 04 10 07

SECTION 6 - PROCESS MONITORING

INTRODUCTION

The operator interface station (OIS) can present information on various aspects of a process The information presented and the way that it is presented depend upon the requirements of the process The console allows for flexibility when developing the responsibilities of the console, in particular process control and data acquisition operations

Because of variations in operation of the console and the displays that can be user created, this section is limited to those operations performed through standard displays and the keyboard Specifically, this section discusses

- Start-up, and password log in and log out
- Accessing displays
- Tag operations
- Trend operations

  Trend display

  Trend control

  Operator assignable trends
- XY plot operation and control
- Operator configurable displays

START-UP

Start-up is automatic after powering up the console The console executes an autoload sequence after applying power. Console power turns on through the power entry panel (see Figure 1 1)

To turn the power on

1 Open the front cabinet door to gain access to the main power circuit breaker Figure 1 2 shows the location of this circuit breaker

2 Set the breaker to the ON (or up) position The POWER ON lamp lights to indicate power to the console The console runs a power up sequence, then an autoload sequence. A complete start up takes several minutes

Normally, a successful start up can be identified by the *General Functions Menu* appearing as the initial screen presentation of the console However, the start up file (***SDISPLAY.CF***) can be modified through file utilities to have any desired display appear at the completion of the start-up sequence If the console has more than one screen, the ***SDISPLAY.CF*** can call the same or different dis plays to each supported screen Refer to the ***Terminal Utilities*** section for procedures to change the start-up file

> **NOTE** Pressing the RESET button located at the power entry panel causes the console to reinitialize by performing the autoload sequence again This is required during some configuration procedures or should a console problem occur

PASSWORD LOG IN AND LOG OUT

The operations that can be performed after start up depend on the key lock position, or password security if implemented The con sole automatically logs in a default user during start up Which user is logged in depends on password security configuration

Log In For specific personnel to access all operations dictated by the ac cess rights of their security level, a log in procedure must be per formed To log in a password at the console

1 Press COM'D LINE MENU to call a bottom line menu

2 Press F to select the *Password* option This calls an input prompt to the screen that appears as ********

3 Enter a valid password Security maintenance personnel define passwords during password security configuration

> **NOTE** The default passwords are **MAINT** for security maintenance per- sonnel and **OPERATOR** for all normal operations

4 Press ENTER, the console prompts if an invalid password was entered The top field in the keyboard status block at the lower left corner of the screen identifies the user index number of the cur- rently logged in user Password log in also appears in the events and operator actions log

A password log in remains in effect until changed by entering an other password or automatic log out To prevent unauthorized personnel from using the current access rights, log in the default user before leaving the console

A new password can be entered at any time without having to log out the current user Repeat the log in procedure to enter another user password An option defined during password security can be set to automatically log a user off the system and log in a default user when the console is inactive for a specified period of time

Log Out A log out procedure cancels the current password access rights and logs in the default user. To log out at the console

1. Press COM'D LINE MENU to call a bottom line menu.

2 Press G to select the *Log Out* option As soon as it is selected, the user index number in the keyboard status block updates to the index number of the default user

NOTE f the console is reset by pressing the RESET button ocated at the power entry pane , the console comes back on-line with the access r ghts of the ast entered user The conso e enters the default user after a comp ete shutdown and power up

ACCESSING DISPLAYS

The console uses several different displays to convey process in formation The operator must access these displays to view that information Depending on the OIS configuration and features built into user-created graphics, the operator can call displays either through keyboard selections or menu selections Another option available through display configuration is for displays or pop up elements to automatically appear on the screen based on the occurrence of certain process events

Menu Items

The process engineer can design menus into any graphic The menu options are built in, interactive display select features of the graphic The operator can use these built in selects to directly access a particular display page This requires the operator to press an alphanumeric key sequence or select the menu item through an optional display select method Refer to the ***Display System*** section for optional select methods available for this console

An option available to the process engineer is to create a graphic that lists all system displays This graphic can incorporate built in selection features for each of the displays listed The graphic can then be assigned to DISPLAY SUMM for easy access The operator can, for example, press DISPLAY SUMM to obtain the list then press specific alphanumeric keys to call a particular display from the list

Keyboard Access

The operator can access displays in several different ways through the keyboard, which include

- Assignable function keys
- Display control keys
- Annunciator display panel (ADP) pushbuttons

During configuration, the process engineer assigns displays to assignable function keys and certain keys in the display control section of the keyboard Refer to the ***Keyboard and Peripherals*** section for the location of these keyboard areas Pressing a function key or one of the display control keys calls an assigned display. The operator can call a display at any time using any of these keys

If an optional annunciator display panel is installed, the process engineer can also assign displays to the pushbuttons of the panel These pushbuttons are normally used for alarm processing Pressing any of the pushbuttons at any time calls an assigned display Refer to the ***Keyboard and Peripherals*** section for an explanation of ADP operation

Pressing an ADP pushbutton or assignable key that does not currently have a display assigned calls a default display This display is the ***BLANK.DU*** file on the hard disk The default can be changed through annunciator display panel or keyboard configuration

Display by Name Access

A *Display by Name* option allows the operator to call a display by its name This option requires the operator to know and enter the name of a desired display The name entered must correspond to an assembled display file (***.DU***) on the hard disk, or an operator configurable display To call a display by its name

1 Press MISC MENU A full page menu appears on the screen

2 Press C to select *Display by Name* A *Display Name* input prompt appears at the bottom of the page

3 Enter the display file name without its extension For example, to call a display defined in a file called ***AREA1.DU***, enter the following at the prompt

AREA1

4. Press ENTER after keying in the name The desired display then appears If a file corresponding to the name entered does not exist, the console prompts with an error message

Display Not Found

Automatic Displays or Pop Up Elements

Depending on configuration, an entire display or a partial pop up element can be defined to automatically appear in place of or on the current page Once configured, the console references a set of digital type tags to trigger the automatic activation of these displays or pop up elements This allows automatic display activation based on process changes

Automatic displays and pop up elements are configured in sets Each set contains a list of tags Each tag in the list has an associated assembled display (***.DU***) or an assembled pop up element (***.DL***) assigned A pop up element also requires an x,y coordinate to determine its position on the page

The triggering of an automatic display or pop up occurs when a digital type tag in the active set changes from its zero to one state. This requires, however, that there is no previously triggered display or pop up, or the state of the digital type tag associated with the last triggered display or pop up element has returned to its zero state

Any display or pop up element triggered for automatic display operates as normal once it appears on the screen Any display or element designated for automatic display can also be called in the normal methods described previously During configuration, the process engineer assigns a master display and a termination display to a set

To ***activate*** a particular set and enable its automatic features, call the master display for the desired set to the screen Either the operator or automatic display function can do this

The console then monitors the list of tags defined in the set to trigger the automatic display function A set remains active until the operator or automatic display function calls a termination display assigned to the set, or another set is made active

The automatic display function for the current active set also deactivates when the operator manually calls a display (not a pop up) that is not a master display The display being called can be part of a tag set as long as it is not a master display In this case, the manually called display operates as normal, and the last active automatic display set will not trigger any displays or pop up elements

To ***reactivate*** the previous set, either call its master display, or call the last display triggered by the set

If configured, a denotation symbol assigned to the set appears to identify to the operator that the display or element is an automatic display or pop up element For this function to work, however, a symbol file (***.DL***) must be created and assigned to the set during configuration of the *Automatic Displays* option. The denotation symbol does not appear for a display or pop up element if it is called to the screen manually using any of the methods previously described Refer to ***AUTOMATIC DISPLAYS AND POP UP ELEMENTS CONFIGURATION*** in the ***OIS Configuration*** section for additional information

Display Paging

The keyboard provides several keys used to move between pages and displays Once a desired display is on the screen, the operator can perform the normal operations related to that screen

The **BACK** and **FORWD** keys recall the last six displays previously viewed by the operator

To use **BACK**

1 Press **BACK** to call the display that was on the screen previous to the current display.

2 Continue to press the key to sequence backwards through additional displays until eventually returning to the current display

To use **FORWD**

1 Press **FORWD** *to call the last of six previous displays*

2 Continue to press the key to sequence forward through additional displays until eventually returning to the current display

The **MARK** and **RECALL** keys provide a bookmark function The operator can mark a display page to recall it at any time in the future Up to ten different displays can be marked for eventual recall

To mark a display.

1 Press **MARK** The console prompts with *Enter display number to MARK*

2 Press any number key from **0** to **9** This becomes the number that must be entered to recall the display

To recall a display

1 Press **RECALL** The console prompts with *Enter display number to RECALL*

2 Press the number key previously selected using the mark function Once entered, the desired display appears on the screen

The **NEXT PAGE** and **PREV PAGE** keys function only at specific pages As a general rule, a function identifies the requirement for using these keys by either presenting *NEXT PAGE* or *PREV PAGE* text or a *Page n of n* field The process engineer can incorporate these keys as interactives in any user created graphic

TAG OPERATIONS

The operator accesses an operating parameters function to view the current operating information related to a selected tag The information presented concerns the process variable or device, INFI 90 module or node, or OIS peripheral device that the selected tag references For process variables or devices, the information relates to the inputs that control operation of a function block,

22 31 36 04/10/07

and outputs of the function block. The outputs, in most cases, are the process control signals

The display also gives the status of events and operator actions logging, tag reporting status, and alarm and alarm inhibit information for the selected tag These are all console level operations In addition, the display presents options for controlling tag operations, which include

- Disestablishing or reestablishing a point
- Inhibiting or enabling alarm reporting
- Primary display call up
- Substituting values
- Viewing block details
- Calling a tuning display for a STATION tag
- Calling a module problem report for an N90STA tag
- Suppressing or allowing alarms for a DANG, DADIG or TEXT STR tag
- Turning exception reporting on or off for a DANG or DADIG tag
- Forcing a report from a DANG or DADIG tag when exception reporting has been turned off
- Reset the alarm state latch for a DADIG tag

Figure 6-1 shows an example of the operating parameters display

Operating Parameters Display Call Up

The operator can call an operating parameters display in two ways Either by menu selection or a keyboard key To call the operating parameters display

1 Press GENL FCTNS MENU, then select the following menu items in the sequence shown

C OIS Operations ⟶ *A Operating Parameters*

- or -

Press OP PARAMS This key allows calling the operating parameters for a tag at any time from any display page

In either case, the console presents a *Tag name or Index* input field

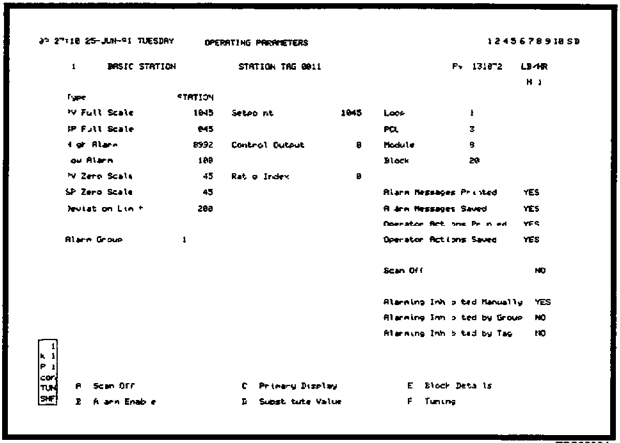

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Figure 6 1 Operating Parameters

2 Key in a valid tag name or index number

3 Press [ENTER] The parameters for the desired tag appear

The [OP PARAMS] key also allows calling the operating parameters page for a tag directly without requiring any input Select the tag or tag element, then press [OP PARAMS]

After display call up, additional keys allow calling or sequencing through tag operating parameters displays for other tags

Press [ESC] to bring the *Tag Name or Index* field back to the screen This allows calling the operating parameters display for another tag Press [ESC] again to exit the display The screen returns to the *Operator Function Menu* page

Press [NEXT PAGE] or [PREV PAGE] to sequence to the operating parameters display for the next or previous tag in the database

Operating Parameters Display Attributes

The information that appears, and operations that can be per formed at the operating parameters display vary depending upon tag selection The attributes of the display itself, however, remain constant

Tag Description

At the top line of the display starting at the left, the index number, tag name, and tag description appear. These are the descriptors set in the tag database for the tag.

Value

At the far right of the top line is a value field. The variable presented is either an analog value or digital state. In most cases, this field presents an output value related to the tag. If the value presented is an analog exception reported value, an engineering unit descriptor (EUD) appears to the right of the value.

Some exceptions include the STATION and N90STA tags. For the STATION tag, this field is the process variable (PV), the N90STA tag does not use this field.

Alarm Comment

Under the tag descriptors, the display presents an alarm comment field. The text displayed in this field depends on the alarm condition of the selected tag. The field remains blank if the tag is not in alarm. Alarm comments associated with specific tag alarm conditions are determined by the configuration of the tag.

Alarm Status

To the far right of the screen on the same line as the alarm comment field is an alarm status/quality/group field. This field presents all normal alarm and quality indications. The field also provides normal alarm processing capabilities, specifically alarm acknowledgment. The same conditions identified at this field appear at all other displays that use a five-position alarm status/quality/group field.

The quality indications that relate directly to this function are *i* for alarm inhibited, *x* for off scan, *s* for substituted and *!!* for suppressed alarming.

Tag Type

The *Type* field reflects the tag type selected. Attributes related to the tag type appear directly under the *Type* field and are dependent on the tag selected. Generally, the information contains scale and alarm limit levels, and additional values that can be user-substituted.

For example, the set point, control output and ratio index values appear and can be substituted for STATION type tags. The status information related to a node or PCU module appear for an N90STA tag.

Function Block Address

The *Loop/PCU/Module/Block* fields are the address of the function block within a PCU module that this tag is referencing.

Alarm Group

An alphanumeric in the *Alarm Group* field identifies the alarm group to which this tag is assigned. The value will be either *0* for no alarm group, or *1* through *99*, *S* or *D*. A tag is assigned to an alarm group during tag configuration.

Tag Events

The operating parameters display presents information on the type of events being logged for a particular tag Event logging prints alarm events and operator actions events to a designated printer immediately as events occur, or periodically at a set schedule Fields at this display reflect the event logging setup as defined in the tag database.

> **NOTE** The process engineer sets attributes governing event and operator actions logging for a tag during tag database configuration Events and operator actions logging requires additional configuration to enable data collection and operation

Alarm Messages Printed if set to *NO*, alarm events for this tag do not appear in an events or operator actions log that prints continuously and immediately Alarm events print immediately as they occur if set to *YES*

Alarm Messages Saved if set to *YES*, the console is saving alarm events for this tag as they occur for periodic log printing or archiving The console is not saving alarm events if set to *NO*

Operator Actions Printed if set to *NO*, operator actions events for this tag do not appear in an events or operator actions log that prints continuously and immediately Operator actions events print immediately as they occur if set to *YES*

Operator Actions Saved - if set to *YES*, the console is saving operator actions events for this tag as they occur for periodic log printing or archiving The console is not saving operator actions events if set to *NO*

Communications Status

The *Scan Off* field identifies a tag as being either established or disestablished with the loop Disestablished means that the tag is completely disconnected from communications with the loop When the field is *YES*, the console is not receiving exception reports for a process point defined by the tag A *NO* at this field indicates normal communications with the loop The operator turns scan on or off through the operating parameters *Scan On/Off* option

Alarm Inhibit

If any of the *Alarm Inhibited* fields indicate a *YES*, the console does not present any of its normal alarm indications for this tag, which include an alarm group indicator, flashing alarm status field, alarm tone, and an entry in the alarm summary and events log The console presents all normal alarm indications if all fields indicate *NO* An alarm status/quality/group field still presents alarm status indications (e g , *A*, *2L*, *3H*, etc) and changes to an alarm color, but no other alarm indications occur

Alarming Inhibited Manually the operator performs manual inhibiting through the operating parameters *Alarm Inhibit/Enable* option

Alarming Inhibited by Group alarms for an entire alarm group can be inhibited If the selected tag is part of a group that has been inhibited, this field indicates *YES* Alarm group inhibiting is performed through the *Alarm Group Inhibit* function. Refer to ***ALARM GROUP INHIBIT*** in the ***Alarm Processing*** section for procedures to inhibit or enable an alarm group

Alarming Inhibited by Tag inhibiting by tag is an automatic alarm inhibit feature configured in the tag database In this case, alarm inhibiting is based on the alarm status or state of another tag (process variable) A *NO* in this field indicates no automatic inhibiting A tag index number appears at this field if automatic inhibiting is in effect In this case, the tag configured to inhibit is in a certain alarm condition or state which causes the alarm indications for this tag to be inhibited The index number is of the tag defined in the database to automatically inhibit this tag (i e , *Alarm Inhibit Tag* field)

Operating Parameters Display Operations

Scan Off

Option *A* appears as either *Scan Off* or *Scan On* depending on the current condition of the tag Press [A] to toggle between on and off.

The *Scan Off* and alarm status/quality/group field update to indicate the current condition The operator can identify a scan off condition by

1 *Scan Off* field indicating a *YES*

2 An *x* in the quality position of an alarm field (e g , *x10*)

3 Value or state fields displaying a bad quality string

Alarm Inhibit

Option *B* appears as either *Alarm Inhibit* or *Alarm Enable* depending on the current manual alarm inhibit condition of the tag. Press [B] to toggle between inhibit and enable

The operator can identify a manual alarm inhibit condition by

1 *Alarming Inhibited Manually* field indicating *YES*

2 An *i* in the quality position of an alarm field (e g., *Ai10*)

Primary Display

The *Primary Display* option allows calling the primary display at which this tag appears The display should be one that lets the operator perform any required actions related to the process point identified by the tag Press [C] to call the primary display

The console exits the operating parameters display to present a new display A tag must have a primary display identified in its configuration for this option to function If it does not, pressing [C] has no effect

Substitute Value

The *Substitute Value* option disestablishes a tag and allows the operator to enter a new value Substitution is a console level op eration only A substituted value is not sent on the communication highway Substitutions do not affect execution of a PCU module control scheme When a substitution is made, the console uses the entered value in all of its operations as it would an ex ception reported value.

Substitution can be performed on all tag types except N90STA and DEVSTAT tags For these tag types, the *Substitute Value* option is not available

For the DANG or DADIG tag, this is a console level or local substitution only This is not the same as selecting the user inserted value, which is a PCU module level substitution (global substitution)

To ***substitute*** a value

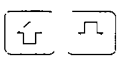
1 Press [D], the console positions an input field at the first value field available for substitution The input field can be moved to other fields using the cursor control keys Refer to the ***Keyboard and Peripherals*** section for their location and function

For a STATION tag, [SET], [OUT] and [RATIO] can also be pressed to position the input field at the *Setpoint, Control Output* and *Ratio Index* fields respectively

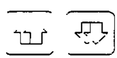
The *Scan Off* field updates to *YES*, and the alarm field updates to *x* in the quality position as soon as the operator selects the *Sub stitute Value* option for an analog type tag The quality position updates to *s* after making the actual substitution The *s* applies for both analog or digital substitutions

2 The operations that can be performed next depend upon the value being substituted

Analog value - key in a new value, or press the following keys in the station and remote control block section of the keyboard, not in the cursor control section



To effect a slow, ramping value change This changes the value 0 2 percent per keystroke



To effect a fast, ramping value change This changes the value 4 0 percent per keystroke

Digital state press the following keys in the station and remote control block section of the keyboard to make a state substitution

Sets a digital type of tag to a one state substituted output
Sets an MSDD tag to a three state substituted output

Sets an MSDD tag to a two state substituted output.

Sets a digital type of tag to a zero state substituted output. Sets an MSDD tag to a one state substituted output

Text string key in the substitution text string. Press [TAB] to move to the *Alarm* field Key in **YES** to put the tag into alarm, or **NO** to not

3 If keying in an analog value or text string, press [ENTER] to put the substitution into effect Substitution takes effect immediately if using the ramping keys to change the analog value A digital state substitution occurs immediately after pressing any of the control keys

4 The input field remains active on the screen to allow further changes to analog values Press [ESC] to deactivate and remove the input cursor The *Substitute Value* option must be selected again to make another digital state substitution for the tag

To ***unsubstitute*** a value, press [A] to select the *Scan On* option. This removes the substitution and reestablishes loop communication for the tag

Block Details

The *Block Details* option can be selected to call a block details display for the current tag The block details display presents information on the parameters controlling the function block that the tag is referencing The option is not available for DEVSTAT, N90STA, INTDIG and INTANG tags Refer to ***Block Details Display*** in the ***Process Control and Tuning*** section for an explanation of information and operations available through this display

Tuning

The *Tuning* option is available for STATION tags only A tuning display for the STATION tag can be called by selecting this option The tuning display allows adjusting loop control parameters, viewing the effects of these adjustments, and initiating station control Refer to ***Station Tuning Display*** in the ***Process Control and Tuning*** section for an explanation of information and operations available through this display

Problem Report

The *Problem Report* option is available for N90STA tags only A display listing detailed problem information related to a specific node or PCU module can be called using this option The problem report is for the node or module being referenced by the N90STA tag Refer to ***Module Problem Reports*** in the ***INFI 90 and OIS Diagnostics*** section for an explanation of information presented at this display

Suppress/Allow Alarms

The operating parameters page provides an alarm suppression control option after selecting a DANG, DADIG or TEXTSTR tag Depending on the current status of the selected tag, the option appears as *Suppress Alarms* or *Allow Alarms* This option activates or deactivates alarm suppression at the PCU module function block level This is different than *Alarm Inhibit/Enable*, which enables or disables alarm indications at the console level only

Press [F] to toggle between suppress and allow If the tag is set to suppress, the module does not report any high or low level alarms, high or low deviation alarms, or high or low rate of change alarms The console identifies the current alarm suppression status, and the type of alarm control being implemented by the PCU module function block under *Alarm Control* on the display

The operator can identify a suppressed alarm condition for a DANG or DADIG tag at the alarm status/quality/group field The status position of the field appears as " to indicate suppressed alarms

On/Off Report The operating parameters page provides an option for changing the reporting status of a DANG or DADIG tag Depending on the current status of the selected tag, the option appears as *On Report* or *Off Report* This option turns reporting on or off at the PCU module function block level This is different than *Scan On/Off*, which locally disestablishes or with a point

Press [G] to toggle between on and off The function block does not generate any exception reports when reporting is off When the tag is initially set to off, the function block sends one final exception report to update the console

The operator can identify a no report condition by an *N* appearing at the top right of the operating parameters page, and at the DANG or DADIG tag faceplate element

Force Report The *Force Report* option for a DANG or DADIG tag allows the operator to force the DANG or DADIG function block to generate an exception report while the block is in a no report condition Press [H] to initiate a forced report

Latch Reset The *Latch Reset* option for a DADIG tag allows the operator to reset the alarm state latch if enabled in the function block The alarm state latch function causes the block to remain at its current output state and alarm status when an alarm occurs When latched the output state and alarm status reported by the block does not update until the operator initiates a reset from the console, or the control logic initiates a reset

TRENDING OPERATIONS

NOTE This section explains the trending operations using standard trend displays and symbols referenced by these displays The console provides the symbols as part of its symbol library on hard disk The procedures and operations explained here remain the same for custom trend displays designed to provide the same capabilities The escape commands defined in the display and symbol files during creation determine the trend display capabilities Refer to the ***Display System*** section for further explanation

Trending provides an historical perspective of process conditions for analysis of current operations The console references the data to time, or as a function of other process variables Trend data for displays can come from two different sources

The console provides the capability to directly gather and store trend data collected by the INFI 90 distributed trending system It also has its own operator assignable trend capability, however, this data is not distributed trend data

The trending operations specifically explained here include

- Information presented at standard trend displays
- Trend control through keyboard keys.
- Operator assignable trends

Refer to ***TRENDING*** in the ***INFI 90 System and OIS Overview*** section for a discussion of the INFI 90 distributed trending system

Trend Displays

The trend operations use standard trend displays in varying sizes These sizes range from a full screen display to ¼-screen Figure 6 2 is an example trend display It shows the display as it appears after being accessed then activated by the operator The display shown contains a standard half size, trend element The trend display source file used to create the trend display shown in Figure 6 2 incorporates a ***TRNDPVHF.DT*** symbol source file

Each trend element on a display can present trended information for up to five separate process variables The display presents the historical data as a continuous line on an x,y graph The x axis is referenced to time and the y axis is the value of the variable

The trend line for each variable on the graph is identified by a specific color and alphanumeric The console periodically updates a trend line as new data is collected for that variable The display presents newly collected values along with the historical values to maintain the continuously running line. An interruption in data collection can be seen as a break in the line

Resolution refers to the amount of time between data samples A 15-second resolution, for example, provides more detail for collected data A one minute resolution provides less detail

During creation, the process engineer sets the initial resolution for a trend display Also, display resolution is set as one of the attributes of an enhanced trend This attribute overrides any display resolution set during display creation The display resolution determines how often the console updates the trends on the display The display resolution must either match the collection resolution of the trends on the display, or be a multiple of the collection

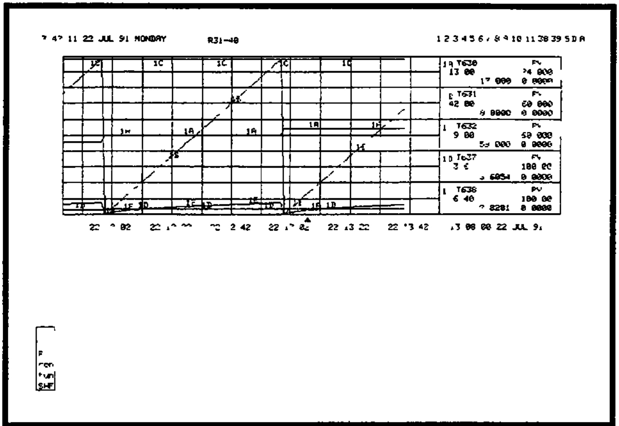


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Figure 6 2 Trend Display

resolutions The resolution defined during display creation is only the initial resolution of the display Zooming allows temporarily changing the resolution.

The initial display resolution for operator assignable trend dis plays and trend elements in operator configurable displays is the least common multiple of the display resolutions among all the trends within the display The display resolution for standard trends is 15 seconds or one minute The display resolution for en hanced trends is specified in the definition of the trend tag.

For trends saved to disk, the console first looks for data on its hard disk to present historical data when a trend display is called to the screen The console retrieves historical data from a PCU module for display only trends Once this data is retrieved, the console connects to the tag associated with the trend and any new data displayed is updated from exception reports rather than trend data reports This type of updating continues until the dis play is removed from the screen Once removed, the console dis connects the tag The data saved to disk is always the data collected by the trend block and sent in a trend data message, not exception reported data

For example, if a trend display is set to two second resolution, the console first retrieves all historical data saved on the hard disk It then updates the display with exception reported data Every two second interval represents the latest exception reported data

An enhanced trend has a minimum resolution of one second Un der heavy load conditions, the console may not be able to update the data for a trend display every resolution period No data is lost in this case, only delayed

The console retrieves the last 30 minutes worth of data from a specified trend block for display only trends This data then displays and is constantly updated with the most recent trend data As new data is received, the old data remains visible until it scrolls off the screen or the operator exits the display then calls the display again

The attributes of a trend line appear at the right of the trend element (see Figure 6 2) The color and alphanumeric of a trend line associate it with the trend line attributes presented in one of the five boxes For example, a trend line in green with an alphanumeric of *1C* corresponds to the trend attributes box with a green, *1C* selector

Figure 6 3 identifies the attributes that appear for a trend Some of these fields do not appear until after selecting a trend element for control

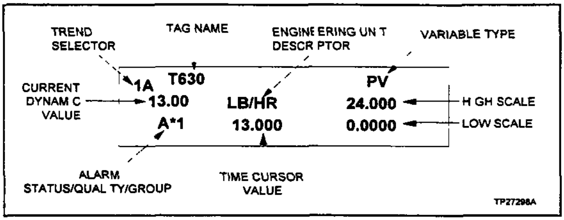

Figure 6 3 Trend Attributes

Trend Attributes

During trend configuration, the process engineer enters a tag name in one of the trend definition fields The name is that of the tag referencing the PCU module function block (process variable) for which a trend block is collecting data The console requires this tag name to present real time attributes associated with a trended variable

Alarm status/quality/group the current alarm information received for the variable (tag) All normal alarm indications appear at this field. The operator can acknowledge an alarm using normal alarm processing procedures Refer to the ***Alarm Processing*** section for alarm processing, conditions and indications

Engineering unit descriptor the unit of measurement being reported for, and associated with the variable A PCU module reports an index number for an analog value the console uses to determine and display the proper engineering unit descriptor

Tag name the name of the tag associated with this trend This is the name of the tag entered during trend definition A tag name entered when defining a trend allows the console to associate real time data and information with the trended variable

Current dynamic value the current value being exception reported for the process point The field updates to reflect any current changes in the process variable.

High and low scale limit the scale limits appear in two different ways For user created trend displays, the limits are set during display creation The limits are the zero and span values received in an exception report for a point when the trend element is part of an operator configurable display or operator assignable trend display The operator can change these limits after calling the trend display to adjust the presentation These are local display changes only A scale limit change does not affect the display configuration or PCU module zero and span set for the point

Variable type this field is configured as part of the symbol file used in creating the trend display It identifies the type of variable being trended The types that can appear include

PV - process variable

SP set point

CO control output

RI ratio index

DG digital

Time cursor value - this field does not appear until after selecting a trend element for control The time cursor value field indicates an historical value dependent on the time cursor position The value corresponds to the value of the variable at the exact time and date determined by the position of the time cursor The field also identifies through text the reason for any gaps or missing trend data

Resolution Invalid	The display resolution time (e g , 15 seconds) defined for the trend is less than the collection resolution time (e g one minute) of a trend in the display This occurs if the display resolution has not been defined correctly during display creation, or the operator zooms the display to a display resolution that provides more detail than that of the trend collection resolution
Not In Yet	The console made a request for data but the data has not been processed or received yet
Not Connected	The console cannot connect to the tag associated with the trend This occurs if the tag type has been changed, or the tag has been deleted from the tag database It also occurs if the tag

index, trend mode or tag subtype has been changed in the trend database, or a trend has been deleted from the trend database while the trend display is on the screen

Stats Suspect Occurs when at least one value used in a statistical calculation was bad quality

Missing The data is not available at the console This is not an error It appears when the console does not have access to the requested data since it is not stored on the hard disk This normally occurs if the display is panned to a point past the data stored on disk

Not Retrieved Indicates that the data is not currently available at the console, but it should be available due to a past archive to media The data must be retrieved using archive data retrieval procedures Refer to the ***Recording Process Data*** section for procedures

Not Available Indicates that the data is not currently available at the console, and an attempt to retrieve the data from archive media was made but unsuccessful due to bad data on the archive media

Data Error Indicates a read error encountered during an attempt to retrieve trend data from an archive media.

Invalid Trend Occurs when the trend display references a trend index number of an undefined trend The process engineer determines the trend index numbers the display is to use during display creation

Internal Error Some internal processing error occurred

A time cursor position field appears directly below the trend attributes boxes (e g , *13.00 08 22 JUL-91*) to identify the current cursor position (see Figure 6 2) The field updates as the time cursor moves along the trend

Time Span Each display presents a series of time increments along the bottom of the trend graph portion of the screen (see Figure 6 2) A time increment appears at every other vertical scale line For example, the time increments in Figure 6 2 appear as *22 12·02, 22 12 22, 22 12.42*, etc Each displayed time increment corresponds to the vertical scale line directly above it The time increments shown in Figure 6 2 represent a time span of ten minutes between each line This time span can be increased or decreased using trend zooming

Trend Control

Trend display control features allow moving, expanding, shrinking and magnifying a trend presentation through keyboard actions Trends, specifically distributed trends, can appear as part of a user created graphic or in an operator configurable display In either case, the functions available for manipulating the trend presentation remain and operate the same The control features affect the display presentation only, not the PCU module configu ration or stored trend data Any changes made to the trend pres entation remain in effect only while the trend element displays on the screen

> **NOTE** Trend elements a so appear in tuning displays or operator as-signab e trend displays They present the same type of nformation as d sp ays using d str buted trending data but d ffer n resolution due to the way that data is col ected for these trends

Several options are available for calling a trend display to the screen When a trend element is part of an operator configurable display, the *Display by Name* option of the miscellaneous menu is normally used A user created trend can be assigned to any avail able keyboard key during keyboard configuration, or also called by name

Move time cursor the operator can move the time cursor along the trend to position it at a specific time and date This allows viewing the value that a variable was at during a particular time instant The operator can also align the time cursor with a specific point on a trend line This allows determining the exact time and date that a process disturbance occurred

The time cursor can be moved using keyboard keys or panning A time cursor value field for each trend displays the value of the variable at the current time cursor position

Modify scale range the high and low scale limits associated with each process variable can be increased or decreased indi vidually. The current data and any historical data to which the time cursor is moved displays at the newly entered scale range

Pan a pan function moves the time cursor to show historical data values for each of the variables A time cursor position field indicates the exact time and date position of the cursor

Zoom · a zoom function expands or compresses the time span of the element for easier trend analysis Negative zooming decreases the time span between each vertical scale line, positive zooming increases the time span

Magnify a magnifying glass feature highlights a limited section of the trend display The operator can use this glass to determine the exact time a process disturbance occurred without having to change the entire trend display presentation The trend inside the magnifying glass can be zoomed to increase or decrease the time span resolution, and the time cursor can be moved within the glass to determine more exactly the time and date of a trended value

Enable Trend Control

A trend element must first be enabled for active control before the operator can initiate any of the previously explained trend control functions. All trend control keys are located in the cursor and trend control section of the keyboard. Refer to the ***Keyboard and Peripherals*** section for their location.

Enter any one of the alphanumeric trend selectors that appear for an element, or use any optional control select method to enable the element. Refer to ***DISPLAY AND CONTROL SELECT OPTIONS*** in the ***Display System*** section for an explanation of alternate control select methods available for this console

Any of the five possible selectors for a single element can be entered For example, if an element contains selectors *1A* through *1E*, [1] then [C] can be pressed to enable control for that trend element Besides the addition of a time cursor, time cursor position field and time cursor value fields, the outline of the trend attributes boxes highlights to identify an element as enabled

Disable Trend Control

Press [ESC] at any time to disable trend control, which resets the display back to its original default presentation

MOVE TIME CURSOR

The time cursor and its related display fields appear after selecting a trend element The trend cursor appears along the bottom of the trend graph The operator can move this cursor along the graph to view historical, trended values collected for a variable Initially, the time cursor positions itself at the right of the graph at its home position

A time cursor position field appears under the trend attributes boxes to indicate the current cursor time and date position When the time cursor is at its home position, the time cursor position field updates its time and date as the console receives new data reports The field shows the time and date of the most recently received data It updates at intervals dependent on the display resolution The resolution determines how often the display updates The displayed time and date also follow any time cursor movement and increment or decrement to show the new cursor position

The time cursor value field for each trend also updates when the time cursor is moved The value in each of these fields is the value of the variable at the time cursor position While the cursor is at its home position, these fields update to newly received trend data values

To move the time cursor, press

Moves the time cursor back in time

 Moves the time cursor forward in time

These keys are normally used to move the cursor in small increments The panning options can be used to make significant changes in the time cursor position

The amount of time movement that each press of these keys represents depends on the time span (or zoom factor) of the graph For example, if the time span between each vertical scale line is ten minutes, each press of the time cursor movement keys represents a one minute movement

Press [HOME] to reset the cursor to its home position

MODIFY SCALE RANGE

When a user created trend display is first called, the scale ranges for each trended variable are those set during creation of the display For operator configurable displays with a trend element or operator assignable trend displays, the limits in most cases will all be set differently This is because the high and low scale limits for each trend reflect the zero and span values set in a function block referencing the variable The varying scale limits may or may not be desired In either case the limits can be adjusted

To change the scale limits of a variable

1 With the element enabled, select the specific variable to change or any variable by entering its alphanumeric selector An input field appears at the high scale limit value of the selected variable This field enables scale range changes

Once the input field is on the screen, it can be moved to any scale limit for any variable by pressing [TAB] or [TAB BACK]

2 Enter a new high or low scale limit for each variable to change Both the high and low scale can be changed, or only one of the limits if desired.

3 Press [ENTER], the display updates to the new scale limits, and both current and historical values for each variable conform to their newly entered range limit

4 Press [ESC] to remove the input cursor

> **NOTE** It is important to remove the input cursor from the screen when done The operator cannot perform some of the trend control functions while it is on the screen

The scale limits return to their original values after exiting the display At the next display call up, the scale ranges are again the default or zero and span values

PAN

The operator can use panning available at trend displays to quickly move the time cursor backward or forward in time, or to a specific time and date Figure 6 4 shows a trend display with panning activated

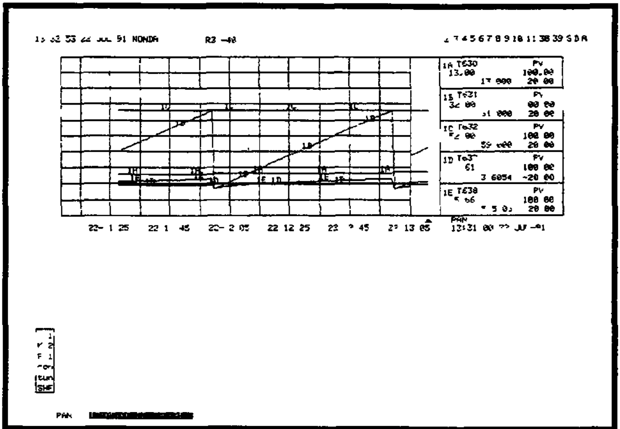

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Figure 6 4 Trend Display Panning Enabled

An option available during trend display creation is to have the element display an update window This window can be seen in Figure 6 4 As the time cursor is panned back to an historical time and date, this window continually updates to show current trend data from newly received trend reports

To pan to a specific time and date

1 With the element enabled, press **PAN** This calls a *PAN* input field to the screen. The field appears at the lower left corner of the screen as shown in Figure 6 4 The time and date in the field is the last entered time and date, or the current time cursor position

2 Enter a desired time and date of historical data to view

3 Press **ENTER** The trend display updates with the time cursor positioned at the indicated time and date

> **NOTE** It s important to remove the *PAN* input field from the screen when done The operator cannot perfo m some of the trend control functions wh le t s on the screen

4 Press [ESC] to clear the *PAN* input field from the screen

To randomly pan backward or forward in time, with the element enabled press

Moves backward in time to view historical data

Moves forward toward the current time and date

When using the keys, the amount of time panned depends on the current time span (or zoom factor) of the display As a general rule, each press moves the display backward or forward half the time span of the entire trend graph For example, if the entire trend graph time span is one hour, pressing either of these pan keys displays the next or previous 30 minutes of data

PAN appears under the trend attributes boxes to indicate that the element has been panned (see Figure 6 4) The operator can zoom while the display is panned

Press [HOME] to reset the time cursor and display back to the cur rent time and date This disables panning, and removes the *PAN* indication and update window

ZOOM

The operator can use zooming features available at trend displays to increase or decrease the amount of trend data (trend line) dis played Figure 6 5 shows a trend display with zooming activated

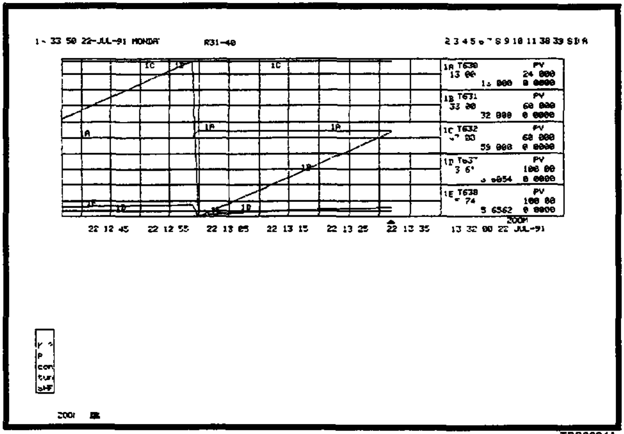
Zooming changes the trend presentation by increasing or de creasing the time span, thereby decreasing or increasing the amount of trend line presented Positive zooming increases the time span or amount of time between each vertical scale line, which makes the presentation look like it is contracting Negative zooming is just the opposite

The operator can zoom in two different ways A display can be zoomed by entering a zoom factor from 9 to -9, or using keyboard keys

To enter a zoom factor

1 With the element enabled, press [ZOOM] This calls a *ZOOM* input field to the screen The field appears at the lower left corner of the screen as shown in Figure 6 5 The factor that appears in the field is the last entered factor

2 Enter a desired zoom factor Enter any number from **1** to **9** to perform positive zooming or **-1** to **-9** for negative zooming



TPS0034A

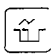
Figure 6 5 Trend Display Zooming Enabled

3 Press **ENTER**, the trend display updates at the entered factor

NOTE It is important to remove the *ZOOM* input field from the screen when done The operator cannot perform some of the trend control functions while it is on the screen

4 Press **ESC** to clear the *ZOOM* input field from the screen.

To randomly zoom, with the element enabled press



Performs positive zooming

Performs negative zooming

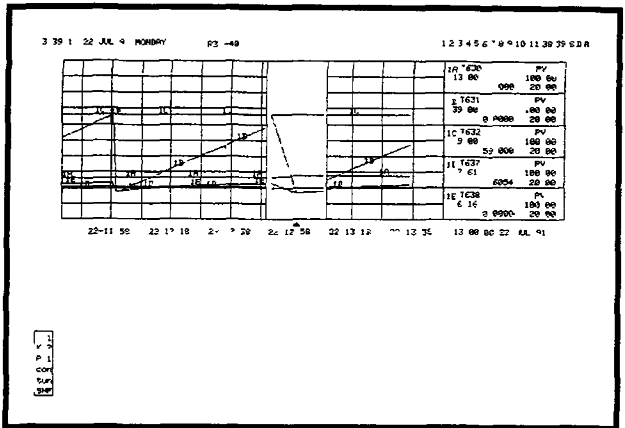
The amount of zoom per keystroke depends on the current time span of the display

ZOOM appears under the trend attributes boxes to indicate that the element has been zoomed (see Figure 6-5) The operator can pan while a display is zoomed

Press **HOME** to reset the display back to its original time span. This disables zooming and removes the *ZOOM* indication

MAGNIFYING GLASS

The operator can move the time cursor, then enable a magnifying glass feature at any time Figure 6 6 shows a trend display with magnifying glass enabled



TPS0035A

Figure 6 6 Trend Display Magnifying Glass Enabled

The magnifying glass can be used to highlight a portion of the trend graph It allows the operator to determine a time and date or value more accurately without having to change the entire display presentation Once enabled, the operator can move the time cur sor within the magnifying glass or zoom the trend lines within the glass for accurate analysis

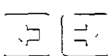
The initial amount of trend line displayed in the magnifying glass depends on the zoom factor set for the element The glass can be zoomed down to show a two minute segment of the trend graph

To enable the magnifying glass:

1 Position the time cursor at a desired segment of the trend graph The move time cursor keys or pan option can be used to position the time cursor The cursor must be moved from its home position to enable the glass

2 Press **ENTER** The glass appears at the time cursor position

3 Press

 Fine tunes the glass position

Once at the desired position, the magnifying glass must be made active to allow its inside operations Press

The next operations that can be performed are time cursor movement or negative zooming Attempting to positive zoom past the initial presentation of the glass clears it from the screen

Zoom To zoom inside the magnifying glass, press

Performs positive zooming

Performs negative zooming

Time Cursor The time cursor can be moved within the glass by using the normal move time cursor keys A pan can be done within the glass, but only with the keys and not the *PAN* field The amount of pan depends on the zoom factor of the glass

Remove Glass Press ESC or HOME to remove the magnifying glass from the screen The HOME key both removes the glass and returns the display to its original presentation The ESC key removes the glass while leaving the display at its current presentation

Operator Assignable Trends

The operator assignable trends function allows the operator to create two types of trends A tag trend that trends variables that are defined as tags in the tag database, and a function block output trend The block output type can be used to trend function blocks in a PCU module that do not exception report values, which means they cannot be defined as tags

Operator assignable trends do not require a trending block in the PCU module configuration Therefore, they do not use data collected by the INFI 90 distributed trending system

The data collection method and resolution also differ from distributed trends The console collects and stores the data rather than a PCU module Data collection occurs every two seconds for each operator assignable trend, which makes trend resolution two seconds The console can store on its hard disk at least two hours of trended data Operator assignable trends are also referred to as ***fast trends***

The console provides two operator assignable trend displays, each display having two standard ½ screen trend elements As normal, up to five trends can appear on a single trend element The operator can create up to 20 operator assignable trends There are, however, some guidelines that must be followed when creating these trends The following text provides further explanation

Refer to ***Trend Displays*** in this section for an explanation of the information presented at operator assignable trend displays

TREND ASSIGNMENTS

The operator must first define an operator assignable trend before the console begins collecting any data To call the display used to create an operator assignable trend (see Figure 6 7), first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities

→ *E Operator Assignable Trends*

→ *F Operator Trend Assignments*

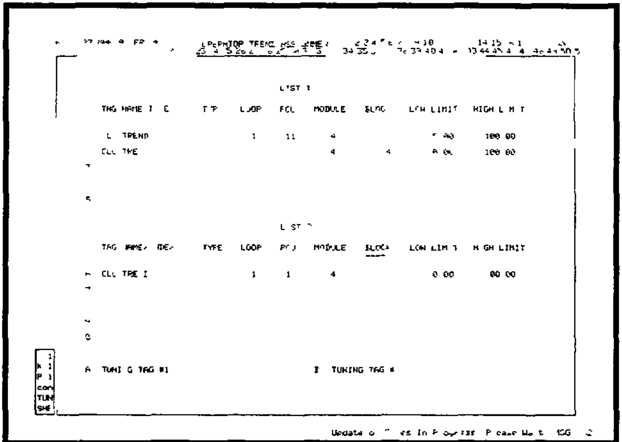


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Figure 6 7 Operator Trend Assignments

There are actually two trend assignment displays The second page can be called by pressing either NEXT PAGE or PREV PAGE Both pages are the same except that the first page defines *LIST 1* and *LIST 2* trends, the second page *LIST 3* and *LIST 4* Each list defines the trends that appear at a specific trend element, five trends per element

The console can collect, store and display data for up to 20 operator assignable trends The 20 can be a mix of tag and block output type trends Each display and trend element can display any combination of trend types Only six of the 20 can be block output trends For example, if the operator defines six block output trends, the 14 remaining can only be tag trends

During the configuration process, certain fields may or may not be accessible depending on the trend type The fields to define for each type trend are

Tag trend - *TAG NAME/INDEX*, *TYPE* (STATION tag only), *LOW LIMIT* and *HIGH LIMIT*

Block output trend *LOOP*, *PCU*, *MODULE*, *BLOCK*, *LOW LIMIT* and *HIGH LIMIT*

Tuning Tags

The console uses operator assignable trends in the trend element that is part of a station tuning display The trend element of the tuning display presents three variables, which count as three block output trends If two tuning tags are active, at least one must be cleared to define any block output trends Both displays must be cleared to define more than three block output trends

The console may also require deleting some block output trends to call a station tuning display If there are three or less block output trends, one station tuning display can be active Four or more and the console will not allow calling a tuning display

The *TUNING TAG #1* and *TUNING TAG #2* fields have two purposes They indicate whether there are active station tuning display tags, and allow clearing or deactivating collection for tuning displays The only valid operation to perform at these fields is to clear them This clears a tuning display making room for additional operator assignable trend entries, or another station tuning display

Define Trends

The operator can configure four lists of trends, five trends per list. Each list defines up to five trends that appear in a single trend element of an operator assignable trends display Each trend is a separate line on the trend graph identified by its color and associ ated alphanumeric

To define or edit a trend

1 Press [NEXT PAGE] or [PREV PAGE] to select which trend lists to define

2 The *Select Field* input prompt calls an input cursor to the dis play and allows positioning it at any desired row Enter a 1 to 10 selector, then press [ENTER] Key in the number of an existing trend to edit that trend, or the number of a blank row to define a new trend

Once the input cursor is on the display, additions or modifications to both lists can be performed Use the cursor control keys to move the input field to any desired row or field

Press [ESC] at any time after the cursor appears to call the *Select Field* prompt back to the screen

3 For a ***tag trend***, define the following fields

TAG NAME/INDEX enter the tag name or index number of the desired tag to trend This must match a tag defined in the tag database If an index number is entered, moving the cursor from this field updates the entry to a tag name Once a tag name or index number is entered, the console fills in the remaining fields after pressing ENTER or moving to another field The console does not allow access to the address fields after entering a tag name or index

TYPE - the type field can be specified for a STATION tag only This determines the station variable to trend Enter either **SP** (set point), **PV** (process variable), **CO** (control output) or **RI** (ratio index)

For a ***block output trend***, define the following fields

LOOP, PCU, MODULE and *BLOCK* enter the function block address of the block output to trend The *BLOCK* field determines the output that the console trends

The console checks the function block address entered to see if it matches any configured tags If a match is found, the console automatically enters a tag name and fills in all of the other fields making the trend a tag trend

The console automatically fills in the *LOW LIMIT* and *HIGH LIMIT* fields when entering either type trend These fields set the scale limits the trend element initially uses The limits can be adjusted at this display, or later after calling the actual operator assignable trend display If set here, the display defaults to these limits every time the operator calls the display

4 Press ENTER to save If required, press NEXT PAGE or PREV PAGE and repeat Step 2 to define the next two lists

5 Press ESC once to call the *Select Field* prompt to the display To exit the page entirely, continue to press ESC to exit to the operator trend assignment menu This menu provides the options for calling the operator assignable trends displays

The operator must call an operator assignable trend display to see the results of these entries Separate menu options are available for calling list one and two trends, and list three and four trends Refer to ***OPERATOR ASSIGNABLE TRENDS DISPLAY CALL UP*** in this section for the procedures

Delete Block Output Trend

To delete a block output trend

1 Clear any one of its address fields

2 Move out of the field, then press ENTER to save the deletion

Delete Tag Trend

To delete a tag trend

1 Clear its *TAG NAME/INDEX* field

2 Move out of the field, then press ENTER to save the deletion.

Delete Tuning Tag

A tuning tag must be deleted in some cases to define block output trends. Each tuning display counts as three block output trends If a tag name appears at one of the *TUNING TAG* fields, a tuning display is active for that tag Refer to ***Station Tuning Display*** in the ***Process Control and Tuning*** section for information on station tuning displays

If two tuning displays are active, a block output trend cannot be defined To make room for entering block output trends, this display provides a means of deleting any active tuning display trends

To delete a tuning tag

1 Press ESC to call the *Select Field* input prompt if it is not currently on the screen Key in either **A** or **B** depending on the tuning tag to delete

2 Press ENTER to position an input cursor at the desired tag field

3 Press CLEAR, this is the only valid option for either of these fields

> **NOTE** If the tuning display is currently called at another display it cannot be cleared

4 Press ENTER to save the deletion and clear the tuning display

5 Press ESC to leave the field and call the *Select Field* prompt

OPERATOR ASSIGNABLE TRENDS DISPLAY CALL UP

The operator can call an operator assignable trends display at any time through menu selections A display presents each trended variable defined through trend assignments as a continuous trend line Two separate trend displays can be called The first is for trends defined in *LIST 1* and *LIST 2* during trend assignment, and the second for *LIST 3* and *LIST 4* trends

To call an operator assignable trend display, press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities

→ *E Operator Assignable Trends*

→ *B Trend Display List 1 & 2*

or

B OIS Utilities
E Operator Assignable Trends
C Trend Display List 3 & 4

Press ESC or call another display to exit the trend display

XY PLOT OPERATIONS

The XY plot function presents pairs of process variables in an x,y graph format The x axis is determined by one process variable, the y axis another

Three type of plots can be created The data source defined for a plot determines whether the data is exception reported tag values (tag source), distributed trend data (trend source), or values collected by a program running in a multi function processor module (MFC source) The process engineer sets the type for a plot during XY plot definition, up to 80 indexed plots can be created

Tag or Trend Plot

NOTE Th s software re ease does not support the trend data source

The variables that appear at a tag or trend type of XY plot depend on a plot index parameter entered during the creation of the display Each plot index defines a single plot

The process engineer defines the characteristics of a tag or trend plot during XY plot definition Specifically, this procedure defines

- Data source (tag data or trend data)
- Initial update mode
- X axis variable
- Y axis variable
- Initial x axis and y axis high and low limits
- Conditions that control plot clearing
- Data collection resolution
- Maximum number of samples

Refer to ***XY Plot Definition*** in the ***OIS Configuration*** section for further explanation of data source and plot index definition, and XY plot display configuration requirements

XY PLOT DISPLAY

The console provides a standard XY plot template that can be incorporated into any process operations The displays vary in size from ½ screen to a full screen display. An XY plot display is normally called by name or through an assignable function key. Figure 6-8 is an example plot display. The display is the ***XYPFL5.DT*** source file.

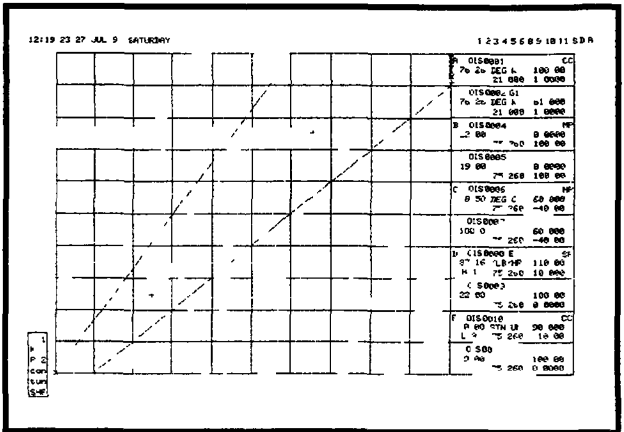

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Figure 6-8 XY Plot

A single XY plot element can present information for up to five separate plot indexes (i.e., five pairs of variables). It presents the plot information as either a single point, a series of dots, or a continuous line on an x,y graph. The console uses a cross hair (+) pointer to indicate the most recent plotted point, and updates the position of the pointer as the console receives new values. Each plot and its pointer are identified by a specific color on the graph.

The resolution of a plot determines how often the display updates. While an XY plot display is active, the console collects data at the rate set during plot definition. The definition pages allow activating or deactivating data collection for a plot. For a tag plot, the resolution can range from seconds to days. A trend plot resolution is either 15 seconds or one minute.

The attributes of a plot appear at the right of the display (see Figure 6-8). The color of a plotted point and pointer associates it with the attributes presented in these boxes. For example, a plot in green corresponds to the attributes with a green selector. Each plot has a pair of related attributes. The top box in the pair contains the x axis attributes. The bottom box in the pair contains the y axis attributes.

Plot Attributes

Figure 6-9 identifies the attributes that appear for each variable of a tag or trend plot.

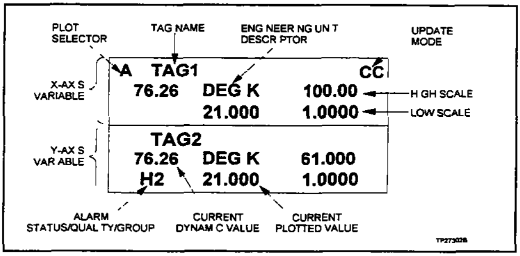


Figure 6 9 XY Plot Attributes

During plot definition, the process engineer enters two tag names, each relates to either the x axis or y axis variable The name is that of the tag referencing the PCU module function block (process variable) for which a plot is collecting data The console requires these tag names to present real time attributes associated with each variable of a plot whether it is a tag or trend type

Update mode an update mode indicator identifies the current mode for the plot The initial indication is the update mode set during plot definition The mode indicator appears as

SP single point

MP multipoint

CC continuous curve

Alarm status/quality/group the current alarm information received for the variable (tag). All normal alarm indications appear at this field The operator can acknowledge an alarm using normal alarm processing procedures Refer to the ***Alarm Processing*** section for alarm processing, conditions and indications

Engineering unit descriptor the unit of measurement being reported for and associated with the variable A PCU module reports an index number for an analog value the console uses to determine and display the proper engineering unit descriptor

Tag name the name of a tag associated with the plot This is the name of the tag entered during plot definition, which allows the console to associate real time data and information with a specific plotted variable

Current dynamic value the current value being exception reported for the process point The field updates to reflect any current changes in the process variable

High and low scale limit ınıtıally, the scale lımıts are set at the hıgh and low scale values entered durıng plot definıtıon The op erator can change these lımıts after callıng a dısplay to adjust the presentatıon These are local dısplay changes only A scale lımıt change does not affect the plot definıtıon values

Current plotted value the current plotted value The field up dates as each new value ıs plotted

A legend can be ıncorporated ınto a custom XY plot dısplay durıng ıts creatıon ıf desıred The plot definıtıon defines the text of the legend

XY PLOT CONTROL

XY plot control optıons allow adjustıng the plot presentatıon The scale and update mode changes made whıle a plot dısplay ıs on the screen are temporary changes After exıtıng, the dısplay resets to ıts orıgınal presentatıon

Scale change (SC) the scale change command allows adjustıng the hıgh and low scale range for each plot ındıvıdually

Update mode change a plot defaults to the update mode set durıng ıts definıtıon The update mode optıons allow changıng the update mode whıle the plot ıs on the dısplay The update modes are

Sıngle poınt (SP)	The console updates a plot as a sıngle poınt The current receıved data ıs ıdentı fied by the posıtıon of the cross haır (+) poınter Hıstorıcal poınts do not appear ın thıs mode
Multıpoınt (MP)	All plotted poınts remaın on the screen as a serıes of dots The most recent plotted poınt ıs ıdentıfied by the cross haır
Contınuous curve (CC)	All plotted poınts connect as a lıne The most recent plotted poınt ıs ıdentıfied by the cross haır.

For the contınuous curve and multıpoınt plots, up to 480 samples can appear on the graph at one tıme dependıng on plot definıtıon. Once the maxımum ıs reached, the last plotted poınts scroll off the graph A clear feature can be ımplemented durıng definıtıon to clear plotted values after a certaın trıgger condıtıon ıs met

Select Plot The control features are set on a per plot basıs To change the presentatıon usıng any of the control commands, select one of the plot elements Eıther enter ıts selector through the keyboard or use an optıonal method of selectıon An *X TARGT MODE* control prompt appears and the outlıne of the attrıbutes box hıghlıghts af ter the element has been selected Refer to ***DISPLAY AND CONTROL SELECT OPTIONS*** in the ***Display System*** section for a description of alternate select methods

The location of the control prompt depends on parameters set during display creation, but normally it appears under the attributes box The *X* portion of the field indicates the currently selected and active plot for control (e g , *A, B, C, D, E*) The following control options can be performed through the *X TARGT MODE* prompt

To change the ***scale limits*** for a selected plot

1 At the *X TARGT MODE* prompt, enter **SC** then press **ENTER** An input field appears at the high scale limit value of the selected plot This field enables scale range changes

Once the input field is on the screen, it can be moved to any scale limit of the selected plot by pressing **TAB** or **TAB BACK**

2 Enter a new high or low scale limit for each plot to change Both the high and low scale can be changed, or only one of the limits if desired

3 Press **ENTER**, the display updates to the new scale limits, and both current and historical values for each plot conform to their newly entered range limit

4 Press **ESC** to remove the input cursor

To change the ***mode*** *of a* selected plot

1 At the *X TARGT MODE* field, type

SP single point mode

MP - multipoint mode

CC - continuous curve mode

2 Press **ENTER** The display updates to the new mode as soon as this key is pressed

Help A help option (HP) is available at any time to call a list of XY plot commands that can be entered at the *X TARGT MODE* prompt

Enter **HP** at the *X TARGT MODE* prompt to enable the help option A list of available operator control actions appears at the bottom of the screen Press **NEXT PAGE** or **PREV PAGE** to move between the lists The list appears as

SC - Scale Change	*ED Edit File*
SF Save into File	*SP Single Point*

HP	*Help*	*BF*	*Background File*
CC	*Continuous Curve*	*CL*	*Clear the Plot*
MP	*Multi Point*		

PLOT DATA BACKGROUND CURVES

The console provides an option available at XY plots to save a snapshot of the current collected plot data The data is saved in a hard disk file, with the file having a user defined name Once saved, the plot data can then be called back to the display as a background plot at any time by entering its name Each plot file contains information for a single plot, not the entire display An option for editing this data or creating this background data is also provided

Commands for saving, viewing and editing plot data files are entered at the *X TARGT MODE* prompt The commands include

- **SF** save collected plot coordinates to file
- **ED** edit a file
- **BF** display a background file of plotted coordinates
- **CL** clear background curve from plot display.

Save collected plot coordinates to file - a prompt *FILE NAME* appears in the control area after entering **SF** at the *X TARGT MODE* prompt Enter a file name of up to eight alphanumeric characters The background files are kept in a single directory on disk (USN 59) in order to group them for transfer .The names given to the background files should be meaningful The data coordinates will be saved to the named file after pressing **ENTER** Control returns to the *X TARGT MODE* prompt when this operation is complete

Edit a file this function builds or modifies a background file. The prompt *FILE NAME* appears after entering **ED** at the *X TARGT MODE* prompt Enter the name of an existing file to edit, or a new name to create a background file. If the file exists, it displays on the graph as a background curve Otherwise, the curve is built from data entered

The prompt *XY XXXXXX YYYYYY* (where *XXXXXX* and *YYYYYY* are the x axis and y axis values) appears after entering the file name The input field is placed on the x-axis value of the first coordinate pair to allow editing

To edit coordinates of a background file

1 Press

To move the input field between the coordinate fields Key in a new coordinate value if desired

2. Press [TAB] and [TAB BACK] to view the next or previous coordinate pair respectively The display updates after pressing either of these keys

3 Repeat Steps 1 and 2 for each coordinate pair until the desired presentation is created. Once completed, press [ENTER] to save all changes to a background file, or press [ESC] to abandon the changes and return control to the *X TARGT MODE* prompt

Display a background file of plotted coordinates the prompt *FILE NAME* appears in the control area after entering **BF** at the *X TARGT MODE* prompt Enter the file name that was created using either the **SF** or **ED** commands After pressing [ENTER], a continuous curve for this data file is drawn on the screen The color of the curve is white Only one background curve can display within the graph element at a time

A background file can be deleted from the hard disk using a delete file command, refer to the ***Terminal Utilities*** section

Clear background curve from plot display a background curve is removed from the presentation after entering **CL** at the *X TARGT MODE* prompt

MFÇ Data Source Plot

The MFC data source plot function gives the ability to transfer data collected by a PCU module to the console for later display The variables that are plotted at an MFC data source plot come from a data file transferred to the console from a multi function processor (MFP) module The MFP module executes a C language program to acquire the data from the process It sends the data to the console in real 2 format Refer to Appendix F for the required data file structure

The console references a plot index parameter defined during creation of the XY plot display to obtain the data from a specific file stored on its hard disk The index defined during display creation is the default data file used when the operator initially calls the display The operator can change to another data file anytime after calling the plot display to the screen

A data file resides in the USN 59 directory, and is in the format

XYxxnnnn.IF

where

xx Plot index number

nnnn File ID as defined in the plot definition

For example, the file ***XY151234.IF*** corresponds to the plot definition with an index number of 15 and a file ID of 1234

The process engineer defines the characteristics of an MFC data source plot during XY plot definition. Specifically, this procedure defines

- Data source as MFC
- File ID
- MFP module address
- Trigger tag
- Initial x axis high limit and low limit
- Border color
- Reference line colors
- Plot legend

Refer to ***XY Plot Definition*** in the ***OIS Configuration*** section for further explanation of data source and plot index definition, and also XY plot display configuration requirements

XY PLOT DISPLAY

A single XY plot display for MFC data source plots can contain up to three plot elements Each element presents the data from a single data file The data can be plotted as a smooth curve or in steps on an x,y graph This is determined by the data file and not the console The console can plot a maximum of 480 samples in a single plot element

The update of a plot element depends on the program collecting the data When the trigger tag goes from zero to some file size, the module sends a data file The trigger tag is an ANALOG type tag that references an analog exception reporting block in a PCU module A new data file from the module overwrites any existing data file The console reads the new data file to update the display. If the console has not yet received a data file for a plot, the display remains blank and the following message appears until the console has read the data from the module

No data from the module for plot index %d

The data file contains a parameter that sets the high scale limit and one that sets the low scale limit of a plot element The console plots data values proportionally between the high and low scale limits Any values that fall outside of these limits are not plotted.

The module can mark a data point as being in alarm The display shows an area on the plot line in red to indicate when a point was in alarm

A grid provides a reference The grid can be enabled or disabled during display creation

A single plot element can contain up to five reference lines The lines can be drawn in either a vertical or horizontal direction The data file enables the reference lines The plot definition sets the color of each line A display can be built to show the values associated with a reference line

Plot Attributes

The attributes that appear for an XY plot and where they appear on the display are determined during display creation Normally, they appear at the right of the display The values come from the data file During display creation, the process engineer can design the plot display to include the following information

Description a description as defined during plot definition

X-axis and y-axis scale limits the high scale limit and low scale limit for the x axis and y axis The initial scale limits are set during plot definition The data file contains values that override these initial values

X-axis and y-axis last value the last value retrieved from the data file for either or both the x axis and y axis

Update mode an update mode indicator identifies the current mode for the plot The initial indication is the update mode set during plot definition The continuous curve (*CC*) mode is recommended for MFC data source plots

Reference line value up to ten reference line values can be displayed A reference line value corresponds to either the x axis value or y axis value of one of five possible reference lines

A legend can be incorporated into a display during its creation if desired The plot definition defines the text of the legend

XY PLOT CONTROL

Using XY plot control, the operator can switch between different MFC data files while a plot display is on the screen This eliminates the need to have several dedicated displays for a set of plot indexes if desired The control features are set on a per plot basis

Initially, a plot element of a display shows the data from a specific plot definition A parameter set during display creation defines the initial definition used by the element At any time after calling an XY plot display, the operator can request a data file for another *ACTIVE* MFC data source plot from the current display This affects only one plot element at a time Some restrictions apply, however, when selecting data files This change is only temporary, and after exiting, the display resets to the plot index defined during display creation

To call another data file from the current XY plot display

1 Select one of the plot elements Either enter its selector through the keyboard or use an optional method of selection Refer to ***DISPLAY AND CONTROL SELECT OPTIONS*** in the ***Display System*** section for a description of alternate select methods

An *X TARGT MODE* control prompt appears when the element is selected The *X* portion of the field indicates the currently selected and active plot for control (e g , *A, B, C, D, E*) The location of the control prompt depends on parameters set during display creation

2 Key in the index number of an *ACTIVE* MFC data source plot, then press **ENTER** A valid entry is from 1 to 80

A plot must be active to call it to the display Up to ten MFC data source plots can be active at one time If the plot being called is not active, the following message appears

Plot must be ACTIVE in order to continue

A plot must be of MFC data source type to call it to the display If not, the following message appears

Plot is not of MFC Data Source Type

Up to six plot elements can be on display at one time, but only three on a display screen If the entered plot index is already displaying on the current screen, the following message appears

Plot already on display

If the same display is called on a different screen, changing plot index is not permitted If an attempt is made to change the index, the following message appears

Same display on CRT %d cannot change plot

OPERATOR CONFIGURABLE DISPLAYS

The operator configurable displays function allows the operator to create displays as needed through menu selections at the console This function provides the ability to create a group display containing standard symbol elements without having to use the software oriented display generator (SODG) program Up to 25 displays can be created

> **NOTE** The parameters controlling operator configurable displays operation can be seen by sequencing through the *Operator Displays' Faceplates* utility pages

The *Operator Displays' Faceplates* configuration procedure, explained in the ***OIS Configuration*** section, determines the symbol elements used to create operator configurable displays The default configuration for this function uses standard control, data acquisition, alarm summary and trend elements to create each group display These elements are provided as part of the symbol library on hard disk Each element presents the same information, and provides the same capabilities as those that are a fixed element of a user created display

The default symbols used to create the operator configurable displays can be changed through the procedures explained in ***OPERATOR CONFIGURABLE DISPLAYS FACEPLATE CONFIGURATION*** in the ***OIS Configuration*** section

The operator can incorporate control elements to control and present information for DD, MSDD, RCM, RMCB, RMSC and STATION tags Data acquisition elements allow viewing process variables referenced by ANALOG, DAANALG, DADIG, DADIGTL, DANG, DIGITAL, INTANG and INTDIG tags A TEXTSTR element allows viewing text strings sent to the console from a PCU module, and entering text strings in response to a question, to verify operator acknowledgment or for historical purposes Refer to the ***Process Control and Tuning*** and ***Data Acquisition*** sections for specifics on information and control capabilities available through these display elements

A trend element as part of the display can be used to view distributed trend data Several trend element sizes are available during display creation The operator configurable displays use trend tags defined during trend definition Refer to ***Trend Control*** in this section for functions available at trend elements

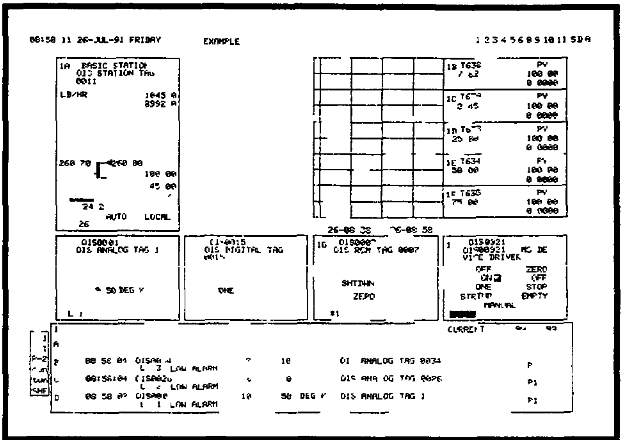
An alarm summary provides all normal summary capabilities The function provides several size options for the summary The format used for each alarm line entry is set during *Operator Displays' Faceplates* configuration Refer to the ***Alarm Processing*** section for an explanation of alarm summary information and operations

Figure 6 10 is an example display that contains a STATION, ANALOG, DIGITAL, RCM and MSDD tag element, and a trend and alarm summary element Figure 6-11 shows the operator configurable displays setup for this example display

The operator can create a display in any format desired limited only by the available elements Two main pages are used to create a display The procedures to create a display include

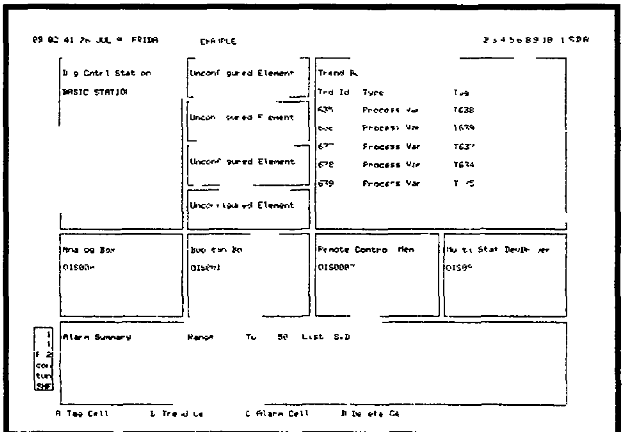
- Defining a display name
- Entering display elements
- Saving the display

Once created, a display can be edited or deleted at any time



TPS0043A

Figure 6-10 Example Operator Configurable Display

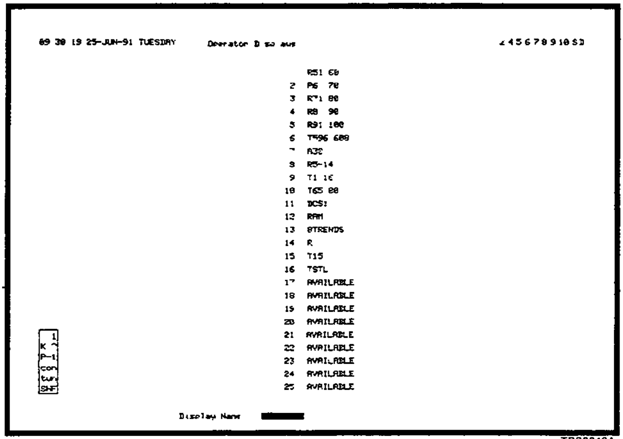


TPS0042A

Figure 6 11 Example Display Setup

The two pages of the operator configurable displays function are the directory page and the editing page The directory page is the initial page when the function is first selected To call this first page (see Figure 6 12), press GENL FCTNS MENU , then select the following menu items in the sequence shown

C OIS Operations ⟶ F Operator Configurable Displays



TPS0040A

Figure 6 12 Operator Configurable Displays Directory Page

Directory Page

The directory page provides two functions The first is a directory listing of both configured and unconfigured displays The second is to call a configured display to either edit or delete it, or to call a blank page to create a new display

At this page, a display name appears for each configured display This name or its associated index number must be entered at the *Display Name* field to call an existing display An *AVAILABLE* appears for each unconfigured display After creating then saving a display its name replaces one of the *AVAILABLE* fields

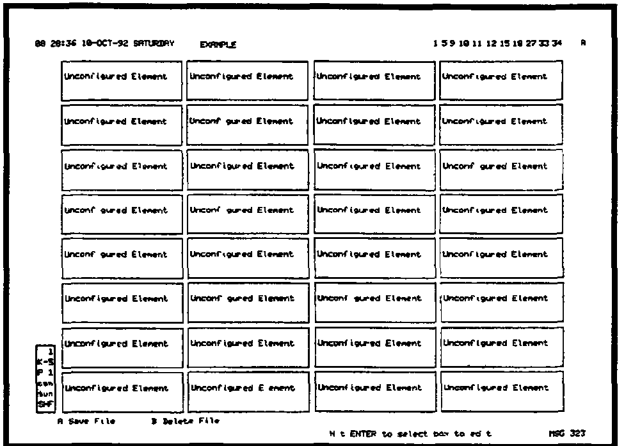
Key in the name or index number of a display, then press ENTER to modify or delete an ***existing*** display The next page that appears reflects the previous configuration for that display, see Figure 6 11 for an example

Enter a display name that does not already exist, then press ENTER to create a ***new*** display

The name entered should be meaningful since this name also appears as the display title In addition, the display name is used to call the configured display to the screen If the display does not exist, an unconfigured page appears after pressing [ENTER] (see Figure 6 13). In either case, the message

Display Requested Not Operator Configurable

appears if the display exists as a user created display (***.DU***), which cannot be operator configured.



TPS0041B

Figure 6 13 Operator Configurable Displays - Editing Page

Press [ESC] at any time to exit this page

Editing Page

The operator performs the actual display creation or editing at the editing page For a previously unconfigured display, the page appears as shown in Figure 6 13 The page contains 32 *Unconfigured Element* boxes. Each unconfigured box identifies an area of the screen that is available for placing a tag, trend or alarm summary element

Each element that can be incorporated into a display consumes a specific number of these boxes The number of elements that can be defined in a single display depends on the number of boxes each element type consumes For example, the *Dig Cntrl Station* element in Figure 6-11 consumes four vertical *Unconfigured Element* boxes, the *Alarm Summary* element consumes a total of eight *Unconfigured Element* boxes Most element types come in varying sizes to help maximize the available space

Selecting a box a cursor identified as a highlighted outline (cyan) appears and can be moved at this page Initially, the cursor appears at the left upper corner of the page

The cursor has two purposes. When creating a display, it allows positioning elements on the page by moving to, then selecting specific boxes It also allows the operator to redefine or delete an element by positioning the cursor at that element In either case, options are presented at the bottom of the display to enable defining or deleting elements after making a box selection

To select a box to edit

1 Use the cursor control keys to move the cursor to a specific *Unconfigured Element* box, or any configured element box if editing or deleting that element The selection determines where the console begins to draw a specific element, not the actual size of the element

2 When the cursor is at the desired box, press ENTER to select that box to edit

A configured box does not have to be deleted to redefine it The function allows selecting a configured box, then redefining its attributes

Element definition the options presented depend on whether the selected box is an *Unconfigured Element* or a previously defined element The console automatically selects the specific element to use based on user inputs Figure 6 11 shows the options

The following options are available after selecting a configured box The *Delete Cell* option is not available if the selected box is an *Unconfigured Element* box

Tag Cell Press A to select the *Tag Cell* option A *Tag Name or Index* input field appears at the bottom of the screen This puts a tag element into the display for presenting process information, or allowing process control The type of the entered tag determines the next prompts that appear

Trend Cell Press B to select the *Trend Cell* option This puts a trend element into the display to view distributed trend data Each trend that is to appear in the trend element can be configured by entering either a trend index number, or tag name or index number, then selecting an element size

Alarm Cell Press C to select the *Alarm Cell* option This puts an alarm summary element into the display for viewing alarm occurrences Additional options select the element size and alarm groups that appear in the summary

Delete Cell Press [D] to select the *Delete Cell* option This option deletes an element making the area available as *Unconfigured Element* boxes

Each option is explained in more detail in the ***Tag Element Definition***, ***Trend Element Definition*** and ***Alarm Summary Element Definition*** sections that follow

NOTE The *Save File* and *Delete File* options are available initially and after completely defining an element

Save display to file - once a display is completely defined, it must be saved using the *Save File* option During a save, the console creates the configuration and display files that make up the display Press [A] when editing is complete to save an operator configured display The console then begins to construct the display file The message *Display being constructed, Please Wait* appears

Do ***not*** press any keys while the console is constructing the display file If the operator configurable displays function is exited while the display file is being constructed, the changes are not saved When construction of the display is complete, the system returns to the directory page

Press [ESC] before saving to abandon any edits If changes were made to an existing file and the changes were not saved before attempting to exit the page, the message

Change Made <ENTER> to save, <ESCAPE> to abandon

appears Press [ENTER] to save the changes, [ESC] to continue the exit

Delete display file - a *Delete File* option when selected clears the current operator configurable display The console erases both the configuration files and display file for that particular display This also removes the display name from the directory list and replaces it with an *AVAILABLE*

Press [B] to delete the current operator configurable display, the current display is removed from the system It is suggested that any displays no longer in use be deleted This frees up hard disk space for use by other console functions

Box Overlap

The size of each element being defined must be considered when creating a display An overlap may occur when attempting to define an element and the chosen size of that element expands over part or all of another already defined element The console will not draw one element over another

The console looks for an open spot to place an element before indicating an overlap Initially, the console searches down and to the right when placing an element It will, however, search up and to the left if encountering an existing element In either case, the search is from the location of the cursor The cursor determines the starting point for drawing an element and the console cannot reposition this cursor

If it cannot find an open spot, the console presents an error and options message

Box Overlap <ENTER> accept, <ESC> reject MSG 319

and draws a red outline showing where the overlap occurs The outline is the actual size of the element being entered and causing the overlap error Any configured elements that fall within this red outline are the overlapped elements

Two choices are available to correct the error The element being defined must either be sized or positioned to eliminate the overlap Or, the overlapped elements can be overwritten by the overlapping element, then redefined at another *Unconfigured Element* box position The *Box Overlap* message allows these choices

Press ENTER with the message on the display to ***accept*** the overlap and overwrite any overlapped elements The screen up dates with the new element after accepting The overlapped ele ments no longer appear

Press ESC to ***clear*** the overlap without overwriting If rejected, the screen restores to its previous state

Tag Element Definition

The operator can define an *Unconfigured Element* box, or redefine a configured element box as a tag element The function requires a tag name or index input to define a tag element And in some cases, it also requires selecting an element size The console automatically selects which symbol source file to use when draw ing the particular element based on tag type and selected size in put The default source files and corresponding tag types include

ANALOG1.DT ANALOG, INTANG, DAANALG tags

ANCBOOL1.DT DIGITAL, INTDIG, DADIGTL tags (annunciator)

ANCREAL1.DT ANALOG, INTANG, DAANALG tags (annunciator)

ANLGHF1.DT ANALOG, INTANG, DAANALG tags (half size)

BOOLEAN1.DT DIGITAL, INTDIG, DADIGTL tags

BOOLHF1.DT DIGITAL, INTDIG, DADIGTL tags (half size)

DADIG1 DADIG tag (full size)

DCSFULL2.DT - STATION tag

DCSHALF1.DT - STATION tag (half size)

DEVDR1.DT DD tag

DNGFULL1 DANG tag (full size).

DNGHALF1 - DANG tag (half size).

MSDEVDR1.DT - MSDD tag

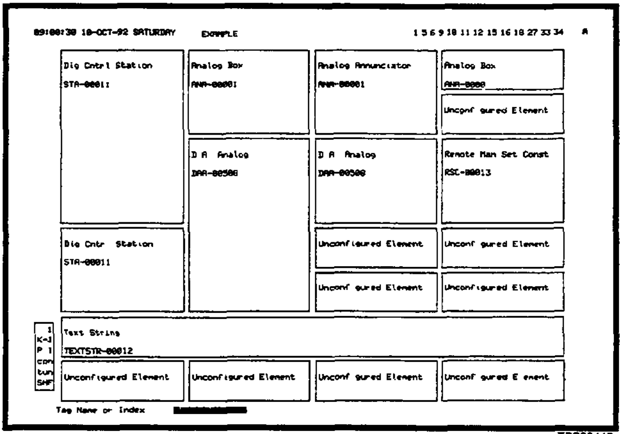
RCM1.DT RCM tag

RMSC1.DT RMSC tag

RMCB1.DT - RMCB tag

TEXTSTR1.DT - TEXTSTR tag

Figure 6-14 and Figure 6-15 show each tag type and the element sizes available



TPS0044B

Figure 6-14 Tag Elements (Page 1)

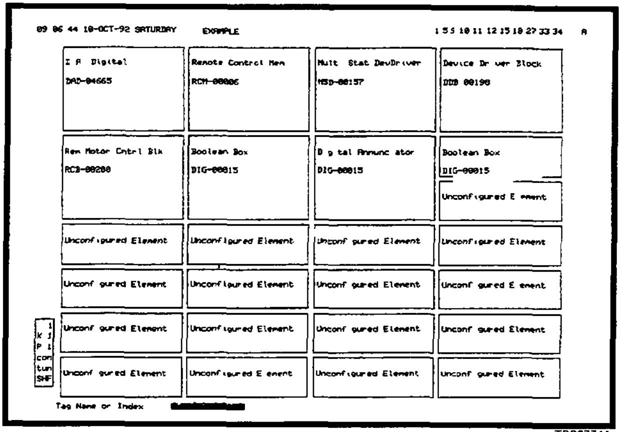
To define a tag element

1 Select an *Unconfigured Element* or configured) box by positioning the cursor at that box, then pressing [ENTER]

2. Press [A] to select the *Tag Cell* option A *Tag Name or Index* input field appears

3 Key in either a valid tag name or index number, then press [ENTER] The console checks the tag type after entering If the tag type is not allowed for this function, an error message appears.

At this point, one of two things happens If defining a DADIG, DD, MSDD, RCM. RMCB, RMSC or TEXTSTR tag element, the console draws a configured box that contains an element type descriptor and the tag descriptor (see Figure 6 14 and Figure 6 15) The



TPS0774A

Figure 6 15 Tag Elements (Page 2)

console requires further input and presents additional options for the remaining tag types

ANALOG, INTANG or DAANALG the console requires first se lecting the type element, then the size The options are

A Analog *B Annunciator*

Press [A] to select the analog type element, which requires an ad ditional size selection by pressing [A] for *Full* size or [B] for *Half* size Press B to select an annunciator type analog element Both types can be seen in Figure 6 14

DIGITAL, INTDIG or DADIGTL the console requires first select ing the type element, then the size The options are

A Boolean *B Annunciator*

Press [A] to select the digital (boolean) type element, which re- quires an additional size selection by pressing [A] for *Full* size or [B] for *Half* size Press [B] to select an annunciator type digital ele ment Both types can be seen in Figure 6 15

DANG or STATION the console requires selecting an element size The options are

A Full *B Half*

Press [A] for *Full* or [B] for *Half*

After makıng all optıon selectıons for a partıcular element, the console then draws a confıgured box that contaıns an element type descrıptor and the tag descrıptor

4 Contınue to configure all tag elements that are to appear ın the final dısplay by repeatıng Steps 1 through 3. If only tag elements are to appear ın thıs dısplay, contınue wıth the next step If trend or alarm summary elements are to be defined, skıp Step 5 and follow the procedures outlıned under ***Trend Element Definition*** and ***Alarm Summary Element Definition*** ın thıs sectıon.

> **NOTE** If trend or alarm summary elements are to be defined in this display, define those elements ***before*** saving the display

5 Press [A] to select *Save File* to create the final dısplay file Press [ESC] to exıt wıthout savıng or to abandon any edıts

Trend Element Definition

The operator can define an *Unconfigured Element* box, or redefine a confıgured element box as a trend element The functıon requıres a tag name or ındex ınput, or a trend ındex ınput to define a trend element It also requıres selectıng an element sıze The console automatıcally selects whıch symbol source file to use when drawıng the partıcular element based on the type of trended varıable (ı e , control output, set poınt, ratıo ındex, etc) and the selected sıze of the element The default source files for each trended varıable type ınclude

TRNDCOFL.DT - control output (full)

TRNDCOHF.DT control output (half)

TRNDDGFL.DT dıgıtal (full)

TRNDDGHF.DT dıgıtal (half)

TRNDPVFL.DT process varıable (full)

TRNDPVHF.DT - process varıable (half)

TRNDRIFL.DT ratıo ındex (full)

TRNDRIHF.DT ratıo ındex (half)

TRNDSPFL.DT set poınt (full)

TRNDSPHF.DT set poınt (half)

> **NOTE** The full and half do not determine the element size but rather the attributes that appear for each trend When the console uses the half source files the tag descriptor does not appear for a trend

Fıgure 6 16 shows some of the avaılable trend element sızes, and the sıze optıons The figure uses the *1/2 screen, 1/2 by 1/2* and *1/4 by 1/2* sızes

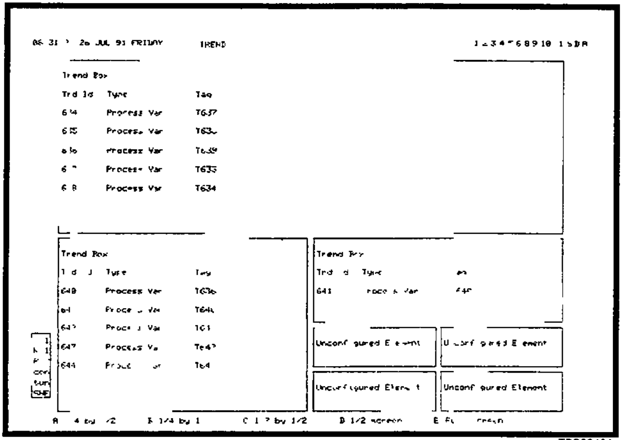


Figure 6-16 Trend Elements

To define a trend element

1 Select an *Unconfigured Element* (or configured) box by positioning the cursor at that box, then pressing ENTER

2 Press B to select the *Trend Cell* option A list of size options then appears at the bottom of the screen

A 1/4 by 1/2

B 1/4 by 1

C 1/2 by 1/2

D 1/2 screen

E Full Screen

3 Press either A, B, C, D or E to select the desired size After selection, the bottom line options are

A By Tag Name *B By Trend index*

4 A trend can be defined by entering a valid trend index number if known, or tag name or index number if the trend index number is not known In either case, the console searches its database to find a match Press A to select the *By Tag Name* option, a *Tag Name or Index* input field then appears Press B to select the *By Trend Index* option, a *Trend Index* input field appears

5 If the trend element size selected previously is *1/2 by 1/2* or larger, up to five trends can appear at that element Any smaller trend elements only allow for one trend

Depending on the option chosen in the previous step, key in a tag name or index number, or trend index number. The console initially presents a single input field To enter additional trends when using either of these options, press TAB after the initial entry The console presents up to four additional input fields Continue to make entries in these fields until all desired trends are entered

Tag name or index if using this option, the entry must be a valid tag, and a trend definition must use this tag The console checks the tag database each time TAB is pressed when entering multiple (up to five) tags

If a tag entry is a STATION tag, these options appear

A Process variable

B Set point

C Ratio index

D Control output

Select the specific type of trended variable The console requires this to determine which trend definition to display since a separate process variable, set point, ratio index or control output trend may be defined for a single STATION tag The tag subtype is identified during trend definition If a trend definition with the selected variable type cannot be found an error message appears

Trend index - the only requirement for this option is that a trend be defined in the trend database All required information is available in the definition of the trend

6 Press ENTER after all inputs have been made The console draws a configured element box that contains the element type descriptor and a *Trd Id* (trend descriptor), *Type* (process variable, set point, control output, ratio index or digital) and *Tag* (tag descriptor) for each trend (see Figure 6 14)

7 Continue to configure all trend elements that are to appear in the final display by repeating Steps 1 through 6 If only trend elements are to appear in this display, continue with the next step If tag or alarm summary elements are to be defined, skip Step 8 and follow the procedures outlined under ***Tag Element Definition*** and ***Alarm Summary Element Definition*** in this section

NOTE f tag or alarm summary elements are to be defined n this display, def ne those e ements ***before*** saving the d splay

8 Press [A] to select *Save File* to create the final display file Press [ESC] to exit without saving or to abandon any edits

Colors for trends are set during operator displays' faceplates configuration procedures The resolution of the trend display element is the maximum resolution of the configured trends for that element

Alarm Summary Element Definition

The operator can define an *Unconfigured Element* box, or redefine a configured element box as an alarm summary element The function requires defining the alarm groups that are to appear in an alarm summary element, and it also requires selecting an element size

The alarm summary line format selected during operator displays' faceplates configuration determines the allowable element size options The number of alarm entries that can appear at a single display page is 16 This also factors into the size options An alarm summary line format defines

Line option number of display lines reserved for each entry in the summary

Line attributes the specific data items that appear and their location in an entry

Attribute colors selects the colors in which attributes of each entry appear

Refer to ***ALARM SUMMARY CONFIGURATION*** in the ***OIS Configuration*** section for further explanation of alarm summary line formats

Figure 6 17 shows some of the available alarm summary element sizes, and the size options The figure uses the *1/2 screen*, *1/4 screen* and *1/8 screen* sizes

To define an alarm summary element

1 Select an *Unconfigured Element* (or configured) box by positioning the cursor at that box, then pressing [ENTER]

2 Press [C] to select the *Alarm Cell* option A list of size options then appears at the bottom of the screen The size options that are available for an alarm summary element depend on the line option being used in the chosen alarm summary line format

Line option 0

A 1/8 screen

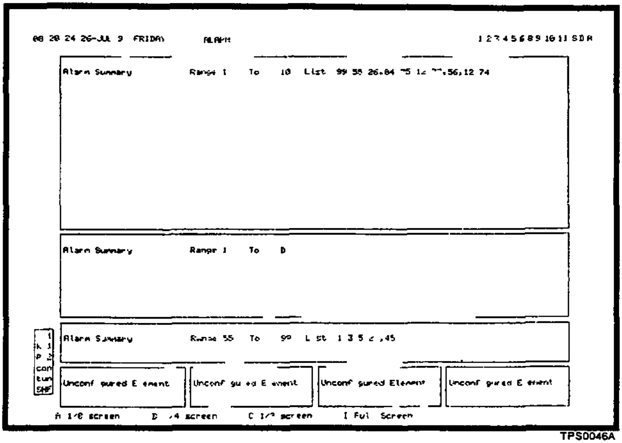


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Figure 6-17   Alarm Summary Element

B 1/4 screen

C 1/2 screen

D Full Screen

Line option 1

A 1/4 screen

B 1/2 screen

C Full Screen

Line option 2

A 1/8 screen

B 1/4 screen

C 1/2 screen

When using line option 2, the *C Alarm Cell* option is removed as one of the cell type options after the display has been configured with a half size element No other alarm summaries can be de fined in the display This is because a half size alarm summary using line option 2 presents the maximum of 16 alarm entries.

Table 6-1 gives a breakdown of the number of line entries each element size presents based on its line option

Table 6 1 Alarm Summary Entries

Line Option	Number of Alarm Entries			
	1/8	1/4	1/2	Full
0	2	4	8	16
1	N/A	2	4	8
2	4	8	16	N/A

3 Press either [A], [B], [C] or [D] to select the desired size After selection a *Range ___ To List* input field appears

4 The input field allows entering an alarm group range, alarm group list or both Use the cursor control keys to move between each input field

Range the *Range To* portion of the prompt determines which tag alarm indications appear in a summary by specifying an alarm group range The range can include all alarm groups, which is an entered range of 1 to D The range can also limit the number of groups For example, entering **2** and **45** shows only those alarms for tags in alarm groups 2 through 45

List the *List* portion of the prompt allows specifying up to 10 alarm groups Initially, the console presents only one input field Press [TAB] after the initial entry to specify up to 9 additional groups

Key in the alarm groups that are to appear in the alarm summary The range and list options can be used in conjunction, or separately if desired

5 Press [ENTER] after all inputs have been made The console draws a configured element box that contains the element type descriptor and the entered alarm group range and list (see Figure 6 17)

6 Continue to configure all alarm summary elements that are to appear in the final display by repeating Steps 1 through 5 If only alarm summary elements are to appear in this display, continue with the next step If tag or trend elements are to be defined, skip Step 7 and follow the procedures outlined under ***Tag Element Definition*** and ***Trend Element Definition*** in this section

> **NOTE** f tag or trend e ements are to be defined n th s d splay def ne those elements ***before*** saving the d sp ay

7 Press [A] to select *Save File* to create the final display file Press [ESC] to exit without saving or to abandon any edits

Making an Operator Configurable Display Permanent

The configuration files for each operator configurable display occupy 13 records on the disk along with the display file It is recommended that an operator configurable display not be created for use as a permanent display as it consumes a considerable amount of disk space An operator configurable display, however, can be made permanent by deleting its associated configuration file (**.CF**) from the USN 53 directory The display can then no longer be modified through the operator configurable displays function

SECTION 7 - PROCESS CONTROL AND TUNING

INTRODUCTION

The functions of the operator interface station (OIS) give access to INFI 90 process control unit (PCU) modules to monitor automatic control and initiate manual control of a process Process control can be performed through the console in three separate ways: Device control, loop control and tuning Device control allows logically turning on or off, setting or resetting and starting or stopping a control device The operator performs loop control to change the set point, ratio index or control output of a control loop Tuning adjusts specific control scheme function block parameters to fine tune PCU control

NOTE This section explains the process control capabilities using standard faceplate symbols The console provides these symbols as part of its symbol library on the hard disk The procedures and operations explained here remain the same for custom symbols designed to provide the same capabilities although they may not and do not have to include all features if not required The escape commands defined in the symbol file during creation determine the capabilities of the faceplate Refer to the ***Display System*** section for further explanation

This section explains and provides procedures for device and loop control through standard faceplate display elements designed to mimic process devices It also explains process tuning capabilities available through various displays

PROCESS CONTROL FUNCTIONS

The control functions of the console provide the operator with both manual and automatic control. and with the capability to monitor individual process variables and devices The control allows changing process conditions by initiating changes to the PCU module control scheme PCU modules receive input and send output signals to the process through termination units hard wire connected to the process devices and stations The operator initiates control through display elements (i e , faceplates) and the keyboard

NOTE Password security can be defined to limit access to control functions

Dynamic faceplates which relate to specific types of control tags can be either standard or user created They can be a fixed element of a display or called as a pop up element In either case, the operator performs the same control through the device mimic The console provides a symbol library containing standard symbols and pop ups

Defined control tags provide access to function blocks within a module The access can be used to manually initiate process changes, and to monitor the results of both automatic and manual control operations Automatic control refers to process control being performed under PCU module execution Manual refers to those actions initiated by an operator after taking the process device or loop out of automatic PCU control Control tags and the function codes (FC) they associate with include

DD	Device driver, FC 123
MSDD	Multi state device driver, FC 129
RCM	Remote control memory, FC 62
RMCB	Remote motor control, FC 136
RMSC	Remote manual set constant, FC 68
STATION	M/A station (basic), FC 21, M/A station (cascade), FC 22, M/A station (ratio), FC 23, and control station, FC 80

NOTE Information reported by these function codes can be incorporated into any display This information is not restricted to faceplate symbols only

Refer to the ***Function Code Application Manual*** for a description of these function codes and their specifications

To initiate control of any of these type tags, a faceplate element must first be enabled for active control This is done through keyboard key presses or any optional control select device Refer to ***DISPLAY AND CONTROL SELECT OPTIONS*** in the ***Display System*** section for an explanation of alternate control select methods for this console Pop up elements are automatically enabled for control when called to a display Once called, they operate the same as fixed faceplate elements

Actual control can only be initiated through the keyboard All control keys are in the station and remote control block section of the keyboard Refer to the ***Keyboard and Peripherals*** section for the location of these keys

Figure 7 1 is an example group display containing the standard faceplate symbols for each type of control tag

Common Control Element Attributes

The standard faceplate elements shown in Figure 7 1 share some common attributes These attributes, which can be incorporated into any graphic or custom faceplate, include

Tag name a name of up to 14 characters entered during tag configuration This is the name of the tag defined to allow monitoring and control of the process point

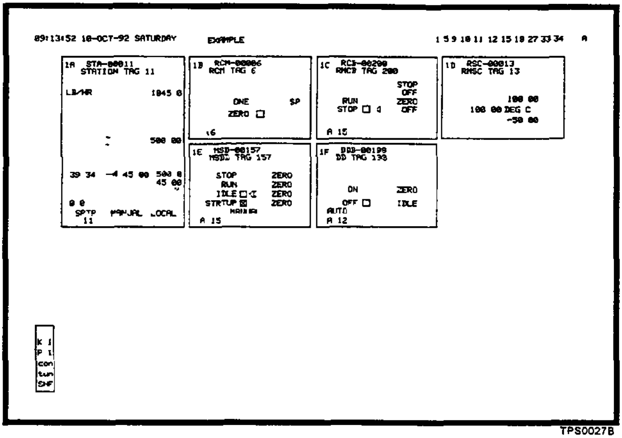


Figure 7 1 Standard Process Control Faceplate Symbols

Tag descriptor a tag descriptor of up to 32 characters entered during tag configuration Normally, this descriptor explains the purpose of the tag (process point)

Faceplate selector a selector is one or two alphanumeric char acters used to select and enable control features of an element The selector characters identify the keyboard keys that must be pressed to enable the element After pressing the keys, the outline of the element highlights to verify selection, and to easily recognize the element as being enabled After selection the control keys function for that element only

Alarm status/quality/group - this field relates to alarm process-ing In standard faceplate symbols, this field accommodates five characters

From left to right, the first two character positions are the alarm status An indicator in these positions identifies the last alarm threshold that a point passed as determined and exception re ported by the PCU control scheme Refer to ***ALARM STATUS IN-DICATORS*** in the ***Alarm Processing*** section for a description of the indicators that can appear in this field

The third character position is the quality field This field identi fies the quality associated with a process value or state, and the operating status for the tag Refer to ***QUALITY INDICATORS*** in the ***Alarm Processing*** section for a description of the quality in dicators that can appear in this field

The last two character positions identify the alarm group to which the tag is assigned The field appears as either blank for no alarm group or *1* through *99*

NOTES

1 Disestab shed substituted and inhibit are initiated at the conso e through operator actions (e operating parameters funct ons) PCU modules report good and bad in exception reports

2 Control cannot be performed for any tag reporting bad quality or off scan

Example An alarm status/quality/group field that appears as

2H 10

indicates that the point has passed the two high threshold set in the PCU module, the module has determined that it is receiving good data for the point, and the tag defining the process point is part of alarm group ten

Refer to the ***Alarm Processing*** section for an explanation of alarm processing, conditions and indications

Red tag descriptor a red tag descriptor (and red outline) identifies a process point as being red tagged Red tagging per formed through PCU management functions at the console does ***not*** prevent a process device from operating It can be set to either display red tag status and disable control actions from being performed at the console, or to display red tag status only The process engineer determines how red tagging operates at the console through system configuration

NOTES

1 n some cases the source f le for a symbo must be mod f ed to en ab e the red tag status out ne feature Either remove the remark (**rm**) at the beg nning of the line conta n ng the **ed 102** escape command or add th s command to the source f le if not present

2 The a arm status qual ty and red tag ind cators presented are de faul characters They can be changed through text substitut on

A PCU module reports red tag status as part of an exception re port Red tag status is available for the following control tags

DD	RMCB
MSDD	STATION
RCM	

Control prompt/field the control prompt and input field ap pears only after selecting an element for control It contains a *TARGET* prompt and input field Depending on the tag being controlled, it shows the current mode, state or value of the se lected control point when it first appears It then allows changing that parameter through keyboard selections When a change is initiated, the displayed parameter updates to reflect the targeted mode, state or value The target is the desired change. The element then updates to reflect the change

The control *TARGET* prompt may appear somewhere else on the screen other than directly with a display element The location of the prompt depends on the control select option set for the element during its creation

Loop Control

A station faceplate element allows the operator to adjust a control loop in the process This requires both a STATION tag defined for the station function block controlling the loop, and a station display element for control Once the process engineer configures a STATION tag, then a display with a station element, the operator can use the console to monitor, or to take control through keyboard actions

A station element is a representation of an analog control station The same functions performed and values displayed at an analog control station physically located in the plant can be performed and viewed by an operator at the console through use of this faceplate element

STATION ELEMENT

The station control element presents a detailed on line display of a single process loop A STATION tag is required to acquire current process values from a manual/auto (M/A) station block in a PCU module configuration, and to direct control

Figure 7-2 details the information presented in a control station element The display source file for this element is the ***DCS-FULL2.DT*** symbol file

The operating state of the block is defined as its level (local or computer), mode (manual or auto) and station mode (basic, cascade or ratio) The operating state determines which values can be adjusted from the console The station operating mode can be changed through the console

The station function block exception reports the dynamic values, modes, and alarm status and quality that display at a station element Attributes that relate to a STATION tag and can be incorporated into any graphic or custom faceplate include·

Process variable (PV) value displays the current value of the process variable being input to a station function block The process variable comes from the function block providing control of the station block, usually a PID block

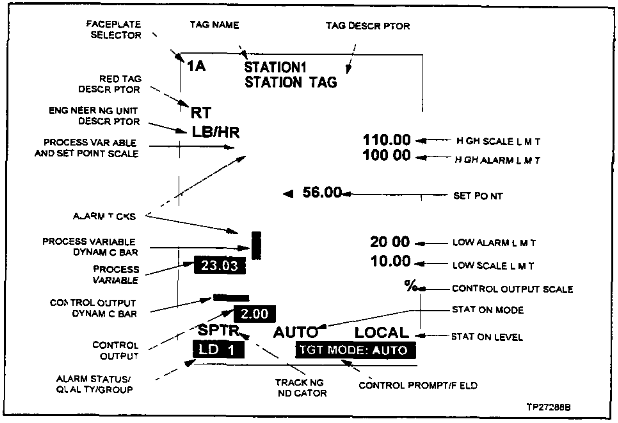


Figure 7 2 Control Station Element

PV dynamic bar indicates the process variable as an expanding or contracting dynamic bar The bar expands vertically from the baseline mark on the scale as the process variable increases in value, and contracts back to the baseline mark as the variable decreases

Set point (SP) value dynamic moving value accompanied by a dynamic pointer The displayed value and the position of the pointer on the scale correspond to the current set point being exception reported by a station function block This value can always be changed through keyboard actions when the station is in automatic mode and is not in set point track mode When in set point track mode, the option chosen to put the station in set point track mode determines whether the set point can be adjusted while in manual mode or while in automatic mode

PV and SP scale a static display element for reference

Engineering unit descriptor (EUD) - indicates the unit of measurement associated with the process variable and set point The station function block reports an EUD index number that the console then cross references against its list of engineering unit descriptors Station elements indicating the process variable and set point values are referenced to this unit of measurement

Control output (CO) value displays the current value (in percent of output) of the control output being output from a station function block The control output can be changed through keyboard actions when the station is in manual mode and not in control output track mode

22 32 42 04 10 07

CO dynamic bar indicates the control output as an expanding or contracting dynamic bar The bar expands horizontally from the baseline mark on the scale as the control output increases in percentage, and shrinks back to the baseline mark as the control output decreases

CO scale a static display element for reference

High and low scale limits define the maximum and minimum value associated with the baseline and top line of the static scale respectively Depending on the configuration of the station element, the zero and span configured in the station function block for either the process variable or set point

High and low alarm limits identify the maximum and mini mum alarm level thresholds These values are set in the station function block configuration If the process variable reaches or passes either the high or low alarm limit, the station is in an alarm condition The console monitors these limits to trigger alarm indications at the console

Alarm ticks provide a scale reference to easily determine when the PV dynamic bar passes an alarm limit These tick marks cor respond to the high and low alarm limit values

Station level - indicates the current station level The station level identifies the device directing the loop control It can operate at either PCU level (local) or computer level control The level indicators are

LOCAL Station under PCU local control The station must be in local level control to allow changes through the console

CMPTR Station under computer control When in computer level control, the operator cannot adjust the loop through console displays and the keyboard

Station mode indicates the current operating condition An indicator shows the current operating mode of the station The station operates in either manual or automatic mode

The operator initiates process changes using the station control element and keyboard During normal, automatic operation, the station mode appears as *AUTO* In this mode the PCU module automatically controls the process The station can be set to either cascade or ratio operation while in this mode The operator can remain in automatic mode to change the set point or ratio index value *MANUAL* appears when the operator takes the station out of PCU control to manually adjust the control output

Depending on the station block in a module configuration, a sta tion can be toggled between basic and ratio, or basic and cascade operation The station status field indicates *RATIO* or *CASC* if se lected through the keyboard keys

Table 7-1 lists the indicators that can appear in the station mode field. The type of indication depends on the escape command used during creation of the station element.

Table 7-1. Station Modes

Mode	Description
AUTO	Automatic control by a PCU module. Set point and ratio index can be adjusted at the keyboard.
MANUAL	Manual control which allows changing the control output (CO).
BYPASS	Analog control station has been set to bypass mode operation. When in this mode, control cannot be initiated through the console.
CASC	Station toggled in cascade operation. Press [CASC] to toggle between basic and cascade operation.
RATIO	Station toggled in ratio operation. Ratio index can be changed while in automatic mode. Press [RATIO] to toggle between basic and ratio operation.
/C	Indicates a cascade station. The mode appears, for example, as *AUTO/C* or *MAN/C*. **NOTE:** The */C* also appears with a tracking indicator if a separate tracking indicator field is not used in the element. For example: *LOCK /C*
/R	Indicates a ratio station. The mode appears, for example, as *AUTO/R* or *MAN/R*. **NOTE:** The */R* also appears with a tracking indicator if a separate tracking indicator field is not used in the element. For example: *SPTR/R*

NOTE: A station element may not have a separate station mode field and tracking indicator field. Depending on the escape commands used during the configuration of the faceplate, the element may display both the tracking and mode indicators in the station mode field.

Tracking indicator - indicates the type of tracking being implemented by the station function block in the module control scheme. A station block can employ either control output or set point tracking. Whenever a reference signal to track goes up or down, the station set point or control output value follows it. Also, this field identifies a set condition for the manual mode interlock in the station function block.

A control output track lock is set by the control logic. A track lock stays in effect until the logic unlocks the tracking. If the station goes into *COTR* mode (refer to Table 7-2), the control output percentage adjusts to changes in its specified reference signal to track. *Control output changes cannot be initiated using the* console when the station is in *COTR* mode.

The set point tracks either the process variable or a selected variable when set point tracking is enabled The configuration of the station function block determines whether the set point is to adjust to the tracking variable while in *MANUAL* mode only or while in either *AUTO* or *MANUAL* mode The option chosen in the configuration to enable set point tracking also determines whether the operator can adjust the set point for the station while it is in *MANUAL* mode or while it is in *AUTO* mode When the station block configuration is set to *SPTR* (refer to Table 7 2) and allows set point changes in *AUTO* mode, SET is functional Set point tracking can be enabled or disabled through PCU management or block details tuning functions while a PCU module is executing control

Table 7 2 Tracking Indicators

Mode	Description
COTR	Control output tracking set in PCU control scheme When the system sets a station operating mode to *COTR* OUT in the station control section of the keyboard does not function
SPTR	Set point tracking set in the PCU function block configuration Depending on the station block configuration set point control may or may not be permitted through the console for this station
LOCK	Manual interlock set in PCU control scheme to lock the station in *MANUAL* mode The manual interlock holds the station in manual mode preventing any automatic mode operations Control output can be adjusted while in *MANUAL* mode
blank	No tracking or manual interlock implemented

NOTE A station element may not have a separate station mode field and tracking indicator field Depending on the escape commands used during the configuration of the faceplate the element may display both the tracking and mode indicators in the station mode field

The manual mode interlock holds the station in *MANUAL* mode This is set by the control logic Until the control logic releases the lockout, the station stays locked and the mode cannot be changed from the keyboard

STATION CONTROL

There are three types of stations, each controllable through the console Basic, cascade and ratio A basic station generates a set point and provides manual or automatic transfers, control output adjustment in manual control mode, and set point adjustments in automatic control mode A cascade station provides the same functions as a basic station plus an additional mode that allows the set point to be controlled by another process variable A ratio station also provides the same functions as a basic station, but differs in its method of set point generation A ratio adjustment factor determines the set point as a ratio of a second uncontrolled (wild) variable Any station type can operate as a basic station

Station control allows changing the mode, set point, ratio index and control output of a control station by manipulating a station function block This function block is part of the configuration in a PCU control module

To ***enable*** a STATION element for control, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the station element is first selected While active, the operator can perform the following station control operations

Level Change

The level determines the device that directs the loop control The station must be in *LOCAL* level control to allow PCU automatic loop control, and to initiate changes through the console A computer directs control when in *CMPTR* mode

Press CMPTR to toggle the station between computer and local control A *TGT MODE* field reflects the targeted level, and the station level field updates when the change is made

Mode Change

A mode change may be required to perform a desired control action The station must be in *MANUAL* control mode to adjust the control output It must be in *AUTO* mode to toggle the station to ratio or cascade operation

Press MAN/AUTO to toggle the station between manual and automatic mode

Press CASC while the station is in *AUTO* mode to toggle a station between basic and cascade operation The station function block must be capable of cascade operation for this key to function for that station

Press RATIO while the station is in *AUTO* mode to toggle a station between basic and ratio operation The station function block must be capable of ratio operation for this key to function for that station

The *TGT MODE* field reflects any targeted mode changes, and the station mode field updates when the change is made

Set Point Change

The operator can change the set point while the station is in *AUTO* mode or *MANUAL* mode when set point track is not enabled The operator cannot change the set point when the station is in *MANUAL* mode and set point track is enabled A change may or may not be allowed when the station is in *AUTO* mode and set point track is enabled and depends on the option chosen to put the station in set point tracking

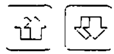
To change the set point

1 Verify the station is in the proper mode to allow a set point change If not, perform a mode change

2. Press [SET]. This calls a *TRGT SET* control prompt, which reflects the current set point value. The EUD descriptor shows the unit of measurement associated with this value.

3. The value can be changed using one of two methods. Key in the desired set point target value and press [ENTER], or press

To effect a slow, ramping set point change. This changes the value 0.2 percent per keystroke.



To effect a fast, ramping set point change. This changes the value 4.0 percent per keystroke.

As soon as the change is made, the display begins to update. The set point value either increments or decrements and the dynamic pointer moves up or down the scale to reflect the entered value.

Ratio Index Change

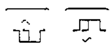
The operator can change the ratio index while the station is in *RATIO* mode. To change the ratio index:

1. Verify the station is in ratio control mode. The module status field should indicate *RATIO*. If not, perform a mode change.

2. Press [SET]. This calls a *TRGT RAT* control prompt, which reflects the current ratio index.

3. The value can be changed using one of two methods. Key in the desired ratio index target value and press [ENTER], or press

To effect a slow, ramping ratio index change. This changes the value 0.2 percent per keystroke.



To effect a fast, ramping ratio index change. This changes the value 4.0 percent per keystroke.

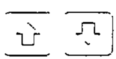
Control Output Change

The operator can change the control output while the station is in *MANUAL* mode. To change the control output:

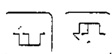
1. Verify the station is in manual control mode. The module status field should indicate *MANUAL*. If not, perform a mode change.

2. Press [OUT]. This calls a *TRGT OUT* control prompt, which reflects the current output value. The value is in percent of output.

3. The value can be changed using one of two methods. Key in the desired output target value and press [ENTER], or press



To effect a slow, ramping control output change. This changes the value 0.2 percent per keystroke.



To effect a fast, ramping control output change. This changes the value 4.0 percent per keystroke.

As soon as the change is made, the display begins to update The control output value either increments or decrements and the dynamic bar expands or contracts to reflect the entered value

While the station is still active, a tuning display, block details display or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** and ***Station Tuning Display*** in this section for an explanation of the functions performed through these displays Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected station, press ESC or select another element at any time

Device Control

The capabilities of the console give the operator access to process devices through its displays and keyboards The operator can control a device by selecting keyboard keys, which enter a targeted or desired change to a device These are logical state changes that are put into effect by manipulating the process control scheme in a PCU control module The display elements related to process control also give feedback while in either PCU automatic control or manual operator control The feedback verifies the actual change in state of a device

REMOTE CONTROL MEMORY ELEMENT

The remote control memory (RCM) element represents a remote control memory function block in a PCU module This function block provides a set and reset flip flop memory to control a process device An RCM tag is required to monitor and control the output of this function block

Figure 7 3 details the information presented in a remote control memory element The display source file for this element is the ***RCM1.DT*** symbol file

The remote control memory block exception reports current output state, feedback state, permissive state, override status, and alarm status and quality presented at the RCM element Attributes that relate to an RCM tag and can be incorporated into any graphic or custom faceplate include

One state descriptor shows the logic state descriptor related to a one state (logic one) output of an RCM function block This descriptor is the *ONE* state descriptor set in the tag database for this tag

Zero state descriptor shows the logic state descriptor related to a zero state (logic zero) output of an RCM function block This descriptor is the *ZERO* state descriptor set in the tag database for this tag

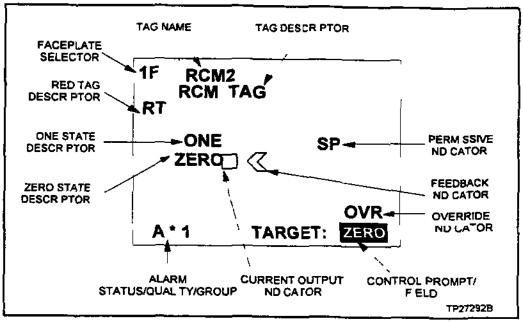


Figure 7 3 Remote Control Memory Element

Current output indicator the position of this indicator identifies the currently requested logic state to be output by the RCM block When next to the one state descriptor, the requested output is a logic one The output is a logic zero when it is next to the zero state descriptor

Permissive indicator shows the status being reported for the permissive input to the function block The block must be in a permissive state to allow the operator (or control logic) to change the RCM function block to a one state (set) An *SP* identifies the RCM as being set to permissive An *NP* indicates non permissive, not allowing a change to a one state output

Feedback indicator provides a feedback indication to verify the actual change in state of a device, and its current state The arrow positions at either the one or zero state as soon as the console receives a reported feedback indication

Override indicator indicates an override condition An override occurs when the RCM function block is permissive and there is a conflict between the set and reset inputs to the function block The output tracks an alternate input if the set and reset signals are both logic one simultaneously

RCM CONTROL

RCM control allows changing the output of a remote control memory function block This function block is part of a PCU control module configuration The remote control memory block provides a set and reset signal to a process device The RCM function block acts on one of two inputs to develop its output The block accepts both a control scheme driven input and an input from the console

The two inputs are also differentiated by the type of input The control scheme can initiate either a pulsed or sustained command to the block where the console can only input a pulsed command A sustained input, which remains at a set logic state, overrides any pulsed input. A pulsed input is a one cycle transition used to trigger a state change In either case, the block maintains its current output even if the input is removed The output remains at either a set or reset state until another command is received to change the state of the output

A pulsed set command from the console causes the block to output a logic one, and a pulsed reset command causes a logic zero output This occurs as long as the control logic is not providing a sustained input to the block A change to the one state (set) can only occur when the RCM function block is set to permissive

To ***enable*** an RCM element to control a remote control memory function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TARGET* control prompt appears when the element is first selected

The RCM function block can only be changed through keyboard actions if *OVR* and *NP* do not appear on the display The *SP* must be displayed to change the RCM function block to the set state

To ***change*** the state of an RCM element, press the following keys

■	Changes the RCM element to a one state output
□	Changes the RCM element to a zero state output

The *TARGET* field changes to the target state after pressing either key As soon as the change is made, the display begins to update The current output and feedback indicators move either up or down to reflect the entered change

While the RCM element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in this section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

REMOTE MANUAL SET CONSTANT ELEMENT

The remote manual set constant (RMSC) element represents a remote manual set constant function block in a PCU module control scheme This function block inserts a constant value used in the process control scheme An RMSC tag is required to both monitor and change the constant value provided by the block from the console

Figure 7 4 details the information presented in a remote manual set constant element The display source file for this element is the ***RMSC1.DT*** symbol file

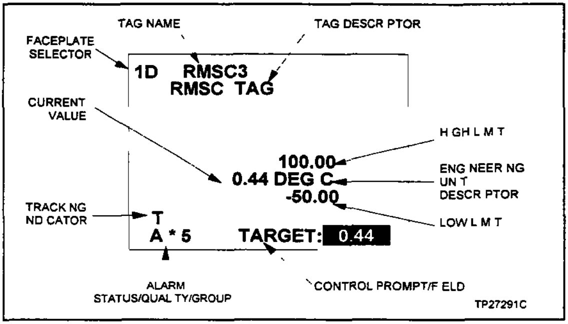


Figure 7 4 Remote Manual Set Constant Element

The remote manual set constant block exception reports the cur rent value, high and low limit, tracking, and alarm status and quality that display at the RMSC element Attributes that relate to an RMSC tag and can be incorporated into any graphic or custom faceplate include

Current value - the current constant value being reported by the RMSC block This value can be changed through keyboard actions

Engineering unit descriptor (EUD) indicates the unit of meas urement associated with the constant value The RMSC function block reports an EUD index number that the console then cross references against its list of engineering unit descriptors

High and low limits - identify the maximum and minimum ac ceptable values The operator can input only values that fall within this maximum and minimum range An attempt to enter a value outside these limits causes the console to prompt with an error message

Tracking indicator appears when an RMSC block has been set to tracking mode The control logic can force the block to track an alternate process variable A *T* displays to identify tracking mode The value cannot be changed when the block is tracking

RMSC CONTROL

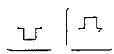
RMSC control allows changing a constant value in a remote manual set constant function block while a PCU module is on line This function block is part of a PCU control module configuration An operator can enter a new value at any time except when the *T* (tracking) indicator is present

To ***enable*** an RMSC element to change the constant value of a remote manual set constant block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TARGET* control prompt appears when the element is first selected

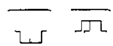
To ***enter*** a new value

1 Press [SET] This calls an input field that appears next to the *TARGET* control prompt The value in the field is the current value

2 The value can be changed using one of two methods Key in a desired target value and press [ENTER], or press



To effect a slow, ramping change This changes the value 0 2 percent per keystroke



To effect a fast, ramping change This changes the value 4 0 percent per keystroke

The RMSC function block will not accept a value that is outside the high and low limits

As soon as the change is made, the display begins to update The constant value either increments or decrements to reflect the entered value

While the RMSC element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in this section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

DEVICE DRIVER ELEMENT

The device driver (DD) element represents a device driver function block in a PCU module control scheme This function block provides an on or off signal to control a process device A DD tag is required to both monitor and change the output provided by the block from the console

Figure 7 5 details the information presented in a device driver element The display source file for this element is the ***DEVDR1.DT*** symbol file

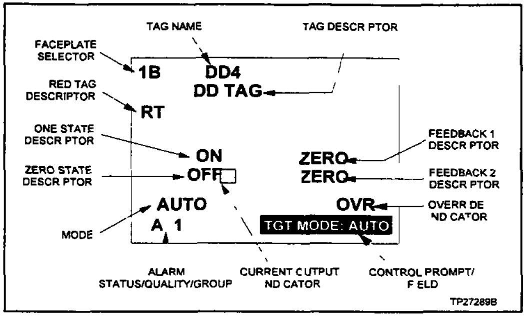


Figure 7 5 Device Driver Element

The device driver block exception reports the current output state, two feedback states, override status, mode, and alarm status and quality that display at the DD element Attributes that relate to a DD tag and can be incorporated into any graphic or custom faceplate include

One state descriptor shows the logic state descriptor related to a one state (logic one) output of the DD function block This de scriptor is the *ONE* state descriptor set in the tag database for this tag

Zero state descriptor shows the logic state descriptor related to a zero state (logic zero) output of the DD function block This descriptor is the *ZERO* state descriptor set in the tag database for this tag

Current output indicator the position of this indicator identi fies the currently requested logic state to be output by the DD block When next to the one state descriptor, the requested output is currently a logic one The output is a logic zero when it is next to the zero state descriptor

Feedback 1 and 2 descriptors display the logic state descrip tors related to the feedback signals input to the DD function block Both feedback one and feedback two fields can indicate either an on (logic one) or off (logic zero) state The element dis plays the *ZERO* and *ONE* descriptors set in the tag database for feedback one and feedback two

The feedback indications provide a verification of the actual state of the field device When a change is initiated, the descriptors remain the same until the block tests the feedback inputs This does not occur until after a specified time elapses The DD block also tests the feedback signals to determine if the output status is either good or bad

Override indicator indicates an override condition Normally, the device driver block determines the output status by comparing the feedback signals to an expected condition set in its configuration An *OVR* indication occurs when the DD block is set to override its reported output status The override forces the status to zero (*Good*)

Mode indicates the current operating condition The block operates in either manual, automatic or remote control mode

A device driver block may be configured to operate in automatic mode only, automatic and manual mode, or remote mode only Parameters set for the device driver function block determine the acceptable operating modes

While in *AUTO* mode, the control logic sets the state of the device driver output In this case, the block only provides an update to the display *MANUAL* mode allows the operator to change the output state through keyboard actions If the DD block is in *REMOTE* control mode, state changes cannot be initiated through the console The output of the block tracks the value of another function block in the process control scheme

DD CONTROL

DD control allows the operator to manually change the output of a device driver function block This function block is part of a PCU control module configuration The device driver block provides an on or off signal to a process device

The DD function block can develop its outputs based on control logic or an input from the console, or be unconditionally set with interlock logic The function block parameters determine which occurs The operating modes also depend on this selection The block can be set to allow automatic mode only, automatic and manual mode, or remote mode only

To ***enable*** a DD element to control a device driver function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the element is first selected

The DD element cannot be controlled if the element displays *REMOTE* in the mode field Manual control may or may not be allowed while the *OVR* indicator is present This depends on the configuration of the device driver block

To ***change*** the device driver output

1 Press **MAN/AUTO** to toggle the DD element to *MANUAL* mode

2. Once in manual mode, press the following keys to change the output state

 Changes the DD element to a one state output

 Changes the DD element to a zero state output

The *TARGET* field changes to the target state after pressing either key As soon as the change is made, the display begins to update The current output indicator moves either up or down to position itself next to the requested state The feedback descriptors update after receiving feedback signals from the process

While the DD element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in this section for an explanation of the functions performed through the block de tails display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

MULTI-STATE DEVICE DRIVER ELEMENT

The multi state device driver (MSDD element represents a multi state device driver function block in a PCU module This function block has three separate output conditions to provide three state process device control An MSDD tag is required to both monitor and change the output provided by the block from the console

Figure 7 6 details the information presented in a device driver element The display source file for this element is the ***MS-DEVDR1.DT*** symbol file

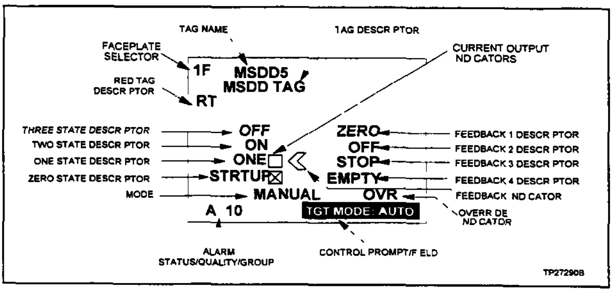


Figure 7 6 Multi State Device Driver Element

The multi state device driver block exception reports current output state, four feedback states, override status, mode, and alarm status and quality presented at the MSDD element Attributes that relate to an MSDD tag and can be incorporated into any graphic or custom faceplate include

Three state descriptor shows the logic state descriptor related to a three state (output mask three) output of the MSDD function block This descriptor is the *THREE* state descriptor set in the tag database for this tag

Two state descriptor shows the logic state descriptor related to a two state (output mask two) output of the MSDD function block This descriptor is the *TWO* state descriptor set in the tag database for this tag

One state descriptor shows the logic state descriptor related to a one state (output mask one) output of the MSDD function block This descriptor is the *ONE* state descriptor set in the tag database for this tag

Zero state descriptor shows the logic state descriptor related to a zero state (default mask) output of the MSDD function block This descriptor is the *ZERO* state descriptor set in the tag database for this tag

Current output indicator the position of this indicator identifies the currently requested output of the MSDD block When next to the three state descriptor, the requested output is currently output mask three for example Refer to ***MSDD CONTROL*** in this section for an explanation of output masks

Feedback 1, 2, 3 and 4 descriptors display the logic state descriptors related to the feedback signals input to the MSDD function block All feedback fields can indicate either an on (logic one) or off (logic zero) state The element displays the *ZERO* and *ONE* descriptors set in the tag database for feedback one through feedback four

These feedback indications provide a verification of the actual status of the field device The MSDD block uses the feedback signals to determine if the output status is either good or bad

Feedback indicator - the position of this indicator identifies the current output based on feedback from the process When a change is initiated, the indicator maintains its position until a specified time elapses before testing the feedback inputs Once the time elapses, the indicator positions itself at the appropriate state

Override indicator indicates an override condition Normally, the multi state device driver block determines the output status by comparing the feedback signals to an expected condition set in its configuration An *OVR* indication occurs when the MSDD block is set to override its reported output status The override forces the status to zero (*Good*). The MSDD can also be configured to default to a specific mode and output when in an override condition

Mode indicates the current operating condition The block operates in either manual or automatic mode

A multi state device driver block may be configured to operate in automatic mode only, or automatic and manual mode Parameters set for the MSDD function block determine the acceptable operating modes

While in *AUTO* mode, the control logic sets the output state of the multi state device driver, the block provides an update to the display only *MANUAL* mode allows the operator to change the output state through keyboard actions

MSDD CONTROL

MSDD control allows the operator to manually change the output of the multi state device driver function block This function block is part of a PCU control module configuration The multi state device driver block provides three state control for a process device

The MSDD function block can develop its outputs based on control logic or console input In *AUTO* mode, two digital inputs from the control scheme select a mask that drives the outputs. In *MANUAL* mode, the operator selects the output masks by pressing specific keyboard keys The function block can be set to allow automatic mode only, or both automatic and manual mode

Four separate output masks defined in the MSDD configuration set the control output signals that are sent to a process device Each mask defined as a three bit code specifies the state of each of the three MSDD block outputs The specific output mask is selected by the state of the two inputs to the block

To ***enable*** an MSDD element to control a multi state device driver function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the element is first selected

The MSDD element cannot be controlled if the element displays *AUTO* in the mode field Manual control may or may not be allowed while the *OVR* indicator is present This depends on the configuration of the multi-state device driver block

To ***change*** the multi state device driver output

1 Press $\boxed{\text{MAN/AUTO}}$ to toggle the MSDD element to *MANUAL* mode

2 Once in manual mode, press the following keys to change the output state

Changes the MSDD element to its three state outputs (output mask three)

Changes the MSDD element to its two state outputs (output mask two)

Changes the MSDD element to its one state outputs (output mask one)

The *TARGET* field changes to the target state after pressing any of these keys As soon as the change is made, the display begins to update The current output indicator moves either up or down to position itself at the requested state The feedback descriptors update after receiving feedback signals from the process

The MSDD function block may be set up to prevent random output changes while in *MANUAL* mode This prevents the operator from accidentally upsetting the process In this case, the operator must follow a sequence defined in the function block configuration The block identifies which output states can be selected based on the current output state

While the MSDD element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in this section for an explanation of the functions performed through the block de tails display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

REMOTE MOTOR CONTROL BLOCK ELEMENT

The remote motor control block (RMCB) element represents a re mote motor control function block in a PCU module control scheme This function block implements a start and stop logic sequence to direct the start up or shutdown of a process device An RMCB tag is required to both monitor and change the output provided by the block from the console

Figure 7 7 details the information presented in a remote motor control block element The display source file for this element is the ***RMCB1.DT*** symbol file

The remote motor control block exception reports the current output state, two feedback states, two permissive states, fault status, error code, and alarm status and quality that display at

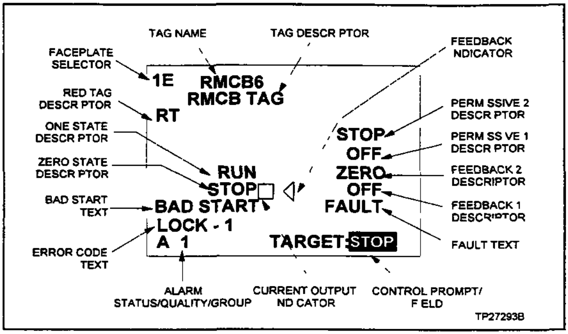


Figure 7 7 Remote Motor Control Block Element

the RMCB element Attributes that relate to an RMCB tag and can be incorporated into anv graphic or custom faceplate include

One state descriptor shows the logic state descriptor related to a one state output of the RMCB function block A one state for the RMCB block sets a device to a running state This descriptor is the *ONE* state descriptor set in the tag database for this tag

Zero state descriptor shows the logic state descriptor related to a zero state output of the RMCB function block A zero state for the RMCB block sets a device to a stopped state This descriptor is the *ZERO* state descriptor set in the tag database for this tag

Current output indicator the position of this indicator identi fies the currently requested output of the RMCB block When next to the one state descriptor, the requested output is run (logic one) The block is set to stop when positioned next to the zero state descriptor

Feedback 1 and 2 descriptors display the logic state descrip tors related to the feedback signals input to the RMCB function block. Both feedback fields can indicate either an on (logic one) or off (logic zero) state The element displays the *ZERO* and *ONE* descriptors set in the tag database for feedback one and feedback two

The feedback indications provide a verification for the actual status of the field device The RMCB block uses the feedback sig nals to determine if the output status is either good or alarm The feedback signals are also used to determine whether to maintain a run output or force the output to stop

Feedback indicator the position of this indicator identifies the current output based on feedback from the process When a change is initiated, the indicator maintains its position until a specified time elapses before testing the feedback inputs Once the time elapses, the indicator positions itself at the appropriate state

Permissive 1 and 2 descriptors show the descriptor reported for the permissive inputs to the function block The element dis plays the *ZERO* and *ONE* descriptors set in the tag database for permissive one and permissive two Both permissive inputs to the block must be in a permissive status (one state) to allow the op erator or control logic) to change the RMCB to a one state (run)

Bad start text displays when the RMCB block has detected a bad start of the process device The text that displays is configur able through text substitution functions, refer to the ***OIS Configuration*** section The block monitors the feedback signals to determine a bad start

Error code text ten different text messages display at this field depending on the error code being sent by the RMCB block The error codes are

0 No error

1 Stopped

2 nterlock 1

3 Interlock 2

4 Interlock 3

5 Interlock 4

6 Feedback 1 set to zero state

7 Feedback 2 set to zero state

8 Feedback 1 set to one state

9 Feedback 2 set to one state

NOTE The b ock sends an nter ock error code when an nter ock s set to a og c zero

The console associates and displays a text string for each of the error codes The process engineer must first create a text set that defines a text string for each code, and identify that text set during RMCB tag configuration Only one text string displays at a time

Fault text indicates a fault condition The text that displays is configurable through text substitution functions, refer to the ***OIS Configuration*** section A fault indication occurs when one of the four interlock inputs to the block is set to off (or logic zero) All interlocks must be on (or logic one) to clear a fault

RMCB CONTROL

RMCB control allows changing the output of a remote motor control function block This function block is part of a PCU control module configuration The remote control memory block provides a start and stop signal to a process device The RMCB function block acts on one of two inputs to develop its output The block accepts both a control scheme driven input and an input from the console

To ***enable*** an RMCB element to control a remote motor control function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TARGET* control prompt appears when the element is first selected

The RMCB can only be changed through keyboard actions (or control logic) if the permissive descriptors indicate a permissive state (one state) A *FAULT* must also be cleared before a change can occur, the fault being driven by the state of the interlock inputs

To ***change*** the state of the remote motor control block, press

■ Changes the RMCB element to a one state output (run)

□ Changes the RMCB element to a zero state output (stop)

The *TARGET* field changes to the target state after pressing either key As soon as the change is made, the display begins to update The current output and feedback indicators move either up or down to reflect the entered change Certain display elements, explained earlier, will update to indicate a bad start if an unsuccessful start-up occurs

While the RMCB element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in this section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press ESC or select another element at any time

PROCESS TUNING FUNCTIONS

A PCU control module directs process control by executing a series of defined algorithms (function codes) Once loaded into a block address in module memory these function codes are referred to as function blocks Each function block has certain parameters that determine which other function blocks provide input and receive output from the block Other parameters relate to the operation of the specific block

PCU modules have different operating modes Normal operating modes include execute and configure A control module must be in ***execute*** mode to implement its control scheme and provide automatic control of the process A module must be in ***configure*** mode to initially enter or change certain parameters of the control scheme

Some function block parameters can only be changed while in configure mode Others can be changed while in either mode Tuning is the procedure used to change parameters while a module is in execute mode Parameters that can be changed while the PCU control module is executing are referred to as ***tunable***

> **NOTE** Tun ng operations can be l mited to spec f c pe sonne by def n ing password security or using key ock security A user password se curity level must enab e tun ng access rights before any tun ng can be in t ated f using key lock security the key must be n the TUNE pos t on

The console provides a few functions that allow function block tuning These include a station tuning display, block details dis play and menu options available through PCU configuration This section explains the station tuning and block details display Refer to ***PCU CONFIGURATION*** in the ***INFI 90 System Configuration*** section for tuning options available through PCU configuration

Block Details Display

The operator can call a block details display to view the parame ters set for a PCU function block This display can be called to view any function block in a PCU module Figure 7 8 shows the block details display

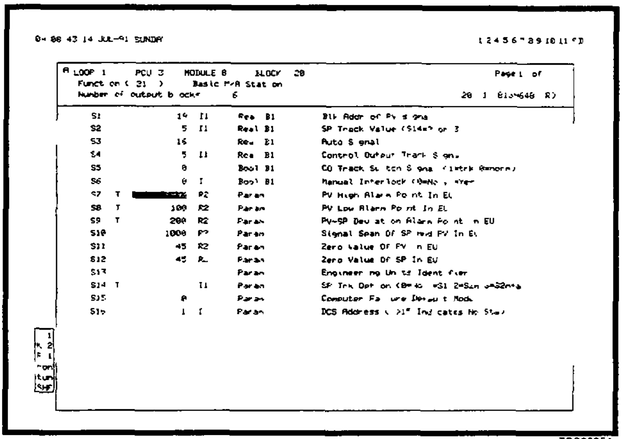


Figure 7 8 Block Details Display

DISPLAY CALL UP

The operator can call a block details display by pressing [DETAILS] or selecting the *E Block Details* option from the operating parameters display If using the *Block Details* option, the display details the function block corresponding to the current tag called through the operating parameters function

The operator can use [DETAILS] in several ways The key can be used to call a block details display by tag name or index number, or loop, PCU, module and block address To call a details display in this method

1 Press [DETAILS], the key can be pressed at any display at any time. An input field appears at the bottom of the display This field allows for two options

2 Enter a tag name or index number at the *Tag Name or Index* portion of the prompt This calls a display for a block defined as a tag in the database

Use the cursor movement keys to position the input field, then enter a function block address in the *Ring* ___ *PCU* *Module* ___ *Block* ____ fields This calls a display for a block not defined as a tag by entering its address instead of a tag name

3 Press [ENTER] The block details display for the selected function block then appears

The operator can also call the block details display for any selected tag on a display First, select a tag or a tag element using the keyboard or any optional control select method Press [DETAILS] after selection The block details display for that tag appears without requiring any further input

Call up another block details display or any other function to exit the display

BLOCK DETAILS DISPLAY OPERATIONS

The operator can call a block details display for several purposes From the block details display, an operator can

- View the parameters set for a function block
- Change tunable parameters
- View the output or outputs of a function block
- Identify the loop, PCU, module and block address of a selected tag

At the top of the screen from left to right, top to bottom are

Display Selector The display must first be enabled before any operations can be performed The display selector appears at the upper left corner of the display Press the letter key corresponding to the display selector to enable the display The outline of the display highlights when selected Press [ESC] to deselect and disable the display

Block Address Displays the current *Loop*, *PCU*, *Module* and *Block* address for the selected tag or block The block address fields can be changed to call the details for another function block while the display is en abled To change the block address

1 Move the input cursor to the address field or fields to change Refer to ***Cursor and Trend Control*** in the ***Keyboard and Pe ripherals*** section for an explanation of keys used to move the input cursor at a display

2 Enter the new address attributes

3 Press [ENTER] The display updates to show the details for the block at the entered address

Page A *Page n of n* field shows the current page and total number of pages Press [NEXT PAGE] or [PREV PAGE] to view additional pages The field updates after each page change

Block Function The page indicates the function code number and noun name for the current block

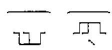
Blocks Outputs Each function block has one or more outputs The total number of outputs displays at the *Number of output blocks* field If a block has more than one output, the address of the first output is the current or *N* block address Any additional outputs occupy addresses *N*+1, *N*+2, *N*+3, etc At the far right of the display, an other field indicates the value of the current block output

For example, a function is at block address 20 and has six out puts The block output field indicates

20 17 8139648 (R)

The *20* is the block address of the output The *17 8139648* is the actual value being output. The *(R)* identifies the output as being a real value A *B* displays in brackets if the value is a boolean (or digital) output

To sequence through all outputs of a block, press



in the station and remote control section of the keyboard, not the cursor and trend control section The output field updates to show the block address and current value of each output Refer to the ***Keyboard and Peripherals*** section for the location of these keys

Parameters

The parameters controlling the block appear at the lower section of the display From left to right the columns are

Specification number the *Sn* is the specification number

Tune - a *T* identifies a specification as being tunable A parameter must be tunable to change it through this display

Value the current value set for the specification To change the value of a tunable specification

1 Move the input cursor to the desired parameter to change The console will only allow moving to a tunable parameter (*T*) Refer to ***Cursor and Trend Control*** in the ***Keyboard and Peripherals*** section for an explanation of keys used to move the input cursor at a display

2 Enter a new value

3 Press **ENTER** to write the change to the module

Data type an *I1* or *I2* appears if the value associated with a specification is an integer An *R2*, *R3* or *R4* appears if the value is a real value.

Input type a *Real BX* means that the input to the block comes from a block that outputs a real value A *Bool BX* means that the input to the block comes from a block that outputs a digital value In either case, the entered value is a block address A *Param* indicates that the value is a constant value entered during function block configuration

Specification description - provides a text description explaining the purpose of the specification

Station Tuning Display

The station tuning display allows adjusting a control loop while viewing the effects of these adjustments on the process variable (PV), set point (SP) and control output (CO) The display can be used to adjust the tunable parameters related to a function block providing loop control

Figure 7-9 shows the station tuning display At the top of the screen is a trend element with trend lines for the process variable, set point and control output A station element appears at the lower right corner of the screen, and a block details element to the left of the station

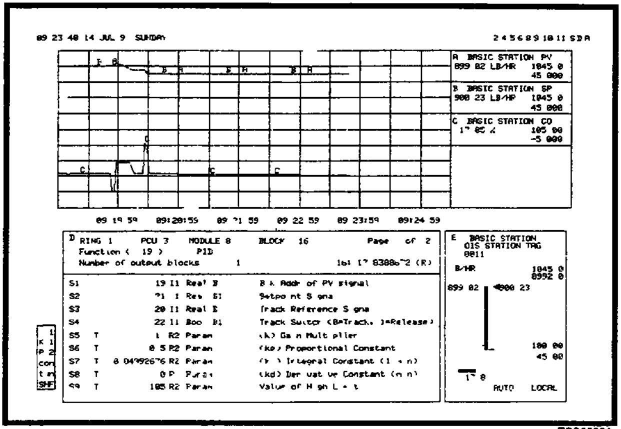


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Figure 7 9 Station Tuning Display

DISPLAY CALL UP

The operator can call a station tuning display by pressing **TUNE** or selecting the *F Tune* option from the operating parameters display The *Tune* option is only available at the operating parameters display for a STATION tag When selected, the tuning display for the current STATION tag appears **TUNE** operates two different ways

To call a tuning display by tag name or index number

1 Press **TUNE**, the key can be pressed at any display at any time An input field appears at the bottom of the display

2 Enter a tag name or index number at the *Tag Name or Index* field, and press **ENTER** Either the tuning display appears, or the console presents another input field requiring additional information If a PID function block is controlling the station function block referenced by the STATION tag, the tuning display appears after entering the tag name or index number

The tuning display can also immediately display if the STATION tag is not being controlled by a PID block, but this must be set up in the configuration of the tag The address of the function block controlling the station must be entered during STATION tag configuration Entering a block address in the *Tuning Block* field during tag configuration enables this immediate call up

If an input prompt appears, continue with Steps 3 and 4

3 A *Loop PCU ___ Module ___ Block* field appears if the controlling block is not a PID, and is not specified for the STATION tag When it appears, the input fields contain the address of the function block providing the PV input to the station block The operator can change this address to any desired function block The block details for the entered block appear at the tuning display. Either verify and use the current address, or enter a new address

4 Press [ENTER] The tuning display for the selected STATION tag appears The display contains a trend display of the process variable, set point and control output. It also contains a station element for control, and a block details element The block details element shows the parameters for the loop control function block or a block entered at the *Loop ___ PCU Module ___ Block ___* field

The operator can also call a tuning display by selecting a STATION tag or tag element on a display First, select a STATION tag or a tag element using the keyboard or any optional control select method Press [TUNE] after selection The same requirements for immediate call up or additional input call up apply after pressing [TUNE], refer to Step 2 explained earlier

Initiate a display call up for another station tuning display or any other function to exit the display

STATION TUNING DISPLAY OPERATIONS

The station tuning display enables tuning operations for a control loop The operations that can be done include

- Trend element control
- Station element control
- Block details element tuning

Trend Element

The trend element in the tuning display provides both real time and historical data for control loop variables The process variable, set point and control output of a loop appear as separate trend lines The purpose of this element is to allow viewing both previous and current values to both analyze and observe the effects of tuning on a process loop

Initial historical data collection does not occur until the tuning display is called for the first time Data collection continues and can be accessed until the tuning display is cleared Only panning can be performed after selection of this element Refer to ***Trend Control*** in the ***Process Monitoring*** section for specifics

The trend element collection and operation is the same as an operator assignable trend (or fast trend) The console stores up to at least two hours of historical data, and collects data from the PCU modules every two seconds while the tuning display is active

Two tuning displays can be active at one time If two are currently active, one must be cleared before another can be called The number of function block output trends currently active in the operator assignable trends function also affects the number of possible tuning displays Refer to ***Operator Assignable Trends*** in the ***Process Monitoring*** section for procedures to delete or clear an active tuning display (tuning tag), and for procedures to delete active block output trends

Station Element

The station element displays the exception reported values from a station function block in a PCU module control scheme The element can be used to monitor and initiate changes to the control loop set point, ratio index and control output Refer to ***STATION ELEMENT*** and ***STATION CONTROL*** in this section for further explanation

Block Details Element

The block details element displays the controlling parameters for either a loop control function block (PID) or any selected function block The element also provides the loop tuning capabilities Refer to ***BLOCK DETAILS DISPLAY OPERATIONS*** in this section for an explanation of operations and information available through the block details element

22 33 06 04 10 07

SECTION 8 - DATA ACQUISITION

INTRODUCTION

The operator interface station (OIS) provides data acquisition functions to support both process monitoring and control. The console gives access to INFI 90 process control unit (PCU) modules to acquire, then display values or state changes related to process operations. This section explains the information presented through standard faceplate display elements for data acquisition.

> **NOTE:** This section explains the data acquisition capabilities using standard faceplate symbols. The console provides these symbols as part of its symbol library on hard disk. The type of information presented remains the same whether using these standard symbols or creating custom symbols designed to provide the same information. The escape commands defined in the symbol file during creation determine the faceplate capabilities.

DATA ACQUISITION FUNCTIONS

The console receives process information in exception reports from function blocks configured in an INFI 90 PCU module. Data acquisition tags allow accessing specific function blocks within the control scheme to display analog values and digital state changes. An analog value can be a process variable such as flow rate, drum level, pressure, temperature, etc. A digital state is either an on or off state for a process device. The tags also allow presenting alarm conditions and quality reported by the function blocks.

> **NOTE:** Password security can be defined to limit access to control functions for data acquisition tags.

The data acquisition tags and the function codes (FC) they associate with include:

ANALOG Analog exception report, FC 30

DAANALG Control station, FC 21, 22, 23 and 80, or data acquisition analog, FC 177

DADIG Data acquisition digital, FC 211

DADIGTL Multi state device driver, FC 129

DANG Data acquisition analog, FC 177

DIGITAL Digital exception report, FC 45

TEXTSTR User defined data export, FC 194

The data acquisition tags and their related faceplate symbols are for presenting process information only. Process control cannot be initiated through these tags and their symbols. Refer to the ***Function Code Application Manual*** for a description of the data acquisition function codes and their specifications.

Figure 8-1 is an example group display containing the standard faceplate symbols used for data acquisition tag types.

NOTES

1. Information reported by the data acquisition function codes can be incorporated into any display. This information is not restricted to faceplate symbols only.

2. DAANALG tag type does not implement the complete functionality of FC 177.

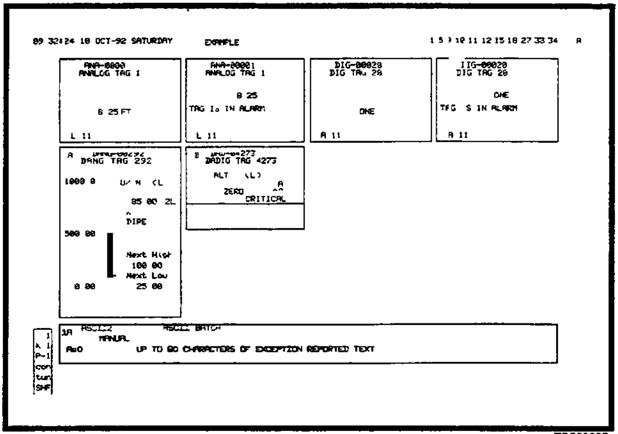

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Figure 8-1. Standard Data Acquisition Faceplate Symbols

Common Data Acquisition Element Attributes

The standard faceplate elements shown in Figure 8-1 share some common attributes. These attributes, which can be incorporated into any graphic or custom faceplate, include:

Tag name - a name of up to 14 characters entered during tag configuration. This is the name of the tag defined to allow monitoring of the process point.

Tag descriptor - a tag descriptor of up to 32 characters entered during tag configuration. Normally, this descriptor explains the purpose of the tag (and process point).

Faceplate selector a selector is one or two alphanumeric characters used to select and enable control features of an element. The selector characters identify the keyboard keys that must be pressed to enable the element After pressing the keys, the outline of the element highlights to verify selection, and to easily recognize the element as being enabled After selection the control keys function for that element only

Alarm status/quality/group this field relates to alarm processing In standard faceplate symbols, this field accommodates five characters

From left to right, the first two character positions are the alarm status An indicator in these positions identifies the last alarm threshold that a point passed as determined and exception reported by the PCU control scheme Refer to ***ALARM STATUS INDICATORS*** in the ***Alarm Processing*** section for a description of the indicators that can appear in this field

The DANG, DADIG and TEXTSTR tags present alarm suppression status in the status portion of the alarm status/quality/group field An " appears when alarm suppression is enabled for the tag

The third character position is the quality field This field identifies the quality associated with a process value or state, and the operating status for the tag Refer to ***QUALITY INDICATORS*** in the ***Alarm Processing*** section for a description of the quality indicators that can appear in this field

NOTES

1 Disestablished substituted and inhibit are initiated at the console through operator actions (e operating parameters functions) PCU modules report good, bad and suspect in exception reports

2 Control cannot be performed for any tag reporting bad quality or off scan

The last two character positions identify the alarm group to which the tag is assigned The field appears as either blank for no alarm group or *1* through *99*

Example An alarm status/quality/group field that appears as

2H 10

indicates that the point has passed the two-high threshold set in the PCU module, the module has determined that it is receiving good data for the point, and the tag defining the process point is part of alarm group ten

Refer to the ***Alarm Processing*** section for an explanation of alarm processing, conditions and indications

Red tag descriptor a red tag descriptor (and red outline) identifies a process point as being red tagged Red tagging performed through PCU management functions at the console does ***not*** prevent a process device from operating It can be set to either display red tag status and disable control actions from being performed at the console, or to display red tag status only The process engineer determines how red tagging operates at the console through system configuration

A PCU module reports red tag status as part of an exception report Of the data acquisition tags, red tag status is available for a DANG, DADIG or TEXTSTR tag

NOTES

1 *n some cases the source f le for a symbo must be modif ed to en-*able the red tag status out ine feature E ther remove the remark **(rm)** at the beg nn ng of the ine conta ning the **ed 102** escape command or add this command to the source fi e f not present

2 The a arm status qual ty and red tag ind cators presented are default characters They can be changed through text subst tut on

Control prompt/field the control prompt and input field appears only after selecting an element for control It contains a *TARGET* prompt and input field Depending on the tag being controlled, it shows the current mode, state or value of the selected control point when it first appears It then allows changing that parameter through keyboard selections When a change is initiated, the displayed parameter updates to reflect the target mode, state or value The target is the desired change The element then updates to reflect the change

The control *TARGET* prompt may appear somewhere else on the screen other than directly with a display element The location of the prompt depends on the control select option set for the element during its creation

Analog Element Attributes

The console provides two different faceplate symbols to present analog tag values Figure 8 2 details the information presented at a standard analog display element The display source file for this element is the ***ANALOG1.DT*** symbol file Figure 8 3 details the information presented at an analog annunciator display element, which is the ***ANCREAL1.DT*** symbol file

An analog function block exception reports the current real value, and alarm status and quality presented at these elements Attributes that relate to an analog type tag and can be incorporated into any graphic or custom faceplate include

Current reported value the current value being reported by the analog function block This value is dynamic and changes as the variable being monitored changes

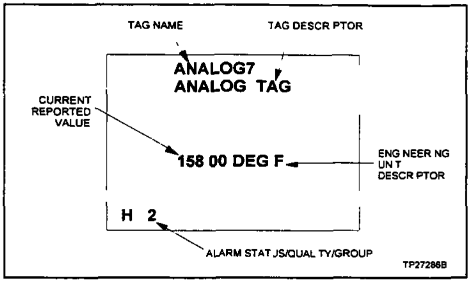

Figure 8 2 Analog Element

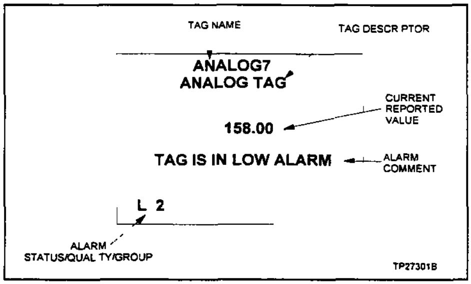

Figure 8 3 Analog Annunciator Element

Engineering unit descriptor (EUD) indicates the unit of measurement associated with the value The analog function block reports an EUD index number that the console then cross references against its list of engineering unit descriptors

Alarm comment an alarm comment of up to 64 characters The alarm comment is entered as part of the tag configuration The comment can describe, for example, the purpose of the alarm indication, or operator actions required to correct the alarm

Digital Element Attributes

The console provides two different faceplate symbols to present digital states Figure 8 4 details the information presented at a standard digital display element The display source file for this element is the ***BOOLEAN1.DT*** symbol file Figure 8 5 details the information presented at a digital annunciator, which is the ***ANCBOOL1.DT*** symbol file

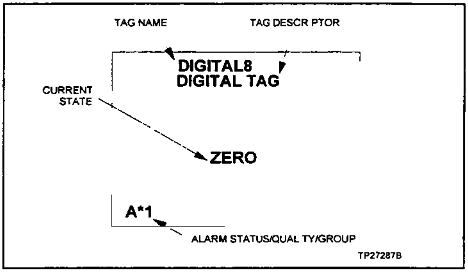

Figure 8 4 Digital Element

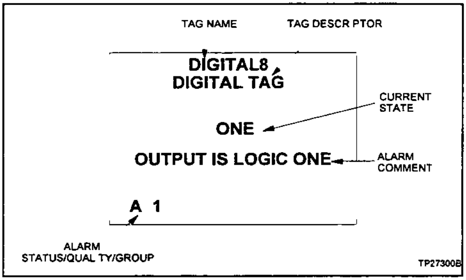

Figure 8 5 Digital Annunciator Element

A digital function block exception reports the current output state, and alarm status and quality presented at these elements Attributes that relate to a digital type tag, and can be incorporated into any graphic or custom faceplate include

Current state the current output state being reported by a digital function block This state is dynamic and changes as the logic state being monitored changes

Alarm comment an alarm comment of up to 64 characters The alarm comment is entered as part of the tag configuration The comment can describe, for example, the purpose of the alarm or operator actions required to correct the alarm

An alarm for a digital tag is used to identify one of two possible states The specific state that causes an alarm indication is determined by the function block configuration A digital alarm may not actually be a problem condition, but instead a digital state transition indicator

Data Acquisition Analog Element

The data acquisition analog function code (FC 177) provides reporting and multilevel, rate of change and deviation alarm monitoring capabilities for an analog point It also supports several time based alarming options with time based alarm filtering capabilities A PCU control module configured with a data acquisition analog function block performs these operations for the process value being monitored by the block The console gives access to the function block to allow the operator to observe the process variable being monitored by the block, and its status Also, it allows the operator to interact with the block to change the input source and enter a user inserted value if desired The block stores the user-inserted value in nonvolatile memory

DANG ELEMENT ATTRIBUTES

The data acquisition analog (DANG) element represents a data acquisition analog function block in a PCU module control scheme A DANG tag is required to monitor and control the operation of this function block

Figure 8 6 details the information presented in a data acquisition analog element The display source file for this element is the ***DNGFULL1.DT*** symbol file

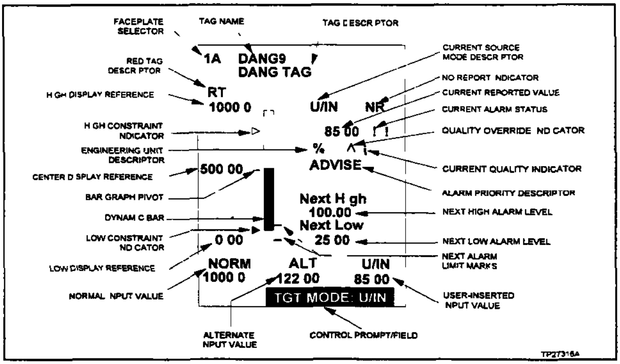

Figure 8 6 Data Acquisition Analog Element

The data acquisition analog block exception reports the current output value, input source mode, and alarm status and quality that display at a data acquisition analog element Attributes that relate to a DANG tag and can be incorporated into any graphic or custom faceplate include

Current reported value the current value being reported by the data acquisition analog function block This is the output of the function block The output value depends on the input source selection

During configuration of the data acquisition analog function block the process engineer can establish constraint limits for the normal user inserted and alternate values The maximum and value displayed and reported by the block will always be within the constraint limits even if the variable being monitored exceeds the constrained level The value is always the true value when within the constrained limits

High display reference reference point value that establishes the highest value represented by the bar graph and constraint limits The console displays the dynamic bar representation of the current reported value and the constraint limit indicators proportionally between the high display reference value and the low display reference value

Center display reference reference point value that establishes the center reference point between the high and low reference points for the bar graph This shows the value that is the pivot point for the bar graph

Low display reference reference point value that establishes the low reference point for the bar graph and constraint limits

High and low constraint indicator marks where the constraint limits fall within the high and low reference range on the bar graph The indicators do not appear unless constraint limits have been enabled in the function block The triangular indicator fills when the variable is at or above the constrained limit

Dynamic bar provides a visual indication of the reported value as an expanding and contracting bar The bar expands from the center pivot point on the bar graph in either a negative or positive direction as the process variable increases or decreases in value

Bar graph pivot marks the center reference point on the bar graph

Current source mode descriptor identifies the current input source selected by the operator, or some other supervisory device The PCU module reports the current mode of the block The descriptor also identifies whether the block is locked or not locked in a certain mode The descriptors are

Source Locked	***Source Unlocked***
NORM (L)	*NORM*
U/IN (L)	*U/IN*
ALT (L)	*ALT*

No report indicator shows whether the function block is in a report or no report state The field appears as *NR* for a no report condition, or blank for a report condition Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for further explanation and procedures to enable or disable reporting

Current alarm status presents all normal alarm status indications The field shows the same information that can be seen in the status portion of an alarm status/quality/group field Refer to ***ALARM STATUS INDICATORS*** in the ***Alarm Processing*** section for a list of alarm status indicators

The block also supports automatic alarm suppression and re alarming Refer to the ***Function Code Application Manual*** to determine the effects of these features on the reported alarm status

Current quality indicator presents all normal quality indications The field shows the same information that can be seen in the quality portion of an alarm status/quality/group field Refer to ***QUALITY INDICATORS*** in the ***Alarm Processing*** section for a list of quality indicators

Quality override indicator indicates whether the block is in an override condition or not The block allows an external source to override the quality status of the reported value A caret symbol (^) identifies an override condition

Engineering unit descriptor (EUD) indicates the unit of meas urement associated with the value The data acquisition analog function block reports an EUD index number that the console then cross references against its list of engineering unit descriptors

Alarm priority descriptor gives a text descriptor that corre sponds to the priority of an alarm level or bad quality being re ported by the function block The process engineer sets priority levels during configuration of the DANG tag Refer to ***Alarm Priority Descriptors*** in the ***Alarm Processing*** section for an expla nation of the descriptors

Next high alarm level identifies the value that is the next high alarm level threshold for the point Refer to Table 8-1 to determine the criteria for this field

Next low alarm level identifies the value that is the next low alarm level threshold for the point Refer to Table 8 1 to determine the criteria for this field

Next alarm limit marks mark the next high and next low points on the bar graph These correspond to the values seen in the next high level field and next low level field

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Table 8 1 DANG Element Next High and Next Low Alarm Limit Criteria

Current Alarm State	Next High Value	Next Low Value
b ank (no a arm)	H	L
N	H	L
3H	>	3H
2H	3H	2H
H	2H	H
L	L	2L
2L	2L	3L
3L	3L	>
V3H	>	V3H
V2H	V3H	V2H
VH	V2H	VH
VL	VL	V2L
V2L	V2L	V3L
V3L	V3L	>
HD	b ank	b ank
LD	b ank	b ank
HR	b ank	b ank
LR	b ank	b ank
	b ank	b ank

Normal input value shows the real input value Normally, this is the real value being received from the transmitter monitoring the process The attribute is dynamic and changes as the variable being monitored changes A value does not appear if the block is in alternate or user inserted mode

User-inserted value shows a numeric value established by the operator at the console, or some other supervisory device A PCU module stores this value in nonvolatile memory The user inserted value can be, for example, stored lab data or an interim value if a process value is not available

Alternate input value shows a dynamic value preconfigured as a contingency In this case, the alternate can be developed from one or more other real values received from the process It also can be the result of a calculation A value only appears when the block is in the alternate input source mode

DANG CONTROL

DANG control allows changing the input source selection for a data acquisition analog function block, and entering a user inserted value Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for procedures to change the alarm reporting and exception reporting status of a DANG block

To ***enable*** a DANG element to control a data acquisition analog function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the element is first selected.

> **NOTE** When the DANG block is in a no report condition any mode change causes the block to output a single exception report

Source Selection

The input source for the DANG block can only be changed through keyboard actions at the console if the block is not in a locked state An *(L)* appearing next to the current source mode descriptor identifies a locked condition.

> **NOTE** When the DANG block is in a no report condition any mode change causes the block to output a single exception report

Press **[MAN/AUTO]** to toggle between the normal input source mode and the user inserted source mode

Press **[CMPTR]** to select alternate input source mode

As soon as a change is made, the display begins to update The *TGT MODE* prompt identifies the currently requested target state after pressing any of these keys The current source mode descriptor identifies the mode being reported by the block

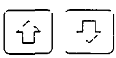
Press **[MAN/AUTO]** to return to normal input source mode from alternate input source mode

Change Value

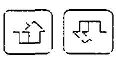
To change the user inserted value being stored in nonvolatile memory of a PCU module

1 Press **[SET]** This calls a *SET U/IN* control prompt, which shows the current user-inserted value The EUD descriptor identifies the unit of measurement associated with the value

2 The value can be changed using one of two methods Key in the desired set point target value and press **[ENTER]**, or press



To effect a slow, ramping change This changes the value 0 2 percent per keystroke



To effect a fast, ramping change This changes the value 4 0 percent per keystroke

While the DANG element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in the ***Process Control and Tuning*** section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press **[ESC]** or select another element at any time

Data Acquisition Digital Element

The data acquisition digital function code (FC 211) provides reporting and alarm monitoring capabilities for a digital point A PCU control module configured with a data acquisition digital function block performs the operations for the digital variable being monitored by the block The console gives access to the function block to allow the operator to observe the state of the point being monitored, and its status Also, it allows the operator to interact with the block to change the input source and enter a user inserted value if desired The block stores the user inserted value in nonvolatile memory

DADIG ELEMENT ATTRIBUTES

The data acquisition digital (DADIG) element represents a data acquisition digital function block in a PCU module control scheme A DADIG tag is required to monitor and control the operation of this function block

Figure 8 7 details the information presented in a data acquisition digital element The display source file for this element is the ***DADIG1 DT*** symbol file

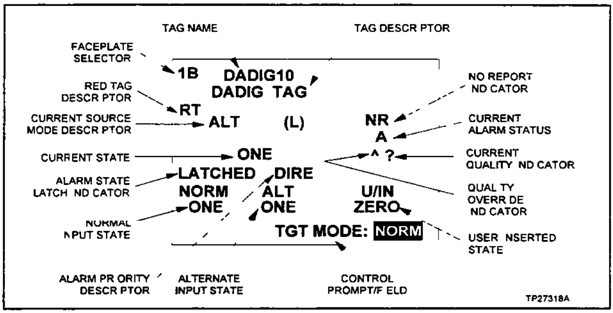


Figure 8 7 Data Acquisition Digital Element

The data acquisition digital block exception reports the current output state, input source mode, and alarm status and quality that displays at a data acquisition digital element Attributes that relate to a DADIG tag and can be incorporated into any graphic or custom faceplate include

Current state the current output state being reported by the data acquisition digital function block This is the output of the function block The output value depends on the input source selection

Dunng configuration of the data acquisition digital function block, the process engineer has the option of performing input conditioning to develop the output of the function block Refer to the ***Function Code Application Manual*** to determine the effects of this conditioning on the reported output

Current source mode descriptor identifies the current input source selected by the operator or some other supervisory device The PCU module reports the current mode of the block The de scriptor also identifies whether the block is locked or not locked in a certain mode The descriptors are

Source Locked	***Source Unlocked***
NORM (L)	*NORM*
U/IN (L)	*U/IN*
ALT (L)	*ALT*

No report indicator - shows whether the function block is in a report or no report state. The field appears as *NR* for a no report condition or blank for a report condition Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for further explanation and procedures to enable or disable reporting

Current alarm status presents all normal alarm status indica tions The field shows the same information that can be seen in the status portion of an alarm status/quality/group field Refer to ***ALARM STATUS INDICATORS*** in the ***Alarm Processing*** section for a list of alarm status indications

During configuration of the data acquisition digital function block, the process engineer has the option of using either the unconditioned input or conditioned input for alarming, and one of four modes of alarming. The block also supports automatic alarm suppression and re alarming Refer to the ***Function Code Application Manual*** to determine the effects of these features on the reported alarm status

Current quality indicator presents all normal quality indications The field shows the same information that can be seen in the quality portion of an alarm status/quality/group field Refer to ***QUALITY INDICATORS*** in the ***Alarm Processing*** section for a list of quality indicators

Quality override indicator indicates whether the block is in an override condition or not The block allows an external source to override the quality status of the reported value A caret symbol (^) identifies an override condition.

Alarm state latch indicator shows whether the function block has its alarm state latch feature enabled The field appears as *LATCHED* when enabled, or blank when not Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for further expla nation and procedures to reset the alarm state latch if enabled

Alarm priority descriptor gives a text descriptor that corre sponds to the priority of an alarm or bad quality being reported by the function block The process engineer sets priority levels during configuration of the DADIG tag Refer to ***Alarm Priority Descriptors*** in the ***Alarm Processing*** section for an explanation of the descriptors

Normal input state shows the real input to the block Normally, this is the state being received from the process The attribute is dynamic and changes as the state of the device being monitored changes A state condition does not appear if the block is in alternate or user inserted mode

User-inserted state shows a descriptor for the user inserted digital state selected bv the operator at the console, or some other supervisory device A PCU module stores this value in nonvolatile memory The user inserted value can be, for example, an interim value if a process device is not available

Alternate input state shows a dynamic state preconfigured as a contingency The alternate can be developed from another function block. A value only appears when the block is in the al ternate input source mode

DADIG CONTROL

DADIG control allows changing the input source selection for a data acquisition digital function block, and entering a user-inserted value Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for procedures to change the alarm reporting and exception reporting status, and to reset the alarm state latch for a DADIG block

To ***enable*** a DADIG element to control a data acquisition digital function block, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the element is first selected

NOTE When the DAD G block s in a no report condit on any mode change causes the b ock to output a s ng e except on report

Source Selection

The input source for the DADIG block can only be changed through keyboard actions at the console if the block is not in a locked state An *(L)* appearing next to the current source mode descriptor identifies a locked condition

Press MAN/AUTO to toggle between the normal input source mode and the user inserted source mode

Press CMPTR to select alternate input source mode

As soon as a change is made, the display begins to update The *TGT MODE* prompt identifies the currently requested target state after pressing either of these keys The current source mode descriptor identifies the mode being reported by the block

Press [MAN/AUTO] to return to normal input source mode from alternate input source mode

Change State

To change the user inserted state being stored in nonvolatile memory of a PCU module

1 Press [SET] This calls a *SET U/IN* control prompt, which shows the current user-inserted state

2 Press the following keys to change the state

■ Changes to a one state output

□ Changes to a zero state output

While the DADIG element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in the ***Process Control and Tuning*** section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

Text String Element

The text string element allows the operator to interact with an application program running in a PCU module A user defined data export function code (FC 194) in a PCU module provides the interface between the console and the program At the console, a TEXTSTR tag referencing a data export block in the PCU module allows an operator at the console to interact with the function block. A data export function block can also be driven by another function block rather than directly by an application program

The text string functionality provides, for example, a means to prompt or question an operator and have the operator respond to the prompt or question in some manner The response may be to make some type of selection, acknowledge an event or provide an answer to a question It can also be used to simply allow the operator, through descriptive text, to monitor and verify the progress of a process routine

The capabilities provided by the text string function are not limited to the uses previously described A C language program or batch program executing in the PCU module determines the operations performed through the text string block and text string element.

TEXTSTR ELEMENT ATTRIBUTES

The text string (TEXTSTR) element gives access to a user defined data export function block in a PCU module control scheme. A TEXTSTR tag is required to interact with this function block.

Figure 8-8 details the information presented in a text string element. The display source file for this element is the ***TEXTSTR1.DT*** symbol file.

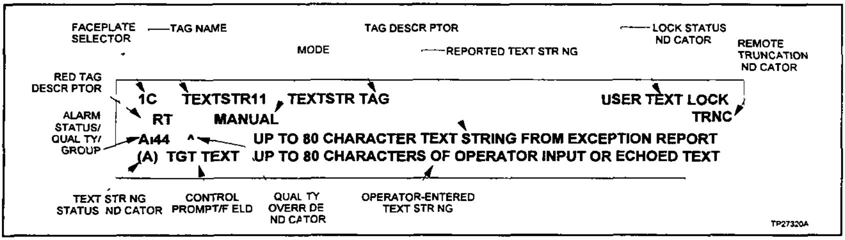


Figure 8-8. Text String Element

The user defined data export block exception reports the text string message, and alarm status and quality that displays at a text string element. Attributes that relate to a TEXTSTR tag and can be incorporated into any graphic or custom faceplate include:

Lock status indicator - indicates whether the function block is in a locked or unlocked condition. When locked, the block does not accept text string inputs from the console. The default descriptors for this field are *USER TEXT LOCK* when the block is locked and blank when it is not.

Mode - indicates the current operating mode of the block. The block operates in either automatic (*AUTO*) or manual (*MANUAL*) mode, which determines how the output of the block is derived.

Quality override indicator - indicates whether the block is in an override condition or not. The block allows an external source to override its quality status. A caret symbol (^) identifies an override condition.

Reported text string - shows the text string being exception reported by the user defined data export function block (FC 194).

The standard text string element (***TEXTSTR1.DT***) provides for a text string length of 80 characters, which is the maximum length for a text string In a user defined text string element the process engineer has the option of setting the maximum length allowed for a text string An option to enable or disable local truncation for a text string is also provided If enabled and the length of the reported text string is longer than the length allowed for in the user defined element, the console indicates local truncation with an ellipsis (.) at the end of the text string

Truncation indicator - indicates the presence or absence of remote truncation for the reported text string Remote truncation is done by a PCU module or the communications interface unit of the console *TRNC* appears if remote truncation has occurred

To identify where remote truncation is occurring and to help identify a truncation error, the operating parameters page for a TEXTSTR tag provides text string length information A *Console String Length* field displays the length defined in the tag database for the TEXTSTR tag A *Module String Length* field identifies the length set in the function block A *Received String Length* field shows the actual length of the text string received in the last exception report for the tag Refer to ***TEXTSTR CONTROL*** in this section for procedures to call the operating parameters page from a selected TEXTSTR element

Operator-entered text string - appears only after the element has been selected for control Depending on configuration, a TEXTSTR tag may or may not allow control The text that initially appears after selecting the element for control is the same as the reported text string

Text string status indicator provides two functions The first is to indicate that there is an alarm associated with the text string being entered if the operator chooses to make this association For this purpose, the indication is either *( )* for no alarm or *(A)* for alarm

The second function is to indicate that following an operator entered response to a prompt or question, the initial prompt or question is received again at the console This occurs when the application program has rejected the response for some reason and has sent the same text string back to the console for another response If this happens, it is possible for the operator to be prompted again with the same text string without first seeing the entered reply confirmed with a new text string The console displays a *NAK* (negative acknowledgment) indication to identify that the current reported text string is the same prompt or question that the operator had previously responded to, but regenerated This requires, however. that the program be specifically written to prompt the operator again after rejecting an input

The block also supports re alarming Refer to the ***Function Code Application Manual*** to determine the effects of this feature on the reported alarm status

TEXTSTR CONTROL

TEXTSTR control allows the operator to respond to a prompt or question introduced by a user-written application program Control also allows the operator to change the operating mode of the user defined data export function block to determine the output of the block Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for procedures to change the alarm reporting status for a user-defined data export function block (TEXTSTR tag)

To ***enable*** a TEXTSTR element for control, either enter its faceplate selector through the keyboard or use an optional method of selection A *TGT MODE* control prompt appears when the element is first selected

The element can only be enabled for control if the *Control Enabled* field for the tag was set to *YES* during its configuration If an attempt is made to enable a TEXTSTR element for control when the tag referenced in the element has its *Control Enabled* field set to *NO*, the following message appears

Control is not enabled

The input source for the user defined data export function block can be either an application program or another function block Besides these two sources, the block also accepts messages from a console This allows the operator at the console to toggle the block between automatic and manual mode and to input a text string The operator can also change the alarm reporting status of the block through the operating parameters function

The user defined data export function block only accepts input from the console if the block is not in a locked state A *USER TEXT LOCK* appearing as the lock status indication identifies a locked condition If the operator attempts any control while the block is locked, the following message appears

Control Invalid While in String Interlock

Mode Change

The operator can change mode to determine the output of the user defined data export function block Press **MAN/AUTO** to toggle the block between manual and automatic mode

The block operates in several ways depending on its input source and current mode

Application driven when an application program drives the user defined data export block, it always controls the output of the block while in auto mode It also always sets the alarm status and quality for the block

When the block is placed in *AUTO* mode, the application can read any input from the console Depending on how the program is written it may or may not update the output of the block based on this input The block does not exception report a new text string to update the console display unless the application itself updates the output of the block or changes either the alarm status or quality status of the block The application does not echo the text string entered by the operator back to the console unless the program is explicitly written to do so An echo feature like this, which can be used to confirm that the block received the entered text, must be built into the program for it to occur The block does, however, generate a new exception report automatically even if the application does not change an output when the maximum time for exception reporting expires

When the block is in *MANUAL* mode, the application can still read any input from the console In this case, the output may either be a new text string generated by the application, or it may be an echo of the operator entered text string When the block receives an input from the console, it immediately places the input into its output buffer This text string is output in the next exception report unless the application overwrites it before the block generates a new exception report

Block driven the user defined data export block in *AUTO* mode operates basically the same when driven by another block as when it is driven by an application program The difference is that the function block driving the user-defined data export block sets the alarm status and quality rather than the application program

When the block is in *MANUAL* mode, only the console controls the output of the block The block exception reports any text strings entered by the operator at the console The operator entered text string is echoed back as the reported text string

Table 8 2 summarizes the operation of the user defined data export function block based on the input source, and current mode and lock status of the block

Table 8-2 TEXTSTR Element Operating Conditions

Input Source	Mode	Lock Status	Operation
Application	*AUTO*	Locked	The application controls the output of the user-defined data export block not allowing any input from the console
	AUTO	Unlocked	The application controls the output of the user defined data export block allowing input from the console The application may or may not update the output of the block based on the input from the console It depends on how the program is written
	MANUAL	Unlocked	Both the application and the console control the output of the user defined data export block A text string received from the console can be read by the application The text string received from the console becomes the output of the block unless the program updates the output with a new text string

Table 8 2 TEXTSTR Element Operatıng Condıtıons (contınued)

Input Source	Mode	Lock Status	Operatıon
Functıon block	*AUTO*	Locked	Another funct on block contro s the output of the user defined data export b ock not al owing any nput from the conso e
	MANUAL	Un ocked	The console controls the output of the b ock A text strıng receıved from the conso e becomes the output of the b ock

Text Strıng Input

To enter a text strıng ın response to a prompt or question

1 Press [SET] to enable the text strıng ınput field The control prompt changes to *TGT TEXT* and the current reported text strıng ıs echoed ın the ınput field after pressıng the key

2 The maxımum number of characters that can be entered ıs 80 However, the *Text Length* attrıbute defined for the TEXTSTR tag the element references determınes the maxımum number of characters dısplayed and accepted by the element Key ın a response

3 Press [ENTER] to enter the text strıng

When the module sends an exceptıon report to the console con taınıng a text strıng, the exceptıon report also contaıns a sequence number assocıated wıth the text The module uses the sequence number to ınsure that the response receıved from the operator at the console corresponds to the text that was sent The user defined data export block ıncrements the sequence number each tıme the applıcatıon program updates the output of the block wıth a new text strıng

The message the console sends to the module ın response to a prompt or questıon also contaıns the sequence number of the message to whıch the operator ıs respondıng If the module de tects a mısmatch between the current sequence number and the receıved sequence number, ıt ıgnores the response Thıs ınsures the ıntegrıty between the prompt and the answer

For example, the operator ıs currently typıng ın a response to a questıon and the console updates the dısplay wıth a new questıon before the operator's response ıs finıshed Thıs causes a mısmatch between the current questıon, whıch ıs the newly generated one, and the response when the operator finıshes typıng the entry and presses [ENTER] To ıdentıfy the mısmatch, the console dısplays the message

Answer Is Invalıd For Current Questıon

Alarm State

The operator has the abılıty to ındıcate an alarm state to be as socıated wıth a response The alarm state can be ındıcated as eıther ın alarm *(A)* or no alarm *( )*, the default ıs no alarm Refer to

TEXTSTR ELEMENT ATTRIBUTES in this section for an explanation of alarm state indications

To indicate an alarm or no alarm condition for a text string, press:

■ Indicates alarm

□ Indicates no alarm

While the TEXTSTR element is still active, a block details or operating parameters display can be called by pressing a corresponding keyboard key Refer to ***Block Details Display*** in the ***Process Control and Tuning*** section for an explanation of the functions performed through the block details display Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for an explanation of the operating parameters display and its functions

To ***disable*** control of the currently selected element, press [ESC] or select another element at any time

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SECTION 9 - ALARM PROCESSING

INTRODUCTION

The operator begins processing alarms after receiving alarm indications at the operator interface station (OIS) The console follows a strategy for alarming established during configuration to indicate alarm occurrences. These indications identify alarm conditions for individual process variables and entire process areas, and also priority alarms

This section explains the console level alarm indications and processing procedures It also details the information and functions available through any alarm summary, and procedures to manually inhibit alarm indications for an entire process area or group of variables

> **NOTE:** The operator can inhibit alarm indications for process variables (tags) individually through the operating parameters page refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for procedures

ALARM INDICATIONS

The console presents several different indications to notify an operator of an alarm condition The console monitors exception reports and its own peripherals to determine if an alarm condition exists Some examples of alarm conditions that cause an alarm indication are

- A process variable passing a certain threshold
- A process device changing to a specific state
- An INFI 90 node or module going off line or operating in an error condition
- An OIS peripheral device going off line, missing or in error

Process Alarms

The console monitors the alarm status for each point within a process that is referenced by a defined tag The tag allows the console to receive exception reports generated by a process control unit (PCU) module with information specific to that process point A portion of the exception report is reserved for alarm status information This information can be alarm levels for analog process variables, or alarm states for digital switching process devices

The parameters in the control scheme of a PCU module controlling function block operations determine the thresholds or states that trigger alarm indications. The parameters are set during module configuration Depending on the function block, alarm indications for analog variables will either be a high or low indication, multilevel alarm indication, high or low deviation, or high or low rate of change alarm Multilevel alarms range from a three high to three low level A change to a specific state triggers digital alarm indications The specific state that triggers an alarm is set as one of the function block parameters

INFI 90 Alarms

INFI 90 PCU modules report status information to the console through exception reports The console monitors the status of each module in the INFI 90 system through an N90STA tag A module sends status exception reports while in any of its on line operating modes. execute, configure or error mode The console indicates an alarm when the message identifies a module in error An alarm also generates whenever a module goes off line

Peripheral Alarms

Each peripheral the console supports must be defined as a DEVSTAT tag to allow monitoring the device and present alarm indications This type alarm condition is generated internal to the console The console checks for a hardware connection, on line, off line or error status

Several indications can appear to identify an alarm condition, and include

Alarm status field used mainly to identify the type of alarm, however, if the field is of the five character type, it also provides quality and alarm area information A status field flashes until the operator acknowledges the alarm condition

Alarm status field colors alarms appear in a standard color (yellow) or a user designated color for easy recognition

Top line indicators presented in a fixed position on the screen, these indicators allow the operator to locate a process area or group of variables in alarm A yellow alarm group indicator (i e , *1* to *99*, *S* or *D*) flashes until the operator acknowledges all alarm occurrences within the process area or group

The title line presents two lines of alarm group indicators If the area fills, an *M* appears to identify that there are more alarms

Alarm tone an audible tone can be associated with each process area to identify an alarm occurrence within that area

Alarm relay a relay associated with a specific process area will close to trigger an external alarm annunciator when a process variable within that area goes into an alarm condition

An entry is also made list to identify an alarm event The console presents the same indications if the process variable returns to its normal condition from an alarm The only difference is that the alarm status characters turn green to indicate a normal state when using standard colors All or only some of these indications may be associated with a given process alarm

An alarm quality option configuration procedure can be used to override any existing color scheme set in both standard console provided displays and user-created displays This option sets the colors used for the alarm status field. Refer to ***ALARM QUALITY OPTION*** in the ***OIS Configuration*** section for procedures to view the color scheme set for both alarm status and quality indications for your console

Alarm Status Fields

An alarm status field as an element of a display presents alarm status information to an operator. The status field appears at most standard displays, and can be incorporated as an element of any user created display. This field can appear in two different ways either a *five-character alarm status/quality/group field* (e g , *2Hi25*), or a single character field showing alarm status only (e g , *H*) From left to right, the five character status field contains

- Two character alarm status indicator
- One character quality indicator
- Two-character alarm group number

The alarm status indicator that appears in the first two positions depends on the type of tag For an analog point, the characters identify the last alarm threshold that the point passed as determined and exception reported by a PCU module The two characters also identify a change in the digital state of a device, and an N90STA, DEVSTAT or TEXTSTR tag alarm

The quality field applies to a process value or state being exception reported The field also shows the current operating status of a tag when it has been taken off scan, has alarm inhibiting implemented, or the value or state shown is a substituted value or state

The last two character positions identify the alarm group to which the tag is assigned The field appears as either blank for no alarm group assignment, or *1* through *99*, *S* (system) or *D* (device)

ALARM STATUS INDICATORS

NOTE The characters used to dentify each a arm cond t on are defau t text characters Each nd cator can be redef ned through text substitution

The alarm status indicators that can appear for a tag depend on its type Table 9 1 describes the indicators that appear as the first two characters of the five character element Table 9-2 describes the indicators that appear if the display element is of the single character field type

Table 9-1 Alarm Status Indicators for the Alarm Status/Quality/Group Field

Indication	Description	Tag Type
B ank	No a arm	AI
3H	Three high alarm	DAANALG, DANG[1]
2H	Two h gh a arm	DAANALG DANG[1]
H	H gh alarm	ANAL OG, INTANG DAANALG DANG[1] STAT ON
L	Low a arm	ANAL OG NTANG DAANALG DANG[1], STATION
2L	Two-low alarm	DAANALG DANG[1]
3L	Three ow alarm	DAANALG DANG[1]
HD	H gh dev at on alarm	STAT ON DANG
LD	Low dev at on alarm	STAT ON DANG
HR	H gh rate of change a arm	DANG
LR	Low rate of change alarm	DANG
N	Return to norma from a arm	A
A	D gita	D G TAL NTDIG DAD GTL RCM RMCB DD MSDD DAD G N90STA DEVSTAT TEXTSTR
*	Bad qua ty **NOTE** The conso e must be set to hand e bad qual ty as an a arm	AI
//	Alarms suppressed	DANG DADIG TEXTSTR

NOTE 1 The DANG element uses a var ab e a arm type nd cator f e d (**ed 110**) to dent fy a var able alarm cond t on The default nd cator s V wh ch appears to the left of the a arm status/qua ty/group f e d Th s nd cator s pos t oned to ook ke it is part of the a arm status/qua ty/group f e d

Table 9 2 Alarm Status Indicators for the Alarm Status Field

Indication	Description	Purpose
H	H gh ana og a arm	Appears when a tag passes a three high two h gh or high threshold
L	Low ana og a arm	Appears when a tag passes a three-ow two low or ow thresho d
D	Dev at on ana og a arm	Appears for e ther a h gh dev ation or ow deviat on a arm

Table 9-2. Alarm Status Indicators for the Alarm Status Field (continued)

Indication	Description	Purpose
R	Rate of change analog alarm	Appears for either a high rate of change or low rate of change alarm
A	Alarm	Indicates a digital, N90STA, DEVSTAT or TEXTSTR alarm
*	Bad quality	Appears when a tag is reported as in bad quality **NOTE** The console must be set to handle bad quality as an alarm
I	Alarm suppression	Indicates that alarm suppression is active for a tag

QUALITY INDICATORS

The quality position (third character) of an alarm status/quality/group field presents point quality, alarm inhibit, off scan and substituted value indications The indicators include

Blank good

? suspect

* bad

i alarm inhibited

x off scan

s substituted

The *i*, *x* and *s* indicators appear after performing certain operations at the operating parameters page of the console These indicators identify changes the operator has made that affect console operations only, ***not*** module control operations The operating parameters display can be viewed at any time to see the current operating status of a tag, and to perform operations that cause or remove these indications Refer to ***Operating Parameters Display Operations*** in the ***Process Monitoring*** section for the information presented and operations performed at the operating parameters display that relate to the *i*, *x* and *s* indicators

Alarm Inhibit

The alarm inhibit indication (*i*) appears when either automatic or manual alarm inhibiting is in effect Automatic alarm inhibiting occurs when another process variable or device defined as an alarm inhibit tag is in a specific alarm condition or changes to a specific state Manual inhibiting is done through either the operating parameters or alarm group inhibit functions In either case, the console does not make any entries in the alarm summary and events log, display a top line indicator, sound a tone, or set a relay when an inhibited tag goes to an alarm condition Also, the alarm summary field does not flash for an inhibited tag The alarm status field still changes to its alarm color and shows any alarm indications (e g , *2L*, *3H*, *A*, etc) even while a tag is alarm inhibited

Off Scan The off scan indication (*x*) appears when a tag is disestablished on the loop The console does not process exception reports for any off scan tags The quality position of the status field will show the *x* indicator, and any value or state fields related to the tag will contain a bad quality string

Substituted The substituted indication (*s*) appears when the operator has forced a tag to a particular value or state A substitution dises tablishes a tag and replaces any exception reported value or state with a substitute value or state The console uses a substitution in all operations as it would an exception reported value or state

Bad or Good Each exception report received by the console contains point quality information A function block generating an exception re port determines the quality of the value or state it is reporting It then sets the reported quality to either bad or good An alarm indication does not mean a point is in bad quality

The quality of a point is good when the function block determines that its output or outputs are valid The bad quality indicator (*) appears for a tag (except DEVSTAT) if the reported quality is bad

A bad quality indication also appears if the console cannot com municate with an entire PCU or an individual PCU module that contains the point referenced by a tag In this case, the console marks all points (tags) associated with the off line PCU or PCU module as being in bad quality A bad quality string defined through text substitution appears for all dynamic fields associated with a tag in bad quality

Suspect The suspect indication (?) appears when the function block refer enced by the tag performs a calculation to derive the value being sent to the console and at least one value used in the calculation was in bad quality

Title Line Indicators

The console presents alarm indications at its title line The title line elements are fixed and appear at all displays whether stan dard or user created This allows the console to present alarm indications while viewing any display page Refer to ***TITLE LINE DISPLAY ELEMENTS*** in the ***Display System*** section for a de scription of fixed display elements, and the area of the screen re served for presenting alarm indicators

The alarm indications presented at the title line are alarm group indicators (e g , *1* to *99*, *S* or *D*) These indicators allow the operator to narrow a problem down to a process area If a tag assigned to an alarm group goes into an alarm condition, the alarm group number to which that tag is assigned appears The indicator flashes until the operator acknowledges all alarms within that process area or group

Alarm Priority Descriptors

The process engineer can assign a priority level to each alarm condition or state of a tag during tag configuration The console can present a text descriptor associated with each priority level A display or element must use the alarm priority escape command (**ed 113**) to present the text string The default text descriptors and the priority level associated with each include

(1) *DIRE*	(5) *WARNING*
(2) *CRUCIAL*	(6) *ADVISE*
(3) *CRITICAL*	(7) *NOTIFY*
(4) *ALERT*	(8) *INFORM*

BAD QUALITY ALARMING

The console can be configured to treat bad quality reports for process variables as alarms A PCU module reports bad quality for a point in an exception report If bad quality alarming is set, the console presents all normal alarm indications for a process variable being reported as in bad quality In addition, an asterisk (*) appears in the alarm status position of the alarm field to identify a bad quality alarm The console also presents bad quality indications when it cannot communicate with a PCU module or a node defined as an N90STA tag

When the console is operating on the Plant Loop communication highway, all bad quality alarms for tags appear in the alarm summary and the events log In this case, the console makes entries in the summary and log for all tags referencing function blocks within a PCU module or node that goes off line

For INFI NET systems, the console filters out certain bad quality alarms to prevent an excessive number of entries from being made in the alarm summary and the events log The console does not make an entry for a tag that is in bad quality due to a PCU module or a node being off line Only an entry for the N90STA tag defining the affected PCU module or node is made All other alarm indications (bad quality indications) remain the same for any tags referencing function blocks within the off line PCU module or node

The process engineer configures bad quality alarming through the *Alarm Quality Option* configuration Refer to ***ALARM QUALITY OPTION*** in the ***OIS Configuration*** section for specifics

ALARM PROCESSING PROCEDURES

Alarm processing concerns steps required to acknowledge alarm indications, then initiate operator actions to correct the alarm conditions Alarm acknowledgment is a console level operation An alarm must first be acknowledged by an operator to stop some of the indications the console uses to identify the alarm occurrence After that, the actions taken to correct an alarm affect the process control responsibilities of the PCU module For example, to maintain the control output of a process loop below a maximum limit may require the operator to initiate manual control actions through a station element

The procedures and requirements for correcting alarms vary for each process, therefore, this section covers the alarm processing requirements at the console level only The steps required to perform alarm processing include

1 Silencing an alarm tone

2 Acknowledging an alarm

3 Initiating actions to correct the problem

Alarm Tone Silence

A tone may or may not be associated with an alarm occurrence A tone sounds on a per tag alarm basis, however, a tag must be part of an alarm area or group to have an assigned tone When a tag that is part of an alarm group goes into an alarm condition, the tone assigned to that group sounds

The console can sound only one tone at a time Each tone has a set logical priority, pitch, volume and duration A triggered tone normally continues to sound until it completes its entire duration, the operator manually silences it, or the tone is overridden by a higher priority tone

When alarms in different groups occur simultaneously, the console checks the logical priority of the tone assigned to each of the groups in alarm It does this to determine which tone of an alarm group it is to sound Once the console has determined which is the highest priority tone, it then activates that tone If an alarm occurs in another group with a higher priority, the current tone automatically silences and that higher priority tone sounds A lower priority tone does not affect a higher priority tone

Other factors within an alarm group also affect alarm tones If multiple tags within a single group go into alarm at the same instant, only one tone sounds to identify the entire group If there is a delay between tag alarms in a single group, each alarm occurrence triggers a new alarm indication A new alarm resets the duration counter of the current tone to zero, then the counter begins to increment until reaching its duration before turning off the tone

Press $\boxed{\text{SILENCE}}$ to manually silence a tone A tone also silences after being acknowledged

Alarm Acknowledge

The operator must perform alarm acknowledgment to stop certain alarm indications at the console Specifically, these include a flashing alarm status field and title line alarm group indicator, and an alarm tone before completing its duration

NOTE The INF 90 system status page and OIS periphera device status page do not present alarm status fie ds but st l prov de the capab ity to acknow edge system and dev ce alarms

Alarm acknowledgment can only be performed at displays that present an alarm status field, either five-character or single char acter type Examples of displays that include an alarm status field include the operating parameters, alarm summary, trend, XY plot and operator configurable group displays

The standard displays of the console incorporate a five-character alarm status/quality/group field The faceplate symbols provided as part of the symbol library also include this five character field Any user-created display can be created to present either the five character or single character type of status field

The operator must acknowledge the alarm to turn off the flashing indicators Besides stopping the flashing, the acknowledgment is also recorded in the events or operator actions log

Acknowledge Keys

Two choices are available for acknowledging alarms, either indi vidually or an entire page Press PAGE ACK to acknowledge all alarms on a single, displayed page To acknowledge alarms individually

1 Press ACK ALARM This calls a cross hair (+) alarm cursor to the screen that positions at the first alarm status field

2 Press either TAB or TAB BACK to position the cursor at a specific alarm field

3 Press ACK ALARM to acknowledge that alarm The field stops flashing once acknowledged

4 Repeat Steps 2 and 3 for each alarm to be acknowledged on the current page Once all acknowledgments are completed, press CANCEL then CURSOR to clear the alarm cursor from the screen

As other variables within a process area go into alarm, the group number for that area continues to flash until all alarms or return to normals for that group are acknowledged by the operator

Correcting Alarm Conditions

As stated previously, the actions that an operator performs to correct an alarm condition depend on the requirements of the process The console, however, does provide the capability to access the specific display at which the operator performs these corrective actions This display is the primary display of the tag

The primary display for a tag can be called up in three different ways The first is to select the tag or tag element on a page, then press DISPLAY The second method requires using a selector that is part of an alarm summary, refer to ***ALARM SUMMARY*** in this section for further explanation The third way is to call the primary display for a tag through the operating parameters page A tag must be assigned a primary display during tag configuration to enable the display call up feature

ALARM SUMMARY

An alarm summary contains a list of up to 1,000 of the most recent acknowledged or unacknowledged alarms, and acknowledged or unacknowledged return to normals A summary can appear as an element of a user created or operator configurable display, and also as its own display page

The console provides a standard full page alarm summary This standard summary or a user created summary can be incorporated into console operations In either case, a summary can be assigned to a dedicated alarm summary key to allow single key access to a complete list of active acknowledged and unacknowledged alarms Once assigned, pressing ALARM SUMM at any time directly displays an alarm summary The operator calls other displays that contain summary elements by using the *Display by Name* option or pressing assigned keys

Alarm management at the console can be set up in a variety of ways Part of alarm management configuration is to set up how the console processes and records alarms in its alarm summaries In particular, the setup determines whether alarms are recorded in chronological order as alarms occur, or grouped by priority then chronologically within the priority levels Once the setup is established, it applies to all summaries

Alarm management configuration also determines how the console handles return to normal alarms One of two methods can be used A fixed position change to a return to normal status or a new return to normal entry Using fixed position, the initial alarm entry in the summary maintains its current position in the list if a process variable returns to its normal condition The entry changes to its return to normal colors, and the status updates to show a return to normal (*N*) condition The initial alarm entry clears and a new return to normal entry is added at the beginning of the list if using the new entry option Refer to ***OIS System Configuration*** in the ***OIS Configuration*** section for an explanation of the *Alarm Management Type* field, which determines the management option

Priority sorting requires assigning a priority from one to eight to each type of alarm condition a tag may enter Depending on tag type, a priority can be assigned to each analog alarm level or digital alarm state, and bad quality and return to normal conditions These are also the conditions that trigger alarm indications. The console references the priority level of an alarm to determine where it locates an entry in the alarm summary list when using priority sorting The console also references the priority of an alarm condition to determine the foreground and background color of the entry Entries appear in priority colors whether using chronological or priority sorting

One of the indicators the console uses to identify a status alarm for a PCU module is an alarm entry in the alarm summary A *System Status I/O Error Filter* option available through OIS system configuration gives the option of preventing alarm entries for status alarms caused by certain types of module errors If the option is enabled, the console filters out any status alarms caused by a remote I/O error or local I/O error

The console allows creating summaries in varying sizes ranging from a full page presentation to a one-eighth page Entries in the summary can be for all alarm groups or priorities, or limited to only specific alarm groups or priorities

A maximum of 16 entries can appear at a single alarm summary page or element The information presented in each alarm summary entry depends on the line format configured for the particular summary Element size and the format can vary from summary to summary A single entry can include all or only some of the following attributes

Date of alarm date of alarm occurrence

Time of alarm time of alarm occurrence

Tag name name of the alarming tag

Current value - current value, state and status of tag in alarm

Exceeded limit value violated alarm limit for analog value reporting tag types

Engineering units engineering unit associated with an analog value

Tag description tag description entered in the tag database

Alarm condition - alarm status, quality and alarm group of the alarming tag

Alarm comment comment entered in the tag database for the alarming tag

Latched alarm time used to latch the time of occurrence to the alarming tag This allows displaying the time of occurrence in a return to normal alarm summary entry for the alarming tag

Latched alarm date used to latch the date of occurrence to the alarming tag This allows displaying the date of occurrence in a return to normal alarm summary entry for the alarming tag

Priority two-character indicator that shows the priority assigned to the alarming tag (set in the tag database)

Text string text string associated with a TEXTSTR tag (with or without local truncation indication)

Remote truncation status - indicates the presence or absence of remote truncation Remote truncation is done by a PCU module or the interface unit of the console

In short, the console allows for flexibility when creating an alarm summary The overall purpose of the summary determines the data and alarms presented The type of information and how this information is presented depends on OIS system, tag database and alarm summary format configuration, along with the parameters set during creation of the summary Refer to ***Alarm Management Configuration*** in the ***OIS Configuration*** section for procedures to view the current settings controlling alarm summary operations, and additional information about alarm processing

Figure 9 1 shows a standard, full page alarm summary The display source file for this summary page is the ***ALMSUMFL.DT*** source file

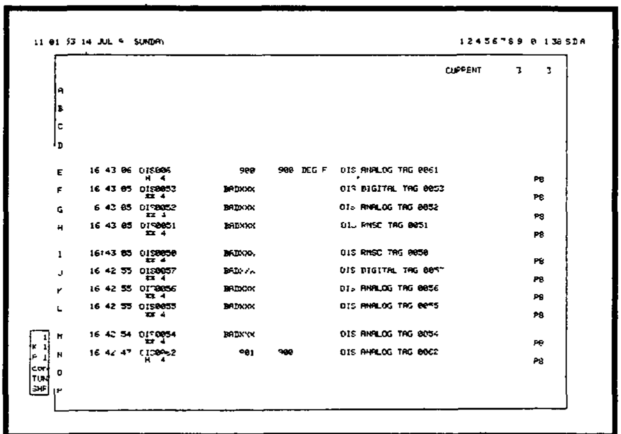

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Figure 9 1 Alarm Summary Page

Alarm Summary Element

An alarm summary element, no matter how it is configured, contains some standard display attributes These attributes can be identified in Figure 9-1

Alarm summary selector - an alphanumeric in the upper left corner of the element is its selector A summary must be made active by using this selector before the operator can perform any operations The selector characters only appear at an alarm summary in an operator configurable display If a full page summary is called using **ALARM SUMM**, it automatically comes up in the active mode

Page indicator a page indicator appears as either *CURRENT* or *PAGING* *CURRENT* appears when the summary is at its first page *PAGING* appears after the next page or subsequent pages are on the screen

Alarm count next to the page indicator are two fields that present alarm count information From left to right, the first field shows the number of current alarms This is the total number of acknowledged, unacknowledged and return to normal entries being saved by the console This does not necessarily reflect the number of alarms in the current list unless the alarm summary shows the alarms for all of the alarm groups The second field shows the number of these total alarms that have not been acknowledged by the operator Each field increments or decrements as alarm conditions change

Primary display selectors - the letters along the left edge of the element are for calling the primary display associated with a tag in the list A primary display must have been defined for a given tag in the list for its adjacent selector to function

Alarm Summary Operations

Alarm summary operations allow viewing and acknowledging alarms, and calling the primary display for each process variable in the list that is in alarm or has returned to normal These operations are standard for all summary elements

The top four lines of the *CURRENT* (or first) page are reserved for new entries A new alarm entry initially appears in this area until being repositioned in the list

ACTIVATING AN ALARM SUMMARY

If a full page summary (***ALMSUMFL.DT***) is called using **ALARM SUMM**, it automatically comes up in the active mode An alarm summary in an operator configurable display must be made active by selecting it using key selects

Press ESC to deactivate control for an alarm summary. This deactivates control for a summary that is part of an operator configurable display, and also the full page alarm summary called by pressing ALARM SUMM

Use the touch point display select built into the display to reactivate an alarm summary called with ALARM SUMM. Or, exit the page then press ALARM SUMM to call the display again Key select characters are not available at this type of summary

Key in the selector characters again to reactivate an alarm summary that is part of an operator configurable display

PAGING THROUGH ALARM SUMMARY ENTRIES

A single alarm summary element may have several pages of alarm entries The number of pages depends on the size of an element and total number of process alarms

Press NEXT PAGE or PREV PAGE with the summary element activated to page through the entire list of entries Press HOME to quickly move back to the first page

ALARM SUMMARY ALARM ACKNOWLEDGE

The operator acknowledges alarms at an alarm summary element in the normal way An alarm status field as part of each alarm entry allows this acknowledgment Two choices are available for acknowledging alarms, either individually or an entire page Press PAGE ACK to acknowledge all alarms on a single, displayed page To acknowledge alarms individually

1 Press ACK ALARM This calls a cross hair (+) alarm cursor to the screen that positions at the first alarm entry

2 Press either TAB or TAB BACK to position the cursor at a specific entry

3 Press ACK ALARM to acknowledge the alarm The field stops flashing once acknowledged

4 Repeat Steps 2 and 3 for each alarm to be acknowledged on the current page Once all acknowledgments are completed, press CANCEL then CURSOR to clear the alarm cursor from the screen

As other variables go into alarm, additional entries are made in the alarm summary list An alarm entry remains in the list while a process variable is in an alarm condition A return to normal entry clears from the list as soon as the operator acknowledges it

PRIMARY DISPLAY SELECT

The operator can call a primary display for any alarming tag in the summary list by pressing a single key For this function to work, a tag must have a primary display assigned Press the key corresponding to the letter adjacent to the alarm entry information of a tag to call the primary display for that tag

ALARM GROUP INHIBIT

The alarm group inhibit page provides several capabilities The operator can use this function to

- Inhibit tag alarming for an entire process area or group
- View the number of tags in each alarm group
- Determine the total number of tags in alarm
- Determine the total number of those tags in alarm that have not been acknowledged
- Find out the number of tags in alarm within each alarm group
- Find out the number of those tags in alarm that have not been acknowledged for each alarm group

The alarm group inhibit page can be used to manually inhibit certain alarm indications for an entire area or group of process variables The console does not make any entries in the alarm summary, display a title line indicator, sound a tone, or set a relay when an inhibited tag goes into an alarm condition Also, the alarm status field does not flash for an inhibited tag The alarm status field still changes to its alarm color and shows alarm indicators (e.g , *2L*, *3H*, *A*, etc) even while a tag is alarm inhibited

The operator can inhibit each alarm group from 1 to 99, S or D individually or by specifying a range To call the alarm group inhibit page (see Figure 9 2), first press GENL FCTNS MENU, then select the following menu items in the sequence shown

C OIS Operations ⟶ *D Alarm Group Inhibit*

The fields at this page provide both alarm information, and the capability of changing alarm group inhibit status The fields and their purpose include

Group	Lists up to 30 alarm groups on a single page
Inhibit	Reflects the current alarm inhibit status of each group on the page A *YES* in this field identifies a group as being inhibited, a *NO* appears for uninhibited

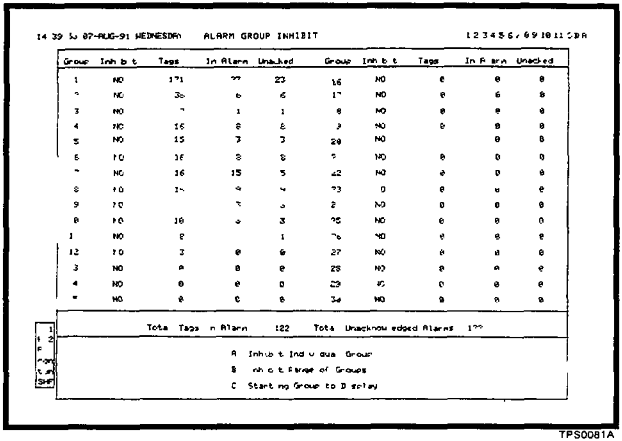

Figure 9 2 Alarm Group Inhıbıt

Tags	Lısts the total number of tags ın the group
In Alarm	Indıcates the total number of tags ın a group that are currently ın an alarm condıtıon Thıs ıncludes both acknowledged and unacknow ledged alarms
Unacked	Shows the total number of tags ın alarm that have not been acknowledged
Total Tags ın Alarm	Increments or decrements to the total num ber of tag alarms for all alarm groups that are not ınhıbıted
Total Unacknowledged Alarms	Increments or decrements to the total num ber of tag alarms that have not been ac knowledged for all alarm groups that are not ınhıbıted

The alarm group ınhıbıt page ıs capable of dısplayıng the ınfor matıon for up to 30 alarm groups at a tıme Press NEXT PAGE or PREV PAGE to page through all alarm groups

The optıons at the bottom of the page

- Enable an ınput cursor, and posıtıon the cursor at a specıfıc group to ınhıbıt or enable

- Enter a single or range of tag groups to inhibit or enable
- Enter a starting group number that becomes the first entry in the displayed list of 30 groups

To inhibit or enable ***individual*** groups

1 Press [A] to select the *Inhibit Individual Group* option This calls an *Enter Group Number* input prompt to the screen

2 Enter any group number from 1 to 99, S or D, then press [ENTER] This positions an input field at the *Inhibit* column of the indicated group Once the input field is at the page, it can be re positioned to any group by using the cursor control keys

3 Key in **YES** to inhibit a group Key in **NO** to enable a group At this point, the change can either be put into effect by continuing with the next step, or additional groups can be inhibited or en abled Either move the input field to each alarm group using the cursor control keys, or press [ESC] to call the *Enter Group Number* prompt back to the page, then repeat Step 2 Continue to enable or disable all desired groups by setting their inhibit status to **YES** or **NO**

4 Press [ENTER] to put all desired inhibits or enables into effect. The message *Group Inhibit change queued* appears after entering

To inhibit or enable a ***range*** of groups

> **NOTE** Enter a range of 1 to D to specify the entire alarm group range Group D is the last group

1 Press [B] to select the *Inhibit Range of Groups* option This calls a *Starting Alarm Group* *Ending Alarm Group* *Inhibit* ___ input prompt to the screen

2 Key in a starting group from 1 to 99, S or D at the *Starting Alarm Group* portion of the prompt

3 Move to the *Ending Alarm Group* portion of the prompt and key in the last group to enable or inhibit The ending group must be a higher numbered group than the starting group

4 Move to the *Inhibit* portion of the prompt Key in **YES** to inhibit the range or **NO** to enable the range

5 Press [ENTER] to put all desired inhibits or enables into effect The message *Group Inhibit change queued* appears after entering

To change the first entry displayed at the page to another alarm group

1 Press [C] to select the *Starting Group to Display* option This calls an *Enter Group Number* input prompt to the screen

2 Key in any desired alarm group from 1 to 99, S or D.

3 Press [ENTER], the display updates and the entered group number then becomes the first in the list of 30 entries

SECTION 10 - OIS OPERATIONAL INFORMATION

INTRODUCTION

The operator interface station (OIS) provides display pages that show *information specific to its operation* These pages *identify* both current successful operations and operations that require some additional action to continue. This section explains the *Operator Request for Action* page and *Operator Information* page

NOTE: Current y, the major ty of information presented at these pages re ates to archiva storage and retr eval

OPERATOR ACTION REQUESTS

The console uses an operator action requests page to inform the operator that some action must be performed to continue proc essing for a certain operation. The action indicated at the display identifies the attempted action, and once selected, provides op tions to respond to the action request

An *A* appears at the title line to alert the operator that at least one action request is outstanding The *A* blinks if any of the requests have not been acknowledged The indicator remains on the screen until all actions listed at the operator requests for action page have been cleared

When *the A* appears on *the* screen, the operator must perform the following steps to process a request for action

1 Call the operator requests for action page

2 Acknowledge the request

3 Respond to the request

Display Call Up

The operator processes all new or outstanding action requests through the operator request for action page (see Figure 10 1) To call this page, first press $\boxed{\text{GENL FCTNS MENU}}$, *then select the* following menu items in the sequence shown

C OIS Operations ⟶ *B Operator Action Requests*

The display contains

Display selector a red *Q* at the upper left corner is the display selector While the page is on the screen, additional action re quests may appear The selector both enables the page for operation and freezes it to prevent additional entries from

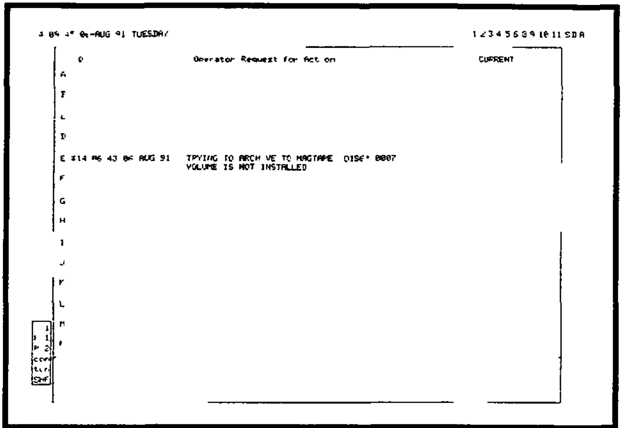

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Figure 10 1 Operator Action Request Display

appearing in the list If any additional action requests occurred during the time the page was frozen, they appear in the list as soon as the operator disables (unfreezes) the page

Page indicator the operator request for action page maintains a list of all outstanding actions A page indicator appears at the right upper corner of the page to show whether the displayed actions are the most current or older requests

The indication will be either *CURRENT* or *PAGING* *CURRENT* appears when at the first page of actions *PAGING* appears after the next or subsequent pages are on the screen

Action selectors down the left side of the page are action item selectors The selectors are used to enable a request on which to act They cannot be accessed until the page is frozen Initially, these selectors appear in cyan when the page is not frozen, and change to red after display select

Unacknowledged indicator a yellow asterisk (*) appears next to an action item and blinks if the operator has not acknowledged the request The asterisk is removed after selecting an action item

When at the *CURRENT* page, the top four lines of the page are reserved for new requests that occur after the page has been called to the screen As these lines fill, the page scrolls the oldest action item off the page and displays the ten most recent messages

Processing Action Requests

The purpose of an action request is to identify a step or procedure that the console requires before it can continue with a certain operation, or to get an acknowledgment from the operator before performing an operation For example, the console may require the operator to install a new medium for archiving, to give approval to initialize a medium, or to initiate a retry Until a request is acknowledged then acted upon, the console cannot continue with an identified, attempted operation

For example, if an attempt to archive data to magnetic tape was unsuccessful, the console presents the message

TRYING TO ARCHIVE TO MAGTAPE 'OIS6' 0007
VOLUME IS NOT INSTALLED

After acknowledging the problem, the following message appears.

Press ENTER when volume is installed

The console continues with the archive after a magnetic tape medium has been installed and the operator then presses **ENTER**

Enabling the Action Request Page

The operator request for action page must first be enabled to perform any acknowledgment or action request processing. Once enabled, the page becomes frozen and no additional action requests will appear until the page is disabled (unfrozen)

Press **Q** to enable the page The outline of the page highlights and the action selectors along the left edge of the page change to red The display selector (*Q*) disappears

Press **ESC** at any time to disable the page If any additional operator requests for action occurred during the time the page was frozen, they appear in the list as soon as the operator disables (unfreezes) the page

Paging Through Entries

The operator request for action function may have several pages of entries The number of pages depends on the number of outstanding action items Press **NEXT PAGE** or **PREV PAGE** after freezing the page to view additional pages Press **HOME** to return to the *CURRENT* page

Acknowledging a Request

The first step in processing requests is to acknowledge the request Once the operator acknowledges all action requests, the title line indicator stops flashing Two choices are available for acknowledging requests, either individually or an entire page The unacknowledged indicator (*) for each new request clears from the page after being acknowledged

Press PAGE ACK with the request for action list enabled to acknowledge all requests on the current page This can be done if the requests have been viewed, but no action will be taken at this time To acknowledge and process a single action request, first enable the list then

1 Select the request to process by pressing the key corresponding to the action selector adjacent to the desired request As soon as the key is pressed, the action selector changes to yellow to identify it as being selected

A response prompt appears at the bottom of the page that identifies the action to perform In some cases, the console only requires an acknowledge, retry or continue response to proceed The type of response required to clear an action item depends on the type of request Some examples are

Press ENTER to acknowledge

or

Press ENTER to initialize magtape

Press ESC at any time to cancel The request remains in the list as an outstanding action The action selector for the request returns to its red color after pressing ESC

2 Respond to the action request, then press the key indicated in the message The action request then clears from the list At this point, either continue processing requests by repeating Step 1, or go to the next step

3 Press ESC to disable the page

If the actions taken to clear a request were not sufficient to allow the console to continue processing, the request will appear again as a new request in the list

OPERATOR INFORMATION EVENTS

The operator information events function provides a chronological, running list of operations performed by the console To call the operator information events page (see Figure 10 2), first press GENL FCTNS MENU, then select the following menu items in the sequence shown

C OIS Operations ⟶ C Operator Information Events

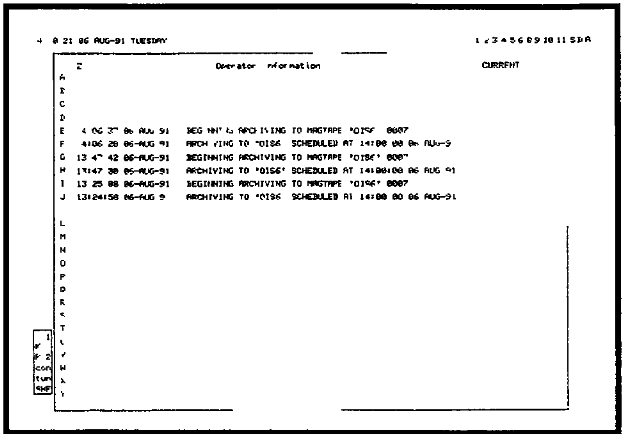

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Figure 10 2 Operator Information Events Display

The display contains

Display selector a red *Z* at the upper left corner is the display selector While the page is on the screen, additional information events may appear The selector both enables the page for opera tion and freezes it to prevent additional entries from appearing in the list If any additional information events occurred during the time the page was frozen, they appear in the list as soon as the operator disables (unfreezes) the page

Page indicator a page indicator appears at the right upper cor ner of the page to show whether the displayed events are the most current or older events The indication will be either *CURRENT* or *PAGING* *CURRENT* appears when at the first page *PAGING* appears after the next or subsequent pages are on the screen

Selectors down the left side of the page are selectors used to delete events They cannot be accessed until the page is frozen Initially, these selectors appear in cyan when the page is not fro- zen, and change to red after display select

When at the *CURRENT* page, the top four lines of the page are re served for new events that come in after the page has been called to the screen As these lines fill the page scrolls the oldest event item off the page and displays the most recent messages

Enabling the Operator Information Events Page

The operator information events page must first be enabled to perform any operations Once enabled, the page becomes frozen and no additional information events will appear until the page is disabled (unfrozen)

Press [Z] to enable the page The outline of the page highlights and the action selectors along the left edge of the page change to red The display selector (*Z*) disappears

Press [ESC] at any time to disable the page If any additional information events occurred during the time the page was frozen, they appear in the list as soon as the operator disables (unfreezes) the page

Paging Through Entries

The operator information page may have several pages of entries Press [NEXT PAGE] or [PREV PAGE] after freezing the page to view additional pages Press [HOME] to return to the *CURRENT* page

Deleting Entries

The only operation to perform at this page is to delete event entries Two options are available for deleting entries, either individually or an entire page In either case, the page must first be enabled

Press [PAGE ACK] to delete all entries on the current page

Press the key corresponding to the selector adjacent to the desired entry to delete that entry The entry clears from the list as soon as the selector key is pressed

SECTION 11 - RECORDING PROCESS DATA

INTRODUCTION

The operator interface station (OIS) provides the capability to record process related information The information records as a hard copy log, or digitally on a storage medium

A printout of a log normally occurs at a set schedule or after a certain process event occurs The console provides a means of storing and printing additional copies of these logs It also provides a means to initiate a printout containing the current data for a log prior to completion of a collection period and printing schedule This section explains the procedures to initiate a printout of a log using the *Log by Name* function

Archival Storage/Retrieval functions give the capability to digitally store both process information, and INFI 90 and OIS operational information This section explains data archiving, the data types that can be stored, and the procedures to retrieve stored data Refer to ***Archival Storage*** in the ***OIS Configuration*** section for procedures to set up data storage

LOGGING

The logging function available through the console provides automatic collection capabilities for recording data Once set up through log configuration procedures, a log begins its scheduled collection period after being activated Depending on configuration and the type of log, a log normally prints after it completes its collection period or at a specific time There are three types of logs

System Events Logs

A system events log continuously collects data once activated The information recorded in this type of log relates to console operations

Depending on configuration, events print continuously as they occur or save to disk for later scheduled printing The console prints each event report and saves up to 1,000 events to disk continuously as long as the system events log remains activated A printout occurs at defined intervals set during configuration A system events log is enabled through configuration procedures Refer to ***SYSTEM EVENTS LOG CONFIGURATION*** in the ***OIS Configuration*** section for more information, and procedures to enable and disable events log collection and periodic printing

The system events log can be separated into an events log and operator actions log during configuration

Custom Logs

Custom configured logs begin their data collection at a schedule set during configuration These type of logs collect process related information such as analog values, digital states and trend data

A custom log generates at a scheduled time or time intervals, after a specific process event occurs, or as soon as the operator activates it Printing can also take place after the same type of occurrences or immediately after a log has completed its collection period In any case, a log must be activated to begin any data collection and printing. A log can be made *ACTIVE* either at the time of its creation or later using the *Log Status* function

For each custom log, up to nine of the most recently generated can be retained on the hard disk for later printing This is also determined by log configuration

Refer to ***CUSTOM LOG CONFIGURATION*** in the ***OIS Configuration*** section for further explanation of custom logs

SOE Logs

The console provides the capability to receive and print data collected by sequential events recorders The recorders are capable of collecting data for several different types of sequence of events (SOE) logs These include standard, summary, prefault, post fault and snapshot type logs

For each type except summary, data collection and printing is automatic after activating a log A log can be made *ACTIVE* either at the time of its creation or later using the *Log Status* function

The multi function processor (MFP) module or multi function controller (MFC) module directing the operation of a recorder reads data from the recorder and notifies the console when it has data to send The console then collects this data, formats a log, and directs it to one of its printers The operator initiates data collection for a summary log by manipulating a specific RCM tag associated with the log

For each SOE log, up to nine of the most recently generated can be retained on the hard disk for later printing This is set up through SOE report definition

Refer to ***SOE LOG CONFIGURATION*** in the ***OIS Configuration*** section for further explanation of SOE logs

Printing and Displaying Log Reports

The system events, custom and SOE logs created with the logging functions of the console can all be set up to automatically print after completing their data collection A *Log by Name* function allows printing any of these logs again if a copy of the log has been retained on the hard disk It can also be used to print the initial log if a particular log does not implement the automatic print feature (i e , demand print type)

A log may or may not be configured to retain a copy of previously generated logs This is required, however, to print additional copies of a previously generated log. In the case of custom logs and SOE logs, the *Number of Retentions* configured for the log determines if and how many generations of the log the console is to retain a copy This must be set to at least one to save a copy of a log for later printing and viewing The console saves a log on the hard disk only after the log completes its entire collection period. For the system events log, the number of events that can be printed or displayed depends on the number of events being saved to disk The *Total Number of Events/Actions Saved To Disk* attribute of events log configuration determines this number

The operator gains access to the *Log by Name* function in two different ways, either through the miscellaneous functions menu or the command line menu Perform either of the following to ac cess the function

To access the *Log by Name* function through the miscellaneous menu

1 Press MISC MENU

2 Select *B Log by Name*

To access the *Log by Name* function through the command line menu

1 Press COM'D LINE MENU

2 Select *E LOG/NAME*

In either case, the console presents the following prompt

Log Name/Index Retention Print/Display

Use the cursor control keys to move between the fields when en tering data. An index number can only be entered to identify a specific custom log or the events log, not SOE logs or the operator actions log. Refer to the sections that follow for further expla nation Use the *Log Status* function to determine the current configured custom logs and SOE logs For any log type, a printout occurs at the logical printer defined during configuration of the log

Display Log Operations

When using the display option, a log appears in the same format as the printed version of the log The console displays only previ ously collected data for SOE logs and custom logs For display purposes, the console does not separate the system events log into an events log and operator actions log Search criteria, however, can be set to select the type of data to display The events log can display in either a real time mode or snapshot mode

The screen of the console supports a maximum width of 300 characters In cases when the console cannot display the entire contents of the log, the screen presentation must be repositioned

Press the double arrow keys or single arrow keys in the cursor and trend control block of the keyboard to change the display presentation Press NEXT PAGE or PREV PAGE to change the presentation Each press of a double arrow key moves the presentation ¼ screen The operator can define the number of horizontal columns or vertical rows each press of a single arrow key is to shift the presentation

To define the single arrow keys

1 Select the *A Define Single ARROW Key* option

2 Enter a number from 1 to 18, default is 10

3 Press ENTER

When moving the presentation, the console identifies the end of the log with *End of File* Since the console presents the same data in a display log as in the printed version of the log, the order in which entries appear on the screen is the same as in the printed version The initial information displayed for a log is the same as the first page of the printed log (i e , oldest information)

Press NEXT PAGE to view newer data Continue to press NEXT PAGE until the *End of File* appears to view the most recent entry in the log

CUSTOM CONFIGURED LOGS

For custom logs, the *Log by Name* function gives the capability to

1 Demand a printout of a retained log

2 Initiate a print for a log having a demand print type

3 Print the data currently collected for a log before it has com pleted its collection period

4 Display the contents of custom logs retained on the hard disk

The console saves custom log retentions in individual files for each configured log The file name identifies the log and retention of that log The file name format is ***LOGnnnn.Ln***. For example, the log file ***LOG0012.L0*** identifies custom log index number 12 and retention one The most recently completed log is retention num ber one (e g , ***.L0***) The retention number increases to correspond to chronologically older retentions, with a maximum of nine (e g , ***.L8***) The console removes the oldest saved copy as it creates new ones

The console automatically makes a hard copy printout of all logs that have either time, event or collect print types Logs that have a demand print type require using the *Log by Name* option to get the initial hard copy printout

A printout of the data currently collected by an *ACTIVE* log can be printed at any time during its collection period The printout contains only the data the console can currently get or that has already been collected up to the current time and date The log resumes with its normal scheduled collection after processing any demanded print

To print or display a custom log

1 After selecting the *Log by Name* option, the following input prompt appears

Log Name/Index   *Retention*   *Print/Display*

Key in a name or index number of a log at the *Log Name/Index* field Use the log status function to find the name or index number of a custom log Refer to ***Log Status*** in this section

Enter the name defined for the log during custom log configuration A log name must be completely spelled out Enter an index number from 1 to 300, the number corresponds to the *Log Number* assigned to the log during its configuration

2 Enter a number from 0 to 9 at the *Retention* field to determine which log to print or display Enter **0** to print the current data collected for the log, or if the log has a demand print type The log must be *ACTIVE* to obtain the current data Enter **1** to print the most recently saved copy, or any number from 2 to 9 for older saved copies The maximum number that can be entered here depends on the number of retentions being saved for the particular log

3 At the *Print/Display* field enter either **PRINT** or **DISPLAY**

4 Press $\boxed{\text{ENTER}}$ to initiate the request A printout occurs at the printer designated in the configuration of the log

GENERATING SEQUENCE OF EVENTS SUMMARY LOGS

There are several different types of SOE logs The standard, pre-fault, post fault and snapshot SOE logs are all automatically generated once set up through SOE log configuration Generation of an SOE summary log, however, must be operator initiated

A defined RCM tag associated with a particular log allows the console to automatically collect data and generate a log, and an operator to manually initiate data collection for a summary log In this case, an RCM element using the specific tag must be part of either a user created display or operator configurable display The tag references an SOE log function block within the control scheme of an MFP or MFC module

To generate an SOE summary log

1 Call the display containing the RCM element for the desired report to generate

2 Select that RCM element for control

3 Set the RCM to its one state Refer to ***RCM CONTROL*** in the ***Process Control and Tuning*** section for procedures

> **NOTE** If using a multi function controller module having firmware revision below F 0, set the target state to zero In this case the state changes identified in the following explanation should be reversed

The RCM tag changing to show a one state indicates a response from the module If the RCM tag remains in the zero state while the *Target* is a *ONE*, check the module configuration When the module completes the summary report and all data is sent to the console, the RCM tag goes back to its zero state A summary report is in progress while the RCM remains in its one state

Data collection ends for a report after the age time set in the module elapses The time in the age specification of an SOE log function block sets this age time It determines when the RCM tag goes back to the zero state, and how much data is expected from the recorder for a summary report The longer the age time, the more data the module handles The console does not print the log until the module sets the RCM tag back to a zero state Therefore, the longer the age time, the longer the wait for data

The SOE log function block only responds to a control command initiated from the console (or some other host) to initiate data collection This block cannot be directly changed to trigger data collection After transferring data, the function block clears itself to allow another summary report request

When a summary report is in progress and the module accepts another summary report request, the report initiated by the new request is appended to a report already in progress The age timer for the report is reset every time the module accepts a summary report request The console does not print the log until the age time elapses

Guidelines

Normally, request a summary report only when none are already in progress The RCM tag in a zero state identifies this condition Do not set an RCM target state to zero if it is currently set to a one state while the module is processing a requested report

SEQUENCE OF EVENTS LOGS

The *Log by Name* function gives the capability of printing or displaying those SOE logs that are retained on the hard disk An SOE log, no matter what type, is identified by the file name assigned to it by the console The console saves SOE logs in individual files for each configured log

The file name identifies the log and retention of that log The file name format is ***SOECLnnn.Ln***. For example, the log file ***SOECL012.L0*** identifies SOE log index number 12 and retention one The most recently completed log is retention number one (e g , ***.L0***) The retention number increases to correspond to chronologically older retentions, maximum of nine (e g , ***.L8***) The console removes the oldest saved copy as it creates new ones

To print or display a copy of an SOE log

1 After selecting the *Log by Name* option, the following input prompt appears

Log Name/Index *Retention* *Print/Display* ____

Enter the log name at the *Log Name* field The log name must be completely spelled out It must also follow the format **SOECL***nnn* where *nnn* is the log number to print. For example, enter **SOECL012** for SOE log number 12

2 Enter a number from 1 to 9 at the *Retention* field to determine which retained log to print or display Enter **1** to print the most recently saved copy, or any number from 2 to 9 for older saved copies The maximum number that can be entered here depends on the number of retentions being saved for the particular log

3 At the *Print/Display* field enter either **PRINT** or **DISPLAY**

4 Press ENTER to initiate the request A printout occurs at the printer designated in the configuration of a log

PRINTING THE EVENTS AND OPERATOR ACTIONS LOG

The console saves both system events and operator actions on its hard disk if configured during events log configuration Events must be saved to hard disk for either periodic printing or *Log by Name* printing The configuration also allows dividing events and operator action items into a separate events log and operator actions log for printing purposes

The events saved to disk capacity is approximately 1,000 of the most recent events (minimum of 1,000 events) An option available during events log configuration allows scheduling an automatic print cycle for the events log and operator actions log. Use the *Log by Name* function at any time to print a current list of saved events even if the logs are scheduled to print automatically. The *Log by Name* function prints the most recently saved events.

To print the events log:

1. After selecting the *Log by Name* option, the following input prompt appears:

    Log Name/Index *Retention* *Print/Display*

    Enter a **0** or the name **EVENT** at the *Log Name/Index* input field. These are reserved to identify the events log.

    Enter **ACTION** to print the operator actions log if the system events log has been divided into a separate events log and operator actions log. The remaining steps apply.

2. At the *Retention* field, key in the number of most recently saved events to print. This number is an approximation. At a minimum, that many events appear in the printout if that many were saved. If the entered number is greater than the actual number of saved events, all saved events print. Enter **0** to print all saved events if desired.

3. At the *Print/Display* field enter **PRINT**.

4. Press **[ENTER]**, the printout occurs at the printer designated in the events log configuration.

DISPLAYING SYSTEM EVENTS LOG

The *Log by Name* option also provides a display option for the system events log. The display can operate in two modes to present events: Real time and snapshot. System events log configuration determines the types of events that can appear in the display. Only those events defined to print or save to disk appear in the display of the events log.

> **NOTE:** The system events log can be separated into an events log and operator actions log during configuration. If this option was chosen, operator actions do not appear in the display of the events log even if enabled in the search criteria.

Real-Time Mode

When in real time mode, the screen updates with new events only as events occur similar to the continuously printing events log. The console presents the events on a single screen, with each new event occupying one or two lines on the display. Once the screen becomes full, new events begin to scroll older events off the screen A new event can be identified by the greater than (>) symbol appearing in the margin Figure 11 1 shows the display log function in real time mode

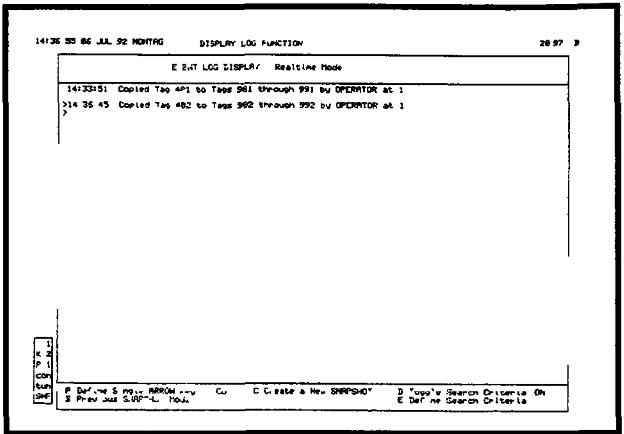

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Figure 11 1 Events Log Display Real Time Mode

Snapshot Mode

A snapshot mode presents both the current events at the time of the request, and all events currently saved on the hard disk The console creates a snapshot file of the events log when the display is called or switched to snapshot mode The console does not up date the initial snapshot file created unless the operator chooses the *C Create a New SNAPSHOT* option, or calls the display up in the new snapshot mode Refer to ***Display Call Up and Mode Selection*** in this section for procedures to call the events log display in the new snapshot mode Figure 11 2 shows the display log function in snapshot mode

In snapshot mode, the initial information displayed is the oldest information chronologically. Press **NEXT PAGE** to view newer entries Continue to press the key until the *End of File* appears to view the most recent entry in the log

Search Criteria

The console allows specifying search criteria The search criteria can be used to limit the displayed information to only a single type of event, or multiple types The search criteria affect the data presented in both the real time mode and snapshot mode The search criteria can be turned on or off through an option available while the screen is in real-time mode (see Figure 11-1)

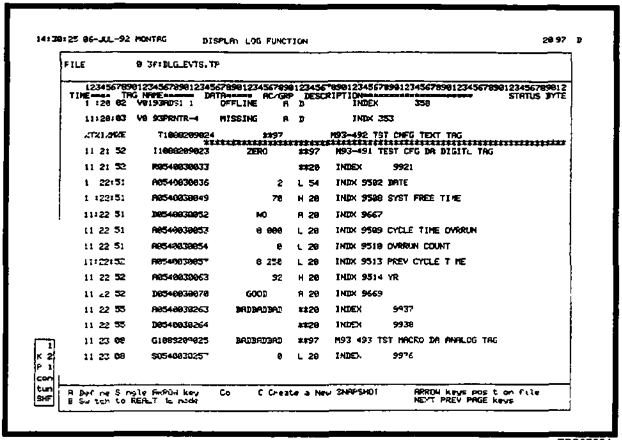

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Figure 11 2 Events Log Display Snapshot Mode

Display Call Up and Mode Selection

To display the events log

1 After selecting the *Log by Name* option, the following input prompt appears

Log Name/Index *Retention* ___ *Print/Display*

Enter a **0** or the name **EVENT** at the *Log Name/Index* input field These are reserved to identify the events log

2 At the *Retention* field, key in one of the following depending on the desired mode for the display log

R real time mode

P calls a previous snapshot of the events log Use this to call the initial or last updated version of the snapshot file

S initiates a new snapshot of the events log Use this to up date the snapshot file and call the new version to the screen

Leaving the *Retention* field blank calls the display log in real time mode Entering a non zero retention number calls the display log in previous snapshot mode

3 At the *Print/Display* field enter **DISPLAY**

4 Press **ENTER**

Select Mode Choose option *B* after calling the display log in either mode to switch between real time mode and previous snapshot mode. Choose option *C* while in either real-time mode or snapshot mode to update the snapshot file and switch to new snapshot mode

Search Criteria

The operator can define search criteria for the events log display function to limit the presented information to only certain types of events Search criteria can be turned on or off at any time It can only be turned off, however, while viewing the log in real-time mode Search criteria does not affect the printed version of the events log Choose *D Toggle Search Criteria ON/OFF* to turn search criteria on or off

To specify search criteria

1 Put the display log in real time mode Refer to ***Display Call Up and Mode Selection*** in this section for procedures

2 Choose *E Define Search Criteria* Figure 11 3 shows the screen that appears next

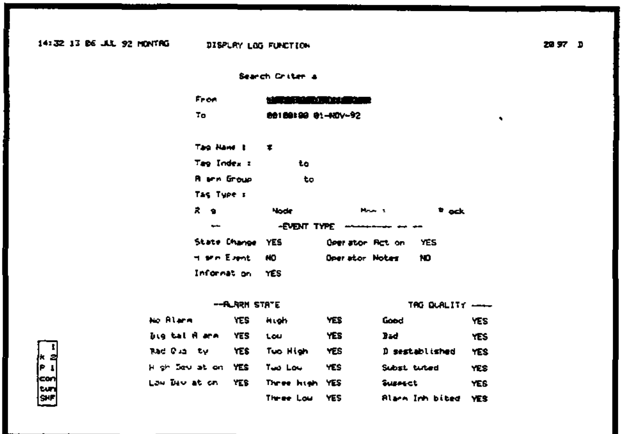

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Figure 11-3 Events Log Display Search Criteria

3 Use the cursor control keys to move between the fields when entering data Refer to Table 11 1 when defining the fields of the search criteria screen

4 Press ENTER to update the search criteria, then press ESC to return to the previous screen

Table 11 1 Display Log Events Retrieval Page Fields

Field	Description
From	Starting time and date at which to begin a search for events
To	Ending time and date at which to stop a search for events
Tag name[1]	Name of the tag for which to retrieve events Wild card characters (e * and ?) can be used when specifying a tag name Enter an asterisk or clear the field to not use tag name as a search constraint An asterisk specifies all tag names
Tag index to [1]	Range of tag index numbers to retrieve A valid entry is from 1 to the number of tags set during system configuration (maximum 5 000) Enter the maximum range or clear the fields to not use tag index number as a search constraint
Alarm group to [1]	Range of alarm groups to retrieve Valid range entries are 1 to 99, S and D The complete alarm group range is from 1 to D Enter the maximum range of 1 to D or clear the fields to not use alarm group as a search constraint
Tag type	Enter any valid tag type Clear the field or leave it blank to not use tag type as a search constraint
Ring node mod ____ block ____	Enter a valid loop node module and block address to which to limit the search Clear the fields or leave them blank to not use tag address as a search constraint
Event type	The console searches for and retrieves each event type that is set to *YES* It does not retrieve any event types set to *NO* **NOTE** At least one event type field must be set to *YES*
Alarm state	The console searches for and retrieves each state change alarm or operator action event that has an alarm condition matching any of the alarm state conditions set to *YES* It does not retrieve any of these events having an alarm condition matching those set to *NO*
Tag quality	The console searches for and retrieves each state change alarm or operator action event that has a quality condition matching any of the tag quality conditions set to *YES* It does not retrieve any of these events having a quality condition matching those set to *NO*

NOTE 1 At least one of these fields must have an entry

Log Status

The *Log Status* function provides a status overview of both configured custom logs and SOE logs It also allows changing the status and canceling queued prints for individual or a group of these type of logs Each entry in a log status page details the information pertaining to a single log

A log must be turned on or made *ACTIVE* to begin its data collection When to activate a log depends on its purpose A log can be activated as the last step when configuring if desired It also can be left *INACTIVE* at the time of configuration and made *ACTIVE* later using log status functions

Taking a log from an *ACTIVE* status to an *INACTIVE* status ceases any further data collection. When data collection is no longer required or a log is to be reconfigured, it must be made *INACTIVE*

The console provides several different methods for changing log status It can be done directly at the *TARGET STATUS* field of a status page for a custom log or an SOE log It can also be done through an action menu

The action menu appears after making a menu selection from the opening page of the log status function, or by pressing ESC while at any of the log status pages The action menu provides the following capabilities

Activate changes status to *ACTIVE*, which turns data collection on

Deactivate changes status to *INACTIVE*, which turns data collection off

Cancel reports waiting to print cancels queued prints

All log status operations start at the log status display menu (see Figure 11-4) To call log status display menu

1 Press MISC MENU

2 Select *A Log Status*

Options *A* through *D* call a status page for all or a specific type of custom logs, and options *E* through *J* for all or a specific type of SOE logs After selecting any of these options, a status page containing a list of the requested logs appears The status page allows directly activating or deactivating individual logs, or calling an action menu to activate or deactivate collection and to cancel queued printing for a log in the list

Options *K* and *L* call an action menu to the screen The menu provides the status change and queued print cancel functions without having to call a status page Refer to ***ACTION MENU OPERATIONS*** in this section for an explanation of operations performed through this menu Refer to ***SELECT START LOG*** for a description of option *M*

The log status function can show the status of up to 300 custom logs or 80 SOE logs Each status page for a custom log displays eight log entries, each status page for an SOE log displays 16

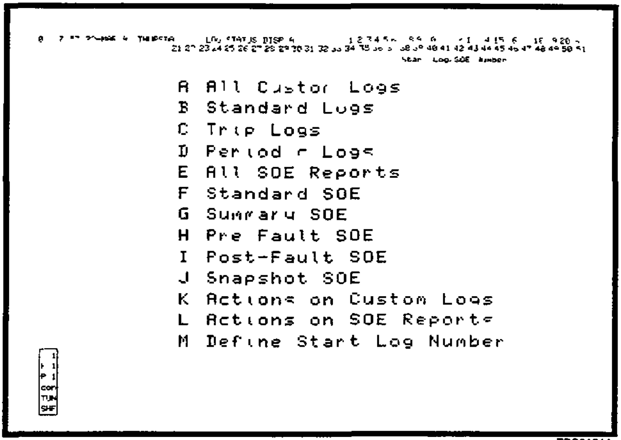

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Figure 11 4 Log Status Display Menu

SELECT START LOG

The console provides an option for selecting which log is to appear as the first entry at a status page This prevents having to press the paging keys several times to find a desired entry To set the start log for the log status page

1 From the opening page of the log status function, select *M Define Start Log Number* A *Select the Start Log Name/Index* input prompt appears

2 Enter the name of a custom log or its log number from 1 to 300 Or, enter the log number of an SOE log from 1 to 80 Enter a name for a custom log only If an undefined log name is entered, an error message requesting valid log name or number appears

3 Press [ENTER]

The *Start Log/SOE Number* field at the top of the log status display menu page (see Figure 11-4) updates to the entered number Initially, the log status function defaults to *1* When selecting items *A* through *E*, the first entry that appears at the status page is the one shown in this field If the number is greater than the 80 limit for SOE logs, the status page defaults to entry number one

CUSTOM LOGS STATUS PAGE

A status page for custom logs contains the same information whether selecting the *All Custom Logs* or one of the specific log type options. Figure 11 5 shows an example of a custom logs status page Select any of the custom log options to call a display similar to the one shown in this figure The log status functions performed at this page are explained in ***Log Status*** in this section.

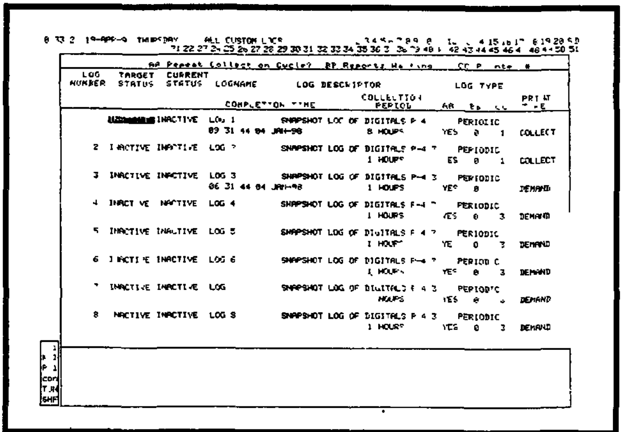

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Figure 11-5 Log Status Display - Custom Logs Status

The top lines of the page provide an explanation of the information detailed in each log entry. From left to right, top to bottom the information for each entry includes.

LOG NUMBER corresponds to the *Log Number* assigned to the log during its configuration The log numbers range from 1 to 300 Enter this number when using the *Log by Name* function Refer to ***Printing and Displaying Log Reports*** in this section

TARGET STATUS - updates to show any requested status change A log status change can be made directly at this field, or through the activate or deactivate options of the action menu

CURRENT STATUS updates to reflect the actual status of the log The field remains at its current indication after a status change has been made until the console completes its processing of the change request The field normally updates after a short time to show the targeted status change

LOGNAME a name assigned to the log during its configuration Enter this name when using the *Log by Name* function Refer to ***Printing and Displaying Log Reports*** in this section

LOG DESCRIPTOR - provides a description of the log as defined during log configuration.

LOG TYPE - gives the log type as defined during configuration. The types are either *STANDARD, PERIODIC* or *TRIP*.

COMPLETION TIME - shows the estimated time of log completion. The console references either a start time defined for a log or the time a log was triggered and the collection period of the log to determine the completion time. If a log is set to repeat its collection cycle, this field updates as each new collection period starts.

COLLECTION PERIOD - shows the collection period defined during configuration. The collection period is the amount of time the log collects data. This field is not used for trip logs.

AA - indicates whether the *Repeat Collection Cycle?* is set to *YES* or *NO* in the configuration of a log. If the repeat cycle is *YES*, a log performs its data collection repeatedly. A log stops collecting data after completing its initial collection period if set to *NO*.

BB - shows the number of logs waiting to print. If a designated printer is currently busy, this field will identify the number of logs that are queued but not printed.

CC - identifies at which logical printer a printout occurs. This is defined in the configuration of a log.

PRINT TYPE - identifies the print type as either *COLLECT, EVENT, DEMAND* or *TIME*. The print type shown corresponds to the print type defined for a log.

A collect type log prints as soon as it completes its collection period. An event type prints after being triggered by a specific process event. A demand type does not print until initiated through the *Log by Name* function, refer to ***Printing and Displaying Log Reports*** in this section. A time type prints at a defined time.

SOE LOG STATUS PAGE

A status page for an SOE log contains the same information whether selecting the *All SOE Reports* or one of the specific log type options. Figure 11-6 shows an example of an SOE log status page. Select any of the SOE log options to call a display similar to the one shown in this figure. The log status functions performed at this page are explained in ***Log Status*** in this section.

The top lines of the page provide an explanation of the information detailed in each log entry. From left to right, top to bottom the information for each entry includes:

SOE NUMBER - shows the *Report Number* assigned to the SOE log during its definition. The SOE numbers range from 1 to 80.

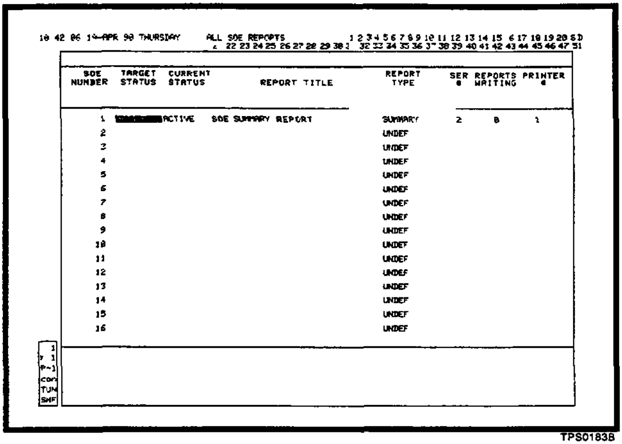

Figure 11 6 Log Status Display SOE Logs

TARGET STATUS updates to show any requested status change A log status change can be made directly at this field, or through the activate or deactivate options of the action menu

CURRENT STATUS updates to reflect the actual status of the log The field remains at its current indication after a status change has been made until the console completes its processing of the change request The field normally updates after a short time to show the targeted status change

REPORT TITLE displays the title defined for the log during its definition The title also appears in a printout

REPORT TYPE gives the type of log as defined during configura tion The type appears as either *STANDARD*, *SUMMARY*, *PRE FAULT*, *POST FAULT* or *SNAPSHOT*

SER # shows the SER number assigned to a log during its definition An SER number associates a list of tags to a particular recorder This is required to link each SER input to a specific tag The console can then present tag database data in a printout of the log

REPORTS WAITING shows the number of logs waiting to print. If a designated printer is busy, this field will identify the number of logs that are queued but not printed

PRINTER # identifies at which logical printer a printout occurs This is defined in the configuration of a log

STATUS PAGE OPERATIONS

Options *A* through *J* at the log status display menu call the status page for all or a selected group of custom logs or SOE logs (see Figure 11 4) Press NEXT PAGE and PREV PAGE to view additional pages after selecting any of these options

The status page provides two options for changing log status The first is by changing the *TARGET STATUS* column of a log entry to either *ACTIVE* or *INACTIVE* The second is through an action menu

After calling a status page, an input cursor appears in the *TARGET STATUS* column of the first log entry The input cursor allows changing the status of the log at which it is positioned

To change the status

1 Use the cursor control keys to move the cursor within the *TARGET STATUS* column Once at the desired log, key in **ACTIVE** or **INACTIVE** to change the status

2 Press ENTER after making all status changes to initiate the change request As soon as the console has completed the request, the *CURRENT STATUS* column for the log updates to the targeted status

Press ESC to call the action menu to the screen Refer to ***ACTION MENU OPERATIONS*** in this section for an explanation of the action menu items

ACTION MENU OPERATIONS

An action menu appears on the screen by selecting one of two options At the log status menu page, select *K Actions on Custom Logs* or *L Actions on SOE Reports* (see Figure 11 4) Press ESC while at any status page to call the action menu

The action menu is the same for both custom logs and SOE logs The only difference is that the custom log menu items use the term *Log(s)* and the SOE log menu items use the term *SOE(s)* The action menu options include

A Activate Log(s)

B Deactivate Log(s)

C Cancel reports waiting to print

D Activate all Logs displayed

E Deactivate all Logs displayed

Options *D* and *E* do not appear when calling the action menu from the log status display menu

Activating Logs

To activate custom logs or SOE logs

1 Call the action menu to the screen Refer to ***ACTION MENU OPERATIONS*** in this section for methods

2 Enter **A** at the input field, then press ENTER Depending on the type of log the action is performed on, the following input prompt appears

Activate Log Number thru

or

Activate SOE Number thru ___

The prompt allows either specifying a single log or range of logs to activate

3 Use the cursor control keys to move between the fields Key in the starting log number in the first input field If a single log is being activated, skip the next step

4 Key in an ending log number in the second input field

5 Press ENTER, the following message appears as the console processes each status change request for each log in the entered range

Activation Submitted for log/ SOE # nnn

A status change request can be seen at the *TARGET STATUS* col umn of a status page The *CURRENT STATUS* column verifies the completion of a requested status change

To activate the eight currently displayed custom logs or 16 SOE logs while at a status page

1 Press ESC to call the action menu to the screen

2 Enter **D** to select *Activate all Log(s) displayed*, then press ENTER.

Deactivating Logs

To deactivate custom logs or SOE logs

1 Call the action menu to the screen Refer to ***ACTION MENU OPERATIONS*** in this section for methods

2 Enter **B** at the input field, then press ENTER Depending on the type of log the action is performed on, the following input prompt appears

Deactivate Log Number ___ thru

or

Deactivate SOE Number thru

The prompt allows either specifying a single log or range of logs to activate

3 Use the cursor control keys to move between the fields Key in the starting log number in the first input field If a single log is being deactivated, skip the next step

4 Key in an ending log number in the second input field

5 Press ENTER, the following message appears as the console processes each status change request for each log in the entered range

Deactivation Submitted for log/SOE # nnn

A status change request can be seen at the *TARGET STATUS* column of a status page The *CURRENT STATUS* column verifies the completion of a requested status change

To deactivate the eight currently displayed custom logs or 16 SOE logs while at a status page

1. Press ESC to call the action menu to the screen

2 Enter **E** to select *Deactivate all Log(s) displayed*, then press ENTER

Canceling Waiting Log Prints

The *Cancel reports waiting to print* option cancels all or selected reports waiting to print for a specific log The *BB* column for custom logs or *REPORTS WAITING* column for SOE logs identifies the number of logs waiting to print The cancel print function can be used to cancel any prints currently in process, or any number of older reports waiting to print

To cancel queued print jobs for a log

1 Call the action menu to the screen Refer to ***ACTION MENU OPERATIONS*** in this section for methods

2 Enter **C** at the input field, then press ENTER

The followıng ınput prompt appears

Cancel from Report # ___ to Report # ___ for Log # ___

3 Use the cursor control keys to move between the ınput fields At the first ınput field, enter the number of the first waıtıng log to cancel

4 At the second ınput field, enter the number of the last waıtıng log to cancel

5 Enter the log name (custom logs only) or the log number of the log for which to cancel waıtıng prınts

6 Press **ENTER** to ınıtıate the cancellatıon

For example, a status page ındıcates a *4* ın the report waıtıng column for log number five. Of the four, the oldest three waıtıng to prınt are to be canceled Enter a **2** ın the first ınput field and a **4** ın the second field Thıs specıfies all waıtıng reports from two to four Enter a **5** ın the last field to desıgnate log number five After enterıng, reports two through four clear leavıng report one as the only queued report waıtıng to prınt

ARCHIVING

The archıvıng functıon avaılable at the console provıdes an ınte grated method for storıng and retrıevıng process data, and both console and INFI 90 operatıonal ınformatıon The archıval functıon can be categorızed ınto two separate types of operatıons Archıve data storage and archıve data retrıeval The data types that can be archıved ınclude

- Logs (after completıon of the collectıon perıod)

  Standard type

  Trıp type

  Perıodıc type

  Sequence of events

- Trends

  Raw trend data on a per trend basıs

- Events (lıst of system events and operator actıons)

- Tag data

  Analog tag snapshots

  Dıgıtal tag exceptıons

  Alarms

- PCU configuratıons

Archiving extends normal console storage of logs, PCU configurations, system events, trends and tag data indefinitely Once archiving is set up, the console collects data and automatically stores it to an archive medium The medium is either floppy disk, magnetic tape or optical disk

The *Archival Storage/Retrieval* option gives access to both archive data storage configuration and archive data retrieval functions The archive data storage functions turn on storage for individual data types, and automatically direct archiving of data to specific storage medium In some cases, the operator may be required to perform a manual store of data or a manual use new volume action during archival storage to prevent data loss The archive data retrieval functions provide directory and retrieve data options A directory of either an archive volume of data or retrieved data can be viewed A retrieve data option provides a method of retrieving any type of data from a medium for display and printing

The operator information and operator request for action pages work directly with the archiving functions The operator information page provides a running list of archival operations including both storage and retrieval request operations Refer to ***OPERATOR INFORMATION EVENTS*** in the ***OIS Operational Information*** section for specifics

The console prompts the operator at the operator request for action page if some action is required before it can continue processing a requested archiving operation An operator action request indication (flashing *A*) appears at the title line to indicate a request for action The console uses the operator request for action page to inform the operator of the attempted operation, and to allow the operator to perform a specific action to continue processing Refer to ***OPERATOR ACTION REQUESTS*** in the ***OIS Operational Information*** section for procedures to process a request

Archive Data Storage

The setup of archival storage directs several different operations The first is to allocate hard disk space used for temporary storage of archived data The console stores any data that it is to archive in an archival storage directory The data remains in this directory until being transferred to a storage medium The console begins to overwrite data that was previously stored for transfer to an archive medium with new data after it completely transfers all of the stored data It does this in preparation for its next archive to medium

Archival storage also enables each data type that is to be eventually archived However, it enables an entire type of data for storage rather than specific data The actual data that archives depends on the configuration of individual functions and tag historian configuration These configurations determine the specific data that archives For example, each configured custom log can be set to either archive or not archive based on its *To Be Archived?* attribute

Log configuration procedures enable the storage of individual custom, SOE and system events logs. Trend definition procedures enable trend data storage PCU management functions store PCU configurations that are to be archived The tag historian function provides the capability to store tag data (i e , exception reports and tag database data)

The last responsibility of archival storage is to schedule when the console transfers stored data, and to which type of medium Data transfer can occur anywhere from every four hours to every 99 weeks Scheduling depends on the amount of data being stored Some data types, such as tag data, consume a large amount of hard disk space and require a shortened archive to medium schedule

Once archival storage is set up, it becomes automatic except for an occasional requirement to install a new storage medium The operator actions function prompts for any archival requirements such as installing or initializing a new medium, disk space allocation reaching maximum capacity, a failed attempt to archive, etc Refer to ***Archival Storage*** in the ***OIS Configuration*** section for procedures to set up archival storage

Data stores to media in volumes of data A volume name defined during data type to volume definition identifies information stored on a medium The console assigns a hexadecimal sequence number to the volume of data being archived to a particular medium The sequence number increments for each new medium installed to store a given volume of data

For example, the medium storing a volume named *TAGS* becomes full The console had assigned a sequence number of 0003 to that medium The new medium installed to continue with the archival storage of volume *TAGS* will be assigned a sequence number of 0004

The sequence number also increments when using the *Use New Volume* option at the archival menu This function is explained later in this section

In some cases, the volume name and sequence number must be known to retrieve data Use the *Directory of Archive Volume* option to acquire this information from a particular medium

Although data archiving is normally automatic, there may be some instances when forcing data to store to medium, or forcing the console to use a new medium is required The *Store Data* and *Use New Volume* options provide these capabilities

STORE DATA

The operator uses the *Store Data* function to initiate a data archive to medium Once archiving is properly configured, this function should not be necessary at any time, unless forcing data storage is desired

The console does not normally require the operator to use this function as long as archiving configuration has been set up to allow for enough archival storage space on the hard disk, and the time span between archives to medium is not too great Both must be considered when initially setting up archiving Some data types require more temporary archive data storage space on the hard disk than others Refer to ***Archival Storage*** in the ***OIS Configuration*** section for further explanation

One example of when this function would be required is if the following message appears at the operator information events page

ARCHIVAL APPROACHING CONFIGURED DISK SPACE ALLOTMENT

This message indicates that the hard disk space allocated during storage configuration has reached a certain fullness level If this occurs, the data must be stored immediately or soon after to prevent data loss

Another example of a possible use for the *Store Data* option is when archiving PCU configurations Since PCU configurations cannot be set to save automatically through PCU management, a scheduled archive to medium may not always be desired In this case, any configurations saved for archiving can be forced to store to medium immediately after being saved through PCU management actions

A store data menu provides options for storing either events, logs, tag data, trend data or PCU configurations (see Figure 11 7) To call this menu, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities
└→ *F Archival Storage/Retrieval*
└→ *E Store Data*

To store data

1 Select any option *A* through *E* depending on the desired data type to store The console presents the message *Press ENTER to archive data* after making a selection

2 Press ENTER to confirm the store data request, or ESC to cancel Archive data storage activates for the selected data type and all other types that archive to the same volume

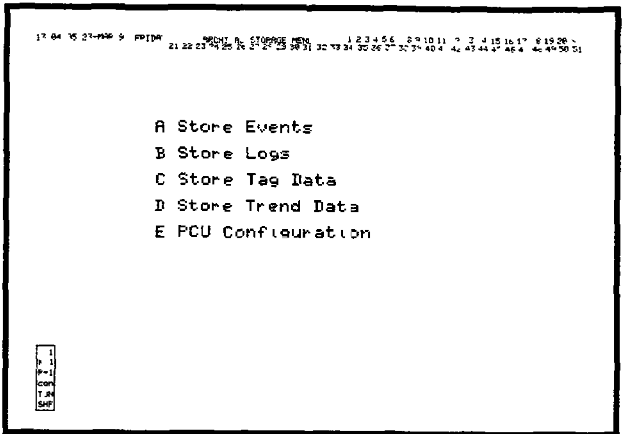

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Figure 11 7 Store Data Menu

If desired, call the operator information page to view the progress of the store data selection.

USE NEW VOLUME

The operator uses the *Use New Volume* option to request that archiving for the selected data type be done on a new volume (or medium) The console normally requires the operator to perform this action only in response to an operator request for action An example would be when the console tries to archive to a volume and an error occurs which cannot be resolved by retrying

A use new volume menu provides options for requesting a new volume for either events, logs, tag data, trend data or PCU configurations (see Figure 11 8) To call this menu, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

B OIS Utilities
└→ *F Archival Storage/Retrieval*
└→ *F Use New Volume*

To use a new volume

1 Select any option *A* through *E* depending on the desired data type for which to use a new volume The console presents the message *Press ENTER for action, ESC to cancel* after making a selection

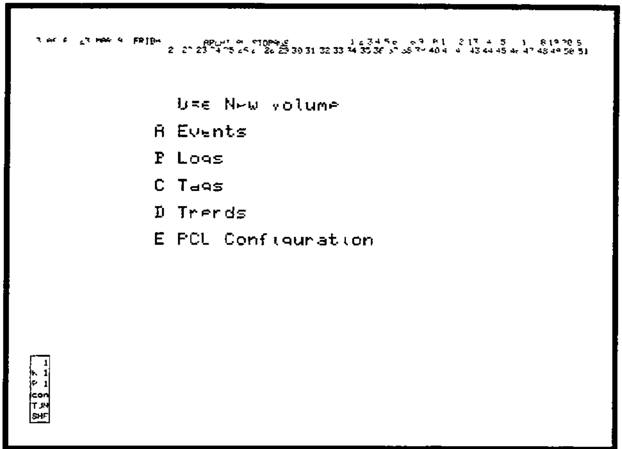

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Figure 11 8 Use New Volume Menu

2 Press ENTER to confirm the use new volume request, or ESC to cancel The console uses a new volume to store the selected data type and all other types that archive to the same volume

After selecting any of these options, the console makes a request for action when it is ready to archive to the new volume The request will be to initialize a new installed medium The request also identifies the name and sequence number that will be assigned to the volume of data upon initialization The operator request for action must be processed completely before an archive to that medium occurs

Archive Data Retrieval

The console provides archive data retrieval functions to allow viewing or printing data previously archived to medium through archival storage operations The pages used to define data retrieval determine which data type and specific data to retrieve

The console can retrieve data from a medium that it had previously archived data to, or from a medium archived to by another console In the latter case, the console may require identifying the volume name and sequence number of the stored data

For some data types, the console transfers data back to its hard disk It stores the retrieved data in archival retrieval directories

The functions used to view or print retrieved data reference these directories The data types transferred to the hard disk include.

Tag data	Requires further retrieval through the tag historian
Trend data	Viewed through a configured trend display
PCU configurations	Used in PCU management functions to download or verify configurations PCU management also provides the ability to print retrieved configurations

The console prints any retrieved events or logs at the printer as signed to the keyboard It does not store the retrieved data on its hard disk

DIRECTORY OF ARCHIVE VOLUME

The console provides an archive directory function to allow viewing the contents of a volume of data stored on a particular medium The information presented identifies the volume name and sequence number stored on specific medium type For each archive to medium, it also indicates the time span of data collected, and the number of events, logs, trends, tags and PCU configurations stored during that time span The information is helpful and in some cases required when retrieving any data The console either displays or prints a directory listing after a directory request

The operator initiates a directory request through menu selections (see Figure 11 9) To call the display shown in this figure, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

B OIS Utilities
→ *F Archival Storage/Retrieval*
→ *B Directory of Archive Volume*

Options *A* through *C* call a directory listing to the screen, options *D* through *F* print a listing After selecting any of these, the console immediately begins a volume search

A magnetic tape or optical disk directory takes several minutes to complete It is suggested that a printout of a directory be maintained with an archive medium to identify the volume of data stored

After selecting a screen display option, the message *Selection Made Please Wait* appears If the selected type of medium is

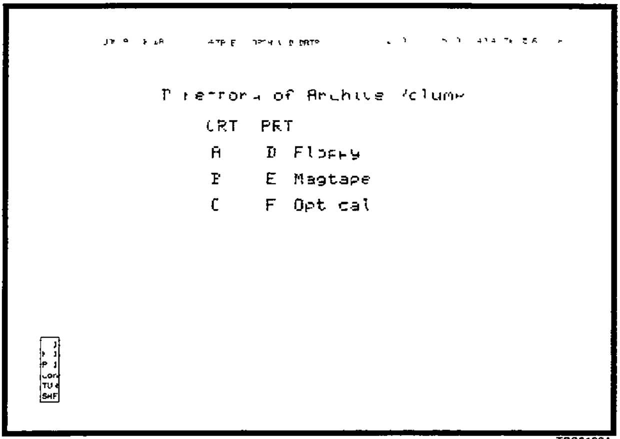

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Figure 11 9 Directory of Archive Volume Display

not installed or the installed medium does not contain an archived volume of data, the message *Install Archive Volume and try again* appears

After selecting a print option, the message *Retrieve archived data request queued* appears If the selected medium type is not in stalled or the installed medium does not contain an archived vol ume of data, the message *Retrieval No Valid Archive Volume is Installed* appears at the operator information events page

Figure 11 10 is an example of a displayed directory The directory provides information necessary when performing archive data retrieval The same information appears in a printout of the direc tory Specifically, the information provided in a directory includes

Archive medium type the *Archive Media* field reflects the type of medium chosen from the directory menu The type appears as either *FLOPPY*, *MAGTAPE* or *OPTICAL*

Volume name and sequence number the *Volume installed* field shows the volume name and sequence number of data stored on a particular medium The console searches for this name and number when retrieving data

Archive time the *Begin Time* and *End Time* fields indicate the time that data collection began and ended for the data stored Refer to this information when entering a from time and to time constraint for data retrieval

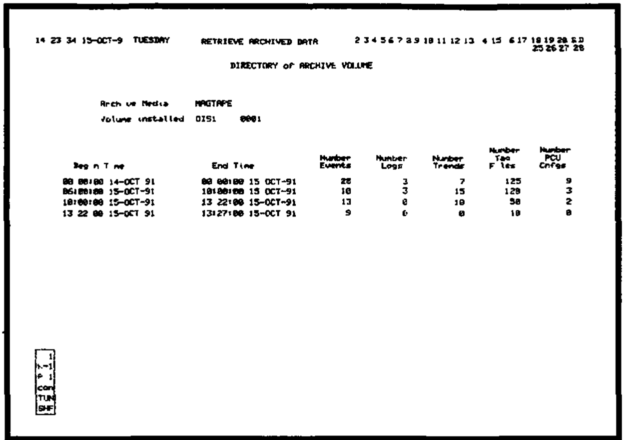

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Figure 11 10 Example Archive Volume Directory

The time span shown normally reflects the time span defined for data collection This is set through volume to media definition The exceptions to this are the initial data collection period and any forced data storage

The initial data collection in most cases does not contain data for an entire defined time span Data can be forced to store to medium prior to completion of a defined time span using the *Store Data* option In this case, the time range reflects the beginning and ending times based on the time that data was stored through the *Store Data* option

Number stored the number of events, logs, trends, tags and PCU configurations columns indicate the number of each data type stored during the time span

DATA TYPE RETRIEVAL

Archival retrieval functions allow directly printing archived logs and system events, or transferring archived tag, trend and PCU configurations back to the hard disk for use in other functions All data types compete for the hard disk space reserved for archival retrieval The amount of space reserved is set during *Miscellaneous Definitions*. Refer to ***Archival Storage*** in the ***OIS Configuration*** section for further information on disk space allocations

Once data is transferred to the hard disk, it resides in an archival retrieval directory Each data type stores in its own directory The functions that allow printing or viewing any retrieved archive data stored on hard disk reference one of these directories to get any desired data The archival retrieval function provides a directory function to view the contents of these hard disk directories

The console retrieves each data type individually Each data type has a separate retrieve data selection at the retrieve archived data menu (see Figure 11 11) To call this menu, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

B OIS Utilities
└→ *F Archival Storage/Retrieval*
  └→ *D Retrieve Data*

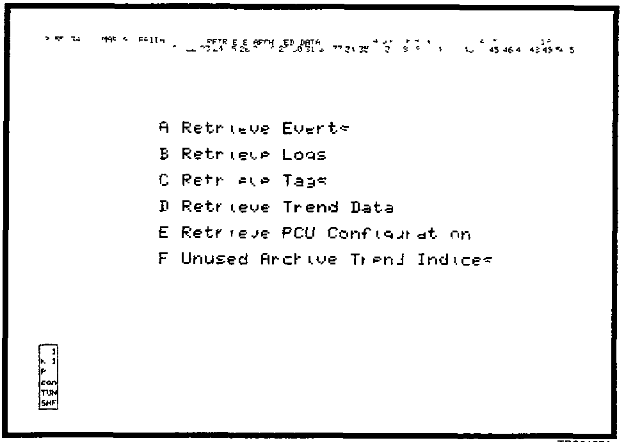

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Figure 11 11 Retrieve Data Menu

The console searches an archive medium based on constraints set at retrieve data pages The operator calls the page for a specific data type through a menu selection Entered search constraints limit retrieval to certain types or ranges of stored data The console does not retrieve any data that does not match or fall within the set constraint limits

To retrieve data

1 Select any of options *A* through *E* The selection determines which type of data to retrieve A retrieve data page for the selected data type appears after selection The page allows entering the constraints the console uses when retrieving data

Use the *Directory of Archive Volume* option to determine the time span, volume name and sequence number associated with data stored on a particular medium if unknown Refer to ***DIRECTORY OF ARCHIVE VOLUME*** in this section for procedures

2 Use the cursor control keys to move between the fields at these pages Each data type has its own page Each page has different input requirements that specify how the console is to search and retrieve data

Refer to ***Retrieving System Events***, ***Retrieving Logs***, ***Retrieving Tag Data***, ***Retrieving Trend Data*** or ***Retrieving PCU Configurations*** in this section for an explanation of each input field when entering data at a specific retrieval page

> **NOTE** Entry in the *Media Type Label* and *Number* fields is only necessary when the installed medium to search is from another console Leave these fields blank if retrieving data from a medium that contains data stored by this console The console references its own archival configuration attributes when this field is left blank An entry must be made in all three fields, or all must be left blank

3 Press ENTER to initiate a retrieval request Do ***not*** press ENTER until all constraint fields have been defined The message *Retrieve Archive Data request queued* appears to indicate the start of a retrieval The console searches a medium for data based on the entered constraints Retrieval takes several minutes to complete

Press ESC at any time before pressing ENTER to exit the page without initiating a retrieval request

> **NOTE** The retrieval operation initiated here can take a variable amount of time depending on the request and system load The retrieval function runs as a background program This allows exiting the page to perform other operations while the console processes a retrieval request

4 Press ESC to exit the page

If all inputs are valid, the console processes a request If not, the console positions the input cursor at the field in error The status of a retrieval request can be seen at the operator information page The console uses the operator request for action page to indicate any required operator actions necessary to complete processing of an archive data retrieval request

Use the *Directory of Retrieved Data* function to view a list of retrieved data Refer to ***DIRECTORY OF RETRIEVED DATA*** in this section for procedures

After the console searches through an installed medium, it may attempt to search the next or previous sequence numbered volume An operator action request message appears at the operator request for action page to identify the attempt If this occurs, access the operator request for action page A message indicating which volume and sequence number the console is attempting to retrieve from appears at the page When processing the action request, two options are available to continue the retrieval request Either install the indicated volume then press [ENTER], or cancel the action request Canceling clears the action request and causes the console to store the data on the hard disk that was retrieved from the currently installed medium onto the hard disk

Retrieving System Events

When system events are set to archive, all events archive Archival storage does not allow storing only selected types of events The archival retrieval function does, however, provide the capability to retrieve only specific types of events The events related to a single or group of tags can be retrieved

> **NOTE** Retrieved system events print only They do not store in an archival retrieval directory

Each retrieval request requires entering a time range, tag name, range of tag indexes, range of alarm groups, tag type, and tag address The retrieve events page also requires selecting which event types, and alarm conditions and qualities reported with each tag event to retrieve The alarm condition and quality can be used to limit the state change, alarm and operator action events the console retrieves An archived event must match or fall within all entered constraints for the console to retrieve it

Figure 11 12 shows the page used to retrieve events, which appears after selecting *A Retrieve Events* from the retrieve archived data menu Table 11 2 explains each field of the retrieve events page

Retrieving Logs

The console archives custom and sequence of events (SOE) logs as log images A log image is a completely formatted report ready for print Archives are on a per log basis The console does not archive a log until the log has completed its entire collection period

When retrieved, a log prints in the same format as a normal log output with the format being determined by log definition for custom logs, or a standard format for SOE logs Log configuration procedures determine if the console is to archive a log or not

> **NOTE** Retrieved logs print only They do not store in an archival retrieval directory

The archival retrieval function provides the capability to retrieve either a single or range of stored custom and SOE logs Each log retrieval request requires entering a time range, log type, log name and range of log numbers An archived log must match or fall within all entered constraints for the console to retrieve it

22 34 21 04 10 07

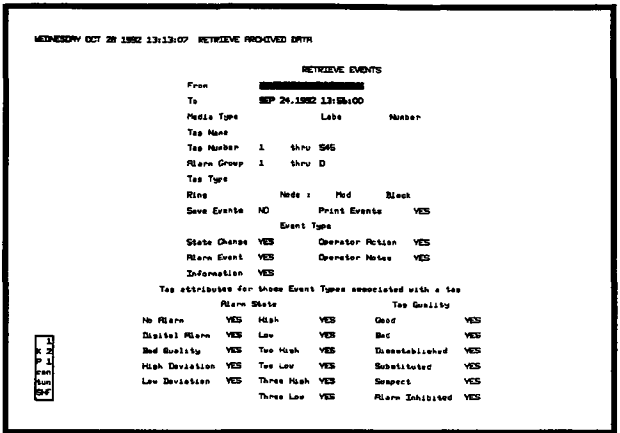

Figure 11 12 Retrieve Events Page

Table 11-2 Events Retrieval Page Fields

Field	Description
From	Starting time and date at wh ch to begin a search for events
To	Ending t me and date at which to stop a search for events
Med a type[1]	A va id media type s FLOPPY MAGTAPE or OPTICAL Entry in this field is re qu red only if retrieving events from a med um that was arch ved to by another conso e
Labe [1]	Volume name assigned to the events data type during *Volume to Media Defini-tion* Entry in this field s requ red only f retrieving events from a medium that was archived to by another console
Number[1]	Sequence number the conso e ass gns to a vo ume of data when storing data Entry in this fie d s required only if retriev ng events from a med um that was ar chived to by another conso e
Tag name[2]	Name of the tag for wh ch to retrieve events W ld card characters (e , * and ?) can be used when specifying a tag name Enter an asterisk to not use tag name as a search constraint (i e , a tag names) An asterisk character specifies al tag names
Tag number thru [2]	Range of tag index numbers to retrieve A val d entry is from 1 to the number of tags set during system configurat on (max mum 5 000) Enter the max mum range to not use tag index number as a search constra nt
Alarm group __ thru __[2]	Range of a arm groups to retrieve Val d range entries are 1 to 99 S and D The complete a arm group range is from 1 to D Enter the max mum range of 1 to D to not use a arm group as a search constra nt

Table 11 2 Events Retrieval Page Fields (continued)

Field	Description
Tag type	Enter any valid tag type Clear the field or leave it blank to not use tag type as a search constraint
Ring ____ node mod block ____	Enter a valid loop node module and block address to which to limit the search Clear the fields or leave them blank to not use tag address as a search constraint
Save events	Default is *NO*, leave this field at its default
Print events	Default is *YES* leave this field at its default
Event type	The console searches for and retrieves each event type that is set to *YES* It does not retrieve any event types set to *NO* **NOTE** At least one event type field must be set to *YES*
Alarm state	The console searches for and retrieves each state change, alarm or operator action event that has an alarm condition matching any of the alarm state conditions set to *YES* It does not retrieve any of these events having an alarm condition matching those set to *NO*
Tag quality	The console searches for and retrieves each state change alarm or operator action event that has a quality condition matching any of the tag quality conditions set to *YES* It does not retrieve any of these events having a quality condition matching those set to *NO*

NOTES

1 If retrieving from a medium archived to by another console the console requires a media type volume name and sequence number entry If retrieving from a medium that this console archived to leave all three fields blank unless changes have been made to the volume names set during data type to volume definition

2 The tag name and range entries can be used in conjunction or separately For example a tag index range and alarm group range can be set to limit a search while the tag name can be set to the wild card asterisk which does not limit a search

Figure 11 13 shows the page used to retrieve log images, which appears after selecting *B Retrieve Logs* from the retrieve archived data menu Table 11 3 explains each field of the retrieval page

Retrieving Tag Data

The tag data that archives to storage medium depends on tag historian configuration The retrieval function transfers the tag data from the medium to the hard disk of the console From there, further retrieval procedures performed through the tag historian function determine the exact data to retrieve for printing Refer to ***Tag Historian*** in this section for an explanation and procedures to perform tag data retrieval through the tag historian function

The archival retrieval function provides the capability to retrieve tag data by entering a time range Archived tag data must fall within the entered time constraint for the console to retrieve it

Figure 11 14 shows the page used to retrieve tag data, which appears after selecting *C Retrieve Tags* from the retrieve archived data menu Table 11 4 explains each field of the retrieval page

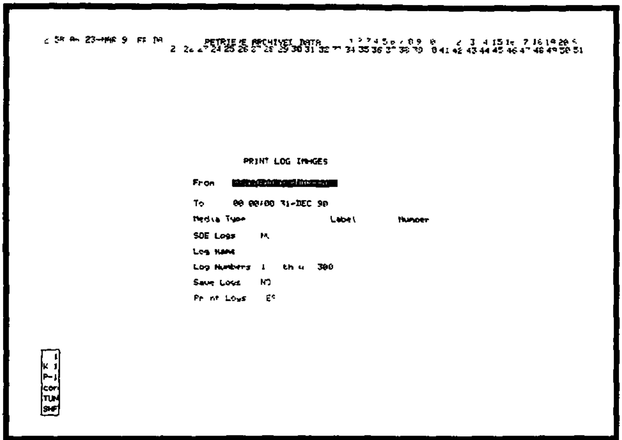

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Figure 11-13 Print Log Images Page

Table 11 3 Log Image Retrieval Page Fields

Field	Description
From	Starting time and date at which to begin a search for log images
To	Ending time and date at which to stop a search for log images
Media type[1]	A valid media type is FLOPPY, MAGTAPE or OPTICAL Entry in this field is required only if retrieving events from a medium that was archived to by another console
Label[1]	Volume name assigned to the events data type during *Volume to Media Definition* Entry in this field is required only if retrieving events from a medium that was archived to by another console
Number[1]	Sequence number the console assigns to a volume of data when storing data Entry in this field is required only if retrieving events from a medium that was archived to by another console
SOE logs	The console retrieves SOE logs if set to *YES* It retrieves custom logs if set to *NO*
Log name[2]	Name of a log for which the console is to search When retrieving custom logs enter the name defined for a log during log configuration Enter a name in the format **SOECL***nnn* where *nnn* is the report number for SOE logs Wild card characters (e * and ?) can be used when specifying a log name Enter an asterisk to not use log name as a search constraint An asterisk wild card character specifies all log names
Log numbers thru [2]	Range of log numbers to retrieve Each log is assigned a log number during configuration Valid range entries are from 1 to 300 for custom logs, or 1 to 80 for SOE logs Enter the maximum range to not use log number as a search constraint

Table 11-3. Log Image Retrieval Page Fields (continued)

Field	Description
Save logs	Default is *NO*, leave this field at its default
Print logs	Default is *YES*, leave this field at its default

NOTES
1. If retrieving from a medium archived to by another console, the console requires a media type, volume name and sequence number entry. If retrieving from a medium that this console archived to, leave all three fields blank unless changes have been made to the volume names set during data type to volume definition.
2. The log name and log number range entries can be used in conjunction or separately. For example, a log number range can be set to limit a search while the log name can be set to the wild card asterisk which does not limit a search.

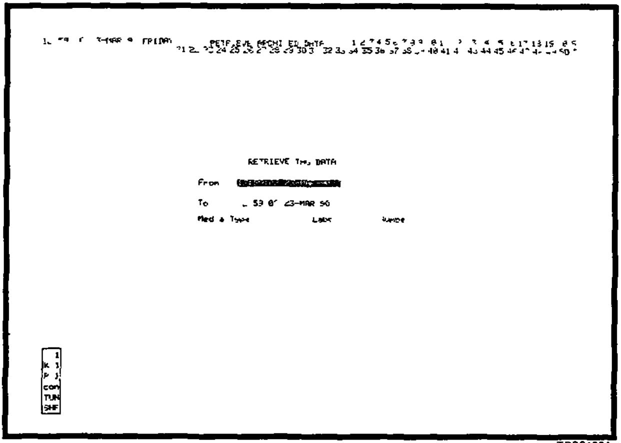

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Figure 11-14. Retrieve Tag Data Page

Table 11-4. Tag Data Retrieval Page Fields

Field	Description
From	Starting time and date at which to begin a search for tag data
To	Ending time and date at which to stop a search for tag data
Media type[1]	A valid media type is FLOPPY, MAGTAPE or OPTICAL. Entry in this field is required only if retrieving events from a medium that was archived to by another console
Label[1]	Volume name assigned to the events data type during *Volume to Media Definition*. Entry in this field is required only if retrieving events from a medium that was archived to by another console
Number[1]	Sequence number the console assigns to a volume of data when storing data. Entry in this field is required only if retrieving events from a medium that was archived to by another console

NOTE: 1. If retrieving from a medium archived to by another console, the console requires a media type, volume name and sequence number entry. If retrieving from a medium that this console archived to, leave all three fields blank unless changes have been made to the volume names set during data type to volume definition.

Retrieving Trend Data

The console archives trend data on a per trend basis During trend definition, the *Trend Usage* field for each defined trend determines whether its data stores for archiving or not The data stores at the same resolution as set in the trend definition The data can be retrieved, however, at a different resolution

A trend does ***not*** have to be defined at the console to retrieve trend data and have it store in an archival retrieval directory The console does, however, require a trend defined to view the data at a trend display Once a trend is retrieved and stored on the hard disk, it is referred to as a retrieved trend

The actual information stored for a trend depends on its configuration The information relates directly to the attributes defined for a particular trend during its definition

Tag name name of the tag associated with a trend The tag references the actual process variable being trended

Tag subtype relates to station trends only The subtype identifies which station variable is being trended, either PV (process variable), SP (set point), CO (control output) or RI (ratio index)

Trend mode - either average, maximum, sample or sum

Trend resolution resolution of the stored trend data

The archival retrieval function provides the capability to retrieve either a single or range of trends

Figure 11-15 shows the page used to retrieve trend data, which appears after selecting *D Retrieve Trend Data* from the retrieve archived data menu

Trend Retrieval List

The first step in trend data retrieval is to determine which stored trends to retrieve Up to 80 trends can be retrieved and stored on the hard disk at one time When a trend is retrieved, the console stores it in its own file Each trend is identified by a retrieved trend index number

The fields at the bottom of the retrieve trend data page (see Figure 11 15) define which trends will eventually be retrieved Each trend in this list must correspond to a trend that has previously been archived The trend retrieval list can be created at any time

The index number assigned to a retrieved trend depends on its position in the trend retrieval list The retrieved trend index number is only used by the archived data retrieval function, and is not the same as the trend index number assigned to a trend during its definition

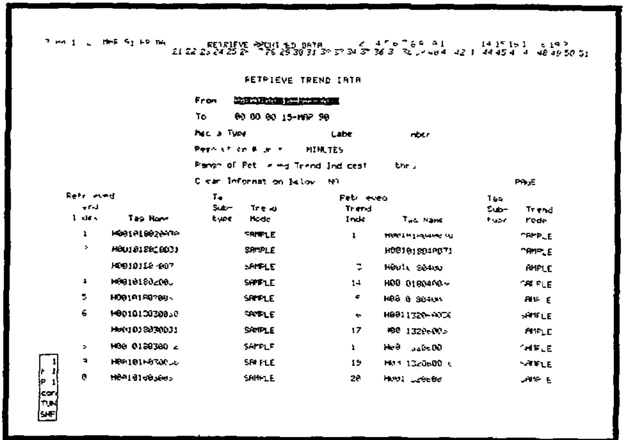

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Figure 11 15 Retrieve Trend Data Page

One way to define the retrieval list is to set it up at the same time as trend data storage *In this way, the trend retrieval list would contain* all trends (up to 80) that have their *Usage Type* field set to *AR CHIVED* The trends can then be retrieved at any desired time

The *Print Trend List* utility allows printing a list of all trends hav ing their *Usage Type* field set to *ARCHIVED* This function provides a list of trends that can be referenced when initially defining or adding trends to the retrieval list All information required to define the list appears in the printout

To enter a trend into the retrieval list

1 An input cursor positions at the *From* field after initially se lecting the *Retrieve Trend Data* option Use the cursor control keys to move the cursor Move the input cursor down the page to access the trend list fields

Only 20 trend index numbers appear at a single page Press NEXT PAGE or PREV PAGE to view the next or previous 20 entries

2 Enter the name of the tag associated with the trend in the *Tag Name* column The name entry must be the same as the tag name defined for a trend during its definition Enter a tag name, not a tag index

3 Enter the subtype in the *Tag Subtype* column if the trend is a station trend Enter either **PV** (process variable), **SP** (set point), **CO**

(control output) or **RI** (ratio index) The console does not give access to this field if the trend is not a station trend

Each variable related to a station block can be trended A single station block may have several trends defined for that one block. The console requires the subtype entry to determine which trended variable of a station block to retrieve In the case of a station trend, the trend list may contain several entries each having the same *Tag Name*, but each having a different *Subtype* entry

4 Enter the mode of a trend in the *Trend Mode* column Enter either **AVERAGE**, **MINIMUM**, **MAXIMUM**, **SAMPLE**, or **SUM** Repeat Steps 1 through 4 for each trend to retrieve

The *Tag Name, Tag Subtype* and *Trend Mode* entries must match a stored trend exactly for the trend data to be retrieved

Clear Retrieval List

The trend retrieval list can be cleared at any time This allows clearing the previous entries to redefine a new retrieval list To clear the retrieval list

1 Move to the *Clear Information Below* field

2 Enter **YES.**

3 Press **ENTER** to initiate the clear

Retrieve Trend Data

After the trend retrieval list has been defined, the procedures described in ***DATA TYPE RETRIEVAL*** in this section can be performed A single, range or all trends defined in the trend retrieval list can be retrieved in a single retrieval request

After initiating a retrieval request, the console deletes any previous retrieved data files residing on the hard disk The files that delete are only those for trends currently being retrieved in the current request All other data files remain intact

The console also deletes any previously retrieved data files if a *Retrieved Trend Index* entry is made blank and that index number is then requested for retrieval

Define a new trend to retrieve in any unused *Retrieved Trend Index* number to leave data file containing trend data from a previous retrieval request intact An unused index number is any that has not been part of a previous retrieval request, and does not have data stored in a data file on the hard disk Refer to ***Unused Archive Trend Indices*** in this section for procedures to obtain a list of unused, available trend index numbers

Table 11-5 explains the remaining retrieve trend data page fields Each trend data retrieval request requires entering a time range, resolution and range of trend indexes Archived trend data must match or fall within all entered constraints for the console to retrieve the data

22 34 27 04 10 07

Table 11 5 Trend Data Retrieval Page Fields

Field	Description
From	Starting time and date at which to begin a search for trend data
To	Ending time and date at which to stop a search for trend data
Media type[1]	A valid media type is FLOPPY, MAGTAPE or OPTICAL. Entry in this field is required only if retrieving events from a medium that was archived to by another console
Label[1]	Volume name assigned to the events data type during *Volume to Media Definition*. Entry in this field is required only if retrieving events from a medium that was archived to by another console
Number[1]	Sequence number the console assigns to a volume of data when storing data. Entry in this field is required only if retrieving events from a medium that was archived to by another console
Resolution # unit[2]	Determines the resolution of the retrieved data. This does not have to match a trends defined resolution but must be a resolution time span greater than and a multiple of the resolution of the stored data A valid entry is an integer from 1 to 99 and either SECONDS, MINUTES, HOURS or DAYS. If using SECONDS, valid integers are 15, 30 or 45 only
Range of retrieved trend indices thru	Range of trend indices from the trend retrieval list at the bottom of the page for which the console is to retrieve data. A valid entry is from 1 to 80 Enter the same index number in both fields if retrieving data for only one trend. The range can include blank undefined index numbers Leave these fields blank to retrieve all trends defined on the current page of the trend retrieval list **NOTE** The console deletes any existing retrieved data files within this range and replaces them with the new requested data

NOTES

1 If retrieving from a medium archived to by another console, the console requires a media type, volume name and sequence number entry. If retrieving from a medium that this console archived to, leave all three fields blank unless changes have been made to the volume names set during data type to volume definition

2 *The console trend displays cannot display unit fields of HOURS and DAYS. Also, the trend element resolution time* span must be equal to or greater than the resolution of the data retrieved. For example, the display used to present trend data retrieved at five minute resolution must be set up for five minute resolution or higher (e.g. ten minutes). A resolution of less than five minutes cannot be defined

Retrieving PCU Configurations

The console archives only those PCU configurations that have been saved through PCU management functions. Archives are on a per module configuration basis. A retrieved PCU configuration can be used to verify or load the configuration of a module. PCU management functions also allow printing a retrieved configuration

The archival retrieval function provides the capability to retrieve either a single or range of stored configurations. Each PCU configuration request requires entering a time range and loop, PCU and module address range. An archived PCU configuration must match or fall within all entered constraints for the console to retrieve it

Figure 11-16 shows the page used to retrieve PCU configurations, which appears after selecting *E Retrieve PCU Configurations* from the retrieve archived data menu. Table 11-6 explains each field of the retrieval page.

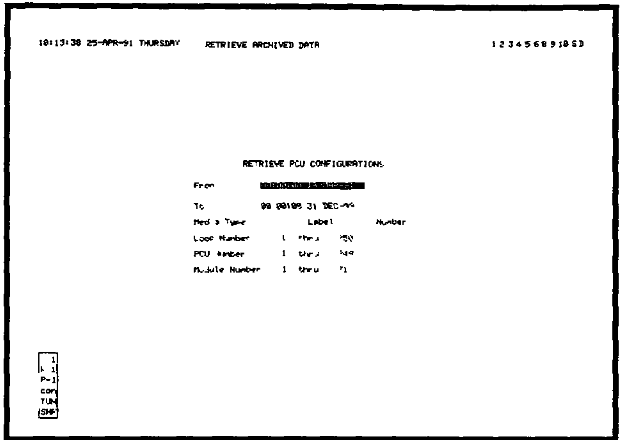

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Figure 11-16. Retrieve PCU Configurations Page

Table 11-6. PCU Configurations Retrieval Page Fields

Field	Description
From	Starting time and date at which to begin a search for PCU configurations.
To	Ending time and date at which to stop a search for PCU configurations.
Media type[1]	A valid media type is FLOPPY, MAGTAPE or OPTICAL. Entry in this field is required only if retrieving events from a medium that was archived to by another console.
Label[1]	Volume name assigned to the events data type during *Volume to Media Definition*. Entry in this field is required only if retrieving events from a medium that was archived to by another console.
Number[1]	Sequence number the console assigns to a volume of data when storing data. Entry in this field is required only if retrieving events from a medium that was archived to by another console.
Loop number	Range of loop addresses for which the console is to search. A valid entry is from 1 to 250. Enter the same address in both fields to search for a single loop address.
PCU number	Range of PCU addresses for which the console is to search. A valid entry is from 1 to 250. Enter the same address in both fields to search for a single PCU address.

Table 11-6. PCU Configurations Retrieval Page Fields (continued)

Field	Description
Module number	Range of module addresses for which the console is to search. A valid entry is from 0 to 31. Enter the same address in both fields to search for a single module address.

NOTE: 1. If retrieving from a medium archived to by another console, the console requires a media type, volume name and sequence number entry. If retrieving from a medium that this console archived to, leave all three fields blank unless changes have been made to the volume names set during data type to volume definition.

Unused Archive Trend Indices

Use the *Unused Archive Trend Indices* function to determine which trends have already been retrieved and reside in a file on the hard disk. This should be done before making a trend data retrieval request to prevent deleting any previously retrieved data.

Select *F Unused Archive Trend Indices* from the retrieve archived data menu. A page similar to the one shown in Figure 11-17 appears. The information is the index numbers for retrieved trends that do not currently have data stored in a file on the hard disk.

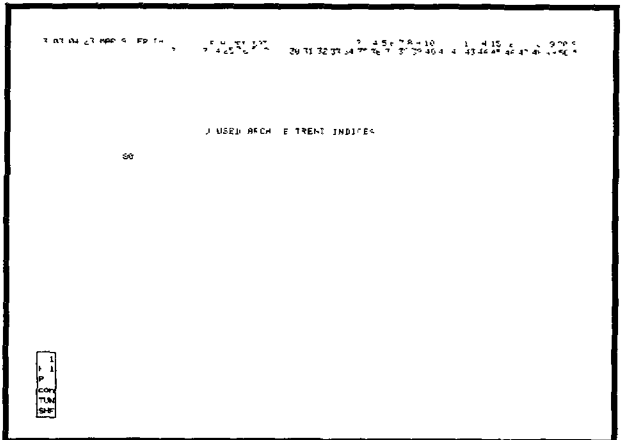

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Figure 11-17. Unused Archive Trend Indices Page

DIRECTORY OF RETRIEVED DATA

The console provides a *Directory of Retrieved Data* function to allow viewing the contents of each archival retrieval directory. The function also allows deleting retrieved data files from the hard disk by deleting an entry from a directory listing.

A directory can be called for each type of data the console retrieves and stores on its hard disk Each data type has a separate directory request selection at the directory of retrieved data menu page (see Figure 11-18). To call this menu, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

B OIS Utilities
└→ *F Archival Storage/Retrieval*
  └→ *C Directory of Retrieved Data*

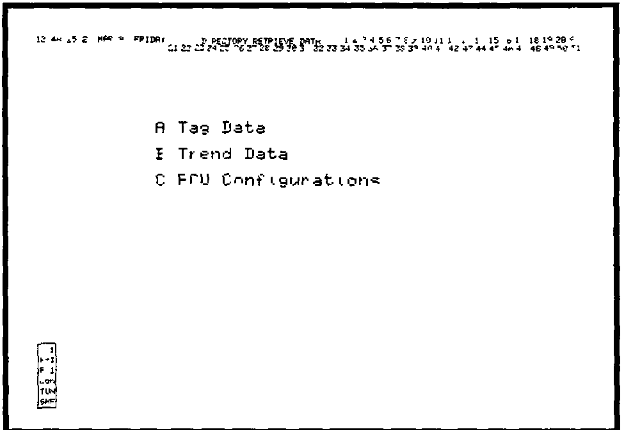

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Figure 11 18 Directory of Retrieved Data Menu

Delete Retrieved Data

A directory page for each data type appears after selecting any of the directory options Each entry in the list has a time range that corresponds to a previously initiated retrieval request The directory page has two options used to delete entries in the listing. *X Delete Selected* and *Y Delete Page.*

To select and delete individual data files

1 Select *X Delete Selected* The letters along the left edge of the page change to red These letters are used to select files to delete

2 Press a key corresponding to the selector letter adjacent to an entry to delete The letter on the screen changes to green to identify an entry as being selected for deletion

3 Repeat Step 2 until selecting all desired entries to delete, then press **ENTER** The console removes all selected entries from the list and deletes the corresponding retrieved data files

4 Press [ESC] to exit delete mode

Select *Y Delete Page* to delete all entries on the page A prompt appears to allow confirming the deletion The console removes all entries on the current page from the list and deletes the corre sponding retrieved data files

Directory of Retrieved Tag Data

A tag data directory listing appears after selecting *A Tag Data* from the retrieved data directory menu (see Figure 11 19) Each entry in the directory contains the time range of data stored during a retrieval request, number of tag data files retrieved, and the amount of hard disk space the files occupy The number of retrieved tag data files cannot exceed 240 The entries are ar ranged chronologically by retrieval starting time shown at the *FROM TIME* field A maximum of 15 directory entries display per page Press [NEXT PAGE] or [PREV PAGE] to view additional pages

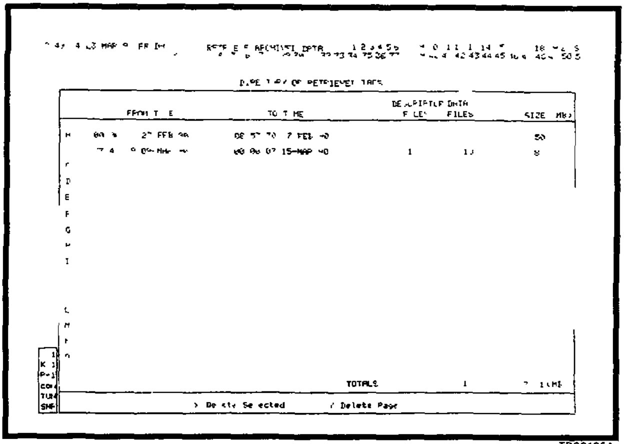

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Figure 11 19 Directory of Retrieved Tags Page

Directory of Retrieved Trend Data

A trend data directory listing appears after selecting *B Trend Data* from the retrieved data directory menu (see Figure 11 20) Each directory entry contains

ARCHIVE TREND INDEX corresponds to the trend retrieval list index number, not the index number assigned to a trend during its definition

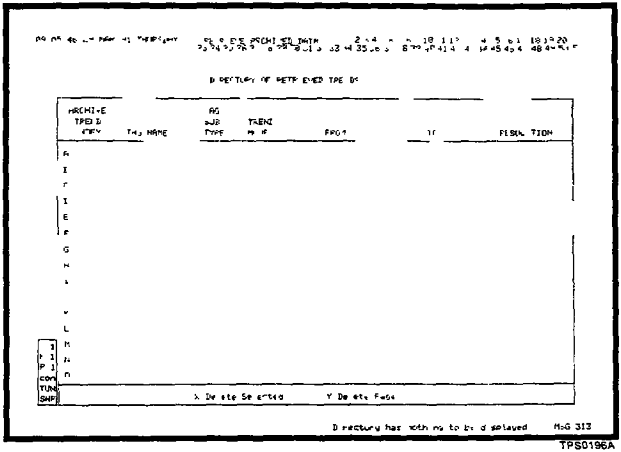

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Figure 11-20. Directory of Retrieved Trends Page

TAG NAME - name of the tag associated with the trended variable.

TAG SUBTYPE - *PV*, *SP*, *RI* or *CO*, appears only if the trend is a STATION tag trend.

TREND MODE - *SAMPLE, MAXIMUM, MINIMUM, AVERAGE* or *SUM* collection mode of the trend.

FROM/TO - time span of the retrieval request.

RESOLUTION - 1etrieved data resolution as determined by the retrieval request ranging from seconds to days.

The number of retrieved trend data files cannot exceed 80. The entries appear chronologically by index number. The trends that are retrieved depend on the trend retrieval list defined at the trend data retrieval page. A maximum of 15 directory entries display per page. Press **NEXT PAGE** or **PREV PAGE** to view additional pages.

Directory of PCU Configurations

A directory listing of retrieved PCU configurations appears after selecting *C PCU Configurations* from the retrieved data directory menu (see Figure 11-21). Each retrieved configuration resides in a separate file. Each directory entry contains the loop, PCU, and module address of the configuration and a retrieval request time. Each entry is for a single file containing the configuration of a single module. Directory entries are in numerical order by the loop, PCU and module address. A maximum of 15 directory entries

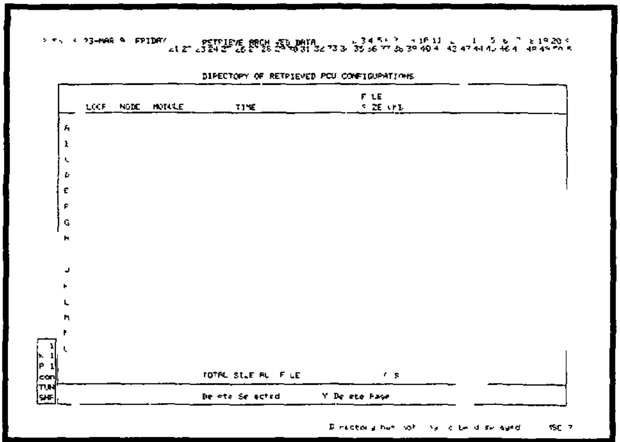

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Figure 11 21 Directory of Retrieved PCU Configurations Page

display per page Press **NEXT PAGE** or **PREV PAGE** to view additional pages

VIEWING OR PRINTING RETRIEVED ARCHIVE DATA

In certain cases, other functions must be used to either print or view the data Specifically, these include

- Tag historian for further retrieval, then printing of selected tag data
- Trend displays for viewing trend data
- PCU management for PCU configurations

Tag Data

Operations performed through the tag historian allow further retrieval capabilities after transferring the data to the hard disk Specifically, the tag historian allows retrieving individual or a group of tags from the files stored in the archival retrieval directory When retrieving a group of tags, the retrieval is based on alarm group, tag historian group or tag name The tag historian function takes the desired data and stores it in another file in a dedicated tag historian directory From there, the data can be printed through other tag historian options

Tag data can be retrieved at any console whether that console archived the data or not When tag data stores for archiving, each tag contains both exception reported values or states and configuration data This allows the data to be retrieved at other consoles, or at this console even if any database changes have been made

Trend Data

When panning to historical data at a trend display, the console first displays any data collected from a PCU module and stored on its hard disk The amount of trend data that remains on the hard disk depends on trend definition, and can be up to 92 days worth of data After panning a trend display past the data maintained on the hard disk, the console looks for additional trend data in an archival retrieval directory

Use the pan options available at a trend display to move the presentation of the display back to a time within the time range of retrieved trend data to view any retrieved trend data Refer to ***Trend Control*** in the ***Process Monitoring*** section for an explanation of panning

PCU Configurations

PCU management allows printing retrieved PCU configurations The configurations can also be used to verify an existing configuration or to download a configuration Refer to ***PCU Management*** in the ***INFI 90 System Configuration*** section for an explanation and procedures

Tag Historian

The tag historian function defines the data collected and stored by the console for tag data archiving Functions available through the tag historian also provide the capability to recover specific tag data from a retrieved tag data file, then print the data Tag historian functions can be classified into two separate categories Tag data storage and tag data retrieval

The operator accesses tag historian functions through a tag historian menu (see Figure 11-22) To call this menu, first press $\boxed{\text{GENL FCTNS MENU}}$, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *J Tag Historian*

The operator performs three different operations through the tag historian menu

Historian Group Configuration determines the tag data that stores in the archival storage directory for eventual transfer to storage medium Refer to ***CONFIGURING TAG DATA TO BE ARCHIVED*** in the ***OIS Configuration*** section for further explanation and procedures

Tag Historian Retrieval - creates a retrieved data file (RDF) containing specific tag information recovered from a retrieved tag data file The retrieved tag data file resides in an archival retrieval directory, and contains the data transferred back to the hard disk using the *Retrieve Tags* function Refer to ***Retrieving Tag Data*** in this section for additional explanation

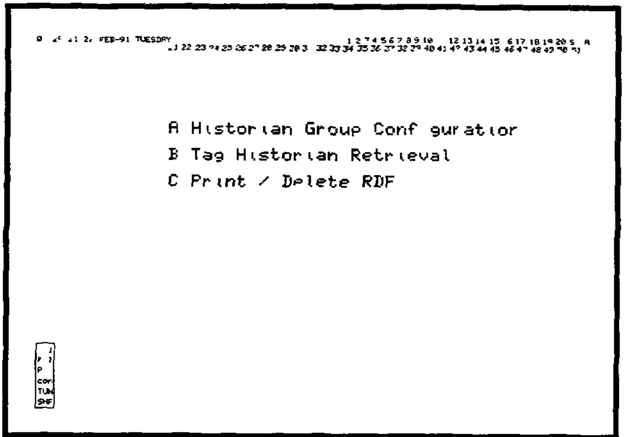

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Figure 11-22. Tag Historian Menu

Print/Delete RDF presents a directory listing of all RDF files, and allows either printing information from these files or deleting them.

To retrieve and print tag data:

1. Create an RDF file that contains the desired retrieved data. Select the *Tag Historian Retrieval* options to perform actions that initiate a retrieval and create this file. The console creates an RDF file and stores it in the tag historian directory. The file can be identified by the *RDF Name* entered at one of the retrieval pages.

2. Use the *Print/Delete RDF* function to view a directory listing of RDF files, and to print data or delete data files.

TAG HISTORIAN DATA RETRIEVAL

The *Tag Historian Retrieval* function provides the capability to recover data from retrieved tag data files residing in an archival retrieval directory. After retrieving and storing tag data to the hard disk using tag data retrieval procedures, this option must be selected to perform a second retrieval. The archive data retrieval function retrieves data based on an entered time range. The console recovers any desired data by searching the retrieved tag data files using search constraints entered through the tag historian.

The result of this second retrieval transfers data for a single or range of tags to an RDF file. A maximum of 50 RDF files can be maintained on the hard disk. RDF files reside in a dedicated tag historian directory, and are identified by a user-defined name The information in these files depends on an entered time range and one of the following

- Alarm group or alarm group range
- Tag historian group
- Tag name or wild card tag name
- Defined list of up to 100 individual tags

The console searches a retrieved tag data file based on constraints set through a tag historian retrieval menu (see Figure 11 23) Select *B Tag Historian Retrieval* from the tag historian menu to call this menu

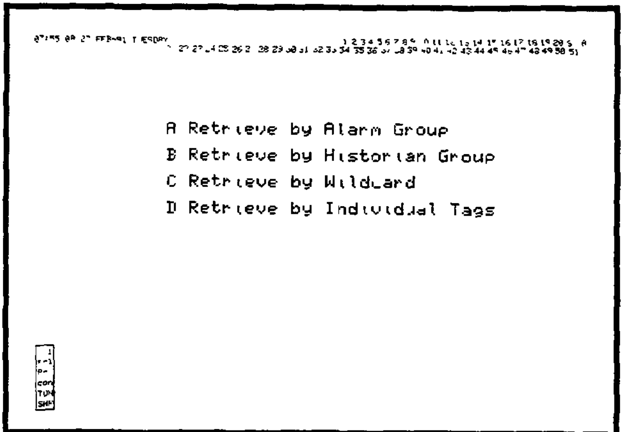

Figure 11 23 Tag Historian Retrieval Menu

The menu page provides separate options to select the tag attrib utes for which the console is to search Constraints entered through the options presented at this menu page limit data retrieval to a specified time range, and to certain tag attributes The console does not retrieve any data that does not match or fall within the set constraint limits

Select any one of the options presented Refer to ***Retrieve by Alarm Group***, ***Retrieve by Historian Group***, ***Retrieve by Tag Name*** or ***Retrieve by Tag List*** in this section for a detailed explanation when creating an RDF file and defining search constraints that determine the data to retrieve

Use the *Directory of Retrieved Data* option available through archival storage and retrieval functions to determine the time span associated with tag data stored on the hard disk Refer to ***DIRECTORY OF RETRIEVED DATA*** in this section for procedures

Retrieve by Alarm Group

Figure 11 24 shows the page that appears after selecting *A Retrieve by Alarm Group* from the tag historian retrieval menu To retrieve tag data by alarm group

1 An input cursor appears at the *From* field when the page appears Use the cursor control keys to move the cursor between *input fields At the From field, enter a starting time and date at* which to begin a search for data

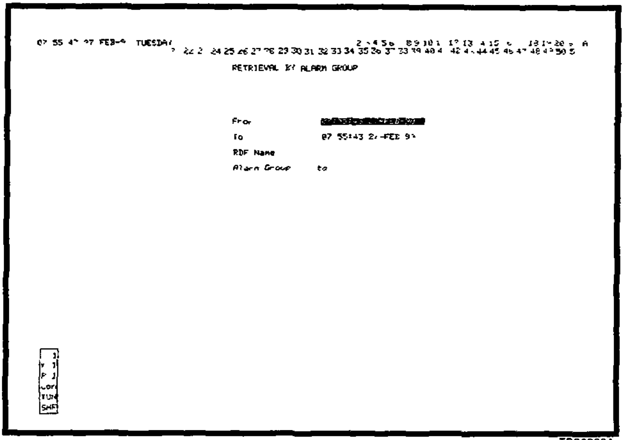

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Figure 11 24 Retrieve by Alarm Group Page

2 Enter an ending time and date at which to stop a search for data at the *To* field

3 Enter a name the console is to assign to the RDF file created after completing a search The name can be up to eight characters After creating an RDF file, this name is used in other tag historian functions to identify the retrieved data

4 Enter an alarm group search constraint at the *Alarm Group to* field This limits any search to a specific set of tags identified by their alarm group The field can identify either a single or range of alarm groups to retrieve A valid entry is 1 to 99, S or D The

complete alarm group range is from 1 to D Enter the same alarm group number in both fields to designate a single alarm group

5 Press ENTER to initiate a retrieval request Do ***not*** press ENTER until all fields have been defined Retrieval takes several minutes to complete Press ESC at any time before pressing ENTER to exit the page without initiating a retrieval request

> **NOTE** The retrieva operation initiated here can take a var ab e amount of time depending on the request and system load The retrieval function runs as a background program This a lows ex ting the page to perform other operations while the console processes a retr eval request

6 Press ESC to exit the page

If all inputs are valid, the console processes a request If not, the console positions the input cursor at the field in error The operator information events page provides informational messages to indicate the current operations being performed to process a retrieval request The *Print/Delete RDF* function also provides retrieval request status information

Retrieve by Historian Group

Figure 11-25 shows the page that appears after selecting *B Retrieve by Historian Group* from the tag historian retrieval menu To retrieve tag data by historian group

1 An input cursor appears at the *From* field when the page appears Use the cursor control keys to move the cursor between input fields At the *From* field, enter a starting time and date at which to begin a search for data

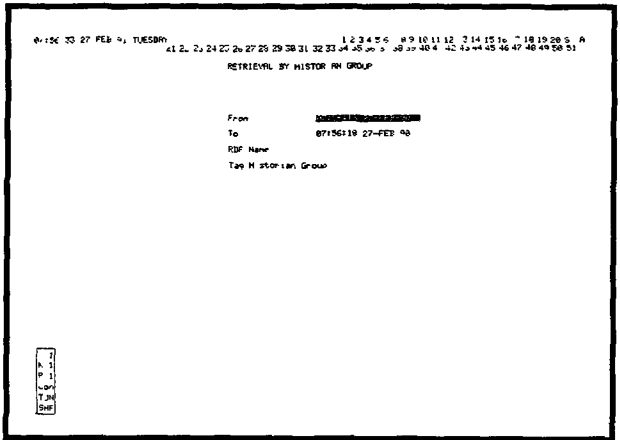
2 Enter an ending time and date at which to stop a search for data at the *To* field

3 Enter a name the console is to assign to the RDF file created after completing a search The name can be up to eight characters After creating an RDF file, this name is used in other tag historian functions to identify the retrieved data

4 Enter a tag historian group search constraint at the *Tag Historian Group* field This limits any search to a specific set of tags defined in an historian group A valid entry is from 1 to 10, and must correspond to a defined group

> **NOTE** The retrieval operat on init ated here can take a variable amount of time depending on the request and system load The retrieval function runs as a background program This a lows exiting the page to perform other operations while the console processes a retrieval request

5 Press ENTER to initiate a retrieval request Do ***not*** press ENTER until all fields have been defined Retrieval takes several



TPS0201A

Figure 11 25 Retrieve by Historian Group Page

minutes to complete Press [ESC] at any time before pressing [ENTER] to exit the page without initiating a retrieval request

6 Press [ESC] to exit the page

If all inputs are valid, the console processes a request If not, the console positions the input cursor at the field in error The operator *information events* page provides informational messages to indicate the current operations being performed to process a retrieval request The *Print/Delete RDF* function also provides retrieval request status information

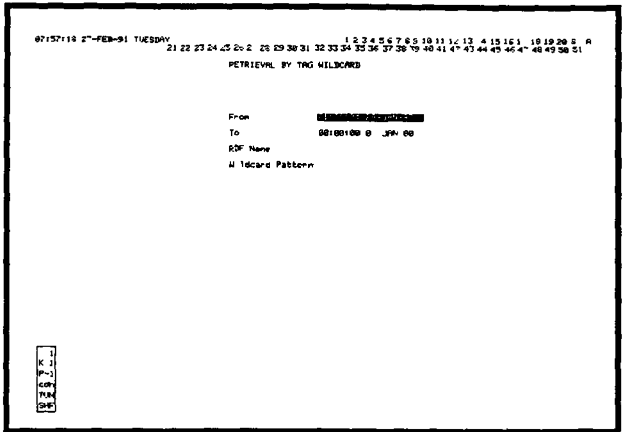
Retrieve by Tag Name

Figure 11 26 shows the page that appears after selecting *C Retrieve by Wildcard* from the tag historian retrieval menu To retrieve tag data by tag name

1 An input cursor appears at the *From* field when the page appears Use the cursor control keys to move the cursor between input fields At the *From* field, enter a starting time and date at which to begin a search for data

2 Enter an ending time and date at which to stop a search for data at the *To* field

3 Enter a name the console is to assign to the RDF file created after completing a search The name can be up to eight



TPS0202A

Figure 11 26 Retrieve by Tag Wild Card Page

characters After creating an RDF file, this name is used in other tag historian functions to identify the retrieved data

4 Enter a tag name search constraint at the *Wildcard Pattern* field This limits any search to only those tags whose name matches either a specific or wild card tag name The wild cards are the asterisk (*) or question mark (?) characters

The * represents multiple characters, the ? a single character For example, ABC*XYZ retrieves any tags beginning with ABC and ending with XYZ with any number of characters in between. ABC?XYZ retrieves any tags beginning with ABC and ending with XYZ and only one character in between The system supports multiple occurrences of ? Multiple occurrences of * are treated as ? after the first *

5. Press **ENTER** to initiate a retrieval request Do ***not*** press **ENTER** until all fields have been defined Retrieval takes several minutes to complete Press **ESC** at any time before pressing **ENTER** to exit the page without initiating a retrieval request

> **NOTE** The retrieval operation initiated here can take a variable amount of time depending on the request and system load The retrieval function runs as a background program This allows exiting the page to perform other operations while the console processes a retrieval request

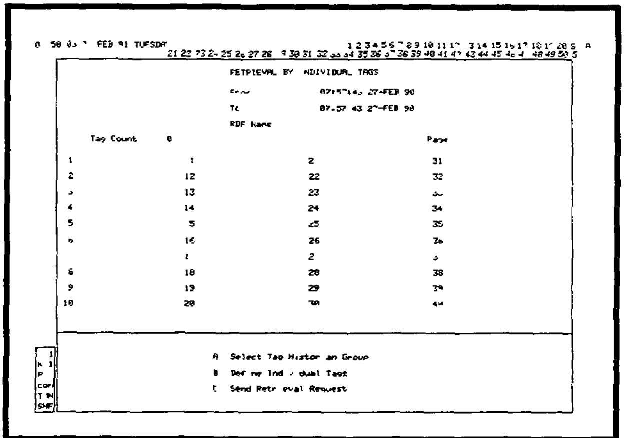
6 Press **ESC** to exit the page

If all inputs are valid, the console processes a request If not, the console positions the input cursor at the field in error The operator information events page provides informational messages to indicate the current operations being performed to process a re trieval request. The *Print/Delete RDF* function also provides re trieval request status information

Retrieve by Tag List

Figure 11 27 shows the page that appears after selecting *D Retrieve by Individual Tags* from the retrieve tag historian retrieval menu This option allows specifying a list of up to 100 individual tags to retrieve The page presents a menu of three options at the bottom of the screen The options include

Select Tag Historian Group defines a list of tags to retrieve by specifying a tag historian group All tags defined in the selected group initially make up the list of tags to retrieve The list can then be modified, however, by adding or deleting tag names from the list before initiating the retrieval request



TPS0203A

Figure 11 27 Retrieve by Individual Tags Page

Define Individual Tags defines a list of tags by individual tag name or index number entry. This option provides an empty tag retrieval list to define individual tags

Send Retrieval Request initiates a retrieval request This option should be selected as the last step to initiate a retrieval request

The complete list of 100 individual tags spans three separate pages Press **NEXT PAGE** or **PREV PAGE** to view the complete tag list The *Page* field updates to show the number of the currently displayed page

To create a list of tags using the *Select Tag Historian Group* option, then initiate a retrieval of the tags

1 Press [A] to select the option An *Enter Tag Historian Group Number* input prompt appears

2 Enter a tag historian group number from 1 to 10, then press [ENTER] The console fills in the tag list with tag names after referencing the specified group The group must be defined for an entered group number to be valid. If not the page remains blank After entering, an input cursor appears at the *From* field

Press [ESC] at any time to cancel any edits

3 Use the cursor control keys to move the cursor between input fields At the *From* field, enter a starting time and date at which to begin a search for data

4 Enter an ending time and date at which to stop a search for data at the *To* field

5 Enter a name the console is to assign to the RDF file created after completing a search The name can be up to eight characters After creating an RDF file, this name is used in other tag historian functions to identify the retrieved data

6 If desired, move the cursor to the tag definition area of the page to modify the list of tags. Continue with the next step if modifications are not required

To remove or redefine a tag in the list, move to the name of that tag and either press [CLEAR] or enter a new name or index number Move to an available, undefined tag definition field and enter a tag name or index number to add an additional tag The *Tag Count* field updates as tags are removed or added

7 Press [ENTER] to save any edits made and to return control to the menu at the bottom of the page

8 Select C *Send Retrieval Request* to initiate the retrieval The message *Retrieval Request Queued* appears to verify the action

> **NOTE** The retrieval operation initiated here can take a variable amount of time depending on the request and system load The retrieval function runs as a background program This allows exiting the page to perform other operations while the console processes a retrieval request

Press [ESC] to leave the list defined without initiating a retrieval request This must be done, however, before selecting option *C*

9 Press [ESC] to exit the page

To create a list of tags using the *Define Individual Tags* option, then initiate a retrieval of the tags

1 Press [B] to select the option An input cursor initially appears at the *From* field Press [ESC] at any time to abort any edits

2 Use the cursor control keys to move the cursor between input fields At the *From* field, enter a starting time and date at which to begin a search for data

3 Enter an ending time and date at which to stop a search for data at the *To* field

4 Enter a name the console is to assign to the RDF file created after completing a search The name can be up to eight characters After creating an RDF file, this name is used in other tag historian functions to identify the retrieved data

5 Move the cursor to the tag definition area of the page to define the list of tags to retrieve Move to an available, undefined tag definition field and enter a tag name or index number to add a tag Continue to enter tags until the list of tags is complete The *Tag Count* field updates as tags are added

6 Once completed, press [ENTER] to save any edits made and to return control to the menu at the bottom of the page

7 Select *C Send Retrieval Request* to initiate the retrieval The message *Retrieval Request Queued* appears to verify the action

> **NOTE** The retrieval operation initiated here can take a variable amount of time depending on the request and system load The retrieval function runs as a background program This allows exiting the page to perform other operations while the console processes a retrieval request

Press [ESC] to leave the list defined without initiating a retrieval request This must be done, however, before selecting option *C*

8 Press [ESC] to exit the page

If all inputs are valid, the console processes a request If not, the console positions the input cursor at the field in error. The operator information events page provides informational messages to indicate the current operations being performed to process a retrieval request The *Print/Delete RDF* function also provides retrieval request status information

PRINTING OR DELETING TAG DATA

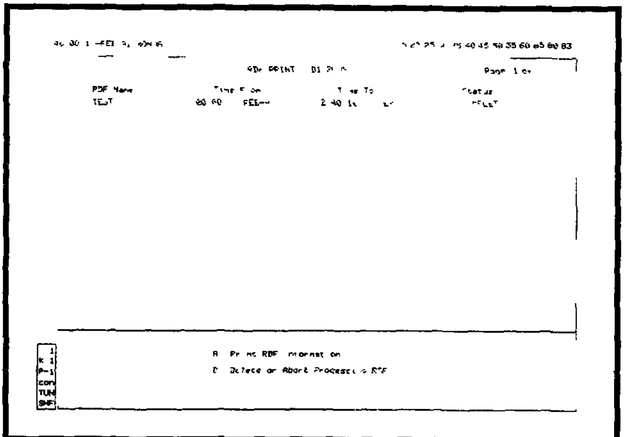
The *Print/Delete RDF* option provides the capability to print the data in a selected RDF file The option also provides the capability to delete or abort processing of RDF files Three types of information from each RDF file can be printed in any combination

Retrieval request data - relates to the retrieval constraints defined during data retrieval. The information identifies the retrieval criteria defined through the alarm group, tag historian group, wild card and individual tags retrieval options

Tag configuration data provides database information as defined for a tag during tag configuration The information consists of both general and specific tag related attributes

Exception reports details the values or states exception reported for the process variable referenced by the tag The information includes tag name, tag type, tag value or state, engineering unit of measurement, quality, alarm state, and date and time of the exception reported data

The operator initiates a data printout or deletion through an RDF print/display page (see Figure 11-28) Select *C Print/Delete RDF* from the tag historian menu to call the page The page provides a directory of RDF files Each entry in the list reflects the status of a previous retrieval request



TPS0204A

Figure 11-28 Print/Delete RDF Page

RDF Name name assigned to retrieved data at one of the retrieval request pages

Time From corresponds to the starting time of a retrieval request

Time To corresponds to the ending time of a retrieval request

Status - identifies the current processing status of both a retrieval, and print or delete request for a selected RDF file The status can appear as

COMPLETE	No current processing
FORMATTING	Formatting a requested print
BUILDING	Building an RDF file after a retrieval request
DELETING	Deleting an RDF file after a delete request
ABORTING	Aborting the current retrieval or print request
ABORT/DEL	Aborting the current retrieval or print request, and deleting an RDF file

The options at the bottom of the page provide the ability to print or delete RDF file data, and abort any retrieval or print processing currently in progress These options are explained in the following paragraphs

Printing RDF Tag Data

The operator prints data contained in RDF files, and selects the type of data to print through the *Print RDF Information* option (see Figure 11 28) To print tag data in an RDF file

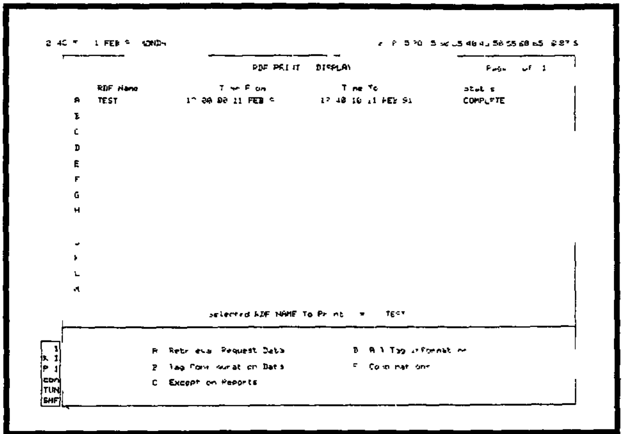
1 Press A to select the option A *Select RDF Name to Print* prompt and selector letters adjacent to the *RDF Name* column appear on the page

2 At this point, press NEXT PAGE or PREV PAGE to call the next or previous page of up to 13 additional RDF file names This is only required if the desired RDF file to print is not currently on the page Continue with the next step if not required or after finding the desired RDF name

3 Select an RDF file to print by selecting the letter to the left of the file name A menu with data type options appears at the bottom of the page (see Figure 11 29) The menu provides the capability to select the type of information to retrieve and print from the selected RDF file Press ESC to deselect the RDF file and make another selection

4 Select one of the options from the menu The console begins processing a print request immediately after selection Press

A	To print only retrieval request data
B	To print only configuration data



TPS0205A

Figure 11 29 Print RDF Tag Data Options Page

[C] To print only exception reported data

[D] To print all data in the RDF file

[E] To allow selecting a combination of the three data types This option requires additional input before the console begins processing the print request

Retrieval Request Data (Y/N) ___
Tag Configuration Data (Y/N) ___
Exception Reports (Y/N)

After selecting, choose whether the console is to gather and print a certain type of data by entering either **YES** or **NO** in the input field associated with each data type. Press [ENTER] to initiate the request

NOTE A print operation initiated here can take a variable amount of time depending on the amount of data to format and system load The tag historian print function runs as a background program This allows exiting the page to perform other operations while the console processes a print request once a print is queued

5 Press [ESC] to exit the page

The status of a print request for an RDF file can be seen at the *Status* column for that RDF file The column shows *FORMATTING* while processing a print request

Figure 11-30 is an example of an RDF file printout The example shows the data that prints when selecting the *All Tag Information* option

```
RDF::  TAGDAT                  OCT 15,1992 07:27:58  -  OCT 24 1992 10:24:37                    Page 1

                                          JOB SUMMARY

               RETRIEVAL OPERATION STARTED AT DEC 05,1992 10:11:51
                                 COMPLETED AT DEC 05,1992 10:14:50

               NO ERRORS ENCOUNTERED

                                        REQUEST CRITERIA
DATA REQUESTED FROM    JUL 27,1992 15:00:00 TO NOV 01,1992 00:00:00

RETRIEVAL CRITERIA  :  ALARM GROUP 1 TO 5

                                    TAG CONFIGURATION DATA
 RCM 00215            Tag Index    2 5                  Tag Descr ptor    SOE1 ISM STANDARD REPORT
                      Tag Type     RCM               Loop PCU Mod B ock   2   5   9   200
                    A arm Group    5
                  A arm Comment
                     Zero State     ZERO                    One State      ZERO
            Conf guration T me     OCT 14 1992 13 02:16
 RCM 00216            Tag Index    2 6                  Tag Descr ptor    SOE2 ISM SUMMARY REPORT
                      Tag Type     RCM               Loop PCU Mod B ock - 2   5   9   201
                    A arm Group    5
                  A arm Comment
                     Zero State     ZERO                    One State      ZERO
            Conf gurat on T me     OCT 14,1992 13:02:16
 RCM 00217            Tag Index    2 7                  Tag Descr ptor    SOE3 ISM PRE FAULT REPORT
                      Tag Type     RCM               Loop PCU Mod B ock   2   5   9   202
                    A arm Group    5
                  A arm Comment
                     Zero State     ZERO                    One State      ZERO
            Conf gurat on T me     OCT 14,1992 13:02:17
 RCM 00218            Tag Index    2 8                  Tag Descr ptor    SOE4 ISM POST FAULT REPORT
                      Tag Type     RCM               Loop PCU Mod B ock - 2   5   9   203
                    A arm Group    5
                  A arm Comment
                     Zero State     ZERO                    One State      ZERO
            Conf gurat on T me     OCT 14 1992 13 02:17

                                    EXCEPTION REPORT DATA
                                 TAG         ENG                 ALARM
      TAG NAME      TAG TYPE  VAL/STATE      UNIT     QUALITY    STATE           TIME

     RCM 00215        RCM        ZERO                   *          *        OCT 15,1992 07 27:58
                      RCM        ZERO                   *          *        OCT 15,1992 08 23 07
                      RCM        ZERO                   *          *        OCT 15,1992 09:18: 9
                      RCM        ZERO                   *          *        OCT 15,1992 10:13 35
                      RCM        ZERO                   *          *        OCT 15,1992 11 08 24
                      RCM        ZERO                   *          *        OCT 15,1992 12 03:05
                      RCM        ZERO                   *          *        OCT 15,1992 12 57 46
                      RCM        ZERO                   *          *        OCT 15 1992 13 52 33
                      RCM        ZERO                   *          *        OCT 15 1992 14:47 13
                      RCM        ZERO                   *          *        OCT 15,1992 15 42:00
```

TPS0206B

Figure 11 30 Example Retrieved Tag Data Printout

Delete or Abort RDF Tag Data Processing

The operator deletes and aborts processing of RDF tag data files through the *Delete or Abort Processing RDF* option (see Figure 11 28) To delete or abort processing of an RDF file

1 Press **B** to select the option A *Select RDF to Delete/Abort* prompt and selector letters adjacent to the *RDF Name* column appear on the page

2 At this point, press **NEXT PAGE** or **PREV PAGE** to call the next or previous page of up to 13 additional RDF file names This

is only required if the desired RDF file to delete or abort is not currently on the page

3 Select an RDF file to delete by selecting the letter to the left of the file name One of two things happens Either an *Are You Sure?* prompt or a new menu appears at the bottom of the page depending on the current processing status for the selected RDF file Press $\boxed{\text{ESC}}$ to deselect the RDF file and make another selection

If the RDF file status is *COMPLETE* or *BUILDING*, the *Are You Sure?* prompt appears

If the RDF file status is *FORMATTING*, the following options appear

A Abort Processing and Delete RDF	Stops processing and deletes the RDF file
B Abort Processing	Stops processing only

Select either *A* or *B* The *Are You Sure?* confirmation prompt appears

4 Answer **YES** in response to the *Are You Sure?* to continue with the request or **NO** to cancel, then press $\boxed{\text{ENTER}}$

The status of the RDF file changes to *DELETING* after confirming a delete request It changes to *ABORT/DEL* after confirming an abort processing and delete RDF request It changes to *ABORTING* after an abort request

5 Press $\boxed{\text{ESC}}$ to exit the page

On the next call up of the *Print/Delete RDF* page, the status should return to *COMPLETE* or a deleted RDF file should not appear as an entry in the directory listing

SECTION 12 - UTILITIES

INTRODUCTION

This section explains the utilities available at the operator interface station (OIS) The utilities relate to both process and OIS operations This section explains and provides operating procedures for the utilities.

SET DATE AND TIME

The *Set Date and Time* option provides system and local time *maintenance capabilities. It performs* two functions

1 Sets the local displayed time of the console This determines the date and time that is associated with data collected by functions such as logging and archiving

2 Establishes a system time to synchronize all nodes on the loop

PCU modules use a system date and time for functions that provide a time stamp along with collected data, an example being trend data System date and time refers to the date and time that is set for the communication highway and available to all nodes on the loop Refer to ***TRENDING*** in the ***INFI 90 System and OIS Overview*** section for further explanation of time-stamp as it applies to trending

> **NOTE** In the following discussion any reference to time also infers date and time

For the INFI-NET system, the system time is normally set to Greenwich Mean Time (GMT) It can, however, be set to any time that is common to your system. In either case, the console requires *some type of absolute time to properly initialize its time* synchronizing variables and offset By using GMT as an absolute time and setting the system time to GMT for this and all other systems, for example, it becomes possible to transfer data that is time stamped between different sites even if the sites are in different time zones The time of occurrence in local time can be derived from the system time associated with a piece of data The console automatically does this by calculating an offset between the system time and local time then adding the difference to the time stamp of the data

The Plant Loop system does not use an absolute time The system time on the loop is always the local time, or the time entered as the local time A console that operates on Plant Loop system, however, still needs an absolute time that it uses internally

Only one node on the time synchronization for all nodes connected to the loop That node is the time sync master Specifically, the communications interface unit of a single node provides a time sync message that synchronizes the communication modules of other nodes For the INFI NET system, the message establishes a common system time and local time on the loop The time sync message establishes a local time on the loop for the Plant Loop system to be used as the system time

The console can become the time sync master on a loop Normally, the console becomes the master when the *Set Time and Date* function is used If there is more than one console in the system, the consoles perform an arbitration process to establish a time sync master Since some external clocks are considered more accurate than others, this allows the console with the most accurate external clock to assume the responsibility of maintaining system time An external clock, for example, is a satellite clock or a battery backed clock

For the INFI NET system, it is suggested that only one console be used to set date and time, preferably the console with the most accurate external clock After initially setting the system time at this console, the time then only needs to be accepted at the remaining consoles on the loop The console provides an option to accept the system time and local time on the loop without making any changes to them Using this method prevents the consoles from having to perform the arbitration process, which begins each time the system time (GMT) or local time (wall clock) is set at a console

Since the local time is the system time for the Plant Loop system, the local time must be set at each console individually to establish time synchronization After this initial setting to establish time synchronization, however, the time can be adjusted for all consoles through a single console Control of time synchronization transfers as the time is set at each console The consoles perform the arbitration process to return control to the console with the most accurate external clock In this case, it may be better to set the time for the console with the most accurate external clock last

The first page of the INFI NET diagnostics function identifies the current time sync master for the loop, refer to ***INFI-NET DIAGNOSTICS*** in the ***INFI 90 and OIS Diagnostics*** section for further explanation

Once the time sync master has been established either through setting time or through arbitration, a console maintains the system time through its communication interface unit The interface unit sends a set time command on the loop every two minutes to maintain the system time To insure that the interface has an accurate time, the console that is the time sync master initiates a set time command to its communication interface unit at least once every half hour If the system does not use a satellite clock, the console sets the time for its battery backed clock to GMT (or the common time established for the system if not using GMT as the absolute time)

For the INFI-NET system, a time-sync message contains both the system time and the local time When a console that is not the time sync master accepts a time sync message, it synchronizes its local displayed time to the local time received in the message If the console is not equipped with a satellite clock receiver, it sets its battery-backed clock to the system time received

For the Plant Loop system, a time-sync message contains only the system time, which is also the local time When a console that is not the time sync master accepts a time sync message, it calculates the time it sets in its battery backed clock as an offset from the local time received in the message The console does this because it still needs some type of absolute time to properly initialize its time synchronizing variables and offsets

The operator uses the *Set Date and Time* function to set both the system time and local time Once done, the console can calculate its offsets to properly display any times associated with collected data The console either adds or subtracts the calculated offset for the local time to the system time associated with a piece of data It does this to present the time in displays or printed reports referenced to local time

The operator accesses the time maintenance functions through the *Set Date and Time* page (see Figure 12 1) To call this display, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *B Set Date And Time*

The set date and time page provides several time maintenance options. Which option to use depends on the current time sync status of the system Options *A*, *B*, *C*, *E*, *H*, *I* and *J* adjust the local time (wall-clock) Options *E*, *F*, *G*, *H*, *I* and *J* change the system time (absolute time) The function of option *D* depends on the type of communication highway on which the console operates

For the INFI-NET system, option *D* accepts the current local time and system time of the loop at this console This allows initializing the local time and system time at the console without affecting the current local time and system time already established on the loop Option *D* allows entering a start and end date and time of daylight savings time for Plant Loop system The console requires this information to properly calculate an offset from the local time to set the time for its battery backed clock if using daylight savings times

> **NOTE** Caution should be taken when using this function to set or change the system time for the loop If the date or time is radically changed existing trend data will be reinitialized causing trend data loss A change could also create gaps in collected trend data Normal time changes such as going to daylight savings time do not cause any loss of trend data

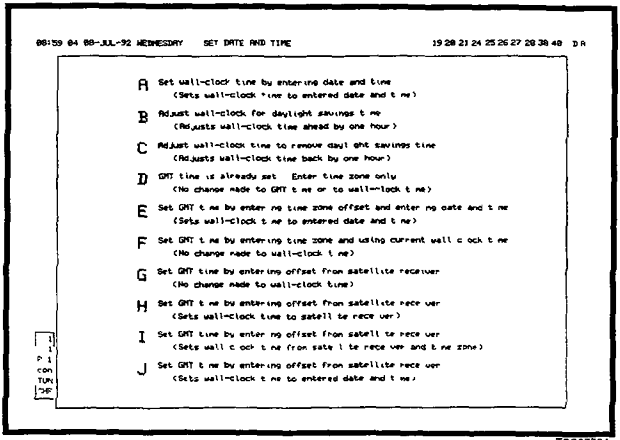


Figure 12 1 Set Date and Time Display

To set the date and time

1 Choose the appropriate time maintenance option for your requirements The page that appears next depends on the option chosen

2 Make any required entries Refer to ***Setting the Time for INFI-NET System*** or ***Setting the Time for Plant Loop System*** in this section for information about the various *Set Date and Time* options Refer to the appropriate paragraph for the option chosen for a description of the entries required

When entering an hour, minute and second offset, indicate whether the offset is a positive or negative offset value in the first position of the *HOUR* entry, for example, **-05** or **+01**

3 Press **ENTER** to initiate the option and time change

4 Press **ESC** to exit

The time maintenance options work slightly different for INFI-NET system than *Plant Loop* system

Setting the Time for INFI-NET System

When setting the time for INFI NET system, it is important to remember that the time sync message sent on the loop contains both the system time and the local time The system time should be set to some common time such as GMT This common time does not have to be Greenwich Mean Time, although it is suggested The common time can be, for example, the tıme at some maın sıte to whıch all remote sıtes are to synchronıze In any case, thıs common tıme must be propagated to all other systems that are to share data The local tıme, ın most cases, should be the local tıme accordıng to the tıme zone ın whıch the system operates

> **NOTE** Caution should be taken when ın t a y settıng system t me (GMT) Trend data collection for an OIS console with software release C *n* or less and a management command system (MCS) console w th *software release* Q *n or less operat ng on the same loop as an* OIS console with software release E 1 or greater and an MCS conso e w th software re ease R 1 or greater can be affected by thıs change On each C *n* or less console or Q *n* or less console archıve any trend data already collected before settıng the system tıme to prevent oss of data After settıng the tıme, de ete the ***TRNDHRD TR*** f le from the USN 14 d rectory, then reset the console

TIME MAINTENANCE OPTIONS

> **NOTES**
>
> 1 In the *Set Date and Tıme* options *GMT* can also be nterpreted as absolute t me f Greenw ch Mean T me ıs not be ng used
>
> 2 When enterıng an hour m nute and second offset nd cate whether the offset ıs a pos t ve or negat ve offset va ue ın the f rst position of the *HOUR* entry for example **-05** or **+01**

Option A *A Set wall clock tıme by enterıng date and tıme* allows settıng or adjustıng the local tıme at the consoles Thıs optıon updates the local tıme beıng sent to all other consoles on the loop wıthout affectıng the system tıme Thıs functıon dırectly sets the local tıme for the consoles to the date and tıme entered as the *Wall Clock Date and Tıme*

Option B *B Adjust wall clock for daylıght savıngs tıme* - advances the local tıme at the consoles by one hour

Option C *C Adjust wall clock tıme to remove daylıght savıngs tıme* retards the local tıme at the consoles by one hour

Option D *D GMT tıme ıs already set Enter tıme zone only* allows enterıng the tıme zone offset from GMT ın hours, mınutes and seconds The entry ıs strıctly for reference and sımply allows enterıng the value so ıt does not have to be calculated or looked up repeatedly The ımportance of the optıon ıs that ıt ınıtıalızes tıme synchronızatıon for a console wıthout affectıng the system tıme or local tıme previously set

Option E *E Set GMT tıme by enterıng tıme zone offset and enterıng date and tıme* sets the system tıme to GMT and sets the local tıme Thıs functıon dırectly sets the local tıme for the consoles to the date and tıme entered as the *Wall Clock Date and Tıme* It sets the system tıme based on a tıme zone offset from the current local tıme

> entered local tıme + *Tıme Zone Offset from Greenwıch Mean Tıme* = system t me

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset

The *Daylight Savings Time Effective* field identifies whether the local time being entered is or is not a daylight savings time to allow the console to adjust system time accordingly Enter **YES** if the time is a daylight savings time, **NO** if not

Option F *F Set GMT time by entering time zone and using current wall clock time* sets the system time to GMT without affecting the current local time Option *A* must be used to set the local time first This sets the system time based on a time zone offset from the current local time

local time set with option *A* + *Time Zone Offset from Greenwich Mean Time* system time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset

The *Daylight Savings Time Effective* field identifies whether the current local time is or is not a daylight savings time to allow the console to adjust the system time accordingly Enter **YES** if the time is a daylight savings time, **NO** if not

Option G *G Set GMT time by entering offset from satellite receiver (No change made to wall clock time)* sets the system time to GMT without affecting the local time This sets the system time based on a time zone offset from the current local time, and any calculated difference in time between the satellite receiver time and GMT

(local time set with option A + *Time Zone Offset from Greenwich Mean Time*) + (*Difference between the Satellite Receiver and GMT*) system time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* entry allows adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference.

Option H *H Set GMT time by entering offset from satellite receiver (Sets wall clock time to satellite receiver)* sets the system time to GMT and sets the local time This sets the local time for the consoles to the time being reported by the satellite receiver

satellite receiver time local time

This sets the system time based on a time zone offset from the current local time, and any calculated difference in time between the satellite receiver time and GMT

(local time + *Time Zone Offset from Greenwich Mean Time*) + (satellite receiver time + *Difference between the Satellite Receiver and GMT*)
system time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

Option I *I Set GMT time by entering offset from satellite receiver (Sets wall clock time from satellite receiver and time zone)* sets the system time to GMT and sets the local time

This option sets the local time for the consoles based on a time zone offset from the satellite receiver, and any calculated difference in time between the satellite receiver time and GMT The final calculated local time is derived directly from the satellite time

(satellite receiver time + *Difference between the Satellite Receiver and GMT*) + *Time Zone Offset from Greenwich Mean Time* – local time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time

This option sets the system time based on any calculated difference in time between the satellite receiver time and GMT

satellite receiver time + *Difference between the Satellite Receiver and GMT* – system time

The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

The *Daylight Savings Time Effective* field identifies whether the local time is to be a daylight savings time or not to allow the console to adjust accordingly Enter **YES** if the local time is to be a daylight savings time, **NO** if not

Option J *J Set GMT time by entering offset from satellite receiver (Sets wall clock time to entered date and time)* sets the system time to GMT and sets the local time This function directly sets the local time for the consoles to the date and time entered as the *Wall-Clock Date and Time*

entered time ocal time

This sets the system time based on a time zone offset from the current local time, and any calculated difference in time between the satellite receiver time and GMT

(local time + *Time Zone Offset from Greenwich Mean Time*) + (satellite receiver time + *Difference between the Satellite Receiver and GMT*) system time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

DATE AND TIME REQUIREMENTS FOR INFI-NET SYSTEM

For a system having only one console operating on an INFI NET system, set GMT and local time (wall clock) at the console This establishes time synchronization for the loop

For a system having more than one console operating on an INFI NET system, setting GMT (or some absolute time) at only one of the consoles is required to set the system time for the entire loop It is suggested that a single console be designated for setting the system time Even though the system time has been set for the loop, the operator must still accept the loop time at each of the other consoles The console requires this to establish the relationship between its local time and system time, and to properly initialize its time synchronizing variables and offsets If this is not done, the message

Greenwich Mean Time Must Be Initialized

appears as an operator request for action The message can be cleared after using any one of options *D* through *J* Refer to ***OPERATOR ACTION REQUESTS*** in the ***OIS Operational Information*** section for procedures to process an action request

One sequence for initially establishing time synchronization might be

1 Set the initial system time (GMT or some type of absolute time) and the local time at one console

2 Initialize time synchronization at all other consoles by choosing option *D*

After initially establishing time synchronization, the local time can be adjusted at any time Use the console with the most accurate external clock to make any time adjustments

Choose option *E*, *F*, *G*, *H*, *I* or *J* to initially set the system time for the loop Options *E*, *H*, *I* and *J* also set the local time for the con soles If using option *F* or *G*, the local time must first be set with option *A*. Choose the best option for your particular requirements

To initialize the time at all other consoles on the loop

1 Select the *Set Date and Time* function after setting the initial time for the loop from any one console

2 Choose option *D* to initialize the time at other consoles without affecting the system time set previously

Any one of options *E* through *J* can also be used to initialize time syncing, but these options either cause this console to become the time sync master, or start the arbitration process to determine the time sync master After completing any one of these options, the *Greenwich Mean Time Must Be Initialized* message can be processed and removed from the operator action requests function

Choose option *A*, *B* or *C* to adjust the local time only for this and all other consoles on the loop

Setting the Time for Plant Loop System

When setting the time for Plant Loop system, it is important to remember that the time-sync message sent on the loop contains only the system time, which in this case is also the local time A console still requires some type of absolute time such as GMT to properly initialize its time synchronizing variables and offsets This absolute time is used internally by the console The system time, in most cases, should be the local time according to the time zone in which the system operates.

TIME MAINTENANCE OPTIONS

NOTES

1 In the *Set Date and Time* options, *GMT* can be interpreted as the absolute time

2 When entering an hour, minute and second offset indicate whether the offset is a positive or negative offset value in the first position of the *HOUR* entry for example -05 or +01

Option A *A Set wall-clock time by entering date and time* allows setting or adjusting the system time at the consoles This option updates the system time being sent to all other consoles on the loop without affecting the absolute time for the console This function directly sets the system time for the consoles to the date and time entered as the *Wall Clock Date and Time*

Option B *B Adjust wall clock for daylight savings time* advances the sys tem time at the consoles by one hour

Option C *C Adjust wall clock time to remove daylight savings time* retards the system time at the consoles by one hour

Option D *D Configure beginning and end of daylight savings time* identifies the dates and times for daylight savings time to the console The console requires this to properly set its battery backed clock The *Daylight savings time used* field determines whether or not daylight savings time is being used for the system

Set the field to **YES** if the system uses daylight savings time Enter a starting day, month and year, and hour, minute and second for daylight savings time Enter the same information for the end of daylight savings time The entry in the *YEAR* field must match for both the start and end date If not the console does not accept the entries This must be done once a year

The field defaults to *NO*, and if it is not changed to *YES*, no further action is required now or at any time in the future

Option E *E Set GMT time by entering time zone offset and entering date and time* sets the absolute time used by the console to GMT and sets the system time on the loop This function directly sets the system time for the consoles to the date and time entered as the *Wall Clock Date and Time* It sets the absolute time based on a time zone offset from the current system time

> entered system time + *Time Zone Offset from Greenwich Mean Time* absolute time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset

The *Daylight Savings Time Effective* field identifies whether the system time being entered is or is not a daylight savings time to allow the console to adjust absolute time accordingly Enter **YES** if the time is a daylight savings time, **NO** if not

Option F *F Set GMT time by entering time zone and using current wall clock time* sets the absolute time used by the console without affecting the current system time on the loop Option *A* must be used to set the system time first This sets the absolute time based on a time zone offset from the current system time

> system time set with option *A* + *Time Zone Offset from Greenwich Mean Time* absolute time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset

The *Daylight Savings Time Effective* field identifies whether the current system time is or is not a daylight savings time to allow the console to adjust the absolute time accordingly Enter **YES** if the time is a daylight savings time, **NO** if not

Option G *G Set GMT time by entering offset from satellite receiver (No change made to wall clock time)* sets the absolute time used by the con sole to GMT without affecting the current system time on the loop. This sets the absolute time based on a time zone offset from the current system time, and any calculated difference in time between the satellite receiver time and GMT

(system time set with option *A* + *Time Zone Offset from Greenwich Mean Time*) + (*Difference between the Satellite Receiver and GMT*) abso ute time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* entry allows adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

Option H *H Set GMT time by entering offset from satellite receiver (Sets wall clock time to satellite receiver)* - sets the absolute time used by the console to GMT and sets the system time on the loop This sets the system time for the consoles to the time being reported by the satellite receiver

satellite receiver time system time

This sets the absolute time based on a time zone offset from the current system time, and any calculated difference in time between the satellite receiver time and GMT

(system time + *Time Zone Offset from Greenwich Mean Time*) + (sate te receiver time + *Difference between the Satellite Receiver and GMT*) − absolute time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

Option I *I Set GMT time by entering offset from satellite receiver (Sets wall clock time from satellite receiver and time zone)* sets the absolute time used by the console to GMT and sets the system time on the loop

This option sets the system time for the consoles based on a time zone offset from the satellite receiver, and any calculated difference in time between the satellite receiver time and GMT The final calculated system time is derived directly from the satellite time

(satell te rece ver time + *Difference between the Satellite Receiver and GMT*) + *Time Zone Offset from Greenwich Mean Time* system t me

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time

This option sets the absolute time based on any calculated difference in time between the satellite receiver time and GMT

satel ite rece ver t me + *Difference between the Satellite Receiver and GMT* absolute t me

The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

The *Daylight Savings Time Effective* field identifies whether the system time is to be a daylight savings time or not to allow the console to adjust accordingly Enter **YES** if the system time is to be a daylight savings time, **NO** if not

Option J *J Set GMT time by entering offset from satellite receiver (Sets wall clock time to entered date and time)* sets the absolute time used by the console to GMT and sets the system time on the loop This function directly sets the system time for the consoles to the date and time entered as the *Wall-Clock Date and Time*

entered t me system time

This sets the absolute time based on a time zone offset from the current system time, and any calculated difference in time between the satellite receiver time and GMT

(system time + *Time Zone Offset from Greenwich Mean Time*) +
(sate l te receiver time + *Difference between the Satellite Receiver and GMT*) abso ute time

The *Time Zone Offset from Greenwich Mean Time* entry determines the amount of offset from the current time zone time The *Difference between the Satellite Receiver and GMT* fields allow adjusting for any difference in time between GMT and the satellite time

The *Satellite Receiver Date and Time* shows the time being reported by the satellite receiver for reference

DATE AND TIME REQUIREMENTS FOR PLANT LOOP SYSTEM

For a system having only one console operating on a Plant Loop system, set GMT and local time (wall-clock) at the console Setting the local time establishes a system time for time synchronization of the loop Setting GMT initializes internal time synchronization for the console

For a system having more than one console operating on a Plant Loop system, GMT must be set at each one of the consoles individually A console requires this to properly initialize its time synchronizing variables and offsets If this is not done, the message

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appears as an operator request for action at each console for which the time has not been set The message can be cleared after using any one of options *E* through *J* Refer to ***OPERATOR ACTION REQUESTS*** in the ***OIS Operational Information*** section for procedures to process an action request

The sequence for setting the time at each console is

1 Set the local time and GMT at the console

2 Enter the start and ending date and time for daylight savings time

After initially setting the time at a console, the local time can be adjusted at any time. Use the console with the most accurate external clock to make any time adjustments

Even though the time-sync message sent on the Plant Loop system does not contain an absolute time, the console still internally requires an absolute time to calculate any offsets

Choose option *E*, *F*, *G*, *H*, *I* or *J* to initially set the local time and establish an absolute time (as GMT or some other common time) for the console If using option *F* or *G*, the local time must first be set with option *A* Choose the best option for your particular requirements

Using any one of these options causes this console to become the time-sync master, or starts the arbitration process to determine the time sync master After completing any one of these options, the *Greenwich Mean Time Must Be Initialized* message can be processed and removed from the operator action requests function

Choose option *D* to identify the dates and times for daylight savings time The console requires this to properly set its battery backed clock This must be done once a year

Choose option *A*, *B* or *C* to adjust the local time only for this and all other consoles on the loop

TAG SUMMARIES

The console provides the capability to both display and print summaries of process information The information in each entry of a summary reflects values exception reported for a particular process point Specifically, the information is the current analog value or digital state of a process variable being referenced by a defined tag The value or state displays or prints with additional information including

TAG INDEX	Tag database index number
TAG NAME	Name of the tag as defined in the tag database
TAG DESCRIPTION	Description for the tag as defined in the tag database
TAG TYPE	Type of tag
LOOP NOD MOD BLK	Hardware loop, node (PCU) and module address, and software block address of the function block in a PCU module the tag references
ALM/QUAL	All normal alarm status and quality indications in a five character alarm status/quality/group field
MODE	Identifies the input source selection for a DANG or DADIG tag Refer to ***Data Acquisition Analog Element*** and ***Data Acquisition Digital Element*** in the ***Data Acquisition*** section for an explanation of the indications presented
PRIORITY	Descriptor that identifies the priority level of an alarm condition Refer to ***Alarm Priority Descriptors*** in the ***Alarm Processing*** section for further explanation
STATUS	Provides the following indications for DANG, DADIG and TEXTSTR tags

V variable alarming enabled for DANG tag

^ quality override condition for DANG, DADIG or TEXTSTR tag

@ constrained value for DANG tag

L alarm state latch enabled for DADIG tag

N no report condition for a DANG or DADIG tag

VALUE	Current value or state For all options except *A General Tags*, the values are snapshots

ENGUT	Unit of measurement associated with an analog value
LOW LMT	Zero or minimum limit for an analog value
HIGH LMT	Span or maximum limit for an analog value

NOTE The engineering unit high limit and low limit fields remain blank for digital variables

TRNC	Indicates the presence or absence of remote truncation for a text string. Remote truncation is done by a PCU module or the interface unit of the console *TRNC* appears if remote truncation has been done for the displayed text string

NOTE The display allows for a 37-character text string The console indicates local truncation of a text string with an ellipsis ( ) at the end of the text string

The operator both views and prints tag summaries through the *Tag Summaries* menu page (see Figure 12 2) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *C Tag Summaries*

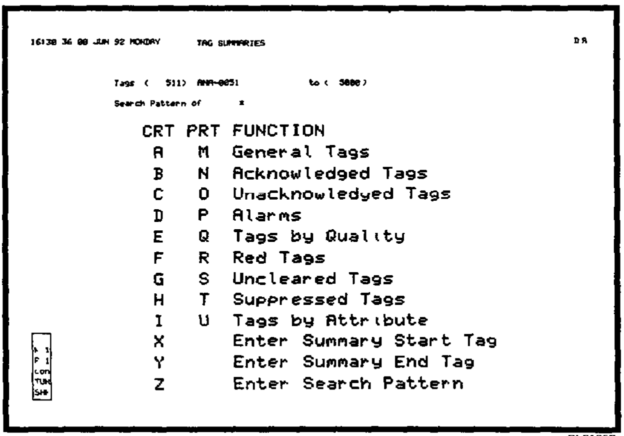

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Figure 12 2 Tag Summaries Menu

The tag summaries menu has choices for on screen presentation (options *A* through *I*) or printer output (options *M* through *U*) of tag summaries It also has options for specifying a start and end tag range, and tag name search pattern The summaries can be for all tags or only those tags in a specific condition identified by the menu items

The fields at the top of the page indicate the current tag range and search pattern The operator sets the tag range through options *X* and *Y* The search pattern is set through option *Z* Initially, the console defaults to the entire tag range and a search pattern of *, which is a wild card character that specifies all tag names

The steps required to display or print a summary include

1 Set tag range

2 Set search pattern

3 *Select a screen (CRT) or print (PRT) option for presenting the* summary Refer to ***Summary Options*** in this section for a description of the available options and the summaries they produce

Set Range and Search Pattern

NOTE Al *CRT* or *PRT* options reference the range and search pattern *when comp l ng summary data*

The tag range allows limiting the displayed or printed listing to only tags within a certain tag index range This procedure is only necessary if the current range shown at the top of the page is not the desired range To specify a range

1 Select *X Enter Summary Start Tag*, a *Tag Name or Index* input prompt appears

2 Key in either the tag name or index number of the first tag that is to appear in the summary list, then press ENTER The starting index number and associated tag name appear in the first range field

3 Select *Y Enter Summary End Tag*, a *Tag Name or Index* input prompt appears

4 Key in either the tag name or index number of the last tag that is to appear in the summary list, then press ENTER The console does not allow entering an index number less than the starting number The ending index number and its associated tag name appear *in the second range field after pressing* ENTER

A search pattern allows limiting the displayed or printed list even further The console uses the entered pattern to search through the tag names within the specified range of tags Only tags having names that match the search pattern appear in the list

Wild card characters can be used when entering a search pattern The asterisk (*) represents multiple characters, the question mark (?) a single character. For example, ABC* limits the list to only those tags with tag names having ABC as their first three characters Any combination of * and ? can be used The console supports multiple occurrences of ? Multiple occurrences of * are treated as ? after the first *

To enter the search pattern

1 Select *Z Enter Search Pattern*, a *Search Pattern* input prompt appears

2 Key in a search pattern from 1 to 14 characters, then press ENTER The *Search Pattern of* field at the top of the page updates to the entered pattern The console defaults to * for an unrestricted search

Summary Options

The tag summaries page provides several options when creating a process summary listing The options determine which tags based on their current operating condition appear in the summary list All options reference the range and search pattern entries when creating the summary The following options are available through the tag summaries function

General Tags The *General Tags* option does not restrict the summary to any specific operating state Using this option, a displayed summary updates to show current process values while on the screen A printout contains snapshot values

Acknowledged Tags The *Acknowledged Tags* summary contains tags that are currently in an alarm or return to normal condition and have been acknowledged by the operator An entry in the *ALM/QUAL* column denotes a tag in an alarm condition where no entry in this column identifies a return to normal

Unacknowledged Tags The *Unacknowledged Tags* summary contains tags that are currently in an alarm or return to normal condition but have not been acknowledged by the operator An entry in the *ALM/QUAL* column denotes a tag in an alarm condition where no entry in this column identifies a return to normal The alarm status/ quality/group field in the *ALM/QUAL* column flashes for tags in alarm

Alarms The *Alarms* summary contains a list of all tags in an alarm condition whether acknowledged or unacknowledged Return to normals do not appear in this type of summary

Tags by Quality

The *Tags by Quality* summary contains a list of all tags in a certain quality state A submenu of options that allows selecting the type of quality to create a summary for appears after choosing this option The submenu options include

A Inhibited Tags the summary lists all tags that have alarm inhibiting implemented either manually or automatically An inhibit indication (*i*) appears in the quality position of the *ALM/QUAL* column Manual inhibiting is done through the operating parameters or alarm group inhibit functions

B Off Scan Tags the summary lists all tags that are currently disestablished or off scan on the loop A tag is set to an off scan condition through the operating parameters function An off scan indication (*x*) appears in the quality position of the *ALM/QUAL* column

C Bad Quality Tags the summary lists all tags being exception reported with bad quality All fields for these tags contain a defined bad quality string An asterisk (*) in the quality position of the *ALM/QUAL* column, and in the alarm status position if the console is set to process bad quality as an alarm, also identifies a bad quality condition

D Substituted Tags the summary lists all tags that currently have substituted values These tags have been taken off scan and forced to a certain value or state Substitutions are made through the operating parameters function A substitute indication (*s*) appears in the quality position of the *ALM/QUAL* column

E Suspect Tags - the summary lists all tags being exception reported with suspect quality A question mark (?) in the quality position of the *ALM/QUAL* column identifies a suspect condition

Red Tags

The *Red Tags* summary contains a list of all tags that are currently red tagged Red tagging is done through module configuration functions

Uncleared Tags

The *Uncleared Tags* option does not function for this console

Suppressed Tags

The *Suppressed Tags* summary contains a list of all tags having alarm suppression enabled Alarm suppression can be enabled or disabled for a tag through the operating parameters function

Tags by Attribute

The *Tags by Attribute* summary contains a list of all tags in a particular alarm group, having a certain tag type, or having a certain address Additional options available after selecting this option determine the type of attribute The options include

A Tags by Alarm Group enter an alarm group number for which to compile a summary list Valid entry is 1 to 99, S or D

B Tags by Type enter a tag type for which to compile a summary list Any valid tag type can be entered

C Tags by Address - enter the loop, PCU and module address for which to compile a summary list

Selecting an Option

Select any of the tag summary options from the tag summary menu (see Figure 12 2) to initiate a display or print of a tag summary As soon as an option is selected, the console either displays the desired summary, or begins processing the print request

Options *A* through *I* display a summary on the screen Up to 24 tags can appear at a single page Press NEXT PAGE or PREV PAGE to view additional summary pages

NOTE A opt ons except *A General Tags* are snapshots

Press ESC at any time to exit a summary page

The displayed summaries present all normal alarm indications Refer to the ***Alarm Processing*** section for a description of these indications Alarm acknowledgment ***cannot*** be done through these summary pages See Figure 12 3 for an example of a displayed summary page

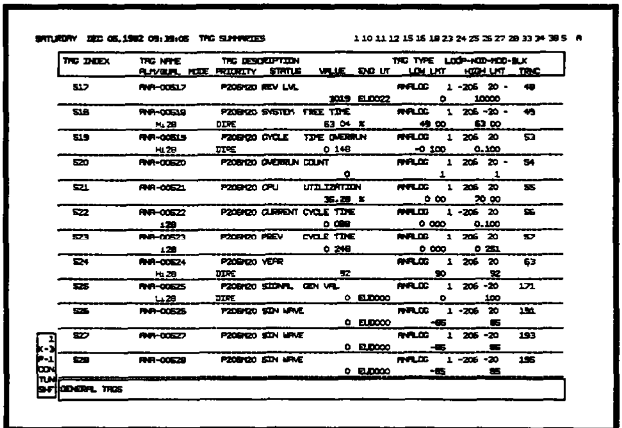

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Figure 12 3 Example Tag Summary

Options *M* through *U* initiate a printout of a tag summary The message *Processing page n* appears while the console creates the requested, printed summary If ESC is pressed while the process ing message displays, the console terminates the print request

A printout occurs at the printer assigned to the keyboard Look at the keyboard status block to determine which printer A maximum of 60 tags appear at a single printed page Each page contains the same information as the displayed version

Each printed summary contains snapshot values or states A time added to the page shows the time at which the summary page was created The summary title and page number also appear at the first line. The time is different for each page to reflect a closer time approximation for collected, dynamic information

Each printed page of a in single file created and sent to the printer This frees the printer for other requirements A message displays on the screen to identify the current page being generated

Press CANCEL to complete the current page, quit the creation of subsequent pages, and return to the summaries menu

In all cases, once the final page has been sent to the printer, control returns to the main menu Figure 12 4 is an example printout of a summary

```
12 21:36   21 JAN 1993          *** GENERAL TAGS              ***                              PAGE    001
TAG INDEX     TAG NAME         TAG DESCRIPTION                TAG TYPE   LOOP NOD MOD BLK
           ALM/QUAL  MODE       PRIORITY      STATUS    VALUE ENG UT       LOW LMT     HIGH LMT TRNC
               -                              ---
   100     ANA 00100           ANALOG TAG 0100                  A          2   3   2     504
                                                           32    LITRES       1          60
   101     ANA 00101           ANALOG TAG 0101                  A          2   3   2     505
                                                           32    LITRES       1          60
   102     ANA 00102           ANALOG TAG 0102                  A          2   3  11     330
             L 12               WARNING                     1                 1          12
   103     ANA 00103           ANALOG TAG 0103                  A          2   8  30     176
                                                           34    LITRES       1          60
   104     ANA 00104           ANALOG TAG 0104                  A          2   8  30     177
                                                           33    LITRES       1          60
   105     ANA 00105           ANALOG TAG 0 05                  A          2   8  30     178
                                                           34    LITRES       1          60
   106     ANA 00106           ANALOG TAG 0106                  A          2   3  11      31
                                                           50                 0         100
   107     ANA 00107           ANALOG TAG 0107                  A          2   3  11      47
             H 12               WARNING                     7    IN/HR        3           7
   108     ANA 00108           ANALOG TAG 0108                  A          2   3  11      69
                                WARNING                    35                 0         100
```

TPS0104B

Figure 12 4 Example Tag Summary Printout

PRINT TAG LIST

The console provides a print tag list utility to print a complete or partial tag database listing The printed information reflects the attributes configured for each tag in the list as defined during database configuration The printout resembles the tag configuration display page and contains all of the same fields

The operator initiates a tag list printout through the *Tag List to Printer* page (see Figure 12-5) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ G Print Database List ⟶ A Tag List

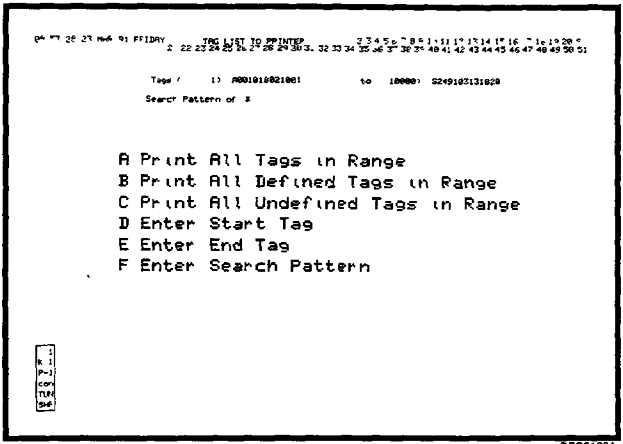

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Figure 12 5 Tag List to Printer

The tag list menu has three separate choices for selecting which tag indexes to print The listing can be for all tags, or only defined or undefined tags Also, the menu provides options for specifying a starting and ending tag range, and tag name search pattern The tag list printout occurs at the printer currently assigned to the keyboard Look at the keyboard status block to determine which printer

The fields at the top of the page indicate the current tag range and search pattern The operator sets the tag range through options *D* and *E* The search pattern is set through option *F* Initially, the console defaults to the entire tag range and a search pattern of *, which is a wild card character that specifies all tag names

The steps required to print a tag list include

1 Set tag range

2 Set search pattern

3 Select tag types to print.

Set Tag Range

The tag range allows limiting the printout to only tags within a certain tag index range This procedure is only necessary if the current range shown at the top of the page is not the desired range

To specify a range

1 Select *D Enter Start Tag*, a *Tag Name or Index* input prompt appears

2 Key in either the tag name or index number of the first tag that is to appear in the summary list, then press ENTER The starting index number and associated tag name appear in the first range field

3 Select *E Enter End Tag*, a *Tag Name or Index* input prompt appears The end range value to enter to print a complete tag list depends on the size of the tag database

4 Key in either the tag name or index number of the last tag that is to appear in the summary list, then press ENTER The console does not allow entering an index number less than the starting index number The ending index number and its associated tag name appear in the second range field

Set Search Pattern

A search pattern allows limiting the printed list even further The console uses the entered pattern to search through the tag names within the specified range of tags Only tags with names that match the search pattern print

Wild card characters can be used when entering a search pattern The asterisk (*) represents multiple characters, the question mark (?) a single character For example, ABC* limits the list to only those tags with tag names having ABC as their first three characters Any combination of * and ? can be used The console supports multiple occurrences of ? Multiple occurrences of * are treated as ? after the first *

To enter the search pattern

1 Select *F Enter Search Pattern*, a *Search Pattern* input prompt appears

2 Key in a search pattern from 1 to 14 characters, then press ENTER The *Search Pattern of* field at the top of the page updates to the entered pattern The console defaults to * for an unrestricted search

Select Tag Type

Options *A*, *B* and *C* determine which tags appear in the listing The console compiles the tag list by checking the *Tag Type* field configured for each tag when using options *B* and *C* It also references the range and search pattern entries when creating any tag list

The options include

Print All Tags in Range - press [A] to print all tags within the defined range and matching the search pattern

Print All Defined Tags in Range - press [B] to print all tags that have been defined through tag configuration A defined tag is of any tag type except *UNDEF*

Print All Undefined Tags in Range press [C] to print all tags that have an *UNDEF* tag type The printout provides a complete list of available tag index numbers

After making any of these selections, the console collects then formats the pages of the list for printing The current page number being processed displays in the message

Processing page n

Exiting the display after making a selection, but while the *Processing page n* is displaying causes the printout to stop

If the console cannot find any tags within the range that match the desired tag type, this message appears

Nothing in Range to Print w/this Option

PRINT TREND LIST

The console provides a print trend list utility to print a complete or partial list of defined trends The utility has several options to select which trends are to appear in the printed list The options identify the trend definition attributes the console is to search for when compiling the trend list Depending on the selection made, the trend list can be based on

Tag name process tag associated with a trend

Trend type - normal (one-minute standard trends), fast (15 second standard trends), enhanced trends, or all available, undefined trend indexes

Collection mode sample, average, minimum, maximum, sum or range

Trend usage display only, save to disk, archived or external source trends

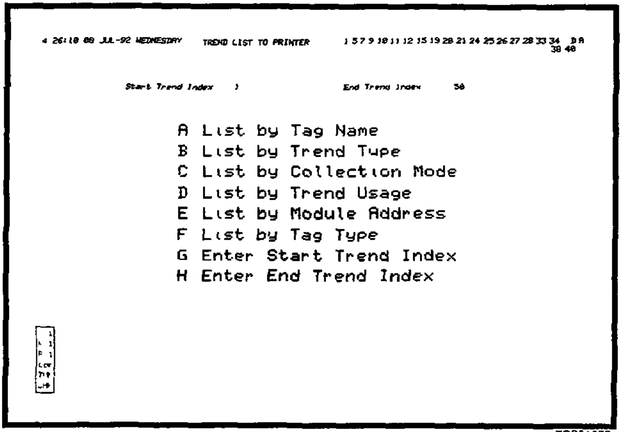
Module address - all trends within a single module

Tag type either analog or digital trends

A trend list printout occurs at the printer currently assigned to the keyboard Look at the keyboard status block to determine which printer

The operator initiates a trend list printout through the *Trend List to Printer* page (see Figure 12 6) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *G Print Database List* ⟶ *B Trend List*



TPS0107B

Figure 12 6 Trend List to Printer

The trend list menu has options for specifying a starting and ending trend index range The fields at the top of the page indicate the current trend index range and search pattern The operator sets the tag range through options *G* and *H* Initially, the console defaults to the entire trend index range

Set Range

The trend index range allows limiting the printout to only trends within a certain trend index range This procedure is only necessary if the current range shown at the top of the page is not the desired range To specify a range

1 Select *G Enter Start Trend Index* This positions an input cursor at the *Start Trend Index* field

2 Key in the index number of the first trend definition that is to appear in the listing, then press ENTER

3 Select *H Enter End Trend Index.* This positions an input cursor at the *End Trend Index* field The end range value to enter to print a complete trend list depends on the size of the trend database

4 Key in the index number of the last trend definition that is to appear in the summary list, then press ENTER The ending trend index must have an index number greater than the starting number

Select Trends

Options *A* through *F* determine which trends appear in the listing The console compiles a trend list by checking the attributes configured for each trend when using any of these options It also references the range entries when creating any trend list The options include

List by Tag Name - press A, a *Tag Name or Index* input prompt appears at the bottom of the display Enter a tag name or index number, then press ENTER The console searches the trend database for all trends defined with the entered tag name.

List by Trend Type press B, a submenu appears on the screen The menu items determine the trends that print by type of trend.

A	To print all normal trends (one minute standard trends)
B	To print all fast trends (15 second standard trends)
C	To print all enhanced trends
D	To print all undefined trends
ESC	To return to the trend list menu without selecting a resolution

List by Collection Mode - press C, a submenu appears on the screen The menu items determine the trends that print by selecting a collection mode

A	To print all trends with a sample collection mode.
B	To print all trends with an average collection mode
C	To print all trends with a minimum collection mode
D	To print all trends with a maximum collection mode

E	To print all trends with a sum collection mode
F	To print all trends with a range collection mode
ESC	To return to the trend list menu without selecting a collection mode

List by Trend Usage press D, a submenu appears on the screen The menu items determine the trends that print by selecting a trend usage

A	To print all trends with a display only usage type
B	To print all trends with a save to disk usage type
C	To print all trends with an archived usage type
D	To print all trends with an external source usage type (Not applicable for this type of console)
ESC	To exit and return to the trend list menu without selecting a trend usage

List by Module Address press E, a *Loop* ___ *PCU* *Module* input prompt appears Use the cursor control keys to move between and enter data into these fields Enter the desired module address, then press ENTER A listing of all trends having the entered module address then begins to print

List by Tag Type press F, a submenu appears on the screen The menu items determine the trends that print by selecting a tag type

A To print all trends with analog tag types Analog tag types include

ANALOG	RMSC
DAANALG	STATION
DANG	

B To print all trends with digital tag types Digital tag types include

DADIG	MSDD
DD	RCM
DIGITAL	RMCB

ESC To exit and return to the trend list menu without selecting tag type

After making any of these selections, the console collects then formats the pages of the list for printing The current page number being processed displays in the message

Processing page n

Exiting the display after making a selection, but while the *Processing page n* is displaying causes the printout to stop

If the console cannot find any trends within the range that have attributes that match the selection type, this message appears

Nothing in Range to Print w/this Option

CANCELING QUEUED PRINT JOBS

A *Cancel Print* option gives the operator the ability to cancel a print job currently queued to be printed It also provides a directory listing of currently queued prints The operator can cancel any of the following print jobs

- Periodic print of the events log or operator actions log
- Periodic print of the alarm summary report
- Directory of an archive volume
- Events retrieved from an archive volume
- A log image retrieved form an archive volume
- Tag summary
- Tag or trend list printout
- Demand print of a retained log (*Log by Name* function)
- Demand print of a log template (custom log configuration)
- Screen image copy

For most of the print jobs, the function that generates the file to be printed waits for the entire contents of the file queued to print to complete printing before making another request of the same type This is not always true such as in the case of tag summaries A single tag summary may generate several files to be printed

The print jobs that cannot be canceled through this function include

- Continuously printing events log
- Continuously printing operator actions log

- SOE logs
- Custom logs

The operator can cancel any queued SOE logs or custom logs through the log status function Refer to ***Log Status*** in the ***Recording Process Data*** section for procedures

The operator cancels print jobs through the *Directory of Queued Prints* page (see Figure 12 7) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ——► K Cancel Print

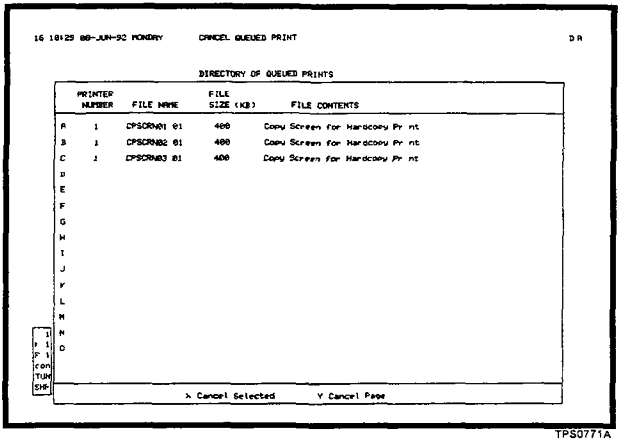


Figure 12 7 Directory of Queued Prints

The console gives the following information for each directory entry

PRINTER NUMBER	Identifies the physical printer that the print job is queued to for printing
FILE NAME	Shows the file name the console assigned to the job to be output
FILE SIZE (KB)	Gives the size of the file in kilobytes
FILE CONTENTS	Presents a general description of the contents of the file

The page can show up to 15 print job entries Press NEXT PAGE or PREV PAGE to view additional pages

To cancel a single queued print job

1 Press X to select the *Cancel Selected* option Once selected, the letters at the left margin associated with each entry change to red

2 Press the letter key that corresponds to the letter adjacent to the print job entry to cancel

3 Press ENTER to initiate the cancel and clear the job from the directory listing Press ESC before pressing ENTER to abort the cancelation request

To cancel all queued print jobs

1 Press Y to select the *Cancel Page* option

2 Press ENTER to initiate the cancel and clear all the print jobs from the directory listing Press ESC before pressing ENTER to abort the cancelation request

TOUCH SCREEN CALIBRATION

> **NOTE** This calibration applies only to the Elographics E271 60MK I touch screen controller Attempting to calibrate when the touch screen controller is not of this type or touch screen is not used causes the console to present an error message

This function calibrates an optional touch screen through menu selections The operator or technician initiates a calibration through the *Touch Screen Calibration* page (see Figure 12-8) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *H Touch Screen Calibration*

The options at this menu and the functions performed include

Calibrate Touch Screen select *A* to calibrate the touch screen The screen presents messages to indicate the required calibration actions First, the console prompts to touch the lower left corner, then to touch the upper right corner

Test Calibration - select *B* to verify that calibration is correct Press anywhere on the screen A cross hair (+) cursor appears at the point of touch (or very close) If the cross hair appears at a good distance from the point of touch, recalibrate the touch screen using option *A*

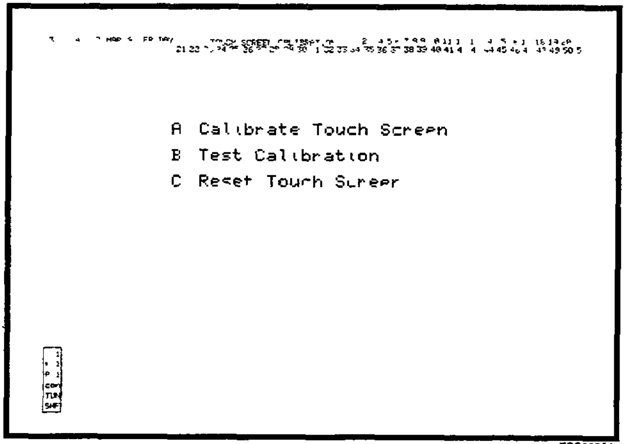


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Figure 12 8 Touch Screen Calibration Display

Reset Touch Screen select *C* to reset the communication between the touch screen controller and the keyboard This procedure does ***not*** affect normal operations

SECTION 13 - INFI 90 AND OIS DIAGNOSTICS

INTRODUCTION

The operator interface station (OIS) provides the capability to monitor the operating status of each node or module in the INFI 90 system, and the status of the communication highway connecting the individual nodes of the system for communication These capabilities allow the console to be a central platform that can be used to diagnose system problems ranging from plant communications failures to individual module problems The console also gives the ability to trace problems encountered at the console through diagnostic error messages

Any node connected to the communication highway reports its status In general, the modules that report status include communication and control modules The console also has the capability to monitor its own peripherals

The console presents alarm indications for module status errors Module status pages provide the capability to acknowledge these alarms and to display the status reports for individual modules. The status pages can also be viewed for those modules not in an error condition This section explains how to call up the status pages It also details the information presented and procedures to acknowledge alarms at these pages

> **NOTE** This section explains INFI 90 diagnostics using standard templates provided for status displays The console provides these templates as part of its symbol library on hard disk The information presented in these displays can also appear in any user created displays to show status information The escape commands defined in the display during its creation determine the capabilities of the display Refer to the ***Display System*** section for further explanation

INFI 90 SYSTEM STATUS DISPLAYS

The console receives INFI 90 node and module status in exception reports The console receives status exception reports for each node or PCU module that has a defined N90STA tag Each exception report contains at a minimum the module error status (either an error exists or no errors), mode and module type Other information in these reports is specific to the type of module reporting its status Refer to ***Database Configuration*** in the ***OIS Configuration*** section for a list of node and module types from which the console can receive status reports

The console provides a series of templates for status displays that can be used to communicate node and PCU module status During configuration, these standard displays or user-created status pages can be incorporated into process operations The provided templates contain all the necessary display elements to access, and to show status information such as

- Node and module type
- Node error indications
- Module operating mode
- Module status bytes
- Module problem reports

Before a template can be used in operations, however, the process engineer must modify it to contain the index numbers of N90STA tags for which the display is to present status information The same type of information can also be incorporated into a user created status page

Status Display Call Up

When the process engineer defines each N90STA tag, the console automatically assigns the tag to a system (*S*) alarm group Any time an N90STA defined node or module goes off line or into an error condition the *S* indicator appears at the title line Other indications may occur depending on the alarm group configuration The indication notifies the operator that a problem exists in the INFI 90 system One option available to determine the problem is to view the status pages

> **NOTE** The operating parameters page called for an N90STA tag also provides status information

The console provided displays use a three level hierarchy to communicate equipment status The hierarchy follows a sequence that starts at a loop overview level and ends at the module status bytes and problem reports for a specific module Normally, the highest level page is assigned to SYSTEM STATUS for single key access to status reports Once the initial page is on the screen, selections made within that and each subsequent page sequence to the desired status level

A status page can also be called using the *Display by Name* option to enter the name of the status page, or the page can be assigned to one of the keyboard assignable function keys The operating parameters page for an N90STA tag provides an option for calling a module problem report page directly The problem report page provides the most detailed view of the exception reported status information

Using the provided status pages, the hierarchy levels include

System level overviews the operational status of INFI 90 equipment on a communication highway This page displays both normal and error conditions

Node level - reviews the status of each module within a node selected from the system level page This page also displays both *normal and error conditions*

Module level details the status of a single module selected from the node level page. It monitors and displays the status bytes and problem reports of individual modules.

SYSTEM STATUS OVERVIEW PAGE

The system status *overview page provides information related to* specified nodes The nodes that appear in the list depend on the N90STA tag index numbers assigned to the display during its creation

Figure 13 1 is the standard system status overview page The display source file for this display is the ***N90STAT1.DT*** file This file provides an empty display template The page uses a ***NOD-LINE.DT*** symbol file to define each node and its related attributes that appear in the list

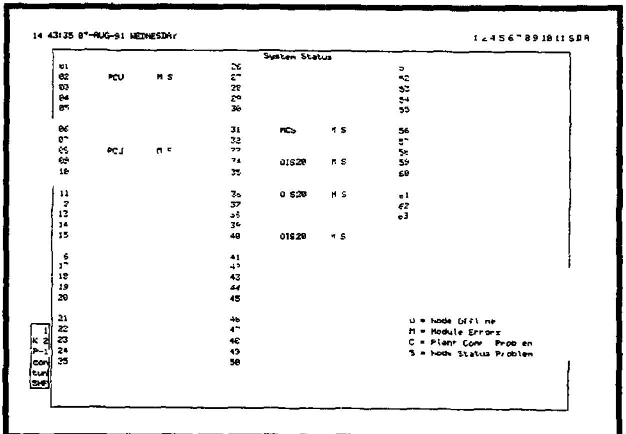

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Figure 13-1 System Status Overview Page

The following information appears at the page

Node selector the numbers *01* through *63* are selectors for calling the next level status page for a specific node Normally, these numbers are also the loop address of the nodes in the list, although this is not a requirement.

Node type - a node type appears next to each node selector number The nomenclature that appears depends on the tag definition

For proper indications, each N90STA tag in the list must define a node rather than a module

A yellow asterisk (*) appears if a node type configured in the database does not match a node type received in an exception report The indication also appears if a module within that node has the same problem The indicator displays to the left of the node type for each incorrect node This node type configuration error causes an alarm

Error indicators - up to four different indicators can appear for a single node in error Each indicator identifies a different type of error Each type of error triggers an alarm

O Node off line, displays when a node is completely off line The console does not receive any exception reports for off line nodes or modules within a node

M Module errors, displays when at least one module in a node is in error The *M* also appears if any module in a node is not in ***execute*** mode

C Plant communication problem, displays when a communication module for a node is in error Each node has communication modules to interface with the communication highway A communication problem exists when one of these modules has a problem related to its transmit or receive capabilities or some internal error

S Node status problem, displays when a node is having power problems A node having a system status error reports this condition through its interface unit The actual problem may be caused by a faulty power supply or fan

Key in a node selector number to access a node status summary page for a node in the list For example, [1] [3] for node number 13 The node status summary page can be called for any node whether it is in a normal or error condition Refer to ***NODE STATUS SUMMARY PAGE*** in this section for information presented at the next page

NODE STATUS SUMMARY PAGE

The node status summary page provides information related to a specific node Which node the console presents information for depends on the node selection made at the system status overview page The node status summary page provides the type and operating mode for individual modules within a given node A general error indication also appears to identify any modules in error

The specific modules that appear in a node summary depend on the N90STA tag index numbers assigned to the display during its creation To present information for each node selected through the system status overview page, a separate node summary dis play must be created for each node listed at the system status overview page

Figure 13 2 is the standard node status summary page The dis play source file for this display is the ***NODSTAXX.DT*** file This file provides an empty display template The page uses a ***MODLINE.DT*** symbol file to define each module and its related attributes that appear in the list

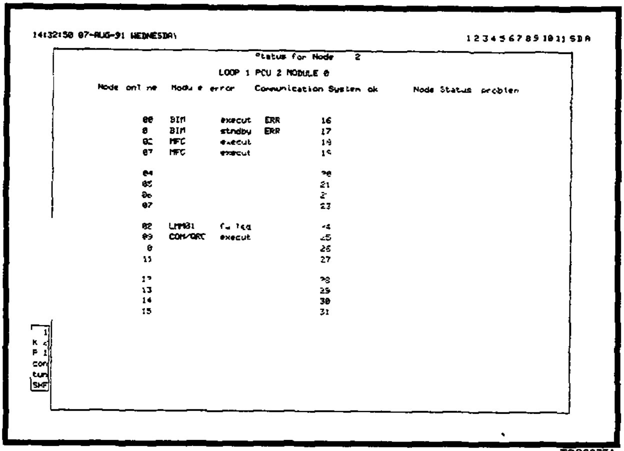

Figure 13 2 Node Status Summary Page

The following information displays at the page

Node number the *Status for Node* field identifies the node num ber that was selected from the system status overview page

Node address - the *LOOP*, *PCU*, and *MODULE* fields show the ad dress of the selected node

Node status - several fields at the top of the page repeat the in formation that was previously shown at the system status over- view page

The fields and their purpose are

Node	Displays as *offline* or *online* depending on the presence or absence of the *O* indicator at the system status overview page

Module Displays as *error* or *ok* depending on the presence or absence of the *M* indicator at the system status overview page

Communication System Appears as *error* or *ok* depending on the presence or absence of the *C* indicator at the system status overview page

Node Status Appears as *problem* or *normal* depending on the presence or absence of the *S* indicator at the system status overview page

Module selector the numbers *00* through *31* are selectors for calling the next level status page for a specific module Normally these numbers are also the module address, although, this is not a requirement The number also does not necessarily reflect the physical location of a module within a cabinet

Module type a module type appears next to each module selector number This is an abbreviated nomenclature, and is the same as the module type defined during tag definition For proper indications, each N90STA tag in the list must define a module

A yellow asterisk (*) appears if a module type configured in the database does not match a module type received in an exception report The indicator displays to the left of the module type for each incorrectly configured module This module type configuration error causes an alarm

Module mode the summary indicates the current operating mode for each module in the list

execut Module is on-line and in execute mode

config Module is on line and in configure mode

error Module is on line and in error mode Generally, this indication normally occurs when a module configuration error exists

stndby Appears for a backup or redundant module The mode of the backup module is the same as the primary module unless the primary fails and the backup assumes the responsibilities of the primary

failed Module is off-line, or some internal problem exists

Error indicator - an *ERR* appears for each module that is in error

Key in a module selector number to access a module status summary page for a module in the list For example, [1] [3] for module number 13 The module status summary page can be called for any module whether it is in a normal or error condition Refer to

MODULE STATUS SUMMARY PAGE in this section for information presented at the next page

Press [BACK] to return to the system status overview page.

MODULE STATUS SUMMARY PAGE

The module status summary page provides information related to a specific module Which module the console presents information for depends on the module selection made at the node status summary page The page provides both the status bytes and module problem reports for a selected module Figure 13 3 is the standard module status summary page.

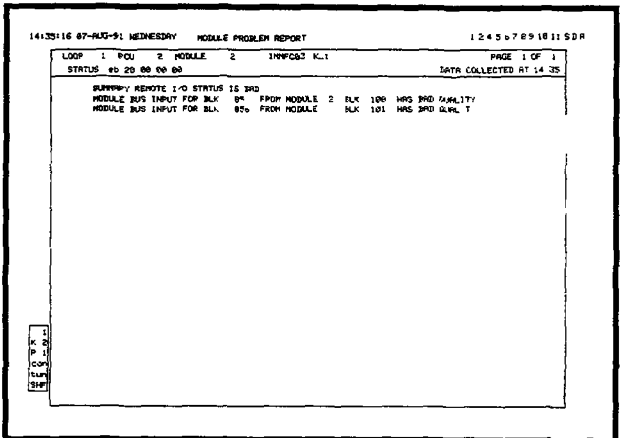

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Figure 13 3 Module Status Summary Page

When the operator calls the module status summary page, the console initiates both a read module status and read module problem report message The selected module then replies with the requested information

The summary page has two sections The information at the top of the page includes from left to right, top to bottom

Address - indicates the hardware *LOOP, PCU* and *MODULE* address of the selected module

Type - this is the exception reported module type The full nomenclature of the selected module appears at the page (e g , *IMMFC03*)

Revision a module revision level may or may not appear for a particular module If the module is capable of reporting its revision level, the console will present the appropriate level An *N/A* appears for any module that does not report revision level

Page the *PAGE n OF n* indicates the number of pages used to present problem report information, and the current page The field updates as each problem report page is viewed

Status bytes the *STATUS* field presents the module status bytes reported by a PCU module Depending on the module type, the number of bytes a module returns can range from five to 16 bytes Each byte is a hexadecimal value

Refer to the product instruction for a specific type of module to interpret the status byte presentation The ***Function Code Application Manual*** also provides some status byte information

Time the *DATA COLLECTED AT* field shows the time at which the status and problem report was read The time updates if the operator initiates an update while at the page, or the page is exited and then called again

The lower section of the page presents module problem reports These reports give a detailed module status report using descriptive text A single module report may span several pages Press NEXT PAGE or PREV PAGE to view additional pages

Press NEXT PAGE while at the last page of the module problem report page to cause another snapshot of the reports to be read from the module This also returns to the first page of the new report

Press BACK to return to the node status summary page

Module Status Bytes

As stated previously, the number of status bytes that display depends on the type of module selected A particular module may report from five to 16 bytes If any of these bytes do not apply for a given module, they are set to zero to show a good status Of these bytes, the first two are common for most type of modules The remaining bytes are specific to a particular module

Table 13 1 details the information presented in bytes one and two Convert the hexadecimal value to a binary value then refer to Table 13 1 to interpret the status bytes

Table 13 1 Module Status Bytes

Byte	Bit							
	7	6	5	4	3	2	1	0
1	ES	MODE		TYPE				
2	FTX	BAC	R O	L O	CFG	NVF	NV	DSS

The abbreviations are defined as

ES	Error summary 0 - ok, 1 = error exists If there is an error indicated in any status byte, the bit is set to 1
MODE	Module mode: 00 - configure, 01 failed, 10 - error, 11 execute
TYPE	Module type each INFI 90 module has a different type identifier The module status summary page provides a module type field that references these bits.
FTX	First time in execute mode 0 - no, 1 yes
BAC	Backup status 0 ok, 1 - bad
RIO	Summary of remote input status 0 - ok, 1 - bad
LIO	0 ok, 1 bad
CFG	On-line configuration changes being made 0 - no, 1 = yes
NVF	Nonvolatile memory failure 0 no, 1 yes
NVI	Nonvolatile memory initialized 0 - no, 1 yes
DSS	Station status: 0 ok, 1 - bad

Module Problem Reports

A module problem report message details information on the status of a module The report provides the same type of data that is presented in module status bytes, but provides a higher level of detail The problem reports cover a wide range of system problems The console associates descriptive text with any reported problems

Depending on the type of report, the returned information can identify, for example, the actual station, or remote or local module and the function block address within that module causing an error The information will also identify individual I/O modules in error, and the type of error condition for that module

Acknowledging System Status Alarms

The operator acknowledges system (*S*) alarms through the summary pages in the normal way Both the system status overview and node status summary pages provide alarm indications All normal (good) status indications appear in green at these pages Any fields that identify a node or module status error appear in yellow These error indications also cause system alarms. The *console presents all normal alarm indications* Since the pages do not use an alarm status field, the fields that indicate a status error flash instead when an alarm has not been acknowledged

Normally, the console indicates a remote I/O error or local I/O error with a system status alarm A *System Status I/O Error Filter* option available through OIS system configuration gives the option to prevent these types of module errors from causing a system status alarm If the option is enabled, the console filters out any remote I/O error or local I/O error and does not treat them as status alarms

Two choices are available for acknowledging alarms at the system status overview page or at the node status summary page either individually or an entire page Press PAGE ACK to acknowledge all alarms at a page To acknowledge individual alarms at a page

1 Press ACK ALARM This positions a cross hair (+) alarm cursor at the first error indication on the screen

2 Press either TAB or TAB BACK to position the cursor at a specific error field

3 Press ACK ALARM to acknowledge that alarm The field stops flashing once acknowledged The *S* indicator at the title line stops flashing after all system alarms are acknowledged It remains at the title line, however, until all system alarms have been corrected

4 Repeat Steps 2 and 3 for each alarm to be acknowledged on the current page Once all acknowledgments are completed, press CANCEL then CURSOR to clear the alarm cursor from the page

Acknowledging a node status alarm at the system status overview page acknowledges all related module alarms at the node status summary page for that node Acknowledging all alarms at the node status summary page acknowledges the related node status alarm at the system status overview page Leaving at least one alarm unacknowledged at the node status summary page causes the node status alarm at the system status overview page to remain unacknowledged

MODULE FIRMWARE REVISION DISPLAY

The module firmware revision page provides a list of modules within a given node, and the mode and revision level for each module The page gives the capability to both print and display this information An N90STA tag must be defined for both the node and individual modules within that node to display at this page To call the firmware revision page

1 Press MISC MENU

2 Press C to select the *Display by Name* option

3. Enter **FIRMWARE** at the *Display Name* prompt, then press **ENTER** The module firmware revision display then appears at the screen

The display can also be assigned to, and called by pressing an as signable function key

Figure 13-4 is an example of a module firmware revision display after a specific node has been selected The page normally appears blank with only the options presented at the bottom of the page. The display source file for this page is the ***FIRMWARE.DT*** display file

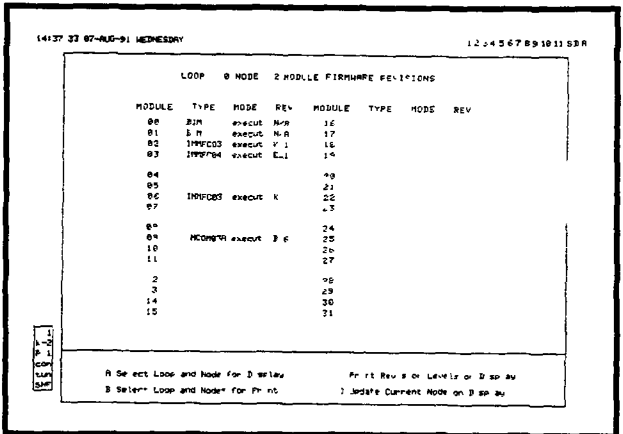

Figure 13 4 Module Firmware Revision Display

Page Attributes

The attributes that appear at the module firmware revision page relate to each module within a selected node

MODULE lists module numbers *00* through *31*, which correspond to the Controlway or module bus address of each control or communication module within the node This does not necessarily reflect the physical position of the module within a cabinet

TYPE shows the module type, which is either the full or abbre viated nomenclature that identifies the module

If a communication error occurs, it is shown in the *TYPE* column in the format *Ennn*, where *nnn* is an error code integer number

Refer to the ***Operator Interface Station, Hardware Manual*** for a list and description of these error codes

MODE indicates the current operating mode for a module

execut Module is on line and in execute mode

config Module is on line and in configure mode

error Module is on line and in error mode Generally, this indication occurs when a module configuration error exists

stndby Appears for a backup or redundant module The mode of the backup module is the same as the primary module unless the primary fails and the backup assumes the responsibilities of the primary

failed Module is off line, or some internal problem exists

REV shows the firmware revision level of the module Not all modules are capable of reporting revision level The type of module and its revision level determine whether the console can display a revision level for that module If a module is not capable of reporting its revision level, the display shows *N/A* in the *REV* column

A plus sign (+) indicator is shown after the revision level if the module firmware is newer than the information in the ***MODULE.RV*** file *This file resides in the USN 02 directory of the hard disk The function uses information from the* ***MODULE.RV*** *file to* translate a revision level received in an exception report to an *ASCII character string*

Operations

Some modules are required to be in execute or configure mode to report their status In this case, the console reads a fixed function block in the module to acquire the revision level Other modules report revision level as part of their module status exception report while in any of their on line modes

Table 13 2 identifies which INFI 90 modules can and cannot report their firmware revision levels The console can display the levels for modules with revision levels equal to or greater than those listed in the availability column

Table 13 2 Module Revision Level Availability

Module Type	Availability
IMAOM01 NAOM01	not available
NAMM01	not available
NAMM02	available with revision E 0
NAMM02A	available with revision A 0

Table 13-2 Module Revision Level Availability (continued)

Module Type	Availability
IMAMM03, NAMM03	available with revision A.0
NCOM02	not available
NCOM02A	not available
NCOM02B	not available
IMCOM03, NCOM03	not available
IMCOM03A, NCOM03A	available with revision B.0
IMCOM04, NCOM04	not available
IMCOM04A, NCOM04A	available with revision A.0
IMQRC01, NQRC01	not available
IMQRC01A, NQRC01A	available with revision B.0
NLMM01	available with revision F.1
NLMM01A	available with revision A.0
IMLMM02, NLMM02	available with revision A.0
NMFC01	available with revision D.0
NMFC02	available with revision B.0
IMMFC03, NMFC03	available with revision B.0
IMMFC04, NMFC04	available with revision A.0
IMMFC05, NMFC05	available with revision A.0
IMMFP01[1]	available
IMMFP02[1]	available
IMMFP03[1]	available
IMMPC01, NMPC01	available with revision F.0
CBC01	available with revision A.0
CSC01	available with revision A.0
CLC01	available with revision B.0
CLC02	available with revision A.0
CLC03	available with revision C.0
CLC04	available with revision C.0
INBIM02, NBIM01/02	not available
INICT01[1], NSSM01[1]	available
INIIT01[1], NBCM01[1]	available
INIIT02[1], NGCM03[1]	available
INIPT01[1], NGCM04[1]	available
INNPM01[1]	available
NSBM01[1]	available
NSCM01[1]	available
NPIM01	not available
NCTM01	not available
PBUG01[1]	available

NOTE: 1. Revision level reported in module status exception report.

The options at the bottom of the page allow selecting, and either displaying or printing revision levels for modules in a specified node. The valid loop and node ranges for all of these options are:

Plant Loop system - loop defaults to *0*. The only required entry is a node number from 1 to 63.

INFI-NET system - loop range is from 0 to 250, node range is from 1 to 250.

Options For the print options, a printout occurs at the printer assigned to the screen Look at the keyboard status block on the screen to de termine which printer The format of all printed information is the same as what is seen on the screen, except a t me of collection appears on the printout

Select Loop and Node for Display - displays the revision informa tion for a single node

1 Press [A] to select the option, a *LOOP___ NODE* input prompt appears Use the cursor control keys to move between the input fields

2 Key in a loop and node address, then press [ENTER]

Select Loop and Nodes for Print prints the revision information for a single or range of nodes without having to display the information

1 Press [B] to select this option, a *LOOP NODE TO* in put prompt appears Use the cursor control keys to move between each input field

2 Key in a loop and node range, then press [ENTER] If a loop number is entered without specifying a range, pressing [ENTER] starts a printout of all nodes on the entered loop

Print Revision Levels on Display prints the currently displayed revision information A loop and node must first be selected using option *A* before using this option Press [C] to choose the option After selection, the console begins to print the information cur rently displaying on the screen

Update Current Node on Display updates the information cur rently displaying, in particular, the mode or any error indications that may have occurred since the node information first displayed Select this option prior to initiating any prints to assure that the most up to date information appears in a printout Press [D] to choose the option This updates the information for all modules at the current module revision display

Press [NEXT PAGE] *or* [PREV PAGE] *to display the firmware infor* mation for the next or previous node on the currently selected loop

INFI-NET DIAGNOSTICS

The INFI NET diagnostics function can be used to facilitate the di agnosis of communication related problems The functions provide diagnostics information on a system wide basis The function en ables maintenance personnel to·

- Display a graphic that provides a complete overview of all nodes connected to a single communication loop The function gives the capability to change to any desired loop

- Determine the types of modules in a single node, and the module address, revision level and current operating mode for each module

- Display the module details for the communication interface modules of a selected node The information presented includes the loop and node address, type for each module that makes up the interface, revision level for each module, and memory utilization of the host module (e g , INICT01 module)

- View a snapshot of event and error counters for the communications modules of a selected node. The information automatically updates every 30 seconds or after an operator request to update the information

- View a snapshot of exception report statistics for the communications modules of a selected node The information automatically updates every 30 seconds or after an operator request to update the information

- Print a listing that overviews the entire plant communication system

Display Call Up

The first page of the INFI NET diagnostics function is the options menu This page allows selecting any desired loop and node in the system, and viewing the details related to the individual nodes on the selected loop It also allows choosing the various diagnostic functions

To access the INFI-NET diagnostics menu (see Figure 13-5), first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities
└→ *A PCU Configuration*
└→ *C INFI NET Diagnostics*

When the display is first called, the boxed area at the top of the page shows the last selected loop and node The sort option being used also appears

At the bottom of the page are fields that show the loop and node address of this console, the node that is the current time sync master, and the accuracy rating of the clock being used by the time sync master The accuracy rating ranges from zero to 12, 12 is the most accurate A satellite clock, for example, has an accuracy rating of 12 Refer to ***SET DATE AND TIME*** in the ***Utilities*** section for an explanation of time synchronization and the time sync master

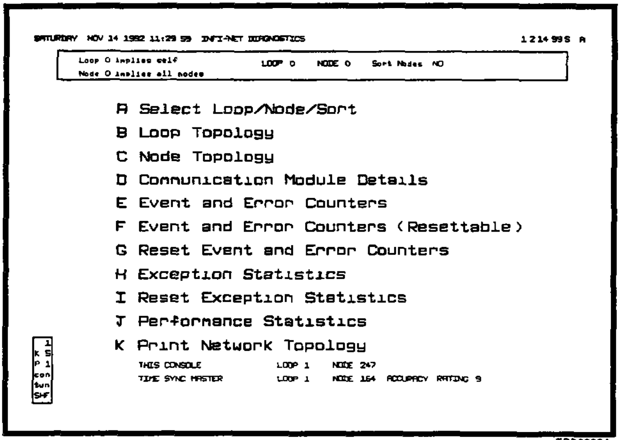

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Figure 13 5 INFI NET Diagnostics Options Menu

Selecting a Loop and Node

There are a few different methods for selecting a loop and node for which to display diagnostics information

- The *A Select Loop/Node/Sort* option can be used before se lecting any of the diagnostics options (i e , *B* through *I*)
- While at the node topology page, the event and error counters pages, and the exception statistics page, the operator can switch to another loop and node directly without having to exit the page The *A Select Loop and Node for Display* option pro vides this capability
- At the loop topology display, the operator can enter a loop number to change the presentation to another loop
- Pressing **NEXT PAGE** or **PREV PAGE** while at the node topol ogy page or event and error counters page calls the same in formation for the node physically located on the loop after or before the current node respectively

Select Loop/Node/Sort

The *Select Loop/Node/Sort* option allows selecting any desired loop and node in the system Choose this option before selecting any of the diagnostics functions The information presented by options *B* through *I* is for the loop and node chosen through the *Select Loop/Node/Sort* option

The *Select Loop/Node/Sort* option also sets the sort option The sort option determines the order in which information presented at the various pages of the function is to appear To make a loop and node selection and set the sort option

1 Press [A] to choose the *Select Loop/Node/Sort* option This enables the input cursor at the *Loop* field at the top of the page

2 Key in the number of any desired loop A valid entry is 0 for self or all depending on the function selected, or 1 to 250

3 Move to the *Node* field and key in the number of any desired node A valid entry is 0 for self or all depending on the function selected, or 1 to 250

4 Move to the *Sort Nodes* field and enter **YES** to have the node information presented by a function appear in chronological order by node address Or, enter **NO** to have it appear in order by the physical location of the node on the loop starting with the selected node If the entry does not need to be changed, skip to the next step

NOTE The sort option does not affect loop topology or node topology

5 Press [ENTER] to save the changes and return control to the options menu

Select Loop and Node for Display

The *Select Loop and Node for Display* option available at most diagnostic pages can be used to display information for another node without having to exit the current page To make a loop and node selection when the *Select Loop and Node for Display* option is available

1 Press [A] to choose the option, a *LOOP* *NODE* input prompt appears

2 Key in the number of any desired loop A valid entry is 0 for self, or 1 to 250

3 Move to the *NODE* field and key in the number of any desired node A valid entry is 0 for self, or 1 to 250

4 Press [ENTER]

Options

NOTE The *J Performance Statistics* option is not supported in this software release

The INFI NET diagnostics function provides a wide range of information to aid in diagnosing communication problems

- Loop topology

- Node topology
- Communication module details
- Event and error counters
- Exception report statistics

The INFI NET diagnostics functions are intended to help diagnose INFI-NET communication problems On a Plant Loop system, only the *Node Topology* and *Print Network Topology* functions can be used

LOOP TOPOLOGY

The *Loop Topology* option calls up a graphic overview of a selected loop Press [B] to choose the *Loop Topology* option (see Figure 13 5)

The selected communication loop is depicted as a continuously *connected series of circles (see Figure 13 6) Each circle symbol* represents a single node connected to the loop The node at the top center of the display is always the selected node The graphic always shows the nodes in their relative position on the loop, not in numerical sequence regardless of the status of the sort option The arrows at the display indicate the direction of data flow The display automatically updates every 30 seconds or when operator requested, but only if there has been a change in the status of the loop Refer to ***Updating Diagnostics Information*** in this section for further explanation

> **NOTE** The display and data collect on time do not update un ess there is a change n the oop status even after the 30 seconds exp re or the operator attempts to update the d splay

Inside the large circle, or the innermost circle depending on the *number of nodes depicted, is information that shows the number* of the selected loop and time at which a snapshot of the loop was taken Each known node on the loop is represented by a filled node symbol that contains the hardware address and category of the node An unknown or off line node displays as an empty node symbol with a hardware address of *0*, and with a *U* for unknown category

The node categories include

B	Bridge
C	Console or computer
P	Process control unit
T	Terminal
U	Unknown

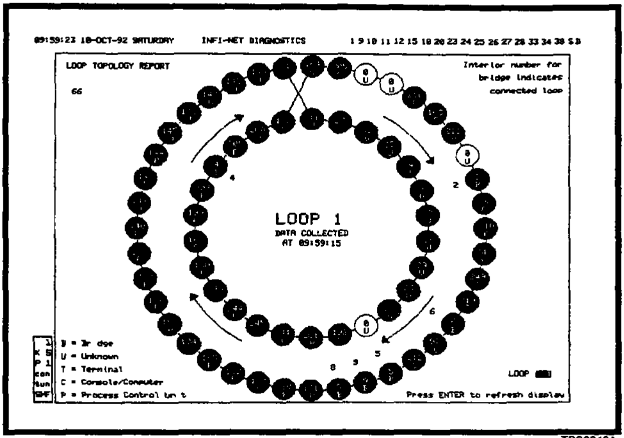

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Figure 13 6. INFI NET Diagnostics Loop Topology

The number at the upper left of the display is the total number of nodes for the loop

For a bridge, the loop number the bridge is providing connection to displays adjacent (towards the center) to the node symbol The number of the connecting loop and hardware address of the bridge do not necessarily have to match

NOTE A max mum of 85 node symbols can disp ay before the symbo s beg n to over ap making the node nformation unreadab e

Loop Failure

Normally, the node symbols appear in green If there is a loop failure (e g , broken cable), the display shows a snapshot of the loop just prior to the failure The node immediately downstream from the fault location will appear as an empty, red node symbol All of the nodes not communicating that are between the selected node and the node nearest the fault appear in cyan These are the node symbols downstream from the selected node and upstream from the node nearest the fault

Operations

The *LOOP* input field appearing at the lower right of the display allows calling a loop topology display for another loop Key in a loop number from 1 to 250, then press **ENTER** to change to another loop Alternatively, the loop number associated with a bridge node symbol is a touch point that can be used to request the loop topology for the connected loop

Each node symbol at the loop topology display is defined with a touch point This allows the operator to call the node topology display for a node directly from the page Refer to ***DISPLAY AND***

CONTROL SELECT in the ***Display System*** section for more information on touch points

Press [ESC] at any time to exit the page

NODE TOPOLOGY

NOTE Each node symbo at the oop topology display s defined w th a touch po nt to a low cal ing the node topology d sp ay fo the node

The *Node Topology* option calls up a display that details all of the modules in a selected node or nodes The information displayed is a snapshot of node details *The display automatically updates* every 30 seconds or when operator requested, refer to ***Updating Diagnostics Information*** in this section for further explanation

Press [C] to choose the *Node Topology* option (see Figure 13 5) The display shows the hardware address, module type, revision level and operating condition for each module in the node (see Figure 13 7)

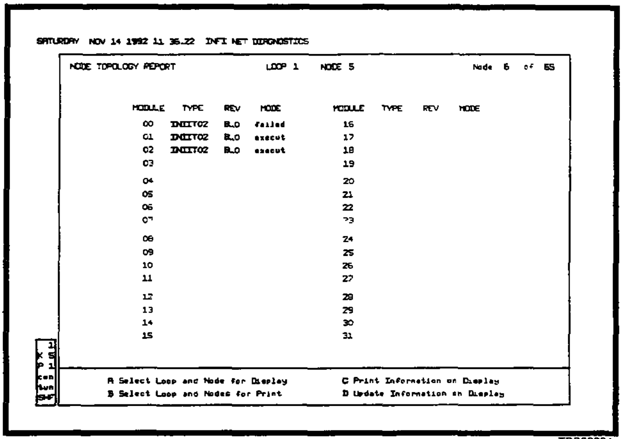

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Figure 13 7 INFI NET Diagnostics Node Topology

The information displayed at the node topology page includes

MODULE lists module numbers *00* through *31*, which correspond to the Controlway or module bus address of each control or communication module within the node This does not necessarily reflect the physical position of the module within a cabinet

TYPE shows the module type, which is either the full or abbreviated nomenclature that identifies the module

If a communication error occurs, it is shown in the *TYPE* column in the format *Ennn*, where *nnn* is an error code integer number Refer to the ***Operator Interface Station, Hardware Manual*** for a list and description of these error codes

REV shows the firmware revision level of the module Not all modules are capable of reporting revision level The type of module and its revision level determine whether the console can display a revision level for that module If a module is not capable of reporting revision level, the display shows *N/A* in the *REV* column

A plus sign (+) indicator is shown after the revision level if the module firmware is newer than the information in the ***MODULE.RV*** file This file resides in the USN 02 directory of the hard disk The function uses information from the ***MODULE.RV*** file to translate a revision level received in an exception report to an ASCII character string

Some modules are required to be in execute or configure mode to report their status In this case, the console reads a fixed function block in the module to acquire the level Other modules report revision level as part of their module status exception report while in any of their on-line modes

Table 13 2 identifies which INFI 90 modules can and cannot report their firmware revision levels The console can display the levels for modules with revision levels equal to or greater than those listed in the availability column

MODE - indicates the current operating mode for a module

execut Module is on line and in execute mode

config Module is on line and in configure mode

error Module is on line and in error mode Generally, this indication occurs when a module configuration error exists

stndby Appears for a backup or redundant module. The mode of the backup module is the same as the primary module unless the primary fails and the backup assumes the responsibilities of the primary

failed Module is off line, or some internal problem exists

Press [ESC] at any time to exit the page

COMMUNICATION MODULE DETAILS

The *Communication Module Details* option calls up a display that details the communication modules of a selected node The information displayed is a snapshot of the module details The information does not update until the operator requests it or at the next display call up Refer to ***Updating Diagnostics Information*** in this section for further explanation

Press [D] to choose the *Communication Module Details* option (see Figure 13 5) The display shows the hardware address, type, revision level, memory utilization and switch settings for each module that comprises the communications interface of the node (see Figure 13 8)

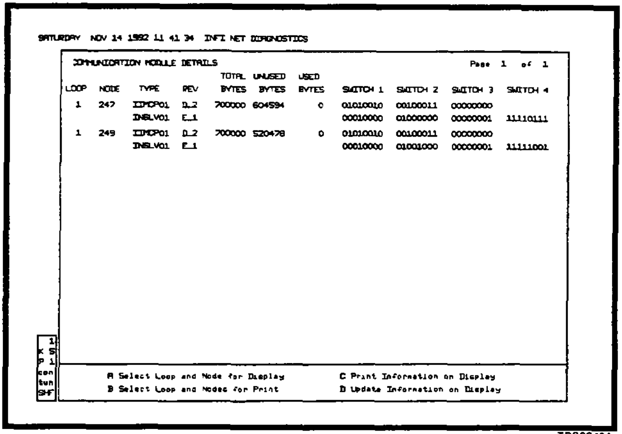

Figure 13 8 INFI NET Diagnostics Communication Module Details

The *information displayed at the communication module details* page includes

LOOP gives the hardware loop address of the communication module

NODE gives the hardware node address of the communication module

TYPE indicates the module type, which is either the full or abbreviated nomenclature that identifies the module

REV shows the firmware revision level of the module

TOTAL BYTES - shows the total number of memory bytes available for the module, normally associated with the host communication module only

UNUSED BYTES shows the total number of unused memory bytes available for the module, normally associated with the host com munication module only

USED BYTES shows the total number of temporary memory bytes allocated, normally associated with the host communication module only

SWITCH n - identifies the switch settings for the module A *1* in dicates open (off), *0* indicates closed (on).

Press [ESC] at any time to exit the page

EVENT AND ERROR COUNTERS

The *Event and Error Counters* options call up a display containing a snapshot of the event and error counters for a selected node (see Figure 13 9) There are two different event and error counters displays Resettable and nonresettable The display automatically updates every 30 seconds or when operator requested, refer to ***Updating Diagnostics Information*** in this section for further explanation

Nonresettable Press [E] to choose the *Event and Error Counters* option (see Figure 13 5) to call the ***nonresettable*** event and error counters display

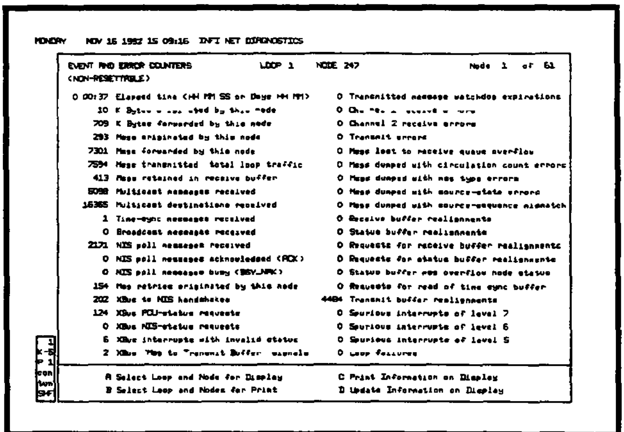

Figure 13 9 INFI NET Diagnostics Event and Error Counters for a node The values returned represent the number of events and errors that have occurred since the most recent manual re start of the node

Resettable

Press F to choose the *Event and Error Counters (Resettable)* option (see Figure 13 5) to call the ***resettable*** event and error counters display for a node The values returned represent the number of events and errors that have occurred since the most recent manual restart of the node, or the most recent manual reset of the counters using the *Reset Event and Error Counters* option

To reset the event and error counters

1 Exit the current page to return to the diagnostics option menu (see Figure 13 5) If already at the options menu, go to the next step

2 Press G to select the *Reset Event and Error Counters* option The message

Event and error counters were reset

appears when the counters have been successfully reset to zero In most cases, the reset may not be readily apparent since the counters normally begin to increment again immediately after the reset completes

If the loop address and node address are set to *0* and the node address is set to *0* when the reset option is chosen, the event and error counters for all nodes on all loops are reset If the loop ad dress specifies the address of a single loop and the node address is set to *0*, the counters for all nodes on the selected loop are reset

Press ESC at any time to exit either of the event and error counter pages

EXCEPTION STATISTICS

The *Exception Statistics* option calls up a display that details the exception report processing characteristics (load) for the selected node The information displayed represents the number of events that have occurred since the most recent manual restart of the node, or the most recent manual reset of the counters using the *Reset Exception Statistics* option The display automatically up dates every 30 seconds or when operator requested, refer to ***Updating Diagnostics Information*** in this section for further explanation The counters of the exception statistics function can be reset to zero at any time

Press H to choose the *Exception Statistics* option (see Figure 13 5) The display shows the hardware address of the selected node or nodes, elapsed time for the counters, and exception reporting characteristics (see Figure 13 10)

Specifically, the information displayed at the exception statistics page includes.

Page n of n shows the current page and total number of pages.

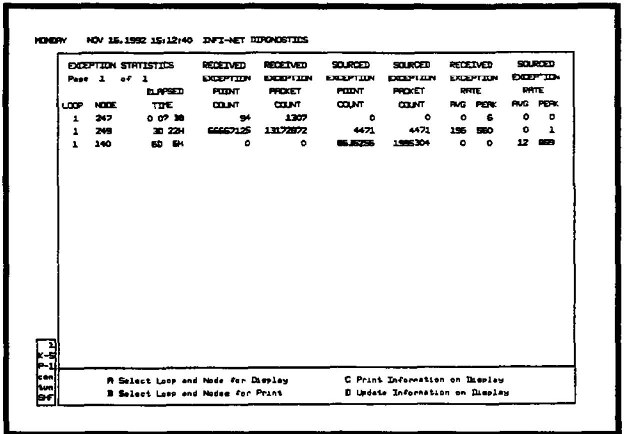

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Figure 13 10 INFI NET Diagnostics Exception Statistics

LOOP gives the hardware loop address of the communication module

NODE gives the hardware node address of the communication module

ELAPSED TIME shows the total amount of time elapsed since the last reset of the counters The counts displayed at the page are the total number of events that occurred during the elapsed time

RECEIVED EXCEPTION POINT COUNT shows the total number of exception report messages received by the node

RECEIVED EXCEPTION PACKET COUNT - shows the total number of exception report packets received by the node A packet can contain one or more exception report messages

SOURCED EXCEPTION POINT COUNT shows the total number of exception report messages sent by the node

SOURCED EXCEPTION PACKET COUNT shows the total number of exception report packets sent by the node A packet can contain one or more exception report messages

RECEIVED EXCEPTION RATE gives the average (*AVG*) number of exception report messages received per second by the node during the entire elapsed time It also shows the maximum (*PEAK*) number of exception report messages received by the node within a one second period This is the maximum seen at some time during the entire elapsed time

SOURCED EXCEPTION RATE gives the average (*AVG*) number of exception report messages sent per second by the node during the entire elapsed time It also shows the maximum (*PEAK*) number of exception report messages sent by the node during a one second period This is the maximum seen at some time during the entire elapsed time

Press **NEXT PAGE** or **PREV PAGE** to view additional pages

Press **ESC** at any time to exit the page

To reset the exception statistics counters

1 Exit the current page to return to the diagnostics option menu (see Figure 13 5) If already at the options menu, go to the next step

2 Press **I** to select the *Reset Exception Statistics* option. The message

Exception statistics were reset

appears when the counters have been successfully reset to zero In most cases, the reset may not be readily apparent since the counters normally begin to increment again immediately after the reset completes

If the loop address and node address are set to *0* and the node address is set to *0* when the reset option is chosen, the event and error counters for all nodes on all loops are reset If the loop address specifies the address of a single loop and the node address is set to *0*, the counters for all nodes on the selected loop are reset

Printing Diagnostics Information

This section explains the methods used to create a hard copy of diagnostic information It explains the methods used to print diagnostic information displayed at the screen The method to use depends on the option chosen

Screen Print For the *Loop Topology* option, use *PRINT* option of the command line menu to print the displayed information

Print Options The *Print Information on Display* option available at the node topology, communication module details, event and error counters, and exception statistics displays allows printing the current diagnostics information presented at the screen Also, the *Select Loop and Nodes for Print* option at these pages can be used to select any desired loop and node for which to print the same type of information This option can be used to print information for a single or range of nodes without having to display the information

For both print options, a printout occurs at the printer assigned to the keyboard Look at the keyboard status block of the page to determine which printer The format of all printed information is the same as what is seen at the screen except that a time of collection appears on the printout

To use the *Select Loop and Nodes for Print* option

1 Press **B** to select the option when it is available on the screen. A *LOOP* ___ *NODE* *TO* input prompt appears

2 Key in a loop number. Use the cursor control keys to move between each input field

3 Key in a single node address or range of node addresses If a loop number is entered without specifying a node address or range of node addresses, the printout contains the information for all nodes on the loop

4 Press **ENTER**

Press **C** to select the *Print Information on Display* print option when it is available. The console begins to print the information currently displayed on the screen

It is a good idea to update the information on the display before initiating a print of the information to guarantee that the most up to date information appears in the printout Refer to ***Updating Diagnostics Information*** in this section

Updating Diagnostics Information

The method used to update diagnostics information depends on the option chosen For the loop topology display, the event and error counters displays, and the exception statistics display, the information displayed automatically updates every 30 seconds The information can also be updated prior to the 30 seconds through operator actions

Press [ENTER] at any time to update information while at the loop topology display The display and data collection times do not up date even after pressing [ENTER] or the 30 seconds expires, how ever, unless there has been

- A change in the loop status since the initial call up of the display
- A change in the loop status since the last update of the display

The *Update Information on Display* option available at the node to pology display, the communication module details display, the event and error counters displays, and the exception statistics display can be used to update the information currently display ing Select this option prior to initiating any prints to insure that the most up to date information appears in a printout Press [D] to choose the option This updates the information for all nodes at the current display

Print Network Topology

The *Print Network Topology* option can be used to print a complete list of all nodes and modules in the entire system The printout contains the hardware address, module type, revision level and current mode for each module in the system The hardware ad dress consists of the loop, node and module address

The information collected for printing may span several pages Each page of the printout contains a page number, and start and completion date for the information printed on that page

Press [K] to choose the *Print Network Topology* option (see Figure 13 5) The message *Print in progress, please wait* and *LOOP, NODE,* and *MODULE* fields appear to indicate the current status of the print request

The printout can take a variable amount of time depending on the complexity of the system The console polls each module in each node on each loop in the system to acquire the information for the printout The *LOOP, NODE,* and *MODULE* fields increment to show the address of the current module being polled

Do ***not*** exit the page while the console is processing the request Exiting the page by pressing [ESC] or calling another display can cels the request in progress The console still, however, prints any data it has already collected

A printout occurs at the printer assigned to the keyboard Look at the keyboard status block of the page to determine which printer The format of all printed information is the same as what is seen on the screen except that a time of collection appears on the printout

PERIPHERAL DEVICE STATUS

The console monitors its own peripherals as long as the device has a defined DEVSTAT tag. The console provides a standard device status display to communicate peripheral status The provided display contains all the necessary display elements to access and display status information for.

- Communications interface unit
- Internal clock
- Keyboards
- Annunciator display panels (ADP)
- CRTs
- Printers
- Touch screens
- Storage devices

    Hard disk drive

    Floppy disk drive

    Magnetic tape unit

    Optical disk unit

Figure 13 11 is the standard device status page The display source file for this display is the ***DEVSTAT1.DT*** file To call the device status page, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

C OIS Operation ——▸ *E Device Status*

Table 13-3 lists the indications that may appear for each device type, and a general description of each indication The text shown is standard default text and can be changed through text substitution

ACKNOWLEDGING DEVICE ALARMS

The operator acknowledges device (*D*) alarm indications through the device status page in the normal way All normal (good) status indications appear in green at this page. Any fields that identify a status error appear in yellow These error indications also cause device alarms The console presents all normal alarm indications Since the page does not use an alarm status field, the fields that indicate a status error flash instead when an alarm has not been acknowledged

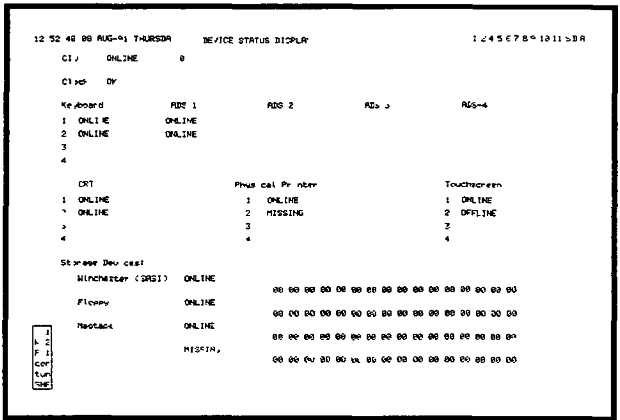

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Figure 13-11. Device Status Display

Table 13-3. Peripheral Device Status Indications

Device Type	Status Indication	Description
CIU	ONLINE	Online normal operation and in communication with INFI 90 system
	OFFLINE	Offline due to three consecutive errors when attempting a command/reply sequence
Clock	OK	Clock time is valid
	FAILED	Clock time is invalid due to an internal clock error or failure
Keyboard	ONLINE	Online normal operation
	OFFLINE	Offline due to error or failure or keyboard disconnection
ADP	ONLINE	Panel and keyboard online
	?ONLINE	Panel was online before keyboard failed
	*ONLINE	Panel was on-line but not accounted for during system configuration
	*?ONLINE	Panel was online before keyboard failed but not accounted for during system configuration (continued)

Table 13 3 Peripheral Device Status Indications (continued)

Device Type	Status Indication	Description
ADP (continued)	OFFLINE	Pane off line due to error or fa lure, keyboard on-line
	?OFFLINE	Pane was off-line before keyboard fa led
	MISSING	Panel accounted for dur ng system configuration but not connected (keyboard on-line or failed)
CRT	ONLINE	On ine normal operat on
	OFFLINE	Set off-line due to contro er error or CRT failure
	MISSING	CRT accounted for during system conf guration but not connected
Phys ca pr nter	ONL NE	On ne norma operation
	OFFLINE	Set off- ine while printer is n loca mode or f a printer error occurs
	M SSING	Printer accounted for during system conf guration but not connected
Touch screen	ONL NE	On- ne, norma operation
	OFFLINE	Set off line due to controller error or touch screen CRT fa lure
	MISSING	Touch screen accounted for during system configurat on but not connected
Storage dev ces	ONLINE	On-l ne normal operation no controller error on last input/output
	O ERROR	Cor troller error on last nput/output
	MISSING	Device not connected

Two choices are available for acknowledging alarms at the device status page, either individually or as an entire page Press [PAGE ACK] to acknowledge all alarms at a page To acknowledge individual alarms at a page

1 Press [ACK ALARM] This positions a cross hair (+) alarm cursor at the first error indication on the screen

2 Press either [TAB] or [TAB BACK] to position the cursor at a specific error field

3 Press [ACK ALARM] to acknowledge that alarm The field stops flashing once acknowledged The *D* indicator at the title line stops flashing after all device alarms are acknowledged It remains at the title line, however, until all device alarms are corrected

4 Repeat Steps 2 and 3 for each alarm to be acknowledged on the current page Once all acknowledgments are completed, press [CANCEL] then [CURSOR] to clear the alarm cursor from the page

MONITOR 68K UTILITY

The monitor 68K (M68K) utility allows directing console diagnostic error messages normally only routed to the monitor 68K terminal to the screen of the console and to a circular file for storage on the hard disk (***MON68K.LG***) The contents of the file can be reviewed or printed at anytime through the M68K utility page (see Figure 13 12)

NOTE The ***MON68K.LG*** file resides in the USN F0 directory on hard disk

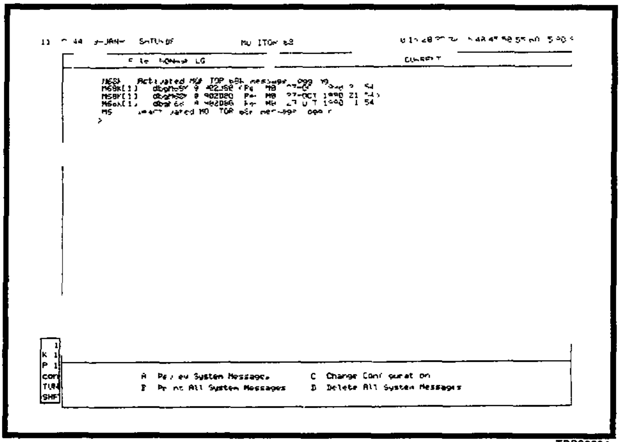

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Figure 13 12 Monitor 68K Utility Display

During normal operation, the monitor 68K terminal provides debugging information required to analyze specific problems The messages output to the terminal are typically messages developed to help trace and identify problems A typical message format is a three character task identifier followed by a text message The message may contain error codes, tag index numbers, values, etc

The M68K utility page only provides the capability to store and view the information normally seen at the monitor 68K terminal The dynamic debugger program accessed through the terminal cannot be accessed through this utility page Also, the utility does not present the trace dump information normally seen at the terminal if a system crash should occur

In some cases, messages indicating errors may not necessarily be a problem since the console implements its own error handling procedures When there is a problem, the utility provides a record of M68K messages that occurred to help isolate the specific problem Refer to Appendix D for a list of the three character task identifiers that appear in most M68K messages

To call the M68K utility page

1 Press MISC MENU A full page menu appears on the screen.

2 Press C to select *Display by Name* A *Display Name* input prompt appears at the bottom of the page

3 Enter **MON68K** at the *Display Name* prompt, then press ENTER The M68K utility display then appears on the screen

The display can also be assigned to, and called by pressing an assignable function key

The options at the bottom of the page allow viewing, printing and deleting stored messages, and also set up the operation of the utility

NOTE The C *Change Configuration* option must be selected first to set up the utility before the other options function

Configuration of the utility sets up the file storage capability and the size of the storage file It also directs the messages to either the monitor 68K terminal or the diagnostic/debug terminal (DDT) after exiting the utility page

While the M68K utility page is on the screen, all newer messages are shown on the screen of the console only New messages do ***not*** appear on the monitor 68K terminal or diagnostic/debug terminal until the page is exited

Review System Messages

Select the *Review System Messages* option to page through and review all diagnostic messages stored in the ***MON68K.LG*** file File storage must have been previously enabled through *Change Configuration* before this option functions.

Press A to select *Review System Messages* option Figure 13-13 shows the display presentation after making the selection The display lists additional options which include

NOTE The utility automatically exits the *Review System Messages* option and returns to displaying current messages when it receives 20 new messages

Display Top of File calls the page that contains the oldest messages in the file Press A to select this option

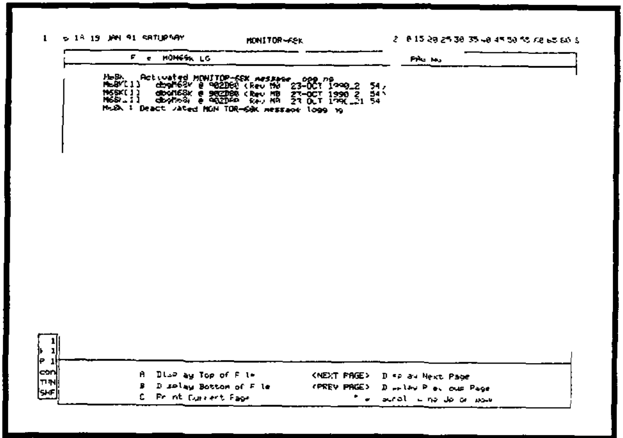

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Figure 13 13 Monitor 68K Utility Page Review System Messages

Display Bottom of File - calls the page that contains the most recent messages in the file Press [B] to select this option

Print Current Page - prints the current, displayed list of messages to the printer assigned to the keyboard Check the keyboard status block to determine which printer Press [C] to select this option

NEXT PAGE/PREV PAGE press [NEXT PAGE] or [PREV PAGE] to advance the diagnostic message page to the next or previous page respectively The indication at the top of the page will be either *CURRENT* or *PAGING* *CURRENT* appears when at the first page, *PAGING* appears after the next or subsequent pages are on the screen

↑ ↓ the single arrow cursor control keys scroll the display page one line at a time Press [↑] to move the page toward older messages, and [↓] to move the page toward newer messages

Print All System Messages

The *Print All System Messages* option initiates a printout of all messages contained in the ***MON68K.LG*** file Press [B] to select the option and start the printout The messages print to the printer assigned to the screen Look at the keyboard status block to determine which printer

Press [ESC] at any time to cancel printing

Change Configuration

The *Change Configuration* option sets up the initial utility operations, and also allows changing them. Attributes set through this option:

1. Start the file storage of diagnostic messages. The console does not store any messages to the ***MON68K.LG*** file until enabled through this option.

2. Define the maximum file size for storage of messages.

3. Direct the messages to either the normal monitor 68K terminal or, if desired, the diagnostic/debug terminal.

Press [C] to select the *Change Configuration* option. Figure 13-14 shows the display presented after selection. The fields at the bottom of the page set up the utilities operation.

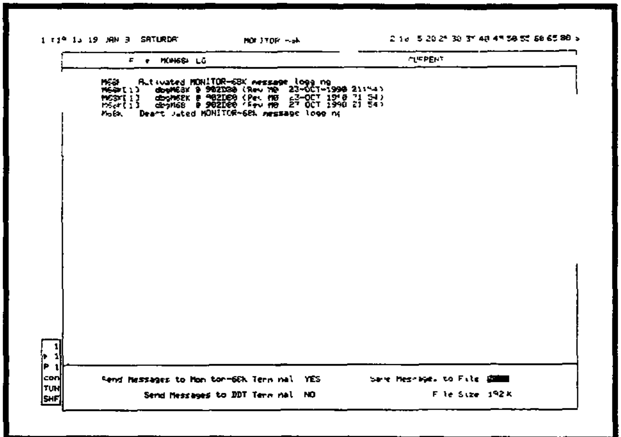

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Figure 13-14. Monitor 68K Utility Page - Change Configuration

Save Messages to File - determines whether or not the messages should be saved to the ***MON68K.LG*** file. Enter **YES** to save all messages to disk.

File Size - defines the maximum size of the ***MON68K.LG*** file on hard disk. The size can be any integer number from 1 to 999, and represents the size of the file in kilobytes (i.e., 1024 byte sections). A one kilobyte file is four sectors on the hard disk, 999 kilobytes is 3396 sectors (i.e., about one megabyte).

A change to the file size does not take effect until the *Delete All System Messages* option is selected, or the *Save Messages to File* option is turned on for the first time The new file is then created with the new file size

NOTE Messages cannot be directed to both the monitor 68K terminal and diagnostic/debug terminal at the same time Also the DDT **MON** and **MOFF** commands should ***not*** be used while the M68K utility display is on the screen

Send Messages to 68K Terminal determines whether the diagnostic messages display on the monitor 68K terminal after exiting the utility Enter **YES** to display the messages on the terminal

Send Messages to DDT Terminal determines whether the messages display on the diagnostic/debug terminal after exiting the utility Enter **YES** to direct messages to the diagnostic/debug terminal This attribute performs the same as the **MON** and **MOFF** commands at the diagnostic/debug terminal

Delete All System Messages

The *Delete All System Messages* option erases all entries in the ***MON68K LG*** file To initiate the deletion

1 Press [D] to select the option

2 The console requires confirmation before the utility will delete any messages Enter **YES** in answer to the *Deleting All System Messages Are You Sure?* prompt to delete the messages

3 Press [ENTER]

All entries in the file must be deleted before attempting to change the file size through the *Change Configuration* option

File Maintenance

The ***MON68K.LG*** file can be copied to floppy disk or renamed as *another file name to assist in diagnosing problems with the console* Before proceeding with either function, set the *Save Messages to File* option to **NO** and exit the M68K utility

To copy the diagnostic file to a floppy disk, enter the following at the diagnostic/debug terminal

COPY 0.F0:MON68K.LG 1.0:

To copy the diagnostic file under a different name, enter the following at the diagnostic/debug terminal

COPY 0.F0:MON68K.LG 0.F0:*filename*.LG

where

filename Any new name up to eight characters

Example **COPY 0.F0:MON68K.LG 0.F0:073092.LG**

Set the *Save Messages to File* option back to **YES** after performing either operation

SECTION 14 - INFI 90 SYSTEM CONFIGURATION

INTRODUCTION

A configuration loaded into memory defines the operating performance limits for a control module in the INFI 90 system A control module executes this configuration to perform its process control responsibilities INFI 90 system configuration capabilities available at the operator interface station (OIS) give access to these PCU module control schemes (i.e , configurations)

This section provides an explanation and procedures for using INFI 90 configuration utilities available at the console The proc ess engineer or technician can change module mode, and config ure, view, modify red tag status or tune a PCU module directly from the console using module configuration functions A control module configuration can be saved, verified and restored using PCU management utilities

NOTE Configuration of PCU modules can be performed using a con f guration and tuning termina (CTT) a console or a persona computer

PCU CONFIGURATION

The PCU configuration functions are accessed through menu se lections To access the PCU configuration menu (see Figure 14 1), first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *A PCU Configuration*

NOTE Refer to ***INFI-NET DIAGNOSTICS*** in the ***INFI 90 and OIS Diagnostics*** sect on for informat on about the *C INFI-NET Diagnostics* opt o-

Module Configuration

Select *A Module Configuration* from the PCU configuration menu (see Figure 14-1) to access module configuration functions This brings up the menu display shown in Figure 14 2.

The status box at the top of the screen provides current information such as module type, operating mode and status of a selected module This information updates every five seconds The configuration functions available are explained in the following paragraphs

All module configuration options except *F Tune a Block* require configuration security access to perform Tuning requires tuning

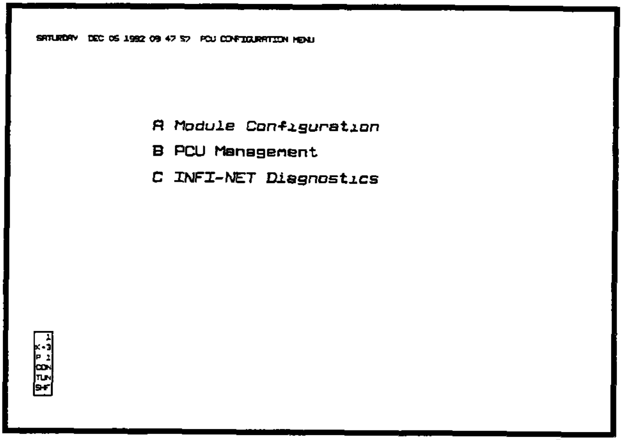

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Figure 14 1 PCU Configuration Menu

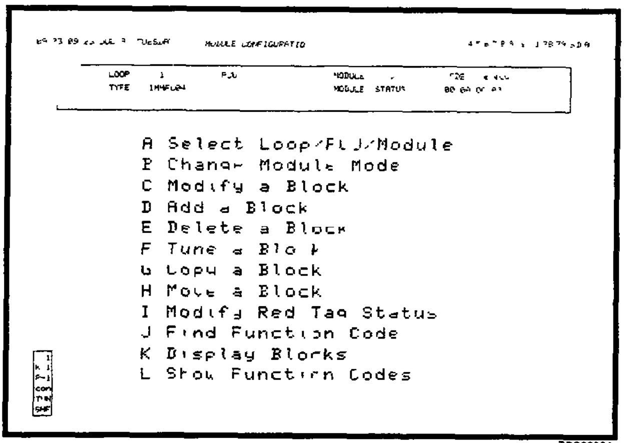

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Figure 14 2 Module Configuration Menu

security access The security key locks must be in the proper position, or password security set to allow configuration or tuning if password security is being implemented An error message appears if these conditions are not met

A module must be in configure mode to perform any of the available configuration options, or execute mode for tuning or red tag modification An error message appears if an attempt to perform a configuration option is made while a module is in the wrong mode

Since the configuration options directly affect PCU module operations, the console requires confirmation for most of the options before it performs the selected operation The console presents a *Press ENTER for action, ESC to cancel* message to allow either confirming or canceling an action Once ENTER is pressed, the console sends a command to the selected PCU module to perform the desired action Pressing ESC abandons an operation before the command is sent to the PCU module

After making any of the configuration selections, use the cursor control keys to move between displayed input fields to enter data Press ESC to exit the current page after completing or canceling an operation, and to return to the module configuration menu page

Valid entries for loop, PCU, module and block address are

Loop	0 or 1 for Plant Loop system, 1 to 250 for INFI-NET system
PCU	1 to 63 for Plant Loop system, 1 to 250 for INFI NET system
Module	0 to 31
Block address	Depends on the module type, the maximum range is from 0 to 9999

SELECT A LOOP, PCU AND MODULE

The *A Select Loop/PCU/Module* option allows the operator to access a module both to view its current mode and status, and to configure or tune its operating parameters

1 Select *A Select Loop/PCU/Module* This option allows selecting any desired module in the INFI 90 system by entering its address A module must be selected through this function before any module specific operations can be performed

2 Enter a module address in the *LOOP, PCU,* and *MODULE* fields

3 Press ENTER The status box fields at the top of the page update to reflect the mode, status and type of the entered module Select this option at any time to change to a different module

CHANGE MODULE MODE

The *B Change Module Mode* option allows the operator to change the mode of operation for the selected module A module must be in **execute** mode to perform any tuning or red tag status modification, or configure mode to make configuration changes Selecting *Initialize* clears the current configuration from the memory of a module to allow downloading another Selecting *Reset* initiates a module circuitry reset In any case, the console requires confirmation before performing the selected operation

> **NOTE** Care should be taken when using the *Initialize* function since it erases module memory A configuration must then be downloaded for the module to resume its control responsibilities

To use the option

1 Select *B Change Module Mode* The mode can be set to either execute or configure The module can also be initialized or reset

2 Select one of the options

3 Confirm the action by pressing ENTER Press ESC to cancel the action The *MODE* field in the status box updates to verify the mode change

MODIFY A BLOCK

The *C Modify a Block* option allows the operator to make changes to the parameters controlling the operation of a specific function block

1 Select *C Modify a Block*

2 Enter a block address at the *Block number* input field, then press ENTER The current specification values for that block display and can be edited

3 Modify all desired specifications, then press ENTER

4 Press ENTER again to confirm the action, or press ESC to cancel the action

ADD A BLOCK

The *D Add a Block* option allows the operator to add a function block to the current configuration of the selected module

1 Select *D Add a Block*

2 Both a block address and function code are required to create a function block Enter a block address at the *Block number* input field and a function code number at the *Function code* input field for the function block to add, then press ENTER Use the *Show Function Codes* option to determine valid function code entries

The console does not allow adding a function block over an existing function block If the block address already has a configured function code, an error message displays To add the new block at the address of an existing block, the existing function block must first be deleted If the address is available, the default specification values for the added block display with specification one highlighted for editing

3 Editing is performed in the same manner as in the *Modify a Block function Enter all specification values, then press* [ENTER]

4 Press [ENTER] again to confirm the action. or press [ESC] to cancel the action

DELETE A BLOCK

The *E Delete a Block* option allows the operator to delete a function block from the current configuration of the selected module

1 Select *E Delete a Block*

2 Enter the address of the block to delete at the *Block number* input field, then press [ENTER] to have the console send the delete command to the module An error displays if the block does not exist, otherwise it is deleted from the configuration

TUNE A BLOCK

The *F Tune a Block* option allows the operator to tune the specifications of a function block in the configuration of the selected module

1 Select *F Tune a Block*

2 Enter the address of the block to tune at the *Block number* input field An error message displays if the module is not in execute mode, otherwise the current specification values of the selected block display A tunable parameter is identified by a *T* The console does not allow moving to specifications that are not tunable

3 Perform all desired tuning changes, then press [ENTER]

4 Press [ENTER] *again to confirm the action, or press* [ESC] to cancel the action

COPY A BLOCK

The *G Copy a Block* option allows the operator to copy a configured block to another block address

1 Select *G Copy a Block*

2 Enter the address of the source block at the *Copy block* input field and destination block address at the *To block* input field, then press [ENTER] The source block is read and copied to the destination address after entering

The console does not allow copying a function block over an existing function block If the destination block address already has a configured function code, an error message displays To copy the source block to the address of an existing block, the existing function block must first be deleted If the destination address is available, the copy executes

MOVE A BLOCK

The *H Move a Block* option allows the operator to move a function block from its current address to another

1 Select *H Move a Block* This is different than *Copy a Block*

2 Enter the address of the function block to move in the *Move block* input field and its destination address to move to in the *To block* input field, then press [ENTER] The source block is read and copied to the destination address, then the source block is deleted

The console does not allow moving a function block to an address of an existing function block If the destination block address already has a configured function code, an error message displays To move the source block to the address of an existing block, the existing function block must first be deleted If the destination address is available, the move executes

After issuing a *Move a Block* command, the console searches a module configuration for all function blocks that reference the old address of the block being moved It then automatically changes the specifications for these blocks to the new block address Some function blocks have more than one output with a separate block address for each output In this case, the console performs the same check for all block addresses, and changes the required specifications

MODIFY RED TAG STATUS

NOTE The red tag status function does *not* lock out the power source for the actual equipment The user must de energize the power source and implement red tagging in compliance with the ANSI Z244 1 specification Red tag status reported to the console is for display purposes only

The *I Modify Red Tag Status* option allows the operator to either indicate red tag status for a function block or to remove the red tag status indication from a function block

The following tags and their associated function codes (FC) allow for red tagging

DANG	Data acquisition analog, FC 177
DADIG	Data acquisition digital, FC 211
DD	Device driver, FC 123
MSDD	Multi state device driver, FC 129
RCM	Remote control memory, FC 62
RMCB	Remote motor control, FC 136
STATION	M/A station (basic), FC 21, M/A station (cascade), FC 22, M/A station (ratio) FC 23
STATION	Control station, FC 80
TEXTSTR	User defined data export, FC 194

To modify the red tag status for a function block

1 Select *I Modify Red Tag Status* A module must be in ***execute*** mode to modify the red tag status

2 Enter either a tag name or index number, or block address at the *Enter Tag Name/Index ____ or Block ____* input field, then press [ENTER] Figure 14-3 shows the modify red tag status page

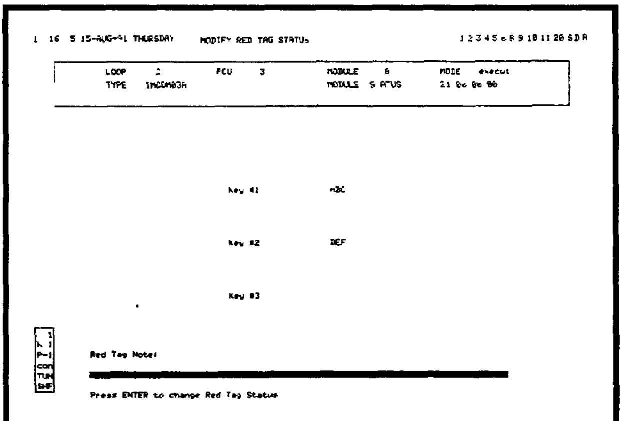

Figure 14 3 Modify Red Tag Status

If a tag name or index is not known, enter a block address The specific module must first be selected through the *Select Loop/PCU/Module* option If using this method to select the block, any red tag modification is done on a function block in the module shown in the status box at the top of the page

Enter a 14-character tag name or an index number at the input field if known Red tag modification can then be performed on the function block defined by the tag Entering a tag name automatically selects a loop, PCU and module The console references the module and block address defined in the tag to automatically select the correct module and function block After entering a tag name or index number, the status box updates to show the address, type, mode and status of the module whose address is defined in the tag

Using tag name or index entry temporarily overrides any previous module selections made through the *Select Loop/PCU/Module* option This selection is only temporary After exiting the modify red tag status page, the selection appearing in the status box returns to the module previously selected through option *A* Any configuration options are also performed on this previously selected module

After the block has been selected, the display shows the current red tag status If the *Key* fields are blank, the block is not currently red tagged If any of the three *Key* fields has alphanumeric characters in them, the block is red tagged The three *Key* fields allow for three different red tag keys to be applied to the block

To ***indicate*** a red tag status for the selected block

1 Enter from one to three characters in any or all of the three *Key* fields, then press ENTER Entry in only one field is required to red tag a block Valid *Key* field characters are A through Z (uppercase only), 0 through 9, colon ( ), dollar ($), period ( ) and space

2 Press ENTER again to confirm the action, or press ESC to cancel the action The action is successful if the *Key* fields show the desired key entries after confirming Any faceplate element or display that provides a red tag indication displays the *RT* indicator as soon as the change is made

To ***remove*** a red tag status indication from the selected block

1 Clear all fields with characters in them, then press ENTER

2 Press ENTER again to confirm the action, or press ESC to cancel the action The action is successful if the *Key* fields are blank after confirming Any faceplate element or display that

provides a red tag indication removes the *RT* indicator as soon as the change is made

In addition to the *RT* indicator, a display element can indicate red tag status by changing the color of the outline for a display element to red The source file for a symbol, however, must be modified in some cases to enable the red tag status outline feature Either remove the remark (rm) at the beginning of the line containing the **ed 102** escape command, or add this command to the source file if not present

The note field at the bottom of the page can be used to enter red tag notes in the events or operator actions log Eighty characters can be entered in this field It can be used to indicate the reason the device was red tagged or for any additional information pertaining to the application or removal of red tag status

FIND FUNCTION CODE

The *J Find Function Code* option allows the operator to find a specific function code within the configuration of a module This can be used to find a function block when the function code is known but the block address is not

1 Select *J Find Function Code.*

2 Enter a starting block number at the *Search from block* input field and a function code to search for at the *Function code* input field, then press ENTER The console reads each block beginning at the start address until finding a block with the desired function code The block parameters then display on the screen Use the *Show Function Codes* option to determine valid function code entries

To continue the search

1 Press ESC to exit the parameters page for a found block This exits back to the input page for the *Find Function Code* option

2 Press ENTER to continue the search starting at the last found block

DISPLAY BLOCKS

The *K Display Blocks* option allows the operator to display each block configured in a module

1 Select *K Display Blocks*

2 Enter a starting block address at the *Search from block* input field, then press ENTER The parameters for the block at the

starting address or the first block found after the starting address appear on the screen

To continue and view the next configured function block

1 Press [ESC] to exit the parameters page for a found block This exits back to the input page for the *Display Block* option

2 Press [ENTER] to continue the search starting at the last found block

SHOW FUNCTION CODES

The *L Show Function Codes* option allows the operator to view a complete list of available INFI 90 function codes The list provides a noun name along with the function code number The list spans several pages, each page containing 64 codes Press [NEXT PAGE] or [PREV PAGE] to move between the pages

PCU Management

PCU management allows saving, loading, verifying and printing module configurations Select *B PCU Management* from the PCU configuration menu (see Figure 14 1) to call the PCU management menu (see Figure 14 4)

The status box above the menu items presents data fields that contain the values last entered at the console The address shown

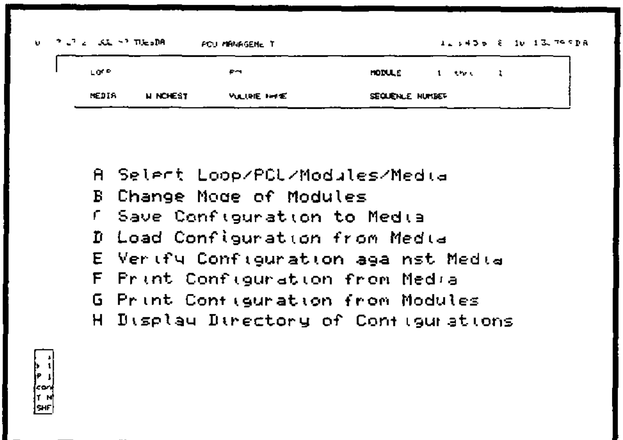

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Figure 14 4 PCU Management Menu

is the last entered while in one of the PCU configuration displays, either module configuration or PCU management All management options reference the modules defined through the *Select Loop/PCU/Module/Media* option Make any changes through this option before initiating any other management functions

Most PCU management functions can be performed on either a single or range of modules in a PCU The top line fields in the status box identify which modules The bottom line fields show whether the medium being used to store, restore, verify or print configurations is the hard disk (*WINCHEST*) or floppy disk (*FLOPPY*). For configurations residing on floppy disk, this line presents a *Volume Name* and *Sequence Number* associated with the configuration data

Since the management options directly affect PCU module operations, the console requires confirmation for most of the options before it performs the chosen operation The console presents a *Press ENTER for action, ESC to cancel* message to allow either confirming or canceling an action Once ENTER is pressed, the console sends commands to the selected PCU modules to perform the desired action Pressing ESC abandons an operation before any commands are sent to the PCU modules

Most management options only require making a selection without having to enter any further data The selector character of an option changes to cyan to identify the option as selected The console provides informational messages at the bottom of the page to identify the current status of the operation. The selector returns to its original red color after the operation completes for all modules, and the following message appears

Processing of modules n thru n complete

The only exception to this is the *A Select Loop/PCU/Modules/Media* option All other management functions reference the selections made here Use the cursor control keys to move between displayed input fields to enter data

Valid entries for loop, PCU and module address are

Loop 0 or 1 for Plant Loop system; 1 to 250 for INFI NET system

PCU 1 to 63 for Plant Loop system, 1 to 250 for INFI-NET system

Module 0 to 31

SELECT LOOP, PCU, MODULES AND MEDIA

The operator can choose a module or range of modules to perform PCU management functions through the *A Select Loop/PCU/Modules/Media* option This option also specifies the type of media and version to use when initiating these functions Select this option at any time to change to a different process control unit and modules

The operator can select any process control unit in the INFI 90 system and modules within that process control unit A process control unit and module must be selected through this function before performing any management operations All PCU management functions affect only one process control unit at a time, most can be performed on a range of modules within that process control unit

To use the option

1 Select *A Select Loop/PCU/Modules/Media* Figure 14 5 shows the select loop, PCU, module and media page

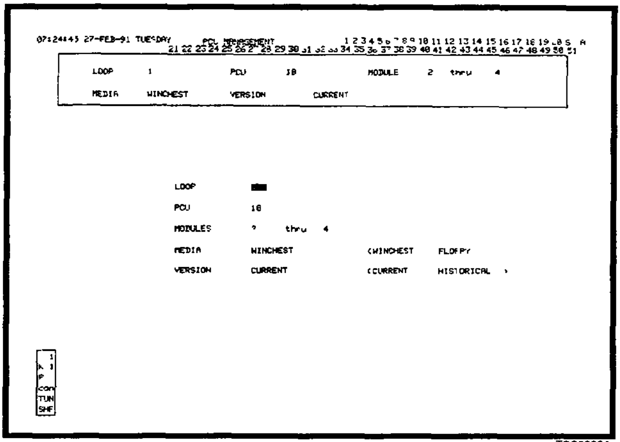

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Figure 14 5 Select Loop/PCU/Modules/Media

2 Enter the address of a specific process control unit in the *LOOP* and *PCU* fields

3 Enter a single or range of modules in the *MODULES thru* fields

4 The media type is either hard disk or floppy disk The *MEDIA* field determines which the console is to use when storing, restoring, verifying or printing configurations Enter either **WINCHEST** (hard disk) or **FLOPPY**

5 When using a *FLOPPY* media type, the screen presents a *VOLUME* field and a *SEQUENCE* field as soon as the input cursor is moved from the *MEDIA* field. A volume name and sequence number assigned to the configuration or set of configurations stored to floppy disk identifies that specific set of configurations This name and sequence number can be used to prevent the console from overwriting a previously stored set of configurations when using the save option Enter a volume name and sequence number if desired If using *WINCHEST* as the media type, this step does not apply

6 The *VERSION* field determines whether the data is current PCU module data (*CURRENT*) or archived data (*HISTORICAL*) Enter the desired version as either **CURRENT** or **HISTORICAL**

7 After fields, press **ENTER** The status box at the top of the page updates to reflect the entered address and media The volume name and sequence number also appear if the media type is floppy disk

Version *The VERSION field determines where the console is to save con-*figurations to, and from where it is to load, verify or print configurations The console saves configurations to two separate directories on its hard disk, a current directory or archival storage directory, based on this entry

The current directory is used to store data that is to remain on the hard disk of the console The configurations in this directory reside on hard disk until deleted through PCU management functions This saved data can be loaded, verified or printed at any time

The archival storage directory provides temporary storage of PCU configurations until a scheduled archive to medium occurs The console automatically stores all saved configurations to this directory if archival storage has been turned *ON* for PCU configurations After the console archives all configurations in this directory to a medium, it begins to overwrite the data with new archived data

Archived configurations can only be loaded, verified and printed after first being retrieved through archival retrieval functions Retrieved configurations store in an archival retrieval directory, this directory is separate from the archival storage directory.

Refer to ***Archive Data Storage*** and ***Archive Data Retrieval*** in the ***Recording Process Data*** section for further explanation

A current directory contains only those configurations that are saved while the version is set to *CURRENT* Configurations automatically save to both the current and archival storage directories while the version is *CURRENT* as long as archival storage has been turned *ON* for PCU configuration data When the version is

HISTORICAL, no configurations store to the current directory They store to the archival storage directory only and only if archival storage has been turned *ON* for PCU configurations When the media is floppy disk, the console ignores the *VERSION* field and any configuration saved to floppy disk also saves to the archival storage directory

The *VERSION* field also determines where the console is to look for configuration data when performing load, verify and print operations If set to *CURRENT* and the media is hard disk, the console references configurations saved in the current directory It looks for configurations in the archival retrieval directory when the version is set to *HISTORICAL* For floppy disk media, the console ignores the *VERSION* field

CHANGE MODE OF MODULES

The *B Change Mode of Modules* option allows the operator to change the mode of operation for the selected modules A module must be in execute mode to perform its control responsibilities A *module must be in configure mode to load a configuration* Selecting *Initialize* clears the current configuration from memory of a module to allow downloading another Selecting *Reset* initiates a module circuitry reset In any case, the console requires confirmation before performing the selected operation

Only one module at a time can be put into ***configure*** mode using this utility If a range of modules is specified, attempting to put the modules in configure mode causes the console to present the message

Limited to one module at a time

To use the option

NOTE Care should be taken before using the *Initialize* function since it erases module memory A configuration must then be downloaded for the module to resume its control responsibilities

1 Select *B Change Mode of Modules* The mode can be set to either execute or configure A module can also be initialized or reset

2 Select an option

3 Press ENTER to confirm the action, or press ESC to cancel the action

SAVE CONFIGURATION TO MEDIA

The *C Save Configuration to Media* option allows the operator to save configurations Each configuration stores in a separate file containing only one configuration The console overwrites existing configurations when saving A configuration file for a specific module can be identified by its loop, PCU and module address

1 Select *C Save Configuration to Media*

2 Press [ENTER] to confirm the action, or press [ESC] to cancel the action The data stores in a directory determined by the *VERSION* field entry

LOAD CONFIGURATION FROM MEDIA

The *D Load Configuration from Media* option allows the operator to download a configuration to a selected module from a selected medium. A module that the configuration is being downloaded to must be in ***configure*** mode If specifying a range of modules, an informational message identifies which modules are not in configure mode

1 Select *D Load Configuration from Media*

2 Press [ENTER] to confirm the action, or press [ESC] to cancel the action

VERIFY CONFIGURATION AGAINST MEDIA

The *E Verify Configuration against Media* allows the operator to verify the downloaded configuration against a stored configuration The first error encountered terminates the verification process The console identifies the error with a message on the screen After correcting an error by either repeating a download or modifying the configuration in the module the verify can be attempted again If the same or another error occurs, it is again identified

1 Select *E Verify Configuration against Media*

2 Press [ENTER] to confirm the action, or press [ESC] to cancel the action

PRINTING CONFIGURATIONS

The management functions provide two options for printing configuration data *F Print Configuration from Media* and *G Print Configuration from Modules* A printout occurs at the printer currently assigned to the keyboard Look at the keyboard status block to determine which printer Configurations print in a standard format

From Media

The *Print Configuration from Media* option initiates a printout of configurations residing on a specific medium

1 Select *F Print Configuration from Media* The *VERSION* field entry determines whether the data is from the current directory or the archival retrieval directory

2 Press ENTER to confirm the action, or press ESC to cancel the action

From Modules

The *Print Configuration from Modules* option initiates a printout of each configuration that currently resides in memory of the selected modules This option references only the loop, PCU and module address selections.

1 Select *Print Configuration from Modules*

2 Press ENTER to confirm the action, or press ESC to cancel the action

After choosing either print option, the console collects the configuration information, then formats pages for printing The current page number being processed displays in the message

Processing page n

NOTE Exiting the page after making a selection but while the *Processing page n* message is displaying causes the printout to be canceled

The console presents other informational messages that identify which module configuration is currently being processed, and when processing is complete for all modules

DISPLAY DIRECTORY OF CONFIGURATIONS

The *H Display Directory of Configurations* option allows the operator to view a directory display that lists the PCU configurations stored in the current directory on the hard disk The listing is for the current directory only The console ignores the *MEDIA* and *VERSION* field entries for this selection The archival storage and retrieval function provides a directory function for viewing retrieved (*HISTORICAL*) PCU configurations Refer to ***Archive Data Retrieval*** in the ***Recording Process Data*** section for specifics

Select *H Display Directory of Configurations* to view a directory (see Figure 14 6) Each directory entry contains a loop, PCU and module number, and a storage time These attributes identify a file that contains the configuration of a single module Directory entries are in numerical order by loop, PCU and module number A single directory page can show 22 entries Press NEXT PAGE or PREV PAGE to view additional pages

At the bottom of the display are two options for deleting saved configuration files from the hard disk *X Delete Selected* or *Y Delete Page*

To delete only designated configurations from the medium

1 Select the *X Delete Selected* option The letters corresponding to each configuration listed in the directory turn red to indicate that the page is in delete mode

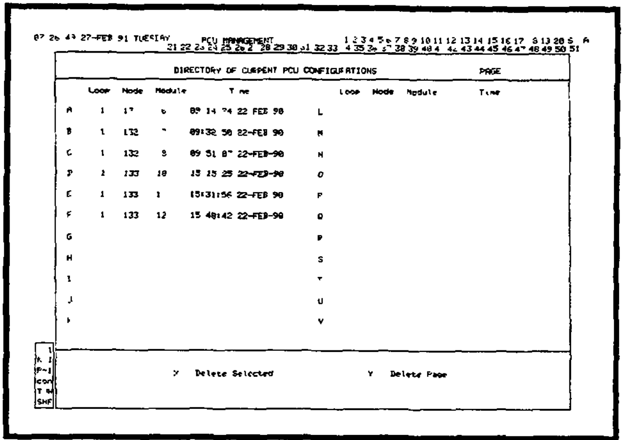

Figure 14 6 Display Directory of Configurations

2 Select a configuration to delete by pressing its corresponding letter key Once pressed, the selector character changes to green to identify a deletion designation

3 After all files have been identified, press ENTER to initiate the deletion Press ESC at any time before pressing ENTER to exit delete mode

To delete all configurations on the page

1 Select the *Y Delete Page* option, the border of the page then highlights

2 Press ENTER to erase all of the configurations listed at the current page from the hard disk

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SECTION 15 - OIS CONFIGURATION

INTRODUCTION

This section describes the configuration procedures of the operator interface station (OIS) The console must be configured ***before*** it is put into operation (initialization is done at the factory) *Careful planning should be done before completing any configuration* Do ***not*** operate the console before reading and clearly understanding this section Complete only the specific configuration procedures required for operation in your plant

NOTE The TUNE/CONFIG key lock and password security when configured limit access to configuration options Before password security configuration, the key lock prevents unauthorized access Password security configuration can be set to limit access to configurations by using both password security and key lock

In this document, main console refers to an IIOIS201, IIOIS202, or IIOIS203. An IIOIS20A or IIOIS20D driver cabinet is also a main console, but it requires an auxiliary terminal Auxiliary terminal refers to an IIOIC201, IIOIC2021, IIOIC2022, IIOIC2023, IIOIC203, or IIOIC204 console The same configurations can be done while at any one of these types of consoles

GENERAL INFORMATION

The *General Functions Menu* provides access to configuration functions (see Figure 15 1) Press GENL FCTNS MENU to call this display from any other display All configuration procedures in this section start at the *General Functions Menu*, and use either *A OIS Configuration* or *B OIS Utilities* options Refer to the ***Menu Structure*** section for a tree structured view of the *General Functions Menu* options

The configuration resides on the hard disk mostly in ***.CF*** files. Each configuration option uses a separate display page Except for display creation, these configuration pages are interactive, fill in-the blank type displays The process engineer can both initially configure and edit an existing configuration on the same configuration pages The procedures and input fields for both purposes are the same

The console automatically checks each input and presents an error message when an attempt to enter invalid data has been made Once the console identifies a field in error, it positions the input cursor at that field until it is corrected, cleared, or reset to its original entry

This section explains the configuration procedures as if performing the initial console configuration Some procedures may not apply for your particular operation and can be skipped If

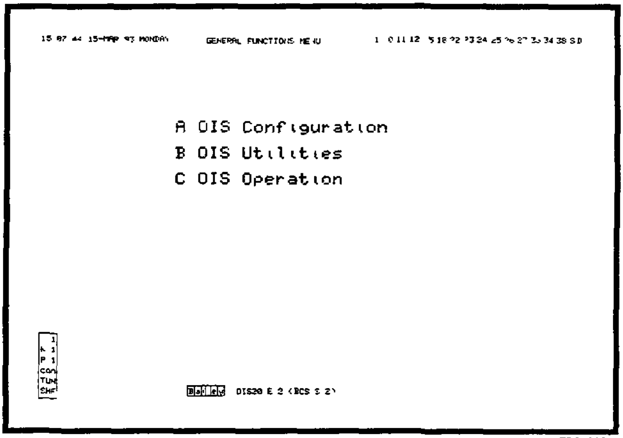

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Figure 15 1 General Functions Menu

modifying an existing configuration, some steps may not be required Valid entries for display fields are given in either the configuration procedures or tables related to the procedures

NOTE The text substitut on function can prov de a l st of val d text en tr es for most conf gurat on pages f unsure of an entry or text has been changed through text substitution reference this function For example to f nd the va id tag types that can be entered dur ng tag configurat on ca the text conf gurat on function, then item *9 Tag Type* Refer to ***Text Definition and Substitution*** in th s section for procedures

Usually configuration of the console is performed off line using the software logging, database and graphics (SLDG) configuration tools, then transferring required configuration files to the console This is the preferred method The SLDG program, however, does not support all console configuration requirements Configuration options available through the console can be used to modify or make additions to the current configuration, or a configuration created on a SLDG work station and uploaded to the console SLDG work station refers to an engineering work station running the SLDG program

The SLDG program also provides tools and an easier method for creating displays The console provides a display editing capabil ity Refer to the ***Software Logging Database and Graphics (SLDG)*** instruction for additional information If changes are made at the console, it is suggested that the configuration files affected be copied back to the SLDG work station This will maintain the integrity of the configuration files

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The process engineer can configure the console using either the standard mylar keyboard or an auxiliary engineering keyboard Both provide the same functions, although, it may be easier and faster to perform configuration procedures using the auxiliary engineering keyboard The layout of the mylar keyboard is set up to facilitate process control and monitoring operations where the auxiliary engineering keyboard layout is a QWERTY style keyboard better suited for data input Refer to Appendix A to cross reference functions of the mylar keyboard keys to auxiliary engineering keyboard keys

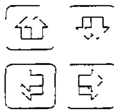
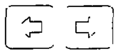
Keys used in configuration procedures are located in the alpha betic character block, cursor control block and numeric keypad block sections of the mylar keyboard Refer to the ***Keyboard and Peripherals*** section for their location Table 15 1 lists the specific keys used for configuration and their functions

> **NOTE** When using the key lock for security switching the key lock back to the LOCK position before saving the current configuration page causes the console to discard any and all modifications Saving occurs after selecting a save option or pressing [ENTER] or [NEXT PAGE] or [PREV PAGE] in some cases

Table 15-1 OIS Configuration Keys

Key	Function
[A]-[Z] [0] [9], punctuation	Enters alphanumeric data and values ASCI characters and punctuation
SPACE	Fills a character position in a field with a blank space
ENTER	Enters current data into the console to update the configuration files In most cases this key must be pressed after completing all entries on a configuration page
ESC	Returns to previous menus and eventually the *General Functions Menu* from the current page Any data keyed in may be lost unless [ENTER] is pressed before [ESC] On some displays this key calls a *Select Field* input prompt that can be used to specify then move the input cursor to a specific display field It also provides an abort option Prompts explain additional use of this key
CLEAR	Erases keyboard entry errors or old data from input fields
TAB	Moves the input field cursor to the next logical field determined by the console If there is an error the cursor stays on the input field in error and the system displays an error message Tabbing also enters data for the field from which the cursor was tabbed

Table 15 1 OIS Configuration Keys (continued)

Key	Function
TAB BACK	Performs the same functions as TAB, but moves *to the previous logical input field*
HOME	Resets the current field to the text string it held when the display was first called To reset a field press HOME while at the field but before moving to the next field or pressing any other key
	*Moves the input cursor one field in the direction of* the arrow Use these keys to randomly move about a display
	Moves the cursor within an input field one position in the direction of the arrow

OIS SUBSYSTEMS CONFIGURATION

During configuration, the process engineer defines information necessary for the console to collect and display INFI 90 process data, and to initiate operator manual control actions The engineer also designs the desired display formats to show all necessary information, and sets up security, alarm management and data recording capabilities

The sections of the instruction that describe the configurations required to completely set up the console for any particular application are

OIS System Configuration defines the operating parameters for the console, and enables and accounts for supported peripherals This section gives the procedures to set the maximum number of exception reports the console processes in a one second cycle, and the order that the console is to perform its remaining processing responsibilities after processing these exception reports It also explains time and date format configuration

Password Security sets console security features These include

- Security options
- Security level
- User password definitions
- Display mask configuration

- Tag security level and group assignment
- Log security level assignment

Database provides procedures for entering or editing tags in the tag database, engineering unit descriptors and logic state descriptors It also explains tag database broadcasting

Display Generation explains display and symbol creation options using either the elementary line editor for line editing or associated engineering tools Also, it explains procedures to assemble displays from source files into a usable OIS format, and to view errors encountered during this final assembly process

Keyboard gives procedures for assigning displays and key macros to keyboard keys and annunciator display panel (ADP) push buttons It also explains key macro definition, and alarm tone and relay configuration

Alarm Management - sets standard console indications that notify an operator of an alarm condition, and console responses such as triggering alarm annunciators It provides procedures and requirements for configuring

- Alarm groups
- Alarm quality options (both good and non good quality)
- Automatic alarm inhibiting
- Alarm summary
- Alarm summary reports
- Alarm tones and relays
- Global alarm acknowledge and silence
- Remote alarm acknowledge

Trend - establishes requirements and procedures for defining trends A trend definition identifies a trend for which the console is to collect and present data in displays and logs It also explains additional configuration requirements for using this collected data in trend displays and XY plots

Logging gives instruction for creating and enabling process data recording capabilities These include the system events log (and operator actions log), custom logs and sequence of events (SOE) logs *Some standard custom logs include trend, trip and snapshot logs*

Archival Storage describes the procedures to set up the console to store collected process data Archiving extends normal console storage of logs, PCU configurations, system events, trends and tag data indefinitely

Peripherals provides a list of available printer types and explains printer configuration requirements It explains console definition and logical CRT assignments required for password security It also gives procedures to enable automatic failover if a CRT or printer fails

Display Configuration provides additional configuration requirements for displays and symbols used in console specific operations These include faceplate elements for operator configurable displays, XY plot definition and alarm summary requirements This section also gives procedures to define a display or pop up element to automatically appear on the screen when a certain process condition occurs

Text Definition and Substitution presents steps to change default console presented text strings to user defined text strings Almost all text can be substituted through this configuration

Trend Pen Cluster Configuration gives procedures for enabling trend pen recorders, and selecting process variables to track This sets up the interface logic required between recorders and the console

Alternate Language Character Substitution required when using an alternate language It should be performed prior to any other configuration to allow entering alternate language character strings during configuration steps It also explains procedures to create the alternate language character set, either extended or complex

The order in which this instruction presents the configuration procedures may or may not be the best order for your specific needs Some of these configurations may not apply to your operations at all System, database and display configuration are the minimum configuration requirements Once the console is completely configured, a backup copy of the configuration on hard disk can be made using a tape drive or floppy disks Refer to the ***Terminal Utilities*** section for procedures to back up (save) the configuration

OIS System Configuration

OIS system configuration must be done ***before*** any further configuration or operation can take place During this component of configuration, the process engineer defines general parameters that effect operation and enable supported peripherals

Additionally, system configuration includes setting up the processing responsibilities of the console This can be used to maximize operation based on its intended application. A *CIU Task Processing* option determines the number of exception reports processed during a one-second cycle and the order of priority for executing the remaining task processing responsibilities

System configuration also includes setting the time and date format. The time and date that appears in the display title line and other functions that use a time and date field conform to the configured format.

SYSTEM CONFIGURATION

> **NOTE** The console must be reset after all or any changes have been made at the *OIS System Configuration* page It will not exit this function once a change has been made without initiating a reset Press ESC ***before*** pressing any other keys to exit this display without having to reset the console

Step 1 The process engineer defines general system operating parameters through one of the *OIS System Configuration* pages (see Figure 15-2) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration
└→ *E System*
  └→ *A System*
    └→ *A General Parameters*

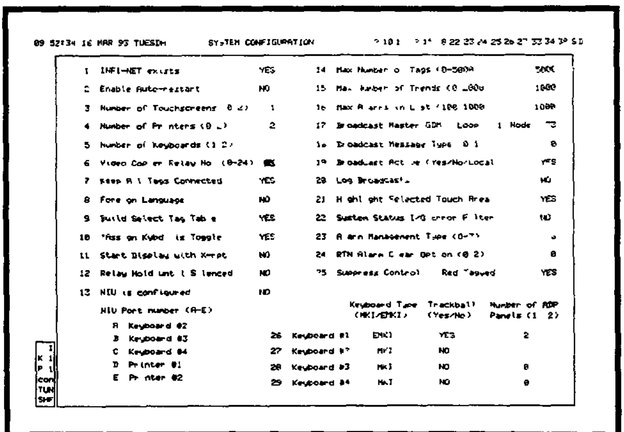


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Figure 15 2 OIS System Configuration

Step 2 To define the displayed fields

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field Table 15 2 lists the system configuration page attributes Refer to this table when entering data After each data entry, pressing ENTER or moving to another field causes the console to prompt with

Do Not Restart the OIS While It Is Processing

Before continuing with further input or resetting the console, wait for the message

Restart System, Updates Have Been Done

Continue with this step until all system attributes have been defined When completed, go to the next step

Press ESC at any time to call a *Select Field* input prompt, which can be used to move to a specific field

b Reset the console by pressing the RESET button located at the power entry panel When the console comes back on line it operates with the parameters defined at the general parameters page

Table 15 2 OIS System Configuration Attributes

Field	Valid Entries	Purpose
NF NET exists	YES/NO	Defines the type of communication highway on which the console is operating NFI NET system or Plant Loop system YES - NF NET system NO Plant Loop system
Enable auto restart	YES/NO	Tells the console whether it is to automatically restart after a system crash YES - enable restart NO disable restart the console must be manually reset to restart
Number of touch screens	0 2	Defines the number of touch screen capable screens The console supports two screens each can use touch screen 0 - default no touch screens 1 or 2 - one or two touch screen capable screens
Number of printers	0 2	Identifies the number of printers connected The console supports two printers 0 - default no printers connected 1 or 2 - one or two printers

Table 15 2 OIS System Configuration Attributes (continued)

Field	Valid Entries	Purpose
Number of keyboards	1 - 2	Ident fes the number of keyboards connected The conso e supports two keyboards 1 − defau t 2 = operating w th two keyboards Each additional keyboard usua ly corresponds to each additional screen Define the fo owing for each keyboard *Keyboard Type* *Trackball* *Number of ADPs*
V deo copier re ay no	0 12	dentifies to which re ay a v deo copier connects The conso e supports a single color video copier which connects and turns on through one of 12 keyboard re ays Each keyboard interface drives s x relays 0 = defau t no connection 1 to 6 = relays supported by a s ngle keyboard 7 to 12 = re ays supported by a second keyboard
Keep a tags connected	YES/NO	Determines whether the conso e monitors exception reports continuously or on y when requ red The console monitors exception reports sent on the communication h ghway YES = monitors except on reports cont nuous y for a l tags defined in its database provid ng a cont nuous update of the database values NO − monitors exception reports for only those tags that curent y appear n a d splay on the screen and on y when a log s collecting data for tags
Foreign anguage	YES/NO	Enables alternate language wh ch al ows substitut on of English language character strings with characters of another language (i e extended or complex) Alternate language characters are def ned throug character defin t on functions YES – enables alternate anguage character entry and def nition NO – default disables alternate language character entry and def n tion
Build select tag tab e	YES/NO	Enables the console to build a tag table it uses to automatica ly activate control for a tag selected through the $\boxed{\text{TUNE}}$, $\boxed{\text{DETAILS}}$ or $\boxed{\text{OP PARAMS}}$ functions YES – enab es the conso e to bui d a tag tab e NO = default disables building a tag table disabling automat c contro act vat on
Assign kybd s togg e	YES/NO	Not requ red for th s conso e YES − default eave th s f e d at defau t

Table 15-2. OIS System Configuration Attributes (continued)

Field	Valid Entries	Purpose
Start display with xrpt	YES/NO	Determines the initial presentation of variables at display call up. YES - causes the console to wait for a new exception report before it displays any values, states or alarms for tags after the operator first calls a display. The alarm status and value fields for a point remain blank until the console receives a new exception report for that point. NO - causes the console to display the values, states or alarms received in previous exception reports for points when the operator first calls a display.
Relay hold until silenced	YES/NO	YES = an alarm relay remains closed until the operator presses **SILENCE** or the duration set for the relay expires. NO - default; an alarm relay remains closed until the alarm condition driving the relay returns to normal or is acknowledged, or the duration set for the relay expires.
NIU is configured	YES/NO	Not applicable for this console. NO - default; leave this field at default.
Max number of tags	0 - 5000	Determines disk space allocation for the tag database. The console can support up to 5,000 tags in its database. If changing the size of the tag database, increase or decrease it to the nearest 2500 increment. **NOTE:** Decreasing this number erases any database tag entries that have index numbers above the new value entered. It is recommended to leave this field at its default (5000) even if the maximum number of tags is not required.
Max number of trends	0 - 2000	Determines disk space allocation for the trend database; should be set close to the current database requirements. This can be increased later to add more trends to the database if desired. The console supports up to 2,000 trend definitions, but the maximum number of each type of trend is 1,000 one-minute standard trends and 2,000 display only trends. The maximum number decreases with a mixture of one minute standard trends, 15 second standard trends and enhanced trends. **NOTE:** Decreasing this number erases any trend definitions that have index numbers above the new value entered.
Max alarms in list	100 - 1000	Determines the maximum number of alarms that the console saves for display in any given alarm summary element. Each summary can include up to 1,000 current alarms.
Broadcast master GDM[1]	0 - 250	Address of an interface unit that connects a workstation running the global database manager to the INFI-NET loop. Relates to tag broadcasting, and is required to enable broadcasting tag changes made at the console, or receiving broadcast tag lists (database) from a GDM workstation. (continued)

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Table 15 2 OIS System Configuration Attributes (continued)

Field	Valid Entries	Purpose
Broadcast master GDM[1] (continued)	0 - 250	Several GDM work stations can be connected to the loop at one time This address insures that only broadcasts from a designated work station are received at this console Valid *Loop* and *Node* address entries are 0 = no loop connection or Plant Loop system 1 to 250 – loop and node address Related fields are *Broadcast Message Type* *Broadcast Active* *Log Broadcasts*
Broadcast message type[1]	0 - 1	Relates to tag broadcasting 0 = default leave at default
Broadcast active[1]	YES/NO/ LOCAL	Relates to tag broadcasting Used to enable disable or limit tag broadcast abilities at the console YES = enables receiving a broadcast tag list from a GDM work station and receiving and broadcasting tag changes made at this console to the GDM work station NO – disables both receiving and sending any type of tag broadcast This disables broadcasting completely LOCAL = enables receiving broadcast tag lists and single tag changes disables sending tag changes to the GDM work station
Log broadcasts (future)[1]	YES/NO	Relates to tag broadcasting Not applicable for this software release NO = default, leave this field at default
Highlight selected touch area	YES/NO	Enables touch point area highlighting The operator can select displays or control points through the keyboard or through a touch point For touch point selects the console can be set to highlight the selected touch point area to provide a visual verification of selection YES – enable touch point highlighting NO – disable touch point highlighting
System status I/O filter[1]	YES/NO	Determines whether the console makes an entry in the alarm summary list or the events log for a system status (*S*) alarm caused by a remote I/O error or local I/O error in a PCU module Valid only when the console is operating on INFI-NET system YES = enables filtering of remote or local I/O status errors NO = default, disables filtering of remote or local I/O status errors

Table 15 2 OIS System Configuratıon Attrıbutes (contınued)

Fıeld	Valıd Entrıes	Purpose
Alarm management type[2]	0 - 3	Determınes a arm summary and a arm processıng operatıons 0[3] – default, conso e bu ds an alarm lıst (e alarm sum mary) ın chrono ogıca order as a arms occur 1 bu ds an a arm ıst w th a arms of the same prıor ty grouped together then chrono ogıca y ordered wıth n that pr orıty 2[3] *same as optıon 0 but employs f xed pos t on return to* norma 3 – same as opt on 1 but emp oys f xed pos t on return to normal
RTN a arm c ear opt on	0 4	Not app cable for th s conso e 0 – defau t leave thıs fie d at ts defau t
Suppress contro f red tagged	YES/NO	Def nes red tag status operat on at the consc e YES defau t suppresses contro changes made from the keyboard for any b ock that ıs red tagged Red tag status n format on also appears on the d sp ay NO – does not suppress control changes made from the key board red tag status appears for nformat ona purposes on y
Keyboard type	MK /EMKI	*Identıf es the type of keyboard nterface module beıng used* for each of the keyboards Use EMK
Trackba	YES/NO	Enab es mouse or trackba capab ty Each keyboard nter face supports a sıngle mouse or trackba YES – enab es mouse or trackba for the co respond ng keyboard NO – default d sab es mouse or trackba l
Number of ADPs	1 2	Enables and dentıfies the number of annuncıator d sp ay pane s (ADP) ass gned to a keyboard Each keyboard sup ports two panels 1 – default one panel ass gned to the keyboard 2 = two pane s assıgned to the keyboard

NOTES

1 Fıelds are va d on y when the conso e s operat ng on NF NET commun catıon h ghway

2 When us ng opt ons 0 and 1 a tag that returns to ıts norma state generates a new a arm l ne at the beg nn ng of the a arm summary scro ng the last entry off of the summary Opt ons 2 and 3 are f xed pos t on retu n to norma opt ons f used a tag that returns to ts normal state ma ntaıns ts current posıt on n the st but changes to a spec f ed return to *normal color*

3 If *Alarm Management Type* s set to 0 or 2 a a arm entr es n a arm summar es defau t to pr or ty 1 (*P1*) Pr orıty sort ng s not mplemented

TASK PROCESSING CONFIGURATION

Durıng operatıon, the console performs ıts processıng ın a certaın order every cycle, a cycle ıs one second Task processıng configu ratıon adjusts the number of exceptıon reports the console ıs to process during a cycle, and it assigns a priority to the remaining processing responsibilities of the console

> **NOTE** Usually the defaults for the *CIU Task Processing* configuration are adequate for proper operation of the console It may be beneficial to become familiar with this function before performing initial console configuration to maximize processing capabilities

The ability to set the number of exception reports to process during a cycle allows the process engineer to adjust the operation of the console for its intended use. If the main responsibility of the console, for example, is to present real-time data for operations, then the number of exception reports to process should remain high A lower number may be desired for a console used for less critical tasks

The tasks the console is responsible for processing during a cycle include

- Control commands initiated at the console
- Exception reports received from the process
- Standard and enhanced trend data
- Operator assignable trends (fast trends)
- MFC data source data for XY plots
- Sequence of events log data
- PCU configuration operations
- PCU management operations
- Module firmware reports

Of these responsibilities, the console always processes control commands first, then exception reports After that, the order of processing depends on *CIU Task Processing* configuration. This option also sets the number of exception reports the console is to process during a cycle

When all tasks have been completed or the one second time elapses, the console restarts its processing order This sequence continues to repeat under normal operating conditions Due to the limited time in a cycle, some tasks may not be executed in the current cycle The processing may be delayed until the next or subsequent cycles depending on the system load

If the console completes all processing requirements of the cycle and determines that there is sufficient time remaining in the cycle, it will return to processing control commands and exception reports until the one second time elapses The *Max number of XR s to be processed each second* set during configuration still applies however The console will not process more than this number of exception reports each cycle even if there is processing time remaining in the cycle

With a configuration that requires the console to process a large number of exception reports, it is possible that some of the lower priority tasks will be executed in later cycles If the number of exception reports to process is too large, the processing of exception reports might not be completed during a single cycle For these reasons, care must be taken when deciding the number of exception reports to process and the priority of each of the remaining tasks

Step 1 The process engineer defines task processing through the *CIU Task* page (see Figure 15 3) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *E System* ⟶ *L CIU Task Processing*

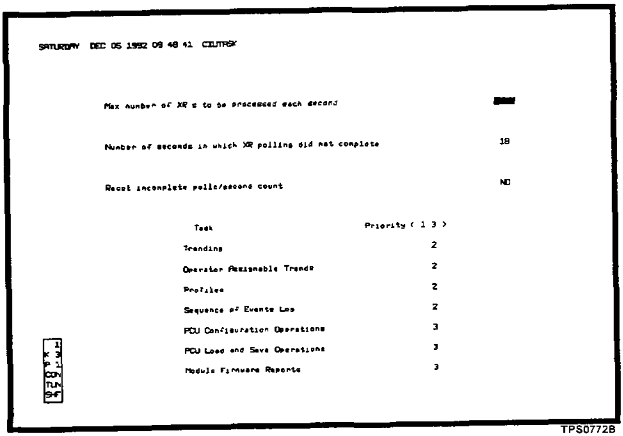

Figure 15 3 System Configuration CIU Task Processing

Step 2 The fields at the page include

Max number of XR s to be processed each second determines the maximum number of exception reports to be processed during a cycle The range is from 1 to 1600, the default is 150 A good starting point for setting the number of exception reports to be processed each second is the default of 150

Number of seconds in which XR polling did not complete - gives a count of the number of times one of two events occurs The count increments each time no exception report polling occurred during a cycle This can happen for example if during the end of the current cycle the console has polled for some type of data other than exception report data and the processing of that data does not complete until the end of the next cycle

The count also increments each time not all exception reports are returned to the console during a cycle This can occur when the buffer containing exception report data fills, which causes the processing of any waiting data to extend into the next cycle. For example, if the console is set to process 100 exception reports and the buffer fills after 50 reports, during the next cycle the console must complete the processing of the remaining 50 reports This assumes that after the first 50 reports, there are 50 more waiting If the console processes the 50 and there are no more reports, then the count does not increment

The not completed attribute can be referenced to determine if the console is requesting a large number of exception reports from its communications interface unit A number in this field does ***not*** indicate data loss, only that there is a large amount of data remaining to be processed

Reset incomplete polls/second count - used to reset the incomplete poll counter to zero Enter **YES** at this field to reset the counter. The field defaults to *NO* before and after initiating a reset Reset the counter after making adjustments at this page

Task the column provides a list of console processing responsibilities

Priority (1 3) - the column indicates and allows changing the priority associated with a task

To define the fields at this page

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field At the *Max number of XR s to be processed each second* field enter a number from 0 to 1600 A maximum of this many exception reports will be processed during a single cycle

Refer to the *Number of seconds in which XR polling did not complete* field to adjust the maximum number of exception reports This field may need to be adjusted later if changes to the system are made

b In the *Priority* column of each task listed, enter a priority from 1 to 3 A task having a priority of *1* executes before a priority *2* task, and a priority *2* task executes before a priority *3* task

For tasks having the same priority level, processing occurs on a first in, first-out basis except in the case of trending If there are other tasks with the same priority as trending, they execute before trending.

c Press **ENTER** to update the configuration, then press **ESC** to exit

During approximately the first ten minutes after the console comes on line, the number of incomplete polls may increase since the entire database must be reported As a result, the processing of exception report specifications takes priority over all other processing except control operations At the end of the ten minutes, the processing should return back to the order dictated by this configuration It is suggested that the incomplete poll counter be reset after the console has been on line for at least ten minutes

To reset the incomplete poll counter

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field At the *Reset incomplete polls/second count* field, key in **YES**

b Press **ENTER** to reset the counter to *0*

TIME AND DATE FORMAT

The process engineer can format the time and date to appear in any desired order For example, the date can appear in conventional format as MONTH DAY YEAR, or military format as DAY MONTH YEAR With this configuration, the time and date order that appears for both log outputs or summary displays, and the title line presentation can be defined

For example, the title line order can be TIME DATE WEEK DAY, or DATE WEEK DAY TIME The day of the week width can be defined to show a completely spelled out day, such as *MONDAY*, or limited to appear as only *MON* All screen display, log output and user input functions that use the time and date string conform to this configured time and date format

Step 1 The process engineer defines the time and date format through the *Time and Date Format* page (see Figure 15 4) To call this display, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

A OIS Configuration → *E System* → *G Time/Date Format*

Step 2 To define the displayed fields

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field Specify the date

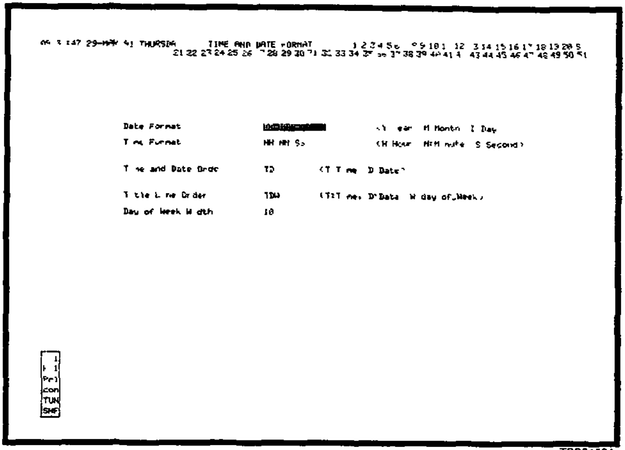

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Figure 15-4 System Configuration - Time and Date Format

format at the *Date Format* field For example, to display the date as 28 FEB-93 enter **DD-MMM-YY** To display the date as FEB 28, 1993, enter **MMM DD, YYYY**

b Specify the time format at the *Time Format* field For example, to display the time as 06 17·35, enter **HH:NN:SS**

c At the *Time and Date Order* field specify the time and date order of appearance the console is to use when presenting time and date This sets the order for all functions except the title line For example, to have the date appear before the time (e g , 28 FEB-93 06 17 35) enter **DT**

d Specify the title line time, date and dav of the week order of appearance at the *Title Line Order* field For example, for the title line to display in time, date and day of the week order, enter **TDW**

e At the *Day of Week Width* field, specify the number of letters that are to appear at the title line for the day of the week For example, to show a day of the week as a three letter abbreviation enter **3** (maximum ten characters) The display will show *MON* for Monday

f After completing all fields, press **ENTER** This updates the configuration on the hard disk

g Press **ESC** until exiting this display

Password Security Configuration

> **NOTE** *Security maintenance functions are provided to allow key personnel to assign access rights to security levels, and to set up user IDs and passwords. These functions should be protected at a high level of security.*

Password security gives or denies access to functions and displays to specific personnel identified by a password. Each display can be configured for full process control access, or access limited by password security. With password security, the operator must log in by entering his password before the console will grant control access.

Security can be applied to an entire display and to individual tags. This enables the ability to organize displays and related tags into security areas. Access to configuration, alarm management and tuning can be secured under password protection. The CONF/TUNE key lock can be used along with passwords for additional security.

System security functions can be modified or changed at any time through password security configuration. Before defining password security, the CONF/TUNE key lock switch limits access to password security configuration. Security maintenance functions support defining, changing and monitoring system security.

> **NOTE** *After modifying a password, the password must be entered again to put the changes into effect.*

Access Rights

Access rights grant unrestricted access of console capabilities to designated personnel. The console allows for up to 16 security levels (minimum four), each user is assigned a security level.

Configuration allows entry into the console configuration functions. This access right allows plant personnel to configure items allowed by individual configuration masks. If a particular configuration is set to not allow access, that configuration page can only be used to view the current configuration.

Control lets an operator initiate process control through a tag if the display level and tag level allow it. The operator initiates control through faceplate type device mimics.

Tuning enables tuning and block details operations, and additionally it enables the operations available at the operating parameters page. Access to tuning and block details is through keyboard keys or the operating parameters page.

Monitor allows viewing all areas of the system.

Key locks enables and disables key lock requirements for access to the tuning and configuration functions. The console can be set to require key lock along with the configuration and tuning access rights of password security, or key lock independent of password security

Alarm management - lets the operator silence or acknowledge alarms Each display or tag can have a security level assigned, which enables alarm management access rights to be defined on a per display or individual tag basis Silence and acknowledge are keyboard key functions.

Log lets the operator activate or deactivate logs, and cancel queued log prints These capabilities are available through log status

Security and password maintenance - allows modifying security levels and user passwords This access should be limited to personnel responsible for console security

Logical CRT - defines at which screens personnel can log into for given operations Defines the screens that can be accessed when using SWITCH CRT This access can also be used in displays to define at which screens a display can be called

Diagnostic/debug terminal limits access to the utility terminal (DDT) Personnel require proper access to use the terminal for tasks such as loading software, running conversion utilities and loading configurations

Operation gives access to general operations functions such as *Log by Name* and operator configurable displays

Display Access

Display access rights are set on a per display basis Each display identified by its display name can have a primary and secondary security level assigned This assignment determines if that display can be called to the screen based on the current security level of the operator The console checks the primary level first to determine if the operator has the appropriate security level clearance If the first check fails, it then checks the secondary level for a match Security level assignments can either be done through password security options, or during display creation using a security mask (**sm**) escape command

Screen Masks

The console combines access rights and screen access into a screen mask This mask then defines the user accessibility levels Initially, each screen has a default mask assigned, which is the level one access mask The console creates a screen mask at log in When an operator attempts to use a given function, the console first checks this mask to determine which displays and operations to allow The console will not give access to a desired operation if the mask does not allow it

Passwords

Passwords identify designated personnel and protect their access rights from unauthorized use Up to 128 passwords (i e , users) can be entered at the console Password definition identifies a user index number, user ID, password, security level and functional region rights Functional region rights are individual configuration, utility and operation options available at the console Access to an entire region can be denied or allowed depending on password definition

NOTE The default passwords are **MAINT** for security maintenance access and **OPERATOR** for normal operations

To identify the current user, the user index number of the last entered password displays in the keyboard status area of the screen, it updates after a user logs in Log in also enters a line in the events log (or operator actions log)

Security Tag Groups

A security tag group feature groups process area related tags into up to 16 different groups During password definition, a group or groups can be assigned for access by specific personnel The groups that a user has access to are set individually, any combination of groups can be assigned Tags are assigned to security groups during tag configuration. The default security group for a tag is group one

Complete password security configuration requires the following

- Security options configuration
- Logical CRT definition
- Security level configuration
- User password definition
- Display mask definition
- Tag security level and group configuration
- Log security level configuration

The configurations listed represent utilization of all security features Any or some may not apply to your specific security strategy Password security should be considered before configuration of the tag database, and custom and SOE logs. The process engineer defines attributes affecting password security during these configuration procedures

SECURITY OPTIONS

Security option configuration sets up general parameters the console uses for password security These include

Number of Levels — Identifies the number of security levels that password security uses

Number of Passwords	Sets the number of passwords that will be defined This corresponds to the number of users
Automatic Logout	Used to automatically log out an inactive user after a specified time period from five minutes to 12 hours
Default User	Tells the console which password (i e., user index number) to log in after start up, and after automatic log out

The *Default User* attribute could be used to specify a user index number set to either permit complete access limited by the key lock switches only, or deny all access until performing a valid password log in

NOTE Care must be taken when making changes at th s display De creasing the number of levels or passwords deletes any entr es with level numbers or user ndex numbers above the new entered value Changes made to the number of security levels could affect d splay, log and tag secur ty

Step 1 Security maintenance personnel define the password security op erating parameters through the *Security Options* page (see Figure 15-5). To call this display, first press $\boxed{\text{GENL FCTNS MENU}}$, then select the following menu items in the sequence shown

A OIS Configuration

└→ *G Security*

└→ *A Security Options Configuration*

Step 2 To define the options

a. Use the configuration keys listed in Table 15 1 to enter data and move between each display input field At the *Number of Levels* field, enter the number of security levels required A valid entry is from 4 to 16

b Enter the total number of passwords required at the *Number of Passwords* field A valid entry is from 1 to 128 This should be large enough to accommodate all personnel requiring a password

c At the *Automatic Logout* field, enter **YES** to have the console automatically log out a password Log out occurs after an inactive period of time determined by the *Time Period* field Enter **NO** to disable automatic log out

d Enter an automatic log out time in the *Time Period* fields This attribute requires two entries, the first being a number, the second being **MINUTES** or **HOURS** The minimum is 5 minutes, maxi mum 12 hours

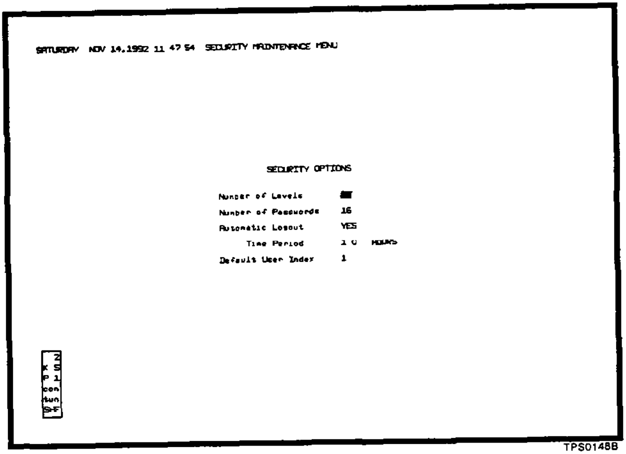


Figure 15-5. Password Security - Security Options

e. At the *Default User Index* field, enter the user index number the console is to automatically log into at start up or after a log out. User index numbers are set during password definition.

f. Press ENTER to save the configuration to hard disk, then press ESC to exit.

LOGICAL CRT DEFINITIONS

Currently, only password security uses logical CRT definitions. Logical CRT definitions specify up to 16 logical CRT assignments. The keyboard can be switched to either screen the console supports by pressing SWITCH CRT. This configuration defines the screens as logical CRTs. Once defined, access to each can be limited to specific security levels through security level configuration. To locate logical CRTs, the console references a console address definition made through console definition procedures, then a physical CRT to console association made through logical CRT definition procedures.

Follow the procedures for logical CRT definition, refer to ***CONSOLE AND LOGICAL CRT DEFINITION*** in this section. Access to each of the 16 possible logical CRTs can then be enabled or disabled through security level configuration.

The console supports two screens and therefore requires only two logical CRT definitions for screens one and two. All 16 can be defined if desired.

SECURITY LEVEL

Once the *Number of Levels* has been set through security options configuration, each security level must be defined separately Security level configuration defines access rights, key lock function, and logical CRTs each level can access

> **NOTE** It is suggested that a console should have a security level defined for common operations such as configuration even if no one is currently assigned to the level

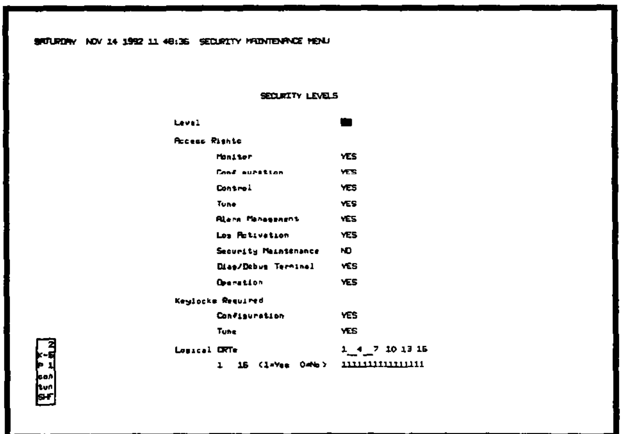
The tune and configuration access rights can be used with or without key lock use Key lock use by a security level can be disabled by setting the corresponding key lock fields to **NO** If key lock alone is to be used to limit access to configuration and tuning functions, their corresponding *Access Rights* fields must always be set to **YES**

Step 1 Security maintenance personnel define each security level through the *Security Levels* page (see Figure 15 6) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration

→ *G Security*

→ *B Security Level Configuration*



TPS0149B

Figure 15-6 Password Security Security Levels

Step 2 To define a security level

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field At the *Level* field, enter the number of the security level to define, then press [ENTER] A valid entry is from 1 to the number of levels set during security options configuration (maximum 16)

b For each *Access Rights* type, enter **YES** to grant access to that type of function for this security level Enter **NO** to not allow this security level access.

c At the *Keylocks Required* fields, enter **YES** to require the key lock to be in the CONF position to perform configuration, and *TUNE* to perform any tuning *If YES,* security is based on both access rights and key lock position If set to *NO* security, the console predicates security on access rights alone, ignoring the key lock position

When using just the key locks for configuration and tuning security, set the *Access Rights* fields for both configuration and tuning to **YES**

d Up to 16 logical CRTs can be defined for this console through logical CRT definition Once defined, the *Logical CRTs* field either enables or disables access to individual screens supported by the console and identified as logical CRTs

The *1 4 7 10 13 16* field corresponds to logical CRT 1 through 16 For this security level to access a logical CRT, set its corresponding field to **1**, set it to **0** to not allow access For example, to allow access to only logical CRTs 1 and 8, the entry would be **1000000100000000**

e Press [ENTER] *to save the configuration to hard disk, then* press [ESC] to exit

USER PASSWORD DEFINITION

User password definition defines each user ID, password, security level, security group and functional region access for a user The user ID and password can be any of up to eight characters ***The default password is the user ID*** Passwords are normally hidden except when they are being entered The security level is one of the levels defined with security level configuration Security tag groups defines the groups that the user has access to if tag grouping is being used The functional region defines the configuration, utility and operational regions the user can enter with his given security level

The regions directly correspond to the access rights enabled during security level configuration For example, if a user is to be given tag configuration access then the security level should include configuration access rights, and database region access should be enabled

NOTE While configuration of passwords is being performed limiting visibility to the screen is suggested

Step 1 Security maintenance personnel define passwords for personnel through the *User Password Definitions* page (see Figure 15-7) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration
└→ *G Security*
└→ *C User Password Definitions*

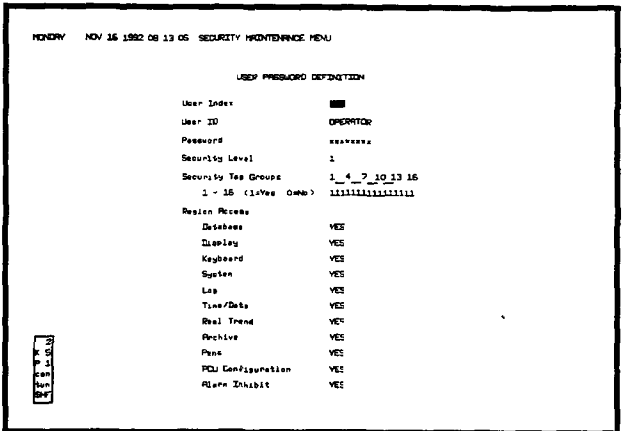


Figure 15-7 Password Security User Password Definitions

Step 2 To define a password.

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field At the *User Index* field enter an index number to define, then press ENTER. A valid entry is from 1 to the number of passwords defined through security options configuration (maximum 128) A user index number displays in the keyboard status block to identify the password currently logged in at the console

b Enter a descriptive identifier at the *User ID* field Any keyboard characters can be used, up to eight characters can be entered If a password has not been entered, this entry becomes the password by default c Enter a password of up to eight characters at the *Password* field The password will be visible during configuration but appears as ******** any other time the display is called

d Enter the security level at the *Security Level* field This is one of the security levels defined during security level configuration A valid entry is from 1 to the number of security levels defined during security option configuration (maximum 16)

e The process engineer assigns tags to any of 16 different security groups A tag is assigned to a group through tag database configuration Once assigned, the *Security Tag Groups* field enables access to each security group for this password

The default tag group set in the configuration of a tag is one, therefore, at least group one should be enabled even if tag grouping is not being used

The *1 4 7 10 13 16* field corresponds to security groups one through 16 For this user ID to access a group, set its corresponding field to **1**, set it to **0** to not allow access For example, to allow access to only groups 1, 5, 8 and 13 the entry would be **1000100100001000**

f For each of the specified regions, set its *Region Access* field to **YES** to allow this user ID access or **NO** to not allow access These fields should be consistent with the *Access Rights* set during security level configuration

Region Access can be used to deny access rights at a higher level than what is available through security level configuration For example, a security level may allow access rights to configuration, but password security may not allow access to database configuration

g Press ENTER to save the configuration to hard disk, then press ESC to exit

DISPLAY MASK DEFINITION

Display mask configuration sets security levels for individual displays Access to certain displays can be limited to only specific security levels Security personnel can determine which users have access rights to a display by specifying a primary and secondary security level Once a user ID has been given access to a display, the operations that can be performed after calling the display are still limited by the parameters set for that user's security level Do ***not*** define a display mask for a display unless it is to have limited access

Display access security levels can be defined during display creation using a security mask (**sm**) escape command If set during display creation, display mask definition is not required It is recommended that changes that are to be permanent be made to the security mask escape command in a display source file (***.DT***). Refer to Appendix B for the format of the command. Displays built with the operator configurable display function are set to the security level of the currently logged in user ID.

Step 1 Security maintenance personnel define display access through the *Display Mask Definition* page (see Figure 15-8). To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown:

A OIS Configuration
→ *G Security*
→ *D Display Mask Definition*

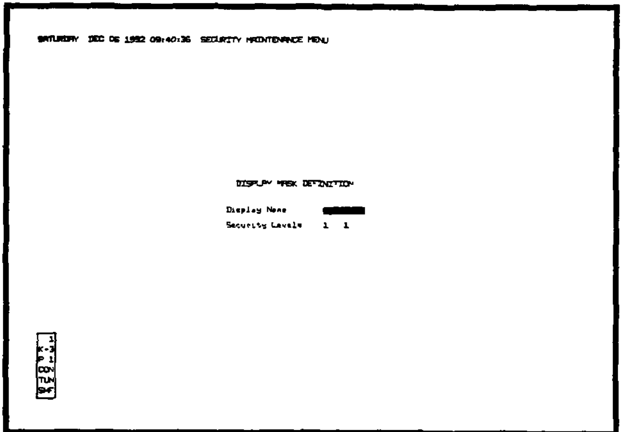


Figure 15-8. Password Security - Display Mask Definition

Step 2 To define access for a display:

a. Use the configuration keys listed in Table 15-1 to enter data and move between each display input field. At the *Display Name* field enter the name of the display to define. The display must reside on the hard disk as a ***.DU*** display file. The name entered is the display file name without the ***.DU*** extension.

b. In the first input field of the *Security Levels* field, enter the primary security level. A valid entry is from 1 to the number of security levels set during security option configuration (maximum 16).

c. In the second input field of the *Security Levels* field, enter the secondary security level (optional). A valid entry is from 1 to the number of security levels set during security option configuration (maximum 16) This field defines a second valid security level for the display

d Press ENTER to save the configuration to hard disk, then press ESC to exit

TAG SECURITY LEVEL AND GROUP

Each tag in the database can have a security level assigned This determines whether an operator can gain access to functions related to that tag based on an entered password A tag can be assigned any of the 16 available security levels

Tags in the database can also be organized into security groups This allows grouping related process points (i e , areas), which gives only personnel with appropriate passwords access to these points The password definition identifies which groups a password can access

Follow the procedures for defining individual tags, refer to ***Entering or Editing a Tag*** in this section for the procedures Set the *Security Level* field to the desired security level for the tag being configured A valid entry is from 1 to 16 Set the *Security Group* field to a specific group number to assign this tag to that group A valid entry is from 1 to 16

The security level and security group will then be used to verify control, tuning, alarm management and screen access for any operations affecting the tag Password security should be considered prior to tag configuration

LOG SECURITY LEVEL

Security levels can also be defined for custom logs and sequence of events (SOE) logs The console checks the security levels defined for these types of logs before allowing an operator to perform log status operations These include activating or deactivating a log, or canceling log printouts If set, the console will not allow an operator to perform log status operations unless authorized by a password Password security should be considered prior to custom and SOE log configuration

Custom Logs Follow the procedures for configuring custom logs through the report generator, refer to ***CUSTOM LOG CONFIGURATION*** in this section Set the *Security Level* field to the desired security level for each configured log A valid entry is from 1 to 16

SOE Logs Follow the procedures for configuring SOE logs, refer to ***SOE LOG CONFIGURATION*** in this section Set the *Security Level* field to the desired security level for each configured log A valid entry is from 1 to 16

Database Configuration

The database of the console consists of a separate tag and trend database The tag database includes specific information for each variable in the process control system that the console is to monitor or control The trend database contains specific information the console needs to collect and display trended data from the INFI 90 distributed trending system Each database also defines additional attributes used in displays, logs, archiving, password security and alarm management Other database features related to the tag database, and defined separately, are tag descriptors and alarm comments

There are two types of descriptors Engineering unit and logic state descriptors These are either analog value units of measurement or digital state identifiers that appear in most functions, and displays that incorporate tag descriptor escape commands (**ec 37**, **ec 38**, and **ed 37**) Consoles on a common communication highway should use the same list of descriptors

Alarm comments related to tags appear at displays when process values exceed certain thresholds or digital variables change to specific states The PCU module configuration determines the alarm thresholds and states that trigger alarms These comments appear at alarm summaries or any displays that incorporate alarm comment escape commands (**ec 33** and **ed 33**) An alarm comment gives the ability to display text that describes, for example, either the purpose of the alarm or operator actions required to correct the alarm

This part of the section provides procedures to define the tag database, alarm comments and tag descriptors only. ***Trend Definition*** in this section explains the trend tag database configuration

TAG DATABASE

The console allows on-line tag configuration Tags can be added or deleted, and almost any tag attribute can be changed then immediately implemented by the console without requiring a console reset

The exception is deleting, adding or modifying an N90STA tag that defines an NNIU01 module These changes require calling the operating parameters page for the tag being changed, then turning scan off then back on, or resetting the console Refer to ***TAG OPERATIONS*** in the ***Process Monitoring*** section for procedures

Each entry in this database is in the form of a tag A tag configured in the console represents each analog and digital exception reporting block, and each station, device driver and control block in PCU module control schemes During database configuration, the process engineer defines a tag for the process variables that the console monitors and process devices available for operator control

Each tag contains all information the console requires to find and establish a communication route to individual points in the process control scheme (i e , loop, PCU, module and block number) The console does not require a tag to support PCU module tuning and configuration functions Not all PCU function blocks can be assigned a tag Once the process engineer defines a tag, the tag index number or tag name is used in other functions

The console automatically does concordance checking to detect certain configuration errors These include data over limits, duplication of tag names or hardware addresses, invalid descriptors and alarm inhibiting requirements.

Each tag type available in the console corresponds to one or more function codes (FC) The tag types are

ANALOG Acquires an analog exception reported value This tag type supports analog exception report, FC 30

DAANALG Acquires an analog exception reported value providing enhanced alarm management capabilities This tag type supports data acquisition only through a DA macro that incorporates a control station function code, FC 21, 22, 23, or 80 It also supports data acquisition analog, FC 177, but does not enable the full functionality of the function code

DADIG Acquires a digital exception reported state providing enhanced alarm management capabilities It also allows the operator to select the input source for an associated function block in a PCU module, and write a user inserted value to the PCU module This tag type supports data acquisition digital, FC 211

DADIGTL Acquires a digital exception reported state providing enhanced alarm management capabilities This tag type supports data acquisition only through a DA macro that incorporates a multi state device driver, FC 129

DANG Acquires an analog exception reported value providing enhanced multiple level alarming as well as deviation and rate alarming It also allows the operator to select the input source for an associated function block in a PCU module, and write a user inserted value to the PCU module This tag type supports data acquisition analog, FC 177

DD Acquires an exception reported set or reset state for a device while it is in either manual or automatic mode It also allows the operator to initiate manual control This tag type supports device driver, FC 123

DEVSTAT For internal console use only, no values are received over the communication highway for this type of tag

It allows the console to monitor the status of its peripheral devices These devices include keyboards, annunciator display panels, CRTs, printers, touch screens and data storage devices

DIGITAL Acquires a digital exception reported state This tag type supports digital exception report, FC 45

INTANG For internal console use only, no values are received over the communication highway for this type of tag The INTANG tag type allows writing an analog value from an application processor that can be used throughout console functions

INTDIG For internal console use only, no values are received over the communication highway for this type of tag The INTDIG tag type allows writing a digital value from an application processor that can be used throughout console functions

MSDD Acquires an exception reported status for a three state device while it is in either manual or automatic mode It also allows the operator to initiate manual three state control This tag type supports multi-state device driver, FC 129

N90STA Reads detailed status information and problem reports from INFI 90 equipment over the communication highway

NOTE For Plant Loop nodes to receive the same time-stamped message to support distributed trending all nodes on the loop must have an N90STA tag

RCM Acquires an exception reported set or reset state of a device It also allows the operator to initiate control of the device Used in this way, this tag type supports remote control memory, FC 62

Monitors the operation of a sequential events recorder, and allows the operator to request sequence of events summary reports Used in this way, this tag type supports sequence of events log, FC 99

RMCB Acquires an exception reported start or stop state of a device, and allows the operator to initiate control of the device This tag type supports remote motor control, FC 136

RMSC Enters a constant value into a PCU module control scheme This tag type supports remote manual set constant, FC 68

STATION Monitors exception reported variables for a process control station while it is in either manual or automatic mode It also allows the operator to change the control output, or initiate a set point or ratio index change This tag type supports M/A station (basic), FC 21, M/A station (cascade), FC 22, M/A station (ratio), FC 23, and control station, FC 80

TEXT Acquires an exception reported text selector message The message, generated by the PCU module control scheme, contains a message number that corresponds to a text string defined at the console It also contains a color and blink option

A defined message can relate to the good, bad or wait condition reported for a device driver block or a multi state device driver block Also, it can relate to the good, alarm or wait condition reported for a remote motor control block This tag type supports text selector, FC 151

TEXTSTR Enables communication between the console and a C language or batch program running in a PCU module to allow transfer of text strings This tag type supports user defined data export, FC 194

Refer to the ***Function Code Application Manual*** for more information and specifications for the previously described function codes

TAG BROADCASTS

The console has the capability to broadcast and receive any change made to a tag in its database The broadcast ability allows any change made at the console to be incorporated and implemented at other consoles The receive ability allows any change made at another console to be incorporated and implemented at this console This requires a work station connected to the INFI NET communication highway and running the global data base manager (GDM) software program

Additionally, an entire tag list can be broadcast to this console from the GDM work station, however, this requires the console to be taken off line by running a command file at the diagnostic/debug terminal (DDT). Refer to the ***Software Global Database Manager (SGDM)*** instruction for program operation specifics and work station requirements Refer to ***ENABLING TAG LIST BROADCAST MODE*** in the ***Terminal Utilities*** section for procedures to take the console off line to receive a broadcast tag list

When a change is made to a tag and that change is then broadcast, the GDM program automatically performs a consistency check to validate the change It verifies that the tag name to loop, PCU, module and block address is unique across the entire database This allows the GDM program to maintain database integrity for all consoles or devices on the communication highway that use the database

Attributes at the general parameters screen must be set during OIS system configuration to enable tag broadcasts The console must be operating on INFI NET communication highway to enable this feature

TAG DATABASE CONFIGURATION

Tag database configuration requirements include enabling tag broadcast abilities if desired, then entering or editing individual tags

During start-up or reset, the console downloads each tag in the database list to its communications interface unit. The interface unit requires this to establish communication with PCU modules Tag configuration cannot take place while the console is down loading the tag database list to its interface unit

In the tag database, certain tag attributes remain the same and have the same function for all tag types, although they are defined differently for each tag Other fields are dependent on the tag type entered Additional attributes in the tag database pertain to alarming, and event logging and archiving

Care must be taken when making changes to the database since the tag database is the foundation for ***all*** other functions For example, deleting or changing a tag that is used to inhibit alarming of other tags requires changing or modifying all of those tags that use it for inhibiting Another example would be making a node type change to a node N90STA tag This in most cases then requires making changes to all the module N90STA tags for that node

The recommended procedure for changing the node type of a node N90STA tag is to first delete all PCU module N90STA tags for that node, make the appropriate changes to the node type, then add any module N90STA tags required

Enabling On-Line Tag Broadcasts

Database broadcasting allows the console to broadcast and receive tag changes or additions over the communication highway (INFI NET system only) When tag broadcasting is enabled, any changes or additions to the database are automatically sent over the communication highway to other consoles through a GDM program running on a work station Likewise, any changes made at other consoles are received at this console

When a tag is modified or added, validation checks are first made at the console level before the tag is broadcast These local validation checks test for duplicate tag name and loop, PCU, module, and block address The console also checks alarm inhibit information for the tag and the tag that it may inhibit (i e , set at the *Alarm Inhibit* field) If any of these checks fail, the broadcast does not occur Once verified, broadcasting is automatic The GDM program performs the same validation checks

Do ***not*** exit the tag configuration function until the console presents a message verifying a successful broadcast If the broadcast was successful, the tag configuration changes save to the hard disk Further tag changes or additions can then take place If tag configuration is exited while the tag is already being broadcast to GDM program, the broadcast runs to completion with the results of the broadcast being logged in the events log

All tag changes are logged as part of the events log This provides a reference to recover edits made to the tag before being aborted

An error message appears if tag updates are made at other screens supported by the console simultaneously The tag broadcast task can issue only one broadcast at a time Any other broadcast attempt while the console is already processing a broadcast causes a *busy* reply from the broadcast task Queued tag broadcasts continue to process as long as tag configuration has not been exited Exiting aborts any queued broadcasts

Follow the procedures for system configuration, refer to ***OIS System Configuration*** in this section for the procedures The fields that enable on line broadcasting of tag changes are *Broadcast Master EWS Loop Node* and *Broadcast Active* Additionally the *Broadcast Message Type* field must be set to provide proper communication

Set the *Broadcast Master EWS Loop ___ Node* field to the loop and node address of the network interface unit (NIU) connecting the work station running the GDM program to the communication highway A valid entry is from 1 to 250 for both address fields This identifies the specific work station that is maintaining the database of this console Several work stations running the global database manager can be connected to the loop at one time

Set the *Broadcast Active* field to **YES** This enables both transmitting and receiving single tag changes, and receiving a broadcast of a complete tag list This field has two other choices **NO** or **LOCAL** **NO** disables both transmitting and receiving of any type of tag broadcast **LOCAL** allows receiving a broadcast of a tag list and any single tag changes from the GDM work station, but disables broadcasting single tag changes to the GDM work station Refer to ***OIS System Configuration*** in this section for proper setting of the *Broadcast Message Type* field

Entering or Editing a Tag

> **NOTE** The preferred method for creating a tag database is by using the SLDG program The console should mainly be used to update or make changes to the existing database

Each tag in the database has a name of up to 14 characters and tag index number (1 to 5,000) A tag name and index number identifies the tag throughout all functions Each tag can also have up to 32 alphanumeric characters to describe its purpose These descriptions help to identify the tag while at certain displays An additional 32 character customer identifier also can be entered in the database to further explain the process point. Each process point value or state that the operator is to monitor or control, and OIS peripheral or INFI 90 module to monitor requires a tag in the database

Step 1 The process engineer defines individual tags through the *Tag Configuration* page (see Figure 15-9) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *A Database* ⟶ *A Tag*

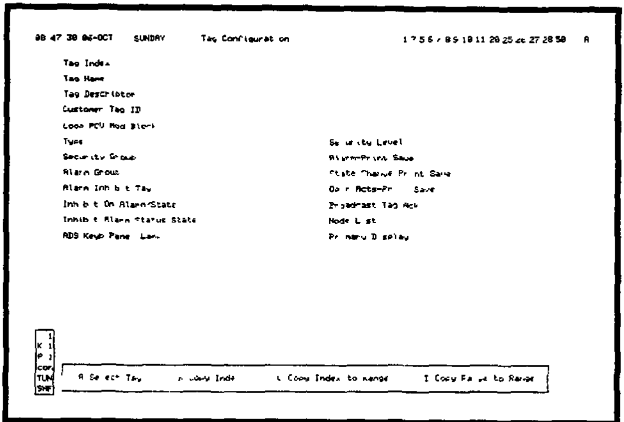


Figure 15 9 Database Tag Configuration

Step 2 Use the *Tag Configuration* display submenu to select a tag to configure or edit It also provides the capability to copy tags Copying can be used to expedite tag configuration

To define a tag

a Choose *A Select Tag* from the submenu This brings up a *Tag Name or Index* prompt Type a tag name or index number for a tag to edit. A valid entry is from 1 to the number of tags set during database sizing (maximum 5,000) Press ENTER to call the tag

b Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Table 15 3 lists general tag attributes that apply to all tag types Table 15 4 to Table 15 16 list additional attributes related to specific types of tags Refer to these tables when entering data c After completing all required fields, press ENTER This updates the configuration on the hard disk

d To enter additional tags, press ESC to call the submenu back to the screen and repeat Steps 2a through 2c Press NEXT PAGE or PREV PAGE to sequence to the next or previous index number without having to use the *Select Tag* option

e Once all tags are defined or edited, press ESC until exiting this display

*This procedure must be done before performing any further con*figuration if a tag database does not exist, or at any time to add or edit new tags Tags are required before any other functions can be enabled

> **NOTE** The *Alarm Groups* option can be used to assign tags to alarms groups Refer to ***ALARM GROUP CONFIGURATION*** in this section for specifics

Configuration Submenu

The Tag Configuration page submenu options (see Figure 15 9) allow selecting tags for editing and copying both individual or a range of defined tags to individual or a range of available index numbers

A tag that has been copied has the same hardware address as the original tag except the function block address is set to an invalid value The tag is ***not*** defined until after entering a unique tag name and address Before using the copy features, verify that a tag is not being copied to an already existing tag since this overwrites an existing tag

Select Tag press A, an input field used to enter a tag name or index number appears After keying in the desired name or number tag, press ENTER to display the attributes for that tag If the field is left blank or cleared and ENTER is pressed, the next available, undefined tag appears

Copy Index press B, a prompt with the current tag index number in a *Copy Index To* input field appears Either use this tag number or enter a different one Move to the *To* field and enter a tag index number to which to copy this tag Press ENTER to execute the copy

Copy Index to Range - press C, a prompt with the current tag index number in a *Copy Index To ,* input field appears Either use this tag number or enter a different one Move to the range fields and enter a range of index numbers to which to copy this tag Press ENTER to execute the copy

Copy Range to Range press D, a prompt with the current tag index number in the first input field of a *Copy Range ,* *To ___,* field appears Either use this tag number or enter a different one Move to the next field and enter the second tag index number to complete the range of tags to copy Enter the range to copy tags to in the *To* range input fields Press ENTER to execute the copy

Delete Tag

A tag can be deleted by changing its *Tag Type* field to *UNDEF*. As soon as **UNDEF** is typed at this field and ENTER is pressed, all other fields clear and a default configuration appears

NOTE Deleting a tag is no longer done by copying a blank tag over an existing tag

Change Tag Type

Changing a tag type from a digital type tag (e g , DIGITAL, DD, MSDD, etc) to an analog type tag (e.g , ANALOG, STATION, DAANALG, etc) causes the console to run validation checks before initiating the change. It checks the database to determine if the state of the digital tag is being used for alarm inhibiting If it is, the following message appears

Alarm Inhibit Mode Conflict on Tag n ERR 437

The tag type change cannot be done until correcting the mode conflict for tag *n* A possible solution is to change the *Inhibit On Alarm/State* field for tag *n* to **ALARM** The console also performs this check during a copy operation

Tag Broadcast Errors

The console presents error messages if a broadcast fails. These include

Tag Update Failed - Duplicate Tagname ERR 438

Tag Update Failed Duplicate Address ERR 439

The console places the input cursor at the field in error Correct the field in error and initiate saving the tag to attempt another broadcast

The message

Tag Update Failed ERR 440

is a general error message. It normally appears when attempting a tag broadcast to an off-line GDM program, or if a communication failure exists This returns the input cursor to the *Tag Name* field Refer to the ***Software Global Database Manager (SGDM)*** instruction for additional information

Do ***not*** exit the tag configuration function until the console presents a message verifying a successful broadcast If the configuration is exited after changes have been made but before a broadcast reply message appears, the console considers all updates as being aborted and records the following message in the events log (operator actions log)

Tag <index number>, <tag name> Update aborted by <user ID> at <CRT n>

This can also occur if tag updates are made at other screens supported by the console simultaneously. The tag broadcast task can issue only one broadcast at a time.

All tag changes are logged as part of the events log. This provides a reference to recover edits made to the tag before it was aborted.

Table 15-3. Tag Database - General Attributes

Field	Description
Tag index	Corresponds to the tag selected for definition or editing. This is not a user input field. An index number identifies a tag throughout all functions.
Tag name	Name of up to 14 characters to identify this tag. The console checks the entire tag list for duplicate names when attempting to move to the next input field or after pressing **ENTER** while at this field.
Tag descriptor	Descriptor of up to 32 characters that appears in most functions to further describe the purpose of the tag.
Customer tag ID	Additional 32-character tag identifier.
Loop, PCU, module, block	Hardware communication (loop, PCU and module address) and software function block address. Establishes a communication route between the console and a PCU module for monitoring and control of a point in the plant control scheme. A valid entry is: *Loop* - 0 to 250 (INFI-NET system up to 250, Plant Loop system 0 or 1) *PCU* - 0 to 250 (INFI-NET system up to 250, Plant Loop system up to 63) *mod* - 0 to 31 *block* - 0 to 9998 **NOTE:** For DEVSTAT, INTANG and INTDIG tag types, the address should be 0-0-0-0. Enter a block address of 0 for N90STA tags. Table 15-15 and Table 15-16 identify the module address to use for certain types of N90STA tags.
Type	Valid tag types are: ANALOG, DAANALG, DADIG, DADIGTL, DANG, DD, DEVSTAT, DIGITAL, INTANG, INTDIG, MSDD, N90STA, RCM, RMCB, RMSC, STATION, TEXT, TEXTSTR The console checks entries against valid tag types.
Security group	Security group assignment for this tag relates to password security. A tag can be assigned to one of 16 security groups. Access to the group can be permitted by assigning the group number to specific personnel identified by a password. *A valid entry is from 1 to 16.*
Alarm group	Alarm group assignment for this tag relates to alarm management. An alarm group number appears at all displays and in the alarm summary if a tag in that group goes into an alarm condition. If configured for group 0, this tag does not trigger alarm group alarm indications when it enters an alarm condition. A valid entry is from 0 to 99. For DEVSTAT tags this field defaults to group *D*. For N90STA tags this field defaults to *S*.

Table 15 3 Tag Database General Attnbutes (contınued)

Field	Descrıptıon
Alarm ınhıb t tag	Inh bıt tag used to ınhıbıt alarm ındıcatıons for thıs tag when ıt ıs ın a specıfic alarm cond tıon or state Thıs ıs an automatıc a arm ınhıbıt feature that relates to alarm management A va ıd entry for th s field ıs any tag name or ındex number (except an RMSC tag) If eft blank, automatıc alarm ınhıbıtıng does not occur Related fie ds are *Inhıbıt On Alarm/State* and *Inhıbıt Alarm Status/State*
Inh b t on alarm/state	Cond tıon of the ınhıbıt tag used to tngger alarm ınhıb tıng Determınes whether alarm ınhıbıtıng for thıs tag ıs based on the alarm condıtıon or the dıgıtal state of the alarm ınh bıt tag Relates to the *Alarm Inhıbıt Tag* field and s not va ıd unless a tag name ıs enterea at the *Alarm Inhıbıt Tag* fieıd A vaııa entry ıs ALARM = default selects ınhıbıtıng on alarm condıtıon of an a arm ınhıbıt tag STATE = selects ınhıbıtıng on state cond tıons of an alarm ınhıbıt tag thıs ıs valıd for dıgıtal state reportıng alarm ınhıbıt tags only
nh b t alarm status/state	Spec fic alarm condıtıon or d g ta state that trıggers a arm ınh b tıng Deter mınes the a arm status or devıce state of the a arm ınhıbıt tag that ınh bıts a arm ng for th s tag Relates to the *Inhıbıt On Alarm/State* field and s not va ıd un ess a tag name s entered at the *Alarm Inhıbıt Tag* fie d A val d entry for th s f eld depends on the type of tag entered as the alarm ınh bıt tag f the *Inhıbıt On Alarm/State* fie d ıs set to ALARM a va ıd entry s H, 2H 3H L 2L 3L HD LD HR LR A and blank f the *Inhıbıt On Alarm/State* fie d ıs set to STATE a va d entry for thıs fie d ıs 0 1, 2 3 or blank
ADP - keyboard pane amp	Annuncıator d splay panel (ADP) ındıcator that ıs to lıght when thıs tag goes ınto alarm relates to alarm management The address of the nd cator ıs the keyboard (*Keyb*) to whıch the panel ıs tıed specıfic panel (*Panel*) and specıfic LED (*Lamp*) A val d entry for these fields depends on the number of keyboards and annuncıator dısplay panels accounted for dunng OIS system confıguratıon *Keyb* – 0 to 2 0 a lows pane s to mım c each other For example a two keyboard conso e w th one annuncıator d splay pane per keyboard can be configured so both panels use the same tag entnes and perform the same functıon *Panel* = 0 to 2 0 specıf es no panel ass gnment for thıs tag *Lamp* = 0 to 32 0 spec fies no lamp ass gnment for thıs tag
Secur ty evel	Secunty level assıgnment for thıs tag relates to password securıty Lım ts access to the functıons performed through thıs tag based on the secunty leve Relates to password secunty A tag can be assıgned to one of 16 secunty levels Access to the tag functıons can be permıtted by gıvıng the appropnate access nghts to per sonnel dentıfied by a password A valıd entry ıs from 1 to 16
Alarm - prınt/save	Events log opt on, determınes f alarms for thıs tag appear ın the events log A va ıd *Prınt* f e d entry ıs YES = enables pr ntıng alarm events for th s tag n an events log pr ntout as a arms occur NO = d sab es pr nt nq a arm events A val d *Save* f eld entry s YES – enables savıng alarm events for th s tag to hard d sk for a per odıc pr ntout of an events og and for system events archıvıng NO = dısables sav ng to hard d sk

Table 15 3 Tag Database General Attributes (continued)

Field	Description
State change *print/save*	Events log option determines if state change events for this tag appear in the *events log* A valid *Print* field entry is YES = enables printing state change events for this tag in an events log print out as state changes occur NO – disables printing state change events A valid *Save* field entry is YES enables saving state change events for this tag to hard disk for a periodic pr ntout of an events log and for system events archiving NO – disables saving to hard disk **NOTE** This field is valid for DADIG, DIGITAL DADIGTL INTDIG RCM RMCB DD MSDD and TEXT tag types
Operator actions print/save	Events log option determines if operator action events for this tag appear in an events log A valid *Print* field entry is YES enables printing operator action events relating to this tag in an events log printout as operator actions occur NO – disables printing operator action events A valid *Save* field entry is YES – enables saving operator actions events for this tag to hard disk for a periodic printout of an events log, and for system events archiving NO – disables saving to hard disk
Broadcast tag acknowledge	Broadcast enable determines whether an alarm acknowledgment for this tag is broadcast on the communication highway to acknowledge the alarm at other consoles or computers Relates to alarm management A node list selected in the *Node list* field determines to which nodes to broadcast the acknowledge A valid entry is YES broadcast alarm acknowledge NO – do not broadcast alarm acknowledge
Node list	*Node list defined through global alarm acknowledge and silence configuration* to reference when broadcasting alarm acknowledges Relates to the *Broadcast Tag Ack* field Up to four node lists can be defined A valid entry is 0 = specifies a node list that the console automatically builds during start up The node list contains the first 32 N90STA tags in the database that define either a console or a computer 1 to 4 – identifies one of four defined node lists
Primary display	Primary display of this tag Any name of an assembled display (*.DU*) on the hard disk can be entered in this field The display becomes the primary display *called from either the alarm summary or operating parameters functions and* $\boxed{\text{DISPLAY}}$

Table 15-4. Tag Database - ANALOG and INTANG Attributes

Field	Description
Engineering unit	Non-entry field; a PCU module reports the index number that associates an engineering unit of measurement with this tag. A list of valid fixed and user-defined engineering units can be viewed at the *EUD Configuration* display.
Decimal places	Number of decimal places to display for this tag. A valid entry is from 0 to 4.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Bad quality High Low A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal High Low Enter **0** to not associate a comment with a condition.

Table 15-5. Tag Database - DANG Attributes

Field	Description
Engineering unit	Non-entry field; a PCU module reports the index number that associates an engineering unit of measurement with this tag. A list of valid fixed and user-defined engineering units can be viewed at the *EUD Configuration* display.
Decimal places	Number of decimal places to display for this tag. A valid entry is from 0 to 4.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal, High, High deviation Bad quality, Low, Low deviation 3-high, 2-low, High rate of change 2-high, 3-low, Low rate of change A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal, Low, Low deviation 3-high, 2-low, High rate of change 2-high, 3-low, Low rate of change High, High deviation Enter **0** to not associate a comment with a condition.

Table 15-6 Tag Database DAANALG Attributes

Field	Description
Engineering unit	Non entry field, a PCU module reports the index number that associates an engineering unit of measurement with this tag. A list of valid fixed and user defined engineering units can be viewed at the *EUD Configuration* display.
Decimal places	Number of decimal places to display for this tag. A valid entry is from 0 to 4.
Alarm type	Type of alarming being implemented in the data acquisition analog function block. A valid entry is: STANDARD - standard INFI 90 alarming using a high and low alarm limit only. FIXED - incorporates multilevel alarming using fixed alarm levels (e.g., 3 high to 3 low) set in the PCU module control scheme. VARIABLE = incorporates multilevel alarming using variable alarm levels. Alarm levels are based on the output values of other function blocks. The *Hi Var Alrm Tag* and *Low Var Alrm Tag* fields identify the function blocks setting the variable alarm levels.
Alarm deadband	Deadband value set in the PCU module. A four character floating point value used for 3 high, 2 high, 2 low and 3 low alarm limits.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal / High Bad quality / Low 3 high (FIXED or VARIABLE only) / 2 low (FIXED or VARIABLE only) 2 high (FIXED or VARIABLE only) / 3 low (FIXED or VARIABLE only) A valid entry is from 1 to 8, 1 being the highest priority, default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal / Low 3 high (FIXED or VARIABLE only) / 2 low (FIXED or VARIABLE only) 2 high (FIXED or VARIABLE only) / 3 low (FIXED or VARIABLE only) High Enter **0** to not associate a comment with a condition.
Limit	*For reference only, the actual limits are set in the PCU module. Information* entered in this field is for values displayed when calling the *Operating Parameters* display for this tag. The alarm conditions requiring a limit value include: 2 high (FIXED or VARIABLE only) / 2 low (FIXED or VARIABLE only) 3-low (FIXED or VARIABLE only) / 3 high (FIXED or VARIABLE only)
High variable alarm tag	Name of the tag whose value determines the high variable alarm limit. Applies *only when the alarm type is* VARIABLE.
Low variable alarm tag	Name of the tag whose value determines the low variable alarm limit. Applies *only when the alarm type is* VARIABLE.

Table 15-7 Tag Database DIGITAL, DADIGTL, DADIG, INTDIG and RCM Attributes

Field	Description
State	ZERO - six-character maximum logic state descriptor that associates with this tag, and appears on displays to identify the zero state of a device. ONE - six-character maximum logic state descriptor that associates with this tag, and appears on displays to identify the one state of a device. The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration. The PCU module reports the device state.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Bad quality Alarm A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal Alarm Enter **0** to not associate a comment with a condition.

Table 15-8 Tag Database STATION Attributes

Field	Description
Engineering unit	Non entry field; a PCU module reports the index number that associates an engineering unit of measurement with this tag. A list of valid fixed and user defined engineering units can be viewed at the *EUD Configuration* display.
Decimal places	Number of decimal places to display for this tag. A valid entry is from 0 to 4.
Tuning block	Identifies the block number of a function block providing control for the station block that this tag is referencing. This is the block that develops the final control output of the station block (e.g., PID block). To call the tuning display, press **TUNE**. A valid entry is: 0 = default; causes the system to prompt for a block number to be displayed in the block details portion of a tuning display. This occurs if the controller block associated with a station block is not a PID block. 11 to 9998 = block address of the controlling function block; allows the tuning display to be requested without having to specify the block number of the associated controller block.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Low Bad quality High deviation High Low deviation A valid entry is from 1 to 8, 1 being the highest priority; default is 1.

Table 15-8. Tag Database - STATION Attributes (continued)

Field	Description
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal — High deviation High — Low deviation Low Enter **0** to not associate a comment with a condition.

Table 15-9. Tag Database - DD, MSDD and RMCB Attributes

Field	Description
State	ZERO - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify the zero state of a device. ONE - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify the one state of a device. TWO (MSDD only) - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify the two state of a device. THREE (MSDD only) - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify three state of a device. The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration. The PCU module reports the device state.
Feedback 1	ZERO - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for feedback one. ONE - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for feedback one. The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration. The PCU module reports the device feedback state.
Feedback 2	ZERO - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for feedback two. ONE - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for feedback two. The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration. The PCU module reports the device feedback state.
Feedback 3 (MSDD only)	ZERO - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for feedback three. ONE - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for feedback three. The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration. The PCU module reports the device feedback state.

Table 15-9 Tag Database - DD, MSDD and RMCB Attributes (continued)

Field	Description
Feedback 4 (MSDD only)	ZERO - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for feedback four ONE - six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for feedback four The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration The PCU module reports the device feedback state
Permissive 1 (RMCB only)	ZERO - six character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for permissive one ONE six-character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for permissive one The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration The PCU module reports the device feedback state
Permissive 2 (RMCB only)	ZERO - six character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic zero state for permissive two ONE six character maximum logic state descriptor that associates with this tag and appears on displays to identify a logic one state for permissive two The entries must match entries in the logic state descriptor list defined through logic state descriptors configuration The PCU module reports the device feedback state
Text set (RMCB only)	Text set number defined through remote motor control block text configuration that contains text to associate and display for each of the ten error codes that can be sent in an exception report from a remote motor control function block The error codes identify the current state of the remote control device
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag Priority relates to alarm management and the alarm summary The conditions that can have a priority assigned include Return to normal Bad quality Alarm A valid entry is from 1 to 8 1 being the highest priority default is 1
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition The conditions that can have an alarm comment include *Return to normal* Alarm Enter **0** to not associate a comment with a condition

Table 15 10 Tag Database - RMSC Attributes

Field	Description
Engineering unit	Non entry field a PCU module reports the index number that associates an engineering unit of measurement with this tag A list of valid fixed and user defined engineering units can be viewed at the *EUD Configuration* display

Table 15-10. Tag Database - RMSC Attributes (continued)

Field	Description
Decimal places	Number of decimal places to display for this tag. A valid entry is from 0 to 4.
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: *Return to normal* Bad quality A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters return to normal condition. Enter **0** to not associate a comment with the condition.

Table 15-11. Tag Database - DEVSTAT Attributes

Field	Description
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Bad quality Alarm A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal Alarm Enter **0** to not associate a comment with a condition.
Device type	Type of peripheral device for which this tag is defined. This is required to acquire the status of a particular peripheral device, and in some cases for proper operation. A valid device type is: ADP PANEL, CIU, CLOCK, CRT, KEYBOARD, PRINTER, STORAGE, TOUCHSCREEN, UNDEFINED
Printer number	Number to select one of the two possible printers for a device type of *PRINTER*. A valid entry is: 1 - printer connected to P5 2 - printer connected to P7
Printer type	Type of printer for a device type of *PRINTER*. A valid entry is: ANSI (low speed, no color) ANSI COLOR (low speed, color) ANSI HIGH (high speed, no color) IBM (low speed, no color) IBM COLOR (low speed, color) IBM B&W 24 IBM COL 24 UNDEFINED'

22 36 57 04 10 07

Table 15-11 Tag Database - DEVSTAT Attributes (continued)

Field	Description
Keyboard number	Number to select one of the two possible keyboards for a device type of *KEYBOARD*. A valid entry is 1 or 2.
Keyboard type	Type of keyboard for a device type of *KEYBOARD*. A valid entry is: EMKI (without mouse or trackball) EMKI TRACK (with mouse or trackball) MKI UNDEFINED
ADP - keyboard number	Number to select one of the two keyboards a panel associates with for a device type of *ADP PANEL*. A valid entry is 1 or 2.
ADP panel number	Number to select one of the two possible annunciator display panels for a device type of *ADP PANEL*. A valid entry is 1 or 2.
Touch screen number	Number to select one of the two possible touch screens for a device type of *TOUCHSCREEN*. A valid entry is 1 or 2.
Touch screen type	Type of touch screen for a device type of *TOUCHSCREEN*. A valid entry is: CALIB ELOGRAPH NONCAL ELOGRAPH (touch screen that cannot be calibrated through the *Touchscreen Calibration* option) UNDEFINED
CRT number	Number to select one of the two possible CRTs for a device type of *CRT*. A valid entry is 1 or 2.
Clock device type	Type of clock for a device type of *CLOCK*. A valid entry is: BATTERY (battery backed clock) SATELLITE UNDEFINED
Storage device type	Type of storage device for a device type of *STORAGE*. A valid entry is: FLOPPY, SASI WINCHESTER MAGTAPE, SCSI WINCHESTER OPTICAL DISK, UNDEFINED

Table 15-12 Tag Database - TEXT Attributes

Field	Description
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Bad quality A valid entry is from 1 to 8, 1 being the highest priority, default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters return to normal condition. Enter **0** to not associate a comment with the condition.

Table 15 13 Tag Database TEXTSTR Attnbutes

Fıeld	Descrıptıon
Text length	Spec fes the length of the text strıng that w l be accepted by the console f the accepted str ng length set here ıs less than the exceptıon reported str ng length, truncatıon occurs Thıs ıs consıdered to be remote truncatıon sınce the commun cat ons ınterface unıt of the conso e uses the strıng length va ue to determ ne the maxımum strıng ength that ıt s to accept A va ıd entry s from 1 to 80
Contro enab ed	Determınes whether the conso e ıs to a ow operator control of the text str ng export b ock n a PCU module from the console When enabled the operator can perform contro through the keyboard and see the results of the act ons on the screen When dısab ed, the screen becomes nformat ona on y A val d entry s YES default enable control for th s tag NO – d sab e contro for th s tag
Pr or ty	Re at ve prıor ty or mportance w thın an a arm group of each alarm cond t on for thıs tag Pr orıty re ates to a arm management and the alarm summary The condıtıons that can have a pr or ty ass gned nc ude Return to norma Bad qua ty A arm A va ıd entry s from 1 to 8 1 be ng the hıghest prıor ty defau t s 1
Comment	Index number of an a arm comment that s to appear at a d sp ay when the tag enters a certain a arm cond t on The condıtıons that can have an a arm com ment ınc ude Return to norma A arm Enter **0** to not assoc ate a comment w th a cond tıon

Table 15 14 Tag Database N90STA Attnbutes

Fıeld	Descrıptıon
Modu e type	The conso e uses thıs attr bute to ınterpret module status reports rece ved over the commun cat on h ghway from NFI 90 modules The ınformat on appears at system status pages The *Module Type* must be spec fied In some cases the modu e type ıs for a module that ıs part of the network nterface unıt of a node The console presents a node type ınstead of modu e type at the system status overv ew and node status summary pages ın thıs case Refer to Tab e 15 15 for valıd module types for conso es and Tab e 15 16 for module types for PCU modu es
Broadcast acknowledge/ sı ence	Used to determıne whether or not to broadcast an a arm acknow edge or sı ence to the node defned by th s tag whose address s specıf ed ın a node l st The fie ds provıdes an a ternate means for turnıng broadcast ng off nstead of havıng to mod ıfy a node ıst Acknow edge and sı ence are enab ed or d sab ed separate y NO = default do not broadcast YES - broadcast
NIU port 0/1 term nal anguage	Not appl cab e for th s conso e leave these f e ds at defau t

Table 15-14 Tag Database N90STA Attributes (continued)

Field	Description
Priority	Relative priority or importance within an alarm group of each alarm condition for this tag. Priority relates to alarm management and the alarm summary. The conditions that can have a priority assigned include: Return to normal Bad quality Alarm A valid entry is from 1 to 8, 1 being the highest priority; default is 1.
Comment	Index number of an alarm comment that is to appear at a display when the tag enters a certain alarm condition. The conditions that can have an alarm comment include: Return to normal Alarm Enter **0** to not associate a comment with a condition.

Table 15-15 N90STA Tag INFI 90 Module Type for Consoles

Module Type[1]	Nomenclature	Description
COMPUTER[2]	N/A	Computer connected to the communication highway through a network interface unit
OIS10	IIOIS10	Operator Interface Station
OIS20	IIOIS20	Operator Interface Station
OIS40	IIOIS401/A/D	Operator Interface Station
OIS41	IIOIS411/A/D	Operator Interface Station
OIU	NOIU01/02/03	Operator Interface Unit
MCS	NMCS02	Management Command System

NOTES
1 All consoles use a module address of 2.
2 Used to access computers running process interface software packages (e.g., SLDG, XRS 90 Data Management, 1090 Process Management, etc.).

Table 15-16 N90STA Tag INFI 90 Module Types for PCU Modules

Module Type	Nomenclature	Description
AMMH	NAMM01	Analog Master Module (high)
AMML	IMAMM03 NAMM02/03	Analog Master Module (low)
AOM	IMAOM01, NAOM01	Analog Output Module
BIM[1]	INBIM02, NBIM01/02	Bus Interface Module
BTM[2]	INBTM01, NBTM01	Bus Transfer Module
CBC	CBC01	Batch Command Controller

Table 15 16 N90STA Tag - INFI 90 Module Types for PCU Modules (continued)

Module Type	Nomenclature	Description
CLC	CLC03/04	Loop Command Controller
COM/QRC	IMCOM03/04, NCOM02/03/04, MQRC01 NQRC01	Controller Module and Quick Response Controller Module
CSC	CSC01	Sequence Command Controller
CTM	NCTM01	Configuration and Tuning Module
CTT	NCTT01/02	Configuration and Tuning Terminal
GCM/PPT[3]	INPPT01 NGCM02	Plant Loop to Plant Loop *Transfer Module (remote)*
T01[3]	N IT01, NBCM01	INFI NET to INFI NET Transfer Module (local)
IIT02[3]	IN T02 NGCM03	INFI NET to INFI NET Transfer Module (remote)
PT01[3]	INIPT01 NGCM04	INFI-NET to Plant Loop Transfer Module (local)
PT02[3]	N PT02	INFI NET to Plant Loop Transfer Module (remote)
LCM01	NLCM01	Large Controller Module
LCM02	NLCM02	Large Controller Module
LCM03	NLCM03	Large Controller Module
LMM01	NLMM01	Logic Master Module
LMM02	IMLMM02 NLMM02	Logic Master Module
LSM/PCT[4]	NPCT01 NLSM01/02	Plant Loop to Computer Transfer Module (interface unit for MCS console and 5 000 tag O U console)
MFC	IMMFC03/04/05 NMFC01/02/03/04/05	Multi Function Controller Module
MFP	IMMFP01/02/03	Multi Function Processor Module
MPC	IMMPC01, NMPC01	Multi Processing Module
NIU[3]	NNIU01	Network Interface Unit
NPM[1]	NNPM01	Network Processing Module (Controlway)
PBUG	N/A	Module Bus Debugger
P M[5]	NP M01	Processor Input Module (interface unit for O U)

Table 15 16. N90STA Tag INFI 90 Module Types for PCU Modules (continued)

Module Type	Nomenclature	Description
PTM	INPTM01 NPTM01	Point Table Module
SBM	NSBM01	Superloop Bus Module
SCM	NSCM01	Sena Communication Module
SSM/ICT[4]	INICT01 NSSM01	NFI-NET to Computer Transfer Module (interface un t for MCS console and 5,000 tag O U console)

NOTES
1 PCU node, use a module address of 0 or 1 depending on the address of the modu e
2 Use a modu e address of 3
3 Commun cation module use a modu e address of 0
4 MCS console or 5 000 tag OIU interface modu e use a modu e address of 2
5 OIU nterface modu e use a module address of 2

ALARM COMMENTS

An alarm with an alarm condition or conditions of a tag in the database An alarm comment can be created for each alarm condition of a tag Each tag type has different possible alarm conditions, which include

- Return to normal (RTN)
- Alarm (A)
- High Alarm (H)
- Two high alarm (2H)
- Three-high alarm (3H)
- Low alarm (L)
- Two low alarm (2L)
- Three low alarm (3L)
- High deviation (HD)
- Low deviation (LD)
- High rate of change (HR)
- Low rate of change (LR)

All alarm comments have an assigned index number The index number allows using a single comment with several tags In this way, a comment does not have to be redefined for each tag Enter the index number for each alarm condition of a tag during its configuration to associate a comment with a condition

Once created, alarm comments reside in an alarm comment file on the hard disk Alarm comment configuration modifies or creates this alarm list The number of comments in the file is variable with a maximum of 20,000 entries The preferred method for creating an alarm comment list is by using the SLDG program then transferring the comment file to the console The configuration option at the console is better suited for making modifications to an existing list. Refer to the ***Software Logging Database and Graphics (SLDG)*** instruction for procedures The configuration option at the console is better suited for making modifications to an existing list

NOTE If changes are made at the console to the alarm comment list it is suggested that the alarm comment file be transferred back to the engineering work station where the alarm comment file is being maintained Transferring the file back maintains the database integrity

Pages of the alarm comment configuration function allow viewing, modifying, adding, deleting and printing alarm comments The process engineer defines alarm comments through the *Alarm Comment Configuration* page (see Figure 15 10) To call this display, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

A OIS Configuration ⟶ A Database ⟶ I Alarm Comment

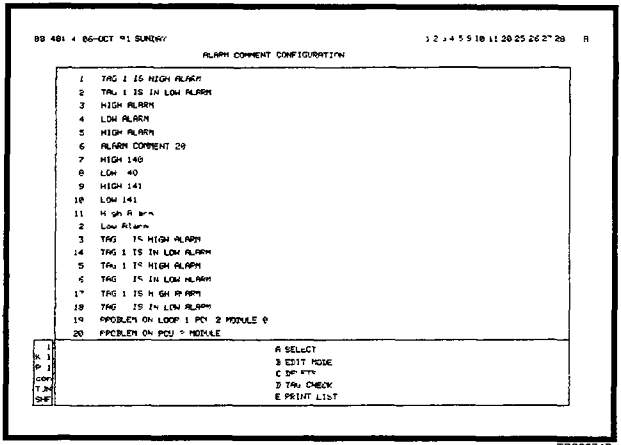


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Figure 15 10 Database Alarm Comment Configuration

Paging The entire contents of the alarm comment file can be viewed by paging through the alarm comment configuration display Press **NEXT PAGE** or **PREV PAGE** to call the next or previous page of comments to the screen Press **HOME** to return to the first page and the   the file

Select The *A SELECT* option calls an alarm comment by index number to have that comment appear as the first entry on the page This positions an input cursor at the comment for immediate editing To use this option

1 Press [A] to select the option

2 Key in the index number of an alarm comment and press [ENTER]

3 Use the configuration keys listed in Table 15-1 to change, modify or clear the selected comment Use the paging keys to move the cursor to other comments in the list while in this mode

4 Press [ENTER] after making all modifications to save the changes and update the alarm comment file

Edit The *B EDIT MODE* option puts the current page into editing mode and enables an input cursor Pressing [ENTER] before any other selection does the same thing To use this option

1 Press [B] or [ENTER] to go into editing mode

2 Use the configuration keys listed in Table 15-1 to change, modify or clear any selected comment Use the paging keys to move the cursor to other comments in the list while in this mode

3 Press [ENTER] after making all modifications to save the changes and update the alarm comment file Press [ESC] before [ENTER] to exit without making changes

Delete The *C DELETE* option specifies a single, list, or range of alarm comments to delete from the alarm comment file After selecting this option, the next page presents two deletion choices *LIST* or *RANGE*

Use the *A LIST* option to specify a single or list of up to five alarm comments to delete To use this option·

1 Press [C] to select *DELETE*

2. Press [A] to select *LIST*; the page presents a single input field

3 Key in the index number of a comment to delete If only one comment is to be deleted, go to the next step Press [TAB] to enter additional index numbers Up to four additional comments can be specified for deletion

4 Press [ENTER] to initiate the deletion Press [ESC] before [ENTER] to exit without deleting

Use the *B RANGE* option to specify a from and a to range of alarm comments to delete To use this option

1 Press [C] to select *DELETE*

2 Press [B] to select *RANGE*, the page presents a *START* and *END* input field

3 Key in the index number of the first comment in the range at the *START* field

4 Move to the *END* field and enter the last index number in the range to delete If only one comment is to be deleted, enter the same index number in both fields

5 Press [ENTER] to initiate the deletion Press [ESC] before [ENTER] to exit without deleting

Tag Check

The *D TAG CHECK* option allows checking the tag database to determine which tags currently use an alarm comment To use this option

1 Press [D] to select *TAG CHECK*. The page presents a single *INDEX* input field

2 Key in the index number of a comment, not a tag index number

3 Press [ENTER]

The next page to appear gives a list of tags that use the selected comment Each entry shows the index number and name of a tag See Figure 15 11 for an example of the tag check page Select *A PRINT LIST* to print the current tag list to a printer, the keyboard status block shows the printer at which a printout will occur Select *B NEXT LIST* to call the *INDEX* input field back to the screen to initiate another tag check Select *C MORE* to view additional tags if the list spans more than one page

4 Press [ESC] to exit the page

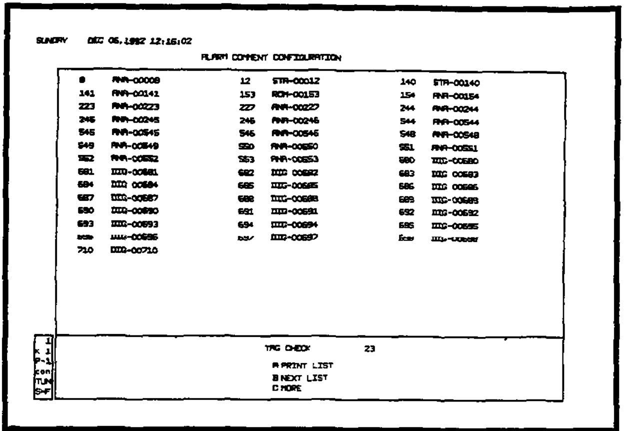
Print

The *E PRINT LIST* option specifies a range of alarm comments to print, the keyboard status block shows the printer at which a printout will occur To use this option

1 Press [E] to select *PRINT LIST* The page presents two input fields

START

END



TPS0222B

Figure 15 11 Database - Alarm Comment Configuration (Tag Check)

2 Key in the index number of the first alarm comment in the range to print at the *START* field

3 Move to the *END* field and enter the last index number in the range to print If only one comment is to be printed, enter the same index number in both fields

4 Press ENTER to initiate the print Press ESC before ENTER to exit without printing

TAG DESCRIPTORS

The console uses tag descriptors defined in its database to display the unit of measurement or current state for a process variable There are two types of descriptors Engineering unit descriptors (EUD) and logic state descriptors (LSD)

Engineering Unit Descriptors

Engineering unit descriptors relate to tag types that present analog values They describe the unit of measurement (e g , DEG F, GPM, AMPS, LB/HR) for a tag value These descriptors show the unit of measurement related to a particular value received from the process A descriptor follows the tag value throughout all console functions.

The console provides an index of common engineering units A total of 256 engineering unit descriptors can be defined in the database (i e , index numbers 0 to 255) 0 through 15 are fixed and 16 though 255 can be user defined Table 15 17 lists the fixed engineering unit descriptors and their index numbers The fixed descriptors can be substituted using the text substitution function Refer to ***Text Definition and Substitution*** in this section

Table 15-17 Engineering Unit Descriptors

Index	Descriptor	Index	Descriptor
0	(b ank)	8	G?M
1	(b ank)	9	CFS
2	%	10	CFM
3	DEG F	11	LB/HR
4	DEG C	12	GAL
5	PS A	13	AMPS
6	PSIG	14	IN HG
7	IN H2O	15	Kl B/HR

The actual reporting of engineering unit descriptors comes from PCU control modules Once the process engineer defines an engineering unit in the module configuration, the module sends an index number to the console to identify the engineering unit associated with an exception reported value The console cross references this index number to its database list of fixed and user defined descriptors Since the modules report the engineering unit descriptor index number, all devices on a common communication highway should use the same EUD list

Logic State Descriptors

Logic state descriptors relate to tag types that present logic states for digital devices These descriptors show the current logic state (e g , on or off, zero or one, run or stop, or closed or open) of a device A descriptor, once defined for a tag, follows the tag throughout console functions

Unlike engineering unit descriptors, a PCU module does not report index numbers for logic state descriptors The console refers to the tag database for the correct descriptor

The console provides an index of common logic state descriptors A total of 256 logic state descriptors can be defined in the database 0 through 15 are fixed, and 16 through 255 can be user defined Table 15 18 lists the fixed logic state descriptors and their index numbers The fixed descriptors can be substituted using the text substitution function Refer to ***Text Definition and Substitution*** in this section

Table 15 18 Logic State Descriptors

Index	Descriptor	Index	Descriptor
0	ZERO	8	LOW
1	ONE	9	H GH
2	ON	10	EMPTY
3	OFF	11	FULL
4	NO	12	RUN
5	YES	13	STOP
6	CLOSED	14	TR P
7	OPEN	15	(b ank)

Additional logic state descriptors and engineering unit descriptors can be added to the database through console configuration, or off-line using the SLDG utility

Defining Engineering Unit Descriptors

Step 1 The process engineer defines individual engineering unit descrip tors through the *EUD Configuration* page (see Figure 15 12) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration → *A Database* → *D Engineering Units*

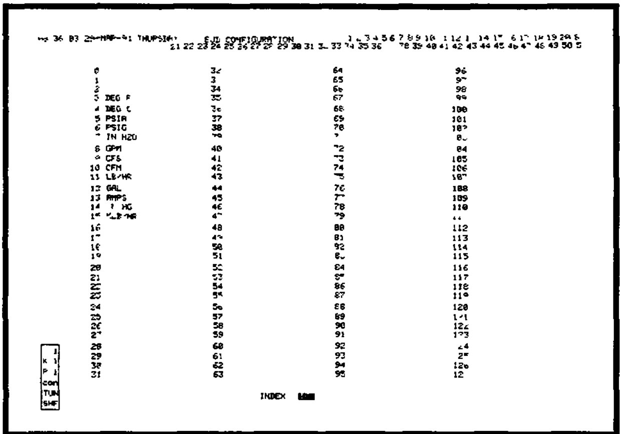


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Figure 15 12 Database EUD Configuration

Step 2 There are two pages of descriptors The first page shows descrip tors 0 through 127, the second page descriptors 128 through 255 Use NEXT PAGE and PREV PAGE to move between the pages New descriptors can be added or existing descriptors can be edited through these display pages

> **NOTE** Descriptors 0 through 15 are fixed and cannot be changed through this configuration

To define analog value engineering unit descriptors·

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display input field The console initially enters 16 at the *INDEX* prompt This is the first user definable descriptor Either use this number or enter another, then press ENTER This moves the input cursor to a specific descriptor to edit or add

b Type a new engineering unit descriptor (six characters maximum) or edit the existing engineering unit descriptor

c Press ENTER to update the EUD list on the hard disk Moving from the current field to another also enters the engineering unit descriptor into the hard disk list Press NEXT PAGE to view the second page of descriptors to make changes if desired

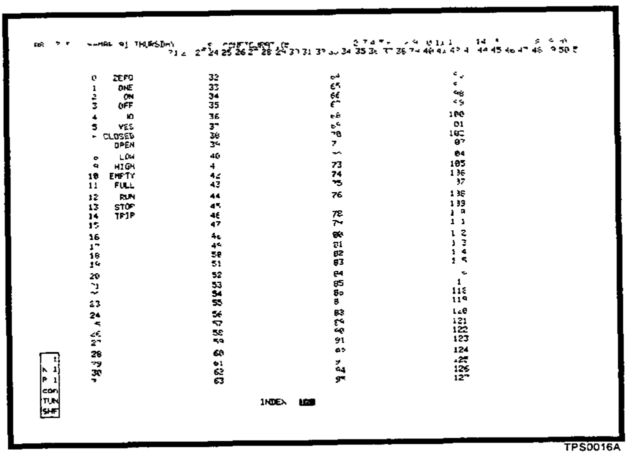
d Either move to another field and repeat Steps 2b and 2c, or press ESC to call the *INDEX* prompt and repeat Steps 2a through 2c to enter or edit additional descriptors

e After completing all additions or edits to both descriptor pages, press ENTER then ESC to exit this display

Defining Logic State Descriptors

Step 1 The process engineer defines individual logic state descriptors through the *LSD Configuration* page (see Figure 15 13) To call this display, first press GENL FCTNS MENU then select the following menu items in the sequence shown

A OIS Configuration
└→ *A Database*
└→ *C Logic State Descriptors*



TPS0016A

Figure 15 13 Database LSD Configuration

Step 2 There are two pages of descriptors The first page shows descriptors 0 through 127, the second page descriptors 128 through 255 Use [NEXT PAGE] and [PREV PAGE] to move between the pages New descriptors can be added or existing descriptors can be edited through these display pages

To define digital logic state descriptors

> **NOTE** Descriptors 0 through 15 are fixed and cannot be changed through this configuration LSD 15 is defined as blank

a. Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display input field The console initially enters 16 at the *INDEX* prompt This is the first user definable descriptor Either use this number or enter another, then press [ENTER] This moves the input cursor to a specific descriptor to edit or add

b Type a new logic state descriptor (six characters maximum) or edit the existing logic state descriptor

c. Press [ENTER] to update the LSD list on the hard disk Moving from the current field to another also enters the logic state descriptor into the hard disk list Press [NEXT PAGE] to view the second page of descriptors to make changes if desired

d Either move to another field and repeat Steps 2b and 2c, or press [ESC] to call the *INDEX* prompt and repeat Steps 2a through 2c to enter or edit additional descriptors

e. After completing all additions or edits to both descriptor pages, press [ENTER] then [ESC] to exit this display

Display Generation

The console uses a variety of summary, interactive and informational displays to convey information about process operations and results of control actions to an operator The displays include summaries, graphic overviews, graphic details and group displays These displays can be assigned to tags, keyboard keys and ADP pushbuttons Displays are not console specific A display on one console can be copied to floppy disk for transfer and use on another console.

Faceplate symbols which mimic process devices can be created and used in these graphic displays, or assigned using the operator displays' faceplates function for use in operator configurable displays This section explains two methods available for creating displays and faceplate symbols

The first and preferred method for display creation is to use a configuration tool called screen oriented display generator (SODG) The SODG utility is available through the software logging, data base and graphics (SLDG) configuration utility program, which runs on a Bailey Controls engineering work station The SODG utility is an interactive display editing program for creating displays, faceplates and symbols This configuration tool can be used to create new or edit existing displays The SLDG program provides a library of standard faceplates and symbols, which can be used as is or modified

NOTE If modifying SLDG provided standard symbols or faceplates it is suggested that a renamed copy of the original file be made then modifications be made to the renamed file This maintains the integrity of the symbol library

Displays and symbols created using SLDG utilities reside in display source files (***.DT***) SLDG utilities can be used to format floppy disks, and download these display source files to floppy disk Once downloaded to floppy disk, the *Display Generator* function of the console must be used to assemble and store the files to its hard disk as ***.DU*** files (i e , displays) and ***.DL*** files (i e , symbol files) File utilities can be used to transfer unassembled ***.DT*** files to the hard disk of the console for storage At the console, file device utilities can be used to format disks, refer to the ***Terminal Utilities*** section

A feature available through the SLDG program (i e , release 4 1 or greater) and enabled at the console is display broadcasting Broadcasting allows the console to receive a display source file (***.DT***) over the communication highway (INFI NET system only) from an engineering work station running the SLDG program The engineering work station initiates the transfer, not the console Once received, the console automatically runs the file through its *Display Generator* function The new display is then available at the next display call up The operations performed by the console on received display files are transparent to the operator

The second method of display creation is to use the elementary line editor (ELE) available through the diagnostic/debug terminal (DDT) connected to the console When using the elementary line editor, a display source file (***.DT***) is created by entering graphic and escape commands for each element or capability incorporated into a display These commands define display interactives, static data, dynamic values and symbols, control points, touch selects, key selects, etc Each line of the source file contains a single escape command Refer to Appendix B for display and symbol graphic and escape commands, and the format that must be followed when creating a display or symbol file

The elementary line editor can be used to create new or edit existing displays The source file (***.DT***) for a display can reside either on the hard disk or on a floppy disk Displays created with the SLDG program and transferred to the hard disk can be edited using the elementary line editor Display files created with the elementary line editor must first be assembled using the *Display Generator* function before they can be used in operations

DISPLAY GENERATOR

The process engineer uses the *Display Generator* function as the last step in display creation. All displays or faceplate symbols whether created using SODG or the *elementary line editor* must be processed through this function before they can be used by the console.

This function takes a ***.DT*** display source file, assembles it into a ***.DU*** display file or ***.DL*** symbol file and transfers it to a specific assembled display or symbol file directory on the hard disk (USN 04 to USN 0E) The console automatically determines to which directory the files store The console references these directories when a display is called by name, or through an ADP pushbutton or keyboard key It also references these directories when assigning faceplate symbols through the operator configurable displays function When assembling a display, both the display source file and the symbol source files for all symbols referenced in that display must reside on disk

NOTE This procedure is not required when broadcasting a display *source file from an engineering work station to the console The console* automatically runs the received source file through the *Display Generator*

Step 1 The process engineer processes display source files (***.DT***) through the *Display Generator* (see Figure 15-14) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *B Display* ⟶ *A Display Generator*

Step 2 To process a display file

NOTE This procedure overwrites existing ***.DU*** display files

a The page presents a single input field, *Enter Display Name* Enter the display file name without extension Wild card characters (i e , * and ?) can be used to process several files or all files that follow a specific name pattern To process a display file that resides on floppy disk, enter

1.00:*filename* or **1.00:*** (for all files on the floppy disk)

Unassembled display or symbol source files whether transferred from a SLDG work station, created with the elementary line editor, or provided with the software normally reside in the USN 54 directory To process a display file that resides in this directory, enter just the file name; a directory number is not needed If the display file is in another directory, specify that directory number For example, a display file resides in the USN D1 user directory At the input prompt, enter

0.D1:*filename*

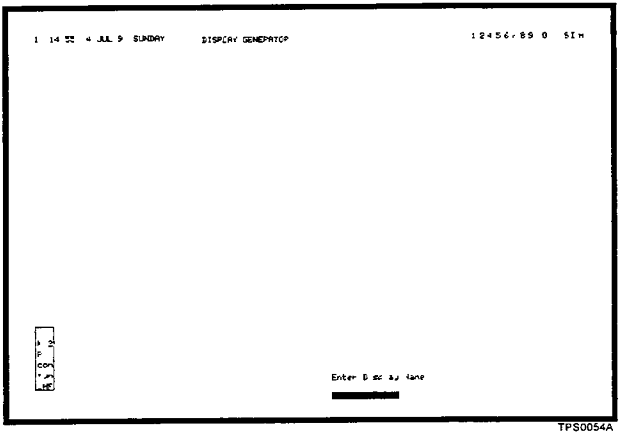


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Figure 15 14 Display Generation Display Generator

b Press ENTER, the console presents messages to indicate completion of display file processing The console indicates successful file processing by displaying the entered file name with a *DU* extension When all file processing is complete, the message is *Completed*

If an error in the display source file exists and the console cannot process a file, the file in error appears with an asterisk (*) beside it and a *DT* extension to indicate an unsuccessful operation This also applies for display source files broadcast from an engineering work station Error messages related to the file in error can be viewed through the *Show Display Errors* function Once corrected, another attempt to process the display file can be made

c Press ESC to exit this display when the console has completed all processing

DISPLAY ERRORS

The console identifies errors it encounters during display file processing (i e , *Display Generator*) Errors encountered during display generator operation appear as **<filename> DT* while at the display generator page The actual errors can be viewed through the *Show Display Errors* option

Display errors are saved in display error files on the hard disk The names of these files, which appear at the first page of this function, correspond to the name of the display source file After viewing the errors through this option then correcting them, the display source file can be run through the *Display Generator* again

Display source file errors are viewed through the *Show Display Errors* page (see Figure 15 15) To call this display, first press **GENL FCTNS MENU**, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *B Display* ⟶ *D Show Display Errors*

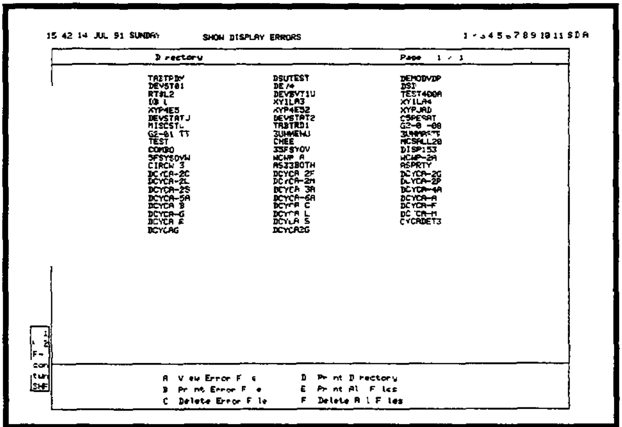

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Figure 15 15 Display Generation Show Display Errors

The page shows a directory listing of display error files that currently reside on the hard disk The options available at this display are

View Error File	Used to call and view the contents of a specific error file The error file corresponds to the source file in which the display generator function encountered errors The error file provides a list of errors encountered
Print Error File	Prints the errors listed in an error file This is also available after calling an error file using the *View Error File* option
Delete Error File	Deletes error files when no longer required Error files should be deleted from the hard disk to free hard disk space This option is also available after calling an error file using the *View Error File* option

Print Directory	Prints the current directory to a printer assigned to the keyboard
Print All Files	Prints the contents of all error files currently listed in the directory and residing on the hard disk
Delete All Files	Deletes all error files currently in the directory

View Error File To view display errors encountered in a display source file

a Select *A View Error File* from the directory options menu This calls an *Enter File Name* prompt

b Enter the file name as it appears in the directory, then press [ENTER] For example, to view the errors encountered while running the display source file ***DISP1.DT*** through the *Display Generator*, enter **DISP1** at the prompt The errors appear on the screen Press [NEXT PAGE] or [PREV PAGE] to view the entire contents of the file

c Three choices are available while viewing the file The two options presented at the bottom of the display allow printing or deleting the contents of the error file, or [ESC] can be pressed to exit the display Exiting leaves the error file intact on the hard disk for future viewing

Select *A Print Current File* to print a hard copy of the error file to a printer Select *B Delete Current File* to delete the error file from the directory and hard disk

d Either select another option, or press [ESC] to exit the error file directory

Print Error Files To print the contents of a single error file

a Select *B Print Error File* from the directory options menu This calls an *Enter File Name* prompt

b Enter the file name as it appears in the directory, then press [ENTER] The console prints the entire contents of the file

Select *E Print All Files* to print the contents of all error files Once selected, the console begins printing the contents of all error files listed in the directory

Delete Error Files To delete a single error file from the directory and hard disk

a Select *C Delete Error File* from the directory options menu This calls an *Enter File Name* prompt b Enter the file name as it appears in the directory, then press [ENTER] The console deletes the file

Select *F Delete All Files* to delete all error files Once selected, the console deletes all error files listed in the directory

Print Directory Select *D Print Directory* to print the directory listing

ELEMENTARY LINE EDITOR DISPLAY GENERATION OR EDITING

Access to the elementary line (ELE) editor is through the diagnostic/ debug terminal (DDT) The terminal is active and available after the operating system has completed start-up The ELE function can be used to access and edit existing display source files, or to create new files

Unassembled display files (***.DT***) reside on the hard disk in the USN 54 directory by default, on floppy disk, or in other user directories Refer to the ***Terminal Utilities*** section for additional information

> ***NOTE*** *Access to DDT functions can be limited through password security* This prevents unauthorized editing of displays

To create a display file

1 The file must be created in the USN 54 directory, on floppy disk or in a user directory This is done using the **ASF** file allocation command The file name must have a ***.DT*** extension

2 Start the elementary line editor to open and gain access to the file created in Step 1

3 Enter all applicable escape commands through the editing functions of the elementary line editor to create the display

4 Use the elementary line editor to exit and save the file to disk

5 Use the *Display Generator* function to process and assemble the display

Refer to the ***Terminal Utilities*** section for procedures to use the diagnostic/debug terminal, commands to create and allocate files (**ASF**), and the specific commands of the elementary line editor (i e , list, edit, delete, insert, and save and exit) Refer to Appendix B for display and symbol file required formats, and available graphic and escape commands Refer to ***DISPLAY GENERATOR*** in this section for procedures to process and assemble displays and symbols for console use

Existing ***.DT*** files can be called and edited through the elementary line editor

Keyboard Configuration

Keyboard configuration assigns displays and key macros to keyboard function keys and annunciator display panel (ADP) push buttons It also defines key macros, alarm tones and alarm relays

Any configured display that resides as a ***.DU*** display file on the hard disk can be assigned to an available, assignable key or ADP pushbutton Once assigned, that display can be accessed through a single key press Assignable keys include

32 function keys (e g , [AREA *n*] or [F*n*])

[DISPLAY SUMM]

[ALARM SUMM]

[SYSTEM STATUS SUMM]

[HELP]

NOTE Use [SHIFT] in combination with the function keys (i e [F1] through [F16]) to access function keys 17 through 32 For example press [SHIFT]-[F1] to access F17

Key macros incorporate multiple keystrokes into a single key press Up to 96 macros can be defined, with each macro incorporating up to 50 keystrokes After pressing a keyboard key or ADP pushbutton which has a macro assigned, the console performs each key action specified in that key macro These actions can include any key sequence incorporated into a display using interactive display select escape commands and keyboard keys

All keyboard keys, except those used during macro configuration, and ADP pushbuttons can be defined in a key macro Each macro can contain a maximum of five display call ups and selects Once defined, macros can be assigned to function keys and ADP pushbuttons

Macros also accept nested definitions If a macro contains a key or ADP pushbutton that has a macro already assigned, that macro executes as a part of the other macro There is no limit to the number of nesting levels possible Care should be taken when creating nested key macros Make sure the nested macro is ***not*** defined in such a way that it causes the console to continually execute a loop

NOTE Key macros should ***not*** be activated while in displays which have elements selected for control Deactivate control before selecting the macro

Each keyboard the console supports provides five tones and six relays Both are used in alarm management Tones sound to inform an operator of an alarm condition, relays close to trigger an external alarm annunciator

Keyboard configuration consists of:

- Defining key macros
- Assigning displays and key macros to keyboard keys
- Assigning displays and key macros to ADP pushbuttons
- Defining logical alarm tones
- Defining logical alarm relays

DEFINING KEY MACROS

Key macros can incorporate any ADP pushbutton and any keyboard key except those used in macro configuration. The keys not available for macros and their configuration functions are:

NOTE: These keys are located in the cursor control, alphabetic characters and numeric keypad blocks of the keyboard, not the station and remote control block.

CLEAR — Erases the current macro definition and returns the input field to the first or starting position.

TAB — Moves the input field to the first position in the next macro definition. If the next macro definition is not displayed, the next page is brought up. This does not save the macro from which the input cursor was tabbed.

TAB BACK — Moves the input field to the first position in the previous macro definition. If the previous macro definition is not displayed, the previous page appears. This does not save the macro from which the input cursor was tabbed.


Performs the same function as TAB except that it also saves the macro definition being exited.


Performs the same function as TAB BACK except that it also saves the macro definition being exited.


Moves the input field within the current macro definition to the previous key definition location. Use this to move to a specific key definition and delete or overwrite that definition.


Moves the input field within the current macro definition to the next key definition location. Use this to move to a specific key definition and delete or overwrite that definition.


Moves the input field within the current macro definition to the previous key definition location, and deletes the key input from which the input field was moved. Use this to delete key entries.

Moves the input field within the current macro definition, and inserts an *undef* key definition Use this to insert key entries between existing entries

Moves the input field to the previous macro definition making it the currently selected macro This calls the pre vious screen if pressed while at the upper macro definition

Moves the input field to the next macro definition making it the currently selected macro This calls the next screen if pressed while at the lower macro definition

HOME Calls the *Enter Macro Number* prompt for selecting a macro to define or edit

NOTE [COM'D LINE MENU] [MISC MENU] and [SWITCH CRT] cannot be used in a key macro

Step 1 *The process engineer defines key macros through the Key Macro Definition* page To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration ⟶ *D Keyboard* ⟶ *E Macros*

Step 2 To define a macro.

a At the *Enter Macro Number* field, enter a number from 1 to 96, then press [ENTER] Figure 15 16 shows an example of the next page that appears

b Use the macro definition keys explained earlier to move to specific macros and key entries, and to save definitions The con sole initially positions the input cursor at the first key position in the macro definition This is the first key in the sequence The console processes macros from left to right, top to bottom Up to 50 keys can be incorporated into a single key macro

Enter a key sequence by pressing each keyboard key or ADP pushbutton in the order that the console is to perform them Any key can be defined in a key macro except for those used in key macro configuration

When a key or pushbutton is pressed, the *undef* key definition is replaced by an abbreviated key name in brackets or an ASCII character enclosed in single quotes For example, *<NXT PAG>*, *<GEN FUN>*, *<F14>*, '*7*' or '*'

c Save the macro definition by either moving from the macro using the double up or double down arrows, or press [HOME] Re peat Steps 2a through 2c to define additional macros

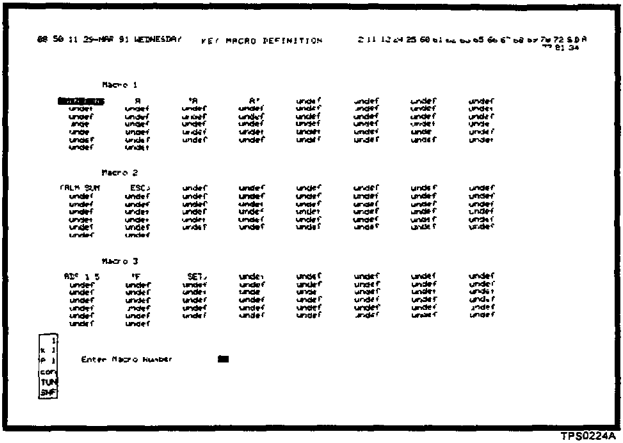

Figure 15 16 Keyboard Configuration Key Macro Definition

d When macro definition is complete, press HOME then ESC to exit

Moving to another macro using the double-up and double down arrow keys, or pressing HOME saves a macro As soon as a macro is saved, it is available for use A macro number assigns that macro to a keyboard key or ADP pushbutton

Edit Macro

Any defined key macro can be edited. To edit an existing key macro, call the macro by entering its macro number at the *Enter Macro Number* field This input field appears when the configuration page is first called, or by pressing HOME Edits can include deleting, adding or changing keys in a macro

To delete a key entry from a macro key sequence, move the input field cursor to highlight the key entry to delete, then press the double-left arrow key The key entry will no longer appear, and the subsequent key entries will move back one place in the macro

To insert a key entry into a macro key sequence, move the input field cursor to highlight the key entry that is to occur immediately before the key to be inserted, then press the double right arrow key This inserts an *undef* key definition into the list. Move to the *undef* field and press the key to add This replaces the *undef* with the defined key

Delete Macro To delete a defined macro

1 Move to the macro by using the *Enter Macro Number* prompt, or TAB or TAB BACK

2 Press CLEAR

3 Save the change by either moving away from the macro using the double-up or double-down arrows, or press HOME Press ESC prior to any other key to cancel the deletion

ASSIGNING KEYBOARD KEYS

Keyboard configuration allows assigning displays and key macros to keyboard assignable function keys Displays must reside on the hard disk as ***.DU*** display files Macros must be previously defined using key macro definition procedures

Step 1 The process engineer makes key assignments through the *Assign Keys To Displays* screen (see Figure 15 17) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *D Keyboard* ⟶ *A Function Keys*

Step 2 Key assignments are keyboard specific When the configuration display first appears, a *KEYBOARD* prompt displays To call the configuration for a specific keyboard

a Enter a keyboard number, either 1 or 2, for which the as signments are being made or modified

b Press ENTER The next display shows the current assignments for that keyboard (see Figure 15 18) If no previous assignments were made, each key contains a default configuration This default causes a function key press to call a display defined as *BLANK*

Step 3 Three fields for each function key define the assignment as a dis play or key macro, identify the display name or macro number, and specify the screen assignment

NOTE The default alarm summary display name is *ALMSUMFL*. The default system status display name is *N90STAT1*

To assign a ***display*** to a key

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Move to a specific key

b At the first field for that key, enter a **D**

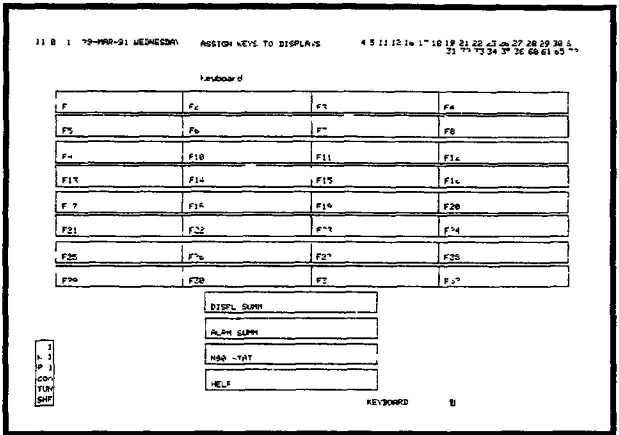

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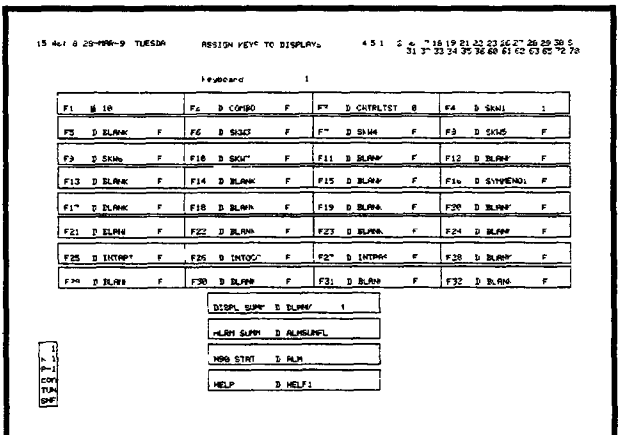
Figure 15 17 Keyboard Configuration Assign Keys to Displays



TPS0117A

Figure 15 18 Keyboard Configuration Assign Keys to Display (Page 2)

c Move to the second field for that key and enter the display name This name must correspond to an assembled display file on the hard disk The entered name is the file name without the ***.DU*** extension d Move to the third field for that key and make the screen assignment This determines where the display will appear when the key is pressed A valid entry is.

0 all screens supported by this console

1 screen one only

2 screen two only

F - screen assignment follows the keyboard assignment

e Repeat Steps a through c to make additional key assignments

f Press ENTER to save the assignments

To assign a ***key macro*** to a key

a Use the OIS configuration keys to move between and enter data into each display field Move to a specific key

b At the first field for that key, enter an **M**

c Move to the second field for that key and enter the macro number This number must correspond to a defined key macro The console allows assigning a macro that is undefined, however, pressing the key has no effect A valid entry is from 1 to 96

d When assigning key macros, the third field for a key is not valid and does not require an entry for screen assignment Repeat Steps a through c to make additional key assignments

e Press ENTER to save the assignments

Delete Assignment

To delete a key assignment, go to that assignment and set the three fields to

D
BLANK
0

This causes that key to display the default ***BLANK.DU*** display when pressed

ASSIGNING ADP PUSHBUTTONS

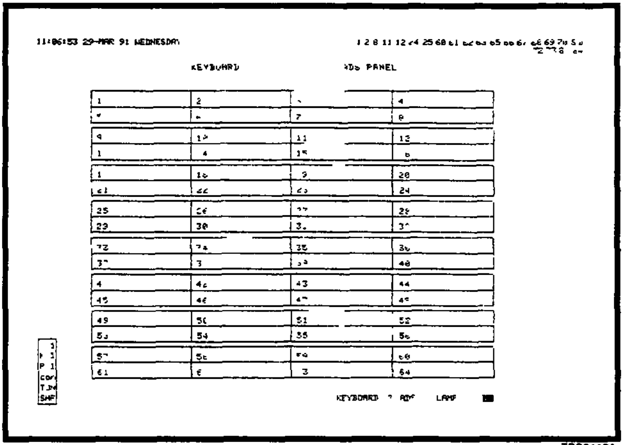
Keyboard configuration allows assigning displays or key macros to ADP pushbuttons Displays must reside on the hard disk as ***.DU*** display files Macros must be previously defined using key macro definition procedures

ADP lamps are assigned through tag database configuration Display assignments should correspond to these tag database lamp assignments This allows the operator to call a display relating to an alarm (indicated by the lamp being lit red) to perform actions required to correct the alarm

Step 1 The process engineer makes pushbutton assignments through the ADP assignment page (see Figure 15-19) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration ⟶ *D Keyboard* ⟶ *B ADP*

NOTE Th s console supports two annunciator d sp ay panels per keyboard, each with 32 LED/pushbutton pa rs Pushbutton assignments 33 through 64 are not valid for this console Attempting to access these assignments causes the console to display an error message



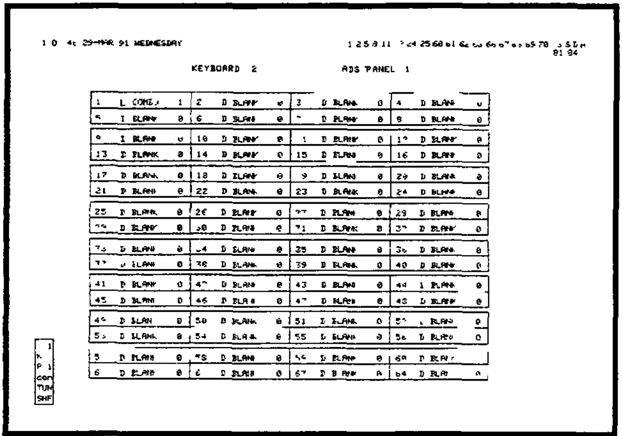
TPS0118A

Figure 15 19 ADP Configuration ADP Assignment Display (Page 1)

Step 2 Pushbutton assignments are annunciator display panel specific When the configuration display first appears, a *KEYBOARD* ___ *ADP* ___ *LAMP* ___ prompt displays To call the configuration for a specific annunciator display panel

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into fields Enter the keyboard number the annunciator display panel is assigned to, ADP number the assignments are being made for, and a specific lamp (pushbutton) being assigned

b Press [ENTER] This calls the second page of the configuration The next display shows the current assignments for that panel (see Figure 15 20) If no previous assignments were made, each pushbutton contains a default configuration This default causes a pushbutton press to call a display defined as *BLANK*



TPS0119A

Figure 15 20. ADP Configuration ADP Assignment Display (Page 2)

Step 3 Three fields for each pushbutton define the assignment as a display or key macro, identify the display name or macro number, and specify the screen assignment

To assign a ***display*** to a pushbutton

a Use the OIS configuration keys to move between and enter data into each display field Move to a specific pushbutton

b At the first field for that pushbutton, enter a **D**

c *Move to the second field for that pushbutton and enter the* display name This name must correspond to an assembled display file on the hard disk The entered name is the file name without the ***.DU*** extension

d Move to the third field for that pushbutton and make the screen assignment This determines where the display will appear when the pushbutton is pressed A valid entry is

0 all screens supported by this console

1 screen one only

2 screen two only

F screen assignment follows the keyboard assignment

e. Repeat Steps a through c to make additional pushbutton assignments

f. Press ENTER to save the assignments

To assign a ***key macro*** to a pushbutton

a Use the OIS configuration keys to move between and enter data into each display field Move to a specific pushbutton

b At the first field for that pushbutton, enter an **M**

c Move to the second field for that pushbutton and enter the macro number. This number must correspond to a defined key macro The console allows assigning a macro that is undefined, however, pressing the pushbutton has no effect

d When assigning key macros, the third field for a pushbutton is not valid and does not require an entrv for screen assignment. Repeat Steps a through c to make additional pushbutton assignments

e Press ENTER to save the assignments

Delete Assignment

To delete a pushbutton assignment, go to that assignment and set the three fields to

D
BLANK
0

This causes that pushbutton to display the default' ***BLANK.DU*** display when pressed

DEFINING LOGICAL ALARM TONES

A logical alarm tone when assigned to an alarm group sounds when a tag in that group goes into alarm Each of ten possible logical tones is formed by selection of a keyboard annunciator and a defined pitch and volume Tone configuration determines the priority, physical keyboard, duration and volume of each logical tone Each tone is identified and assigned by its logical tone number The console uses the priority to identify which tone should sound first in the event two tones trigger at the same instant

Press SILENCE to disable all

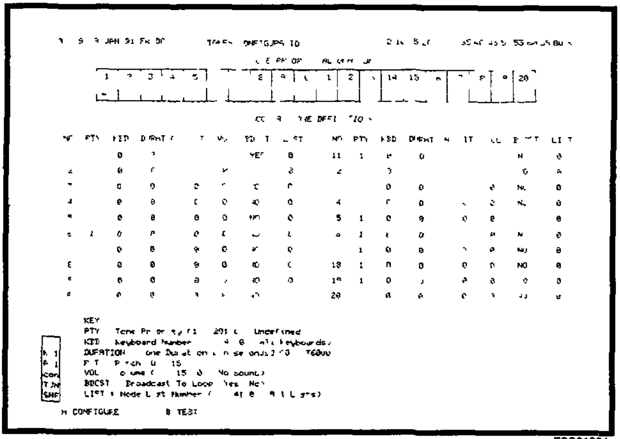
Tone configuration also sets a global alarm silence toggle for each logical tone, and defines a node list to use when broadcasting tone silences This is a function of global alarm acknowledge and silence configuration Tone configuration provides an enable or disable of silence broadcasting on a per tone basis Refer to ***GLOBAL ALARMING ACKNOWLEDGE AND SILENCE*** in this section for specifics

Logical tone configuration provides a test feature that allows hearing a tone to

- Verify a keyboard annunciator is working
- Verify correct configuration
- Determine if the pitch, volume and duration are sufficient to identify an alarm

Step 1 The process engineer configures logical alarm tones through the *Tones Configuration* page (see Figure 15 21) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *D Keyboard* ⟶ *C Tones*



TPS0120A

Figure 15 21 Keyboard Configuration Tone Definition

Step 2 To define a logical tone

a Press A to select *CONFIGURE*, this calls a *Tone Number* prompt

b Enter the number of a logical tone, then press ENTER A valid entry is from 1 to 10 After pressing ENTER, the input cursor appears at the *PTY* field for that logical tone The tone count displaying in the *TONE PRIORITY ALLOCATION* box for a given tone priority changes from cyan to green when a tone with that priority is being configured.

c The *LOGICAL TONE DEFINITIONS* portion of the screen displays the current alarm tone configuration, and is the area of the screen used to change configurations Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field. Enter a priority for this tone A valid entry is **0** for undefined, or 1 to 10

After entering, the priority level indicated in the *TONE PRIORITY ALLOCATION* box at the top of display increments to the total number of tones with that priority assigned For example, if tones 6 and 10 are set to priority 4, the *TONE PRIORITY ALLOCATION* box indicates a 2 under priority level 4

d Enter the number of a physical keyboard that is to provide this tone in the *KBD* field A valid entry is **0** for all keyboards, or 1 or 2 for a specific keyboard. If the *KBD* field is set to all zeroes, only five tones can be defined

e Enter the duration in seconds that this tone is to sound when triggered A valid entry is **0** for no tone, or 1 to 36000 The tone can be silenced prior to completing its duration by pressing **SILENCE**

f Enter the pitch of this tone in the *PIT* field A valid entry is from 0 to 14 Each pitch number corresponds to a different frequency in hertz

g Enter the volume of this tone in the *VOL* field A valid entry is **0** for no sound, or 1 (softest) to 15 (loudest)

> **NOTE** The next two fields relate to global silencing and alarm management

h Set the *BDCST* field to **YES** to enable broadcasting a tone silence for this logical tone Tone silencing is initiated through **SILENCE** on the keyboard Set this field to **NO** to disable broadcasting

i *If the BDCST field is set to YES,* enter a node list number at the *LIST* field. This field determines to which nodes, specified in a node list, to broadcast the silence A valid entry is

0 - broadcast the silence to the nodes in the node list automatically compiled by the console during start up This list contains the first 32 N90STA tags that define a console or a computer

1 node list one

2 node list two

3 node list three

4 node list four

If the *BDCST* field is set to *NO*, the *LIST* field is not valid Refer to ***Alarm Management Configuration*** and ***GLOBAL ALARMING ACKNOWLEDGE AND SILENCE*** in this section for more information on silence broadcasting

j *To define another logical tone, use the OIS configuration* keys to move to the fields of the tone and repeat Steps 2c through 2i Or, press ESC to call the *Tone Number* prompt and repeat Steps 2b through 2i When complete, press ENTER to save the configuration to the hard disk

Test Tone configuration provides a test option that sounds a tone using its configured pitch and volume Test duration is set through the test function

To test a defined tone

1 Press B to select *TEST*, this calls a *Tone Number* *Test Duration* input field

2 Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Enter the tone number to test, then the duration of the test in seconds (0 to 36000) The tone count displaying in the *TONE PRIORITY ALLOCATION* box for a given tone priority changes from cyan to yellow when a tone with that priority is being tested

3 Press ENTER, the console presents a *Test in progress* message and a *Test Time* field that counts down the test duration The tone sounds until the test time decrements to zero.

Testing a tone turns off any active tones that are currently sounding, and also prevents any new tones from sounding during the test Press ESC to discontinue a test in progress

DEFINING LOGICAL ALARM RELAYS

A logical alarm relay closes for a defined duration when a tag goes into alarm The alarm relay, however, must be assigned to an alarm group, and the tag assigned this group number for this to occur

Each of the 12 logical relays is formed by one of six physical relays per keyboard and a specified duration Relay configuration identifies the physical keyboard and relay, and the duration for a logical relay Each relay is assigned by its logical relay number The duration is the number of seconds the relay closes

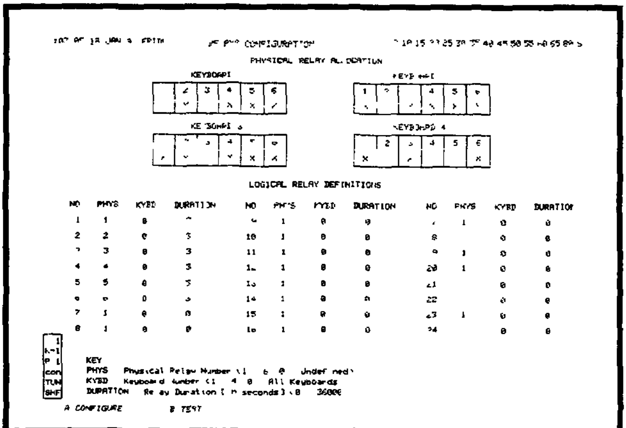
Normally, a relay remains closed until the alarm driving the relay returns to normal, the alarm is acknowledged, or the duration set for the relay expires A *Relay Hold until Silenced* field at the system configuration page provides an option to change the functionality of the relays If this field is set to *YES*, any alarm relays that close due to an alarm condition remain closed until the operator presses SILENCE, or their duration expires The duration is set on an individual relay basis. If the field is left at its default of *NO*, relays maintain their original functionality Refer to ***OIS System Configuration*** in this section for procedures to change the *Relay Hold until Silenced* field

Logical relay configuration provides a test feature that allows closing a relay to

- Verify a keyboard relay is working
- Verify correct configuration
- Determine if the duration is sufficient for an external alarm annunciator

Step 1 The process engineer configures logical alarm relays through the *Relays Configuration* page (see Figure 15 22) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ D Keyboard ⟶ D Relays



TPS0121A

Figure 15 22 Keyboard Configuration - Relay Definition

Step 2 To define a logical relay

a Press [A] to select *CONFIGURE*, this calls a *Relay Number* prompt

b Enter the number of a logical relay, then press [ENTER] A valid entry is from 1 to 12 After pressing [ENTER], the input cursor appears at the *PHYS* field for that logical relay

An *X* displays in the *PHYSICAL RELAY ALLOCATION* boxes for each configured relay This *X* changes color from cyan to green for a given relay when that relay is being configured

c The *LOGICAL RELAY DEFINITIONS* portion of the screen displays the current alarm relay configuration, and is the area of the screen used to change configurations Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Enter the physical relay number at the *PHYS* field A valid entry is **0** for undefined, or 1 to 6 After entering, an *X* appears in the *PHYSICAL RELAY ALLOCATION* box at the top of display

If a *Physical Device Overlap* error message occurs when attempting to enter a physical relay number, that relay number has been used previously This can occur, for example, if a physical relay has been assigned to keyboard one and an attempt to assign that relay number to keyboard two has been made If this occurs, move to the *KYBD* field of the relay being defined and make the keyboard assignment before the physical relay assignment

d Enter the number of a physical keyboard that is to provide this relay in the *KYBD* field A valid entry is **0** for all keyboards, or 1 or 2 for a specific keyboard If the *KYBD* column is set to all zeros, only six physical relay assignments can be made

e Enter the duration in seconds that this relay is to close when triggered A valid entry is **0** to disable the relay, or 1 to 36000

f To define another logical relay, use the OIS configuration keys to move to the fields of the relay and repeat Steps 2b through 2e Or, press [ESC] to call the *Relay Number* prompt and repeat Steps 2b through 2e When complete, press [ENTER] to save the configuration to the hard disk

Test Relay configuration provides a test option that closes a specific relay defined through this configuration Test duration is set through the test function To test a defined relay

1 Press [B] to select *TEST*, this calls a *Relay Number* *Test Duration* input field

2 Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Enter the relay number to test, then the duration of the test in seconds (0 to 36000) The *X* displaying in the *PHYSICAL RELAY ALLOCATION* box for a given keyboard changes from cyan to yellow when a relay driven by the keyboard is being tested

3 Press **ENTER**, the console presents a *Test in progress* message and a *Test Time* ____ field that counts down the test duration The relay remains closed until the test time decrements to zero. Press **ESC** to discontinue a test in progress.

Alarm Management Configuration

Alarm management configuration involves setting standard console indications and responses to alarm conditions for operator ease of alarm processing Alarm management starts at the PCU module level The actual alarm limits that trigger a process alarm condition are set in the control scheme of PCU modules, and remain the same when viewed at any console

Through the tag database, the console can monitor individual process points to trigger its alarm indications and responses This allows the operator to manage process alarms from a single point Alarm management must be considered during initial tag database creation since several attributes in the database pertain to alarming

Alarm management configuration encompasses the following configurations

- OIS system configuration
- Alarm group
- Alarm quality
- Automatic tag alarm inhibiting
- Alarm summary format
- Alarm summary report
- Alarm tones and relays
- Global alarm acknowledge and silence
- Remote alarm acknowledge

This section of the manual discusses alarm management configuration only Refer to the ***Alarm Processing*** section for alarm management operations

ALARM GROUP CONFIGURATION

The number of points defined in a single process can be substan tial For ease of alarm processing, *alarm groups keep related proc ess tags together in groups for easier management* After tags have been assigned to a group, each alarm group must then be defined The process engineer establishes standard alarm indications and console responses to alarm conditions through alarm group configuration

During tag configuration, a tag can be assigned to an alarm group Each tag can be assigned to groups 1 through 99, groups S and D are reserved for INFI 90 system and OIS peripheral devices re spectively Tags in the tag database can be grouped by assigning the same alarm group number to each tag that is to be in that group When any tag in a group enters an alarm condition, a group indicator (e g , *1* to *99*, *S* or *D*) displays at the upper right corner of the screen on all displays This alarm group indicator allows the operator to quickly identify a problem area in the proc ess The indicator also appears in the alarm summary, and as part of an alarm status/quality/group field

The process engineer configures each alarm group separately Alarm group attributes relate to all tags assigned to that group Group configuration sets up the console responses that notify an operator or trigger an alarm annunciator A keyboard annunciator tone assigned to a group sounds to notify an operator of either a tag in that group entering an alarm condition or returning to its normal condition from an alarm condition A keyboard relay as signed to a group closes for either an alarm or return to normal condition, and can be used to trigger an external alarm annunciator

Alarm group configuration requirements include

- *Individual tag alarm group assignments*
- Alarm group definition

Tag Alarm Group Assignment

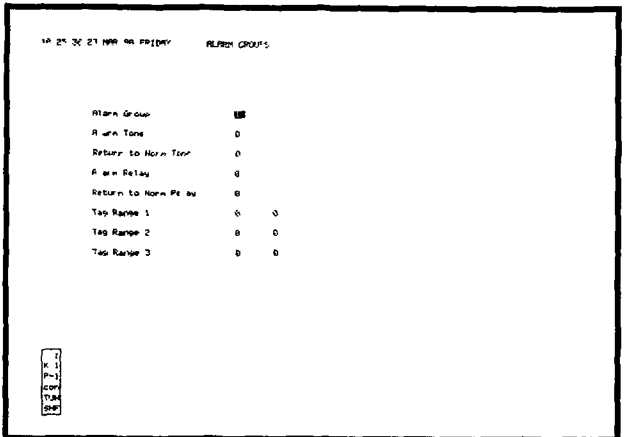
Each tag in the database can be assigned to an alarm group The alarm group assignment is optional A tag must be assigned to a group, however, for its alarm conditions to be indicated to an op erator with an alarm group indicator and other alarm indications

Follow the procedures for defining individual tags, refer to ***Enter- ing or Editing a Tag*** in this section for the procedures Set the *Alarm Group* field to the desired group number for all tags related to that group. A valid entry is from 1 to 99, the console automati cally assigns group *S* to N90STA tags and group *D* to DEVSTAT tags Setting this field to **0** leaves the tag unassigned Tags should be assigned to groups during initial database configuration

Alarm Group Definition

Step 1 The process engineer defines an alarm group through the *Alarm Groups* page (see Figure 15 23) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration → *E System* → *B Alarm Groups*



TPS0001A

Figure 15 23 Alarm Management - Alarm Group Configuration

Step 2 To define an alarm group

a Enter the number of an alarm group to define or edit at the *Alarm Group* field, then press [ENTER] A valid entry is from 1 to 99, **S** or **D**.

b Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display input field Table 15 19 describes alarm group attributes, refer to this table when entering data

c After completing all required fields, press [ENTER] This up dates the configuration on the hard disk

d To define or edit additional groups, press [ESC] This positions the input cursor at the *Alarm Group* input field Enter the next group number to edit, then press [ENTER] Press [NEXT PAGE] or [PREV PAGE] to sequence to the next or previous group

e. Repeat Steps 2a through 2c until all required alarm groups are defined. This includes groups S and D. Press [ESC] to exit this display when done.

Table 15-19. Alarm Group Attributes

Field	Description
Alarm group	Identifies and calls an alarm group for configuration. Enter this number in the tag database to assign a tag to this group. A valid group number is: 1 to 99 = process tags S – NFI 90 system type tags group. The console automatically assigns N90STA type tags to this group. D – OIS peripheral device type tags group. The console automatically assigns DEVSTAT type tags to this group.
Alarm tone	Defines the logical tone that is to sound when a tag in this group enters an alarm condition. A valid entry is: 0 – no tone assigned to group 1 to 10 – logical tone to assign to this group **NOTE:** The actual logical tone configuration and keyboard assignments are made through keyboard configuration. The configuration defines the duration, pitch and volume of the tone, and selects the keyboard that supplies the tone.
Return to normal tone	Same as the *Alarm Tone* field, except that this tone sounds when a tag in this group returns to its normal condition. A valid entry is: 0 – no tone assigned to group 1 to 10 – logical tone to assign to this group
Alarm relay	Defines the keyboard relay that is to close when a tag in this group enters an alarm condition. A valid entry is: 0 – no relay assigned to group 1 to 12 – logical relay to assign to this group **NOTE:** The actual logical relay configuration and keyboard assignments are made through keyboard configuration. The configuration defines the duration in seconds that the relay closes, and selects the keyboard and physical relay.
Return to normal relay	Same as the *Alarm Relay* field, except that this relay closes when a tag in this group returns to its normal condition. A valid entry is: 0 – no relay assigned 1 to 12 – logical relay to assign to this group
Tag range 1/2/3	Used to expedite alarm group assignment, or to override any existing alarm group assignments in the tag database. Up to three ranges of tag index numbers can be entered for this alarm group. A valid entry is: 0 – range not assigned 1 to 5000 – maximum entry can be from 1 to 5,000 depending on the current size of the tag database **NOTE:** Alarm groups should be assigned during tag database configuration. The configuration that was performed more recently overrides the previous configuration.

Tag Range

The process engineer can use the *Tag Range* fields to initially define or to modify alarm group assignments for tags in the tag database. To use the *Tag Range* fields to make or modify alarm group assignments

a. Perform Steps 2a through 2c as described in the preceding steps

b. At the *Tag Range* fields, define up to three tag ranges The tag ranges specify which tags in the tag database are to be assigned to the currently selected alarm group

c After completing all required fields, press **ENTER** This procedure modifies the alarm group assignments in the tag database for the tags that fall within the specified range or ranges

For example, if a range is defined as 1 to 50 and the configuration page shows *15* in the *Alarm Group* field, then tags 1 to 50 will be assigned to alarm group 15 after pressing **ENTER** The console does not retain the tag range entries after exiting the configuration page The fields reset to *0* to allow defining additional tag ranges if desired

ALARM QUALITY OPTION

The alarm quality option configuration both enables quality status alarming, and defines color schemes for presenting non-good and good quality indications Good indications refer to any of the alarm conditions of a tag Setting the foreground and background colors used to indicate an alarm through this option standardizes console indications

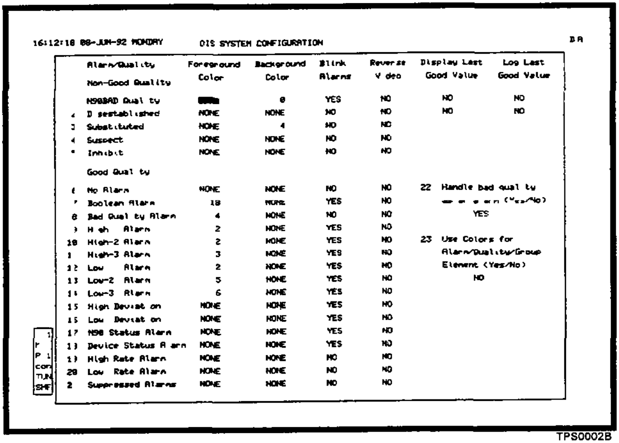
By setting the color scheme, alarm fields that appear at all displays and dynamic symbols built into user created displays conform to a standard allowing the operator to easily recognize specific alarm and quality conditions. An alarm field is either the five character alarm status/quality/group field or the one character alarm status field on a display Alarm quality configuration also affects console return to normal processing (i e., *Blink Alarms* field for a *No Alarm* condition)

There is a distinct difference between tag alarm condition and tag quality. Tag quality relates to the validity of an exception reported point A point reporting good quality means that the process control scheme has determined that it is receiving valid input from a process device, and transmitting valid data to the console for that point whether the point is in a normal or alarm condition. The control scheme identifies an alarm condition in an exception report when a point has passed an alarm threshold set in the control scheme A point can report good quality but still be in an alarm condition To use the quality reported for a process point in alarm management, bad quality alarming must be enabled Refer to the ***Alarm Processing*** section for an explanation of the alarm status and quality indications

Step 1 The process engineer defines alarm quality options through one of the *OIS System Configuration* pages (see Figure 15 24) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *A System*
→ *E Alarm Quality Option*

NOTE Changes made at this display require a reset Press ESC before making any changes to exit this display without having to reset



TPS0002B

Figure 15 24 Alarm Management Alarm Quality Options

Step 2 To configure the alarm quality options

a Initially the console positions the input cursor at the first field available for entry Either use the OIS configuration keys (refer to Table 15 1) to move between fields, or press ESC *to call a Select Field* prompt At the prompt, enter the number associated with the attribute to which to move Table 15 20 describes the alarm quality options attributes, refer to this table when entering data

b After completing all required fields, press ENTER This updates the configuration on the hard disk

c Press the RESET button located at the power entry panel When the console comes back on line, it operates with the entered parameters

Table 15-20. Alarm Quality Options

Field	Description
Handle bad quality as an alarm	Enables using bad quality as an alarm. A valid entry is: YES = enable bad quality alarming, a bad quality condition causes the console to display all normal alarm indications for a process variable being reported as in bad quality. In addition to the normal bad quality indicator (*) in the status position of an alarm status/quality/group field, the console also makes an entry in the alarm summary and gives alarm group indications for bad quality. NO = disable bad quality alarming.
Use colors for alarm/quality/ group element	Determines if the alarm status/quality/group field of a tag uses a default color scheme or the color scheme defined at this page. A valid entry is: YES = use the color scheme set at this display. NO = use the default colors defined during display creation.
Foreground color	Identifies the foreground color that is to appear for a particular non good quality or alarm condition (good quality). Specify a color in this field to override default colors. Once defined, this color identifies an alarm condition or non good quality for a tag. *Use Colors for Alarm/Quality/Group Element* must be set to *YES* for this to have any effect. A valid entry is NONE or 0 through 63. Refer to ***Printer Color Maps*** in this section to cross reference color index numbers to presented colors.
Background color	Identifies the background color that is to appear for a particular non good quality or alarm condition. Specify a color in this field to override any default colors. Once defined, this color identifies the alarm condition or non good quality for a tag. *Use Colors for Alarm/Quality/Group Element* must be set to *YES* for this to have any effect. A valid entry is NONE or 0 through 63. Refer to ***Printer Color Maps*** in this section to cross reference color index numbers to presented colors.
Blink alarms	Determines if the specific alarm condition or non good quality should blink when unacknowledged. A valid entry is: YES = enable blink. NO = disable blink.
Reverse video	Used to highlight a specific alarm condition or non good quality instead of specifying a foreground and background color. A valid entry is: YES = enable reverse video, causes default colors to appear in reverse. NO = disable the color reverse feature, disable when specifying a foreground color and a background color in this configuration.
Display last good value	Determines if the value of a tag displays as a bad quality string or as the last known good value. This occurs when the tag enters a bad quality condition. A valid entry is: YES = display the last known good value. NO = display a bad quality string, the bad quality string is defined through text substitution.
Log last good value	Determines if the console logs the value of a tag as a bad quality string or as the last known good value. This occurs when the tag enters a bad quality condition. The option affects custom logs. A valid entry is: YES = log the last known good value. NO = log a bad quality string, the bad quality string is defined through text substitution.

Return to Normals

The *Blink Alarms* field for the *No Alarm* state can be used to identify return to normal conditions to an operator Set the *Blink Alarms* field to **YES** for the *No Alarm* condition to cause any tag that returns to normal from an alarm to blink The tag can then be acknowledged using ACK ALARM or PAGE ACK This applies to acknowledging return to normals for both the alarm status/quality/group field, and for dynamic symbols When this feature is enabled

1 All acknowledge keys work for the alarm status/quality/group fields for tags that return to normal state

2 Alarm and quality indicators blink in the tag summaries function to indicate unacknowledged return to normals

3 Alarm status/quality/group fields and value fields blink for unacknowledged return to normals

4 The foreground color for all standard symbols is green to indicate normal state

AUTOMATIC TAG ALARM INHIBITING

A feature defined in the tag database is automatic alarm inhibiting This feature designates a tag to disable alarm indications for another Either the alarm condition of an analog type of tag, or the alarm state or digital state of a digital type of tag can disable alarming An alarm inhibit tag and its condition that triggers inhibiting are defined through tag database configuration For analog types of tags, only alarm condition can trigger inhibiting

Follow the procedures for defining individual tags, refer to ***Entering or Editing a Tag*** in this section for the procedures Three attributes in the tag database define alarm inhibiting Enter the name of the tag used for inhibiting at the *Alarm Inhibit Tag* field Any type of tag except RMSC can be used Set the *Inhibit Alarm Status/State* field to **ALARM** for alarm condition triggering, or **STATE** for digital state triggering

If *Inhibit On Alarm/State* field is *ALARM*, set the *Inhibit Alarm Status/State* field to the specific alarm condition that inhibits alarming for this tag Any valid alarm condition that the inhibit tag can be in is valid Enter the alarm condition as **H**, **L**, **2H**, **2L**, **3H**, **3L**, **HD**, **LD**, **HR**, **LR** or **A** Using A specifies the state designated as the alarm state for a digital type of tag

If the *Inhibit On Alarm/State* field is *STATE*, set the *Inhibit Alarm Status/State* field to the specific state that inhibits alarming for this tag Any valid state that a digital inhibit tag can be in is valid Enter the state as **0**, **1**, **2** or **3**

Leaving the *Alarm Inhibit Tag* field blank disables automatic alarm inhibiting The *Inhibit On Alarm/State* and *Inhibit Alarm Status/State* fields cannot be accessed when it is blank

ALARM SUMMARY CONFIGURATION

> **NOTE** Configurat on changes made w th n the a arm summary format functıon do not requıre a reset to put any changes ınto effect Ca ıng any dısplay contaınıng an alarm summary shows the results of the changes

An alarm summary can contaın a lıst of up to 1,000 of the most recent process alarms The number of alarm entrıes that can ap pear ın any alarm summary lıst depends on OIS system configu ratıon An alarm summary can be assıgned to ALARM SUMM through keyboard configuratıon

The console provıdes a standard alarm summary dısplay Alarm summarıes can appear ın operator configurable dısplays, or any user-created dısplays The alarm summary escape command (**as 82** or **as 83**) defines the overall characterıstıcs of the summary, whıch ınclude

- Alarm groups or prıorıtıes (all or selected)
- Element sıze
- Key selects
- Posıtıon
- Lıne format (ındex number)
- Colors
- Alarm types (all, or acknowledged only, or unacknowledged only)

The alarm summary escape commands provıde three alarm group or alarm prıorıty optıons Range of alarm groups/prıorıtıes only, ındıvıdual groups/prıorıtıes only, or both range and ındıvıdual The process engıneer can use these optıons to lımıt the summary to only specıfic alarm groups or specıfic alarm prıorıtıes It can also be set to show all alarms, acknowledged alarms only, or un acknowledged alarms only Refer to Appendıx B for alarm sum mary escape command specıfics

Alarm summary format configuratıon allows taılorıng the format and content of lıne entrıes ın alarm summarıes (ı e , lıne formats) The console allows for 106 lıne formats numbered from 0 to 105 Of these, lıne formats 0 through 4 are fixed formats and cannot be modıfied The remaınıng 101 can be user defined. A format, once specıfied ın an alarm summary escape command, defines the at trıbutes and theır order of appearance for all entrıes that appear ın the summary The alarm summary report also uses one of the lıne formats to determıne the attrıbutes and order of appearance ın the prınted versıon of the summary

This section provides the procedures to configure individual alarm summary line formats Only one line format can be specified for an alarm summary element or an alarm summary report The process engineer can use any one of 106 possible line formats (0 to 105) in a single alarm summary element or report

Each format requires a specified line option and character height The position and color of each alarm line element is configured individually Elements of an alarm line include

Date of alarm date of alarm occurrence

Time of alarm time of alarm occurrence

Tag name name of the alarming tag

Current value current value, state and status of the tag in alarm

Exceeded limit value violated alarm limit for tags that report analog values

Engineering units engineering unit associated with an analog value

Tag description tag description from the database

Alarm condition alarm status, quality and group of the alarm ing tag

Alarm comment up to 64 character comment from the database for the alarming tag Only one alarm comment field can be used in a single alarm line format (i e , alarm comment cannot be used with alarm comment/text string)

Latched alarm time used to latch the time of occurrence to the alarming tag This displays the time of occurrence in a return to normal entry for the alarming tag

Latched alarm date used to latch the date of occurrence to the alarming tag This displays the date of occurrence in a return to normal entry for the alarming tag

Priority two character indicator that shows the priority assigned to the alarming tag (set in the tag database)

Text string up to 80 character text string associated with a TEXTSTR tag A local truncation indication will not appear Only one text string field can be used in a single alarm line format (i e , text string cannot be used with alarm comment/text string)

Text string with local truncation up to 80 character text string associated with a TEXTSTR tag The summary indicates any local truncation of the text string with an ellipsis ( )

Alarm comment/text string up to 80-character text string or alarm comment for a tag The text string appears for a TEXTSTR tag while an alarm comment appears for all other tags No local truncation indication will appear

Alarm comment/text string with local truncation - up to 80 character text string or alarm comment for a tag The text string appears for a TEXTSTR tag while an alarm comment appears for all other tags The summary indicates any local truncation of the text string with an ellipsis ( )

Remote truncation status - indicates the presence or absence of remote truncation for a text string Remote truncation is done by a PCU module or the communications interface unit of the console

After defining a line format, the alarm summary display (or any display that uses an alarm summary element) must be edited to include the desired format For example, to use line format 5 in a summary display, the alarm summary escape command (**as 82** or **as 83**) must be edited to include line format 5 as the configurable record number

Table 15-21 lists the default line options and character height for formats 0 to 4 The actual line elements can be viewed by using the *Display/Modify Format* option

Table 15-21 Default Alarm Line Formats

Format Number	Line Option	Character Height
0	0	Sing e
1	1	Single
2	2	S ng e
3	0	Doub e
4	1	Doub e

The screen of the console can display 64 different colors, 16 base colors and three shades of each base color Through line format ting, the process engineer can assign a color to each element of an alarm line

Alarm summary format configuration also defines priority override colors and alarm report titles A *Priority Colors* option allows setting a foreground and background color for each priority level for both alarm and return to normal alarm entries These colors override any existing color scheme A title configuration option defines the titles that appear in alarm summary printouts

Before defining line formats for alarm summaries, the size of the alarm summary element should be considered Table 15 22 shows the effects that a selected element size, line option and character height has on the capabilities of an alarm summary The element size is set in the alarm summary escape command Element capabilities refers to number of lines per alarm entry and number of alarm entries that can appear on a single page of the element

Table 15 22 Alarm Summary Element Options

Element Size	Line Option	Character Height	Number of Alarms[1]	Lines Per Alarm Entry
32	0	Single	16	2
32	0	Double	16	1
32	2	Single	16	1
33	0	Single	8	2
33	0	Double	8	1
33	2	Single	8	1
33	1	Single	8	4
33	1	Double	8	2
34	0	Single	4	2
34	0	Double	4	1
34	2	Single	4	1
34	1	Single	4	4
34	1	Double	4	2
35	0	Single	2	2
35	0	Double	2	1
35	1	Single	2	4
35	1	Double	2	2

NOTE 1 The maximum number of alarm entries on one alarm summary cannot exceed 16

Alarm summary configuration includes

- Setting chronological or priority sorting for alarms
- Setting maximum number of current alarms
- *Defining the format of* alarm summary lines
- Setting the priority override colors

Setting the Sorting Option

NOTE This procedure requires a reset of the console

The process engineer defines the type of sorting, either chronological or priority, for alarm summaries through OIS system configuration Refer to ***OIS System Configuration*** in this section for the procedures Set the *Alarm Management Type* field to

0 default, the console builds an alarm list for alarm summaries in chronological order as alarms occur

1 the console builds an alarm list with alarms of the same priority grouped together, then chronologically ordered within the priority

2 same as option zero but employs fixed position return to normal

3 same as option one but employs fixed position return to normal

If using options zero or one, a tag that returns to its normal condition generates a new alarm line at the beginning of the alarm summary scrolling the last entry off of the summary Options two and three are fixed position return to normal options If used, a tag that returns to its normal condition maintains its current position in the list but changes to a specified return to normal color

If using options zero or two, all alarm entries in alarm summaries default to priority one (*P1*) Priority sorting is not implemented

Setting Maximum Alarms

NOTE This procedure requires a reset of the console

The process engineer defines the number of current alarms that can appear in an alarm summary list through OIS system configuration This sets the maximum number of current alarms saved for review

Follow the procedures for setting the OIS system configuration, refer to ***OIS System Configuration*** in this section for the procedures Set the *Max Alarms in List* field to the desired maximum number of alarms to save A valid entry is from 100 to 1000

Defining Summary Lines

The process engineer can determine which data items are to appear in an entry of an alarm summary This can be done for the standard alarm summary or any displays that use an alarm summary element An alarm summary escape command (**as 82** or **as 83**) sets the actual size of the alarm summary element ranging from full size to one-eighth size

Before setting the format of an alarm line, the number of different formats for the system must be specified. Once established, the process engineer then sets the line option and character height for each line format. Once these are set, each data item and order of appearance in an alarm line can be defined

The line option and character height attributes work together Character height can be single or double height, single height is 124 display units (one line) and double height is 248 display units (two lines) using 0 0 fixed spacing factor. Less double height characters than single height characters can appear in a line entry Line options can be 0, 1 or 2

Line Options

Line option 0 allocates two physical lines of the screen With this option an alarm entry appear's as either two lines of single height characters or one line of double height characters This option can use either standard English and *Extended* characters, or *Complex* language characters An alarm line entry using complex language characters occupies the same amount of space as one line of double height characters

Line option 1 allocates four physical lines of the screen, and is intended for two lines of complex characters If not using a complex language set, alarm entries appear as four lines of single height characters or two lines of double height standard English and extended characters

Line option 2 allocates one physical line of the screen With this option only single height standard English and extended characters are allowed

Extended and complex characters are those enabled through system configuration (i e , *Foreign Language* attribute set to *YES*), and defined through character definition The extended character set consists of one byte alternate language characters, and is an extension to the normal English character set These characters occupy the same amount of space as standard English characters The complex character set consists of two byte alternate language characters These characters occupy twice the space used by standard English and extended characters, therefore, they require two physical lines on the screen

The following procedures define a line format The procedures are the same, and can be repeated to define additional line formats Line formats can be entered at any time To enter a new line format, follow the procedures in the order presented Existing line formats can be viewed or edited through option *A Display/Modify Format*

The process engineer selects the alarm summary options through the *Alarm Summary Format* page (see Figure 15 25) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

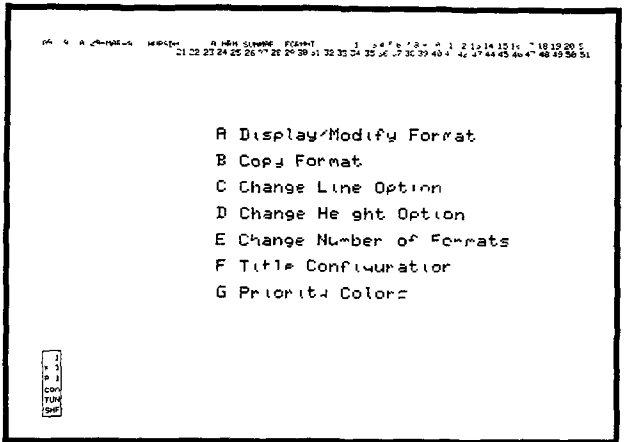
A OIS Configuration
→ *E System*
→ *E Alarm Summary Format*

Number of Formats

Set the number of formats

1 Select *E Change Number of Formats* This clears the option menu and displays a *Number of Formats* input field

2 Enter the total ***number of formats*** required A valid entry is from 5 to 106 Line formats 0 through 4 are predefined, and can be viewed but not modified The number of formats depends on the number of alarm summary displays or reports that require different line formats If several alarm summary displays or reports are used, they can all use the same line format, or can all use different line formats



TPS0003A

Figure 15-25 Alarm Summary Format Options Menu

3 Press **ENTER** to update the configuration

4 Press **ESC** to exit and return to the *Alarm Summary Format* options display

Line Option

Set the line option

1 Choose *C Change Line Option* This clears the option menu and displays the line option fields (see Figure 15 26)

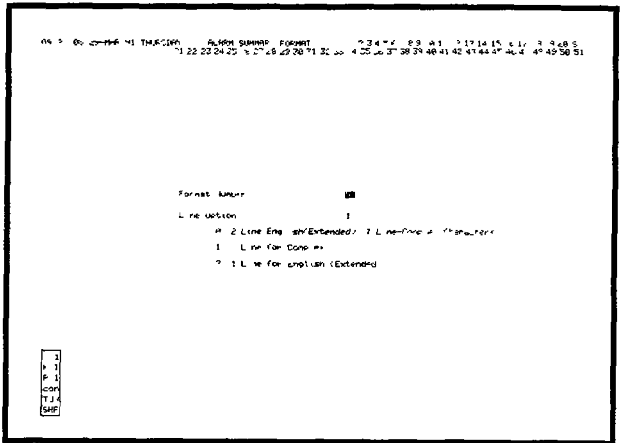
2 Enter the number of the line format that the line option is being selected for in the *Format Number* input field A valid entry is from 5 to 105 depending on the total number of formats set previously Formats 0 through 4 cannot be changed

3 Use the OIS configuration keys (refer to Table 15 1) to move to the *Line Option* field Enter the desired line option for this line format An extended character is a normal, one display line character, a complex character is a double height, two display line character A valid entry is

0 = summary allows for two lines of single height characters or one line of double height characters for each entry

1 = summary allows for four lines of single height characters or two lines of double height characters for each entry

2 summary allows for one line of single height characters only



TPS0004A

Figure 15 26 Alarm Summary Format Line Options

Refer to Table 15 22 to determine the effects of this option on the capabilities of an alarm summary

4 Press [ENTER] to update the configuration

5 Press [ESC] to exit and return to the *Alarm Summary Format* options display

Character Height Set the character height

1 Choose *D Change Height Option.* This clears the option menu and displays character height selection fields

2 Enter the number of the line format that the character height is being selected for in the *Format Number* input field A valid en try is from 5 to 105 depending on the total number of formats set previously Formats 0 through 4 cannot be changed

3 Use the OIS configuration keys (refer to Table 15 1) to move to the *Character Height Option* field Enter the desired character height A valid entry is **0** for single height characters, or **1** for double height characters This must be consistent with the chosen line option

4 Press [ENTER] to update the configuration

5 Press [ESC] to exit and return to the *Alarm Summary Format* options display

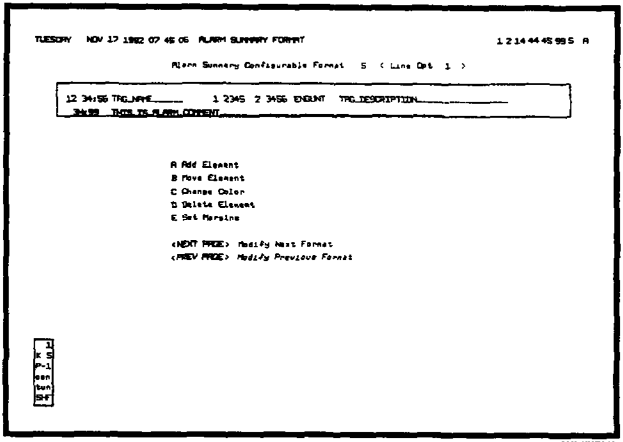
Display/Modify Format

To display an existing line format, edit an existing format or define a new format

1 Choose *A Display/Modify Format* This clears the option menu and displays an *Enter Format Number* input field

2 Enter the number of the line format to view, edit or define at the input field A valid entry is from 0 to 105 depending on the total number of formats set previously Formats 0 through 4 can be viewed only

3 Press **ENTER** to call the format A menu of options appears (see Figure 15 27)



TPS0005B

Figure 15 27 Alarm Summary Format Display/Modify Format Menu

The *Alarm Summary Configurable Format (Line Opt __)* field at the top of the display shows the currently selected line format, and line option previously selected for the line format Press **NEXT PAGE** or **PREV PAGE** to sequence to the next or previous line format

The boxed area of the display represents the actual format of an entry as it will appear in a summary that uses this format The console presents a default format in this box If any of formats 5 through 105 are selected, the options presented allow modifying the default elements of the line shown in this boxed area

Add element use this option to add new elements to the current format For line formats using line option 0, line elements must be positioned within a maximum 400 to 9600 x coordinate and 0 to 310 y coordinate For line formats using line option 1, line elements must be positioned within a maximum 400 to 9600 x coordinate and 0 to 620 y-coordinate For line option 2, line elements must be positioned within a maximum 400 to 9600 x coordinate and 0 to 155 y coordinate This can be seen in the grid that appears after choosing any of the *Add Element* options Each element of a line format can display in a different color

NOTE The left and right margin of the line format can be modified using the *Set Margins* option

To add an element

1 Choose option *A*, this calls up an *Add Element* menu (see Figure 15 28) Use the configuration keys (refer to Table 15 1) to move between and enter data into each display input field

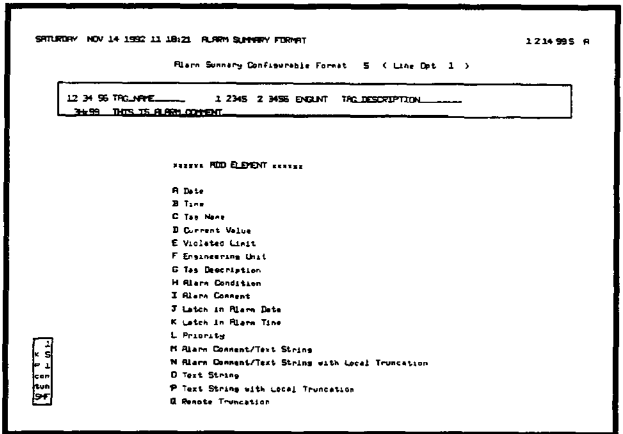


Figure 15 28 Alarm Summary Format Add Element Menu

2 All of the different line elements are entered in basically the same way Select the letter designator for the type of line element to add from the list of displayed options (i e , *A* through *Q*) This calls up prompts that allow entering an x coordinate and y coordinate, and in some cases the length of a field The length needs to be specified when choosing any of the alarm comment or text string options For all other options the field is informational only

Only one of each type of line element can be defined in a single format The console presents the message *Duplicate definition* if an attribute has already been defined in the format

3 Enter the x coordinate and y coordinate, and the length if required for the chosen option, then press **ENTER** The console displays an error message if an entered coordinate attempts to place a line element outside the margin limits, or causes the element to overlap another or the element to extend beyond the margins After entering, a color selection menu appears

4 Enter a color code, then press **ENTER** The color graph presented shows the actual colors and their respective color codes Select the color that this element should display as in an alarm summary Once entered, the new element appears in the boxed area at its respective position and in its color

If the position or character length of an element is not correct, they can be adjusted by using the *Move Element* option If the color of an element is not correct, it can be changed by using the *Change Color* option

5 After making any or all changes, press **ENTER** to update the configuration on the hard disk

6 If no further modifications are required, press **ESC** to exit this display Further line modification can be performed through the *Display/Modify Format* menu items

Move element - use this option to move elements of a line format, and to change the character length of an element if desired To move an element or change its character length

1 Choose option *B*, press **TAB** or **TAB BACK** to select an element An element blinks when selected using the tab keys Press **ENTER** once selected Use the OIS the configuration keys to move between and enter data into each display input field.

2 Enter a new x coordinate, y coordinate and length if required, then press **ENTER**. The console displays an error message if an entered coordinate attempts to place the line element outside the margin limits, or causes the element to overlap another or the element to extend beyond the margins Once entered, the element appears in the boxed area at its respective position and length

3 After making any or all changes press **ENTER** to update the configuration on the hard disk

4 If no further modifications are required, press **ESC** to exit this display Further line modification can be performed through the *Display/Modify Format* menu items

Change color use this option to change the color of a line element To change the color of an element

1 Select option *C*, press TAB or TAB BACK to select an element. An element blinks when selected with the tab keys Press ENTER, this calls a color selection display

2 Enter a color code, then press ENTER The color graph presented shows the actual colors and their respective color codes Select the color that this element should display as in an alarm summary Once entered, the element appears in the boxed area in its respective color

3 After making any or all changes, press ENTER to update the configuration on the hard disk

4 If no further modifications are required, press ESC to exit this display Further line modification can be performed through the *Display/Modify Format* menu items

Delete element use this option to delete a line element that is no longer required To delete an element

1 Select option *D*, press TAB or TAB BACK to select an element An element blinks when selected with the tab keys Press ENTER, this deletes the selected element After pressing ENTER, the element no longer appears in the boxed area

2 After making any or all changes, press ENTER to update the configuration on the hard disk

3 If no further modifications are required, press ESC to exit this display Further line modification can be performed through the *Display/Modify Format* menu items

Set margins this option can be used to reduce the size of a line by adjusting the left and right margins Once changed, all elements of a line format must be within these new x coordinate limits Any element outside the margins will not appear in the summary The upper and lower limits are still maintained by the line option selection

To change either or both left and right margins

1 Select option *E*, the display presents two input fields The upper field is for the left margin, lower for the right Entries can be made in both or only one of these fields Use the OIS configuration keys to move between and enter data into each display input field

2 Enter the new margins, then press ENTER A valid entry is from 400 to 9600 Once entered, the outline of the boxed area will be reduced or expanded to the new limits entered Any elements added or moved must fall within these new limits

3 After making any or all changes, press [ENTER] to update the configuration on the hard disk

4 If no further modifications are required, press [ESC] to exit this display Further line modification can be performed through the *Display/Modify Format* menu items

Copy Format

Use the *B Copy Format* option to copy an existing line format to another To copy a format

1 Choose option *B*, the display presents a *Copy From Format # To* prompt

2 Use the OIS configuration keys to move between and enter data into each display input field Key in the number of the line format to copy from, then the number of the line format to copy to A valid entry depends on the total number of formats set previously The range is from 0 to 105 for the from entry, and 5 to 105 for the to entry

3 Press [ENTER] to initiate the copy If copying a line format over an existing format, the console requires confirmation before it initiates the copy

Setting Priority Colors

The process engineer can define colors for each alarm priority level After configuration, the priority of a tag in alarm determines the foreground and background colors used in an alarm summary for the tag These colors override any color scheme defined using the *Add Element* feature of the *Display/Modify Format* option, refer to ***Defining Summary Lines*** in this section Priority colors are set separately for alarm and return to normal tag conditions

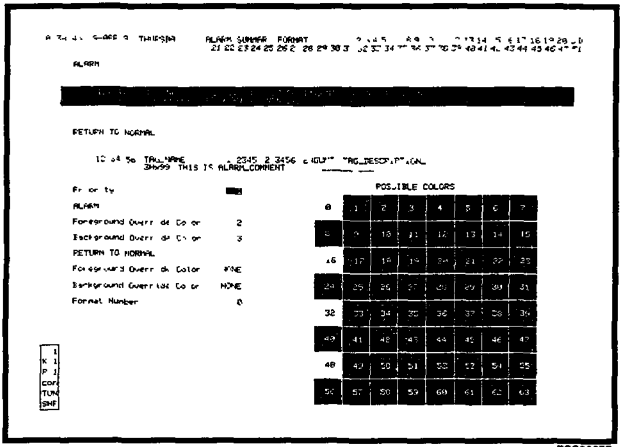
Step 1 The process engineer defines priority colors through the *Alarm Summary Format* page (see Figure 15 25) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *E Alarm Summary Format*

Step 2 To define foreground and background colors for a priority level.

NOTE Enter **NONE** in the override color fields to use the colors selected during line format configuration without using priority color override

a Select *G Priority Colors* This calls the *Alarm Summary Format* display for defining priority colors (see Figure 15 29) Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field



TPS0007B

Figure 15-29. Alarm Summary Format - Priority Colors

b. At the *Priority* input field, enter the number of a priority level to define. A valid entry is from 1 to 8. Press [NEXT PAGE] or [PREV PAGE] to sequence to the next or previous priority level.

c. Enter a color code from the displayed color chart in the *Foreground Override Color* field for *ALARM*. A valid entry is from 0 to 63, or **NONE**. This identifies the foreground color of an alarm summary entry for a tag that enters an alarm condition with this priority.

d. Enter a color code from the displayed color chart in the *Background Override Color* field for *ALARM*. A valid entry is from 0 to 63, or **NONE**. This identifies the background color of an alarm summary entry for a tag that enters an alarm condition with this priority.

e. Enter a color code from the displayed color chart in the *Foreground Override Color* field for *RETURN TO NORMAL*. A valid entry is from 0 to 63, or **NONE**. This identifies the foreground color of an alarm summary entry for a tag that returns to its normal condition from an alarm condition.

f. Enter a color code from the displayed color chart in the *Background Override Color* field for *RETURN TO NORMAL*. A valid entry is from 0 to 63, or **NONE**. This identifies the background color of an alarm summary entry for a tag that returns to its normal condition from an alarm condition and has this priority level.

g The *Format Number* field allows entering the number of a defined line format to be shown at the top of the display This provides an example of what the line will actually look like at an alarm summary for both alarm and return to normal tag conditions A change to this field does not affect the configuration of alarm summaries, only the line format displayed at the top of the page

Enter the number of a line format, then press ENTER A valid entry is from 0 to 105 depending on the total number of line formats configured The entered line format appears at the top of the screen in the selected alarm and return to normal colors Pressing ENTER also updates this configuration

h Either repeat Steps 2a through 2g to define additional priorities, or press ESC to exit this display

ALARM SUMMARY REPORT

An alarm summary report creates a hard copy list of current alarms Up to 1,000 alarm summary entries can appear in a report The entries are for those tags that are part of selected alarm groups designated in the definition of a report Each report can summarize the alarms for a range of alarm groups and a maximum of ten additional alarm groups. Up to 12 different reports can be generated

The process engineer can schedule printing for the reports to occur at a specific time, then at time intervals Printing can also be left unscheduled to occur after being triggered by a specific process event. Either or both types of scheduling can be used. A process event that can trigger an alarm summary report is a change in

- Analog alarm condition
- Digital state
- Alarm status — to alarm from normal, or from alarm to normal

Each alarm summary report starts on a new page and can consist of several pages Each page has a title line followed by a maximum of 30 alarm entries The title line format is configurable, up to 12 different title lines can be created Each report can have the same title, or each can use a different title.

Alarm summary report configuration includes

- Defining the titles for alarm summary reports
- Formatting the line entries of a report
- Defining each summary report, and scheduling all reports.

Summary Report Title Lines

The *Title Configuration* option of *Alarm Summary Format* is used to define titles for alarm summary reports Up to 12 titles can be defined, then assigned to each of 12 possible reports The title is a two line entry with a maximum of 132 characters per line

Step 1 The process engineer defines each title individually This is done through the *Alarm Summary Format* page (see Figure 15 25) To call this display, first press **GENL FCTNS MENU** Select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *E Alarm Summary Format*

Step 2 To call the page for defining the titles, and to define titles

a Select *F Title Configuration* This clears the menu, then displays an *Enter Format Number* input field

b Enter the number of a report title, then press **ENTER** A valid entry is from 1 to 12 This displays the *Alarm Summary Title* page for the selected title (see Figure 15-30)

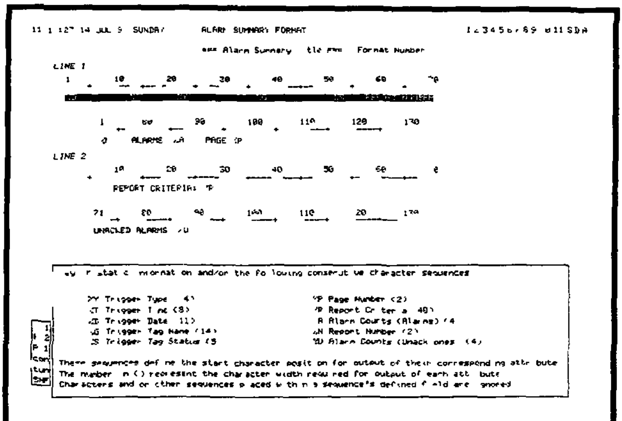


Figure 15 30 Alarm Summary Format Alarm Summary Title

The *Alarm Summary Title* page contains a default title definition when it first comes up This format can either be used as is, or can be modified Title items can be deleted, added or moved using the OIS configuration keys Each attribute that is to appear in the title of an alarm summary title line is entered as a separate character sequence code The position of the sequence code on the input line defines the starting character position for the attribute.

At the bottom of this display is a list of two character sequence codes that define each item that can appear in the title of the final, printed report Static text strings can be entered. Each character occupies a single character space Available title attributes (sequence codes) and their results are

Report Number (%N)	Two characters that identify the report number (1 to 12)
Report Criteria (%R)	40 characters that identify an alarm group range and an alarm group list
Trigger Type (%Y)	14 characters that identify the trigger type (time or tag)
Trigger Time (%T)	Eight characters that show the time of trigger for either a time or tag triggered report
Trigger Date (%D)	11 characters that show the date of trigger for either a time or tag triggered report
Trigger Tag Name (%G)	14 character tag name identifier for a tag triggered report
Trigger Tag Status (%S)	Five characters that identify the alarm condition, status or state of the trigger tag for the report
Alarm Counts (Alarms) (%A)	Four characters that indicate the total number of current alarms that meet the report criteria
Alarm Counts (Unack ones) (%U)	Four characters that indicate the total number of current unacknowledged alarms that meet the report criteria
Page Number (%P)	Two characters showing the current page number of the report

All or only specific codes can be used as long as the 132 character maximum is maintained The number in brackets ( ) next to each sequence code identifies the number of character spaces each code item occupies, which is the number of spaces to leave between each code The console ignores characters placed within these reserved spaces The two characters of the sequence code count as two spaces The codes can be placed anywhere within the highlighted *LINE* fields to allow placing data items in any order desired

Entering Sequence Codes

To define the sequence codes

1 Use the configuration keys listed in Table 15 1 to enter data and move between each display input field Enter the sequence codes or static data that are to appear in an alarm summary re port in the *LINE 1* and *LINE 2* input fields The placement of codes in these fields directly corresponds to their position in the final printout

Be sure to allow the number of spaces indicated in the brackets between sequence codes The code itself counts as two spaces Each *LINE* field is separated into two parts, however, in the final printout the entries appear as one line

2 Press [ENTER] after completing the entries to update the con figuration on the hard disk

3 Press [ESC] to exit the display

4 Repeat Steps 1 through 3 for each title that is to be defined Titles can be created or edited at any time

Formatting Report Entries

Alarm entries are formatted for printing based on the line format chosen for the report The process engineer defines the line format of alarm summary format configuration Each of the 12 reports can use the same or a different line format These formats can be the console default line formats (0 to 4) or user-defined formats (5 through 105)

To define a line format, follow the procedures outlined in ***Defining Summary Lines*** in this section Once a line format has been created, it can be identified for use in individual reports through alarm summary report configuration

Defining and Scheduling Alarm Summary Reports

Alarm summary report configuration enables individual reports and schedules report printing Print scheduling is for ***all*** defined reports, not individual reports

Alarm summary reports can print at a specific time, then at time in tervals (i e , *PERIODIC REPORTS*) Reports can also be unscheduled to print only after a specific process event occurs (i e *TRIGGERED RE PORTS*) Either or both types of scheduling can be used A print time starts periodic report printing, and a time interval reschedules the report for periodic printing The console monitors a specified tag to start triggered report printing The trigger can be the alarm condition of an analog type of tag, or the alarm state or digital state of a digital type of tag The alarms that print are the current (snapshot) alarms at the time the report starts The console can work on only one trig ger condition at a time It ignores any triggers that occur while currently processing alarm summary reports regardless of whether the trigger is time or a tag trigger

The printed alarm entry is similar to the alarm entry in an alarm summary display, but it is limited to two lines of printed text As a result, alarm formats of more than two display lines may give un desirable and possibly unreadable results in the printed report.

When the line format contains a value field, the printed version outputs a value that is the tag value at the time of alarm occur rence, or the time at which the tag returned to normal The dis play shows the current exception reported value

Each summary report can present alarms for all alarm groups or only specific alarm groups if desired Alarm summary report configuration can assign a range of alarm groups and a list of up to ten specific alarm groups to each report Either a range or individual groups can be defined, or both can be defined for each report Using both allows specifying a limited range, then up to ten more groups (e g , 1 to 10 range, and 12, 13, 19, 20, etc)

Step 1 The process engineer schedules printing for alarm summary reports, and defines each report through the *Alarm Summary Report* page (see Figure 15 31) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *F Alarm Summary Report*

Step 2 To schedule alarm summary reports

a At the *Report number or parameter letter* input field enter **A**, then press [ENTER] This places the input cursor at the *Logical printer* field Use the OIS configuration keys listed in Table 15-1 to enter data and move between each display input field

b Enter the number of a logical printer to be used for printing of the reports A valid entry is from 1 to 8

c Press [ESC] to call the *Report number or parameter* input field, or use the OIS configuration keys to move to the *Print time* field Enter a time and date to start the first print The format of this time and date entry depends on the time and date format configu ration, refer to ***TIME AND DATE FORMAT*** in this section If using only tag triggering, clear this field

d Move to the *Periodic time interval (Hour)* field Enter the time interval (in hours) between printing of subsequent reports after the initial A valid entry is from 1 to 24 If using only tag trigger ing, clear this field

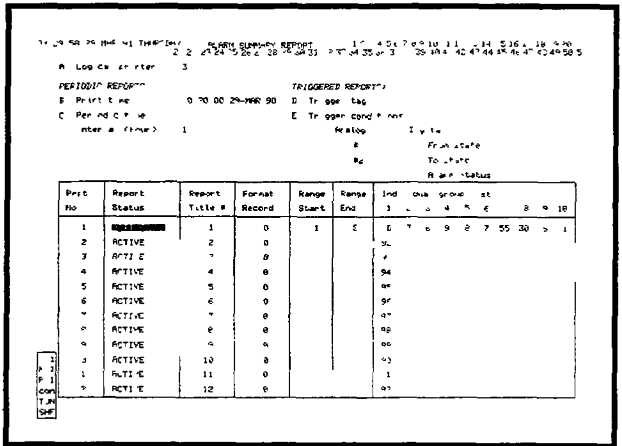


Figure 15 31 Alarm Summary Report

e Move to the *Trigger tag* field Enter the name or index number of the tag that is to trigger printing This can be an analog or digital type of tag If using only periodic triggering, clear this field

f If the trigger tag is analog, enter one or two alarm conditions for the tag that are to trigger the reports Valid entries are H, 2H, 3H, L, 2L, 3L, HD, LD, HR, LR or A depending on the type of trig ger tag If using only periodic triggering, clear these fields

If the trigger tag is digital, define the from or to state transition and the alarm status that are to trigger the reports Valid *From* state and *To* state entries are the logic state descriptors set in the tag database for the trigger tag A valid *Alarm status* field entry is blank (no status triggering), **ALARM** or **RTN** (return to normal) If using only periodic triggering, clear these fields

g If this was a change to the configuration of an existing report, press ENTER to update the configuration If further configuration (i e , individual report definitions) is required, either press ESC to call the *Report number or parameter letter* input field or move the input cursor to the report fields using the OIS configuration keys Perform Steps 3a through 3i

Step 3 Each alarm summary report is defined separately To define each report

a At the *Report number or parameter* input field, enter a report number (1 to 12) to select that report, then press ENTER This places the input cursor at the *Report Status* field for the report

Use the OIS configuration keys listed in Table 15 1 to enter data and move between each display input field When initially defining a report, this field should be set to *INACTIVE*; for an existing report, this field may indicate *ACTIVE* To add or edit a report, enter **INACTIVE** at the field

Making an existing report *INACTIVE* takes that report off line The *INACTIVE* report will not print if triggered, all other *ACTIVE* reports print when triggered

b Move to the *Report Title #* input field Enter the title number to use for this report This is the title that was created earlier A valid entry is from 1 to 12

c Move to the *Format Record* input field Enter the number of a line format to use for this report This determines the line format that each entry in a report uses A valid entry is from 0 to 105

d Move to the *Range Start* input field Enter the first alarm group in a range of alarm groups Range can be used separate from, or in conjunction with the individual group list A range can be specified without a list

e. Move to the *Range End* input field Enter the last alarm group in a range of alarm groups

f Move to the *Individual group list* input fields Enter up to ten alarm groups that are to appear in this report The group list can be used separate from, or in conjunction with an alarm group range A group list can be specified without a range

g At this time the alarm summary report must be turned on Move to the *Report Status* input field, key in **ACTIVE** Reports can be turned on or off individually, and at any time

h Press $\boxed{\text{ENTER}}$ to update the configuration

i To define additional reports, repeat Steps 3a through 3h for each report Once all required reports are complete, press $\boxed{\text{ESC}}$ to exit this display

ALARM TONES AND RELAYS

The process engineer defines logical alarm tones and relays through keyboard configuration procedures, refer to ***Keyboard Configuration*** in this section for the procedures Tone configuration defines the priority, keyboard, duration, pitch and volume of an alarm tone It also determines whether a tone will be broad cast to other nodes on the communication highway, which nodes to broadcast to depends on the node list selected Relay configu ration determines the physical relay and keyboard location, and how long the relay closes

The tone priority sets a logical order for sounding tones in case several alarms (with tones) occur at the same instant The keyboard assignment tells the console which keyboard is to supply the tone or relay Tone and relay duration can range from one second to 36,000 seconds

GLOBAL ALARMING ACKNOWLEDGE AND SILENCE

After the console indicates an alarm condition, the operator needs to first silence an alarm tone, then select the alarming tag and acknowledge its alarm This is done by pressing specific keyboard keys. The console provides the option of sending this silence and acknowledge action to other nodes over the communication highway This can be used to silence and acknowledge an alarm at other consoles from this console The process engineer must configure global alarm acknowledge and silence functions to enable this feature

Global alarm acknowledge and silence configuration sets up a plant wide network for alarm acknowledgment and tone silencing With global acknowledgment an operator at one console can acknowledge alarms for both his console and other consoles linked to the communication highway The global silence performs the same type of function except that the operator can silence the alarm tone generated at other consoles

A node list determines to which INFI 90 nodes on the loop an acknowledge or silence is broadcast The console automatically compiles a node list during start-up which contains the first 32 N90STA tags in the database that define either an OIS console, an MCS console, or a computer In addition, up to four lists can be user defined Each list can contain a maximum of 32 node addresses Each node that appears in a user defined node list must be defined in the database as an N90STA tag If a node in the list is not a console or computer, it is ignored and no message is sent to that node

Each tag in the database can be set to broadcast to one of the user defined node lists or to the node list compiled during start up Each user defined node list has a toggle that controls the broadcasting of messages to all nodes contained in the list The node list toggle ability allows turning individual lists on or off without having to modify the database If this toggle is set to *NO*, no messages are sent to the nodes in the list regardless of the broadcast setting in the tag database Acknowledge and silence functions both share the same node lists

For N90STA type tags, an additional acknowledge and silence attribute acts as a toggle for turning alarm acknowledge and silence broadcasting on or off for that particular tag The toggle setting determines whether the console is to broadcast an acknowledge or silence to the N90STA node if its node address is defined in a node list This provides an alternate means of disabling broadcasting for nodes defined in a list rather than having to modify a node list and remove a node from a particular list Acknowledge and silence are configured separately

To enable this console to broadcast an alarm acknowledge and silence to other nodes on the communication highway, the following configurations must be performed

- Node list configuration
- Tag configuration
- Alarm tone configuration
- Enable console receive and broadcast capabilities

This console also can be set to receive, or to not receive broad casts from other consoles

Node List Configuration

The OIS system configuration defines up to four separate node lists These lists, selected for each tag and each tone, specify the nodes to which the console broadcasts acknowledges and silences Each list defines up to 32 nodes Specified nodes must be either OIS consoles, MCS consoles, or computers connected to the loop through network interface units (NIU)

Step 1 There are two pages for defining node lists, page one for list one and two, page two for list three and four The process engineer defines node lists through one of the *OIS System Configuration* pages (see Figure 15 32) To call this display for node lists one and two, first press GENL FCTNS MENU Select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *A System*
→ *B Global Alarm Acknowledge/Silence*

To call this display for node lists three and four, first press GENL FCTNS MENU Select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *A System*
→ *C Global Alarm Acknowledge/Silence*

NOTE Any changes or additions made to the node lists require the console to be reset

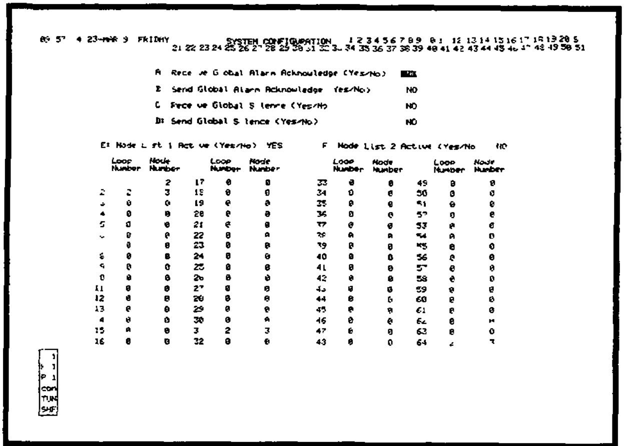


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Figure 15 32 Alarm Management Global Alarm Acknowledge/Silence

Step 2 To define a node list

a Use the OIS configuration keys listed in Table 15 1 to enter data and move between each display input field Enter a loop and node number in the *Loop Number* and *Node Number* input fields respectively for each node that is to be part of this list A valid node entry is 0 to 250 for INFI NET system and 0 to 63 for Plant Loop system If a node specified in the list is not a console or computer (NIU connecting the computer), the console ignores the entry and sends no messages to that node

b If required, move to the second node list on this page and repeat Step 2a to define this list If not required, continue with the next step

c After completing all entries, press ENTER

d Press the RESET switch located at the power entry panel

e If required, after the console comes back on-line call the second page of node lists (refer to Step 1) and repeat Steps 2a through 2d

Tag Configuration

When setting up global alarm acknowledge and silence, the process engineer performs tag configuration for two purposes First, an attribute in the tag database enables alarm acknowledge broadcasting for a tag, and another attribute defines the node list the console references when broadcasting these alarm acknowledges Secondly, each node defined in the node lists must be defined in the tag database as an N90STA type tag.

To define an N90STA tag for a node and to enable broadcasting for a tag, follow the procedures for defining individual tags, refer to ***Entering or Editing a Tag*** in this section for the procedures. Tags in the tag database must be enabled individually to broadcast an alarm acknowledge on the communication highway Set the *Broadcast Tag Ack* field to **YES** to enable broadcasting alarm acknowledges for the tag Set the *Node List* field to **0** to direct broadcasts to the node list compiled by the console, or **1**, **2**, **3** or **4** to direct broadcasts to a specific user-defined list of nodes

Alarm Tone Configuration

The process engineer enables alarm tone silence broadcasting through keyboard tone configuration Each tone must be enabled individually to broadcast an alarm tone silence on the communication highway

Follow the procedures for logical alarm tone configuration, refer to ***Keyboard Configuration*** in this section for the procedures Set the *BDCST* field to **YES** to enable broadcasting alarm silences for that tone Set the *NODE* field to **0** to direct broadcasts to the node list compiled by the console, or **1**, **2**, **3** or **4** to direct broadcasts to a specific user defined list of nodes

Enabling Receive and Send Capabilities

The OIS system configuration both enables and disables receiving and sending alarm acknowledges and silences on the communication highway A console can be set to transmit only, receive only, or transmit and receive alarm acknowledges and silences System configuration also allows activating or deactivating node lists This allows selectively enabling or disabling broadcasts to a complete list of nodes

Step 1 The process engineer enables sending and receiving alarm acknowledges and silence through one of the *OIS System Configuration* pages (see Figure 15-32) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration
→ *E System*
→ *A System*
→ *B or C Global Alarm Acknowledge/Silence*

Either option *B* or *C Global Alarm Acknowledge/Silence* can be used Both options provide the same capabilities

Step 2 Use the OIS configuratıon keys lısted ın Table 15 1 to enter data and move between each dısplay ınput field Set the *Receıve Global Alarm Acknowledge* field to **YES** to receıve at thıs console any alarm acknowledges sent on the communıcatıon hıghway by other nodes To broadcast alarm acknowledges from thıs console, set the *Send Global Alarm Acknowledge* field to **YES**

Set the *Receıve Global Sılence* field to **YES** to receıve at thıs con sole any alarm tone sılences sent on the communıcatıon hıghway by other nodes To broadcast sılences from thıs console, set the *Send Global Sılence* ınput field to **YES**

Each of these global features can be toggled on or off Settıng any of these fields to **NO** dısables that global feature If thıs node ıs sendıng an acknowledge or sılence to another, the node that ıs to receıve the acknowledge or sılence must have ıts global receıve ca pabılıty enabled

Step 3 A node lıst must be made actıve before any broadcasts to nodes ın that lıst can take place Each node lıst can be actıvated or deactı vated separately Set the *Node Lıst n Actıve* field to **YES** for the node lıst to actıvate Set the field to **NO** to deactıvate the lıst

REMOTE OIS ALARM ACKNOWLEDGE

A *Remote Acknowledge Tag Assıgnments* optıon defines up to five DIGITAL tags that can be used to perform alarm acknowledgment Use remote acknowledgment to acknowledge alarms on the maın console and ıts auxılıary termınals, but only auxılıary termınals supported by thıs console The selected DIGITAL tag can acknowledge alarms on all or only a specific screen Usıng the same DIGITAL tag as the remote acknowledge tag on other consoles enables usıng thıs sıngle tag for acknowledgıng alarms at several consoles at one tıme

An alarm acknowledge occurs when the remote acknowledge tag changes to ıts one state The tag must return to ıts zero state be fore another acknowledge can occur

Step 1 The process engıneer defines remote acknowledge tags through one of the *OIS System Configuratıon* pages (see Fıgure 15 33) To call thıs dısplay, first press GENL FCTNS MENU, then select the followıng menu ıtems ın the sequence shown

A OIS Configuratıon
→ *E System*
→ *A System*
→ *D Remote Acknowledge Tag Assıgnments*

NOTE Changes made at the remote acknowledge tag ass gnments d sp ay requ re a reset after comp et on

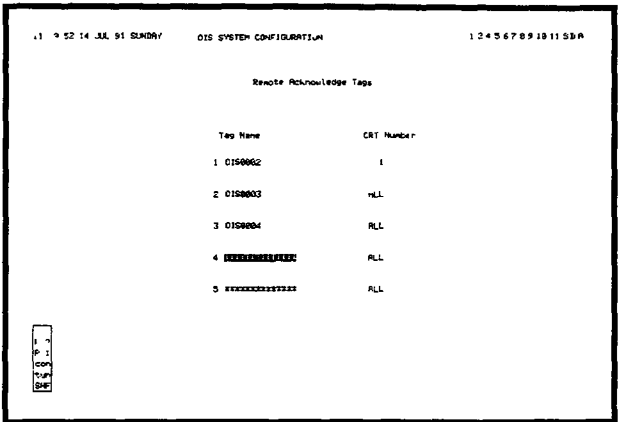

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Figure 15 33 Alarm Management Remote Acknowledge Tag Assignments

Step 2 Up to five remote acknowledge tags can be specified To define a remote acknowledge tag

a Use the OIS configuration keys listed in Table 15 1 to enter data and move between each display input field Enter a tag name or index number for a DIGITAL type tag at the *Tag Name* input field

b Move to the *CRT Number* field and enter the number of the screen for which this tag is to perform acknowledgment. A valid entry is 1 or 2, or **ALL**

c Repeat Steps 2a and 2b for each tag that is to perform ac knowledgment When completed, press the RESET button located at the power entry panel When the console comes back on line, it will operate with the entered parameters

Trend Definition

To access and use PCU collected trend data in trending functions, a trend must first be defined in the trend database Up to 2,000 trends can be defined during trend definition A definition identifies the trend data collection point, and provides the console with information it requires to establish a communication route to the collection point within a PCU module (i e , trend block) Refer to ***TRENDING*** in the ***INFI 90 System and OIS Overview*** section for additional information on trending

The process engineer defines trending functions after establishing trend database Trending functions at the console are

- Trend graph displays
- Trend plot displays
- Trend logs

A trend display is either a trend graph or an XY coordinate plot A trend graph shows variables as continuous lines An XY coordinate plot presents a set of process variables in a two-dimensional grid Trend logs provide a hard copy record of historical trend data Refer to ***Trend Displays*** in the ***Process Monitoring*** section for an explanation of the displays

Standard Trends

A standard trend is a trend that employs function code 66 (FC 66) to perform data collection Any analog exception reporting point can be trended by using a trend block in the control scheme of a PCU module The trend block is always associated with an exception reporting block The PCU module performs the initial trend data compression and calculations (e g , average, sum, etc) for collected data that is eventually sent to the console

Digital values can also be trended, but require conversion from a digital value to an analog (real) value This can be done by using the analog trend function code with an analog transfer function code Refer to the ***Function Code Application Manual*** for specifics Configure the analog transfer function code as

S1 5 (fixed block with value of 0 0)
S2 6 (fixed block with value of 1 0)
S3 *Block address of logic level to trend*

Enhanced Trends

An enhanced trend is a trend that employs function code 179 (FC 179) to perform data collection The console must be operating on the INFI NET system to use enhanced trending With this type of trending, the exception reporting function blocks that can be trended include

- Analog exception report (FC 30).
- Digital exception report (FC 45)
- Remote control memory (FC 62)
- Remote manual set constant (FC 68)
- Control station (FC 80)
- Device driver (FC 123)
- Multi state device driver (FC 129)
- Remote motor control block (FC 136)

- Data acquisition analog (FC 177)

- Data acquisition digital (FC 211)

The enhanced trend block records analog values and digital states from these function blocks, and also records alarm status and quality The PCU module performs the initial trend data compression and calculations (e g., average, sum, etc) for collected data that is eventually sent to the console

TREND DATABASE CONFIGURATION

Each trend the console processes is defined as a tag in the trend database The console requires a trend definition to collect trend data from a PCU module

To define a trend, the console requires an exception reporting block and a trend block in the control scheme of a PCU module It also requires a tag defined in its database for the exception reporting block The console uses the tag to display real time values and attributes along with historical trend data A tag as part of a trend definition creates a link between an exception reporting block and a trend block

The database of the console can handle up to 2,000 trend definitions Of these, the console allows for a maximum of

- 2,000 with a *DISPLAY ONLY* usage type

- 1,000 with a *SAVE TO DISK* or *ARCHIVE* usage type

A combination of one minute standard, 15-second standard and enhanced trends affects the maximum number of *SAVE TO DISK* or *ARCHIVE* trends the console can process The maximum number of enhanced trends is not known at this time

Refer to Table 15 23 for guidelines to determine the number of trends the console is capable of processing This table assumes that the console is using only standard trends, and all are defined as *SAVE TO DISK* or *ARCHIVED* trend usage

Table 15 23 Standard Trend Capabilities

One Minute Trends	15 Second Trends	Total System Trends
1 000	0	1 000
800	100	900
600	200	800
400	300	700
200	400	600
0	500	500

The size of the trend database can be adjusted during OIS system configuration The database should be only large enough to accommodate the current trend requirements, and can be increased in size when necessary

The attributes of a trend definition depend on its usage type The attributes give the console information required to collect trended data from PCU modules Additional attributes in the database pertain to displays and archiving Trend database configuration requirements include setting the database size, then entering individual trends.

NOTE Trend definitions are required to retrieve data collected by the distributed trending system Operator assignable trends do not use trend definitions to acquire data Refer to ***Operator Assignable Trends*** in the ***Process Monitoring*** section for an explanation of operator assignable trends

Sizing the Trend Database

Not all configurations require the maximum number of trend definitions The size of the database (i e , number of trends) should be only large enough to accommodate the current trending requirements. The process engineer sets the database size through the *OIS System Configuration* page

NOTE Changes made at this display require a reset after completion

Follow the procedures for setting the OIS system configuration, refer to ***OIS System Configuration*** in this section for the procedures Set the *Max Number of Trends* field to the number of trend definitions currently required, a valid entry is from 0 to 2000 This number should be close to, but greater than the actual number of trend definitions that will be created

NOTE Decreasing the number of trends erases all trend tags that have index numbers greater than the newly entered size value

This procedure can be used to initially set or subsequently change the database size The console allocates hard disk space based on the value entered Entering a value that reflects the current database requirements frees unused disk space for other functions The number of trends can be increased at any future time to incorporate additional process control scheme requirements

Entering a Trend Definition

Several attributes define a trend When defining the trend database, the process engineer enters the trend type and a trend mode The entered type and mode must match the type and mode configured for the trend block in the PCU module These data entries inform the console of the type of trend block being referenced, and the collection method being used by the module for the particular process point

The console also requires entering the address location (i e , loop, PCU, module and block) of the trend block configured in a PCU module This establishes a communication route to collect data Additional trend database attributes determine when and how long the console will store trend data

NOTE The console determines the order that each PCU modu e is polled for trend data and not the trend index number order

Standard Trends

For standard trends, the length of time trend data is stored can be adjusted and ranges from hours to 92 days This sets the maxi mum amount of historical data that can appear at a display Any data that displays past this time span comes from the archiving function *Other information entered in the database pertains to* archiving, and also to a control station trend A subtype identifies which variable of a control station is being trended

NOTE If archiv ng a trend its *Time Span* fie d must be set at the archiv ing t me span plus two hours Th s provides some marg n between trend storage and archive storage to prevent loss of archived data

Enhanced Trends

For enhanced trends, the trend definition defines the initial dis play resolution for a trend display This resolution does not have to be the same as the collection resolution of the trend block The resolution, however, must be greater than and a multiple of the resolution set in the block For example, if an enhanced trend block is set for two second resolution, then the display resolution can be set to ten seconds instead

The amount of enhanced trend data that the console stores on disk can be adjusted This sets the maximum amount of historical data that can appear at a display

This procedure must be done ***before*** performing any other trend ing configuration It establishes a trend index number which is used in all other trending functions

Step 1 The process engineer defines each process trending point the con sole is to collect data from individually This is done through the *Define Trends* page (see Figure 15 34) Each trend point requires a trend definition in the database To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *A Database* ⟶ *B Trend*

Step 2 To define individual trends

NOTE Enhanced trends can be def ned only f the console is operating on the INFI-NET system

a The console initially positions the input cursor at the *Trend Index* field Key in a trend index number for a desired trend to de fine or edit A valid entry is from 1 to the number of trends set

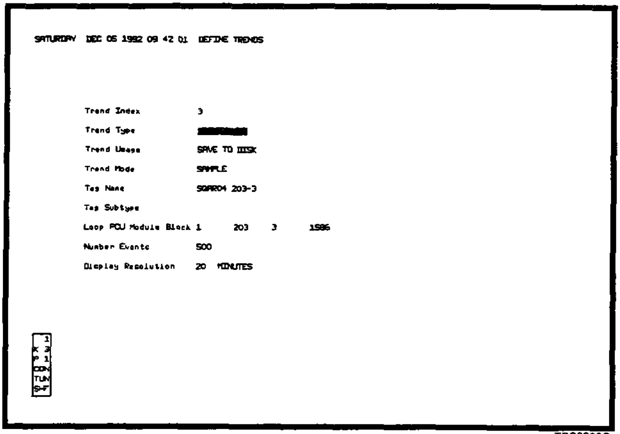

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Figure 15 34 Trend Definition - Define Trends

during database sizing (maximum 2,000) Press ENTER to call the trend definition

b Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Table 15 24 explains the attributes of a trend definition, refer to this table when entering data

c After completing all required fields, press ENTER This updates the configuration on the hard disk

d To define additional trends, press ESC to call an *Index Number* prompt Enter the next index number to define or edit, then press ENTER Press NEXT PAGE or PREV PAGE to sequence to the next or previous index number without having to call the index number prompt

e Repeat Steps 2a through 2d until all trends are defined or edited Once complete, continue to press ESC to exit this display and configuration

Table 15 24 Trend Definition Attributes

Field	Description
Trend Index	Shows the index number of the trend currently being defined or edited The index number identifies a trend in all trending functions A valid entry is from 1 to 2000

Table 15-24 Trend Defınıtıon Attrıbutes (contınued)

Fıeld	Descrıptıon
Trend type	Determınes the type of trend as eıther a standard trend (FC 66) or an enhanced trend (FC 179) A valıd entry s ENHANCED - enhanced trend FAST - 15 second standard trend NORMAL = one-mınute standard trend UNDEFINED = use to remove a trend defin tıon **NOTE** Th s type must match the type of the trend b ock beıng used ın a PCU modu e The entry ın th s f eld a so determ nes wh ch of the remaın ng f elds require entry
Trend usage	Enables or dısab es savıng data to the hard dısk Thıs determınes f the console saves trend data to ıts hard dısk for dısplay of hıstorıcal data and for loggıng and arch v ng It also def nes a trend as a dısp ay only trend whıch the conso e does not save data for For d splay on y trends the amount of hıstor ca data presented at a d splay ıs l mıted to the amount of data stored by the PCU module A val d entry ıs ARCHIVED - same as SAVE TO DISK except that t also enab es savıng data to the hard d sk for archıvıng The conso e temporarı y stores the data to an archıval storage dırectory for eventual transfer to storage medıum Thıs optıon ıs not avail able for enhanced trends D SPLAY ONLY - the conso e does not store any data for thıs trend to ıts hard d sk Trend data ıs dısplay only SAVE TO DISK - the console stores trend data collected for thıs trend to ts hard d sk for dısp ay and loggıng
Trend mode	Ident f es the col ect on mode beıng mplemented by the trend block n a PCU modu e For a ***standard trend*** a valıd entry ıs AVERAGE SAMPLE MAX MUM SUM M NIMUM For an ***enhanced trend***, a va ıd entry ıs AVERAGE RANGE MAXIMUM SAMPLE M N MUM SUM **NOTE** Th s fie d must match the trend mode def ned n the PCU module trend b ock Current y the console only supports SAMPLE mode for enhanced trends
Tag name	Name or ndex number of a tag defined ın the tag database Thıs must be the tag that references the functıon block that sources the values to the trend b ock ın the PCU module The console requıres thıs for dısplay purposes
Tag subtype	For ***standard trends*** on y Thıs f e d appl es when the trend s for a control stat on t dent f es whıch varıab e of the control stat on ıs be ng trended A va ıd entry ıs CO - contro output PV - process varıable R - ratıo ndex SP set poınt

Table 15 24 Trend Definition Attributes (continued)

Field	Description
Loop PCU *module block*	Hardware communication highway PCU and module address, and software function block address of the trend block in a PCU module This is not the address of the source function block This establishes a communication route between the console and a PCU module for collecting trend data
Time span	For ***standard trends*** only Sets the maximum amount limited by time of historical trend data that can be saved on the hard disk The *Time Span* requires two entries A numeric value and HOURS or DAYS The maximum time span is 92 days
Number events	For ***enhanced trends*** only Sets the maximum number of events the console is to save to disk The number to set in this field depends on the type of event being saved the anticipated duration between samples and the amount of free disk space available for storage The size of each sample for each type of event is ANALOG 10 bytes DANG - 23 bytes DADIG 8 bytes Digital type 8 bytes RMSC 10 bytes STATION 23 bytes
Display resolution	For ***enhanced trends*** only Sets the initial display resolution at a trend display The *Display Resolution* requires two entries a numeric value and SECONDS MINUTES or HOURS The minimum resolution period is one second the maximum is eight hours **NOTE** This field does not have to match the collection resolution of the trend block and should be set to the minimum resolution necessary for console purposes The resolution must, however be a multiple of the resolution set for the trend block For example if the block collects every one minute this resolution can be 2 MINUTES 4 MINUTES 6 MINUTES 8 HOURS

TREND DISPLAY AND XY PLOT CONFIGURATION

Trended data can appear at the console in either a trend display or XY plot The process engineer can use trends in graphic overview, graphic detail, group or operator configurable displays

> **NOTE** This software release does not support the trend data source for XY plots

The console provides standard trend elements in varying sizes Whether using these standard elements or creating custom displays, the escape commands in the source file of a trend display must reference trend index numbers defined through trend definition The trend definition allows the console to acquire trended data, then presents this data in displays

The console also provides standard XY plot displays in varying sizes XY plots require additional configuration to display trended data, or other types of data A plot index number that defines the variables to display must be referenced in the XY plot display source file The process engineer establishes these plot index numbers through XY plot configuration

Refer to ***Display Generation*** in this section for specific information and procedures to modify or create displays. Operator configurable displays only require entering a trend index number to present trended data. Other configuration procedures set up the operating parameters for operator configurable displays.

Logging Configuration

The process engineer configures each type of log available at the console separately. These include custom, system events (and operator actions) and sequence of events (SOE) logs. Logging provides a means of recording process data, then making a hard copy printout.

Some standard custom logs are snapshot, trend and trip. These logs are derived from periodic, standard and trip log types. A snapshot log takes a sample of current process values at a designated time, on demand, or when a specific process event occurs. Trend logs present a hard copy of data collected from the INFI 90 distributed trending system. The trend log can also contain current process values. Trip logs retrieve historical trended data to present pretrip event data, and collect current data to present post trip event data. The process engineer or system management personnel are not limited to only these type of custom logs. These are, however, standard logs for the console.

Events logs and operator actions logs record process events such as digital and analog tag events, and tag and INFI 90 module alarms. Operator actions logging records actions taken to manage alarms and process events. These types of logs are normally merged into a single system events log, although the console allows separating these into two distinct logs.

Sequence of events logging provides a means to collect, store and print data collected by sequential events recorders (SER) connected directly to process devices. This type of logging requires additional hardware external to the console, and dedicated to events recording.

The custom and SOE logs can be set to save up to nine of the most recently generated reports to hard disk. Refer to ***Printing and Displaying Log Reports*** in the ***Recording Process Data*** section for procedures to print these retentions.

SYSTEM EVENTS LOG CONFIGURATION

The process engineer must perform three separate configuration procedures to enable system events logging:

- Individual tags in the tag database.
- Events log configuration.
- Events log format configuration.

During events log configuration, the process engineer sets the attributes that affect the printing and archiving of event log data items Tag database fields related to events logging determine if an alarm, state change or operator action for a tag will appear as an entry in the events log Events log configuration determines if an alarm, state change or operator action will appear based on the settings in the tag database *The events log configuration function* acts as the master switch for turning events logging on or off

For example, if the *Alarms Save* attribute is set to *NO* in the database for a tag, and the events log configuration *Alarms Save* attribute is set to *YES*, an alarm for that tag does not appear in a periodic printout Conversely, if the *Alarms Save* attribute is set to *YES* in the database for a tag, but the events log configuration *Alarms Save* attribute is set to *NO*, an alarm for that tag still does not appear in a periodic printout Both fields must be set to *YES* to print the alarm

For system events logging purposes, process events are classified into two groups Events and operator actions Events are alarms and digital state changes Operator actions include operator control and configuration actions, alarm acknowledges and operator notes The console can save up to 1,000 of the most recent events on hard disk, then archive the saved events for long term storage The console saves these events in the ***EVENTS.LG*** file

NOTE The ***EVENTS.LG*** file should ***not*** be directly manipulated using file management utilities

System event logs can print continuously or periodically to a printer Continuous printing sends event data to the printer every time a system event occurs This provides a real time, dynamic printout In this case, entries are sent line by line to the printer For periodic printing, the console formats the entire log before sending it to the printer

Events log data saved to disk also can be demanded using log retrieval functions Refer to ***Printing and Displaying Log Reports*** in the ***Recording Process Data*** section for procedures to demand a printout of an events log or an operator actions log

Continuous Print

To print a process event item in a continuous printout, the *Print* attribute in the tag database for that type of event must be set to **YES** Continuous printing also must be switched on during event log configuration, set the *Print* field to **YES** for an item to turn on continuous printing If the continuous events log shares a printer with the periodic events log or other types of logs, each events log entry is inserted in the printout between completed log printouts

Periodic Print

To print a process event item in a periodic printout and to archive an item, the *Save* attribute in the tag database for that type of event must be set to **YES** Saving the item to hard disk also must be switched on during events log configuration, set the *Save* field to **YES** for an item to enable saving to the hard disk For periodic printouts, a starting date and time and a print period of up to 24 hours determine when and how often printing occurs

Items set for continuous print do not necessarily have to be saved to hard disk Conversely, not all event log items saved to disk must be printed continuously

The process engineer or management personnel can modify the format and content of the system events log to tailor it to specific plant requirements Modifications are limited to entering a title line, and selecting the type of event and any amplifying data (e.g , date, time, tag name, tag description, etc.) that is to appear in a printout or archive

The event log format options further divide the process events and operator actions into distinct categories Each of these categories appears as a separate entry in the events log

Process event

- Analog alarm events
- Device status alarm event
- Digital events
- Module alarm event
- Node alarm event.
- Text selector event

Operator action

- Configuration event
- Information event
- Operator action events
- Operator notes

Log entries are either one or two lines with a maximum of 132 characters per line The process engineer can arrange the information that appears in each line in any desired order Attributes for each type of event item and the event log title establish the information that appears in a log entry Each entry can contain all available attributes or only attributes needed by plant operation managers

Configuring Individual Tags

Three attributes configured in the tag database for a tag enable saving and printing events for the tag Each attribute enables a different type of event Each tag event must be enabled on a per tag basis System events logging should be considered during initial tag database creation since attributes defined in the tag database affect system events logs

The process engineer enables the events logging for each tag through the *Tag Configuration* display Follow the procedures for entering a tag to enable each type of event, refer to ***Entering or Editing a Tag*** in this section for the procedures

Three separate fields on the display enable and set up printing of each type of tag event *Alarms Print Save*, *State Change Print Save* and *Optr Acts-Print Save* fields These attributes configure events to print in a continuous and periodic printout of the events log

To enable printing tag events to a printer as the events occur, set the *Print* field for each event type to **YES** To enable saving events to the hard disk for periodic printing (and archiving), set the *Save* field for each event item to **YES**

This can be done during the initial creation of the tag database or during initial configuration of the events log, or at any time to add new events to an already existing events log This procedure, however, only enables event types for individual tags Events log configuration attributes act as a master switch to enable or disable each type of event for logging, refer to ***Events Log Configuration*** in this section

Events Log Configuration

Once each tag is enabled, the process engineer can configure attributes controlling events logging The attributes set the operating parameters and identify the type of events to log

Step 1 The process engineer enables events logging and schedules printing through the *Event Log Configuration* page (see Figure 15 35) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration → *C Logging* → *B System Events Log*

Step 2 To define events logging

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Table 15 25 explains the attributes of event log configuration, refer to this table when entering data

b *After editing all input fields*, press ENTER This updates the configuration on the hard disk

c Press ESC to exit this configuration page

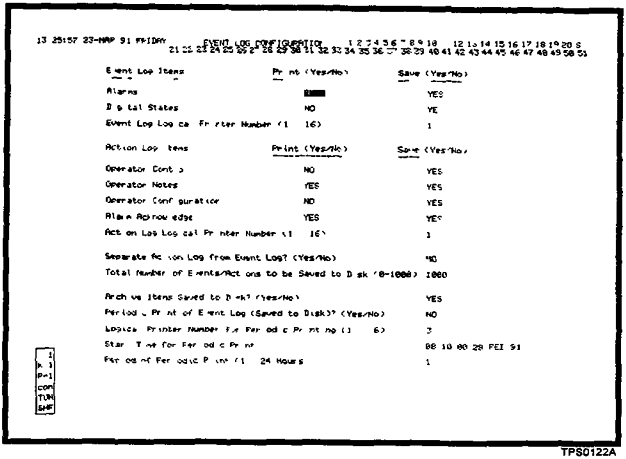


Figure 15-35. Log Configuration - Event Log Configuration

Table 15-25. Event Log Configuration Attributes

Field	Description
Item print	Enables printing each type of event to a printer as each type of event occurs for a tag. This enables printing events for all tags that have their events item *Print* fields set to *YES* in the database. A valid entry is: YES = enable printing events as they occur NO = disable printing events as they occur
Item save	Enables saving each type of event to the hard disk as each type of event occurs for a tag. The item must be saved to disk for periodic printing and archiving. This enables saving to disk for all tags that have their events item *Save* fields set to *YES* in the tag database. A saved log can be demanded at any future time for printing using the *Log by Name* function. A valid entry is: YES = enable saving events to hard disk NO = disable saving events to hard disk
Events log logical printer number	Specifies to which logical printer the event log items print to as they occur. This field relates to the *Print* field for each event item. A valid entry is from 1 to 8.
Action log logical printer number	Specifies to which logical printer the operator actions log items print to as they occur. This field relates to the *Print* field for each event item. A valid entry is from 1 to 8.

Table 15-25. Event Log Configuration Attributes (continued)

Field	Description
Separate action log *from events log?*	Used to separate the events log into two distinct logs. An events log con*taining process events, and an operator actions* log containing only operator actions related to console processing. A valid entry is: YES - enable separate logs. NO - disable separate logs; this maintains a single log containing both events and operator actions.
Total number of events/ actions to be saved to disk	Defines the total number of events to save to disk. The console can save up to 1,000 of each event and operator action on hard disk for periodic printing and archiving. A valid entry is from 0 to 1000. **NOTE:** Any number except 0 must be entered in this field to enable the *Save* field entries.
Archive items saved to disk?	Relates to archival storage. A valid entry is: YES - enable archiving. *NO - disable archiving.*
Periodic print of *events log (saved to* disk)?	Turns periodic printing on or off. A valid entry is: YES - enable periodic printing. NO - disable periodic printing. **NOTE:** If set to *YES*, the *Logical Printer Number for Periodic Printing, Start Time for Periodic Print* and *Period of Periodic Print* fields require entry.
Logical printer number for periodic printing	Specifies to which logical printer a periodic printout of event and operator action items occurs. This field relates to the *Periodic Print of Event Log* field, and is valid only if that field is set to *YES*. A valid entry is from 1 to 8.
Start time for periodic print	Time and date at which an initial periodic print occurs. Any subsequent prints occur at a defined period. This field relates to the *Periodic Print of Event Log* field, and is valid only if that field is set to *YES*. The time is defined in the format set during time/date format configuration.
Period of periodic print	Time interval in hours between each periodic print after the initial start time. This field relates to the *Periodic Print of Event Log* field, and is valid only if that field is set to *YES*. A valid entry is from 1 to 24.

Defining Events Log Format

NOTE: The console has a default configuration already set. If the default entries for a selected event item fit plant requirements, no further configuration is necessary.

The final configuration procedure the process engineer must complete is event log format configuration. This allows changing the format and content of an entry in the events log or operator actions log.

Step 1 The process engineer performs events log formatting through the *Event Log Format* menu (see Figure 15-36). To call this display, first press $\boxed{\text{GENL FCTNS MENU}}$, then select the following menu items in the sequence shown:

A OIS Configuration ⟶ C Logging ⟶ E Event Log Format

Step 2 Each event or operator action that appears as an entry in an events log must be configured separately An events log entry, including its title, is either a one or two line entry with a maxi mum of 132 characters per line The *Event Log Format* menu has several options, each selects a different type of event for editing The formatting procedures are the same for all options presented

A Event Log Title
B Operator Action Log Title
C Digital Event
D Analog Alarm Event
E Operator Action Event
F Operator Note Event
G Information Event
H Node Alarm Event
I Module Alarm Event
J Device Status Alarm Event
K Text Selector Event
L Configuration Action Event

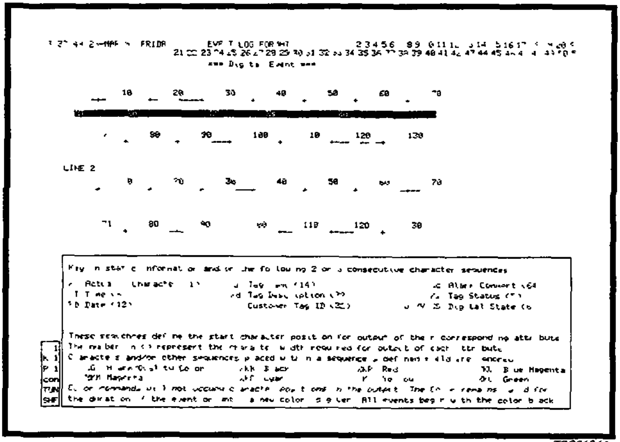
TPS0123A

Figure 15-36 Log Configuration Event Log Format Menu

Select one of the event types from the *Event Log Format* menu to edit the format of that type of event This brings up a formatting display for the event (see Figure 15 37 for an example)

At the bottom of this display is a list of two character sequence codes that define each item that can appear in the final log print-out Each type of events log entry has a different set of sequence codes Color codes can be used if the console is equipped with a color capable printer.

All or only specific codes can be used as long as the 132 character maximum is maintained The number in brackets ( ) next to each sequence code identifies the number of character spaces each code item occupies. and the number of spaces to leave between each code The console ignores characters placed within these reserved spaces The two characters of the sequence code itself count as two spaces The codes can be placed anywhere within the highlighted *LINE* fields to place data items in any order desired



TPS0124A

Figure 15 37 Log Configuration Event Log Item Format Page

Step 3 To define the sequence codes for an event

a Use the OIS configuration keys listed in Table 15 1 to enter data and move between each display input field Enter the se quence codes or static data that are to appear in the events log in the *LINE 1* and *LINE 2* fields The placement of a code within these fields directly corresponds to its position in the final printout

NOTE Each *LINE* nput fe d s separated nto two parts on the d sp ay *however, in the f nal printout the entr es appear as one ne*

b Press ENTER after completing all entries to update the con figuration on the hard disk

c Press ESC to exit the display

d Repeat Steps a through c for the title, and for each event and operator action item listed in the *Event Log Format* menu

Events Log Considerations

For archiving, the console does not separate process events and operator action events when it saves these items to disk The con sole only saves event items in separate files when used for periodic printing and log retrieval

If the target printer for a periodic printout or an archive device for archiving of the events log is not functioning, the file buffer may overflow while waiting for the printer or archive device This can cause a loss of event data from the periodic printout, and loss of event data on the archive medium

If the console is reset during a periodic print period, the accumulated events do not print until the original log period has been reached after the console comes back on line If the time period passed while the console was off line, the accumulated events print immediately after the console comes back on line The next periodic print occurs at its originally scheduled time based on the defined log start time and not the restart time for the console.

Log Rescheduling

The periodic print function can be turned off at any time The start time and period for a log can be redefined at any time Rescheduling does not affect data that has already been archived

If the period is extended, the printout does not occur until the new period has been completed If the period is shortened and the current time has already passed the new period, the accumulated events print immediately The next print time is based on the start time and the new period

If the start time is changed, events print immediately The log reschedules at the new time and period

CUSTOM LOG CONFIGURATION

Custom logging provides three variations in log operation Periodic, event triggered or operator demanded A periodic log produces operations summaries at a specified time or time intervals An event triggered log produces summaries of a particular operation (e g , batch report, prefault and post fault log) at the time it occurs Operator demanded logs are unscheduled and initiated through operator actions

Custom log types are periodic, trip and standard The difference between each type is the method used to collect data for the log.

The ***standard*** type log is intended to collect trend data The standard type can be used to create trend logs that contain data the console has collected from the distributed trending system. This log continues to collect trend data at defined intervals during its entire collection period These logs can also contain current, snapshot tag values the console collects from the process at the end of the collection period for the log, not at intervals like trend data

The ***trip*** type causes the console to retrieve a specified amount of data prior to and after a plant fault This data is trended process values for pretrip data and current process values for post trip data The amount of pretrip and post trip data depends on configuration of the log Only event triggering can be used to start data collection

The ***periodic*** type log is intended to collect tag data For a periodic type, the console collects process values at a specified time, after an event triggers collection, or on demand Current, snap shot values are collected at the end of the collection period for the log Normally, the collection period is set to *0* to allow the console to collect the data as soon as it is triggered or made active A periodic log can also retrieve data collected from the distributed trending system If this is done, however, the periodic log acts similar to, and must be configured in the same way as a standard type log

Custom Log Scheduling

The process engineer can schedule data collection and printing to occur at a specified time, time intervals, or after a particular process event A log can also be defined but unscheduled to allow an operator to demand the collection or printing at any time The time span or length of time a log collects data also can be defined

Collection types are time, event or demand (operator demanded) Print types are time, event, demand or collect (collection completion) The console uses these types, in any combination, to schedule logging Printing takes place at a designated printer

Collection Types

A ***time*** collection type applies to only trend logs (standard type) and snapshot logs (periodic type) Using this type of collection, a log has a specific starting time The data collection for the log occurs at the scheduled time

An ***event*** collection type starts data collection for a log when a particular process event takes place The console monitors a trigger tag and collects data after a defined event occurs for the tag An event can be an analog alarm or digital state change Two trigger conditions for data collection can be specified for a log

A ***demand*** collection type starts data collection for a log as soon as it becomes *ACTIVE* Activating a log can be done at the time of log creation, or later using the log status function This type of collection is for unscheduled logs, and allows the operator to start log collection at any time

Repeat Cycle

Use the repeat cycle option to automatically reschedule data collection for a log It can be enabled for any of the collection types Log printing, with repeat cycle enabled, occurs at the normally scheduled print cycle which is dependent on the print type configured for the log

With the repeat cycle enabled for a ***time*** collection type log, the log continues to repeat its collection period after it completes its initial collection period By not setting this option, log data collection stops after completion of the initial collection period

With the repeat cycle enabled for an ***event*** collection type log, the log begins its collection period each time the event defined to trigger the log takes place An event that takes place during a collection cycle does not affect or trigger subsequent collections By not scheduling a repeat cycle, collection occurs only the first time the event occurs

With the repeat cycle enabled for a ***demand*** collection type log, the log begins its collection period as soon as it is made *ACTIVE* and continues to repeat its collection period until it is made *INACTIVE*. By not scheduling a repeat cycle, the log does not repeat its collection period until it is made *INACTIVE* then *ACTIVE* again.

Print Types

A log with a ***time*** print type has a specified starting time for printing. If a log continues to repeat its collection period, printing repeats at the defined time.

A log with an ***event*** print type starts after a specified process event occurs, regardless of how much of the collection period is complete. The console monitors a trigger tag and prints log data after a defined event occurs for the tag. An event can be an analog alarm or digital state change. This is similar to a demand print type for a log, but the demand is based on a process event. Two conditions that trigger printing can be specified for a log.

A log with a ***collect*** print type begins printing immediately upon completion of its collection period. This type of print does not occur before a log has completed its entire collection period.

A log with a ***demand*** print type is an unscheduled log. The log does not print any of its data until the operator manually demands the printout using the *Log by Name* function.

> **NOTE** A retained copy of a log or any currently collected data for a log can be demanded for printout using the *Log by Name* function. Refer to ***Printing and Displaying Log Reports*** in the ***Recording Process Data*** section for procedures to demand a printout of a custom log.

Saving Logs

The logging system can save on hard disk up to nine generations of each custom log. A custom log resides in a ***LOGnnnn.Ln*** file where ***nnnn*** is the log index number from 0001 to 0300 and ***.L0*** through ***.L8*** is the retention number. The saved logs are the nine most recently generated (i.e., logs after completed collection). The console removes the oldest log as new logs are retained. Any custom log can be saved as a permanent record using the archiving function.

Custom Log Generator

The console provides a custom log generator function the process engineer or manager can use to tailor each type of report to specific plant requirements. During log definition, the process engineer defines the attributes that determine data collection and printing cycles. Log definition also sets the number of columns and rows in a log, which is important for determining how many values can appear in a log.

After custom log definition (i.e., [NEXT PAGE]), an empty log shell containing a number of cells provides the means to tailor the report. This is where the process engineer or manager details the data that appears in a printout of the log, and also the data that appears in a log archive. The format is limited only to the number of rows and columns defined previously, and available cell definition types.

As in spreadsheets, cells contain or define the data that is to appear in a printout A cell can also be hidden A cell of a custom log can contain

ASCII text characters up to 80 characters of descriptive text (e g , headings, legends, descriptions) or printer escape codes (e g , color, new line, form feed, compressed print)

Trend value a trend value based on a selected trend definition

Tag attribute tag database configuration data (e g , tag name, description, engineering units or alarm groups)

Tag value a tag value current at the time of data collection based on a selected tag (mainly used for snapshot logs)

Alarm or quality - alarm state or quality status for a tag defined in the database, not a trend definition

Calculation result sum, difference, division, product, average, maximum value for specified cells

OIS date and time - either the current time at log output or the start time of the log

Offset time offset time from the start of the log

Constant value a defined constant value which can be used in calculations

Log Definition

A custom log must first be defined to identify its type and operating parameters, specifically the collection and print cycles Log definition is the same for all types of custom logs The attributes to define depend on the log type

Step 1 The process engineer defines a custom log through the *Log Definition* page (see Figure 15 38) *To call this display, first press* GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ C Logging ⟶ A Report Generator

Step 2 The fields that are available for data entry depend on the log type, collection type and print type The console will allow moving the input cursor to valid fields only All others are left blank To define or edit log operating parameters

NOTE A log must be *INACTIVE* to edit its operating parameters

a Enter the index number or name of a log to edit at the *Log Name/Index* prompt, then press ENTER A valid entry is from 1 to 300 If this is a new log definition, enter the index number of an

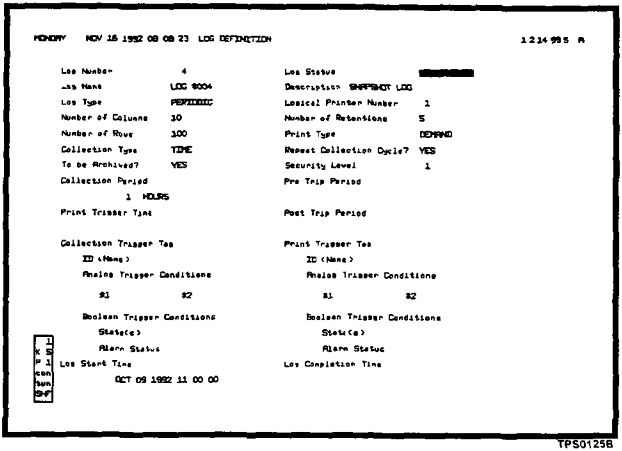


Figure 15-38 Log Configuration Log Definition

available, undefined log Enter the number of an existing log to edit it

b After pressing [ENTER], the log definition page for the log ap pears The console initially positions the cursor at the *Log Status* field The log must be set to *INACTIVE* to edit the display fields. Key in **INACTIVE**, making a log inactive disables log collection and printing for the log A queued print will still occur however.

c Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Table 15 26 ex plains the log definition attributes, refer to this table when enter ing data

d After completing all required fields, press [ENTER] This up-dates the configuration on the hard disk

e Press [NEXT PAGE] to call the *Cell Configuration* page This is the display used to format the actual log

Step 3 Log definition attributes set the number of rows and columns in a log This determines the number of cells that can be used to pre sent data in a log output The next step in custom log definition is to create the appearance and content of the log by selecting and defining cells Refer to ***Cell Definition*** in this section for procedures

Step 4 To start data collection for a completely defined and formatted log, make it *ACTIVE* A log can be activated as the final step in log creation, or it can be left inactive after configuration and activated later through log status functions. Refer to ***Log Status*** in the ***Recording Process Data*** section for procedures to activate a custom log.

To activate a log:

a. Press [ESC] to exit the *Cell Configuration* page.

b. Use the OIS configuration keys to move to the *Log Status* field. Key in **ACTIVE**.

c. Press [ENTER] to initiate the change. Press [ESC] to exit.

When a log is activated, the console checks the validity of the log header configuration. If any field is not configured correctly, an error message displays and the input cursor positions at the field in error.

Make a log *INACTIVE* and blank its *Log Name* field to ***delete*** the log.

Table 15-26. Log Definition Attributes

Field	Description
Log number	Noninput field, this identifies the currently selected log by its number. The console supports up to 300 definitions.
Log status	Shows the current status of the log and allows turning the log on or off. A valid entry is: ACTIVE = activates the log. INACTIVE = deactivates the log; the log must be *INACTIVE* to edit any fields. The log can be set to *ACTIVE* as the last step of log definition, or it can be left *INACTIVE* and turned on later using log status functions. A log begins its collection period as soon as it is made *ACTIVE*.
Log name	Name of up to eight characters to identify the log. This name appears at other functions to identify the log (e.g., log status summary display).
Log description	Description of up to 32 characters to describe the purpose and function of a log. This description appears at other functions.
Security level	Level assigned to the log and required by operators to perform log status operations for the log; relates to password security. A valid entry is from is 1 to 16.
Log type	A valid entry is PERIODIC, TRIP or STANDARD.
Logical printer number	Logical printer where a printout of this log is to occur. A valid entry is from 1 to 8.
Number of columns	This and the number of rows determine the number of cells in a log. The number of cells establishes the amount of data that can appear in the log. A valid entry is from 1 to 64.

Table 15-26 Log Definition Attributes (continued)

Field	Description
Number of rows	This and the number of columns determine the number of cells in a log The number of cells establishes the amount of data that can appear in the log A va d entry is from 1 to 250
Number of retent ons	Number of historical copies of the og to be saved on d sk, up to n ne logs can be saved The saved logs are the nine most recently generated The console drops the oldest log as new logs are retained A va d entry s 0 for no retentions, or 1 to 9 **NOTE** Saved copies of a log can be demanded for print ng at a future t me using the *Log by Name* function
Collection type	Schedules data collection for the log DEMAND = an operator in tiates the co lection by changing the *Log Status* field to *ACTIVE* at log definition completion or through log status func tions Th s is an unscheduled log EVENT = a process event (i e tag a arm cond t on or state change) tr g-gers col ection If used re ated f e ds are *Collection Trigger Tag Analog Trigger Conditions* and *Boolean Trigger Conditions* TIME = reaching a specif ed time triggers co ect on f used the *Log Start Time* field must be def ned
Print type	Schedules pr nt ng for the log DEMAND = a printout does not occur unti the operator demands it using the *Log by Name* function EVENT = a process event (i e tag a arm condition or state change) tr g-gers printing If used, related fields are *Print Trigger Tag Analog Trigger Conditions* and *Boolean Trigger Conditions* T ME = reaching a specif ed time triggers pr nt ng If used the *Print Trig-ger Time* field must be def ned COLLECT = a log pr nts as soon as it comp etes its co ect on per od
Repeat col ection cyc e	Enab es automatic rescheduling of ogs after a log completes ts nit a col ect on period YES - enab e reschedu ng For a ***time*** triggered log the og repeats col lection at the intervals specified by its co lection period This beg ns after the initially scheduled collection time For an ***event*** triggered log the og col ects every time a spec fied process event occurs For a ***demand*** triggered og the log continues to repeat its co lection pe riod unt l it is made *INACTIVE* NO - disable rescheduling The log collects on y once either at the speci fied time or at the first occurrence of the process event
Collect on period	Amount of time that a log cont nues to col ect data after t is tr ggered for collection it requ res a number and time unit entry A va id numeric entry is from 0 to 999 a un t is SECONDS MINUTES or HOURS For a ***trip*** type log th s fie d shou d equal the tota amount of pretr p and post trip time (i e *Pre Trip Period* field plus *Post Trip Period* field) (cont nued)

Table 15 26 Log Definition Attributes (continued)

Field	Description
Collection period (continued)	For a ***periodic*** type log the console collects tag data at the end of the collection period not the log start time In most cases this is set to zero For a ***standard*** type log the console collects trend data at intervals during the entire collection period This sets the intervals
Pretrip period	Determines the amount of historical or pretrip data *measured in time* that the console is to retrieve once a process trip occurs Applies to trip type logs only It requires a number and time unit entry A valid numeric entry is from 0 to 999, a unit is SECONDS MINUTES or HOURS
Post trip period	Determines the amount of data to collect after a process trip occurs Applies to trip type logs only It requires a number and time unit entry A valid numeric entry is from 0 to 999, a unit is SECONDS MINUTES or HOURS
Collection trigger tag ID	Name or index number of a tag the console is to monitor to trigger data collection for the log This attribute is valid for event collection type logs only and is independent of the print trigger tag Other attributes related to this field include *Analog Trigger Conditions* *Boolean Trigger Conditions*
Print trigger tag ID	Name or index number of a tag the console is to monitor to trigger printing of the log This attribute is valid for event print type logs only and is independent of the collection trigger tag Other attributes related to this field include *Analog Trigger Conditions* *Boolean Trigger Conditions*
Analog trigger conditions (collection or print trigger tags)	Identifies one or two (i e , #1 and #2) alarm conditions of the trigger tag that start data collection or printing This entry depends on the type of tag identified as the analog trigger tag Valid entries are N = trigger on return to normal condition (blank) = no trigger 3H = trigger on 3H alarm condition 2H = trigger on 2H or 3H alarm condition H = trigger on H, 2H or 3H alarm condition L = trigger on L 2L or 3L alarm condition 2L = trigger on 2L or 3L alarm condition 3L = trigger on 3L alarm condition HD = trigger on high deviation LD = trigger on low deviation HR = trigger on high rate of change LR = trigger on low rate of change
Boolean trigger conditions (collection or print trigger tags)	Enables digital state triggering when using a boolean trigger tag It identifies the digital state of the trigger tag that starts data collection or printing This entry depends on the type of tag identified as the boolean trigger tag A valid entry is any one of the logic state descriptors defined in the data base for the trigger tag Leave the field blank to not use digital state as the trigger

Table 15 26 Log Definition Attributes (continued)

Field	Description
A arm status	Enables alarm status triggering when using a boolean trigger tag It identi fies the alarm status condit on of the trigger tag that starts data co lection or printing Alarm status triggering can be based on a transition from nor- mal to alarm or alarm to normal One of the digita states of a tag is des g- nated as an alarm state in the PCU module A valid entry is ALARM – use normal to alarm status as the trigger RTN use alarm to norma status as the trigger
Log start time	Starting time for data collection when using a time collection type The format to use when entering the time and date depends on time/date for mat configuration For a ***periodic*** type og data col ect on starts at the start t me as long as col ection period s zero If not data collection starts at the start time plus the col ection per od For ***trip*** and ***demand*** type logs th s field s not va d
Log completion t me	Non input f eld, the console automatically determines the time of comple t on and enters the t me here

Cell Definition

The *Cell Configuration* page provides the ability to create the final format and content of a custom log (see to Figure 15-39) Press NEXT PAGE while at the *Log Definition* page to call this page. Each cell location on the screen occupies the same relative posi tion in the final printout

At the top of the page is the cell configuration main menu This menu lists the possible cell definitions, and provides access to utilities for

- Copying cells
- Copying rows
- Copying columns
- Deleting cells
- Setting column width
- Printing a sample of the log format.

Refer to ***Cell Utilities*** in this section for an explanation of the utilities and procedures to use them

The middle of the page shows a group of 16 cells To the upper left of this block of cells is the log name The letters across the top of

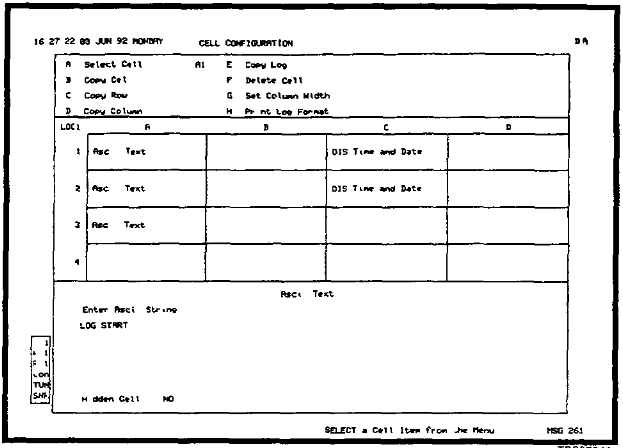


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Figure 15 39 Log Configuration Cell Configuration Display

the cells identify each column of cells Columns start at A and end at a maximum of BL (column 64) The numbers down the left side identify each row of cells The number of rows is from 1 to 250 The process engineer defines the number of rows and columns for a log through the *Log Definition* page

If a cell has already been defined, a name indicating the cell type appears in that cell If not, the cell is blank Use the *A Select Cell* option to select a cell within the log area and to reposition the display A cell selected through this option becomes the upper left cell in the block of 16 cells

The console presents the attributes relating to a cell at the bottom area of the page After selecting a cell, the attributes defining the type of cell appear in this area and can be changed To define a cell

> **NOTE** ASC text OIS time and date offset time and tag attr bute type ce s can cross co umn boundaries for ease of def nition Refer to ***Cell Utilities*** n th s sect on for procedures to set ce w dths

a Choose *A Select Cell* At the input prompt, enter the address of a cell to define or edit, then press ENTER Key in the column address first then row address Columns use alphabetic charac ters from A to BL (64) and rows number from 1 to 250 For ex ample

AC40

b Select one of the cell definition options from the menu by pressing a keyboard key For example, press [F] if the cell is to contain the OIS time and date Once selected, the attributes that define the cell appear at the bottom of the page

c Define each field for the selected type of cell Refer to the information that follows for an explanation of each type When complete press [ENTER] This enters the cell definition The name of the type should appear in the cell once successfully defined

A *Print Log Format* option accessed through *K Cell Utilities* allows printing a sample of the created log. The console substitutes false values wherever a process value should appear Refer to ***Cell Utilities*** in this section for an explanation of the option

d Choose the *A Select Cell* option to define additional cells and *repeat Steps b and c until the log is completely defined*

e Press [ESC] to exit back to the *Log Definition* page

This procedure can be performed to initially set up a log, or to make changes to an existing log

Hidden Cell

A cell designated as a hidden cell does not appear in the final printout The result of the hidden cell is available to the logging function when performing calculations however For example, a hidden cell could be used for data or formulas needed to produce an intermediate value but its data or value is not necessarily needed in the final log output

To designate a cell as hidden

1 While defining the attributes of that cell use the OIS configuration keys (refer to Table 15-1) to move to the *Hidden Cell* field

2 Set the field to **YES** Set the field to **NO** to remove a hidden cell designation

Alarm/Quality

B Alarm/Quality Field specifies a tag name or index number in order to present the alarm status and quality status for the tag. This status can only be associated with tag values (snapshot values), not trended values Trended values do not carry status Figure 15 40 shows the attributes that must be defined for this cell type

A status field width can be selected at the *Alarm Quality Field Size* field either one or three characters A three character field shows two characters for the alarm status and one character for the quality It is the same as a five character alarm status/quality/group field that appears at a display minus the two characters for the alarm group A one character field will have an abbreviated alarm status overridden by bad quality similar to a one character alarm/quality field Refer to the ***Alarm Processing*** section for a description of the alarm and quality indications

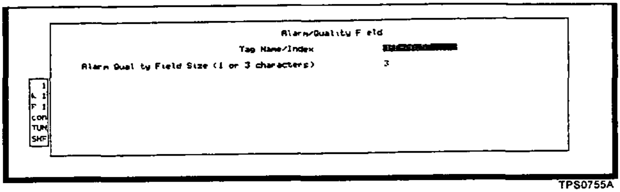

Figure 15 40 Log Configuration Alarm/Quality Field Cell Definition

ASCII Text *C ASCII Text* enters a fixed ASCII text string into the log This string can be up to 80 characters long The maximum ASCII characters is 5,120 per log Figure 15 41 shows the attribute that must be defined for this cell type

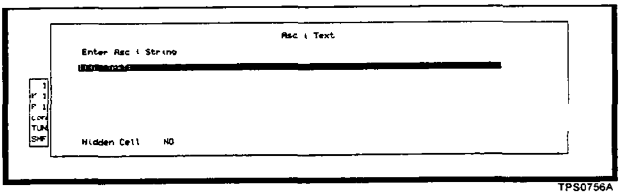

Figure 15 41 Log Configuration ASCII Text Cell Definition

In addition, printer control can be done using this type of cell The percent (%) character followed by a one or two character code defines a *printer command* All *non valid command* codes print as ASCII text Printer command codes are

%N new line (carriage return and line feed)

%F form feed (top of form and carriage return)

%C0 turn compressed print off

%C1 turn compressed print on (allows maximum of 200 characters per line)

The code **%C1** puts the printer into compressed mode The printer does not automatically reset to normal mode (132 characters per line) when another log prints A **%C0** command must be defined to return to normal, uncompressed print Place this command in the last cell of the log

NOTE Key in **%%** to print the percent character (%) the escape sequence character s ignored

A color can be specified for a log through an ASCII cell definition For example, the color code **%K2** sets the color output to red This code does not print in the final output The standard color codes are

%K0 black

%K2 red

%K3 green

%K5 cyan

%K6 - magenta.

%K7 yellow

%K12 blue magenta.

These are the codes that support the current color printer capa bilities of the console The colors listed here reflect the default colors, colors can be remapped through printer color map con figuration If remapped, the number portion of the code can range from 0 to 63 as in screen color codes

The number denoting the color is terminated by any non numeric character If the character is %, it is not in the output The % character acts as the terminating character for the color, and al lows a numeric character to be output immediately following the color code For example, to output the number 3 following a color code, enter

%K5%3

Constant Value

D Constant Value enters some constant value to be printed in this cell The constant value can be used with formula type cells If the value is not to be used with a formula cell, define the con stant as an ASCII text cell instead Figure 15 42 shows the at tribute that must be defined for this cell type

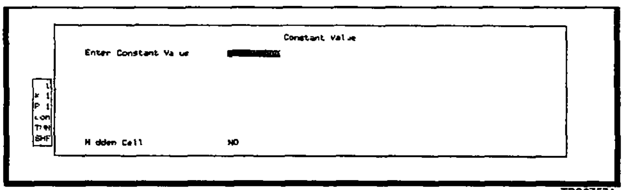

Figure 15 42   Log Configuration   Constant Value Cell Definition

Formula

E Formula defines a cell to be a function of other cells Specifi cally, a cell can be defined to perform calculations using operands that are the result of other cells After choosing the *E Formula* option from the cell configuration main menu the following options appear

B SUM sum of operands'

C DIFFERENCE difference of operands

D PRODUCT product of operands

E DIVISION division of operands

F AVERAGE sum of operands divided by number of operands

G MINIMUM minimum of operands

H MAXIMUM maximum of operands

The process engineer defines all formulas in the same way After selecting one of the formula options an *Enter List/Range of Oper ands* input field appears (see Figure 15 43) Use the field to spec ify the cells that are to be part of an equation The field allows for up to 80 characters

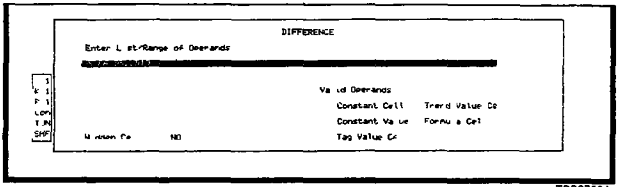

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Figure 15 43 Log Configuration Formula Cell Definition

The cell types that are valid when specifying operands used in a formula include

- Constant value cell
- Tag cell (analog value only)
- Trend cell (analog value only)
- Formula cell

A column address and row address reference a cell Columns use alphabetic characters from A to BL (64), and rows number from 1 to 250 For example

BD12

In formula cell definition, enter the row address as **0** to specify all valid entries in an entire column Enter **ZZ** as the column address to specify all valid entries in an entire row Enter a list of operands by entering individual cell addresses each separated by a comma or blank space Enter a range of operands by specifving a starting cell then ending cell separated by an ellipsis of two pe riods ( ) It is possible to specify a range of cells within a list of individual cells

Examples

A16,BZ1,J70,M1 or **A16 BZ1 J70 M1**

A1 . . AZ1

A1 . . L1 C7 L22

If any one of the cells involved in the calculation is bad quality, it is omitted from the calculation The resulting value of the formula cell is marked with the suspect indicator (?) This indicator overwrites the right most character (least significant digit position) of the formula cell result

Example calculation. Cell C3 contains an averaged trend value Cell C4 contains another averaged trend value Cell D4 is being defined as a formula cell to calculate the difference between C4 and C3 Selecting *C DIFFERENCE* and entering the cell address of the two operands as

C4,C3

results in the calculation C4 C3

OIS Time and Date

F OIS Time and Date - generates an OIS time and date for the cell The time and date can be either the time of the log output, or the time the log started (start collection time) Figure 15 44 shows the attributes that must be defined for this cell type

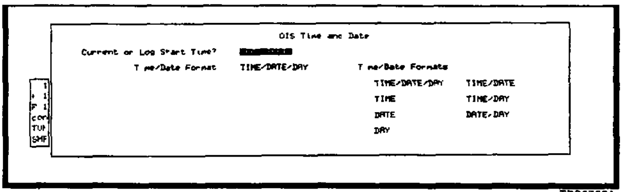

Figure 15-44 Log Configuration OIS Time and Date Cell Definition

The *Current or Log Start Time?* field determines whether the time is the current time at log completion, or the time the log started Enter **CURRENT** or **LOG START**

The *Time/Date Formats* field determines the format and content of the printed time and date The options for this field are

TIME	16 32.00
DATE	19 DEC 92
DAY	Tuesday
TIME/DATE	16 32 00 19 DEC 92
TIME/DAY	16 32 00 Tuesday

DATE/DAY	19 DEC 92 Tuesday
TIME/DATE/DAY	16 32 00 19 DEC 92 Tuesday

Time and date format configuration sets the order and format for time (e g , 16 32 00 or 16 32) and for date (e g , 19 DEC 92 or December 19, 1992) Refer to ***TIME AND DATE FORMAT*** in this section

The following describes the *LOG START* time for the different log types

Standard (trend) the time that the log starts collecting Normally, the first trend cell is offset zero from the log start time In this case, the log start time is also the time of the first trend cell

Trip the time of the event

Periodic (snapshot) - the time the snapshot was taken

The following describes the *CURRENT* time for the different log types

Standard the time that collection of the log completes This does not include the processing time required to format the log for printing

Trip the time that collection of the log completes (i e , the time of the latest post trip data that has been collected) This time does not include the processing time required to format the log for printing

Periodic the time that collection of the log completes This does not include the processing time required to format the log for printing

Offset Time

G Offset Time defines a horizontal or vertical series of cells to show time The first time is an offset from the starting time of the log, and the subsequent times are offset from each other An offset is defined as a count and a unit, such as a count of 45 and a unit of seconds This causes a cell to show a time 45 seconds offset from the previous cell Figure 15 45 shows the attributes that must be defined for this cell type

The time attributes that can be presented in the printout for offset time are

HH:MM:SS	12 30 00
HH:MM	12 30
DD HH:MM	20 12 30
MM:SS	30 00

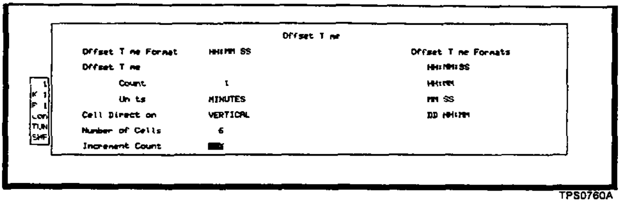

Figure 15 45 Log Configuration Offset Time Cell Definition

The *Cell Direction* field determines whether the cells are to be defined consecutively across a given row or down a given column, enter either **VERTICAL** or **HORIZONTAL**

The *Number of Cells* field defines the number of consecutive cells that will show a time This must not exceed the maximum number of cells in a row or column

The *Offset Time* fields set the initial offset time for the first cell This time is relative to the log start time Specify the time as a *Count* from 0 to 999, and *Units* as **SECONDS**, **MINUTES**, or **HOURS**

The *Increment Count* field sets the time difference between consecutive cells after the first cell The entry increases the count of the offset time by the specified number for each consecutive cell The unit associated with this count is the unit defined for the *Offset Time* field

Tag Value

H Tag Value specifies the name or index number of a tag to show its value or state The value is a snapshot taken at completion of the collection period for the log Some types of tags require a *Tag Value Type* specification to choose whether the cell shows the value, state or operating condition of the tag Figure 15-46 shows the attributes that must be defined for this cell type

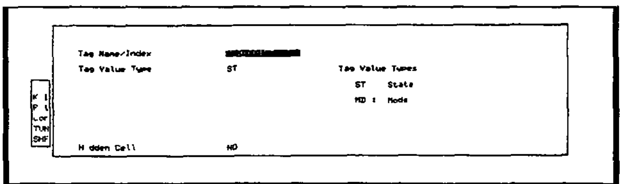

Figure 15 46 Log Configuration Tag Value Cell Definition

Trend Value

I Trend Value defines a series of horizontal or vertical cells to show trend values. It can also be used to define a single trend value cell The cell must reference a valid trend definition A trend block performs calculations on samples it collects to derive the final value that a PCU module sends to the console The trend value cell allows performing a second calculation on the values it receives from the trend block Cell attributes determine the type of calculation After selecting the option, the screen shown in Figure 15 47 appears, refer to *Table 15 27 for an explanation of the* fields

NOTE Currently only standard trends can be logged

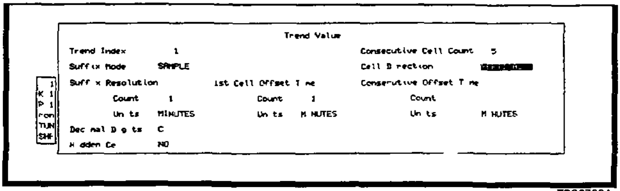

Figure 15 47 Log Configuration Trend Value Cell Definition

Table 15 27 Trend Value Cell Fields

Field	Description
Trend index	Index number of the trend definition that provides the values for the trend value cells A valid entry is from 1 to 2000
Suffix mode	Determines the type of calculation to perform on trend data The *Suffix Resolution* field determines the amount of time the console takes samples to use in the calculation A valid entry is AVERAGE - sum of all samples divided by the number of samples Not valid for a digital trend MINIMUM - minimum value during the period MAXIMUM - maximum value during the period SAMPLE - default presents a single value SUM = sum of all values during the period Not valid for a digital trend **NOTE** This is a second calculation if the module uses any collection mode besides SAMPLE
Suffix resolution	Determines the period of time over which the console collects samples for a suffix calculations Should be set at a minimum to the collection resolution of the trend or to any multiple of the resolution Specify as a *Count* from 0 to 999 and *Units* of SECONDS MINUTES or HOURS For example if the trend is a one minute trend the resolution can be set to 2 MINUTES 3 MINUTES 4 MINUTES etc

Table 15 27 Trend Value Cell Fields (continued)

Field	Description
Dec mal digits	Defines the precis on for the number of digits displayed to the r ght of the decima point Enter **0 1 2 3 4 5 6** or **C C** chooses prec sion based on the column width as fol ows **Width** / **Precision** 1 / 0 2 / 0 3 / 0 4 / 1 5 / 2 6 / 2 7 / 2 >8 / 3
Consecutive ce l count	Def nes the number of consecut ve cel s that w l be def ned as trend cel s Must not exceed max mum number of cells in a row or co umn
Cell direction	Defines whether the cells are to be defined consecutively across a given row or down a g ven column enter either **VERTICAL** or **HORIZONTAL**
1st cell offset time	Time relat ve to the start ng t me of the og for the first trend ce l Specify as a *Count* from 0 to 999 and *Units* of SECONDS, M NUTES or HOURS
Consecut ve offset time	T me d fference between the consecut ve trend cel s after the first ce Each consecutive cell wil be offset from the previous cel by this much t me Specify as a *Count* from 0 to 999 and *Units* of SECONDS, MINUTES or HOURS **NOTE** The *Units* entry must match that of the *1st Cell Offset Time*

Data values in the log are listed in ascending time order from either the starting time or earliest value of the log Therefore, it is not possible for the data in a log to be printed in reverse chrono logical order After defining these attributes and pressing **ENTER**, the console copies the cell definition into the number of consecutive cells specified

Problems may occur if the collection period defined for the log exceeds the time span defined for the trend In this case, trend data would be overwritten before a calculation could be done The con sole marks the value as suspect (?) If the number of samples col lected is less than expected, the console performs a calculation but again marks the result as suspect If the trend is not defined or is no longer defined in the database, the console marks the value as bad quality

Tag Attribute

J Tag Attribute - enters static tag configuration data in a cell The tag name or index number must be specified along with the type of data requested The following configuration items for the tag can be selected Name, description, engineering unit or alarm group Figure 15-48 shows the attributes that must be defined for this cell type

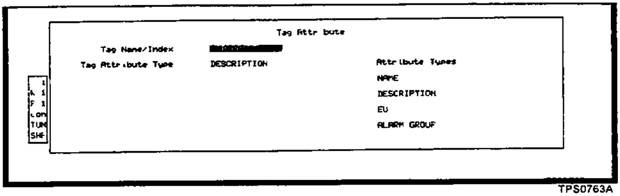

Figure 15 48   Log Configuration - Tag Attribute Cell Definition

Cell Utilities

The *K Cell Utilities* option gives access to utilities that can be used to expedite cell definition, delete cells, copy an entire log, set col umn widths, and initiate a sample printout of the log Figure 15 49 shows the options available after choosing this option

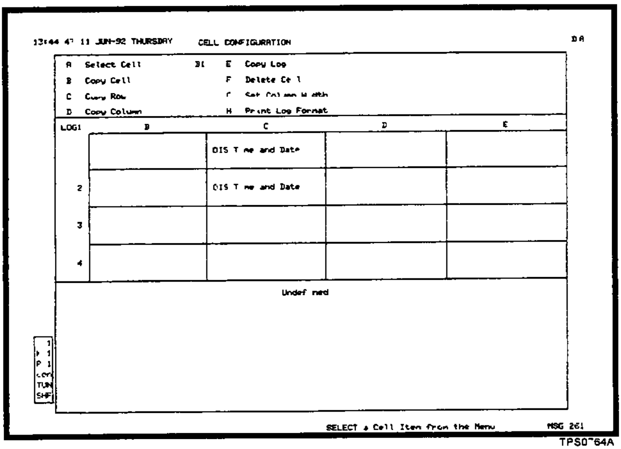

Figure 15-49   Log Configuration   Cell Utilities Menu

B Copy Cell   copies one cell definition to another To use the option

1   Press [B to] select the option

2   Enter the column and row address of the source cell at the *Copy From* field The source cell initially defaults to the currently selected cell

3   Enter the address of the destination cell at the *To* field

4 Press [ENTER] to initiate the copy

C Copy Row copies one entire row to another row The default destination row and source row are the same as the currently selected row. To use the option

1. Press [C] to select the option

2 If the currently selected row and the desired row to copy are the same, skip this step If not, enter a source row at the *Copy From* field

3 Enter a destination row at the *To* field

4 Press [ENTER] to initiate the copy The function copies the ***entire*** source row of cell definitions to the destination row

D Copy Column copies one entire column of cell definitions to another The default source column and destination column are the same as the currently selected column To use the option

1 Press [D] to select the option

2 If the currently selected column and the desired column to copy are the same, skip this step If not, enter a source column at the *Copy From* field

3 Enter a destination column at the *To* field

4 Press [ENTER] to initiate the copy The function copies the ***entire*** source column of cell definitions to the destination column

E Copy Log copies an entire log definition to another log definition file The source log will always be the log currently being defined or reviewed, a destination log can be specified To use the option

1 Press [E] to select the option

2 Enter the index number of a log at the *To* field to specify the destination log

3 Press [ENTER] to initiate the copy

F Delete Cell - deletes one or more cells To use the option

1 Press [F] to select the option

2 Enter the column and row address of the first cell to delete

3 Enter the address of the last cell to delete If deleting a single cell definition, either skip this step or enter the same cell that was entered as the first cell to delete

4 Press ENTER to initiate the deletion This makes the cell or cells *Undefined* Press ESC before pressing ENTER to return to the cell definition menu without deleting any cells

G Set Column Width defines the width of each of the columns of the log Columns default to a width of six printable characters Column widths are used to determine the starting point for each column and for justifying values within a column field ASCII text, OIS time and date, offset time, and tag attribute type cells can cross column boundaries for ease of definition

To use this option

1 Press G to select the option

2 Enter the address of the column to adjust

3 Enter a width The console will allow entering any number up to 99 Before making this adjustment, however, make sure to consider the appearance of the entire log and also the number of characters a printer can output on a single line

4 Press ENTER to initiate the change

H Print Log Format prints a sample format of the log currently being defined Figure 15-50 is an example of a printout created with this option On the printout, the rows and columns are numbered with the starting point of a column marked by a symbol Actual tag attributes and ASCII text will be shown, but times values and alarm status and qualities will be artificial quantities in order to provide a more realistic presentation

To use the option

1 Press H to select the option

2 Specify a logical printer number This directs the printout to a specific printer

3 Press ENTER to start the print

Log Errors

The console checks for any invalid tag and trend references when a log is made active The console indicates an invalid reference error through the monitor 68K function, and at the *Operator Information* page (refer to ***OPERATOR INFORMATION EVENTS*** in the ***OIS Operational Information*** section) Also, at the end of each log printout, the console includes an error report to notify of any invalid tag index, trend index or formula reference

The *Log Last Good Value* fields at the alarm quality options page determine how the console is to handle bad quality or

```
                     3          5          7       1  9        11         13        115      1 117      1  19        121        23
001

                                                        TRIP LOG

TRIP LOG FOR    1 26 2" 31 JAN 9  THURSDAY                                                    DATE PRINTED 11 28:27 31 JAN 91 THURSDAY

                3 F  184   FDWTR FLOW                         7    3 PT 165   DRUM LEVEL
           2    3 FT 177   SH ATTEMP SPRAY FLOW               8    3 PT 020   MAIN STEAM PRESS
           3    3 FT 1"9   RH ATTEMP SPRAY FLOW               9    3 PT  93   BFP DISCH HEADER PRESS
           4    3 FT 162   BFP 3A MOTOR AMPS
           5    3 F"-164   BFP 3B MOTOR AMPE
           6    3 FT 165   DRUM LEVEL


                                                        PRE TRIP

                                2          3          4          5          6          7          8          9

  T ME

00:00 00       1234 568    234 566   1234 568   1234 562   12"4 568   1234 568   1234 548   1234 568   1234 566
00:00:15       1234 568   1234 568   1234 568   1234 568   1234 568   1234 568   1234 568   1234 566   1234 568
00:00:30       1234 568   1234 568   1234 568   1234 565   1234 568   1234 568   1234 568   1234 568   12"4 "68
00 00:45        234 568   1234 "66    234 "68   1234 568   1234 568   12"4 568    234 568   1234 568   1234 568
00:01:00       1234 568   12"4 569   1234 566   1234 568   1234 568   1234 568   1234 568   1234 566   1234 568
00 01 15       1234 566   1234 668   1234 568   1234 568   1234 568   1234 568   1234 548   1234 568    234 568
00 0 :30       1234 568   1234 5<8    234 566   1234 566   1234 568   1234 568   1234 548   1234 568   1234 568
00 01:45       1234 568   1234 568    234 568   1234 568   1234 568   1234 568   1234 549   1234 568   1234 568
00 02 00       1234 568   1234 563   12"4 568   1224 568   1234 568   1234 568   1234 56"   1234 569   1234 568
00:02  5       1234 "66    234 568   1234 568    234 568   1234 568   1234 568   1234 548   1234 568   12 4 868
00:02 30       1234 "69    234 568   1234 569   1234 565   12"4 569   1234 568   1234 58"   1234 568   1234 568
00:02 45       1234 568   1"34 568   1234 568   1234 568   1234 568   1234 668   1234 568   1234 568   1234 560
00 03 00       1234 568   12"4 568   1234 568   1234 668   1234 569   1234 568   12 4 569   1234 562   1234 568
00 03  5       1234 568   1234 569   1234 569   1234 569   1234 568   1234 568   1234 568   1234 568   1234 568
00 03 30        234 568   12"4 549    234 568   1234 568    234 568   1234 569   12"4 56"   1234 568   1234 568
00 03 45       1234 568    2 4 568   1234 "68   1234 568    234 568   1234 568   1234 566   1234 663   1234 566
00 04:00       1234 648   1234 566   1234 568   1234 568   1234 568    234 568    234 56"   "34 568    234 568
00 04 15        234 "68   1234 668   1234 668   1234 566   1234 568   1234 568   1234 668   1234 568    234 566
00:04 30       1234 568   1234 56"   1234 566    234 566   1234 568   1234 568   12"4 668   1234 568   1234 568
00 04:45       1234 568   1234 568   1234 568   1234 663   1234 568   1234 "68   1234 568   1234 568   1234 565


                                                        POST TR P

00:05 00        234 566   1 "4 566    234 566    234 566    234 566    234 566   1234 568   1234 56"   1234 568
00:05  5        234 "63   1  4 568   1234 568   1234 568   1234 568   1234 568   1234 568   1234 569   1234 568
00:05 30       1234 566    234 56"      4 "66    234 566   1234 568   1234 568   1234 568    234 566   1 34 568
00 05:45       1234 566   1234 "69    234 566   1234 568   1234 568   1234 568   1234 "68    234 568   1224 568
00 06:00       1234 "66      4 5"   12"4 565     34 569   1234 568   1234 565   1234 568   1234 565   12"4 568
00 06  5        234   "     1 "4 "65   1234 566    234 648   1234 548   1234 568    224 568    234 568   1234 569
00:06 30       12 4 566   1234 566    234 566   1234 569   1234 568   1234 568    234 560   1234 566   1234 568
00 06 45       1234 569   1234 568   1234 568    234 568   1234 568   1234 668   1234 "68    234 568   1234 568
00:07 00        2"4 568    234 566     34 566    "34 566   1234 568   1234 568   1234 568    "34 568   1234 568
00:07  "       1"34 "68    234 "68     34 565    234 568   1234 668   1234 568   1234 566   1"34 568   1234 568
00:07:30        234 568     34 56"    2 " 568    23" 568   1234 568   1234 568   1234 563   1234 566   1234 568
0 :07 45       1234 566   1234 "     "4 "68    234 568   1234 568   1234 568   1234 568   1234 566   12"4 568
00 08 00       1  4 568    234 568   12"4 668    234 668   1234 548   1234 568    234 668   1234 568   1234 568
00:08:15        234 662   1234 56"    234 568   1234 568   1234 568   1234 666   1234 568   1234 "60   1234 568
00 08 30       1234 568    2"4 568    " 4 568   1 "4 569   1234 568   1234 568    234 569   1234 568   1234 568
00 08 45       1234 568   1234 568    234 568    234 568   12"4 568   1234 "69    234 568   1234 668   1234 568
00 09:00        234 568   1234 568   1234 568    234 568   1234 668   1234 568   1234 568   1234 568   1234 568
00:09 15        234 568   1234 568   1234 568    234 568   1234 568   1234 548   1234 568   1234 568   1234 568
00:09 30       1234 568    234 568   1234 548   1234 669   1234 566   1234 560    234 568   1234 568   1234 566
00 09:45        234 568   1234 568   1234 568   1234 568    234 568   1234 568    234 668   1234 568   1234 569
```

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Figure 15-50 Example Trip Log Printout

disestablished points in a log The option specifies whether the console is to print a bad quality string or the last good value for the point Set the fields to **YES** to have the console print the last good value, or **NO** to have it print a bad quality string Refer to ***ALARM QUALITY OPTION*** in this section for procedures to set the fields

Scheduling Examples

Trend Log Example

A trend log (standard type) with a *TIME* collection type and *COL LECT* print type has a start time of 12 00 p m (12 00), its collection period is 12 hours and its and rows are 20 and 50 respectively A trend value cell in the log is set for 30 minute offset time, 30-minute resolution and 24 consecutive cells (vertical cells)

The first value will not be collected until 12 30 p m (12 30), then every 30 minutes until the collection period is complete The col lected values will occupy 24 of the 50 defined rows The log prints at 12 00 a m (24 00) The example assumes the remaining rows and columns contain other data defined with additional cell attributes

Trip Log Example

A trip log with an *EVENT* collection type and *DEMAND* print type has a one hour pretrip period and one hour post trip period Its collection trigger is a high alarm (H) for an analog tag, and alarm status is ALARM The defined columns and rows for the log are 20 and 100 respectively A trend value cell in the log is set for zero minute offset time, two minute resolution and 62 consecutive cells (vertical cells) The specified trigger tag reaches a high alarm point at 1 00 p m (13 00) which starts data collection for the trip log

The first value will be the trend value at 12 00 p m (12 00), and values collected at two minute intervals until the post trip period is complete at 2 00 p m (14·00) The collected values will occupy 61 of the 100 defined rows The log prints when demanded using log retrieval procedures The example assumes the remaining rows and columns contain other data defined with additional cell attributes

Snapshot Log Example

A snapshot log (periodic type) with a *DEMAND* collection type and *COLLECT* print type has a zero collection period The defined col umns and rows for the log are 50 and 20 respectively It contains 20 individual tag value cells listed horizontally The log is left *IN ACTIVE* during configuration

At 3 00 p m (15 00), the operator enters the log status function and changes the log status to *ACTIVE* The console starts data collection immediately and prints as soon as it collects all required data The printout contains the 20 specified values as they were at 3 00 p m (15 00) The values occupy all 20 columns and one of the ten rows The example assumes the remaining rows and columns contain other data defined with additional cell attributes

SOE LOG CONFIGURATION

The console collects data for a sequence of events (SOE) log from a multi function processor (MFP) or multi function controller (MFC) module The MFP or MFC module collects data from a sequential events recorder (SER) connected to the actual process field devices

Module/SER Requirements

Before a console can collect any SOE data for an SOE log, the process engineer must configure both the MFP or MFC module and the recorder An SOE log function block (i e , function code 99) allows the module to collect data from a recorder This func tion code defines the type of report and maximum age of data saved and sent to the console. The module automatically removes data that is older than the specified age limit

The function code also allocates data storage space depending on the type of report Each SOE log function block handles only one type of report, and the report includes data on all points configured in the recorder to be that event type.

The recorder has function codes (independent of INFI 90 function codes) that

1 Define normally closed or open conditions for each of its input points

2 Turn scan off or on for each point

3 Allocate maximum prefault memory storage or sets a prefault window that determines the amount of data collected before a process fault

4 Designate specific prefault, post fault, snapshot and summary events

5 Set logic that triggers prefault, post fault and snapshot reporting

Refer to the ***Sequential Events Recorder*** instruction manual and ***Function Code Application Manual*** for further information

Once these configurations are established, the console can

- Collect event data after receiving a data present indication in an exception report generated by an MFP or MFC module

- Format the log printout

- Send event data to a printer

- Archive event data for permanent storage

- Enable operator summary log requests

OIS Requirements

The console can generate up to 80 SOE logs consisting of a com bination of any of the available report types This requires up to 16 MFP or MFC module and recorder pairs

The process engineer defines the sequence of events logging parameters for the console. These parameters tell the console.

1 How many recorders are present

2 Total number of SOE logs to produce

3 Number of inputs per recorder

All SOE logs use these parameters Before the console can collect and print SOE data, it requires a correlation between the SER inputs and tags in its tag database

The physical connection point for field wiring is at the terminal block of a recorder The point of connection determines the input number for a field input to the recorder A list of console index numbers (1 through 1,536) correspond to each SER input Input one at the recorder is SER index one at the console The process engineer defines the input list containing each SER input This list links the index numbers used by the console to tags in its database The console needs this linkage to show the correct tag name, tag description and logic state descriptor in an SOE log entry

NOTE The tags defined in the input list during SER definition must be digital state reporting tag (e g DIGITAL RVCB DD)

The console uses an RCM tag defined in its database to monitor the sequence of events log function block in an MFP or MFC module Each log has a dedicated RCM tag The tag contains the loop, PCU and module address of the module interfacing SER data It also contains the block number of the SOE log function block located in memory of a module (i e , module block address that contains function code 99) The console monitors this function block to determine if the module has data ready to send The RCM tag for an SOE log is also required to demand a printout of a summary log

The recorder continuously polls and saves data for each of its inputs The MFP or MFC module polls the recorder every 250 milliseconds and saves collected event data in memory How long it saves the data depends on the configuration of the module Once the module collects data from the recorder, it initiates an exception report to notify the console that it is ready to send data After receiving this report, the console polls the module for its SOE event data This does not apply for summary logs, the operator initiates data collection for a summary log by changing the state of an RCM tag

Report types defined by the SOE log function block include standard, summary, prefault, post fault and snapshot Each log has a unique identifier number and a 32 character (maximum) descriptor A report trigger tag entered during SOE log configuration is the RCM tag associated with the MFP or MFC module that is reporting SOE event data An SER number defines the point list to use for the log The number of retentions identifies the number of logs to save on disk for archiving purposes

A wait time can be entered for post fault and snapshot reports This value tells the console how long in minutes to wait after notification of data from the MFP or MFC module before polling the module for the data This field has no meaning for other report types The console continues to collect data until zero points are returned

NOTE The wait time should be shorter than the age limit set in the module configuration

Defining SOE Log Operating Parameters

The first step in configuring the console for SOE logging is setting the operating parameters This tells the console the number of re corders that are operating with this console, number of logs to create, and number of inputs per recorder It establishes a base for later configuration procedures, and determines the amount of disk space to allocate for SOE logging

Step 1 The process engineer sets the SOE operating parameters through the *SOE General Parameters* page (see Figure 15 51) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration
└→ *E System*
└→ *A System*
└→ *F SOE General Parameters*

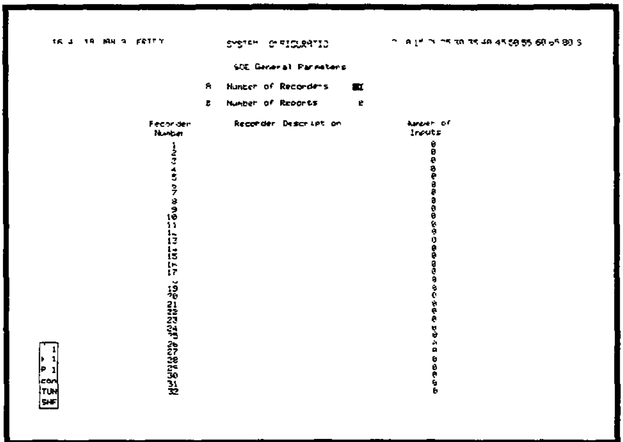

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Figure 15 51 Log Configuration SOE General Parameters

Step 2 To set the SOE logging parameters

a Use the OIS configuration keys refer to Table 15 1) to move between and enter data into each display field Table 15 28 de scribes the attributes of the SOE general parameters page, refer to this table when entering data b After completing all required fields, press ENTER This updates the configuration on the hard disk

c. Press ESC to exit this display

Table 15 28 SOE General Parameters Attributes

Field	Description
Number of recorders	Total number of sequential events recorders available for data collection in the system The console supports a maximum of 16 recorders A valid entry is from 0 to 16
Number of reports	Total number of SOE logs to be produced The console supports up to 80 SOE logs A valid entry is from 0 to 80
Recorder description	Optional field Up to 32 alphanumeric characters can be entered to identify and describe the recorder
Number of inputs	Number of inputs for that recorder The console supports a maximum of 1 536 inputs per recorder The SER hardware configuration determines the actual number of inputs of which each recorder is capable A base unit per recorder is 128 A valid entry is from 0 to 1536

Defining SOE Log RCM Tags

Each log the console is to create requires an RCM type of tag configured in the database For example, if the *Number of Reports* field set at the SOE general parameters page is 25, then 25 RCM tags for SOE logging must be defined The console uses an RCM tag to monitor the SOE log function block in the control scheme of an MFP or MFC module It monitors this function block to determine when to collect SOE data

The operator also uses this tag to initiate data collection and printing of an SOE summary log Refer to ***GENERATING SEQUENCE OF EVENTS SUMMARY LOGS*** in the ***Recording Process Data*** section for procedures to initiate a summary log

Follow the procedures for entering a tag, refer to ***Entering or Editing a Tag*** in this section Define a tag as a normal RCM tag, except define the *Loop, PCU,* and *Mod* fields as the hardware address of the MFP or MFC module being used for SOE logging The *Block* field must be the address of the SOE log function block (i e , FC 99)

Defining SER Input Lists

After setting the general parameters for SOE logging, the console requires a defined SER input list that links each input (i e , index number) to a tag defined in the database The console needs this list to acquire and print tag database data (e g , tag name and description) in the log printout

Step 1 The process engineer defines SER input lists through the *SER Definition* page (see Figure 15 52) To call this display, first press

[GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration
→ *C Logging*
→ *C Sequence of Events Log*
→ *A SER Definition*

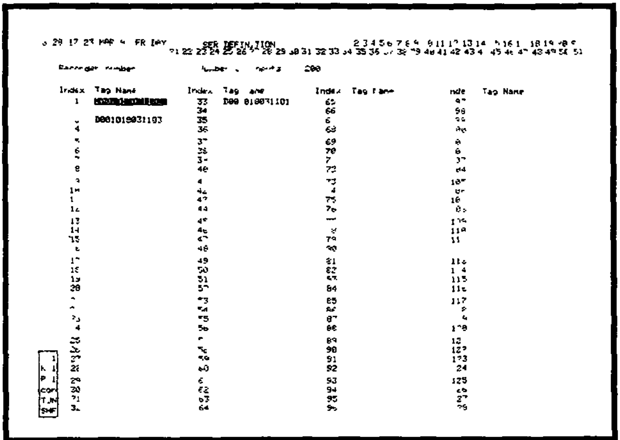

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Figure 15 52 Log Configuration SER Definition

Step 2 To define an SER input list

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field At the *Recorder number* field, type the recorder number to define an input list for, then press [ENTER] A valid entry for this field depends on the number of recorders set during SOE general parameters configu ration Refer to ***Defining SOE Log Operating Parameters*** in this section The *Number of inputs* field reflects the number of inputs defined for the selected recorder. This is also the number of index numbers that require definition

b Enter a tag name at the *Tag Name* field for each index number A maximum of 128 index numbers can display on the page Press [NEXT PAGE] to display the next set of 128 index numbers Continue to enter tag names for each index number until all re quired inputs (i e , index numbers) are defined

c Press [ENTER] after all entries are made to save the data to the hard disk d If additional lists are to be defined, move to the *Recorder number* field and repeat Steps 2a through 2c If this is the last or only list to define, press ESC to exit this display

---

SOE Report Definition

Each SOE log the console is to create must be defined individually The total number of logs to define relates directly to the *Number of Reports* set at the *SOE General Parameters* page Each RCM tag for logging is identified in the definition of a log

Step 1 The process engineer defines SOE logs through the *SOE Report Definition* page (see Figure 15 53) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration
→ *C Logging*
→ *C Sequence of Events Log*
→ *B SOE Report Definition*

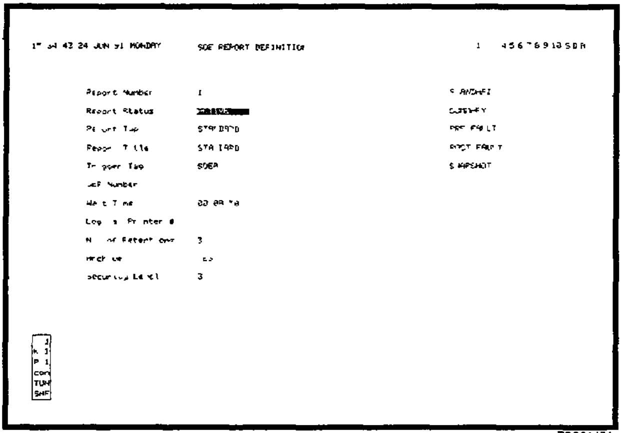

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Figure 15 53   Log Configuration   SOE Report Definition

Step 2 To define a log

NOTE A og must be *INACTIVE* to ed t

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Table 15 29 describes the attributes of the SOE report definition page, refer to this table when entering data At the *Report Number* field, type the number of a log to define, then press [ENTER] A valid entry for this field depends on the number of logs set during SOE general parameters configuration Refer to ***Defining SOE Log Operating Parameters*** in this section.

b After completing all required fields, press [ENTER] This updates the configuration on the hard disk

c To enter additional logs, press [ESC] to call a *Report number* prompt Enter the number of the next log to define or edit then press [ENTER] Repeat Steps 2a and 2b Press [NEXT PAGE] or [PREV PAGE] to sequence to the next or previous index number without having to call the *Report number* prompt

d Once all tags are defined or edited, press [ESC] to exit this display

Step 3 To start data collection for a completely defined log, make it *ACTIVE* A log can be activated as the final step of definition, or it can be left inactive after definition and activated later through log status functions Refer to ***Log Status*** in the ***Recording Process Data*** section for procedures to activate a custom log

To activate a log

a Use the OIS configuration keys to move to the *Report Status* field Key in **ACTIVE**

b Press [ENTER] to initiate the change

Table 15 29 SOE Report Definition Attributes

Field	Description
Report number	Shows the number of the current log Each SOE log must be configured separately A valid entry is from 1 to the number of reports set during SOE general parameters configuration (maximum 80)
Report status	Shows the current status of the log and allows turning the log on or off A valid entry is ACTIVE = activates the log INACTIVE = deactivates the log the log must be *INACTIVE* to edit any fields The log can be set to *ACTIVE* as the last step of SOE report definition, or it can be left *INACTIVE* and turned on later using log status functions Once *ACTIVE* the console begins to monitor a module for data
Report type	Identifies the report type for printing purposes only The actual report type is set in the configuration of an MFP or MFC module A valid entry is PRE FAULT SNAPSHOT SUMMARY POST FAULT STANDARD
Report title	Report title of up to 32 characters that is to appear in a printout, this field is for printing purposes only

Table 15 29 SOE Report Definition Attributes (continued)

Field	Description
Trigger tag	*Name of the RCM tag defined to support this SOE log*
SER number	Number of the recorder for this log which is also the number of an SER input list This links an SER input list to this log A valid entry is from 1 to the number of recorders set during SOE general parameters configuration (maximum 16)
Wait time	Amount of time the console should wait after notification of data from the MFP or MFC module before polling the module for the data Valid for post fault and snapshot reports only The time is entered in *hour minute second format* **NOTE** The wait time should be shorter than the age limit set in the module configuration
Logical printer #	Logical printer this log prints to after the console collects data A valid entry is from 1 to 8
No of retentions	Number of generations of the log that are to be saved on disk up to nine generations can be saved The saved logs are the nine most recently generated Saved logs can be demanded at a future time for printing using the *Log by Name* function The console drops the oldest log as new logs are retained A valid entry is from 0 to 9
Archive	Enables archiving for this log relates to archival storage YES – enable archiving, use to enable storage of log images to an archival storage medium NO – disable archiving
Security level	Security level assigned to the log and required by an operator to perform log status operations on the log Relates to password *security A valid entry is from 1 to 16*

Archival Storage

NOTE *Archival storage discusses the configuration requirements that define data archiving to storage media only Refer to* ***ARCHIVING*** *in the* ***Recording Process Data*** *section for data retrieval procedures and methods for displaying and printing retrieved data*

The archiving function provides an integrated method for storing console data and INFI 90 process data Archiving extends normal storage of logs, PCU configurations, system events, trends, and tag data indefinitely Data can be archived to floppy disk, magnetic tape or optical disk storage medium Archiving extends normal storage of logs, PCU configurations, system events, trends and tag data indefinitely Once data is archived, the operator can use archival retrieval or tag historian functions to retrieve data for printing or display

NOTE Currently only standard trends can be archived

The different data types are

- Logs (after completion of the collection period)

  Trend log (standard type custom log)

Trip log (trip type custom log).

Snapshot log (periodic type custom log)

Sequence of events log

- Trends

  Raw trend data on a per trend basis

- Events (list of system events and operator actions)

- Tag data

  Analog tag snapshots

  Digital tag exceptions

  Alarms

- PCU configurations

  NOTE n most cases the amount of tag data be ng stored is considerable The console requires a hard d sk with a m nimum s ze of 170 megabytes for tag data storage and tag historian operat on

Any of the data types in any combination of data can be put on any single medium However, individual data types cannot be split up to go to more than one medium

The archival storage and retrieval function of the console enables storage for individual data types, and also directs data type archiving to specific storage medium This function also provides retrieve data, directory (archive volume and retrieved data), store data and use new volume options

Archiving should be considered prior to trend, tag, and log configuration since the process engineer sets attributes related to archiving during these configurations It can, however, be enabled any time Complete archival storage configuration requires the following procedures

- Archival configuration
- Configuring events to be archived
- Configuring trend data to be archived
- Configuring custom logs to be archived
- Configuring sequence of events logs to be archived
- Configuring PCU configurations to be archived
- Configuring tag data to be archived

The *Archival Configuration* option sets up the operating parameters as they pertain to archival storage This must be done first since attributes set during this configuration allocate hard disk space for archived data storage, and turn archiving on for each data type to be archived

The configuring of individual data types establishes the specific logs, events, PCU configurations, tags, and trends that are to be archived These configurations define the data that the console collects and stores in hard disk files

These procedures reflect requirements when utilizing all available archival storage options Not all data types have to be set to archive when archiving is being configured Therefore, not all of the procedures in this section are required The console can archive only one data type at a time, or a few or all data types if desired If archiving any data, archival configuration must be done first

ARCHIVAL CONFIGURATION

The process engineer performs three separate configuration procedures to set up archival storage All work together to allow the console to establish archiving criteria These include

- Data type to volume definition
- Volume to media definition
- Miscellaneous definitions

Hard Disk Data Storage

The console requires archival storage configuration to automatically store data to its hard disk for eventual archiving to storage medium The data, established through configuration of the individual types of data, stores in archive data files These files contain the data collected that will eventually be archived

The parameters set during archival storage configuration affect all data types Archived data resides temporarily at a reserved area of the hard disk The amount of hard disk space reserved for archiving is set during this configuration Each data type competes for this reserved space Storage to hard disk of trend, tag, event, log, or PCU configuration data must be enabled before any data can be archived

The log configuration procedures enable storage of individual custom logs and system events Trend definition procedures enable storage of trend data PCU management functions enable storage of PCU configurations

The tag historian function provides the capability for storing, archiving and retrieving tag data (i e , exception reports) Since the initial archival storage and retrieval of tag data is handled the same as other types of data, the same media and options are available Archived tag data that has been retrieved can be printed for up to 100 tags at a time

Hard disk storage for archived data is temporary Once configured, the console collects and saves specific data in hard disk files until it reaches a scheduled archive time or time interval It then archives the data to the specified storage medium After archiving all saved data, the console then overwrites old data in these archive data files with new data in preparation for its next archival storage This sequence repeats until archiving is disabled Once archived to medium, process data storage becomes more permanent

The amount of hard disk space that can be used for archival storage depends on the total amount of unused disk space available The console references a disk space for archiving allocation made during miscellaneous definitions This allotment and a disk space for data retrieval storage allocation should be at or less than the total unused disk space available

To limit storage of archived data to a reasonable amount, the console uses the disk space for archiving allocation as a guideline for data storage To prevent data loss, it will temporarily use additional hard disk space as necessary going beyond the allocated amount It does this in anticipation of some data files being deleted after archiving to medium If for some reason archiving to medium cannot take place (e g , medium not installed or wrong volume), the console begins to write new data over old data resulting in loss of archived data

Media Storage

The console automatically stores archived data to storage medium after reaching a defined time or time interval Before it can automatically archive, the console requires specific parameters that identify the archived data that stores to a particular medium The files for archived data contain only one type of data Any combination of these data files can be stored on any one medium

An archive to medium consists of only the data saved during a defined time interval The console assigns a sequence number to each archive that occurs This sequence number is used later to retrieve data

The console uses two configuration definitions to determine which data stores on a particular medium Data type to volume definition and volume to media definition

Data Type to Volume Definition

Data type to volume definition does three different things

1 Turns archiving on or off for each data type

2. Assigns a volume name to each data type

3 Sets the console overwrite priority

An on/off attribute acts as a master switch for archiving of each type of data Archiving can be enabled or disabled for individual data types This affects both media storage and hard disk storage

The console requires a volume name for each archived data type This groups data types into a single volume for archiving to a single medium The console uses this name to verify that the correct medium is installed for the volume of data being archived

Archiving hard disk space is limited If this space is completely consumed, the console begins overwriting old data with new data An overwrite priority sets the order the console uses to overwrite old data The console overwrites the lowest numbered data type first

Step 1 The process engineer defines the data type to volume through one of the *Define Archiving* pages (see Figure 15 54) To call this display, first press $\boxed{\text{GENL FCTNS MENU}}$, then select the following menu items in the sequence shown

B OIS Utilities
→ *F Archival Storage/Retrieval*
→ *A Archival Configuration*
→ *A Data Type to Volume Definition*

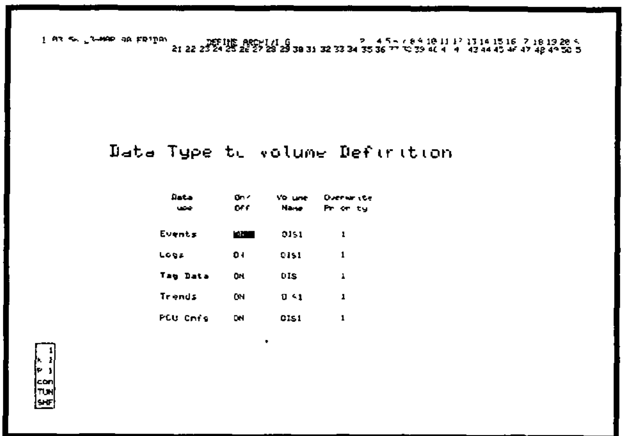

Figure 15 54 Archiving Data Type to Volume Definition

Step 2 The five fields under the *Data Type* column are *Events*, *Logs*, *Tag Data*, *Trends* and *PCU Configuration* The data types can be segregated as individual volumes of data or consolidated in any combination into one volume of data However, a data type cannot be split up between volumes

When changing a data type from on to off, the console deletes all files containing data already collected for the data type from the hard disk This data then does not archive at any time to a storage medium To prevent loss of archived data, it is suggested that this change not be made until either the console completes an archival storage or the *Store Data* option is used to force data storage Refer to ***ARCHIVING*** in the ***Recording Process Data*** section

To define each data type

a Use the configuration keys listed in Table 15 1 to enter data and move between each display input field Set the *On/Off* field for each data type to **ON** to enable archiving of that type of data, set it to **OFF** to disable archiving

The *On/Off* field activates or deactivates archiving for a given data type For example, *Trends* field is *ON* *Logs* field is *OFF* All trends with a *Usage Type* of *ARCHIVED* will archive, while logs do not even if they are set to archive in their configurations

If the *On/Off* field is turned on for a data type, the *Volume Name* cannot be left blank An error message appears if the name is blank and **ENTER** is pressed

b For each data type that is *ON*, enter a four character volume name at the *Volume Name* field The name appears when perform ing volume name to media definition

This is ***not*** the type of medium The console associates a volume name to a certain type of medium through volume to media defi nition If the name of the volume of data stored on an installed medium does not match the name configured here when it is time to archive data, the console prompts to install the correct volume through an operator action request

If the *Volume Name* field was previously defined, the console does not allow clearing it at any time in the future The volume name can be changed, however, at any time If attempting to clear the name, the message *Volume Name previously defined cannot be blank* appears

c At the *Overwrite Priority* field for each data type, enter the pri- ority the console is to use when determining the overwrite order This field sets the order in which old data is overwritten in the event archiving exceeds its allotted disk space The lowest num bered data type is overwritten first

d When completed, press **ENTER** to save the changes This up dates the configuration on hard disk

e Press **ESC** to exit

Volume to Media Definition

Once the volume names are assigned, volume to media definition

- Assigns the type of medium to which a volume of data archives
- Assigns descriptive text to identify a volume of data
- Sets the time of day that archiving to medium occurs
- Sets the time interval between each archive to medium after the initial start time

The console requires a medium type assigned to each volume of data This determines to which medium the volume stores Remember that a volume of data includes all data types that have the same volume name When the console attempts to archive a volume of data to medium, it first checks if the storage medium is installed It also checks the medium for a volume name before it begins storing data If the medium was previously used and contains a volume of data with a name that does not match a volume being archived, the console generates an operator action request to install the correct volume This can be a medium that contains previously archived data or a blank tape

The console provides a function to read the directory of an installed medium Refer to ***ARCHIVING*** in the ***Recording Process Data*** section for specifics The directory gives

- *Type of archive medium*
- Volume name
- Sequence number
- Beginning and ending time of each archived period
- Number of events, logs, trends, tag data files and PCU configurations stored during each archive period

Archive Scheduling

A time of day attribute sets the start time for archiving A time span attribute sets the interval between archives The frequency can be every four, six, eight or 12 hours, or any multiple of one day or week The start time and the interval operate in conjunction with each other

Any time span equal to or less than one day (i e , 24 hours) causes an initial archive of data to occur at the specified time of day After this initial archive, they continue to occur regularly at a defined interval Any time span greater than one day causes the initial archive to occur at the defined time of day after completing the initial time span period Additional archives occur regularly at the defined time span interval, and at the defined time of day

Time Span ≤ One Day

For example, an archive has a *Time of Day to Output Data* set for 13:00 (i e , 1 00 p m) It also has a 12 hour *Time Span* The first archive to storage medium does not take place until 13 00 The data in this initial archive is all data saved between the time starting at completion of archiving configuration and 13 00 Additional archives continue to occur at 1.00 and 13.00 daily The initial archive does not contain a full 12 hours of data, but subsequent archives contain 12 complete hours of data

Time Span > One Day

For example, an archive has a *Time of Day to Output Data* set for 17:30 (i e , 5 30 p.m) It also has a seven day *Time Span* The first archive to storage medium does not take place until 17 30, six days after the first 17 30 time passes This is because the first day in the seven day count is from the time starting at completion of archiving configuration to 17.30 of the same day The first day of the initial archive is not a complete 24 hour collection Additional archives occur at seven day intervals and at 17:30 These subsequent archives contain seven complete days of archived data.

The console generates an operator action request if archiving does not take place at its scheduled time, or if it cannot automatically archive stored data An operator action request notifies the operator that specific actions must be taken to continue processing data and prevent data loss If no action is taken, the console begins writing new data over old data resulting in loss of archived data

Because the amount of tag data that stores on the hard disk can be considerable, the recommended frequency for tag data archiving to medium is at least once a day The time interval between archives determines the amount of hard disk space files containing tag data consume. The console automatically archives tag data more frequently when necessary (e g , no more hard disk space available) The storage medium must already be installed when the console attempts to archive data to prevent data loss

Step 1

The process engineer determines volume to media definitions through one of the *Define Archiving* pages (see Figure 15 55) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities

→ *F Archival Storage/Retrieval*

→ *A Archival Configuration*

→ *B Volume to Media Definition*

Step 2

The *Volume to Media Definition* page allows configuring each volume of data This defines to which medium (i.e , floppy disk, magnetic tape or optical disk) a volume should archive The *Volume Name* field cannot be changed, and reflects the volume names configured in data type to volume definition

a Use the configuration keys listed in Table 15 1 to move between and enter data into each display input field At the *Volume*

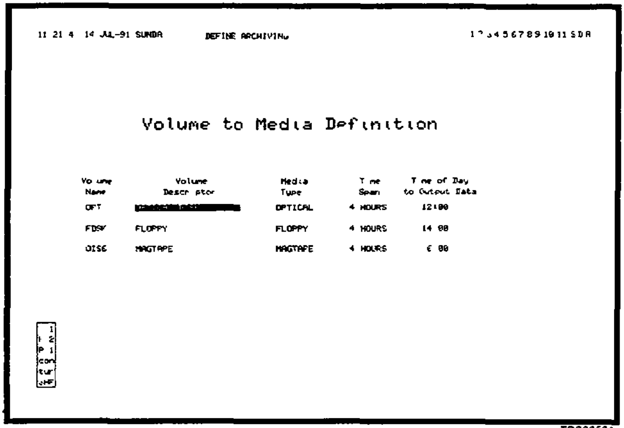

Figure 15 55 Archiving - Volume to Media Definition

Descriptor field, assign a meaningful descriptor of up to 20 char acters to describe the purpose of this volume of data For example, it can show the type of data being stored such as *TRENDS AND LOGS*

b At the *Media Type* field enter the type of medium to which the console is to store this volume of data A valid entry is **FLOPPY**, **MAGTAPE** or **OPTICAL** The magnetic tape and optical disk options require optional hardware

> **NOTE** Examples of *Time Span* and *Time of Day to Output Data* field interaction and setting are given earlier in this section

c The *Time Span* field determines how often the console will write the volume of data to storage medium A valid entry is **4 HOURS 6 HOURS, 8 HOURS, 12 HOURS**, *nn* **DAYS** or *nn* **WEEKS**, where *nn* is a maximum of 99 Longer time spans require more hard disk space

> **NOTE** The shortest valid time range is four hours The *Time Span* field set for each trend to be archived must be at least the archive time span set during this configuration plus two hours It is the responsibility of the process engineer or operator to insure that this requirement is met

Since floppy disk media do not provide a large amount of storage space, it is recommended that storage to this type media be lim ited to a time span not greater than seven days, and this seven day time span be reserved for archiving of logs or PCU configura tions The number of archives to floppy should be minimized to allow the console to collect data until it just fits on the floppy (about one megabyte of data) Using an extended time span with this media type to store other data types would require installing new medium almost continuously

d At the *Time of Day to Output Data* field enter a time that archiving to storage medium is to occur each day

e. When all fields are complete, press ENTER to update the configuration on hard disk

f Press ESC to exit

Miscellaneous Definitions

Miscellaneous definitions

- Allocates hard disk space for archival storage
- Sets a disk fullness warning level
- Allocates disk space for archive data retrieval
- Defines magnetic tape density

Up to 20 megabytes of hard disk space (or 40 megabytes when using a hard disk of 170 megabytes or greater) can be reserved for archived data storage during configuration This allocation limits hard disk space consumed by archive data files, which prevents the console from using so much space just for archiving that other operations would not function properly The amount to reserve depends on the amount of data being archived, the time span between archives, and the amount of available unused hard disk space

The console uses this allocation as a guideline when storing data It will temporarily use additional hard disk space if required to prevent data loss, however, there is still a limit to the amount of space available for temporary use

The console has the ability to notify an operator to perform certain actions to prevent loss of archived data It uses a fullness warning level value set during configuration to notify an operator when archived data storage has consumed a certain percentage of allocated disk space When the percentage is reached, the following message appears at the operator information events page to notify an operator

ARCHIVAL APPROACHING CONFIGURED DISK SPACE ALLOTMENT

A *Store Data* option in the archival storage and retrieval function allows the operator to force data storage if this message appears Refer to ***OPERATOR INFORMATION EVENTS*** in the ***OIS Operational Information*** section for details concerning the operator information events page

The message *Fullness warning level/100* displays if the allocated hard disk space fills completely At this time, the operator must take some action to prevent loss of archived data The action can be to decrease the amount of data being archived, decrease the time span or increase the amount of hard disk space reserved for data storage Decreasing the time span causes archiving to storage medium to occur at closer intervals reducing the amount of data stored on disk

A temporary solution is to force data to be archived using the *Store Data* option This removes the message temporarily but does not fix the problem

If the message *ARCHIVAL APPROACHING CONFIGURED DISK SPACE ALLOTMENT* appears on the operator information events page when the fullness level is set to 90 percent, the *Time Span* should be decreased If the *Time Span* is already at its minimum of four hours, the only other option is to decrease the amount of data to be archived (e g turn off archiving for some of the data)

Step 1 The process engineer defines the operating parameters of archiving through one of the *Define Archiving* pages (see Figure 15 56) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities
→ *F Archival Storage/Retrieval*
→ *A Archival Configuration*
→ *C Miscellaneous Definitions*

Step 2 To define the operating parameters

a Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field At the *Disk Space for Archiving* field, enter the amount of space to use for data storage This limits the maximum amount of disk space that archival storage uses A valid entry is from 1 to 20 (or 40 when a hard disk of 170 megabytes or greater is installed

The value to enter depends on the quantity of data to be archived, and the time span between each data type archive The more data to be archived and the longer the time span, the larger this field should be It should allow enough hard disk space for four archiving periods After the fourth period, files for the oldest archiving data are replaced by the newest archived data

When archiving to magnetic tape or optical disk, a starting value of five megabytes is suggested The maximum value of this field should be set to four megabytes if storing to floppy disk only This requirement is due to the limited storage capacity of floppy disks (approximately one megabyte) If a higher number is used and data is not stored before reaching one megabyte, archiving continues to ask for a new medium to be installed and no data is stored

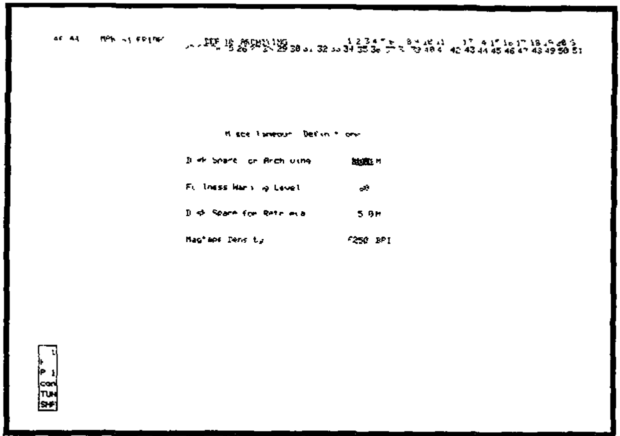

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Figure 15-56 Archiving Miscellaneous Definitions

The amount of hard disk space used for tag data storage varies. The amount of space tag data occupies depends on the number of exception reports received for each tag, the configuration data of each tag, and the amount of time between archives to medium. For example, at a rate of ten exception reports every second collected over 24 hours with a tag type distribution of 50 percent analog, 30 percent digital and 20 percent station, 1,000 tags generate approximately 17 megabytes of data in one day.

b. Enter a percentage of disk space in the *Fullness Warning Level* field. The entry in this field determines when the following message appears at the operator information events page:

ARCHIVAL APPROACHING CONFIGURED DISK SPACE ALLOTMENT

The level is based on the amount of *Disk Space for Archiving* that archival storage has consumed.

c. The *Disk Space for Retrieval* field limits the amount of disk space that archival retrieval uses. The value to assign to this field depends on how much data is to be retrieved, and other functions competing for disk space. A starting value of one megabyte is suggested. Refer to ***ARCHIVING*** in the ***Recording Process Data*** section for specifics on data retrieval. A valid entry is from 1 to 20 (or 40 when a hard disk of 170 megabytes or greater is installed).

d. The *Magtape Density* field selects the amount of data to be stored per inch of tape. A valid entry is **1,600**, **3,200** and **6,250**. To minimize tape usage, a density of 6,250 is suggested.

e When complete, press ENTER to update the configuration on the hard disk

f Press ESC to exit

CONFIGURING EVENTS TO BE ARCHIVED

Events and operator actions related to tags defined in the data base can be archived The process engineer enables individual types of events for archiving during tag configuration These event types include alarms, digital state changes and operator actions, each is enabled separately Once tag configuration is set, system events log configuration then provides the master switch for enabling storage to hard disk for eventual archiving

The same data that appears in a periodic printout of a system events log (or operator actions log) appears in an archive of events *Operator actions and system events are not separated in* an archive as can be done when printing Before any archiving of events can occur, first each tag event must be saved to disk, then archiving of those events saved must be turned on

> **NOTE** Changes made to these configuration pages also affect printing of events and operator actions logs

Step 1 Follow the procedures for editing tags, refer to ***Entering or Editing a Tag*** in this section Each event type to be archived must be enabled to store to the hard disk The tag configuration page provides three attributes for enabling this storage *Alarm Save*, *State Change Save* and *Optr Acts Save* These fields also enable saving data to hard disk for periodic printing of events and operator actions Set the *Save* field for each event type to **YES** to enable storing that type of event, set the field to **NO** to disable storage *This must be done for all tags that are to have events or operator* actions archived

Step 2 Follow the procedures for defining system events log operating parameters, refer to ***Events Log Configuration*** in this section To set the attributes required for archiving

a At the top of the event log configuration page are fields that enable saving to disk all tag events previously configured through Step 1 The console provides the option of enabling or disabling specific types of events Each event type permitted through tag configuration does not store until its *Save* field is set to **YES** at this page Set the *Save* field to **NO** for an event type to disable saving that event to disk, which also disables archiving If this field is set to *NO*, events will not store to the hard disk even if they are enabled in the configuration of the tag

b Set the *Archive Items Saved to Disk?* field to **YES** to enable archiving *of all events previously saved to the hard disk* This turns on storage of events for later archiving Set the field to **NO** to disable archiving

These actions along with other configuration changes (explained earlier) enable archiving for events of selected tags

CONFIGURING TREND DATA TO BE ARCHIVED

> **NOTE** Trend resolution defined in a trend definition for storing data is the resolution used in archiving

Each trend that is to be archived must be enabled individually Follow the procedures for trend definition, refer to ***Entering a Trend Definition*** in this section The trend definition page has a *Trend Usage* field Set this field to **ARCHIVED** to enable archiving This action along with other configuration changes (explained earlier) enables archiving of the selected trend data This must be done for all trends that are to be archived

CONFIGURING CUSTOM LOGS TO BE ARCHIVED

Logs can be archived on a per log basis To configure a custom log to archive, follow the procedures for custom log configuration, refer to ***CUSTOM LOG CONFIGURATION*** in this section Set the *To be Archived?* field to **YES** to enable or **NO** to disable archiving for the log This action along with other configuration changes (explained earlier) enables archiving of the selected log This must be done for all custom logs that are to be archived

In order for the log to print and be archived, it must be *ACTIVE* A log can be activated at the log definition page during initial configuration, or later through log status operations A log archives only after completing its entire collection period

CONFIGURING SEQUENCE OF EVENTS LOGS TO BE ARCHIVED

Each SOE log configured at the console must be enabled individually to archive Follow the procedures for SOE report definition, refer to ***SOE Report Definition*** in this section Set the *Archive* field to **YES** to enable or **NO** to disable archiving for the log This action along with other configuration changes (explained earlier) enables archiving of the selected log This must be done for all logs that are to be archived

CONFIGURING PCU CONFIGURATIONS TO BE ARCHIVED

Besides turning PCU configuration archiving on through data type to volume definition, there is no other configuration to perform to enable archiving of configurations Once turned on, saving a configuration through PCU management functions automatically stores the configuration in an archive data file The configuration is then archived to medium when scheduled through volume to media definition, or after using the *Store Data* option

CONFIGURING TAG DATA TO BE ARCHIVED

NOTES

1 Th s section discusses the *Histonan Group Configuration* opt on of the tag histonan only Th s option def nes the tag data that is to archive Refer to ***ARCHIVING*** n the ***Recording Process Data*** section fcr nformat on on the *Tag Histonan Retneval* and *Pnnt/Delete RDF* options

2 The tag histonan does not support TEXTSTR tags

The process engineer enables archiving of tag data through tag historian functions For the console to collect and store tag data for archiving, a tag must be part of a tag historian group Up to ten groups can be defined, each group containing up to 100 tags The console records both exception reported and database con figuration data for each tag defined in an historian group Record ing both allows data to be recalled regardless of database changes

Tag historian functions also provide tag data retrieval and printing abilities Retrieval is done by alarm group, historian group, specific tag names or wild card tag names

Collection for groups can be activated or deactivated through group configuration at any time Tag historian groups can be modified while *ACTIVE* (i e , tags can be added or deleted)

NOTE Tag historian requ res a hard disk of 170 megabytes or greater

Data archives to medium automatically at a frequency defined through archival storage configuration The operator can retrieve tag data from medium using standard archival storage and re trieval functions Once retrieved, a second retrieval for more spe cific data can be requested through tag historian operations

Step 1 The process engineer enables and defines tag data archiving through the *Historian Tag Configuration* page To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities

→ *J Tag Historian*

→ *A Historian Group Configuration*

Step 2 To define or edit a tag historian group

a At the *Enter Historian Group Number* field enter the number of a group to define or edit, then press ENTER A valid entry is from 1 to 10 Figure 15 57 shows an example of the next page after pressing ENTER If the group has previously been defined, the name of each tag assigned appears Also, the *Group Status* field may indicate *ACTIVE* A group can be edited while the group is active

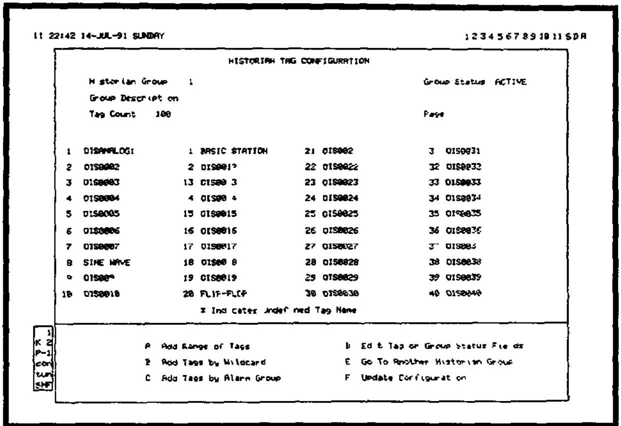

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Figure 15 57 Archiving - Historian Tag Configuration

b Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field Use one of the add options or the edit option from the menu to enter tags into the historian group list These options are explained in the text that follows the steps

When tags are added, the *Tag Count* field increments to indicate the current number of tags in the list An asterisk (*) appears next to the name of a tag in the historian group tag list if that tag has been either renamed or removed from the database

c After editing or entering all tags in a list, select option *D Edit Tag or Group Status Fields* This places the input cursor at the *Group Status* field

d If *INACTIVE*, enter **ACTIVE** to start data collection and storage for this group If already *ACTIVE* go to the next step

e Select *F Update Configuration* to save any changes, update the configuration on hard disk, and to begin data collection If edits are made without saving, the console prompts with

Edits Were Made - Update Configuration"

f If another group requires editing, select *E Go To Another Historian Group* Or press NEXT PAGE or PREV PAGE to go to the next or previous group respectively Repeat Steps 2a through 2e

g Press ESC to exit this configuration

Use the add options to add a new list of tags, or to append to an existing list of tags Adding tags by specifying a range, wild card name or alarm group does not duplicate tags that already appear in an historian group

If more than 100 tags are specified, the tag list is updated, but the console does not add any tags over the 100 limit It displays a warning at the bottom of the screen to identify this, and control returns to the bottom line menu

The process engineer can perform any of the configuration options after calling a specific group from the *Enter Historian Group Number* field This input field appears when the function is first called, or after selecting *E Go To Another Historian Group* The definition of the current group must be saved (i e , option *F*) before using the *Go To Another Historian Group* option If the current group is not saved first, the console prompts with

Edits Were Made Update Configuration

This message appears when attempting to exit the configuration without saving If no changes have been made to the group, the configuration can be exited or option *E* can be selected without first saving

Add Range of Tags

Use the *A Add Range of Tags* option to specify a consecutive range of tags or a single tag to add Select the option, the system prompts with *Tag Index* ___ *To* To enter a range, specify the first tag in the range at the first input field Then move to the sec ond input field and enter the last tag in the range To enter a sin gle tag, enter the same tag index number in both fields

Press ENTER to add the specified tags to the historian group and to update the screen Press ESC before pressing ENTER to cancel all inputs and return control to the options menu

Add Tags by Wild Card

Use the *B Add Tags by Wildcard* option to enter tags by specifying a search pattern and range Select the option, the system prompts with *Wildcard Pattern* ___, *Tag Index* *To* Enter a wild card pattern the console is to use when searching for tag names, then enter a tag range The tag range is optional The console defaults to the entire tag database range

The asterisk (*) and question mark (?) are reserved for wild card use The asterisk represents multiple characters, the question mark a single character For example, ABC*XYZ retrieves any tag beginning with ABC and ending with XYZ with any number of characters in between ABC?XYZ retrieves any tag beginning with ABC and ending with XYZ and only one character in between Any combination of * and ? can be used The system supports multiple occurrences of ? Multiple occurrences of * are treated as ? after the first *

Press [ENTER] to start the search and to add tags within the range that match the wild card pattern into the tag historian group Press [ESC] before pressing [ENTER] to cancel all inputs and return control to the options menu

Add Tags by Alarm Group

Use the *C Add Tags by Alarm Group* option to enter tags by specifying an alarm group range and tag range Select the option, the system prompts with *Alarm Group* ___ *to* , *Tag Index* ___ *To* ___ The entire tag range is from 1 to D (i e , 1 to 99, S and D) *To enter an alarm group range, specify the starting alarm group of* the range in the first input field Then move to the second input field and enter the last alarm group of the range To enter a single alarm group, enter the same alarm group number in both fields The tag range is optional The console defaults to the entire tag database range

Press [ENTER] to add tags within the alarm group range that are within the tag range into the historian group Press [ESC] before pressing [ENTER] to cancel all inputs and return control to the options menu

Edit Tag or Group

Use the *D Edit Tag or Group Status Fields* option to view the entire list of tags in the group to modify the list Also use the option to activate or deactivate the group Select the option, the console initially positions the input cursor at the *Group Status* field Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field The *Tag Count* field increments or decrements to show the current number of tags in the list as tags are added or deleted There are three pages associated with each group Press [ESC] at any time to cancel all inputs and return control to the options menu

To view the entire list of tags in the group

a Select *D Edit Tag or Group Status Fields*

b Press [NEXT PAGE] or [PREV PAGE] The *Page* field indicates the current page

Enter **ACTIVE** at the *Group Status* field to activate the current group and enable data collection

Enter **INACTIVE** at the *Group Status* field to deactivate the current group and disable data collection

To delete a tag

a Move to a specific tag name in the list to delete that tag.

b Press [CLEAR] to delete the tag name

c Select *F Update Configuration* to update the configuration on the hard disk

To add or change a tag

a Move to an available location in the list to add a tag Move to a specific tag name in the list to change the name

b Enter the tag name or index number of the tag to add. Type a new tag name or index number to change the current tag to another

c Select *F Update Configuration* to update the configuration on the hard disk

If the entered tag name or index number is invalid, the console presents an error prompt and positions the input cursor at the tag in error

Peripheral Configuration

The console uses several peripheral devices to support data storage and recording, and process monitoring and control These include keyboards, annunciator display panels, CRTs, printers, touch screens and data storage devices Besides enabling and defining the number of peripherals the console uses, peripheral configuration requirements are few The number of each type of device being used is accounted for during OIS system configuration Refer to the ***Operator Interface Station, Hardware Manual*** for peripheral connections

Peripheral configuration includes

- Defining DEVSTAT tags
- Console and logical CRT definitions
- Printer configuration
- Peripheral failover configuration

DEFINING DEVSTAT TAGS

The console has the ability to monitor the status of its own peripherals and indicate problems through alarm indicators, and status through a device status display To do this, a DEVSTAT type tag must be defined for each peripheral device the console uses Refer to ***Entering or Editing a Tag*** in this section for procedures to define a DEVSTAT tag

During tag database configuration, each DEVSTAT tag is automatically assigned to alarm group D Alarm management configuration defines alarm indications for this alarm group

The console provides a standard device status display The only requirement for a peripheral device to appear in this display is a DEVSTAT tag defined for that device This display can be called through menu selections or *Display by Name*. Refer to ***PERIPHERAL DEVICE STATUS*** in the ***INFI 90 and OIS Diagnostics*** section The operator can also monitor a DEVSTAT tag through the operating parameters page

A DEVSTAT tag also performs another purpose. It identifies the type of peripheral device being used For example, the console supports several different printer types The number of printers supported by a console is set during OIS system configuration The types of printers are set in DEVSTAT tags If any other printer is used besides the default ANSI, low speed, no color printer, a DEVSTAT tag must be defined to identify the type.

CONSOLE AND LOGICAL CRT DEFINITION

Currently, only password security requires logical CRT definition The console uses console definition and logical CRT definition to define its screens as logical CRTs Once these configurations are set, the console can enable or disable access to its own screens The access is determined through security level configuration, refer to ***Password Security Configuration*** in this section

The *Console Definition* and *Logical CRT Definition* options used together create a single security strategy for screen access that can be used on multiple consoles if desired The security requirements of the process dictate how the configurations should be set up to work together

For a system having a single console driving two screens for example, the console requires only one console definition to identify itself and two logical CRT assignments to identify each of its screens A system having four consoles each driving two screens, for example, would require four console definitions and also a logical CRT assignment for each screen of each console The same assignments would be defined on all four consoles The advantage to using this method rather than treating each console as an individual is that all four consoles can use the same configuration since the hardware address of a console definition identifies the console

Console Definition

Console definition identifies the hardware address location of a console on the communication highway. The address definition is used strictly at the console level for password security to distinguish between consoles This address is the loop and node address of a console Console definition allows up to eight definitions Once defined, the *Console #* can be used in logical CRT definition Only one console definition is required by the console, however, all eight can be defined to allow flexibility in creating a security strategy common to several consoles

> **NOTE** Console definition must be done before logical CRT definition it defines a console number required in logical CRT definition

Step 1 The process engineer defines consoles through the *Console Definition* page (see Figure 15 58) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration → *E System* → *J Console Definition*

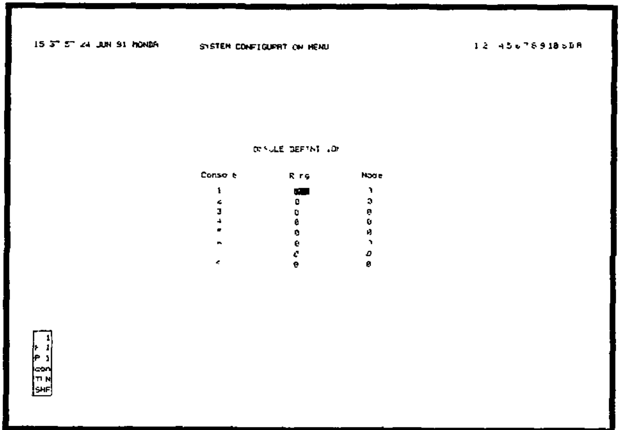

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Figure 15 58 Peripheral Configuration Console Definition

Step 2 To create a console definition

a Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field At the *Ring* field, enter a communication highway address A valid entry is from 1 to 250 for INFI NET system, or 0 and 1 for Plant Loop system Set the field to **0** to have the console use its own loop address automatically

b Enter the node address for the console at the *Node* field A valid entry is from 1 to 250 for INFI-NET system, or 1 to 63 for Plant Loop system Set the field to **0** to have the console use its own node address automatically

c Repeat Steps 2a and 2b for each console that is to be defined Press ENTER to save the configuration to hard disk

d Press ESC to exit this configuration page

Logical CRT Definition

Logical CRT definition creates up to 16 logical CRT assignments The configuration identifies the screens of the console as logical CRTs A console number and a screen number define a logical CRT Console definition procedures assign a number to a console, which is required and used in this configuration

Step 1 The process engineer creates logical CRT definitions through the *Logical CRT Definition* page (see Figure 15 59) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *E System* ⟶ *I Logical CRT Definition*

NOTE The number of logical CRT ass gnments requ red depends on the number of screens supported by the conso e

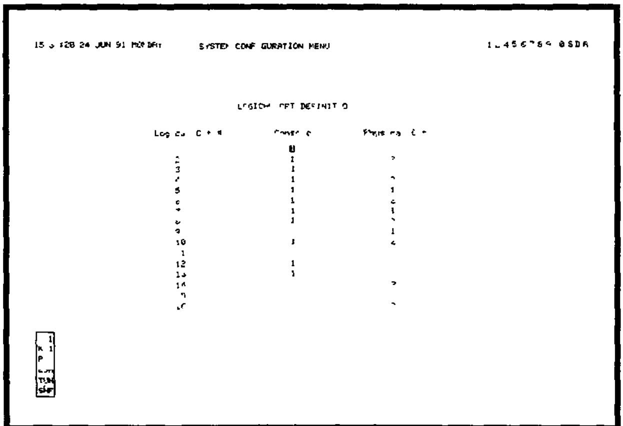

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Figure 15 59 Peripheral Configuration - Logical CRT Definition

Step 2 To create a logical CRT definition

a Use the OIS configuration keys listed in Table 15-1 to move be tween and enter data into each display input field At the *Console* field, enter the console number for which the logical CRT assign ment is being made. A valid entry is from 1 to 8 This is the con sole number defined earlier through console definition

b Enter a physical CRT number at the *Physical Crt* field This defines which of the supported screens the *Logical Crt #* is to identify A valid entry is 1 or 2 c Repeat Steps 2a and 2b for each logical CRT to define Press ENTER to save the configuration to hard disk

d Press ESC to exit this configuration page

PRINTERS

A single console supports two physical printers. The number of physical printers is defined during OIS system configuration The types for log and display screen printing are

- ANSI low speed, no color
- ANSI low speed, color
- ANSI high speed, no color
- IBM, no color
- IBM, color
- IBM, black and white, 24 pin
- IBM, color, 24 pin

The console also supports a color video copier for printing true color prints of displays Refer to the ***Operator Interface Station, Hardware Manual*** for specifics and connections

The console can monitor its printers by defining a DEVSTAT tag for each printer A DEVSTAT tag is also required to define a printer if it is any type other than ANSI low speed, no color

In addition to defining DEVSTAT tags, printer configuration consists of printer assignment (i e , logical printers) and printer color map configuration

Printer Assignments

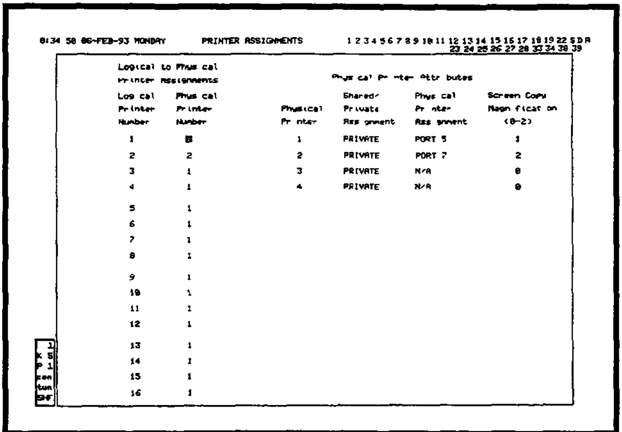
The process engineer directs a log printout to a specific physical printer by specifying a logical printer number Logical printer assignment associates a logical printer number to a physical printer Up to eight logical printer assignments can be made

The process engineer can also choose a magnification setting for each physical printer The magnification determines the size of a screen copy printout initiated through the *PRINT* option of the command line menu The setting does not affect printing of logs

Step 1 The process engineer defines logical printers through the *Printer Assignments* page (see Figure 15-60) To call this display, first press GENL FCTNS MENU, then select the following menu ıtems ın the sequence shown

A OIS Configuratıon ——▸ E System ——▸ C Pnnter Assıgnment

NOTE Logıcal pnnters 9 through 16 are not applıcable for thıs console The conso e does not gıve access to these assıgnments



TPS0154B

Fıgure 15 60 Penpheral Configuratıon Pnnter Assıgnments

Step 2 The *Shared/Pnvate Assıgnment* field for each of the physıcal pnnters ıs not applıcable for thıs console and defaults to *PRIVATE* The *Physıcal Pnnter Assıgnment* field for each of the physıcal pnnters ıs for reference only It shows the port on the console to whıch a physıcal pnnter connects These fields cannot be accessed

To make pnnter assıgnments

a Use the OIS configuratıon keys (refer to Table 15 1) to move between and enter data ınto each dısplay ınput field. At the *Physıcal Pnnter Number* field for each logıcal pnnter, enter the number of a physıcal pnnter A valıd entry ıs 1 or 2 Whenever a pnntout ıs dırected to a logıcal pnnter, ıt wıll occur at the physıcal pnnter defined here Contınue wıth the next step after completıng all required logıcal pnnter assıgnments

b Move to the *Screen Copy Magnıficatıon (0 2)* field for each physıcal pnnter and choose a magnıficatıon A valıd entry ıs from

0 to 2 Enter **0** for no magnification, enter **2** for maximum magnification (full sheet)

c Press ENTER to update the configuration on the hard disk The physical assignments go into effect immediately after pressing ENTER All new output is then routed to physical printers as defined here. Anything queued to a physical printer before an update of this configuration remains queued to that printer

Printer Color Maps

The printer color maps function sets the colors used for printing of both images and text files Image printouts are screen prints initiated through the *PRINT* option of the command line menu Text file printouts are generated by functions such as logging

The printer color maps configuration is required since console printers are not capable of reproducing all of the colors the console is capable of presenting The console uses these settings to determine which colors to substitute for its 64 possible colors when printing The available printer colors are

Black

Cyan

Green

Magenta

Red orange

Violet

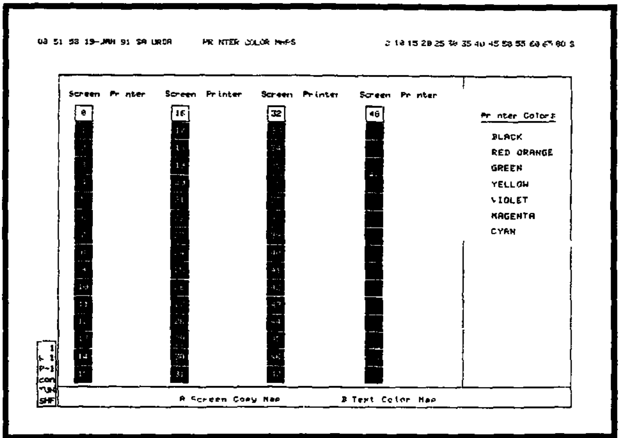
Yellow

There are separate color maps for screen copies and text copies because of how the console interprets background color When screen printing, colors marked as background colors do not print For example, a display has a blue background If blue is not defined as *BACKGROUND* in the screen copy map, the blue would fill the entire printout making it difficult to distinguish the foreground items If blue is set to *BACKGROUND* in screen copy map, the blue background will not print which makes the foreground items distinguishable In the text print mode, the console treats all text as foreground only

The process engineer sets printer colors for both screen and text prints through the *Printer Color Maps* page (see Figure 15 61) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *E System* ⟶ *H Printer Color Maps*

Both the screen copy map and text color map can be defined through this configuration, both require the same procedures to configure Select either *A Screen Copy Map* or *B Text Color Map*



TPS0155A

Figure 15-61 Peripheral Configuration - Printer Color Maps

Press NEXT PAGE or PREV PAGE to toggle between the screen copy map and the text color map. Press either one of these keys and the currently displayed color map clears and the other map displays in its place. This only works after first selecting either the *A Screen Copy Map* or *B Text Color Map* options.

Screen Copy Map

Figure 15-62 shows the next page that appears after selecting the *Screen Copy Map* option. The screen copy map function maps the screen colors available at the console for printing to a color capable printer. For each color that appears on this page, either a color or *BACKGROUND* must be specified. The console references this mapping when the operator initiates a screen print.

For example, a printer is not capable of printing in light gray (color code 15). If a display uses light gray as one of its colors, the color code 15 must be remapped to one of the available printer colors.

The console provides a default color map definition. This definition is set to provide proper printing of standard displays.

To change this default mapping:

1. Key in a color index number to change at the *Select Field* prompt, then press ENTER. This positions the input cursor at that color index.

Optionally, the *Select Field* prompt can be left at its default *0*. The configuration keys can then be used to move to a specific color index.

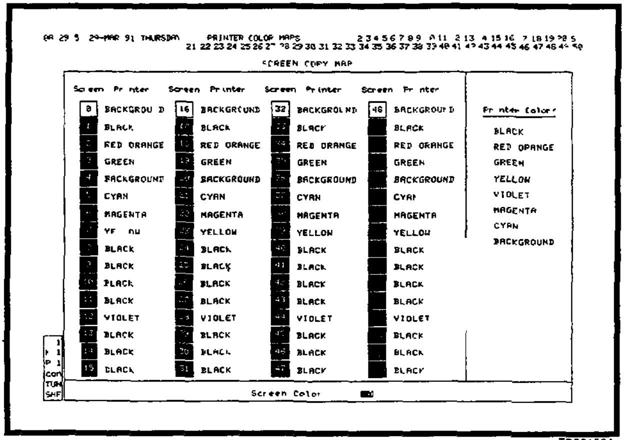


Figure 15-62. Printer Color Maps - Screen Copy Map

2. Enter a color that this color index is to print as when a screen copy is initiated. The console displays the available colors under the *Printer Colors* heading.

If this color has been used as a background color for displays, set the field to **BACKGROUND**. A color set to *BACKGROUND* does not print in the final output.

3. Press **ENTER** or move the input cursor to enter the change. If additional colors are to be remapped, either press **ESC** to call the *Select Field* prompt and return to Step 1. Or, use the configuration keys to move to a specific color index and repeat Step 2.

4. Press **ENTER** to update the configuration. Once **ENTER** is pressed, any changes made are written to the hard disk and put into immediate effect for all current and subsequent printings. If a color printer is in the middle of a print, any changes made cause the printer to change to the new color in the middle of that print.

5. Press **ESC** to exit.

Printer Color Map

Figure 15-63 shows the next page that appears after selecting the *Printer Color Map* option. During log configuration, colors can be specified for the final printout of a log. Color codes (e.g., %K0) set the printer to a specific color. Any text following the code prints in this color.

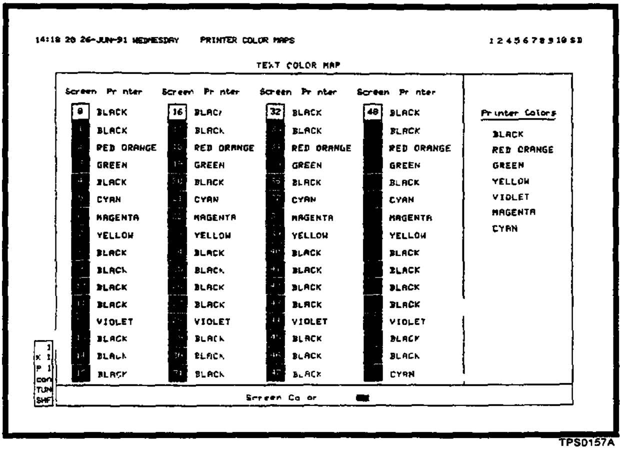


Figure 15 63 Printer Color Maps Text Color Map

Part of the code is a number that identifies a color The number can range from 0 to 63, which also corresponds to the 64 available screen colors Text color mapping allows mapping the codes for colors to any of the available printer colors The console provides a default map

This default map sets the color codes to

%K0 black

%K2 red-orange

%K3 green

%K5 cyan

%K6 magenta.

%K7 yellow

%K12 violet

These are the standard color codes. Any number from zero to 63 can be used in a color code as long as it has one of the available printer colors defined for its corresponding index number.

Each color code that is to be used in a log requires a defined printer color. The console references this mapping when a log prints For example, to have a log entry print in red, the log must have a color code that selects a color index set to *RED-ORANGE* If using the default settings, color index number two is set to red, therefore, the log code should be **%K2** to select the printer color red

To change the default mapping, or to define additional color codes

1 Key in the index number of a screen color to change at the *Screen Color* prompt, then press ENTER This positions the input cursor at that color index The number in the *Screen* column is the same as the code number

Optionally, the *Screen Color* prompt can be left at its default *0* The configuration keys can then be used to move to a specific color index

2 Enter a color that this color index is to print as when a log containing this color code prints The console displays the available colors under the *Printer Colors* heading

3 Press ENTER or move the input cursor to enter the change If additional colors are to be mapped, press ESC to call the *Screen Color* prompt and return to Step 1 Or, use the configuration keys to move to a specific color index and repeat Step 2

4 Press ENTER to update the configuration on the hard disk Once ENTER is pressed, any changes made are written to the hard disk and put into immediate effect for all current and subsequent printings If a color printer is in the middle of a print, any changes made cause the printer to change to the new color in the middle of that printing

5 Press ESC to exit

PERIPHERAL DEVICE FAILOVER

The process engineer can define the peripheral device failover function to enable an automatic reassignment of a monitor (CRT) or printer if it should fail Using this feature, the workload of a failed device automatically transfers to a working device with no information lost or delayed

If a CRT fails it may be desired to continue operations at another CRT It may also be desired to have any printing currently queued to a printer that fails rerouted to another working printer A CRT or printer can only be reassigned to another CRT or printer already connected to, and accounted for at the console

CRT Failure

When a CRT fails and it is set up to transfer its current display and keyboard assignment to another, the console rebuilds the display at the failover CRT The console automatically reassigns the keyboard previously assigned to the failed CRT to the working CRT

When a failover reassignment of a display occurs, the following takes place

1. The console discards any editing or configuration changes not saved before the CRT failure Saving usually requires pressing [ENTER] to update the configuration

2 The display, as in the case of interactive configuration pages, may not be restored to the exact level active at the time of the CRT failure

3 If a display was being used for process control and a control element was selected for control, the display appears at a working CRT but the previously selected control element will be disabled

The console logs a message in the events log (or operator actions log) to identify a reassignment

Display xxxxxxxx at CRT #n failed over to CRT #n

After a successful automatic reassignment, all normal operations resume CRTs and keyboards can be reassigned as normal using [SWITCH CRT], although they cannot be assigned to a failed CRT If a failed CRT comes back on-line, it displays the *General Functions Menu* page

Printer Failure

When the console determines that a printer has failed, it checks for a failover assignment Once a working printer is found, the currently queued work for the failed printer reroutes to the working printer The failover printer does not cancel any current printing. It completes the current print job then alternates between any additional printing assignments and any additional printing assignments made to the failed printer The failover printer also reprints from the beginning a printing assignment the failed printer was in the middle of when it failed

The failover processing continues as long as the console determines that a printer is off line When the failed printer becomes operational, it takes over any work assigned to it The failover printer continues with its own work

The console logs a message in the events log (or operator actions log) to identify a failover.

Physical Printer #n failed over to Physical Printer #n

Step 1

The process engineer defines peripheral device failover through the *Failover Assignment* page (see Figure 15-64) To call this display, first press [GENL FCTNS MENU], then select the following menu items in the sequence shown

A OIS Configuration ⟶ *E System* ⟶ *K Peripheral Failover*

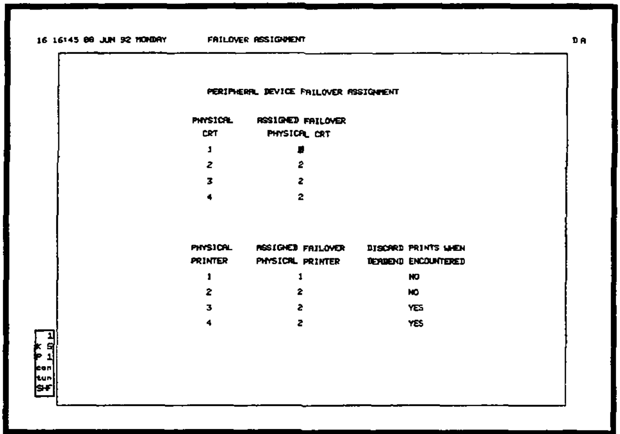


Figure 15 64 Penpheral Configuration - Failover Assignment

Step 2 To define failover assignments

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display input field In the *AS SIGNED FAILOVER PHYSICAL CRT* column, enter a number, 1 or 2, for each physical CRT This designates which CRT the physical CRT is to automatically be reassigned to if it fails If a CRT is to not automatically reassign, define itself as the failover CRT

A failover assignment cannot be made to a physical CRT the con sole does not currently support

b In the *ASSIGNED FAILOVER PHYSICAL PRINTER* column, enter a printer number, 1 or 2, for each physical printer This desig nates which printer the physical printer is to automatically be re assigned to if it fails If a printer is to not automatically reassign, define itself as the failover printer.

A failover assignment cannot be made to a physical printer the console does not currently support

c The *DISCARD PRINTS WHEN DEADEND ENCOUNTERED* column determines whether the console is to discard all printing assign- ments made to a failed printer if the console cannot find a working printer, or if it is to save the assignments until a working printer can be found Enter **YES** to discard, **NO** to save d Press ENTER to update the configuration, then press ESC to exit

Display Configuration

Some displays available at the console require further configuration beyond the requirements stated in ***Display Generation*** in this section These include operator configurable displays, XY plots and alarm summaries This part of the section explains the additional configuration requirements It also gives the procedures to set up automatic displays and pop up elements

The console provides the default symbols used to create operator configurable displays To incorporate user-created symbols instead of using these default symbols, the process engineer must perform operator displays' faceplates configuration

XY plot definition must be performed to define the data source and operating parameters for XY plot displays Each plot definition has an associated plot index number An XY plot escape element uses this plot index number as one of its parameters

Each alarm summary element references a line format parameter. This parameter determines how an alarm entry will appear at a given alarm summary page or an element of a display Up to 106 line formats can be created Of these 106, the console provides five standard line formats The standard formats can be used in an alarm summary by specifying line format numbers 0 through 4 in the alarm summary escape command (**as 82** or **as 83**) The process engineer can tailor the line format of a summary by defining any of the remaining five formats, then specifying that format in the alarm summary escape Refer to ***ALARM SUMMARY CONFIGURATION*** in this section for procedures to configure additional line formats

OPERATOR CONFIGURABLE DISPLAYS FACEPLATE CONFIGURATION

NOTES

1 This configuration procedure is not required unless changing the default configuration of the operator configurable displays function

2 Become thoroughly familiar with the operator configurable displays function ***before*** attempting any operator displays faceplates configuration

The operator displays' faceplate configuration defines the operating parameters for the operator configurable displays function The console provides a default configuration that can be used without making any modifications This default configuration uses standard, provided faceplate symbols (i e , device mimics). A user-created faceplate symbol can be substituted for a standard symbol by using this configuration function The default configuration can also be modified

The console references the parameters set here when at the operator configurable displays setup page, and also to construct a final saved display file This function

1 Defines the user created faceplate symbols and trend symbols used in operator configurable displays

2 Edits default colors to be used in operator configurable trend displays

3 Configures the display format used during creation of an operator configurable display (e g , defines title position, box separation, element height, etc)

4 Determines the line format used in an alarm summary element of an operator configurable display

5 Defines the number of horizontal and vertical boxes a certain type of display element consumes when setting up a display This depends on the type and size of the faceplate mimic

This configuration encompasses five separate pages Each page is for a specific configuration option A *DEFAULT* column lists the defaults for operator configurable displays Access at these pages is limited to the *CONFIGURED* column This is where any changes are made to the default parameters The default parameters always appear for reference to easily recover from undesired changes Press NEXT PAGE and PREV PAGE to sequence through each page of this function

Page 1 and 2

Page one defines the symbol file that is to be used for each type of element that can be part of an operator configurable display The symbol file defines the appearance and interaction that can be performed through a specific device mimic The element types include

Analog Annunciator
Analog box full and half size
Boolean box (digital) full and half size
Device Driver
Digital Annunciator
DCS (digital control station) full and half size
MSDD (multi state device driver)
Remote Control Memory
RMSC (remote manual set constant)
RMCB (remote motor control block)
Text Selector Block
D A Analog full and half size
D A Digital
Text String

The default identified for each of these element types is the standard symbol provided with the console The name is of the assembled symbol file without the *.DL* extension This page allows entering a file name of a user-created symbol to use in place of the default symbol. The entered name must be an assembled symbol file on the hard disk

Page two performs the same function as page one but can be used to substitute user created trend display elements for default symbols It also sets or changes the default colors that identify each of the five possible trends that can appear in a trend element A list of available colors and their index numbers are provided at this display

Page 3 Page three specifies the horizontal (x coordinate) and vertical (y coordinate) *positions the console uses when constructing the op*erator configurable displays setup page and the final saved display file The console also references the position fields when constructing touch points and highlights Page three attributes affect

- *Position of the operator configurable* display title (name associated with the display)
- Starting position the console uses to begin drawing the display
- Separation space between each box that appears on the display
- Number of boxes that appear horizontally
- Number of boxes that appear vertically
- Height and width of a box that is not configured
- Height and width of a full and half size trend box
- Line format to use for an alarm summary element

Screen space available as user space is 400 to 9,600 horizontal (x-coordinate) and 400 to 7,200 vertical (y coordinate). The title line is positioned by default at the center and top of the screen above the user space

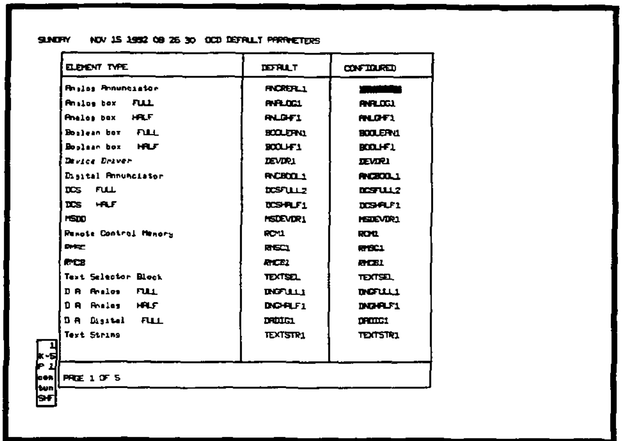
Page 4 and 5 Page four and page five define the number of horizontal and vertical unconfigured boxes an element occupies This must be consistent with the number of horizontal and vertical boxes, and the height and width of specific types of boxes defined on page three The actual size of the faceplate symbol determines the number of horizontal and vertical boxes to allocate When performing configuration, page three, page four and page five are dependent on each other

The process engineer defines operator configurable displays' face plates through the *OCD Default Parameters* pages Figure 15 65 is the first page of the function To call this page, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration

B Display

C Operator Displays' Faceplates


SUNDAY NOV 15 1992 08 26 30 OCD DEFAULT PARAMETERS

ELEMENT TYPE	DEFAULT	CONFIGURED
Analog Annunciator	ANCREAL1	[redacted]
Analog box FULL	ANALOG1	ANALOG1
Analog box HALF	ANLGHF1	ANLGHF1
Boolean box FULL	BOOLEAN1	BOOLEAN1
Boolean box HALF	BOOLHF1	BOOLHF1
Device Driver	DEVDR1	DEVDR1
Digital Annunciator	ANCBOOL1	ANCBOOL1
DCS FULL	DCSFULL2	DCSFULL2
DCS HALF	DCSHALF1	DCSHALF1
MSDD	MSDEVDR1	MSDEVDR1
Remote Control Memory	RCM1	RCM1
RMSC	RMSC1	RMSC1
RMCB	RMCB1	RMCB1
Text Selector Block	TEXTSEL	TEXTSEL
D A Analog FULL	DNGFULL1	DNGFULL1
D A Analog HALF	DNGHALF1	DNGHALF1
D A Digital FULL	DADIG1	DADIG1
Text String	TEXTSTR1	TEXTSTR1

PAGE 1 OF 5

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Figure 15 65. OCD Default Parameters Page 1 of 5

Press NEXT PAGE and PREV PAGE to sequence through each page of this function,

Defining Faceplates

Page one and page two define the symbol files to use as the face plate symbols for certain types of tags, and the symbols to use in trend elements Page two also defines colors used in trend ele ments Figure 15 65 shows *PAGE 1 OF 5* and Figure 15 66 shows *PAGE 2 OF 5*

At *PAGE 1 OF 5* and *PAGE 2 OF 5*, enter the name of a symbol that is to appear for a certain type of element in the *CONFIGURED* col umn for that element Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field The symbol name entered must correspond to an assembled symbol file (***.DL***) that resides on the hard disk (i.e , USN 44

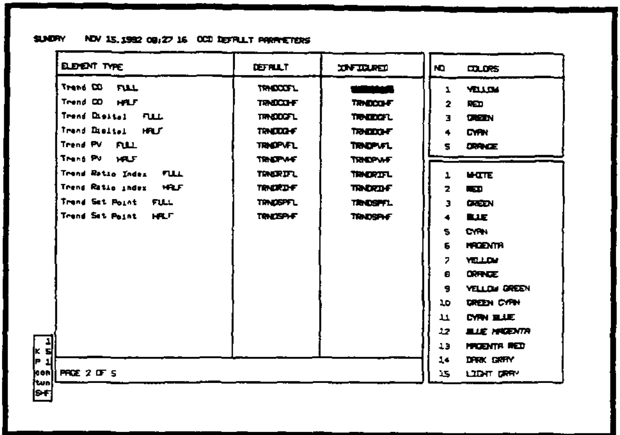

Figure 15 66 OCD Default Parameters Page 2 of 5

through USN 4E directories) If the symbol file does not exist, the following error message appears

Display Not Found in Given Directory ERR 68

Enter a valid symbol name Press [HOME] to restore the previous file name entry Anytime a tag that uses the element type is configured in an operator configurable display, the symbol file that matches the entered name will be used

On *PAGE 2 OF 5* the current color choices for trend elements appear in the upper right box The colors listed in the *COLORS* column are for each of the five possible trends that can appear at a trend element. The numbers in the *NO* column correspond to trends one through five

To define trend colors

1 Move to the *COLORS* column for the trend to define

2 Enter the index number or name of a color The list of colors in the bottom right box of the display are the color choices The names appear in their actual colors

3 Press [ENTER] to save the changes

Defining Operating Parameters

Page three defines the various screen parameters for both the saved operator configurable display, and the operator configurable displays setup page Figure 15 67 shows *PAGE 3 OF 5* Page four and page five determine the number of unconfigured boxes a single type of element consumes The height and width specified in the source file of a symbol determines the actual height and width of a faceplate symbol that appears in an operator configur able display

MONDAY NOV 16 1992 08 27:07 OCD DEFAULT PARAMETERS

COORDINATE TABLE	DEFAULT	CONFIG
Horizontal title position	3000	
Vertical title position	7350	7350
Horizontal position of lower left box	496	496
Vertical position of lower left box	496	496
Horizontal separation of element boxes	96	96
Vertical separation of element boxes	96	96
Number of horizontal boxes	4	4
Number of vertical boxes	8	8
Width of unconfigured element box	2180	2180
Height of unconfigured element box	742	742
Width of trend box	2180	2180
Height of half size trend box	600	600
Height of full size trend box	1280	1280
Alarm format record number	0	105

PAGE 3 OF 5

1
K 5
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SHF

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Figure 15 67 OCD Default Parameters Page 3 of 5

When creating symbol files to be used in operator configurable displays, a standard height and width should be used for all face plates A standard size is important since this configuration af fects all faceplate symbols defined at the setup page of operator configurable displays, and assumes the same size has been used for all symbols

NOTE *Configuration of PAGE 4 OF 5* and *PAGE 5 OF 5* is dependent on configuration of *PAGE 3 OF 5*

Step 1 The height and width limits set during *PAGE 3 OF 5* configuration determine the size that an unconfigured box appears as at the op erator configurable displays setup page The console references the height and width when constructing the touch points and highlights for a faceplate symbol This configuration also affects the title position, the starting position and the box separation for both the setup page and a saved display file

To define the display fields at *PAGE 3 OF 5*

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field At the *title position* fields, enter the horizontal (x coordinate) and vertical (y-coordinate) position at which the title of the display is to appear A valid entry for the horizontal position is from 400 to 9600, a valid entry for the vertical position is from 400 to 7350

b At the *position of lower left box* fields, enter the horizontal and vertical position at which the console is to start drawing the operator configurable displays A valid entry for the horizontal position is from 400 to 9600, a valid entry for the vertical position is from 400 to 7200

c At the *separation of element boxes* fields, enter the horizontal and vertical spacing This defines the number of display units separating each faceplate box. The console requires at least 40 display units separating each element for proper touch point selection A valid entry is from 1 to 2000

> **NOTE** When defining the next parameters the source files for the faceplate symbo s should be referenced

d Enter the number of boxes that are to display horizontally at the *Number of horizontal boxes* field and the number that are to display vertically at the *Number of vertical boxes* field There can be no more than 32 boxes total on a single page A valid entry for these two fields is 1 to 32

For example, if the horizontal number of boxes is 16, then the vertical can be no more than 2 These values are dependent on the actual height and width of each faceplate symbol

The number of unconfigured boxes each faceplate symbol consumes is set at page four and page five When setting these attributes, the height and width of a box and separation between each box must be considered

e Enter in display units a width for an unconfigured box at the *Width of unconfigured element box* field, and a height at the *Height of unconfigured element box* field This sets the size of an unconfigured faceplate box The width of a box should correspond to the width or x-offset set in the source files of the faceplate symbols, the height should correspond to the height or y offset Entries must be no more than the available user space, or 1 through 9200 horizontal and 1 through 6800 vertical spaces

f This software release does not support variable trend box sizes The *Width of trend box, Height of half size trend box* and *Height of full size trend box* fields cannot be changed from default Go to the next step

g Enter the number of a line format at the *Alarm format record number* field This determines the format an alarm summary element uses for each line entry in the summary There are 106 possible formats 0 through 4 are fixed and 5 through 105 are user configurable Refer to ***ALARM SUMMARY CONFIGURATION*** in this section for an explanation, and also for procedures to define a line format

h After completing all required fields, press [ENTER] This up dates the configuration on the hard disk

i Press [ESC] to exit this configuration procedure or [NEXT PAGE] to call *PAGE 4 OF 5*

Step 2 Page four and page five define the number of unconfigured boxes a certain type of display element consumes For example, default faceplate symbols consume one horizontal and up to four vertical boxes depending on the chosen size Alarm summaries use four horizontal and up to eight vertical boxes depending on the chosen size Figure 15 68 and Figure 15 69 show *PAGE 4 OF 5* and *PAGE 5 OF 5* respectively The actual size defined in the assembled sym bol file and the parameters defined on *PAGE 3 OF 5* should be ref erenced when defining the number of boxes an element consumes

MONDAY NOV 16.1992 08:01:02 OCD DEFAULT PARAMETERS

ELEMENT TYPE	DEFAULT		CONFIGURED	
	HORIZON	VERTICAL	HORIZON	VERTICAL
Analog Annunciator	1	2	■	2
Analog Box full size	1	2	1	2
Analog Box half size	1	1	1	1
Boolean box full size	1	2	1	2
Boolean Box half size	1	1	1	1
Digital Annunciator	1	2	1	2
Digital Control Station Full	1	4	1	4
Digital Control Station Half	1	2	1	2
Multi State Device Driver	1	2	1	2
Remote Control Block	1	2	1	2
Remote Manual Set Constant Block	1	2	1	2
1/4 1/2 screen Trend box	2	2	2	2
1/4 1 screen Trend box	4	2	4	2
1/2 1/2 screen Trend box	2	4	2	4
1/2 1 screen Trend Box	4	4	4	4
Full Screen Trend Box	4	8	4	8
Alarm Summary 1/8 screen	4	2	4	2
Alarm Summary - 1/4 screen	4	4	4	4
Alarm Summary 1/2 screen	4	8	4	8
Alarm Summary Full screen	4	8	4	8

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Figure 15 68 OCD Default Parameters Page 4 of 5

To define *PAGE 4 OF 5* and *PAGE 5 OF 5*

a Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Press [NEXT PAGE] and [PREV PAGE] to move between *PAGE 4 OF 5* and *PAGE 5 OF 5*

b Enter the number of horizontal and vertical unconfigured boxes an element should consume at the *HORIZON* and *VERTICAL* fields for that element

MONDAY NOV 15,1992 08 00 33 OCD DEFAULT PARAMETERS 1214 995 A

ELEMENT TYPE	DEFAULT		CONFIGURED	
	HORIZON	VERTICAL	HORIZON	VERTICAL
Remote Manual Constant Block	1	2	[illegible]	2
Device Driver Tag	1	2	1	2
Text Selector Block	1	1	1	1
Data Aquisition Analog full size	1	4	1	4
Data Aquisition Analog half size	1	2	1	2
Data Aquisition Digital full size	1	2	1	2
Text String Block	4	1	4	1

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Figure 15-69 QCD Default Parameters Page 5 of 5

c After making all changes press **ENTER** Press **ESC** to exit this configuration

XY PLOT CONFIGURATION

The XY plot function allows representing sets of process values in a two dimensional graph The console provides a standard XY plot display that can be modified to use plots defined through XY plot definition The data shown on the XY plot display consists of co ordinate pairs whose x axis value represents one process variable and y axis value represents a different process variable Each axis is bounded by the low and high limits of the x-axis and y-axis tag

NOTE Th s software release does not support the trend data source

The values plotted can be distributed trend values, exception reported tag values, or from a data file in an MFP module The data file is created by a C program running in the module Refer to Ap pendix F for required MFC data source file structures, and the ***C Utility Program*** instruction for information about the C utility program (CUP) used to load a C program into an MFP module

The console has a limit to the total number of XY plot samples it can process A sample is a single piece of data The limit is based on the total number of samples for all of its currently active plots Any combination of plots can be active, however, the total samples for all plots cannot exceed 2,880 samples (maximum 1,440 samples per screen) If all of the plots are 480 sample plots, then the maximum number of active plots is six

Table 15-30 shows some combinations that can be used and still stay within the 2,880 sample limit This table shows how many XY plot elements of each size could typically be on a screen and the number of samples that each plot can display The process engineer can combine these elements in other ways

Table 15-30 Active Plot Sample Constraints

Element Size	Elements per Screen	Plots per Element	Samples per Plot	Number of Screens	Total per Screen[1]	Total Samples[2]
100% × 100%	1	5	120	2	600	1200
100% × 100%	1	3	480	2	1440	2880
100% × 50%	2	5	120	2	1200	2400
50% × 50%	4	5	60	2	1200	2400

NOTES
1 Max mum 1 440
2 Max mum 2 880

The number of plots per element is set as one of the XY plot escape command **(et 154)** parameters during display creation XY plot configuration requires making individual XY plot definitions, and entering the plot index number of the definition into the source file of an XY plot display

XY Plot Definition

The console identifies a plot by its index number Up to 80 plots can be defined Each plot definition specifies the operating parameters related to a single plot During display creation, this index number is used as one of the parameters in XY plot escape commands The plot definition

- Enables and disables data collection
- Defines a data source
- Sets plot operating parameters

Step 1 The process engineer defines a plot through the *XY Plot Definition* page (see Figure 15 70) To call this page, first press GENL FCTNS MENU, then select the following menu items in the sequence shown.

A OIS Configuration ⟶ A Database ⟶ H XY Plot

Step 2 To define or edit a definition

a The page first appears with the input cursor at the *Plot Index* field Enter the number of a plot to define or edit, then press ENTER *A valid entry is from 1 to 80*

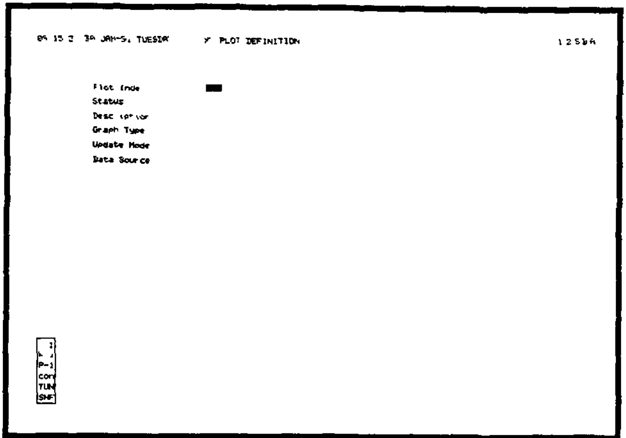

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Figure 15 70 XY Plot Definition Display

b When the plot definition appears, the input cursor positions at the *Status* field If editing an existing active plot definition change the status to **INACTIVE** The console will not allow any changes to an active plot

c Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display field Some attributes defined at this configuration page remain the same for all XY plot definitions, although they are defined differently Others depend on the type of data source

Table 15-31 lists the attributes that apply for all types of plots Table 15 32 lists the attributes as they apply to a tag data source plot *Table 15-33 lists the attributes as they apply to a trend data source* plot Table 15 34 lists the attributes as they apply to a MFC data source plot Refer to these tables when defining the display fields

The type of plot (tag, trend or MFC data source) cannot be changed at the definition display if the plot is currently displaying on another screen The plot display must be exited, the type changed, then the plot recalled to the screen All other definitions can be changed while the plot is displaying on another screen

d Press **ENTER** after completing all required fields This updates the configuration on the hard disk

e To define additional plots, press **ESC** to position the input cursor at the *Plot Index* field, then repeat Steps 2a through 2d. Press **ESC** to exit this configuration

The console does a logical consistency check of the entire plot definition after pressing $\boxed{\text{ENTER}}$, and also when changing from inactive to active. If it finds an error, the input cursor positions at the field in error.

Table 15-31. XY Plot Definition - General Fields

Field	Description
Plot index	Index number assigned to the plot; range is 1 to 80. This number identifies the plot definition when used in XY plot escape commands (e.g., ei, su and et) for a display.
Status	Used to activate or deactivate data collection for the plot. A valid entry is: *ACTIVE - activates the plot; data collection begins when the plot is activated.* INACTIVE - *deactivates the plot; the plot must be inactive to make any configuration changes.*
Description	32-character description of the plot. This description is used only here; it does *not appear elsewhere.*
Graph type	Defines how the console presents the data that appears in the graph element. CONTINUOUS is currently the only mode supported.
Update mode	Selects the display method used to present collected data. A valid entry is: SP - single point; only one point per coordinate pair displays on the graph at a time. When a coordinate value is received by the plotter, it plots the point with a cross hair and removes the previous point. The cross hair represents the most recent value plotted. MP - multipoint; same as single point but previous points appear as dots. The most recent value is represented by the cross hair. CC - continuous curve; same as multipoint except that the previous points are joined with a line. Points are joined from left to right. **NOTE:** Use CC for MFC data source plots.
Data source	*Defines the type of data that is collected by this plot definition. A valid entry is:* TAG - tag plot using exception reported values. TREND - trend plot using distributed trend data. MFC - data comes from a C language program running in a multifunction processor module.

Table 15-32. XY Plot Definition - Tag Type

Field	Description
X tag name/index	Defines the tag that provides the exception reported value for the x axis variable of the plot. *Enter either a tag name or index number.*
X high limit	Represents the high scale value of the x axis for this plot. The field defaults to the full scale limit of the tag but can be changed.
X low limit	Represents the low scale value of the x axis for this plot. The field defaults to the zero scale limit of the tag but can be changed.
Y tag name/index	Defines the tag that provides the exception reported value for the y axis variable of the plot. Enter either a tag name or index number.

22 39 34 04 10 07

Table 15-32. XY Plot Definition - Tag Type (continued)

Field	Description
Y high limit	Represents the high scale value of the y axis for this plot. The field defaults to the full scale limit of the tag but can be changed.
Y low limit	Represents the low scale value of the y-axis for this plot. The field defaults to the zero scale limit of the tag but can be changed.
Clear screen	Use this field to clear the plot. There are several different combinations that can be used. For example, a plot can clear after a defined number of samples display, after a defined time period elapses, or when a trigger tag trips to its one state. A valid entry is: YES = enable automatic clearing; the *No. of Displayed Samples*, *Time Period Units* and *Trigger Tag* fields must then be defined. NO = disable automatic clearing.
No. of display samples	Defines the number of samples to display before clearing the plot. A valid entry is: 2 to 480 = must be less than or equal to the number set in the *No. of Samples* field. For example, entering 120 clears the plot when the 121st sample is received. The 121st sample then plots as the first sample of the next plot. *blank* = disable this type of clearing.
Time period-units	Sets the time period that must elapse before the plot clears. The timer begins to count down at the first sample occurrence. The time period is expressed as a count from 0 to 99 and a unit of SECONDS, MINUTES, HOURS or DAYS. Leave these fields blank to not use this type of clearing.
Trigger tag	Defines a DIGITAL or RCM tag that is to clear the plot when its state changes from zero to one. Enter either a tag name or index number. Leave this field blank to not use this type of clearing.
Sample period units	Defines the resolution of the data collection for the plot. The sample period is expressed as a count from 0 to 99 and a unit of SECONDS or MINUTES. Enter a sample period that is a multiple of two seconds. The *Sample Period Units* range is from 2 SECONDS to 30 MINUTES. Data collection begins when the plot is made active, and continues to sample at the rate set here.
Number of samples	Defines the maximum number of samples to be collected for the plot at one time. A valid entry is from 2 to 480. For example, if a multipoint plot is being displayed and a value of 120 had been defined for the *No. of Samples*, a maximum of 120 samples would be plotted. The oldest sample scrolls off the display when a new sample is received once the maximum number of samples are on the display. Refer to Table 15-30 for guidelines when setting this field.

Table 15-33. XY Plot Definition - Trend Type

Field	Description
X trend index	Identifies the trend definition that supplies the x-axis variables of the plot. Enter the index number of a trend definition. A valid entry is from 1 to 2000.
X tag name	Displays the tag name associated with the x-axis trend. Blanks are shown if no tag name is assigned to the trend.

Table 15-33. XY Plot Definition - Trend Type (continued)

Field	Description
X high limit	Represents the high scale value of the x-axis for this plot. The field defaults to the full scale limit of the tag specified at the *X Tag Name* if one is assigned. Otherwise, the field defaults to *0*. This field can be changed.
X low limit	Represents the low scale value of the x-axis for this plot. The field defaults to the zero scale limit of the tag specified at the *X Tag Name* if one is assigned. *Otherwise, the field defaults to 0. This field can be changed.*
Y trend index	Identifies the trend definition that supplies the y-axis variables of the plot. Enter the index number of a trend definition. A valid entry is from 1 to 2000.
Y tag name	Displays the tag name associated with the y-axis trend. Blanks are shown if no tag name is assigned to the trend.
Y high limit	Represents the high scale value of the y-axis for this plot. The field defaults to the full scale limit of the tag specified at the *Y Tag Name* if one is assigned. Otherwise, the field defaults to *0*. This field can be changed.
Y low limit	Represents the low scale value of the y-axis for this plot. The field defaults to the zero scale limit of the tag specified at the *Y Tag Name* if one is assigned. Otherwise, the field defaults to *0*. This field can be changed.
Clear screen	Use this field to clear the plot. There are several different combinations that can be used. For example, a plot can clear after a defined number of samples display, after a defined time period elapses, or when a trigger tag trips to its one state. YES = enable automatic clearing; the *No. of Displayed Samples*, *Time Period Units* and *Trigger Tag* fields must then be defined. NO = disable automatic clearing.
No. of display samples	Defines the number of samples to display before clearing the plot. A valid entry is: 2 to 480 = must be less than or equal to the number set in the *No. of Samples* field. For example, entering 120 clears the plot when the 121st sample is received. The 121st sample then plots as the first sample of the next plot. *blank* = disable this type of clearing.
Time period units	Sets the time period that must elapse before the plot clears. The timer begins to count down at the first sample occurrence. The time period is expressed as a count from 0 to 99 and a unit of SECONDS, MINUTES, HOURS or DAYS. Leave these fields blank to not use this type of clearing.
Trigger tag	Defines a DIGITAL or RCM tag that is to clear the plot when its state changes from zero to one. Enter either a tag name or index number. Leave this field blank to not use this type of clearing.
Sample period units	Defines the resolution of data collection for the plot. Data collection begins when the plot is made active, and continues to sample at the rate set here. This field requires two entries. The sample period must be based on the resolution of the trends specified at the *X Trend Index* and *Y Trend Index* fields. A trend can have a resolution of one minute or 15 seconds; resolution is defined during trend definition. Enter a period that is a multiple of the greater of the two resolutions. For example, if the x-trend has a 15 second resolution and the y-trend has a *one minute resolution, the period and units can be 1 MINUTES to 30 MINUTES*. If both trends are 15 second trends, the period and units can be 15 SECONDS, 30 SECONDS, ... 30 MINUTES.

Table 15 33 XY Plot Definition Trend Type (continued)

Field	Description
Number of samples	Defines the maximum number of samples to be collected for the plot at one time A valid entry is from 2 to 480 For example if a multipoint plot is being displayed and a value of 120 had been defined for the *Number of Samples*, a maximum of 120 samples would be plotted The oldest sample scrolls off the display when a new sample is received once the maximum number of samples are on the display Refer to Table 15 30 for guidelines when setting this field

Table 15 34 XY Plot Definition - MFC Type

Field	Description
MFC file ID	Each MFC data source file is identified in an MFP module by a number from 1 to 32 759 however the console only accepts a number from 1 to 9999 Enter the number that identifies the file used for this plot
MFC address	Defines the loop PCU and module address of the MFP module providing the MFC data source file
Trigger tag	Identifies the tag that is set by the MFP module to notify the XY plot task that a data file is ready for collection This must be an analog exception reporting block (i e FC 30) defined as an ANALOG tag type in the tag database Refer to ***MFC Data Source Guidelines*** in this section The analog exception reporting block must be set to the size (in bytes) of the MFC file The set value must be greater than the high alarm state The XY plot task will be triggered by the alarm state of this tag
X high limit	High scale value of the x axis
X low limit	Low scale value of the x-axis
Y high limit	High scale value of the y-axis
Y low limit	Low scale value of the y-axis
Border color	Color for the border of the XY plot A valid entry is from 0 to 63 (default BLUE)
Reference line color[1]	Color of the five available reference lines Each reference line is displayed as a solid line Specify a color for those x-lines and y-lines that are used A valid entry is from 0 to 63 (default CYAN) **NOTE** A single plot can have only five reference lines If the plot does not use a reference line the console ignores the color entry
X/Y axis legend plot	24 character legend displayed on the XY plot

NOTE 1 A reference line is disabled if its value is either greater than the high limit or less than the low limit Reference line values are defined in the MFC data file High and low limits are defined at the XY plot interactive display

MFC Data Source Guidelines

To limit console loading and provide reasonable XY plot response time, the following configuration restrictions are recommended when using the MFC data source for XY plots

- One plot per plot element

- Maximum of three plots per screen
- Maximum of six plot elements on all screens at one time
- Maximum of 480 data points per plot
- Only ten plots active at one time

The trigger tag must be an analog exception reported tag in the tag database An ANALOG tag is used instead of a digital type to provide a means of sending the size (in bytes) of the MFC data source file at the same time the trigger is provided The floating point value set in the analog exception reporting block will be rounded and converted into an integer

The trigger tag is considered set when the value exceeds the high alarm limit and the last value was a no alarm condition It is up to the process engineer setting the tag to reset the tag to zero after a short period of time This time should be no less than *approximately*

5 × *num files*

where

num_files Total number of files that use this trigger tag (in seconds)

NOTE For proper XY plot operat on, the tag database must contain a system status tag (e N90STA) for th s conso e that spec fies its own address If t does not an *ERROR 304* wil disp ay on the d agnost c/ debug (DDT) term na

The PCU module control scheme must have the following configu ration Analog exception report (FC 30) settings

High alarm limit 1 0

Low alarm limit - 1 0

Set condition - MFC file size

Reset condition 0 0

MFC segment control (FC 82) settings

Alarm deadband for all high/low alarm reports 0

Alarm deadband for all deviation alarm reports 0

XY Plot Display Configuration Requirements

The process engineer must edit the source file (*.DT*) of an XY plot to use a plot definition in a display This requires entering the plot index number as one of the parameters in the escape commands of the display These include, for example, the XY plot (**et 154**), plot control (**ei 107** and **ei 108**), and plot information (**su 154**) escape commands. Refer to Appendix B for the parameters relating to these escape commands

> **NOTE** The conso e provides a standard XY plot display It can be used as is or it can be modified When modifying or ed t ng the disp ay it is suggested that the d splay fi e being usec be cop ed and renamed using file management util ties first This helps to maintain the ntegr ty of the d sp ay and symbol l brary A plot ndex number can then be entered into this renamed file The operator can call or assign this display by its new name

The elementary line editor available through the diagnostic/debug terminal, or the SLDG program can be used to edit the XY plot displays After editing, the ***.DT*** source file must be assembled into a ***.DU*** display file through the *Display Generator* function The display can then be called for viewing by name using MISC MENU functions, or assigned to a keyboard key or ADP pushbutton

Refer to ***Display Generation*** in this section for an explanation of the *Display Generator*, SLDG program and elementary line editor Refer to ***Keyboard Configuration*** in this section for procedures to assign a display to a keyboard key or ADP pushbutton

AUTOMATIC DISPLAYS AND POP UP ELEMENTS CONFIGURATION

Depending on configuration, an entire display or a partial pop up element can be defined to automatically appear in place of, or at the current page Once configured, the console references a set of DIGITAL tags to trigger the automatic activation of these displays or pop up elements This enables automatic display activation based on process changes

Automatic displays and pop up elements are configured in sets The console allows for up to 30 sets with up to 100 trigger tags and associated displays and pop up elements per set During con figuration, the process engineer assigns a master display and a termination display to a set Each set contains a list of DIGITAL tags Each tag in the list has an assembled display (***.DU***) or an as sembled pop up element (***.DL***) assigned to it A pop up element also requires an x,y coordinate to determine its position on the page

The triggering of an automatic display or pop up occurs when a DIGITAL tag in the active set changes from its zero state to its one state This requires, however, that there is no previously triggered display or pop up, or the state of the DIGITAL tag associated with the last triggered display or pop up element has returned to its zero state

If configured, a denotation symbol assigned to the set appears to identify to the operator that the display or element is an automatic For this function to work, however, a symbol file (***.DL***) must be created and assigned to the set during configuration. The deno tation symbol does not appear for a display or pop up element if it is called to the screen manually Refer to ***Automatic Displays or***

Pop Up Elements in the ***Process Monitoring*** section for procedures to activate of deactivate a set

The procedures required to create automatic displays or pop up elements include

- Creating a pop up element
- Creating a denotation symbol
- Configuring the tag set

Configuring a tag set requires

- Assigning a master display.
- Assigning a termination display
- Assigning a denotation symbol
- Setting the number of tags
- Defining the tags that are part of the set and the displays or pop up elements that they trigger

Creating a Pop Up Element

For pop up elements, the pop up symbol must first be created as a ***.DT*** symbol source file using either the SODG utility of the SLDG program or the elementary line editor at the console It then must be assembled using the *Display Generator* function as a ***.DL*** symbol file before it can be incorporated into an automatic display or pop up element group The process engineer creates this symbol in the normal way Refer to ***Display Generation*** in this section for an explanation of the SODG utility and the elementary line editor

The standard control and data acquisition elements provided with the console and SLDG program can be used as pop up elements When using automatic pop up elements, make sure to reserve a portion of the display that they are to appear at for only pop ups This prevents the pop up from overwriting any display elements

The automatic displays function gives the ability to specify a substitution tag to be used for a pop up element A substitution tag is the tag that is to be substituted for any tag already defined in the symbol source file This allows using the same symbol source file for several pop up elements instead of having to create a dedicated source file for each

The process engineer sets an x,y coordinate during *Automatic Displays* configuration that determines where the pop up is to appear on the screen This coordinate in most cases determines where the lower left corner of the pop up element will be positioned In some cases, the actual position may not be the lower left corner of the element but instead a position offset from the corner It depends on the reference (**rf**) command within the symbol source file If the command is **rf 0,0** then the reference point for the symbol is the lower left corner Any other setting for this command offsets the reference point from the corner position

Creating a Denotation Symbol

Optionally, each tag set can be configured with a unique denotation symbol Whenever a display or pop up is triggered, this denotation symbol appears on the display at a specified location The symbol allows the operator to easily recognize that a display or pop up element is an automatic It can also be used to indicate to the operator which tag set the display or pop up is a part

The denotation symbol must first be created using either the SODG utility or elementary line editor as a ***.DT*** symbol source file It then must be assembled using the *Display Generator* function as a ***.DL*** symbol file before it can be incorporated into an automatic display or pop up element group The process engineer creates this symbol in the same way as a symbol used in a dynamic symbol The symbol itself must not contain any other interactive escape commands (**ei**) Refer to ***Display Generation*** in this section for an explanation of the SODG utility and the elementary line editor Refer to Appendix B for an explanation of escape and graphic commands

During configuration, the process engineer enters the name of the symbol and the x,y coordinate location where the symbol is to appear The name is the assembled display file name without its ***.DL*** extension The coordinate in most cases determines where the lower left corner of the symbol will be positioned In some cases, the actual position may not be the lower left corner of the symbol but instead a position offset from the corner Refer to ***Creating a Pop Up Element*** in this section for further explanation

Example To have a text string such as AUTO appear on the displays and pop ups of a tag set, the complete symbol would consist of the letters A U T O and a color and size Specify the name of the symbol (file name) as the *Denotation Symbol* during configuration The string *AUTO* would then appear at its defined location when a tag in the set triggers its display or pop up element

Configuring a Tag Set

Step 1 The process engineer defines automatic displays and pop up elements through the *Automatic Displays* pages. Figure 15 71 is the first page of the function To call this page, first press $\boxed{\text{GENL FCTNS MENU}}$, then select the following menu items in the sequence shown

A OIS Configuration
→ *B Display*
→ *E Automatic Displays*

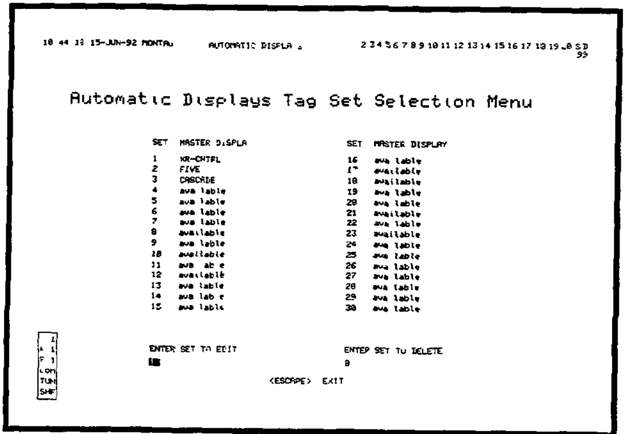

Figure 15 71 Automatic Displays Tag Set Selection

Step 2 The tag set selection page enables defining new, deleting existing, or editing existing tag sets Up to 30 tag sets can be defined, each set containing up to 100 trigger tags Each tag has an associated display or a pop up element This first page identifies any previously defined tag sets and those sets that are still available for configuration If a tag set has previously been defined the name of a master display appears for that set, if not, *available* appears

To define or edit a tag set

a Enter the number of a tag set to define or edit at the *ENTER SET TO EDIT* field A valid entry is from 1 to 30

b Press **ENTER** to call that set

To delete a tag set

a Enter the number of a tag set to delete at the *ENTER SET TO DELETE* field A valid entry is from 1 to 30

b Press **ENTER** to initiate the deletion An *available* replaces the master display name after deletion

Step 3 A tag set configuration page appears after entering a tag set number at the selection page This configuration page determines the operation of the selected set Figure 15 72 shows the tag set configuration page

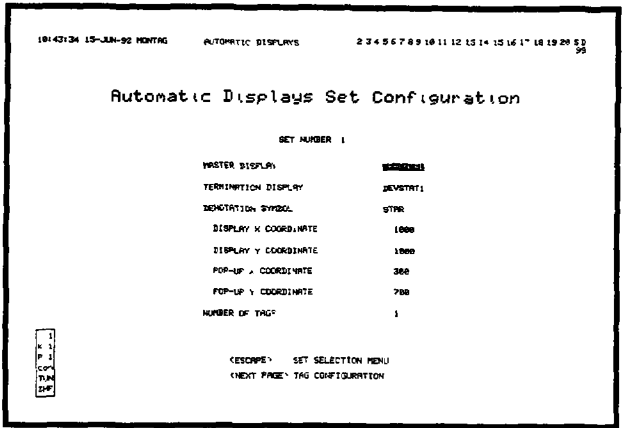

Figure 15 72 Automatic Displays Tag Set Configuration

To configure the tag set

a The console initially positions the input cursor at the *MASTER DISPLAY* field This field designates the display that the operator or the automatic display function must call to the screen to acti vate the tag set Enter the name of an assembled display file (***.DU***) without extension that is to be the master display for this set. Any display that resides on the hard disk can be a master display

b Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into the remaining display fields At the *TERMINATION DISPLAY* field enter the name of an assembled display file (***.DU***) without extension that is to be the termination dis play for this set This designates the display that the operator or automatic display function must call to the screen to deactivate the tag set

c Making an entry in the *DENOTATION SYMBOL* field is optional If a denotation symbol is to be used for this set it must already have been created Enter the name of the assembled symbol file (***.DL***) without extension Refer to ***Creating a Denotation Symbol*** in this section for further explanation Leave the *DENOTATION SYMBOL* field blank and continue with Step 3e if not using a denotation symbol

d The x,y coordinates of the denotation symbol for both displays and pop up elements can be configured at this page Enter the display coordinates and pop up coordinates for the denotation symbol

Enter an x-coordinate at the *DISPLAY X COORDINATE* field and a y coordinate at the *DISPLAY Y COORDINATE* field if the tag set contains automatic displays A valid entry is from 0,0 to 9999,7499, although user space is from 400,400 to 9600,7200

Enter an x coordinate at the *POP UP X COORDINATE* field and a y coordinate at the *POP UP Y COORDINATE* field if the tag set contains automatic pop up elements A valid x coordinate entry is from 9999 to 9999 A valid y coordinate is from 7499 to 7499 The position is based on a reference point (**rf**) defined in the symbol file Refer to ***Creating a Denotation Symbol*** in this section for further information

e Enter the number of tags that are to be part of this tag set at the *NUMBER OF TAGS* field A valid entry is from 1 to 100

f Press ENTER to update the configuration Press NEXT PAGE to define the tags and the displays and pop up elements for this set Or press ESC to return to the tag set selection page

Step 4 Figure 15 73 shows the tag configuration page which appears after pressing NEXT PAGE while at the tag set configuration page This page defines a list of tags for the tag set, and defines the display or pop up element that each tag is to trigger

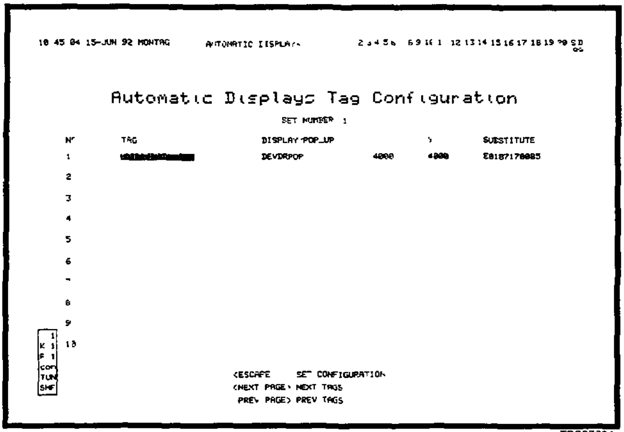

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Figure 15 73 Automatic Displays Tag Configuration

The tag configuration page presents only ten tag entries at one time Press NEXT PAGE or PREV PAGE to sequence between the next and previous ten entries

To define a tag

a The console initially positions the input cursor at the first tag entry Use the configuration keys (refer to Table 15 1) to move between and enter data into each display input field At the *TAG* column field for a tag, enter the name or index number of a DIGITAL tag

b Enter the display name or pop up element name at the *DISPLAY/POP UP* column field that this tag is to trigger The name is the assembled display file name without its ***.DU*** extension, or the assembled symbol file name without its ***.DL*** extension

c The x-coordinate and y coordinate of the pop up element is configured at this page Enter the coordinates for the element at *the X* and *Y column fields A valid x-coordinate entry is from 0 to* 9600 A valid y coordinate is from 0 to 7200 If the tag triggers a display, skip this step and continue with the next step

d The *SUBSTITUTE* field is optional and pertains to pop up elements only If the index number of the tag the pop up element is to present information for is already defined in the pop up element, leave this field blank Enter a tag name or index number in this field if the pop up element is to use a substitute tag in place of the tag already defined for the symbol Refer to ***Creating a Pop Up Element*** in this section for additional explanation

e Repeat Steps 4a through 4d until all tags have been defined Press **ENTER** to save the configuration, then continue to press **ESC** to exit

Text Definition and Substitution

The console provides text definition and text substitution for two purposes Text substitution can be used to replace default text that appears at displays and configuration pages Text definition defines text strings associated with, and selected by text selector function blocks (FC 151) and remote motor control blocks (FC 136) in PCU module configurations Also, alarm comment definition, and logic state descriptor definition and engineering unit descriptor definition can be considered text definition procedures

TEXT SUBSTITUTION

Almost all text that appears in displays at the console can be modified through text substitution The process engineer can use this configuration to change displayed text, error messages, configuration specific entries, prompts, etc

This configuration can substitute default text with any desired English ASCII character strings, or any extended and complex alternate language character strings Not all text sets allow alternate language character substitution English character substitution is supported for most text sets The options available for a particular text set appear next to the *Language* field after calling a particular set If alternate language text is to be used, the *Foreign Language* field must be set to enable alternate language entry during OIS system configuration Refer to ***Alternate Language Substitution*** in this section for additional requirements and specifics related to alternate language

Step 1 The process engineer defines text substitution strings through the *Text Substitution* pages Figure 15 74 shows the first page of this function To call this page, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *A Database* ⟶ *E Text Substitution*

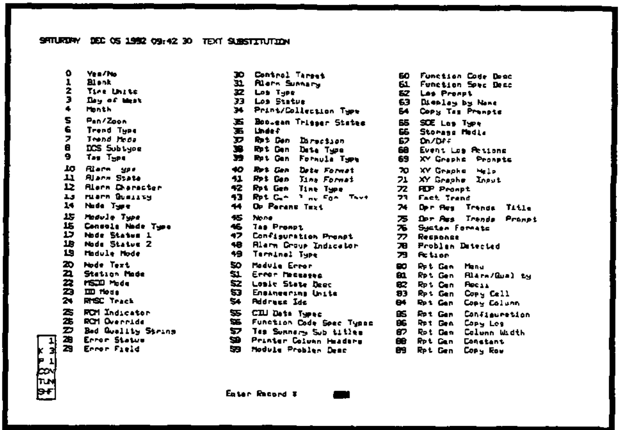

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Figure 15-74 Text Substitution Page 1

The text substitution pages provide a complete list of text groups that can be substituted Press NEXT PAGE and PREV PAGE to move between the pages

Step 2 At the bottom of this page are three informational fields and two input fields The informational fields and their purpose are

Description - shows the currently selected text set The number in brackets ( ) is the record number followed by the text set descriptor

Max Width indicates the maximum number of characters that can be entered for each text string of the selected set

# of Entries shows the number of text strings related to the current text set Not all entries appear on a single display page

The input fields are explained in the following steps

To modify a text set

a Find the specific set to modify and enter its record number at the *Enter Record #* prompt Press **ENTER** to call that set to the screen

For example, enter **3** to modify the text for days of the week The page that appears next lists the text strings related to that particular text set, see Figure 15-75 for an example

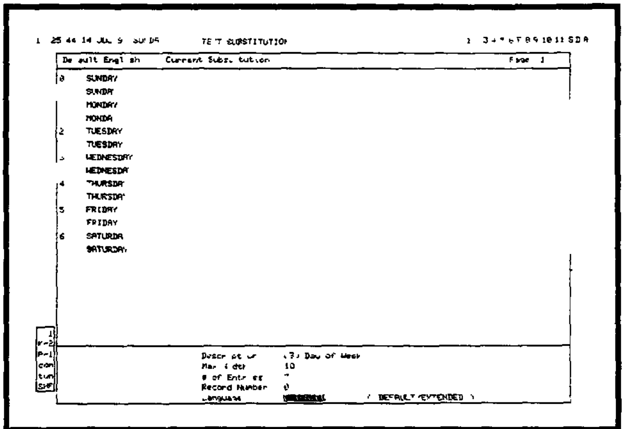


Figure 15 75 Text Substitution Example Configurable Text String Page

Press **NEXT PAGE** and **PREV PAGE** to access the next or previous text set while a set is currently on the screen The *Description* field updates to show the current text set

For each text string, there are two entries on the screen. The default text displays in cyan, the substitute text in green If no changes have been previously made to a text string, both entries are the same

b Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field The console initially positions the input cursor at the *Language* field Use the field to either put the page into editing mode, or to set all previously substituted text strings for the set to default Depending on the text set selected, options for this field are *DEFAULT*, *EXTENDED* and *FORLANG* The *FORLANG* option will not appear unless alternate language was previously enabled, and the console is in complex character mode

Key in **EXTENDED** to substitute default text with normal ASCII character strings, or extended characters defined through alternate language character substitution configuration Key in **FORLANG** to substitute with alternate language complex characters also defined through alternate language character substitution After entering either of these, continue with the next step

Use the *DEFAULT* option to reset the text back to default Enter **DEFAULT**, then press ENTER The display and configuration on the hard disk return to the default settings If resetting to default, two options are available at this point Continue substitution for the set by keying in **EXTENDED** or **FORLANG**, then go to the next step Or exit configuration of this text set by pressing ESC

c Move to the *Record Number* field and enter the number of a specific text string to modify, then press ENTER A valid entry is from 0 to the number of records shown in the *# of Entries* field minus one

The *Record Number* field can be left at *0* to position the input cursor at the first entry, then the configuration keys can be used to search for a specific entry Also, if the number of entries is substantial this field can be used to move the input cursor and scroll the display to a higher numbered entry

For example, if the text set has 100 entries, enter **50** to position the cursor and scroll the display to text string number 50 The configuration keys can then be used to move up or down in the list

d Once at the desired text string, key in the substitution text, then press ENTER This updates the configuration on hard disk and immediately implements the change Additional substitution text strings for this text set can be entered by using the configuration keys to move the input cursor to any desired text string

e After completing all changes for this text set, press ESC This positions the input cursor back to the *Language* field Two choices are available at this point

Press NEXT PAGE or PREV PAGE to call the next or previous text set to modify that set Repeat Steps 2b through 2d Press ESC to return to the first configuration page

f Press ESC to exit this configuration

Some text sets are restricted to English only, other sets are alter nate language only The possible language options for a set are listed next to the *Language* field

TAG TEXT SELECTOR

The *Tag Text Selector* option defines text strings that can be as sociated with DD, MSDD and RMCB tags These text strings relate to the good, bad and waiting condition reported by a device driver or multi-state device driver function block, and the good, alarm and waiting condition reported by a remote motor control function block The conditions are exception reported by a PCU module The module must contain a text selector function block (FC 151) that references one of these function blocks The text selector function block can also be configured as a stand alone text selector

A text selector function block in a PCU module sends a message number, and color and blink option to the console A TEXT tag configured at the console enables receiving this information from the exception report The message number is used to select a specific text string defined at the console The text (message) can display in a graphic by using the text dynamic escape command (**ed 79**)

The tag text selector function block does not send alarm status to the console Therefore, the only time a TEXT tag appears in alarm is when its status is bad quality This also requires the console to be configured to use bad quality as one of its alarm conditions, refer to ***ALARM QUALITY OPTION*** in this section

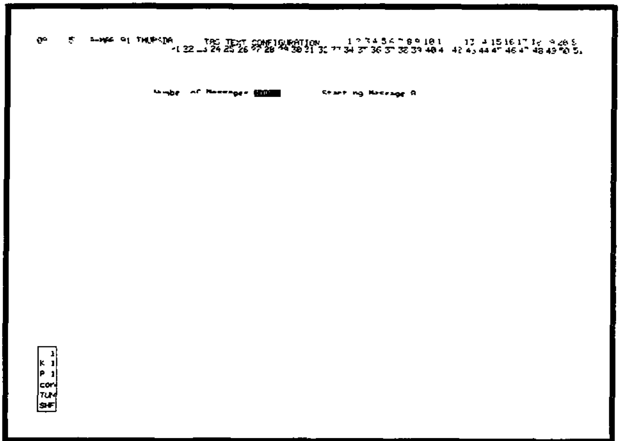
When the tag exhibits bad quality, either a bad quality text string replaces the currently displayed text string, or the last known good or current string remains on the display The alarm quality option also determines which of the two occurs The bad quality string can be modified through text substitution

The escape command does not specify any colors Configuration of the text selector function block in the PCU module determines the color and blink options If associated with one of the function blocks discussed earlier, the configuration set for a text selector block links it to the specific function block The console receives the color and blink specifications in an exception report generated by the function block Color and blink configured in the PCU module should be consistent with the overall color and blink set tings of the console

Each message defined in the console has a message number Up to 10,000 text selector messages can be defined at the console The message number sent from the PCU module selects one of these messages by its number If the message number received from the block is outside the range of messages defined at the console, error text appears The *Error Field* text set accessed through text substitution sets this error text Color is still a func tion of the exception report in this case

Step 1 The process engineer defines text strings through the *Tag Text Configuration* page (see Figure 15-76). To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown.

A OIS Configuration ⟶ *A Database* ⟶ *F Tag Text Selector*



TPS0162A

Figure 15-76. Text Definition - Tag Text Selector Configuration

Step 2 To define text selector messages:

a. Use the OIS configuration keys listed in Table 15-1 to move between and enter data into each display input field. At the *Number of Messages* field, enter the total number of messages required. A valid entry is from 1 to 10000. If no change is required, go to the next step.

> **NOTE:** Care must be taken when changing the *Number of Messages* field since this field indirectly affects PCU module configurations. This number establishes the range of valid message numbers which becomes the valid message numbers that can be set in the PCU module text selector function blocks. Decreasing this number erases any entries above the newly entered value which could make message numbers indicated in PCU modules invalid.

b. Each display shows only 20 text messages. Enter the message number the display is to start with at the *Starting Message* field, then press ENTER. A valid entry is from 0 to the number of messages minus one.

Pressing ENTER both updates the configuration on the hard disk to allocate enough space for all required messages, and calls 20 messages for display starting with the first message entered at the *Starting Message* field The console positions the input cursor at this starting message

Increase Size If the total number of messages is changed from the current value, the console resizes the file that contains the messages When the size is increased, the current messages copy to the same location in the file and the remaining new messages fill with blanks During update of the file, this message appears

Update of Files in Progress, Please Wait MSG 32

Do ***not*** continue until the message disappears

Decrease Size If the number of messages is decreased, this prompt appears

WARNING, ARE YOU SURE? ESCAPE IF NOT MSG 31

Press ESC to cancel Press ENTER to continue The console then reduces the file to its new size It saves the messages with message numbers at and below the newly entered number of messages It erases any entries above the entered value During update of the file, this message appears

Update of Files in Progress, Please Wait MSG 32

Do ***not*** continue until the message disappears

The *Starting Message* field can be left at *0* to call the first entry in the list, then the configuration keys can be used to move to a specific entry Also, if the number of entries is substantial this field can be used to move the input cursor and scroll the display to a higher numbered entry

For example, if the number of messages is 100, enter **50** to position the cursor and scroll the display to text message number 50 The configuration keys can then be used to move up or down in the list

c Enter a text string of up to 80 characters Any keyboard characters can be used At this level, additional text strings can be defined by moving to a specific message number using the configuration keys

d Press ENTER to update the configuration on the hard disk

e Press ESC, this returns the input cursor to the *Starting Message* number field Additional messages can be called and defined by repeatıng Steps 2b through 2d at thıs poınt Or, press **ESC** to exıt thıs configuratıon

REMOTE MOTOR CONTROL TEXT

The *Remote Motor Control Text* optıon defines text sets that contaın text strıngs related to remote motor control functıon blocks (FC 136) The functıon block can report any of ten dıfferent error codes that ıdentıfy ıts current status These error codes are re ported to ıdentıfy the condıtıon that caused a bad start of a devıce An RMCB tag must be confıgured to receıve an exceptıon report at the console Error codes and status reported ınclude

No error

Stopped

Interlock 1

Interlock 2

Interlock 3

Interlock 4

Feedback 1 0

Feedback 2 0

Feedback 1 1

Feedback 2 1

NOTE The nter ock codes nd cate not set or og c zero cond t ons for each of four ınter ocks

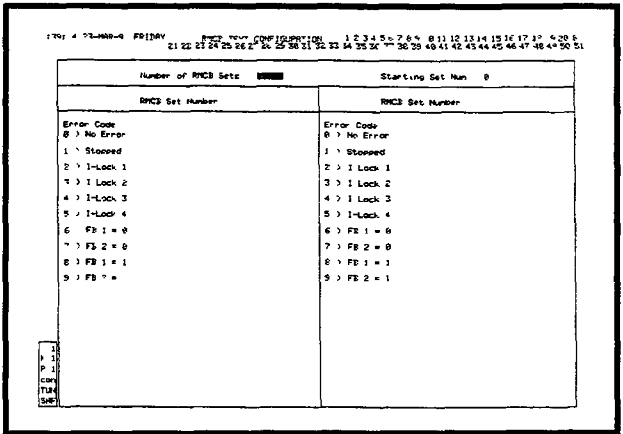
Each error code text set has an assıgned numbeı Up to 100 text sets can be defined Durıng RMCB tag confıguratıon, a *Text Set* at trıbute ıdentıfies whıch text set to use When the console receıves an exceptıon report for a remote motor control block, ıt references one of the defıned sets by ıts number The specıfic text strıng to dısplay depends on the error code returned ın the exceptıon re port The text message can appear at any dısplay by usıng the RMCB error code text dynamıc escape command (**ed 92**) The stan dard RMCB faceplate element contaıns thıs command

Step 1 The process engıneer defınes text strıngs for text sets through the *RMCB Text Confıguratıon* page (see Fıgure 15 77) To call thıs dıs play, fırst press **GENL FCTNS MENU**, then select the followıng menu ıtems ın the sequence shown

A OIS Confıguratıon

→ *A Database*

→ *G Remote Motor Control Text*



TPS0163A

Figure 15-77 Text Definition RMCB Text Configuration

Step 2 To define an error code text group

NOTE Care must be taken when changing the *Number of RMCB Sets* field since this field directly affects the tag database This number establishes the range of text sets which becomes the valid range for an entry in the *Text Set* field of an RMCB tag Decreasing this number erases any entries above the newly entered value which could make message numbers indicated in tags invalid

a Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field At the *Number of RMCB Sets* field, enter the total number of text sets required A valid entry is from 1 to 100

b The configuration page can show two text sets at a time Enter the number of a text set at the *Starting Set Num* field, then press **ENTER** to have that set appear on the screen A valid entry is from 0 to the total number of sets minus one

Pressing **ENTER** both updates the configuration on the hard disk to allocate enough space for all required sets, and calls two sets for display starting with the first set indicated at the *Starting Set Num* field The console positions the input cursor at the first configurable error code

Increase Size If the number of text sets is changed from the current value, the console resizes the file that contains these sets when ENTER is pressed When the size is increased, the current sets copy to the same location in the file and the remaining new sets fill with blanks During update of the file, this message appears

Update of Files in Progress, Please Wait MSG 32

*Do **not** continue until the message disappears*

Decrease Size If the number of text sets is decreased, this prompt appears

WARNING, ARE YOU SURE? ESCAPE IF NOT MSG 31

Press ESC to cancel Press ENTER to continue The console then reduces the file to its new size It saves the text sets with set numbers at and below the newly entered number of sets It erases any entries above the entered value During update of the file, this message appears

Update of Files in Progress, Please Wait MSG 32

Do ***not*** continue until the message disappears

The *Starting Message* field can be left at *0* to call the first set, then the OIS configuration keys can be used to move to a specific set Also, if the number of entries is substantial this field can be used to move the input cursor and scroll the display to a higher numbered set

For example, if the number of sets is 100, enter **50** to position the cursor and scroll the display to text set number 50 The configuration keys can then be used to call the previous or next set

c For each error code, enter a text string of up to 15 characters Any keyboard characters can be used

d Press ENTER to update the configuration on the hard disk after *defining all error codes The second set displayed can then be* configured in the same way Use the OIS configuration keys to move to the second set Additional text sets can be defined at this *point by pressing NEXT PAGE or PREV PAGE to sequence to the* next or previous set, then repeating Step 2c and this step

e Press ESC, this returns the input cursor to the *Starting Set Num* field Additional text sets can be called and defined by repeating Steps 2b through 2d at this point Or press ESC to exit this configuration

ALARM COMMENT TEXT

An alarm comment is a text string that can be associated with a specific alarm condition of a process device (i e , tag) The process engineer determines the purpose of this text as it applies to the

22 40 03 04 10 07

device It can be, for example, text that describes the alarm condition the device is currently in, or text that describes any operator action required to correct the condition

An alarm comment can be up to 64 characters It can appear at an alarm summary or any display. However, the alarm summary must use a line format that is defined with an alarm comment field, and the display must incorporate an alarm comment escape command (**ec 33** or **ed 33**)

Refer to ***Database Configuration*** in this section for further explanation of alarm comments and alarm comment definition procedures Refer to ***ALARM SUMMARY CONFIGURATION*** in this section for procedures to define a line format Refer to Appendix B for information about the alarm comment escape commands

ENGINEERING UNIT AND LOGIC STATE DESCRIPTOR TEXT

An engineering unit descriptor is a text string that shows the current unit of measurement for a process value The descriptor is for an analog value only A function block in the PCU module reporting the value also exception reports an index number along with the value This number determines the descriptor that relates to the value. Each descriptor defined at the console has an index number The console cross references the reported index number with the defined list of engineering unit descriptors to present the appropriate text

A logic state descriptor is a text string that describes the current operating state of a process device The descriptor is for a digital state only The method used to determine the appropriate descriptor for a digital state is different than that used for an analog value A PCU module does not send an index number along with a reported digital state The console uses the tag database to determine which logic state descriptor The choice of descriptors is defined in the tag

Refer to ***TAG DESCRIPTORS*** in this section for further information, and for procedures to define descriptors

Trend Pen Cluster Configuration

NOTE This configuration procedure describes setting up a trend pen using an analog output module (AOM) to drive a trend pen device The AOM module operates on module bus only

The trend pen cluster function provides an interface between the console and trend pen recorders, and indicator stations This function enables assigning trend pen recorders to track a set of process variables selected from the console The function distinguishes between trend pen recorders, indicator stations and output transfers Limits for each are

- 16 trend pen recorders with up to 32 pens per recorder

- Eight indicator stations with up to eight bars/displays per station
- 16 output transfer groups with up to 32 transfer units per group

The distinction between devices is for identification purposes Trend pen is for some type of trend pen or chart recorder Station indicator is for a device that displays values through bar indicators or digital readouts Output transfer group is for generic use and can refer to a trend pen recorder, bar recorder or INFI 90 input logic

To implement the trend pen function, a PCU module that supports the restore function block (FC 140), timer block (FC 35), input from a different PCU (FC 26) and input from a different ring (FC 121 is required to provide the hardware interface between the console and the trend pen recorder

Trend pen configuration consists of

- General parameters configuration
- Device definition
- Device assignments

The process engineer configures trend pen clusters through the *Trend Pen Cluster* page (see Figure 15 78) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

B OIS Utilities ⟶ *I Trend Pen Cluster*

GENERAL PARAMETERS

Select *A General Parameters*, a menu with these selections appears

A Trend Pen Recorder

B Indicator Station

C Output Transfer

After selecting option *A*, the display in Figure 15 79 appears With this display, the process engineer can configure recorder module tags, recorder description, number of pens and key lock requirements

The system verifies edits made at this level on a per field basis If changes are valid, the system saves them without requiring fur ther action Press ESC for a prompt to enter a device number to edit, or the number of a device to change

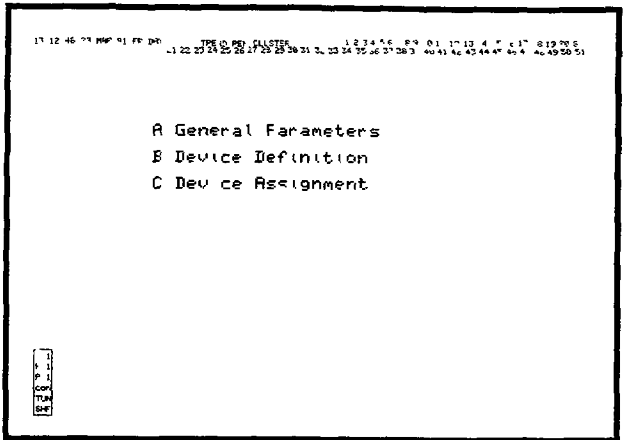


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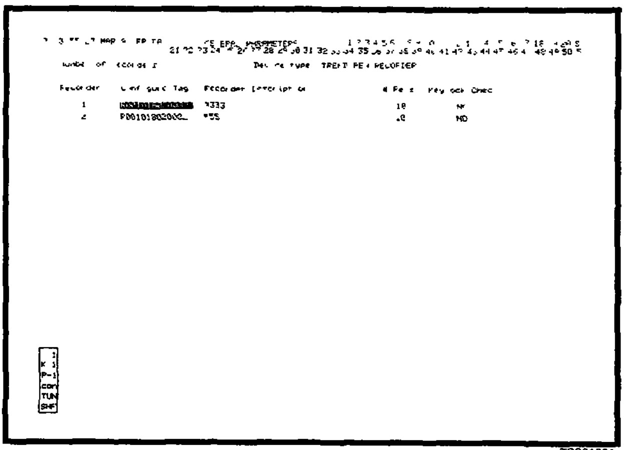
Figure 15 78 Trend Pen Configuration Trend Pen Cluster Main Menu



TPS0166A

Figure 15 79 Trend Pen Configuration General Parameters

DEVICE DEFINITION

Select *B Device Definition*, as in general parameters, a display with the following appears

A Trend Pen Recorder

B Indicator Station

C Output Transfer

After selecting option *A*, the device definition page (Figure 15 80) comes up This display allows defining a unique RCM tag to correspond to each physical pen within the device This RCM tag must reference a function block in the same module as the configure tag defined through general parameters

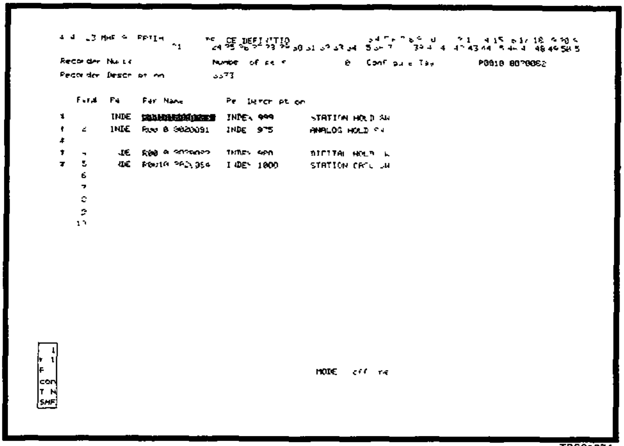


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Figure 15 80 Trend Pen Configuration Device Definition

For trend pen cluster functions, reference pens by the pen number only When displaying a pen, the pen number and the first four characters of the corresponding RCM tag description are used This helps to distinguish between the pens Use tag configuration procedures to define tag descriptions, refer to ***TAG DATABASE CONFIGURATION*** in this section

When edits are made, the message *EDITS HAVE BEEN MADE* displays This message informs the operator that what is being displayed does not necessarily reflect what is in the module To save edits, press ESC This action brings up a menu with the following choices

A Submit edits made

B Submit entire configuration

C Change mode to configure

D Change mode to execute

E Change recorder number

Choose an option, then press ENTER

Submit Edits Made

Select option *A* to save the edits made at the console. If a pen already has a pen assignment, the necessary configuration information is gathered and downloaded to the module The console downloads only the part of the module block configuration for which it is responsible For example, block *n*+1, block *n*+2, block *n*+3 and block *n*+4 for a pen at block address *n*, refer to ***TREND PEN CLUSTER USAGE EXAMPLE*** in this section for block information If a download for a pen fails, it is marked faulty and identified with an asterisk (*) next to its number Pens without a pen assignment are also marked faulty

Submit Entire Configuration

Select option *B* to download the configuration of all pens with assignments to the module

Change Mode to Configure

Select option *C* to place the module corresponding to the current device in configure mode This function is useful when changing RCM tag assignments of previously defined pens A pen already defined with an RCM tag cannot be redefined with another RCM tag while the module is in execute mode This operation would require configuration changes outside the scope of the trend pen cluster function (logic to turn the pens on and off) If a pen definition was changed during module execution, the old pen may not turn off correctly or the new pen may not turn on correctly

Change Mode to Execute

Select option *D* to place the module corresponding to the current device in execute mode

Change Recorder Number

Select option *E* to change to different recorders Key in the pen number and press ENTER to reposition the cursor to a pen entry on the display

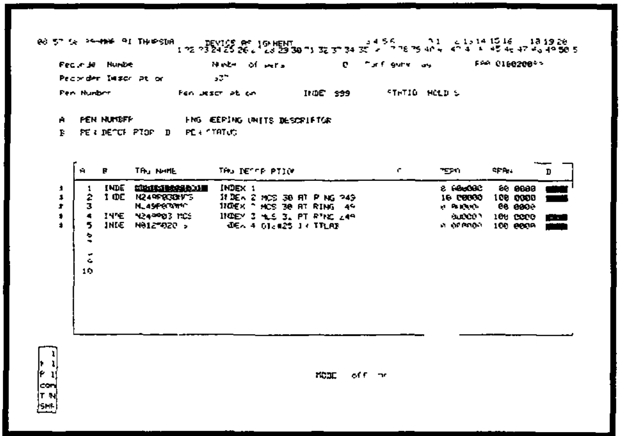
Press NEXT PAGE and PREV PAGE to sequence through additional pages if all pens cannot be displayed on one page Press ESC to exit this menu and go to the previous menu level

DEVICE ASSIGNMENT

Select *C Device Assignment*, a display with the following appears

A Trend Pen Recorder
B Indicator Station
C Output Transfer

After selecting option *A*, the display in Figure 15 81 appears This display summarizes the input source assignment, scaling factor



TPS0168A

Figure 15 81 Trend Pen Configuration Device Assignment

and pen status of each pen within a device Each pen on the dis play is identified by pen number and the four character pen description

To the left of the pen number may be an asterisk (*) when a pen configuration is faulty A pen is marked faulty when the recorder module has not been successfully downloaded with the pen con figuration displayed The input source is identified by its tag name and tag descriptor

Other information on this display is the engineering units of the input tag, the scaling factor, pen status, configure tag, module mode, recorder number, and maximum number of pens allowed for this recorder

To save edits made in this display, press ESC This action brings up a menu with the following choices

A Submit edits made

B Submit entire configuration

C Change mode to execute

D Change recorder number

These choices are the same as those available under the device definition display, refer to ***DEVICE DEFINITION*** in this section Only *Change mode to configure* is not allowed because this display can override configuration key lock

TREND PEN CLUSTER USAGE EXAMPLE

In this example, the console is set up with three trend pen recorders each with five pens The trend pen function logically groups up to 32 pens from one or more physical trend pen recorders The three trend pen recorders can be grouped into one trend pen module, or a different trend pen module defined for each one.

In this example, all three trend pen recorders are grouped into one trend pen module The console identifies this grouping through an RCM tag The RCM tag is the configure tag that serves two purposes

1 It identifies the PCU module configured for this grouping of pens

2 It is used by the console to synchronize when the PCU module can be put into configure mode for input source (pen) reassignments and input source scaling changes It also can be used to trigger the user configured logic to drive the pens to a predetermined condition This requires setting up additional logic during initial configuration of the module and its external devices

> **NOTE** Before placing the module into configure mode for input source reassignment or input source scaling drive all pens within the trend pen module to a predetermined rest position

Additionally, a unique RCM tag must be defined to correspond with each individual pen This tag must reference a function block within the same module as the configure tag It identifies the module blocks that the trend pen cluster function must manipulate when input source (pen) assignments and scaling modifications are made

Each pen tag must be allocated five consecutive blocks within the PCU module as follows

1st Block The first block (i e , block address *n*) must be configured as an RCM block (FC 62) The trend pen cluster function uses this block to turn the physical pen on or off Define the meaning for on and off (e g , off places the pen in some predetermined rest position)

2nd Block The second block (i e , block *n*+1) is reserved for the trend pen cluster function to obtain the source input signal

3rd Block The third block (i e , block *n*+2) is reserved for the trend pen cluster function to obtain the digital source input signal

4th Block Initially, configure the fourth block (i e , block *n*+3) as a sum block (FC 15) The trend pen cluster function manipulates this block to scale the input signal destined to the physical pen The output of this block feeds another set of logic to drive the physical pen This must be set to how this output relates to the physical pen

5th Block The fifth block (i.e., block *n*+4) is reserved for the trend pen cluster function. This block restores the state of the RCM block (i.e., block *n*) to its previous execute state whenever the module is put into execute mode.

Changes can only be made when the module is in ***configure*** mode. The trend pen cluster function handles changing the module mode and downloading changes transparent to the user.

This block saves the state the RCM block is in just before the module goes into configure mode. When the module is put back into execute mode, this block restores the RCM block to the saved state.

Figure 15.82 is an example of a block configuration to drive a physical pen to the off position. In this figure, the RCM tag controls which signal gets sent to the physical pen. The logic one state of the RCM corresponds to the on position of the pen, logic zero state corresponds to the off position of the pen. Blocks X1, Y1 and Z are not accessed by the trend pen cluster function.

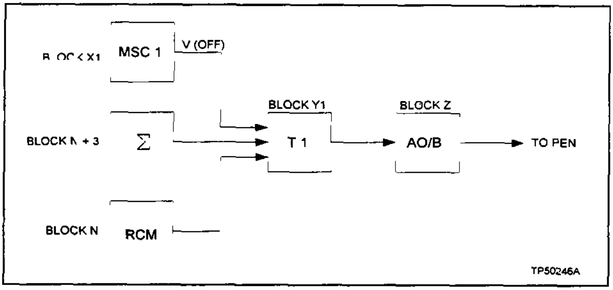


Figure 15.82. Pen Configuration - Pen Off

Block X1 is a manual set constant block. It provides a 0.0 signal to drive the pen to the predetermined *off position*. Block Y1 is an analog transfer block, it selects which signal goes to block Z. Block Z is an analog output block that directly interfaces to the pen. The following explains the specifications for the function codes.

Manual set constant (FC 2)

S1 = 0.0 Default

Analog transfer block (FC 9)

S1 = x1 To reference the manual set constant block

S2 = *n*+3 To reference the sum block

S3 - *n*	To reference the RCM block
S4 - 0	Default
S5 - 0	Default

Analog output block (FC 28)

S1 = d1	Destination module address The location of the physical device (user provided)
S2 - d2	Destination block address (user provided)
S3 y1	To reference the analog transfer block, which is the signal to be sent to the pen
S4 0 0	Default, input zero
S5 =100 0	Default, input span

Input Scaling

The trend pen cluster function allows scaling the input source signal going to the pen The desired zero and span can be specified

zero	Lowest output value
span	Difference between the lowest output value and the highest output value

The trend pen cluster function uses these two parameters to cal culate the S3 and S4 for a two-input summer block (FC 15) The summer block performs the desired scaling

For example, the input signal ranges from 100 to 200 units The specific signal range of interest is from 150 to 200 units, which is the 50 percent to 100 percent level of the input signal It is de sired to have this portion of the input signal drive the trend pen full scale (0 to 100 percent) and represent the 150 to 200 unit range This provides better resolution at the trend chart To do this, set the following

Zero = 150	Low limit
Span = 50	High limit minus low limit, 200 150

The trend pen cluster function calculates the following constants for S3 and S4 of the two input summer block The input summer provides a scaling function as follows

summer output = (input × S3) + (S2 × S4)

S2 is always set to 1 0, so the equation reduces to

summer output (nput × S3) + S4

The followıng relatıonshıps can be derıved

S3 = 100 0/span

S4 = zero × (100 0)/span

100 0 represents the percentage of scale range for the output sıg nal (full scale). For thıs example, the functıon comes up wıth

S3 - 100 0/50 0 2 0

S4 = 150 0 × (-100 0)/50 0 - 300 0

When ınput equals 150 0, output equals

150 0 × 2 0 - 300 0 = 0%

Thıs ıs the percent sıgnal, so zero percent corresponds to 150 unıts

When ınput equals 200 0, output equals

200 0 × 2 0 300 0 100% (200 unıts)

When ınput equals 175 0, output equals

175 0 × 2 0 - 300 0 = 50% (175 unıts)

The desıred sum block output ıs a normalızed value rangıng from 0 to 100 The output of the sum block may not always be ın thıs range If the desıred sıgnal must be wıthın a certaın range, a hıgh/low lımıt block (FC 6) may be needed to be placed ımmedıately after the sum block

Module Configure Tag Requirements

The output sıgnal of the confıgure tag ıs at logıc one state when the module ıs ın execute mode Its feedback sıgnal ıs also logıc one When a download procedure ıs requıred, the trend pen cluster functıon sets the output of the RCM confıgure tag to logıc zero When the feedback sıgnal ıs at logıc zero, the trend pen cluster functıon places the module ınto confıgure mode

The sample ın Fıgure 15 83 lags the feedback sıgnal of the RCM block one second before ıt goes to logıc zero Thıs gıves the user confıgured logıc tıme to execute ıts pen posıtıonıng logıc before the module enters confıgure mode

Confıgure the RCM functıon block used as the confıgure tag as follows

S1 = 0
S2 = 1
S3 0
S4 = 0

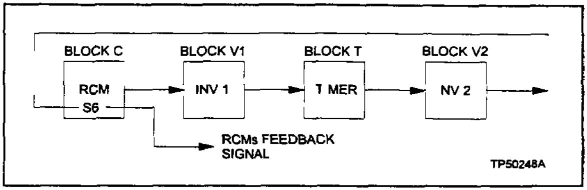


Figure 15 83 Configure Tag/Timer Configuration

S5 1
S6 = V2
S7 = 0
S8 = 0

S5 set to one insures the output signal of this RCM block is a logic one when the module returns to execute mode S6 is set to V2 to reference a block at address V2 Block V1 inverts the RCM output signal and feeds it to block T, which is a timer block

The timer block (FC 35) has this configuration

S1 - V1	To reference the inverter block (inverted output of configure tag)
S2 = 1	To select the time out mode
S3 = 1	To select a time period of one second

When the input to this block is logic zero, its output is immediately logic zero Its input must be at logic one for one second, the selected time period (S3), before its output goes to logic one This output is fed to another inverter before going to the feedback input of the configure tag This accomplishes the desired time lag

Specification S3 can be set to the lag time required for the pens to go to the configuration reset position This lag time must not be greater than ten seconds The trend pen cluster function waits a minimum of ten seconds for the RCM feedback signal to go to logic zero If the feedback signal is still at logic one, the download procedure is aborted The configuration to be downloaded is saved in the console and marked faulty

Configuration of block V1, Not block (FC 33)

S1 = C	To reference the configure tag block

Configuration of block V2, Not block (FC 33)

S1 = T	To reference the timer block

The RCM tags referenced by the trend pen cluster function should not be controlled outside of this function Doing so may confuse and defeat the usefulness of this function

Figure 15 84 is a sample configuration to drive pens to a configure position when the download position is initiated by the configure tag being set to logic zero

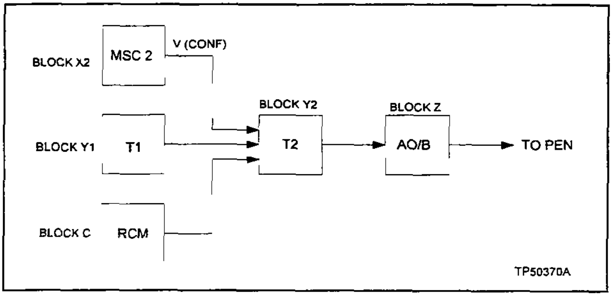


Figure 15 84 Configure Tag to Pen Configuration Position Logic

Block C is the RCM function block used as the configure tag It determines which signal is sent to the pen Block Y2 is an analog transfer block (FC 9) that determines which signal is fed to block Z, the analog output block The V (conf) signal is sent when the RCM block is at logic zero The pen assignment signal (T1) is sent when the RCM block is at logic one

TREND PEN CLUSTER CONFIGURATION RESTRICTIONS

This section discusses the proper methods for making changes to existing parameters Use the device assignment display to change pen assignments and scaling factors Adding pen assignments to undefined pens can be saved in the console However, those pen assignments are marked faulty because their corresponding pens are undefined Their configuration is not downloaded to the mod ule until the pens are defined through the device definition display

Modifications at the device definition and general parameters dis plays are more complex Changes made here can cause drastic re sults at the module For example, changing a configure tag may require readjusting the background configuration The back ground configuration refers to the logic that places the pens in a predetermined rest position More often, changing a configure tag requires making other changes to insure that the configure tag controls the right pens

At the device definition display, pens are allowed to be defined, changed or deleted (insure that configure tag is already defined at the general parameters page) if

1 The module is ***not*** in ***execute*** mode

2 A pen assignment has not been defined for this pen

3 A pen assignment is defined, but marked faulty

At the general parameters display, a configure tag change is allowed if

1 The target module of the original configure tag is ***not*** in ***execute*** mode

2 There are no pens and pen assignments defined

3 All pens and pen assignments defined are marked faulty

When a configure tag is deleted, the pen definitions and pen assignments are marked faulty If the configure tag is changed to reference a different module, all of its pen definitions and assignments are marked faulty If the configure tag is changed by another reference to the same module, the pen faulty status is unchanged

TREND PEN CLUSTER OPERATION RESTRICTIONS

The *Change Mode to Configure* operation at the device definition page always puts the module in ***configure*** mode The configure tag is set to logic zero. The trend pen cluster function waits for the feedback signal to become logic zero If the feedback signal does not become logic zero after a period of 15 seconds (ten seconds minimum), the error message *No Response to the Requested Action* appears, and the module is placed in configure mode

The *Change mode to configure* operation available through trend pen cluster configuration functions provides the ability to drive the pens to a rest position before the module goes into ***configure*** mode The *Change mode to configure* operation from any other device does not provide this capability, for example, changing the mode from the PCU configuration function of the console, or from a configuration and tuning terminal at the PCU module. This places the module in configure mode, however, the logic to drive the pens is not executed

The *Submit edits made* and *Submit entire configuration* operations in the device definition and device assignment displays also have a time out The error message *No Response to the Requested Action* appears, however, the module is not put in configure mode and the download procedure is canceled

TREND PEN CLUSTER FUNCTION RESTRICTIONS

1 The module driving the pen devices is expected to be a multi function processor (MFP) or multi-function controller (MFC) module This module is dedicated to receiving inputs and driving the external devices This module works in conjunction with an analog output module (AOM) to drive each pen

The MFP or MFC module feeds values to the AOM module The AOM module converts these values to voltages to feed the physical devices connected to it The AOM module holds its outputs until the MFP or MFC module sends other values For example, when the MFP or MFC module is put in configure mode, the AOM module continues to drive its external devices with the last signals received from the MFP or MFC module

The console does not verify nor enforce the configuration of the module Pen assignment changes place the module in ***configure*** mode and can pose a problem if the module is configured to per form other functions

2 A tag within the module driving the external device cannot be an input source for the device All input source tags must be out side of the module referencing it The trend pen cluster function configures an analog input block to reference the input source, which requires the source to be outside the module

To bypass this restriction, a second tag must be defined at an other module This second tag tracks the same signal as the first tag The pen assignment references the second tag This configu ration may introduce a time lag

3 A tag residing in a module of a different PCU from the module driving the external devices cannot be an input source for more than one pen within that module For example, Tag A at PCU 2 cannot be assigned to pen number one and two of module B in PCU 3 Tag A can be assigned to pen one of module B and pen one of module C (both in PCU 3)

DOWNLOAD PROCEDURES

All pens are temporarily marked faulty when a download is re quested Each pen gets updated to successful or not faulty when its download completes successfully If the target module is in execute, it is placed in configure mode by the trend pen cluster function

1 The configure tag is set to logic zero This triggers the back ground logic to place all pens at the predetermined configuration position

2 The trend pen cluster function places the module in ***configure*** mode when the configure tag feedback signal is at logic zero This is obtained from the tag exception report

If the configure tag feedback signal remains at logic one, the download procedure cancels The configuration to be downloaded is saved in the console and marked faulty

3 When the module is in configure mode, the block configuration for each pen is sent one by one

22 40 16 04/10/07

4 As each download of a pen completes, it is marked faulty or successful at the console A download failure does not stop the download procedure The download continues until all are processed

The download process can be canceled by pressing ESC or calling another display The pens that were not downloaded remain faulty until they are successfully downloaded

ADDING OR CHANGING AN ANALOG TAG ASSIGNMENT

1 The function checks for an RCM block for the pen and sum block If neither block exists, the download of the pen fails

2 If the restore block exists, it is deleted

3 The restore block is added It references the RCM block and sets it for logic zero when the module is returned to execute mode

4 The sum block is configured as follows

S1 = *n* + 1	To reference the source input
S2 – 6	To reference a constant 1 0 value

S3 and S4 are set as explained in the preceding example

5 The analog input block is added It references the input signal (tag) to be trended

If the source input is coming from a module within the same PCU as this module, function code 25 is used, if from a different PCU, function code 26 is used, if from INFI NET system, function code 121 is used.

6 Block *n*+2 is deleted It is only used in digital inputs When the module is put back in execute mode the RCM block is set to logic zero (pen off position)

ADDING OR CHANGING A DIGITAL TAG ASSIGNMENT

1 The function checks for an RCM block for the pen and sum block If neither block exists, the download of the pen fails

2 If the restore block exists, it is deleted

3 The restore block is added It references the RCM block and initially sets it for logic zero when the module returns to execute

4 The sum block is configured as follows

S1 – *n* + 1	To reference the input source
S2 = 6	To reference a constant 1 0 value

S3 span	User specified
S4 = zero	User specified

5 The digital input block is added It references the input signal (tag) to be trended

If the input is coming from a module within the same PCU as this module, function code 41 is used, if from a different PCU, function code 42 is used, if from INFI NET system, function code 122 is used

6 The analog transfer block is added It references the digital in put block in specification S3 The specifications are

S1 = 5	Block supplying an analog 0 0 constant
S2 = 6	Block supplying an analog 1 0 constant
S3 *n* + 1	Digital input block
S4 0	Default
S5 = 0	Default

When the module is put back in execute mode, the RCM block is set to logic zero (pen off position)

DELETE PEN ASSIGNMENT

1 The sum block is reconfigured with the default specifications Its output signal is zero

2 The restore block is deleted When the module is put in exe cute mode, the RCM block corresponding to the pen that no longer has a pen assignment resumes execution at logic zero (pen off po sition) The restore block is no longer there to restore its prior state

MODIFY SCALING FACTOR

Only the sum block is modified Specifications S3 and S4 are changed to reflect the zero and span parameters selected

The restore block is not modified The RCM block is set to its last state when the module is placed back in execute mode

TREND PEN CLUSTER CONFIGURATION FILES

The trend pen cluster configuration files reside in the USN 02 directory

TPCPF001.CF	Contains configuration information gathered from the general parameters display for the trend pen recorder devices

TPCPF002.CF Contains configuration information for the indicator station devices

TPCPF003.CF Contains configuration information for the output transfer devices

PIO1DFnn.CF Contains pen definition and pen assignment information for trend pen recorder device number ***nn***, which ranges from one to 16 For example, ***PIO1DF01.CF*** is for trend pen recorder device number one

PIO2DFnn.CF Contains bar definition and bar assignment information for indicator station device number ***nn***, which ranges from one to eight

P1O3DFnn.CF Contains unit definition and unit assignment information for output transfer device number ***nn***, which ranges from one to 16

These files need to be saved as a set per device type For example, when transferring a trend pen cluster configuration for the trend pen recorder device, transfer the ***TPCPF001.CF*** and all the ***PIO1DDFnn.CF*** files Additionally, the corresponding tags in the database need to be transferred or verified at the destination console

The console does not verify configuration, this must be done manually after the transfer is complete Verify referenced tags, set up the referenced target modules, and go through each trend pen recorder assignment

Alternate Language Substitution

Alternate language substitution gives the ability to use an alternate language when entering data It also allows substituting the default English text that appears at displays with alternate language characters Configuration of the console for alternate language should be performed prior to any other configuration to allow entering alternate language character strings during configuration steps This section provides procedures to

- Enable alternate language entry
- Modify characters of either an extended or complex alternate language character set
- Translate system displays
- Translate default text

The configuration procedures that pertain to alternate language include

- OIS system configuration (*General Parameters*)

- Character definition
- System attributes for foreign language assignment
- System display translator
- Text substitution
- Alarm summary format configuration

The console can be configured for either default ASCII characters, extended characters or complex characters

Extended Character

The extended character set provides an additional 128 characters that is an extension to the default ASCII character set (English) Once enabled, this set along with English characters can be entered as input to the system, and to create the database and user created displays of the system The *Character Definition* function can be used to modify characters in an extended set

To enter extended characters, the console must have a keyboard that contains the additional characters of the alternate language Refer to ***Entering Alternate Language Characters*** in the ***Keyboard and Peripherals*** section for additional information about extended character entry The console also requires a printer that supports the characters of the alternate language to print text correctly

Most alternate languages can be supported by using the extended character set This set is normally used for languages that require a limited number of characters, 128 or less Since this set is an extension to the default ASCII, characters also must be able to follow the default ASCII character size and spacing characteristics The console requires this to prevent system character spacing problems since both ASCII and extended characters can be entered at the same time If either of these requirements cannot be met, the complex set must be used

Complex Characters

The complex character set is a separate, independent set for languages that use complicated and intricate characters The complex set gives additional flexibility for creating up to 3,000 unique characters

To enter complex characters, the console requires either

1 A serial input device set up for the particular language

2 A standard keyboard used in a character Romanization mode Refer to ***Entering Alternate Language Characters*** in the ***Keyboard and Peripherals*** section for additional information about character Romanization

The console also requires a printer that supports the characters of the alternate language to print text correctly

The complex set is separate from the standard ASCII character set When creating this set, the character height and spacing requirements can be expanded This is to allow creating intricate characters that cannot be reproduced maintaining the size and spacing standards set for default ASCII characters If the complex set is used for this purpose, the character height and width is double that of standard characters If using this type for the added number of characters only, the character height can be adjusted to the standard size

The complex set can also be modified using the *Character Definition* function. It is impractical, however, to use this function to create the complex character set Contact Bailey Controls for other methods

When using complex characters, all configuration must be done at the console. The current SLDG program does not support complex languages The database and logs must be created at the console, however, displays can be created using the SLDG program leaving text strings blank or entering English while creating the display Once created initially with the SLDG program, a display can then be edited at the console to contain the alternate language characters The process engineer can edit the displays using functions available at the console, refer to ***Display Generation*** in this section for specifics If created in this way, complex character height and spacing must be considered while creating a display with the SLDG program The display must allow enough space for complex characters, either single or double height

The complex character set requires setting specific attributes to enable entry of the alternate language The console requires this to compensate for complex character size The complex character code causes a standard displayable input field length such as *Tag Name* to be half the normal size but still requires the same amount of memory to store Database and system attributes can be set to either alternate language or default English through the *System Attribute for Foreign Language Assignment* function Once set to alternate language, the console treats any occurrence of that type of attribute as if it is an alternate language

Input Fields

An input field will accept both ASCII characters and extended or complex characters File names, display names and numeric value fields require ASCII characters only

Use of an alternate language must be enabled before any alternate language configuration can take place The console does not allow access to alternate language configuration pages until enabled Character definition allows modifying the alternate language character sets. the English character set cannot be changed *System Attribute for Foreign Language Assignment* tells the console for which of its database or system text attributes to allow entry of an alternate language (complex characters only) This configuration adjusts the input fields accordingly

To put the console in extended character mode, simply enable alternate language, refer to ***ENABLING ALTERNATE LANGUAGE*** in this section for procedures After initially enabling alternate language, the console comes up in extended character mode The *Character Definition* function determines whether the console operates in extended or complex character mode

To put the console in complex character mode

1 Enable alternate language, refer to ***ENABLING ALTERNATE LANGUAGE*** in this section for procedures

2 Use the *Character Definition* option to set the console to complex character mode Refer to ***CHARACTER DEFINITION*** in this section for procedures

3 Set database and system attributes to enable alternate language entry Refer to ***ENABLING SYSTEM ATTRIBUTES FOR FOREIGN LANGUAGE ASSIGNMENT*** in this section for procedures

ENABLING ALTERNATE LANGUAGE

The process engineer enables alternate language character definition and substitution through OIS system configuration Changes made at the general parameters page of system configuration require a RESET after completion

Follow the procedures for setting the system configuration, refer to ***OIS System Configuration*** in this section for the procedures Set the *Foreign Language* field to **YES** to enable *Character Definition* and *System Attribute for Foreign Language Assignment* functions Enter **NO** to disable use of an alternate language

CHARACTER DEFINITION

The process engineer can use *Character Definition* to modify characters of an extended or complex character set

Character definition also

- Determines whether the console operates in extended or complex character mode
- Sets a left to right or right to left attribute This affects input fields only, not data returned to the fields
- Sets raster size which determines character size
- Identifies the default code being used for the space code

Extended and complex characters can be distinguished by other features besides their practical use The extended characters are each one byte in length, complex characters two bytes Extended one byte characters use a code range from 80 hexadecimal (128 decimal) to FF hexadecimal (255 decimal) Each byte of a complex two byte character code can start at A0, but cannot go past FF This makes the complex character code range A0A0 to FFFF Both extended and complex characters cannot exist simultaneously

The normal ASCII character code range is from 00 to 7F hexa decimal (0 to 127 decimal). The ASCII range cannot be accessed through either extended or complex character definition

When modifying a character, the process engineer performs what is essentially pixel editing Each bit of the character is either turned on or off to create the final character This is part of the *Character Definition* function

Character definition also sets raster size Raster size determines the size and number of pixels for each character The extended set uses a raster size of eight, which is 8 × 8 pixels The complex characters can use either raster size eight or 16, 16 being 16 × 16 pixels A raster size of eight fits on a single line of the screen (single height), raster size 16 requires two lines of the screen (double height)

Character data for two-byte complex characters is divided into 130 groups Each group can contain character set data for 128 charac ters at raster size eight, or 32 characters at raster size 16 Each group can have only one raster size, therefore, 8 × 8 and 16 × 16 pixel characters cannot be in the same group

The process engineer defines the operating parameters and indi vidual characters for an alternate language through options avail able at the *Character Definition* menu (see Figure 15 85) There are two *Character Definition* menus One for an extended set and one for a complex set This figure shows the complex character defini tion menu selections The extended set display does not have the *A Define Group* menu selection To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

A OIS Configuration ⟶ *E System* ⟶ *D Character Definition*

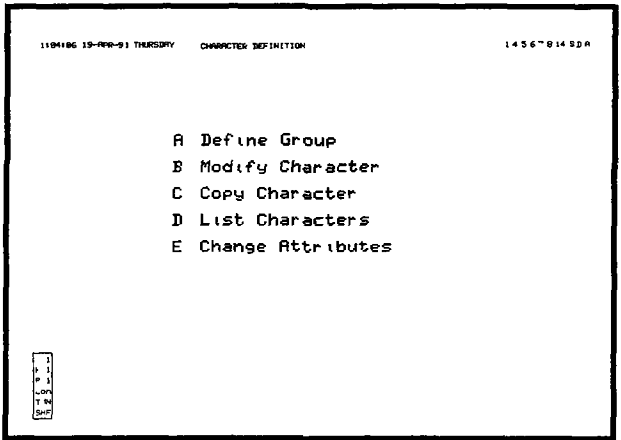
Define Group

The *Define Group* option appears only when entering complex characters Initially, the console presents the menu without this selection It appears after using the *Change Attributes* option to set the console for two byte (complex) characters, then resetting the console When the console comes back on-line, this selection is available

The complex characters are divided into 130 groups Through this option the *Raster Size*, *Start Index* and *End Index* for each group is defined The console automatically calculates the end index after entering the raster and start index number

Modify Character

The *Modify Character* selection is the option used to modify the individual characters When called, depending on the raster size being used, an 8 × 8 or 16 × 16 grid appears Each box of the grid



TPS0011A

Figure 15 85 Character Definition Menu Complex Character Mode

is a single pixel By turning a pixel on or leaving it off, the process engineer can create or modify a character

Copy Character

The *Copy Character* selection can be used to expedite character definition *It allows specifying a character index number (i e ,* character code address) to copy, and an index number to copy to Effects of this operation cannot be seen through the *List Characters option* until after the console is reset They can, however, be seen by selecting the *Modify Character* option, then entering the index number that received the copy

List Characters

The *List Characters* selection allows viewing the current character definitions Use this option when editing to find the character code of the character to edit

If in extended character mode, a list of 128 character codes appears when using this option Next to each code is its respective character if defined. In complex character mode each character group, defined through the *Define Group* option, is viewed separately If the group uses raster size eight, a list of 128 character codes with their respective defined characters appears If using raster size 16, a list of 32 character codes appears

Change Attributes

The *Change Attributes* selection puts the console into extended character mode or complex character mode It also sets a character path attribute that determines whether input fields enter characters from left to right or right-to left for the particular language

The console references a specific character code when clearing input fields, or using [SPACE] to enter blank spaces This option identifies the character code the console is to reference Once identified, that character must remain blank or undefined

Extended character definition requires first setting the *Change Attributes* options, then using *Modify Character* to define individual characters

Complex character definition requires

1 Setting the *Change Attributes* options

2 Establishing character groups through *Define Character*

3 Defining individual characters through *Modify Character*

The last step for the *Change Attributes* option is a console reset. If entering complex character mode through *Change Attributes*, perform *System Attribute for Foreign Language Assignment* **before** resetting the console

Change Attributes

The fields presented through selection of the *Change Attributes* option set the console operating parameters for either extended character mode or complex character mode

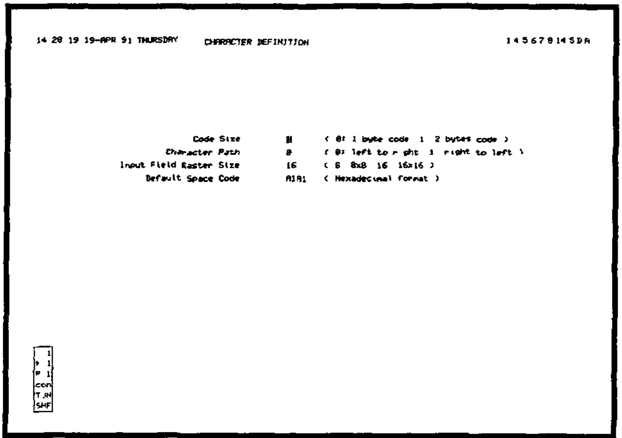
To set the character mode of the console

> **NOTE** Changes made at this display require a reset to take effect If the page can be used with the defaults that are already set, do not make any changes and exit this page The current settings are already established which allows continuing without having to reset the console

1 Select *Change Attributes* from the *Character Definition* menu (see Figure 15 85) Figure 15-86 shows the configuration page that appears next

2 Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field Set the *Code Size* field to **0** for one-byte extended character mode Set the field to **1** for two byte complex character mode After setting, either moving away from this field or pressing [ENTER] updates the *Input Field Raster Size* and *Default Space Code* fields

The *Input Field Raster Size* field cannot be changed from its current setting The console uses this to set the raster size for input fields The console requires raster size eight for extended characters and raster size 16 for complex characters The raster size used when defining groups of complex characters can be adjusted to eight or 16 through the *Define Group* option



TPS0013A

F gure 15 86 Character Definition Change Attributes

3 Set the *Character Path* field to **0** to have the console enter characters at input fields from left to right Set the *Character Path* field to **1** to have the console enter characters at input fields from right to left This field applies to input fields only and does not affect text returned to fields

4 The *Default Space Code* field sets the character code address the console references whenever a blank space is entered This also applies to clearing a field The console defaults to character code 20 (ASCII blank) for extended characters and code A1A1 for complex characters Any valid character code can be assigned as the blank space code Once defined, do ***not*** define a character at that code number

5 Press ENTER to save the changes

This configuration page can be exited by pressing ESC without initiating a reset If changing to complex character mode perform *System Attribute for Foreign Language Assignment* configuration ***before*** resetting as this configuration also requires a reset at completion

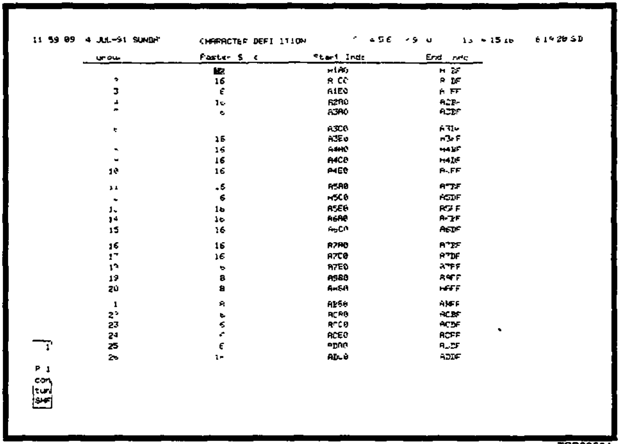
6 Press the RESET button located at the power entry panel When the console comes back on line, it operates with the parameters set here

Define Group

The *Define Group* option is only available and only required for complex character definition The process engineer sets up com plex characters in groups If using raster size eight, 128 charac ters can be defined in a single group If using raster size 16, 32 characters can be defined Raster sizes cannot be mixed in a sin gle group, all characters in a group follow the same raster size.

To define group ranges and raster sizes

1 Select *Define Group* from the *Character Definition* menu (see Figure 15-85) Figure 15 87 shows the configuration page that ap pears next



TPS0058A

Figure 15 87 Character Definition Define Groups

2 Each page shows only 26 of the 130 groups Press NEXT PAGE or PREV PAGE to sequence to the next or previous set of group numbers

Use the OIS configuration keys listed in Table 15 1 to move be tween and enter data into each display input field At the *Raster Size* field for a group, enter the raster size for that group A valid entry is **8** or **16** Once set, all characters defined in that group conform to the raster size

3 At the *Start Index* field for the group, enter the starting index number of this group A valid entry is any character code from A0A0 to FFE0

4 Press ENTER or move to another group to enter the values As soon as either is done, the console automatically calculates and updates the *End Index* field to reflect the last character code of the group If raster size is eight, the index is 128 hexadecimally greater than the start If raster size 16, it is 32 hexadecimally greater than the start The next group should start at the next available character code after the *End Index* code of the last entered group

For example, if group one is set to *Start Index A0A0* and *Raster Size 16* the *End Index* field indicates *A0BF* In this case, the *Start Index* of the next group should be A0C0

If group one is set to *Start Index A0A0* and *Raster Size 8* the *End Index* field indicates *A11F* In this case, the *Start Index* of the next group should be A120

5 Repeat Steps 2 through 4 until the attributes for all required groups are defined The number of required groups depends on the number of characters being defined When completed press ENTER

6 Press ESC to exit this configuration page

Modify Character

The *Modify Character* option allows both initially defining or editing existing characters The procedures for creating complex and extended characters are basically the same The differences are explained in the following steps

To define or modify a character

1 Select *Modify Character* from the *Character Definition* menu (see Figure 15 85) A single input field selects the character code to define The fields at the lower right corner of the display remain blank until making this selection

A two byte complex character code cannot be accessed through *Modify Character* if it is not part of a group defined through *Define Groups*

2 Key in an the index number, then press ENTER to call the character with this character code For complex characters, definition is done per character group

Press NEXT PAGE or PREV PAGE to increment or decrement the index number instead of keying one in

Figure 15-88 shows the next configuration page that appears The modify character page presents an 8 × 8 grid for raster size eight, or 16 × 16 grid for raster size 16 Each block of this grid represents a single pixel

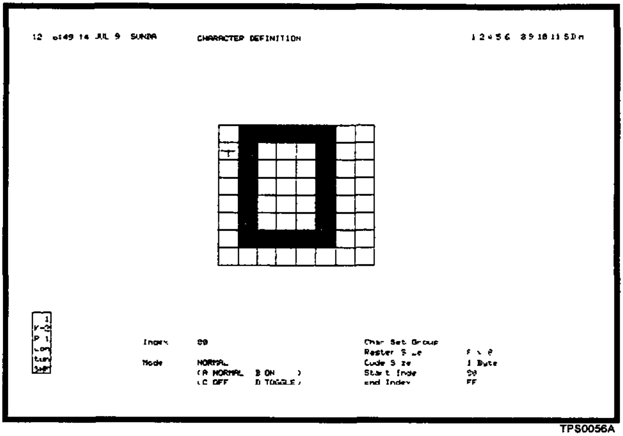


Figure 15 88 Character Definition Modify Character

At the lower left corner of the page are fields that indicate the attributes previously set for an extended character code set or complex character group These fields pertain to all characters in the character set or group, and identify

Char Set Group Indicates the current complex character group called, 1 through 130 If the console is in extended character mode, this field is set to *1*

Raster Size For extended characters, this indicates *8 × 8* For complex characters this identifies the raster size chosen through the *Define Group* option for the selected group, either *8 × 8* or *16 × 16* This field also corresponds to the grid pattern shown

Code Size Indicates the current code size, either *1 Byte* or *2 Bytes*

Start Index Shows the starting index code for the set or group For extended characters, this is set to *80* For complex characters, this is the first code for the selected character group. This corresponds to the *Start Index* attribute set for a group through *Define Group* procedures

End Index Shows the ending index code for the set or group For extended characters, this is set to *FF* For complex characters, this is the last code for the selected character group This corresponds to the *End Index* attribute set for a group through *Define Group* procedures

3 Use the OIS configuration keys to move the cross hair within the pixel block Each pixel of a character can be selectively turned on or off, on pixels determine the character presentation The menu items presented at the bottom of the page are the pixel editing options The function of each option is

NORMAL Select this option when randomly moving the cross hair cursor This disables both turning pixels on or off

ON Select this option to turn pixels on A pixel block turns on when the cross hair is moved to that block

OFF Select this option to turn pixels off A pixel block turns off when the cross hair is moved to that block

TOGGLE Select this option to toggle the state of a pixel A pixel turns off if it was on when the cross hair is moved to that block, or on if it was off

After the pixel presentation of the character has been defined, press ENTER The character defined appears next to the right upper corner of the pixel box at its exact size and shape This is exactly how the character will appear when entered

4 At this point, either define additional characters for this set or group by repeating Steps 2 and 3, or press ESC to exit

Press NEXT PAGE and PREV PAGE to call the next or previous character in the current set or group

If in complex character mode, only characters with codes defined in the current group can be called at this level The *Start Index* and *End Index* fields show the range for the group To modify characters of another complex character group, exit this configuration and repeat Steps 1 through 3

5 Press the RESET button at the power entry panel after completing all character definitions

Defined characters do ***not*** appear in a character list viewed through the *List Characters* option until the console comes back on line after a reset

Considerations If entering extended characters, define the character size as 5 × 7 instead of the full 8 × 8 as shown in Figure 15 88 This is required to prevent problems with character spacing

Standard spacing for ASCII characters is 0 1 display units, which causes a slight overlap to occur with no effect to the actual characters If the extended characters use the entire 8 × 8 grid, characters will overlap

If defining complex characters, the entire 8 × 8 or 16 × 16 grid can be used Spacing can be adjusted to prevent character overlap during *System Attribute for Foreign Language Assignment* and display creation

Delete Character

To delete a character

1 Call the character using the *Modify Character* procedures.

2 Press CLEAR

3 Press ENTER

Copy Character

The process engineer can use the copy character function to expedite character definition This function copies an existing or blank character defined in a specified character code address to another

To copy a character

1 Select *Copy Character* from the *Character Definition* menu (see Figure 15-85) Figure 15 89 shows the configuration page that appears next

2 Use the OIS configuration keys (refer to Table 15 1) to move between and enter data into each display input field Enter the character code of the character being copied at the *Source Index* field

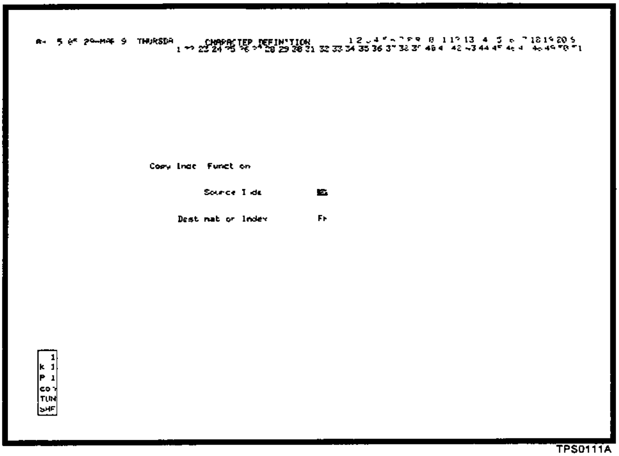
3 Enter the character code to which to copy at the *Destination Index* field This procedure overwrites any existing character

4 Press ENTER to initiate the copy, then ESC to exit.

List Characters

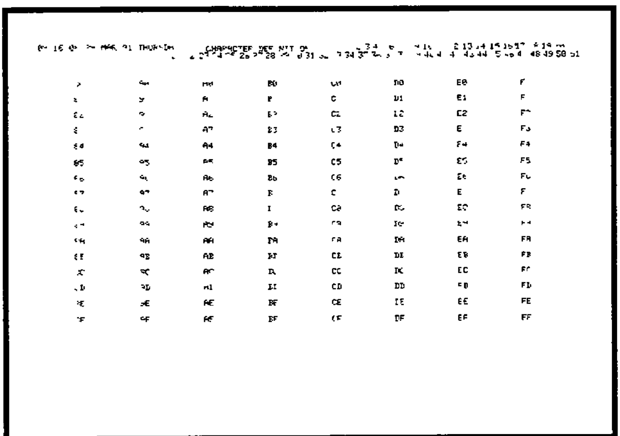
The *List Characters* option allows viewing the current character code definitions To view a list of characters, select *List Characters* from the *Character Definition* menu (see Figure 15 85) If the console is set for extended characters, the configuration page shown in Figure 15-90 appears next If the console is in complex character mode, further entry is required to call a page like the one shown in this figure

For complex characters, listing is done by character groups When the console is set for complex character mode, the console requires entering a group number At the *Group* field, type the group



TPS0111A

Figure 15 89 Character Definition Copy Character



TPS0112A

Figure 15 90 Character Definition List Characters

number then press ENTER After pressing ENTER, a page similar to Figure 15-90 appears

An extended character list presents all characters from character code 80 to FF Beside each character code is the actual character

A complex character list contains only the characters from a selected group If the selected group has a raster size of 16, only 32 character codes and associated characters display A list of 128 character codes and associated characters appears if the selected group has a raster size of eight

Press NEXT PAGE or PREV PAGE to view the next or previous complex group after calling a group

The *List Characters* option does ***not*** show characters defined if the console has not yet been reset after using the *Modify Character* option to create the characters After reset, the list is then complete

Press ESC to exit this page

ENABLING SYSTEM ATTRIBUTES FOR FOREIGN LANGUAGE ASSIGNMENT

The process engineer must enable specific database and system attributes to allow entry of complex alternate language characters This is done through the *System Attribute for Foreign Language Assignment* function, and applies to complex characters only

Each type of attribute can be enabled or disabled individually This enables the console to determine whether a specific type of field should allow alternate language characters Any console functions or displays that use the types of attributes listed at the *System Attributes* page test this configuration The console does this to insure that it builds displays and input fields to accommodate complex alternate language characters, whether single or double height

This configuration also provides a spacing attribute used to adjust character spacing for complex characters The factor adds pixels to adjust the spacing between characters

Step 1 The process engineer defines system attributes through the *System Attributes* page (see Figure 15 91) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

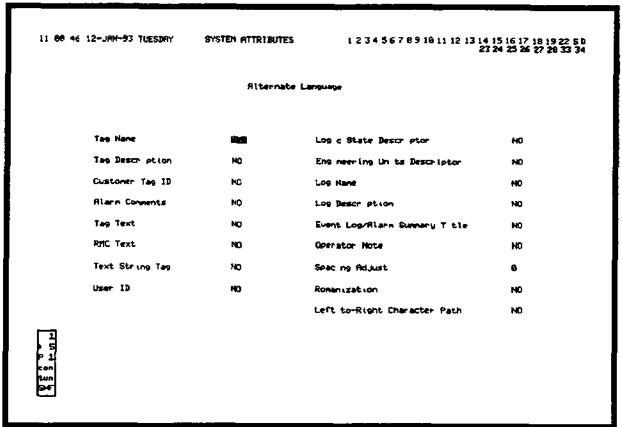
A OIS Configuration

→ *E System*

→ *A System*

→ *G System Attribute for Foreign Language Assignment*

NOTE Any changes made at this configuration page require a reset to implement



TPS0113B

Figure 15 91 Alternate Language System Attributes

Step 2 To enable or disable attributes

a Use the OIS configuration keys listed in Table 15 1 to move be tween and enter data into each display input field Set each at tribute that is to use complex alternate language characters to **YES** Leave the fields at **NO** to use English characters only

b Enter a spacing factor at the *Spacing Adjust* field A valid entry is from 0 to 9 The console adds that many pixels between each character

c Leave the *Romanization* field at its default *NO* unless the par ticular alternate language uses character Romanization, then set the field to **YES**

d Leave the *Left to Right Character Path* field at its default of *NO* This field is for future use

e Press ENTER to save

f Press the RESET button located at the power entry panel to implement the changes When the console comes back on line it operates with the parameters set here

DISPLAY AND TEXT TRANSLATION

Once alternate language is enabled, standard English characters in displays can be translated to the alternate language This can be done using the *System Display Translator* option and the *Text Substitution* option

System Displays

System displays can be translated to alternate language by using the *System Display Translator* This function can be used to modify system menus and pages. The changes are made to the system display files (***.DS***) and display partial files (***.DP***)

Text Substitution

Text substitution allows changing text that appears at displays, logs, messages and other functions Refer to ***Text Definition and Substitution*** in this section for specifics related to alternate language character substitution.

After these configurations are complete, all other configurations can be performed Either ASCII characters and extended characters, or ASCII characters and complex characters can be used depending on the configuration of the console

Both *Character Definition* and *System Attribute for Foreign Language Assignment* configurations require a reset at completion If setting the console for complex characters, perform both before resetting the console

SYSTEM DISPLAY TRANSLATOR

The process engineer uses the display translator in systems with alternate language enabled to translate standard system display text The translation is performed on text strings that reside in permanent system display files The translator can also be used to modify English character strings The process engineer can change any current text to any English or alternate language text strings. If text is changed, character string length, height and position can also be changed

The translator performs changes in both system display and display partial files System displays reside on the hard disk in files with ***.DS*** extensions Display partials are separate from system display files and reside on the hard disk in ***.DP*** files User entries at certain system displays call partials, the partial called depends on the entry System displays and display partials must be translated separately since they reside in separate types of files and in different hard disk directories

Step 1 The process engineer translates displays through the *System Display Translator* page (see Figure 15-92) To call this display, first press GENL FCTNS MENU, then select the following menu items in the sequence shown

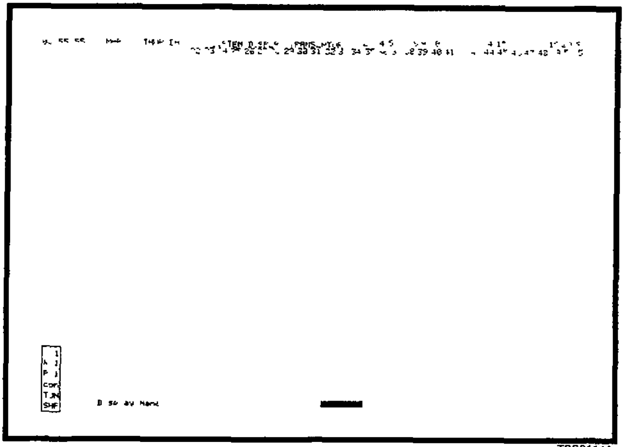
A OIS Configuration

└→ *B Displays*

└→ *B System Display Translator*

Step 2 The page has a single input field One of four possible modes of operation can be enabled depending on the entry at this field The process engineer can translate

- A single system display (i e , ***.DS*** file)



TPS0114A

Figure 15 92 Alternate Language - System Display Translator

- All system displays
- A single display partial (i e , ***.DP*** file)
- All display partials

A file name must be known to translate a single system display or partial File names for files on the hard disk can be acquired through the diagnostic/debug terminal, refer to the ***Terminal Utilities*** section The entry at this field is the system display or partial file name without the ***.DS*** or ***.DP*** extension To translate a system display, type the file name as

!filename

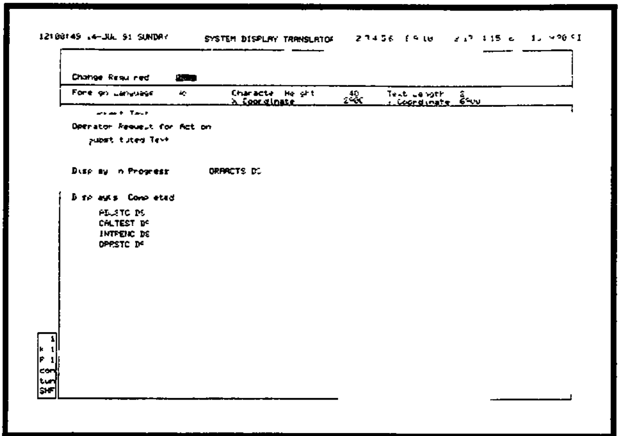
To translate a display partial, type the file name as

filename

The console requires the **!** to distinguish between a system display file and display partial file

When file names are not known, or all system display and display partial files must be translated, wild cards are used The wild card character is the asterisk (*) Using the wild card entry causes the console to cycle through each of the files alphabetically, and each text entry in that file The next configuration page to appear provides an option to select or pass over each text entry in the file (display) To translate all or unknown system displays, type !*. To translate all or unknown display partials, type *.

Press [ENTER] after keying in the file name Figure 15-93 shows the next configuration page that appears



TPS0059A

Figure 15-93 Alternate Language System Display Translator (Page 2)

Step 3 If a file name was entered in the previous step, only the text entries for that file can be translated The console sequences through all text entries for all files on its hard disk if in wild card mode The current text entry of a file can be seen at the *Current Text* field

For any text entry that is not to be translated, leave the *Change Required* field at *NO* and press [ENTER] The console automatically calls the next text entry for that file In wild card mode, when all text entries in a given file are either translated or passed over the console automatically starts to sequence through the text of the next file in the sequence

The *Display in Progress* field shows the current file being processed If in single file mode, this field remains at the file name initially entered When in wild card mode, this is the current file in the sequence of files This field updates to the next file name in the sequence after all text entries for the current file have been processed Any files that have either been passed over or previously translated appear under the *Display(s) Completed* heading.

Wild card mode can be exited at any time by pressing ESC The console then displays a *QUIT WILD CARD* prompt Key in **YES** and press ENTER

To select a text entry, then change its attributes and text string

a Set the *Change Required* field to **YES** then press ENTER This positions the input field at the *Foreign Language* field

b Use the OIS configuration keys listed in Table 15 1 to move between and enter data into each display input field Set the *Foreign Language* field to **YES**

If possible, use the current settings for this text string When changing any of the attributes, the entire layout of the display must be considered, not just the current text string

c Set the character height for this text string at the *Character Height* field The height is limited to 250

d Set the text string length at the *Text Length* field The length can be adjusted to allow more or less characters if required The maximum length is 80 characters

> **NOTE** Exercise caution when changing text position defined touch points do not follow the new position

e At the *X Coordinate* and *Y Coordinate* fields, set the x,y coordinate the console uses to position this text string This identifies a position on the screen that the console is to begin drawing the string

A valid entry for the *X Coordinate* ranges from 400 to 9600 For the *Y Coordinate*, the entry can be from 400 to 7300 The y coordinate should not exceed 7200 except for title line entries It should not be less than 500 for complex characters

f When all attributes are set, press ENTER This positions the input cursor at the *Substituted Text* field

g Key in the text that is to appear in place of the current text, which is shown at the *Current Text* field

h When completed, press ENTER to save and implement the change The change can be viewed after exiting this function and calling the display

i After enter, the console positions the input cursor at the *Change Required* field, and the next text entry of the file appears To continue changing the text strings for that file or other files if in wild card mode, repeat Steps 3a through 3h

When all text entries for a file or all files if in wild card mode have been sequenced through, the console presents the message *Processing Complete* At this time exit the configuration page

If in single file mode, press ESC to exit If in wild card mode, press ESC to call the *QUIT WILDCARD* prompt Key in **YES** and press ENTER to exit

SECTION 16 - TERMINAL UTILITIES

INTRODUCTION

NOTE This sect on does ***not*** g ve software nsta lation procedures Refer to the ***Operator Interface Station, Hardware Manual*** for the procedures

This section explains the commands and utilities available at the operator interface station (OIS) maintenance terminal The terminal provides management capabilities for both system files and file storage devices Also, it gives access to memory operations and system utilities This section lists the commands and syntax re quired to initiate the functions at the terminal

The console requires both a monitor 68K terminal and a diagnos tic/debug terminal connected to the console for certain system loading procedures The same terminal can be used as both the monitor 68K terminal and diagnostic/debug terminal by moving the RS 232-C cable connecting the terminal between ports on the console Refer to the ***Operator Interface Station, Hardware Manual*** for procedures to connect the terminal to the console

MONITOR 68K TERMINAL

A monitor 68K terminal connected to the console outputs infor mational and diagnostic messages at system start up and during normal operations. The terminal connects to the monitor 68K terminal port (P10) at the power entry panel The terminal is also required to put the diagnostic/debug terminal in off line mode Refer to ***Accessing Off-Line DDT*** in this section for further explanation

DIAGNOSTIC/DEBUG TERMINAL

A terminal connected to the console provides access to file utilities necessary to create and manage files, and to initiate system loading procedures The terminal connects to the diagnostic/ debug terminal port (P8) at the power entry panel Once the ter minal is connected for file management operations, it is referred to as the diagnostic/debug terminal or DDT Utility commands entered at the terminal allow saving, restoring and manipulating system, configuration and display files

The diagnostic/debug terminal can be operated in either an on line or off-line mode In either case, its functions remain the same Some file commands, system commands and command files can only be executed while in the off line mode, although most work in either mode

Accessing On-Line DDT

The DDT system becomes active immediately after the console completes its start up sequence A *0 00>* prompt at the diagnostic/debug terminal verifies a successful start up and access to the terminal The prompt indicates the current file system device

File system devices that the diagnostic/debug terminal allows access to include

0 00> hard disk drive

1 00> floppy drive

2 00> magnetic tape drive

3 00> optical disk drive

To change drives, use the **FD** command, refer to ***COMMANDS*** in this section for an explanation

Accessing Off-Line DDT

The diagnostic/debug terminal must be in off line mode to initiate certain command files, described later, that load the system The monitor 68K terminal must be used to interrupt the normal autoload sequence of the console, then to execute a utility program to put the diagnostic/debug terminal in off line mode

To operate the diagnostic/debug terminal in off line mode

1 Power up the console, or reset the console if already powered up The console begins its autoload sequence

2 Wait for the system restart message to appear on the monitor 68K terminal Press **Return** prior to the console completing its MTOS count down to prevent the autoload sequence from continuing The prompt should be *1 >* If not, reset the console and press **Return** again

3 Type

LF 1000 UTILITY.OB 0 Return

This loads the utility from the hard disk To load the utility from floppy disk, install the SYS6 floppy disk and type

LF 1000 UTILITY.OB 1 Return

4 Type

MT Return

5 Key in a time and date, then press [Return] after the *Please en ter time and date [DD MMM YYY HH MM SS]* prompt appears

After a few seconds, the start up message for the utility program will appear on the screen of the monitor 68K terminal The prompt on the diagnostic/debug terminal should be *0 00>* All normal utility commands, explained later, can now be entered at the prompt of the diagnostic/debug terminal

DDT Password Log In and Log Out

Some operations or procedures run from the diagnostic/debug terminal are protected by password security To perform any of these operations, a password giving diagnostic/debug terminal ac cess rights must first be logged in

To log in at the terminal

1 Type **LOGIN** [Return]. An *Enter Password* prompt appears

2 Type a valid password in response to the prompt, then press [Return]

The default security maintenance password is **MAINT** If password security has not been defined, enter this as the password This password gives access to all DDT functions If password security has been defined, a valid user defined password must be entered. Make sure that the password has diagnostic/debug terminal access rights

To log out the current user and log in a default password and user, type

LOGOUT [Return]

Use the **WHO** command to identify the currently logged in users Refer to ***COMMANDS*** in this section for further explanation

UTILITY COMMANDS

Commands can be entered at the diagnostic/debug terminal in either upper or lower case The terminal, however, is case sensi tive to file names For example, ***dsply00.DU*** is different from ***DSPLY00.DU*** All numeric parameters at the diagnostic/debug terminal must be hexadecimal

All I/O commands (i e , **COPY**, **CPF** and **APF**) verify reads and writes to disk If a verification error occurs, the diagnostic/debug terminal prompts to exit the command, retry the read or write, or continue with the file operation and ignore the error The com mands **VON** and **VOFF** turn on and turn off the verify option respectively

When the system calls for volume names, it is recommended that the wild card period (.) be used. The period identifies the volume name as the volume name of the current device. An exception is when using the **INI** command, which requires explicit volume names.

Some commands prompt for confirmation before executing the command. Include at the end of a command entry either a **-P** to suppress or **+P** to force confirmation.

When the diagnostic/debug terminal displays hexadecimal numbers, such as USN or error codes, the characters A through F display in uppercase.

Directories

The file system of the console uses a two tier directory. This structure divides a storage device such as the hard disk and floppy disk into up to 256 USN (user number) directories. Table 16-1 shows the current, valid assignments for the hard disk directories. Use the **MDIR** command to call a master directory listing to the DDT screen.

Table 16-1. Hard Disk Directories

USN	File Description	Extension	Type[1]
00	System interactive program files	*.OB, .PG, .SP*	00
02	Configuration files	*.CF, .TX*	00 & 01
03	Miscellaneous files		
04-0E	Assembled display files	*.DS, .DU*	00
0F-13	Fast trend data files (operator configurable trends)	*.TR*	00
14-2B	Trend data files	*.TR*	00
2C-43	Logging data files	*.LG, .Ln, .Sn, .Rn, .CF, .LF, .Dn*	00 & 01
44-4E	Assembled symbol files	*.DL*	00
50	Character sets	*.CS*	00
51	Configurable text	*.TX, .CF*	00 & 01
52	Interactive display partials	*.DP*	00
53	Operator displays configuration files	*.CF*	00
54	Display/symbol source files	*.DT*	01
55	SO generator files	*.LI, .DR*	00
59	XY plot MFC data source	*.IF*	00
60-67	Archival retrieval	*.DR, .RF*	00

22 40 50 04 10 07

Table 16 1 Hard Disk Directories (continued)

USN	File Description	Extension	Type[1]
68-6F	PCU configurations	*.CF*	00 & 01
80-87	Tag historian	*RD*	00
90-BF	Archival storage		
D0-DF	User directories		
FF	Command files	*.CN*	01

NOTE 1 00 = contiguous 01 sequential

Files

The console uses two types of files Contiguous (*Con*) and sequential (*Seq*) The difference is how the console (or user when creating a file) allocates disk space for storage of these files Contiguous files have a fixed record size of one sector A single disk sector is 256 bytes (100 hex) A sequential file does not have a fixed record size A record size parameter entered during the allocation (or creation) of a file determines the number of bytes in each record of a sequential file The record size and number of records each file contains determines its size

Creating Files

When creating a contiguous file using the **ACF** command, the number of disk sectors to allocate for that file is one of the required parameters For sequential files, the number of bytes contained in each record must be specified using the **ASF** command Refer to ***COMMANDS*** in this section for additional information

File Protection

Write (*wr prot*) and read (*rd prot*) protection are optional parameters available when allocating files Setting the parameter to **0** leaves the file unprotected, **1** provides protection Once a file has been read or write protected, the DDT program cannot access the file for the protected operation Therefore, use of read and write protection is ***not*** recommended

Preparing Floppy Disks

Floppy disks should be formatted before performing any file manipulation It is recommended that a supply of formatted floppy disks be prepared ahead of time Saving a backup copy of both configuration and display files requires a good supply of floppy disks Floppy disks can be formatted while the diagnostic/debug terminal is in either off line or on line mode

To prepare unformatted floppy disks for use

> **NOTE** The **FO** (format) and **INI** (initialize) commands erase all data currently saved on a floppy disk

1 Label the floppy disk using an adhesive label

2 Insert the floppy disk into the floppy disk drive

3 Type **FO 1**, then press **Return** The following prompt allows either confirming or canceling the format operation

This command will ERASE ALL DATA on FD01
Proceed with command [Y/N]?

4 Key in **Y** to continue or **N** to cancel, then press **Return** If continuing, formatting takes one to two minutes

5 When done, remove the floppy disk from the drive If additional floppy disks are to be formatted, repeat Steps 1 through 4 for each floppy disk

The formatted disks must be initialized before use To initialize a floppy disk

1 Insert a formatted disk into the floppy disk drive

2 Type

INI FD01 *volume*

The *volume* parameter can be any four character identifier The name should be meaningful since it identifies the volume of data when using other DDT commands

3 Press **Return**, an *Are You Sure [Y/N]?* prompt appears to allow confirming or canceling the initialize operation

4 Key in **Y** to continue or **N** to cancel, then press **Return**

5 When done, remove the floppy disk from the drive If additional floppy disks are to be initialized, repeat Steps 1 through 4 for each floppy disk

Mounting and Dismounting Floppy Disks

Due to archiving of data, the diagnostic/debug terminal checks for a volume label before mounting or dismounting, or opening files The **MNT** or **VMNT** (mount) commands and **DSM** (dismount) command may appear to function differently when used with floppy disks The following are guidelines when using floppy disks Also, refer to ***COMMANDS*** in this section for a description of these commands

1 Mounting a floppy disk reserves the device for the host CPU, and causes the file system to check volume labels for floppy disks on subsequent operations

2 Any commands which read or write data to the floppy disk cause the device to be reserved for the host CPU However, the floppy is not considered to be mounted by the file system

3 Dismounting a floppy disk releases the device from the host CPU

4 A floppy disk cannot be truly dismounted unless it has first been mounted. The **DSM** command releases the device from the host CPU even if the floppy disk was not previously mounted

5 If a particular floppy is also being used by other tasks in the system, such as archiving, that floppy disk can be mounted or dis mounted by these functions as well as by the diagnostic/debug terminal

6 It is not absolutely necessary to mount a floppy disk to access it

Magnetic Tape Commands

Use the commands **APF***, **APN***, **COPY***, **CPF***, **DIR**, **DSM**, **FD02**, **INI**, **ITRND***, **MNT** and **VMNT** when the storage device is a magnetic tape drive The commands with an asterisk require mounting a magnetic tape with either the **MNT** or **VMNT** command first The **DIR** command when used with the magnetic tape drive does not require mounting the volume

Use **INI** to initialize a magnetic tape The command prompts to enter the tape density in bits per inch (BPI) Valid densities are 1,600, 3,220 and 6,250 (default).

NOTE nitial zing ***erases*** any data on the tape

Data can be appended from magnetic tape files, but not to magnetic tape files Magnetic tape files can neither be deleted, nor overwritten

Although wild card copy operations can be used with magnetic tape drives, the first time requires two passes After the first wild card operation, the next requires only one pass Therefore, if copying only a few files, it is advisable to not use wild cards

The on-line or off line diagnostic/debug terminal can access the magnetic tape drive unless the archival storage system is archiving data to the drive If the archival storage system is active, it denies access by the on line terminal

Optical Disk Commands

Use the commands **APF***, **APN***, **COPY***, **CPF***, **DIR**, **DSM**, **FD03**, **INI**, **ITRND***, **MNT** and **VMNT** when the storage device is an optical disk drive The commands with an asterisk require mounting an optical disk with either the **MNT** or **VMNT** command first The **DIR** command when used with the optical disk drive does not require mounting the volume

Data can be appended from optical disk files, but not to optical disk files Optical disk files can neither be deleted, nor overwritten

Although wild card copy operations can be used with optical disk, the first time requires two passes After the first wild card operation, the next requires only one pass Therefore, if copying only a few files, it is advisable to not use wild cards

The on line or off line diagnostic/debug terminal can access the optical disk unless the archival storage system is archiving data to the optical disk If the archival storage system is active, it denies access by the on line terminal.

Commands and Syntax

The commands executed through the diagnostic/debug terminal can be categorized into several groups These include

- File device and allocation commands
- File operation commands
- Memory operations commands
- System utilities
- Volume commands

In commands that call for file specification (*file spec*), use the following syntax

device fusn-lusn volume,filename ex

where

device	Device name, such as **FD00**, **FD01**, **FD02**, **FD03**, **0**, **1**, **2** or **3**.
fusn	First user number (USN) of a range
lusn	Last user number of a range
volume	Disk volume name
filename	Name of the file (eight character maximum)
ex	File name extension (two characters)

A period ( ) separates the device from the USN and the file name from the file extension

A colon ( ) indicates a device or device and USN

A comma (,) indicates a volume name

Examples

***.DT**	All ***.DT*** files
TEST?0.DT	All files having a name beginning with ***TEST*** followed by any other character and end with 0 and have an extension of ***.DT***
1:	Drive **FD01**
FD01:	Drive **FD01** with default volume and USN area
0.1:	Drive **FD00**, USN 01
0.04-0E:	Drive **FD00**, USN 04 to USN 0E
0 *:	Drive **FD00**, USN 00 to USN FF

COMMANDS

Table 16-2 provides a quick reference listing of DDT commands

Table 16-2 DDT Commands

Type	Command	Purpose
File device and allocation commands	ACF ASF DAF DEL FD IN	Create and delete files on specified or default file system devices They also allow changing to and initializing file devices
File operations commands	APF APN COPY CPF RDF REN WRF	Read write rename append and copy files
Memory operations commands	DM FM MM	Allow viewing and modifying hexadecimal data structures and files
System utilities commands	ACT COFF/CON CSUM CVER DIR DOFF/DON ELE EXIT FDS FO FREE	Perform configuration and disk maintenance functions (continued)

Table 16 2 DDT Commands (contınued)

Type	Command	Purpose
System ut lit es commands (cont nued)	HELP INT TRND LOG N LOGOUT MDIR MOFF/MON NOT RS RT RUN T ME USN VOFF/VON WHO	Perform conf guratıon and dısk ma ntenance functıons
Volume commands	DSM MNT VMNT	Used to mount a dırectory volume that s used for a l operatıor s untı be ng dısmounted

ACF

file device and allocation

PURPOSE: Allocates space when creating a contiguous file on the current file device at the current USN directory

COMMAND· **ACF** *volume filename ex sectors* [*wr prot*] [*rd prot*]

where

sectors Number of sectors

DISCUSSION. The read protect (*rd prot*) and write protect (*wr prot*) fields are optional and default to 0 if not specified Contiguous files allocate as continuous unbroken space on the disk They cannot be extended.

Example **ACF . TESTFILE.TX 10**

ACT

system utility

PURPOSE: Initiates a request for operator action during command file processing Command file processing suspends at this line until responding to the request for action

COMMAND· **ACT** *message*

ACTION· *message*

DISCUSSION· Example **ACTION: please insert next disk**

APF

file operation

PURPOSE:

Appends a source file or files to a destination file This is similar to the **APN** command

COMMAND:

APF *src-file_spec dst-file_spec* [*src1*] [*src2*] [*nr*]

where

src1	Source file starting record
src2	Destination file starting record
nr	Number of records

DISCUSSION·

Examples

APF 0.2:ALMDESC.CF 1:ALMDESC1.CF 0 0 9C4

APF 0.2:ALMDESC.CF 1:ALMDESC2.CF 9C4 0 9C5

The example takes the alarm descriptor file of a 5,000 tag console and breaks it in half, copying it to two separate files on floppy disk In actual use, the files store on separate floppy disks requiring a dismount between each **APF** command to install new disks

To merge the second file, the source record should be 1

Example **APF 1:ALMDESC2.CF 0.2:ALMDESC.CF 1 9C5 9C4**

For contiguous files, allocate space for total size, then append both parts The first half of the file cannot be copied

APN

file operation

PURPOSE:

Appends a source file or files to a destination file. Other functions include use as a partial copy, and as a cut and paste function overlaying files on top of each other **APN** is used in conjunction with the display generator and configuration loading and backup of the system

> **NOTE APF** s the newer version of **APN**

COMMAND·

APN *src file spec dst file_spec* [*src1*] [*src2*] [*nr*]

where

src1 Source file starting record

src2 Destination file starting record

nr Number of records

DISCUSSION:

The *src1*, *src2* and *nr* are the copy parameters They can be in combinations such as

[empty]
[*src1*]
[*src1*] [*src2*]
[*src1*] [*src2*] [*nr*]

Examples

APN FD01 . FILE.EX FD00.99 . PART1.EX 0 0 100

APN FD01 . FILE.EX FD00.99 . PART2.EX 100 0 100

If file ***FILE.EX*** contains 220 records, the above commands split it into two files, ***PART1.EX*** and ***PART2.EX***, each containing 100 records

ASF

file device and allocation

PURPOSE: Allocates space when creating a sequential file on the current file device at the current USN directory

COMMAND: **ASF** *volume filename ex size* [*seg*] [*fab*] [*wr prot*] [*rd prot*]

where

size Record size.

DISCUSSION: The *seg*, *fab*, *wr prot*, and *rd prot* parameters are optional and de fault to 4 4 0 0 if not specified. Sequential file segments are threaded throughout the disk and are extensible

Example **ASF . TESTFILE.TX 50**

COFF and CON

system utility

PURPOSE: Allows checksums to be automatically created when copying files The command **CON** is for checksum on, and **COFF** for off Checksum off is the default

COMMAND: **COFF**

CON

NOTE Checksums can be created on hard and floppy d sk on y not on magnet c tape or opt ca disk

COPY

file operation

PURPOSE: Copies files or groups of files Two parameters are required. The source file specification (*src-file_spec*) and the destination file specification (*dst-file_spec*)

COMMAND· **COPY** *src file_spec dst-file_spec* [**+P**]

DISCUSSION: When **COPY** is complete, it dismounts the disk Additionally, dis mount can be controlled with the **DON** and **DOFF** commands. The **DON** command tells the diagnostic/debug terminal to issue a dis- mount command after all copy or append operations The **DOFF** command tells the terminal not to issue a dismount after file copy or append operations

> **NOTE** When copy ng with wild card opt ons (file name or USN d rec tory) the system prompts the user when a f oppy disk is fu l and re quests another Labe floppy d sks and number in the sequence n which they were saved

If the destination USN directory is a wild card and ***.DS***, ***.DU***, or ***.DL*** files are being copied, they are automatically placed in the proper USN directory This feature allows restoring display files with one wild card **COPY** command The copy is placed in the cur rent USN directory if the file being copied is not a ***.DS***, ***.DU***, or ***.DL*** file

The **+P** option causes the **COPY** command to pause and prompt before performing a file copy The prompt allows confirming each copy before it takes place A **Y** response causes the copy to occur, **N** skips the file to copy This option allows for selective copying of files when using the wild card

Examples

COPY 0.2:*.CF 1:	Back up all ***CF*** files to floppy disk
COPY 0.04-0E: 1:	Back up all ***.DS*** and ***.DU*** files to floppy disk
COPY 1:*.DS 0.*:	Restore all ***.DS*** files from floppy disk to USN 04 to USN 0E
COPY 1:*.CN 0.FF:	Restore all command files from floppy disk
COPY 1:TEST*.DT 0.54:FRED*.*	Copy all ***.DT*** files with names starting with ***TEST*** from floppy disk to hard disk directory USN 54, and save under the names of ***FRED*.DT***

CPF

file operation

PURPOSE: Copies a file from a source device and USN directory to a desti nation device and USN directory

COMMAND. **CPF** *src file_spec dst-file_spec*

DISCUSSION The destination file name is optional and defaults to the source file name if not specified The file names can also include wild card characters The question mark (?) is used as a single charac ter wild card while the asterisk (*) is for multiple characters

NOTE COPY *is the newer form of* **CPF**

The following examples copy all files in the USN 02 directory with extension ***.CF*** to the device **FD01** (floppy disk) Destination can be assumed

Examples

CPF FD00.2 . *.CF FD01 .

CPF FD00 . TEST?0.DT FD01

CSUM

system utility

PURPOSE: Creates a checksum entry for files created or modified by means other than copying files The command accepts wild card patterns

COMMAND· **CSUM** *file_spec*

CVER

system utility

PURPOSE: Verifies a file against its checksum entry If no parameters are given, the diagnostic/debug terminal attempts to read the desired file names from the file ***0.2:CVERFILS.CF*** The command accepts wild card patterns

COMMAND: **CVER** *file spec*

DAF

file device and allocation

PURPOSE: Deallocates a file from the current file device at the current USN directory

COMMAND: **DAF** *volume filename ex*

DISCUSSION: The file name can contain wild card characters The **DAF** command can also use a path Examples are similar to those given with the **DIR** command

> **NOTE DEL** s the newer version of this command

Example **DAF . TESTFILE.TX**

DEL

file device and allocation

PURPOSE: Deletes a file or group of files

COMMAND: **DEL** *file spec* [**-P**]

DISCUSSION: The file specification of the files to be deleted is the only required parameter The system prompts with *Are You Sure?* message before deleting each file Adding the **-P** parameter turns off this message

Examples

DEL 0.54:*.DT	Delete all ***.DT*** files
DEL 0.54:TEST*.DT	Delete all ***.DT*** files with name starting with *TEST*
DEL 0 54:TEST*.DT -P	Delete all ***.DT*** files with names starting with *TEST* and do not prompt before deleting
DEL 0.4-E:MYFILE.DS	Delete *file name* ***MYFILE.DS*** in USN 04 to USN 0E

DIR

system utility

PURPOSE: Calls a directory listing to the screen showing the files in the cur rent device and USN directory If the file specification is not entered, the entire current device and USN directory displays

COMMAND: **DIR** [*file_spec*] **[-P]**

DISCUSSION: The file specification can be used to limit the directory display to a specific file or group of files using wild cards For example, ***.CF***, ***.DT***, etc Additionally, the file specification can select a device and USN directory other than the current

Through the use of USN ranges, global file searches are possible The standard file specification allows a single USN directory or range of USN directories to be specified The asterisk (*) wild card character may be entered for the USN parameter to specify the range of 00 to FF or all USN directories

Examples

DIR FD00.4-E:*.*	All files in USN 04 to USN 0E
DIR 0.4-E:	Same as previous, shortened version
DIR 0.*:MYFILE.DS	All copies of ***MYFILE.DS*** in all USN directories
DIR 0.*:	All files on hard disk

The display shows the USN directory where files reside The last update field is displayed as an ASCII date

Adding a **-P** parameter following the file specification causes the **DIR** command to not stop after each page

Examples

DIR 0.54:*.DT -P	All ***.DT*** files in USN 54
DIR 0.*:*.* -P	All files in all USN directories

If using **DIR** to display the directory of an archival media, use the following command sequences

DIR 1.0-FFFF:* (floppy disk)

DIR 2.0-FFFF:* (magnetic tape)

DIR 3.0-FFFF:* (optical disk)

DM

memory operations

PURPOSE: Displays memory in byte format (16 bytes per line) starting at a specified memory location ASCII equivalent codes appear at the end of the line

COMMAND: **DM** *address*

where

address Memory address

DISCUSSION: Only valid locations should be viewed If an error occurs, the DDT utility terminates or causes the console to crash It may be neces sary to reset the console if this happens

Example **DM C20000**

> **NOTE** *For the on ne d agnostic/debug term nal the usab e memory* begins at DA8200 through DFFFFF

DOFF and DON

system utility

PURPOSE: Turns an automatic dismount option on or off. If on, the diagnostic/debug terminal issues a dismount command after all copy or append operations. It requires using the **DSM** command if off.

COMMAND: **DOFF**

DON

DSM

volume

PURPOSE: Dismounts the volume installed on the current device

COMMAND: **DSM** [*device*]

DISCUSSION. The **DSM** command supports an optional device parameter to dismount only one device at a time This parameter can be a single digit, or be in the **FD0***n* format For example, to dismount only the hard disk, either of these commands can be used

DSM 0

DSM FD00

If no parameters are supplied, the diagnostic/debug terminal attempts to dismount ***all*** devices In all cases, the **DSM** command releases that device from the host CPU if it was previously reserved

The **COPY** command dismounts the disk when complete

Additionally, dismount can be controlled with the **DON** and **DOFF** commands The **DON** command tells the diagnostic/debug terminal to issue a dismount command after all copy or append operations

When scanning directories on multiple removable disks, the **DSM** command must be used to dismount between disks

ELE

system utility

PURPOSE: Provides line editing capabilities to create user files. To access the elementary line editor·

COMMAND: **ELE** *volume filename ex*

DISCUSSION. Line editor commands include

List	**.L** *starting line number* [*number of lines*]
Edit line	**.E** *line number*
Delete	**.D** *line number*
Save and e**X**it	**.X**
Insert	**.I** *line number*

The **.L** command lists the number of lines requested If a file con taining 22 records is being edited and 30 lines are requested, only 22 lines up to line 22 display

To enter line editing mode, type **.E** followed by the line number and [Return] The following commands are available in edit mode

[Cntrl] [H] or [←] move cursor left one character

[Cntrl] [L] or [→] move cursor right one character

[Cntrl]-[K] or [↑] move to previous line

[Cntrl] [J] or [↓] move to next line

[Cntrl] [B] - move to beginning of line

[Cntrl] [E] move to end of line

[Esc] [W] or [Delete] delete character and shift line to left.

[Esc] [Q] or [Cntrl] [I] insert space and shift line to right

[Return] exit line editing mode

Any other key overwrite character with this key and move cursor to right one space

NOTE *.X must be used to save the f e to disk before the d splay f e* can be generated or before the command fi e can be run

ELE (continued)

system utility

Example ELE session

This example creates a command file that displays the hard disk directory and system date and time At the DDT prompt, type

0 FF> **ASF . TEST.CN 50**

0 FF> **ELE . TEST.CN**

00< **TIME**

01< **DIR**

02< **.X**

0 FF>

To call and run the command file, tvpe

0 FF> **INT . TEST.CN**

EXIT

system utility

PURPOSE: Causes the diagnostic/debug terminal to abort interpretation and return control to the DDT command line when encountered during interpretation of a command file When entered from the DDT command line, it has no effect

COMMAND: **EXIT**

FD

file device and allocation

PURPOSE: Sets the current file device to either hard disk, floppy disk, magnetic tape or optical disk drive, and USN directory to a given or current number An optional period ( ) and USN parameter can follow the command to designate a specific USN directory

COMMAND.

FD00[*USN*] or **0**[*USN*]	hard disk
FD01[*USN*] or **1**[*USN*]	floppy disk
FD02[*USN*] or **2**[*USN*]	magnetic tape
FD03[*USN*] or **3**[*USN*]	optical disk

DISCUSSION: The following examples all specify device 0, USN 02 directory

Examples

FD00 2

FD00.2

0 2

0.2

Usage example

FD01.0	Set device 1, USN 00
FD00.54	Set device 0, USN 54
COPY FD00:*.* FD01:	Copy from 0 54 to 1 0 (requires using previous two commands first)

Usage example

1 00> **FD00**

0 00> **FD01.54**

1 54> **FD00.FF**

0 FF> **FD01**

1 54> **FD00**

0 FF> **FD00.0**

0 00>

FDS

system utility

PURPOSE: Flushes dynamic symbol cache Use only if symbols have been copied from floppy disk and not run through the *Display Generator*, or run through the *Display Generator* using the wild card option

COMMAND: **FDS**

FM

memory operations

PURPOSE: Fills memory with a designated character pattern

COMMAND· **FM** *address bytes pattern*

where

address	Memory address
bytes	Number of bytes to fill
pattern	Word pattern

DISCUSSION. The first parameter is the memory address to which to write This address must be on a long word (32 bit) boundary The second parameter is the number of bytes to fill, and is rounded down to the nearest multiple of four bytes The third parameter is the long word pattern with which the memory will be filled

FO

system utility

PURPOSE: Formats floppy or hard disks

COMMAND: **FO** *device*

DISCUSSION: The **FO** command can be used on-line or off line to format floppy disks

Example **FO 1**

FREE

system utility

PURPOSE: Displays total hard disk size in bytes, the number of bytes used and the number of bytes available (or free) If this command is used off line before the hard disk has been initialized, the totals displayed are not valid until the next system restart

COMMAND: FREE

HELP

system utility

PURPOSE: Displays a list of valid commands and their syntax

COMMAND: **HELP**

DISCUSSION: Presents the following

-- DDT Terminal Help --

In the following < > indicates a required parameter
[ ] indicates an optional parameter
* indicates available only off line

file specification syntax FD0n usn vol,filename ex

ACF <vol><file><# sect> [wr prot] [rd prot]
ACT <message>
APF <file_spec><file spec> [src rec #] [dst rec #] [# rec]
APN <dev USN><vol><file><dev USN><vol><file>[rec #][rec #][rec #]
ASF <vol><file><rec size> [seg] [FAB] [wr prot] [rd prot]
*CF [dev]
CON set CREATE CHECKSUM option ON
COFF set CREATE CHECKSUM option OFF
COPY <src file_spec><dst file spec> [+P]
CPF <dev><vol><file><dev><vol><file> [+P]
CSUM <file spec>
CVER [file_spec]
DAF <vol><file spec> [P]
DEL <file_spec> [P]
DIR [file spec] [-P]
DM [address] [# loc]
DON set DISMOUNT option ON
DOFF set DISMOUNT option OFF
DSM
ELE <vol><file>
FD00 [USN]
FD01 [USN]
FD02 [USN]
FD03 [USN]
FDS <display name>
FM <address><# bytes><pattern>
FO <dev>[type]
FREE Display Winchester Free Disk Space
HELP
INI <dev><vol name>
INT <vol><file cn>
*ITRND [trend definition file spec]
LOGIN Login to DDT terminal
LOGOUT - Logout of DDT terminal

HELP *(continued)*

system utility

MDIR
MM [address] [B ¦ W L]
MNT <vol>
MON Redirect system error messages to DDT terminal
MOFF Redirect system error messages to MON68K terminal
NOT <message>
REN <old_file spec><new_file spec> [+P]
RDF <vol><file><address><# rec>
**RS <dev>*
**RT <dev>*
RUN <file spec>
TIME [dd mmm yyyy hh.mm.ss]
USN <file DS file DU file DL>
VMNT <dev><vol>[seq #]
VON set VERIFY option ON
VOFF set VERIFY option OFF
WHO show current logged in user
WRF <vol><file><address><# rec>

INI

file device and allocation

PURPOSE: Initializes the volume on the specified file device This command ***destroys all data*** on the specified file device

COMMAND: **INI** *device volume* [*sequence number*]

DISCUSSION: The *sequence number* parameter is optional The *volume* is a four character name Its primary use is for access to archival media

Example **INI FD01 TEST**

INT

system utility

PURPOSE

Interprets a command file found on the current file device A command file can be created with the **ELE** command A command file can contain all DDT commands

COMMAND

INT *volume filename*.**CN**

DISCUSSION:

If creating a command file that allocates files, it should explicitly set the default drive and USN directory, or must reside at and be invoked from the USN directory where the allocations are to occur

If the **INT** command encounters a file system error, either exit the file or retry the failed operation The **INT** command displays messages when entering and exiting nested command files

Example **INT . CP01CFE2.CN**

ITRND

system utility

PURPOSE. Installs trends configured off line This command takes the file name of the new trend definition file as a parameter If no parameter is entered on the command line, the diagnostic/debug terminal attempts to open the file ***TRENDDEF.CF*** in the current USN directory The option to install all the trends defined in a new definition file or only specific trends selected by trend index ranges is available

COMMAND. **ITRND** *[filename*.**CF***]*

where

filename Name of the trend definition file

DISCUSSION. This command updates the system trend definition and header files and deletes the trend data files for each trend installed The **ITRND** command can only be used when in the off line terminal mode If the trend header file does not exist, the **ITRND** command will create it

LOGIN and LOGOUT

system utility

PURPOSE. Password security configuration limits access to certain DDT operations The **LOGIN** command calls an *Enter Password* prompt to allow logging into the diagnostic/debug terminal by entering a password The **LOGOUT** command logs the current user out of the diagnostic/debug terminal and logs in a default user

COMMAND· **LOGIN**

LOGOUT

DISCUSSION. Example

LOGIN [Return]
Enter Password <password> [Return]
Hellc (user ID)

LOGOUT

MDIR

system utility

PURPOSE:	Calls a master listing of all file USN directory assignments
COMMAND·	**MDIR**

MM

memory operations

PURPOSE: Modifies memory locations Displays a specified memory location and then waits for input

COMMAND. **MM** *address* [*size*]

where

address Memory address

size Word size Valid word sizes are

blank 16 bit (default)

L - 32 bit (long word)

W 16 bit (word)

B = eight bit (byte)

DISCUSSION: Only valid locations should be manipulated If an error occurs, the DDT utility terminates or causes the console to crash It may be necessary to reset the console if this happens

To move about RAM while modifying memory locations

Space	Increments to next location
	Decrements to previous location
Return	Exits modify mode

NOTE For the online diagnostic/debug terminal the usable memory *begins at DA8200 through DFFFFF*

Example MM session

0 00> **MM C20000**	(user enters)
C20000 0A1B	(system response)
0 00> **Return**	(user enters)
0 00> **MM C20000 L**	(user enters)
C20000 0A1B23D9	(system response)
0 00> **Return**	(user enters)
0 00> **MM C20000 B**	(user enters)
C20000 0A	(system response)

MM *(continued)*

memory operations

0 00> $\boxed{\text{Space}}$	(user enters)
C20001 1B	(system response)
0 00> $\boxed{}$	(user enters)
C20000 0A	(system response)
0 00> $\boxed{-}$	(user enters)
C1FFFF C8	(system response)
0 00> **MM C20002**	(user enters)
C20002 23D9	(system response)

MNT

volume

PURPOSE: Mounts a volume on the current file device

COMMAND: **MNT** *volume* [*sequence number*]

PURPOSE. A single period ( ) can be used instead of the four character vol ume name It is recognized as a wild card character The *sequence number* parameter is optional Its primary use is for access to ar chival media

Examples

MNT TEST

MNT .

MOFF and MON

system utility

PURPOSE. *Redirects system error messages to and from the DDT terminal* (**MON**) and monitor 68K terminal (**MOFF**)

COMMAND: **MOFF**

MON

NOT

system utility

PURPOSE: Allows a one line message to be sent to the user during command file processing

COMMAND: **NOT** *message*

NOTE: *message*

RDF

file operation

PURPOSE: Reads file data from the current file device at the current USN directory and places it into system memory Exercise caution when selecting the RAM area for use so as not to disturb console operation or data areas

COMMAND **RDF** *volume filename ex address nr*

where

address	Memory address
nr	Number of records

DISCUSSION: Example **RDF . SYSTSIZE.CF C20000 1**

> **NOTE** For the on line diagnostic/debug terminal the usable memory begins at DA8200 through DFFFFF

REN

file operation

PURPOSE: Renames a file or group of files

COMMAND. **REN** *old filename ex new-filename ex* **[+P]**

REN *old file_spec new file_spec* **[+P]**

DISCUSSION: The old and new file specifications are required parameters An optional **+P** parameter can be added causing the terminal to prompt before renaming each file

Examples

REN MYFILE.DT YOURFILE.*	Renames the file *MYFILE DT* to *YOURFILE DT*
REN 0.54:*.dt *.DT	Renames the * *dt* files to * *DT* in USN 54 of device 0 (hard disk)

RS

system utility

PURPOSE: Returns four hexadecimal bytes of sense information for either the floppy or hard disk (off-line only)

COMMAND: **RS** *device*

RT

system utility

PURPOSE:

Replaces bad tracks Prompts for a bad cylinder and head address (decimal format) Automatically assigns an alternate track and prompts for the next bad cylinder address If **Return** is pressed in response to the prompt, the **RT** command exits back to the DDT command line (off line only)

COMMAND.

RT *device*

RUN

system utility

PURPOSE: Loads and executes programs

COMMAND: **RUN** *filename ex*

TIME

system utility

PURPOSE: Displays or sets current system date and time

COMMAND: **TIME** Return

TIME *dd mmm-yyyy hh mm ss*

> **NOTE** For the on ine d agnostic/debug term nal the **TIME** command on y displays current date and time it cannot be used to set the date and t me

22 41 37 04 10 07

USN

system utility

PURPOSE·	Finds a possible USN directory assignment for a display file The system returns the proper USN directory assignment for the specified file name The console assigns system displays, user displays and user symbols to USN directories based on an encoding of the file name
COMMAND.	**USN** *filename ex*
DISCUSSION:	Example **USN disply00.DU**

VMNT

volume

PURPOSE: Mounts a device and volume. It is used primarily for command files which back up or restore files to the console.

COMMAND: **VMNT** *device volume [sequence number]*

DISCUSSION: This mount command does not allow the wild card character ( ) as a volume label. If the proper volume is not installed in the drive, the diagnostic/debug terminal prompts to either escape or retry mounting the volume. There is no way to continue processing the command file without installing the proper volume.

The *sequence number* is optional. Its primary use is for access to archival media.

VOFF and VON

system utility

PURPOSE: A toggle for setting the verify option on (**VON**) and off (**VOFF**) Controls whether or not the diagnostic/debug terminal verifies reads and writes during file copy and append operations

COMMAND: **VOFF**

VON

WHO

system utility

PURPOSE: Identifies the user ID of the currently logged in users at both the diagnostic/debug terminal and each supported screen of the console

COMMAND: **WHO**

DISCUSSION: Example

WHO

DDT (user ID)
CRT #1 (user ID)
CRT #2 (user ID)
CRT #3 (user ID)
CRT #4 (user ID)

WRF

file operation

PURPOSE: Writes data from memory to a preallocated file on the current file device at the current USN directory. Exercise caution when selecting the RAM area for use so as not to disturb console operation or data areas

COMMANDS: **WRF** *volume filename ex address nr*

where

address	Memory address
nr	Number of records

DISCUSSION: Example **WRF . SYSTSIZE.CF C20000 1**

> **NOTE** For the on line diagnostic/debug terminal the usable memory *begins at DA8200 through DFFFFF*

SAVING A CONFIGURATION USING DDT

The diagnostic/debug terminal provides the capability to save a backup copy of the configuration currently running on the console. Saving a backup of the configuration is recommended to allow recovery in case of loss or corruption of configuration files. A configuration should also be saved prior to upgrading the software.

The procedures in this section can be used to save a complete configuration, or to save only specific files of a configuration. The procedures identify the necessary commands that must be entered at the prompt of the diagnostic/debug terminal.

Tag and System Files

Executing a command file provided with the software saves the necessary tag database and system configuration files. Be sure to have enough formatted floppy disks to save the configuration.

Tag Range	***Floppy Disks Required***
0000 2500	*xx*C1, UCF2, UCF4, UCF5, UCF6
2501 5000	*xx*C1, UCF2, UCF4, UCF5, UCF6

When saving the system configuration, prompts will ask to record the size of the ***ALMDESC.CF*** file. The size is needed later during a restore. If the size is greater than 9C4, the console saves the file to floppy disk in two parts using the **APF** command: ***ALMDESC1.CF*** to the UCF4 floppy disk and ***ALMDESC2.CF*** to the UCF5 floppy disk. If the size is greater than 9C4, than the file must be restored from both the UCF4 and UCF5 floppy disks.

To save:

1. Put the terminal into off line mode if not already. Refer to ***Accessing Off-Line DDT*** in this section for procedures.

2. Log in a password at the terminal if not already logged in. Refer to ***DDT Password Log In and Log Out*** in this section for an explanation and log in procedures.

3. At the *0 00>* prompt type **FD00 FF** [Return]. The prompt changes to *0 FF>* to indicate that the current directory is the command file directory.

   NOTE: Take note of the name of the command file. To save from the hard disk to floppy disk, the file name is ***CP01CFE2.CN***. To restore from floppy disk to hard disk, the file name is ***CP10CFE2.CN***.

4. Type:

   INT . CP01CFE2.CN [Return]

This starts a utility to store database and system configuration files The diagnostic/debug terminal prompts when requiring any user actions such as installing the next floppy disk

The utility saves the necessary files to floppy disk, and labels the floppy disks as E2C1, UCF2, UCF3, UCF4, etc The utility checks for these volume names when restoring any configurations Be sure to label the floppy disks with these names

Site Specific Configurations

Besides the tag database and system configurations, backing up the complete configuration requires saving additional files such as display files, custom log definitions, sequential events recorder (SER) definition for sequence of events (SOE) logs, trend pen configuration and trend data files

> **NOTE** Be sure that enough blank formatted n t al zed floppy disks are available

The floppy disks being used to save the backup configuration should be labeled with enough information to identify the configuration files stored on a particular floppy disk (e g , software revision, time, configuration type, etc) Also, when initializing the floppy disks, the volume name assigned to each floppy disk should be meaningful and reflect the contents of the disk

Avoid using volume names in the form ***xxC1***, where ***xx*** represents the software release identifier (e g , ***A1C1***, ***B1C1***, etc) The command files used to store and restore the tag database and system configurations reference volume names in this format

The **COPY** command provides the backup capability for configuration files of a site specific configuration

To save a copy of a file

1 When making copies of any files except display files, put the terminal into off line mode if not already Refer to ***Accessing Off-Line DDT*** in this section for procedures

2 Log in a password at the terminal if not already logged in Refer to ***DDT Password Log In and Log Out*** in this section for an explanation and log in procedures

3. Install a blank, formatted, labeled floppy disk into the floppy disk drive

4 Depending on the type of configuration files being backed up at the *0 00>* prompt type the **COPY** command using the following format

COPY *src-file spec dst file spec* [+P]

The paragraphs that follow give the specific **COPY** command to enter for each configuration file type Refer to this information when entering the command

5 Press [Return] When prompted, install the next formatted, blank floppy disk and continue *Be sure to label each successive floppy disk in the order in which it was saved*

Repeat these procedures for each configuration requiring backup

The following **COPY** commands save a group of configuration files by specifying a wild card asterisk (*) and extension The same procedures can be used to save a single file by replacing the * with a file name

These commands also save the files in directories on floppy disk that have the same USN directory number as the files on the hard disk Do ***not*** assume a floppy disk is empty just because it does *not contain any files in directory 1 00>*

Display files consist of ***.DT***, ***.DL***, ***.DU*** and ***.CF*** files The ***.DT*** display files reside in the USN 55 directory *To save a copy of* these files, type the command

COPY 0.55:*.DT 1.55:

NOTE The USN 54 directory is reserved for release specific display files USN 55 directory for user-created display files

The ***.DL*** display files reside in directories USN 44 through USN 4E To save a copy of these files, type the command

COPY 0.44-4E:*.DL 1.*:

The ***.DU*** display files reside in directories USN 04 through USN 0E To save a copy of these files, type the command

COPY 0.04-0E:*.DU 1.*:

The ***.CF*** display files are for operator configurable displays, and reside in the USN 53 directory *To save a copy of these files, type* the command

COPY 0.53:*.CF 1.53:

Custom log definitions custom log file names are in the format ***LOGnnnn.LF***, where ***nnnn*** is the log index number ranging from 0001 to 0300 These files reside in directories USN 2C through USN 34 To save a copy, type the command

COPY 0.2C-34:*.LF 1 *:

SOE logs - saving an SOE log requires saving an SER definition for the log SER definition file names are in the format ***SERDEF-nn.CF***, where ***nn*** is the recorder number These files reside in the USN 02 directory To save a copy, type the command

COPY 0.02:SERDEF* 1.*:

Trend pen backing up trend pen configurations requires saving two different types of files ***TPCPFnnn.CF*** and ***PIOnDFnn.CF*** These files reside in the USN 02 directory To save a copy, type the commands

COPY 0.02:TPC* 1.*:

COPY 0.02:PIO* 1.*:

Refer to ***Trend Pen Cluster Configuration*** in the ***OIS Configuration*** section for an explanation of these files

Trend data files - trend data file names are in the format ***Tnnn-nnnn.TR***, where ***nnnnnnn*** is the trend index number ranging from 0000001 to 0002000 These files reside in directories USN 14 through USN 2B To save a copy, type the command

COPY 0.14-2B:*.TR 1.*:

RESTORING A CONFIGURATION USING DDT

The diagnostic/debug terminal provides the capability to restore backed up configuration files if required The procedures restore configuration files previously backed up using the save configurations procedures A restore should be required only when loss or corruption of a configuration file occurs

The procedures in this section can be used to restore a complete configuration, or to restore only specific files of a configuration The procedures identify the necessary commands that must be entered at the prompt of the diagnostic/debug terminal

Tag and System Files

Executing a command file provided with the software restores the necessary tag database and system configuration files saved previously The configuration files reside on configuration floppy disks labeled E2C1, UCF2, UCF3, UCF4, etc

To restore

1 Put the terminal into off-line mode if not already Refer to ***Accessing Off-Line DDT*** in this section for procedures

2 Log in a password at the terminal if not already logged in Refer to ***DDT Password Log In and Log Out*** in this section for an explanation and log in procedures

3 At the *0 00>* prompt type **FD00 FF** Return The prompt changes to *0 FF>* to indicate that the current directory is the command file directory

4 Type

INT . CP10CFE2.CN Return

This starts a utility to restore tag and system configuration files The utility prompts when requiring any user actions such as installing the next floppy disk

> **NOTE** Take note of the name of the command file To save from the hard disk to floppy disk the file name is ***CP01CFE2.CN*** To restore from floppy disk to hard disk the file name is ***CP10CFE2 CN***

ALMDESC.CF File

The save operation automatically stores the ***ALMDESC.CF*** file to floppy disk During the save, the console prompts to record the size of the file

During a restore of the tag and system files, the console does not automatically restore the ***ALMDESC.CF*** file The file can be restored in two ways, either by modifying a command file prior to performing the procedures for restoring tag and system files, or manually by entering commands at the diagnostic/debug terminal This section gives the commands required to restore the file manually To restore the file through the command file, refer to the ***Operator Interface Station, Hardware Manual*** for procedures

The size of the original file recorded earlier during a save determines the commands necessary to restore the file

To restore an ***ALMDESC.CF*** file with a file size of 9C4 or less

1 Insert the UCF4 floppy disk

2 Type **VMNT 1 UCF4** Return

3 Type **FD00 02** Return

4 Type **DEL ALMDESC.CF -P** Return

5 Type **ACF . ALMDESC.CF** *filesize* **0 0** Return

6 Type **FD00 FF** Return

7 Type **APF 1.00·ALMDESC1.CF 0.02·ALMDESC.CF 0 0** *filesize* Return

8 Type **DSM** Return

To restore an ***ALMDESC.CF*** file with a file size greater than 9C4·

1 Insert the UCF4 floppy disk

2 Type **VMNT 1 UCF4** [Return]

3 Type **FD00 02** [Return]

4 Type **DEL ALMDESC.CF -P** [Return]

5 Type **ACF . ALMDESC.CF** *filesize* **0 0** [Return]

6 Type **FD00 FF** [Return]

7 Type **APF 1.00:ALMDESC1.CF 0.02:ALMDESC.CF 0 0 9C4** [Return]

8 Type **DSM** [Return]

9 Insert the UCF5 floppy disk

10 Type **VMNT 1 UCF5** [Return]

11 Type

APF 1.00:ALMDESC2.CF 0.02:ALMDESC.CF 0 9C4 *filesize* [Return]

where·

filesize Size of the ***ALMDESC.CF*** file recorded earlier minus 9C4 For example, if the size recorded earlier is A10, then the *filesize* can be calculated as A10 - 9C4 = 4C

12 Type **DSM** [Return]

Site Specific Configurations

If restoring a configuration file because of loss or corruption, re store ***only*** that file by specifying its name It is not necessary to restore the entire group of configuration files The asterisk (*) or question mark (?) wild cards can be used when entering a file name to restore multiple files

The save procedures store the configuration files in directories on the floppy disks, therefore, they must be recovered by specifying a USN directory number Do ***not*** assume a floppy disk is empty just because it does not contain any files in directory *1 00>* Use the command **DIR 1.*** to view the contents of a floppy disk

The **COPY** command provides the restore capability for the con figuration files of a site specific configuration

To restore a file

1 When restoring any files except display files, put the terminal into off line mode if not already Refer to ***Accessing Off-Line DDT*** in this section for procedures.

2 Log in a password at the terminal if not already logged in Refer to ***DDT Password Log In and Log Out*** in this section for an explanation and log in procedures

3 Install the floppy disk containing the desired file to restore into the floppy disk drive

4 Depending on the type configuration file being restored, at the *0 00> prompt type the* **COPY** *command using the following format*

COPY *src file spec dst file_spec* **[+P]**

The paragraphs that follow give the specific **COPY** command to restore each configuration file type Refer to this information when entering the command

5 Press **Return** to initiate the restore

Repeat these procedures for each configuration requiring restoration

The following **COPY** commands restore a single configuration file by specifying a file name and extension The same procedures can be used to restore a group of configuration files by replacing the file name with a name using either the asterisk (*) or question mark (?) wild card

Display files consist of ***.DT***, ***.DL***, ***.DU*** and ***.CF*** files To restore a ***.DT*** file, type the command

COPY 1.55:*filename***.DT 0.55.**

NOTE The USN 54 directory is reserved for release specific display files USN 55 directory for user created display files

To restore a ***.DL*** file, type the command

COPY 1.44-4E:*filename***.DL 0.*:**

To restore a ***.DU*** file,

COPY 1.04-0E:*filename***.DU 0.*:**

To restore a ***.CF*** file, type the command

COPY 1.53:*filename***.CF 0.53:**

Custom log definitions custom log file names are in the format ***LOGnnnn.LF***, where ***nnnn*** is the log index number ranging from 0001 to 0300 To restore a ***.LF*** file, type the command

COPY 1.2C-34:LOG*nnnn*.LF 0.*:

SOE logs recorder number must be known to restore a desired SER definition file To restore an SER definition file, type the command

COPY 1.02:SERDEF*recorder-number*.CF 0.*:

Trend pen requires restoring two different types of files. To restore trend pen configuration, type the commands

COPY 1.02:TPC* 0.*:

COPY 1.02:PIO* 0.*:

Refer to ***Trend Pen Cluster Configuration*** in the ***OIS Configuration*** section for an explanation of these files

Trend data files - trend data file names are in the format ***Tnnnnnnn.TR***, where ***nnnnnnn*** is the trend index number ranging from 0000001 to 0002000 To restore a copy, type the command

COPY 1.14-2B:T*nnnnnnn*.TR 1.*:

TRANSFERRING SLDG CREATED CONFIGURATIONS

The SLDG program running on an engineering work station (EWS) allows creating and modifying configurations The steps required to implement a configuration created with the SLDG program include

1 Transferring files to the hard disk of the console after building the various pieces of a configuration with the SLDG utilities

2 Converting the transferred files to an OIS format for use

The SLDG package provides the capability to define several, but not all configuration requirements of the console The configuration files to transfer include

- Configuration files (***.CF*** and ***.AD***)
- Compressed ASCII tag database files (***.CP***)
- Display and symbol source files (***DT***)
- Trend definitions file (***.CF***)
- Log configuration files (***.LF*** and ***.LG***)

Configuration files created at the engineering work station using the SLDG program must be transferred to the console from floppy disk Refer to the ***Software Logging Database Graphics (SLDG)*** instruction for procedures to transfer configuration files from the engineering work station to floppy disks

SYSTSIZE CF File

The information contained in the ***SYSTSIZE.CF*** file of the console must be valid for the configuration being transferred to the con sole from the SLDG work station This file contains system infor mation including the number of tags, trends, keyboards, CRTs and annunciator display panels Either modify the system con figuration at the console or use the SLDG program to examine and modify the ***SYSTSIZE.CF*** file prior to loading the configuration created with the SLDG program if necessary Refer to ***OIS System Configuration*** in the ***OIS Configuration*** section for procedures

Configuration Files

Configuration files created with the SLDG program can be in stalled by simply copying them from the floppy disk to the hard disk Put the diagnostic/debug terminal into off line mode, then use the **COPY** command to perform the copy Refer to ***Accessing Off-line DDT*** in this section for procedures to put the terminal in off line mode The specific files to copy reside on the floppy disk labeled CF01 and include

SYSTSIZE.CF	Contains system information
SETnnn.AD	Contains automatic display and pop up in formation, ***nnn*** is the set number
KTAS.CF	Contains keyboard configuration information
ADSTA.CF	Contains annunciator display panel configu ration information
ALMTONES.CF	Contains alarm tones configuration infor mation
ALMRELAY.CF	Contains alarm relays configuration infor mation

The configuration files reside in the USN 02 directory on the hard disk

Tag Database

Two steps are required to completely install and build the tag da tabase

1 Transfer the required files to the hard disk of the console

2 Run the tag database builder to convert the files from ASCII format to a usable OIS format

TRANSFERRING FILES

The console provides a command file to copy compressed ASCII database files to the console from floppy disk The files transferred with the command include

Floppy Label	***File Name***
TG01	***EUDSCP.CP***
	LSDSCP.CP
	ALMCOMmn.CF (***m*** of ***n***)
TG02	***TAGLST1n.CP*** (1 of ***n***)
TG03	***TAGLST2n.CP*** (2 of ***n***)
⋮	⋮
TG*nn*	***TAGLSTmn.CP*** (***m*** of ***n***)

The files reside on floppy disks labeled TG*nn* These volume labels are reserved for compressed-ASCII files only The number of floppy disks necessary to transfer a complete tag database varies The SLDG utilities used to create the files will indicate the number of files which comprise the complete database The transfer utility also requires the CF01 floppy disk

To transfer the database files from floppy disks to the console

1 Insert the CF01 floppy disk

2 At the *0.00>* prompt, type **FD00 FF** [Return] The prompt changes to *0 FF>* to indicate that the current directory is the command file directory.

3 Type

INT . TAGCP-10.CN [Return]

4 Respond to the prompts and insert floppy disks as required

5 The command file is written to copy the maximum number of files As soon as the last floppy disk is copied to the console, es cape from command file execution

The compressed-ASCII files of the tag database can also be copied from the console to floppy disk for transfer back to an engineering work station This requires, however, using the tag database builder to unbuild the database to compressed ASCII format first The database builder will indicate the number of files which com prise the complete database Refer to ***TAG DATABASE BUILDER*** in this section for further explanation

To transfer compressed-ASCII tag list files from the console to floppy disk

1 Insert the CF01 floppy disk or a blank floppy disk

2 At the *0 00>* prompt, type **FD00 FF** [Return] The prompt changes to *0 FF>* to indicate that the current directory is the command file directory

3 Type

INT . TAGCP 01.CN [Return]

4 Respond to the prompts and insert floppy disks as required

5 The command file is written to copy the maximum number of files Escape from command file execution after all files have been copied to floppy disk

TAG DATABASE BUILDER

After transferring the tag list configuration files (*.CP*) created with the SLDG program, a database build utility must be run to con vert the database to an OIS format The console must be in an off line mode

The console displays any pertinent messages concerning the da tabase builder at the diagnostic/debug terminal It may be bene ficial, however, to also connect a monitor 68K terminal

To put the console in off line mode

B 1 At the *0 00>* prompt type

0 FF [Return]

This changes to the USN FF directory

2 At the *0 FF>* prompt, type

INT . TAGMODE.CN [Return]

This initiates the off line mode command file

3 Reset the console The console will be in the off line mode after completing its start up sequence Once the console is back up, start the database builder

4 To start the database builder, type

RUN DBB.SP [Return]

first made to temporary files with *.XX* extensions. These temporary files do not become permanent unless the build is successful The old database is retained until the new database is completely and successfully built

Examples of unrecoverable errors are tag indexes out of sequence or an index greater than the configured system size If an error occurs while decoding the input of a tag, a message displays to indicate that the tag was made inactive This is considered to be a recoverable error and the build continues

The database build writes the following files to the USN 02 directory

EUDSCP.CF	Engineering unit descriptors
LSDSCP.CF	Logic state descriptors
ALMDESC.CF	Alarm comment descriptors
TAGNAME.CF	Tag names
TAGDESC.CF	Tag descriptors
TAGCNFG.CF	Tag configurations
CUSTTGID.CF	Customer identifier

Upon successful completion of the tag database build, the console automatically deletes the **.CP** files from the USN 02 directory

Unbuild Database unbuild performs the exact opposite of the database build to create the **.CP** files for transfer back to an engineering work station To unbuild the database, select *2 Unbuild Database*

Upon completion of the tag database build, another command file must be run to put the console back in on line mode

To put the console in on line mode

1 At the *0 FF>* prompt, type

INT . ONLINE.CN $\boxed{\text{Return}}$

2 Reset the console The console will be in the on line mode with the new tag database installed after completing its start up sequence

User-Created Display and Symbol Files

A display or symbol source file (***.DT***) must be translated and assembled before it can be used in normal operations A display source file can be processed either directly from the floppy disk, or transferred to the hard disk then processed The USN 55 directory

The following menu appears

1 Build Database
2 *Unbuild Database*
3 Exit

Build The console requires the following input files to reside in the USN 02 directory to continue with a database build

EUDSCP.CP

LSDSCP.CP

ALMCOM11.CP

TAGLST1n.CP (1 of ***n***)

TAGLST2n.CP (2 of ***n***)

•
•
•

TAGLSTmn.CP (***m*** of ***n***)

NOTE *The console requires an* ***ALMCOM11.CP*** f e even if alarm comments are not used f not used create an alarm comment fi e using the SLDG program with at least one blank a arm comment

To initiate a build

1 Select *1 Build Database* The console prompts for the number *of tag list files*

2 Enter the number of tag list files, which must correspond to the ***n*** portion of the ***TAGLSTmn CP*** files The console checks for a complete set of tag list files based on this entry before continuing If any files are missing, it immediately exits the build routine and displays the name of the missing files at the terminal If no files are missing, the build begins

A start time displays along with messages that reflect various stages of the build sequence The display presents a series of dots to identify the current progress of the database build A new dot displays each time 85 tags have been built This allows monitoring the progress of the build and estimating the completion time since a database build takes considerable time

When the entire build process completes successfully, the follow ing message appears

Tag List build completed successfully

3 Once complete, select the *3 Exit* option

If the console detects an unrecoverable error while performing a build, specific messages appear to indicate a failure, and to indi cate that the build cannot continue The entire database build is on the hard disk is reserved for user-created displays Use the **COPY** command to copy a ***.DT*** file from a floppy disk to the hard disk These copies can be performed while the terminal is in either on line or off line mode

> **NOTE** The USN 54 directory is reserved for release specific display f es USN 55 directory for user-created display fi es

Refer to ***Display Generation*** in the ***OIS Configuration*** section for procedures to process a display source file

Trend Database

After transferring the trend definition file (***TRENDDEF.CF***) created with the SLDG program to floppy disk, a database build utility must be run to install the database

To run the builder

1 Put the terminal into off line mode if not already Refer to ***Accessing Off-Line DDT*** in this section for procedures

2 Log in a password at the terminal if not already logged in Refer to ***DDT Password Log In and Log Out*** in this section for an explanation and log in procedures

3 Insert the floppy disk containing the ***TRENDDEF.CF*** file (normally CF01)

4 At the *0 00>* prompt, type

FD01 Return

5 Type

ITRND

Upon completion, the utility writes the trend definition file to the USN 02 directory

Log Definition

Log definition files created with the SLDG program can be installed by copying them from the floppy disk to the hard disk, then running a conversion utility However, the logging system and log conversion utility of the console require the log definition files to be in specific USN directories The definition files store in directories ranging from USN 2C to USN 30 Put the diagnostic/debug terminal into off line mode, then use the **COPY** command to perform the copy Refer to ***Accessing Off-Line DDT*** in this section for procedures to put the terminal in off-line mode The specific commands to enter are

COPY 1.0:*.LG 0.3F: (for the ***LOGNAMES.LG*** file)

COPY 1.0:LOG*nnnn*.LF 0.*xx*: (for a specific log definition file)

where

nnnn Log number from 0001 to 0300

xx A USN directory ranging from 2C to 30 A log definition file must reside in a specific directory determined by its log number

Log Number	***USN Directory***
0001 to 0070	2C
0071 to 0140	2D
0141 to 0210	2E
0211 to 0280	2F
0281 to 0300	30

Wild card characters can be used to copy the definition files For example

COPY 1.0:LOG001?.LF 0.2C

After transferring all log files to the hard disk, run the conversion utility

1 At the *0 00*> prompt, type

FD00 FF Return

The prompt changes to *0 FF*> to indicate that the current directory is the command file directory

2 Type

INT . LOGCONV.CN

MODIFYING START-UP DISPLAY FILE

Normally at the completion of start up, the *General Functions Menu* displays at all screens supported by the console The con figuration file ***SDISPLAY.CF*** residing in the USN 02 directory on hard disk determines this start up display presentation If de sired, this file can be changed using the elementary line editor **(ELE)** Any assembled system display can be assigned to each of the supported screens to be called as the start up display

The following example lists the commands required to modify the ***SDISPLAY.CF*** file Each line should contain the display name (up to eight characters) that is to display at an associated screen The example is set up for a console having two screens in which display ***ALMSUMFL*** (full page alarm summary) is called up on screen one and display ***!GENFUN*** (*General Functions Menu*) on screen two

Example

0 00> **0 2**

0 02> **ASF . SDISPLAY.CF 50 4 4 0 0**

0 02> **ELE . SDISPLAY.CF**

000< **ALMSUMFL**

001< **!GENFUN**

002< **.X**

0 02> **DSM**

NOTE The file creation command (**ASF SDISPLAY CF**) is only needed if the file does not already exist

ENABLING TAG LIST BROADCAST MODE

An entire tag list can be broadcast to this console from a work station running the global database manager software This, however, requires the console to be taken off line by running a command file at the diagnostic/debug terminal Refer to the ***Software Global Database Manager (SGDM)*** product instruction for further explanation. The procedures to take the console off line to receive a broadcast tag list, then to put the console back on line follow

Off-line Mode

Before initiating a broadcast from an engineering work station, perform the following at the diagnostic/debug terminal

1 At the *0 00>* prompt type

0 FF [Return]

This changes to the USN FF directory

2 At the *0 FF>* prompt, type

INT . TAGMODE.CN [Return]

This initiates the off line mode command file

3 Reset the console The console will be in the off-line mode after completing its start up sequence

Once the console is back up, initiate the broadcast from the engineering work station

On-line Mode

Upon completion of the tag list broadcast, another command file must be run to put the console back in on line mode Perform the following at the diagnostic/debug terminal

1 At the *0 FF>* prompt, type

INT . ONLINE.CN [Return]

2 Reset the console The console will be in the on line mode with the new tag list installed after completing its start up sequence

22 43 16 04 10 07

APPENDIX A - AUXILIARY ENGINEERING KEYBOARD

KEYBOARD

The auxiliary engineering keyboard is mapped to match the mylar keyboard that is standard with the console The engineering keyboard is an IIAKB01 keyboard used with the IIMKM02 keyboard interface Figure A 1 shows the keyboard providing a cross reference to the mylar key functions

> **NOTE** When using the auxiliary keyboard ignore the F1 through F12 designators printed on the top row of keys

Press [Alt] in conjunction with another key to access the function shown in Figure A 1 for that key (e g., Home, Disp, Pan, F1, F2, etc) For example, to access the Cncl (cancel) function

Press [Alt] and [L] simultaneously

Press [Ctrl] in conjunction with a key in the numeric keypad to access the process control function shown for that key For example, to access the Out (control output) function

Press [Ctrl] and [8] (in the numeric keypad) simultaneously

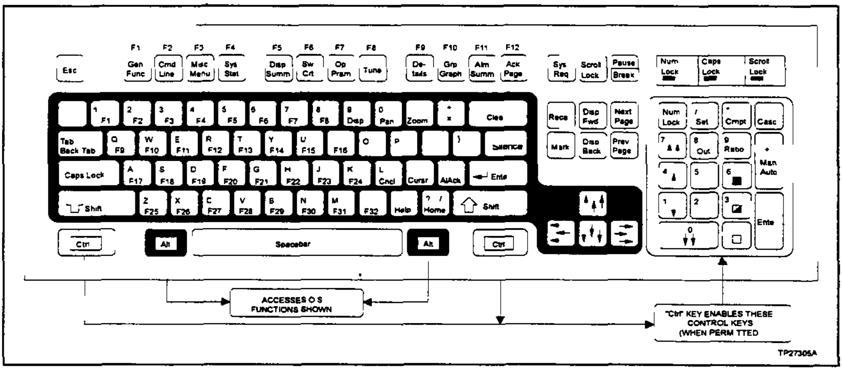


Figure A 1 IIAKB01 Keyboard Mapping

APPENDIX B - GRAPHIC AND ESCAPE COMMANDS

INTRODUCTION

This appendix lists the commands and escapes that define the elements and capabilities of a display or symbol enabling operator interface station (OIS) functions These commands create the display and symbol source files that eventually become the assembled display used in operations

Either the software oriented display generator (SODG) or the elementary line editor (ELE) can be used to create or edit display and symbol source files The SODG utility is available at an engineering work station running the software, logging, database and graphics (SLDG) software, and ELE utility is available at the diagnostic/debug terminal

The display source files reside on the hard disk or on floppy disk as ***.DT*** files Once assembled using the *Display Generator* function they become ***.DU*** display files and ***.DL*** symbol files Some example display and symbol source files are given at the end of this section

Display Guidelines

Some guidelines to follow when creating the source files and entering escape commands are

> **NOTE** Refer to ***ELEMENTARY LINE EDITOR DISPLAY GENERATION OR EDITING*** n the ***OIS Configuration*** section for procedures to create (allocate) a display fi e

1 File limits are 2,500 70-character line entries per display file.

2 User coordinate space for creating displays is 400,400 to 9600,7200

3 If any command has an x or y coordinate value of zero, that element does not appear on the display

4 Commands and parameters should be contained on one line If not, use the continuation character /

5 Commands must be in lower case characters

6 Text color, line color, fill color and marker color must appear in this order as the first elements in the symbol file immediately after the **bb** (begin body) command For dynamic symbols, the first occurrence of each will be overwritten by dynamic symbol changes

7 A non good symbol takes precedence over an alarm state and value symbol in a dynamic symbol Generally the order of ap pearance is quality, alarm, then value A symbol without leading color commands changes color according to the color parameters of a dynamic symbol escape

8 When using circle (**cc**) and polygon (**pg**) commands that need to be filled, the following syntax and order applies

is interior style

fc fill color

lc line color (only if perimeter is on)

cc or **pg** circle or polygon

If there is another **pg** or **cc** the file and it is not to be filled, add an **is** command set to 0 (hollow) prior to the next **pg** or **cc** command occurrence

9 After creating a source file, it can be edited on a personal computer running the SLDG program To do so, copy the ***.DT*** file *from the console to a floppy disk*

10 Enter all escape types and subtypes in decimal

11 Generally, any display without escape for control should not contain **pe 124,CONTROL~** Any menu display that does not re quire any control action using either **ei 107,83** or **ei 108,83** and has only text and display selects using **ei 107,82** or **ei 108,82** should ***not*** have an escape for control

12 Refer to Table B 1 and Table B 2 when entering key and color parameters respectively

13 When defining touch point select commands for use with touch screen, each touch area must be at least 400 × 400 display units separated by 40 units Touch point areas for mouse or trackball selects must be at least 40 × 40 separated by 40 units

14 The console accepts a comma (,), semicolon (;) or colon ( ) as a separator between parameters

Table B 1 Key Legend

Key	Descriptor
PREV PAGE	33305
NEXT PAGE	33309
ESC	33663
ENTER	33659
HELP	33619
0 9	ASC codes 48 to 57
A Z	ASC I codes 65 to 90

Table B-2 Color Index

Index	Color	Index	Color
0	Black	8	Orange
1	White	9	Yellow-green
2	Red	10	Green-cyan
3	Green	11	Cyan blue
4	Blue	12	Blue-magenta
5	Cyan	13	Magenta red
6	Magenta	14	Dark gray
7	Yellow	15	Light gray

NOTE For each color there are four shades available making the total number of available colors 64 (0 to 63) Add 128 to a color code for flashing color

Display Element Syntax

All display source files require the following format and syntax

bm 0,*Name~*

bp *0,Name~,0*

sm

bb

graphic and escape commands

•
•
•

ep

em

%%

All symbol source files referenced or used in display source files require the following format and syntax

bp *0,Name~,0*

sm

bb

rf

graphic and escape commands

•
•
•

ep

%%

All pop up symbol source files referenced or used in display source files require the following format and syntax

bp *0,Name~,0*

sm

bb

rf

cr

es

ei

pe 124,CONTROL~

ep

%%

General Display and Symbol Escape Commands

This part of the section identifies the commands that create a display or symbol source file, and the attributes of that file It also contains the graphic commands that create figures and static text, and the characteristics of them

FILE DELIMITERS

The console requires file delimiters placed in a display and symbol source file to separate each section of the file, for example, the beginning, body and end of the display file

These delimiters are placed both before and after the body of the source file The body contains the escape commands that define the display features and characteristics Some delimiters pertain to both display and symbol source files while others apply only to one or the other

Begin Body (bb)

PURPOSE. The begin body command indicates that graphic commands follow This must be present in a display or symbol source file before any graphic commands

COMMAND: **bb**

Begin Metafile (bm)

PURPOSE. The begin metafile command must be present on the first line in a source file for a graphic display.

COMMAND: **bm 0,***metafile name~*

where

0	Required
metafile name	Maximum of 27 characters followed by a tilde (~)

Example **bm 0,D03SD001~**

Begin Picture (bp)

PURPOSE: The begin picture command identifies the beginning of the escape commands that make up an element or elements of the display Each time a **bp** command is encountered, all variables of the pre ceding element return to default states Several **bp** commands can appear in a single file

COMMAND· **bp** *flag,text~,color*

where

flag 0 clear screen to *color*, 1 do not clear screen

text Maximum of 28 characters for description purposes only, must end with a tilde (~)

color Background color for the picture This is a color index number from 0 to 63, refer to Table B-2 for color index numbers

Example **bp 1,dcsfull~,0**

End Metafile (em)

PURPOSE: The end metafile command marks the end of the display source file

COMMAND **em**

End Picture (ep)

PURPOSE· The end picture command causes a picture output

COMMAND **ep**

End of Input (%%)

PURPOSE. The end of input characters mark the end of a display and symbol file

COMMAND: **%%**

FILE ATTRIBUTES

The console requires certain commands placed in the file to identify the overall characteristics of the display or symbol, for example, the security level required to access functions available through the display or symbol

Some of these commands can be placed in various locations within the source file while others have certain requirements. Some delimiters pertain to both display and symbol source files while others apply only to one or the other

Clip Rectangle (cr)

PURPOSE: The clip rectangle command defines the opposite corners of a control window rectangle for a pop up element, and the area that clears on the next call up of a pop up element Use the command to create pop up control elements Place the command after the **bb** and **rf** command in the symbol source file

COMMAND: **cr** *x1-coordinate,y1-coordinate,x2-coordinate,y2-coordinate*

where

x1-coordinate,y1 coordinate	Lower left corner coordinate
x2 coordinate,y2 coordinate	Upper right corner coordinate

Example **cr 1000,1000,3180,4280**

VDC Extent (ex)

PURPOSE: The VDC extent command defines the unit size of the screen area The default is 10,000 by 7,500 units, which is x,y coordinates of 0,0 lower left corner and 10000,7500 upper right corner This is required only if changing the defau t size Place the command at the beginning of the display source file

COMMAND: **ex** *x-coordinate y-coordinate*

where

x coordinate	Lower left coordinate
y-coordinate	Upper right coordinate

Example **ex 0,0,10000,7500**

Reference (rf)

PURPOSE: The reference command provides a reference point when creating symbols All coordinates of the symbol are referenced to this starting point Use this command in symbol files only

COMMAND. **rf** *x-coordinate,y-coordinate*

Example **rf 400,1000**

Remark (rm)

PURPOSE: The remark command can be used to enter remarks into the source file These remarks do not appear in the final display presentation Remarks can be placed anywhere in the file

COMMAND: **rm** *text~*

where

text Maximum of 69 characters followed by a tilde (~)

Example **rm FULL STATION SYMBOL~**

Security Mask (sm)

PURPOSE: The security mask command sets the security level access for a display and symbol

COMMAND: **sm** *primary level,[secondary-level]*

where

primary-level	Security level from 1 to 16 The console checks the primary level first
secondary level	Security level from 1 to 16 The console checks this level after the primary The secondary level is optional

Examples **sm 1**

sm 1,10

GRAPHIC PRIMITIVES

Graphic primitives create the figures and text that appear as part of a display or symbol. The commands to draw figures include arc (both open and closed), circle, polygon, polyline, polymarker and rectangle Graphic attribute commands set the characteristics of the figure or text (e.g , color, width, type, etc)

Arc (ac)

PURPOSE:

The arc command defines an open arc defined by a starting, intermediate and ending coordinate The attributes of the line creating the arc can be defined using an **lc**, **lt** and **lw** command

COMMAND:

ac *x1-coordinate,y1-coordinate,x2-coordinate,y2-coordinate x3-coordinate,y3-coordinate*

where

x1-coordinate,y1-coordinate Starting point coordinate

x2-coordinate,y2-coordinate Intermediate point coordinate

x3-coordinate,y3-coordinate Ending point coordinate

Example **ac 1000,1000;2000,500;3000,1000**

Append Text (at)

PURPOSE:

The append text command appends a defined text string to a previous character string The command can be used to define up to an additional 69 characters if the original string exceeds the maximum of 69 characters, or to change text attributes. This command must be preceded by a **tx** command or another **at** command A **ch** and **cs** command can be used to define the height and spacing of the characters

COMMAND:

at *flag,string~*

where

flag 0 - normal text string, 1 append following **at** command text

string 0 to 69 characters followed by a tilde (~)

Example **at 0,SILO~**

Closed Arc (ca)

PURPOSE:

The closed arc command produces a pie shaped arc defined by a starting, intermediate and ending coordinate The attributes of the line creating the arc can be defined using an **lc** and **lt** command The console automatically closes the arc When the arc is to be filled, it must be preceded by an **is** and **fc** command, and an **lc** if perimeter is on for the **is** command

COMMAND:

ca *x1-coordinate y1-coordinate,x2-coordinate,y2-coordinate, x3 coordinate,y3 coordinate,flag*

where

x1 coordinate,y1-coordinate	Starting point coordinate
x2 coordinate y2 coordinate	Intermediate point coordinate
x3-coordinate y3-coordinate	Ending point coordinate
flag	Arc subtype, 0 chord arc (future), 1 pie arc

Example **ca 1000,1000;2000,500;3000,1000;1**

Circle (cc)

PURPOSE:

The circle command draws a circle based on a center point and radius parameter The attributes of the line creating the circle can be defined using an **lc** and **lt** command When the circle is to be filled, it must be preceded by an **is** and **fc** command, and an **lc** command if perimeter is on for the **is** command

COMMAND:

cc *x coordinate,y-coordinate,radius*

where

x coordinate,y coordinate	Center point coordinate
radius	Number of display units from center point

Example **cc 1650,4450;50**

Polygon (pg)

PURPOSE: The polygon command draws a polygon figure based on a starting point and up to 30 displacement parameters The attributes of the line creating the figure can be defined using an **lc**, **lt** and **lw** command. When the polygon is to be filled, it must be preceded by an **is** and **fc** command, and an **lc** command if perimeter is on for the **is** command

COMMAND: **pg** *x-coordinate,y-coordinate,x-displacement,y displacement~*

where

x coordinate,y coordinate	Starting point coordinate
x-displacement y-displacement	X offset and y-offset display units from the start or last displacement Up to 30 displacements can be defined with the last followed by a tilde (~)

Example **pg 950,950;100,0;0,100;-100,0;0,-100~**

Polyline (pl)

PURPOSE: The polyline command draws a polyline figure based on a starting point and up to 30 displacement parameters The attributes of the line can be defined using an **lc**, **lt** and **lw** command

COMMAND. **pl** *x-coordinate,y-coordinate,x-displacement,y-displacement~*

where

x-coordinate,y-coordinate	Starting point coordinate
x displacement,y-displacement	X offset and y offset display units from the start or last displacement Up to 30 displacements can be defined with the last followed by a tilde (~)

Example **pl 950,950;100,0;0,100;-100,0~**

Polymarker (pm)

PURPOSE:

The polymarker command draws a figure comprised of polymarker points The figure is based on a starting point and up to 30 displacement parameters. The attributes of the line can be defined using an **mc**, **mt** and **ms** command

COMMAND.

pm *x coordinate,y-coordinate,x-displacement,y displacement~*

where

x coordinate,y coordinate	Starting point coordinate
x displacement y displacement	X offset and y offset display units from the start or last displace ment Up to 30 displacements can be defined with the last followed by a tilde (~)

Example **pm 950,950;100,0;0,100;-100,0~**

Rectangle (rt)

PURPOSE:

The rectangle command draws a rectangle whose size and position is based on a lower left and upper right corner parameter The attributes of the line creating the rectangle can be defined using an **lc** and **lt** command When the rectangle is to be filled, it must be preceded by an **is** and **fc** command, and an **lc** command if perimeter is on for the **is** command

COMMAND·

rt *x1 coordinate,y1-coordinate x2 coordinate y2-coordinate*

where

x1 coordinate,y1 coordinate	Lower left corner coordinate
x2-coordinate y2 coordinate	Upper right corner coordinate

Example **rt 496,496,2676,3752**

Text (tx)

PURPOSE:

The text command enters a text strıng of up to 69 characters A **tc**, **bc**, **ch** and **cs** command can be used to define the heıght and spacıng of the characters If a character strıng exceeds the 69 character maxımum, use the **at** command to contınue the strıng and append up to 69 addıtıonal characters

COMMAND:

tx *flag,x-coordınate,y-coordınate,strıng~*

where

flag	0 - normal text strıng, 1 to append the followıng **at** command text
x-coordınate,y-coordınate	Startıng poınt coordınate of the strıng
strıng	0 to 69 characters followed by a tılde (~)

Example **tx 0,2250,5900,A~**

GRAPHIC ATTRIBUTES

Graphic attributes define the characteristics of a figure or text that follow For text, the attributes include character height, spacing and color For figures, they include

- Background color
- Fill in color and style for closed figures
- Line color, width and type
- Marker color, size and type

Once an attribute is set, it remains in effect until changed by an other of the same attribute command For example, if line color is set to red, any lines drawn with graphic primitives after the line color command appear in red until another line color command occurs to change the color In a file containing multiple **bp** com mands, each **bp** command resets all file attributes to default

Background Color (bc)

PURPOSE.

The background color command sets the color used as the back ground color of figures in a display The console defaults to a black background color Background color, if used. must come before text color **(tc)** Currently, the **bc** command can only be used for text

COMMAND:

bc *flag,color-index*

where

flag	1 off, 0 on
color-index	Number of a color from 0 to 63, refer to Table B 2 for color index numbers

Example **bc 1,0**

Character Height (ch)

PURPOSE:

The character height command defines the size of the text char acters in display units (or VDC extent) that follow Standard single height characters are 124 units while double height characters are 248 units If specifying a character height, the command must precede a **tx** command

COMMAND:

ch *units*

where

units Number of screen units

Example **ch 124**

Character Space (cs)

PURPOSE: The character space command defines the amount of space be tween characters as a percent of character height Specify the character height **(ch)** ***first*** If specifying a character space, the command must precede a **tx** command

COMMAND: **cs** *scaler*

where

scaler Two digit percentage

Example **cs 20** (equals 20% or 0 20)

Fill Color (fc)

PURPOSE: The fill color command defines the color to use as the fill in color of a closed figure such as a circle **(cc)** and polygon **(pg)** If using a fill color, the command must precede a **cc**, **rt**, **pg** or **ca** command

COMMAND: **fc** *color-index*

where

color-index Number of a color from 0 to 63, refer to Table B 2 for color index numbers

Example **fc 1**

Interior Style (is)

PURPOSE. The interior style command defines the attributes of the interior portion of a closed figure, including fill-ins and outline perimeter The command must be present before all polygon **(pg)** and circles **(cc)**

COMMAND: **is** *index,flag*

where

index 0 - hollow (do not use fill color), 1 solid (use fill color)

flag Perimeter flag, determines if the perimeter or outline of the figure is on or off 0 no outline visible, 1 outline visible

Example **is 1,0**

Line Color (lc)

PURPOSE· The line color command specifies the color of the line used to draw a figure or line The line color command must precede the line or figure being drawn

COMMAND: **lc** *color index*

where

color-index Number of a color from 0 to 63, refer to Table B 2 for color index numbers

Example **lc 2**

Line Type (lt)

PURPOSE: The line type command specifies the type of line used to draw a figure or line The line type command must precede the line or figure being drawn

COMMAND: **lt** *index*

where

index 0 solid, 1 dash, 2 dot, 3 dash dot, 4 dash dot dot

Example **lt 0**

Line Width (lw)

PURPOSE The line width command specifies the width of a line expressed in number of display units (or VDC extent) The line width command must precede the line being drawn

COMMAND: **lw** *units*

where

units Number of screen units

Example **lw 1**

Marker Color (mc)

PURPOSE: The marker color command specifies the color of the marker used to draw a polymarker **(pm)** line The marker color command must precede the polymarker command

COMMAND: **mc** *color-index*

where

color-index Number of a color from 0 to 63, refer to Table B-2 for color index numbers

Example **mc 3**

Marker Size (ms)

PURPOSE: The marker size command defines the size of the marker characters in display units (or VDC extent) that follow If specifying a character height, the command must precede a **pm** command

COMMAND: **ms** *units*

where

units Number of screen units

Example **ms 124**

Marker Type (mt)

PURPOSE: The marker type command specifies the character type used as the marker character The marker type command must precede the **pm** command

COMMAND: **mt** *index*

where

index 0 dot ( ), 1 plus (+), 2 asterisk (*), 3 circle (o), 4 ×

Example **mt 2**

Text Color (tc)

PURPOSE: *The text color command specifies the color of the text that follows* The text color command must precede the **tx** command

COMMAND: **tc** *color-index*

where

color index Number of a color from 0 to 63, refer to Table B 2 for color index numbers

Example **tc 3**

Graphic and Escape Commands

Escape commands define the attributes of a display, and create the elements and capabilities built into a display. The escape commands in this part of the section are specialized, and when defined create a specific characteristic or enable a specific function of a display This section presents the commands categorized by their function.

Each escape command requires a series of parameters defined to perform its intended function Table B 3 lists common acronyms used to represent some of the parameters used in the escape command format It also explains the purpose of these parameters and requirements to define If a command uses a parameter acronym that does not appear in this table, the purpose and requirements to define that parameter appear in the section detailing the use and format of the command

Table B-3 Escape Command Parameters

Parameter	Description
almcolor	Alarm color, index number of a color to use as the alarm color which is to identify an alarm condition presented by the escape command Refer to Table B-2 for color index numbers
bgcolor	Background color index number of a color to use as the background color for the field at which the escape command presents information Refer to Table B-2 for color index numbers
charlength	Character string length number of characters to allow for a character string returned by the escape command Valid character length depends on the maximum number of characters returned by the escape command and is from 1 to 255 Using the starting character (*start-char*) parameter allows breaking a character string to continue it on another line
charsize	Character size size of the characters presented by the escape command expressed in display units (or VDC extent) Standard single height characters are 124 units while double height characters are 248 units
decimal-digits	Number of digits from 0 to 4 that are to appear after a decimal point
fgcolor	Foreground color index number of a color to use as the foreground color for the field at which the escape command presents information Refer to Table B 2 for color index numbers
key1	First key ASCII character code for an alpha or numeric key or key designator for a specialized key (e g , ESC HELP, etc) refer to Table B-1 If using a specialized key it should only be used for display selects This defines the key to press in a single key select or the first numeric key in a two key select sequence
key2	Second key ASCII character code for an alpha or numeric key or ENTER, refer to Table B 1 This defines the second key in a two-key select sequence
spacing	Spacing factor amount of space between characters expressed as a percent of character size (*charsize*)

Table B-3. Escape Command Parameters (continued)

Parameter	Description
start-char	Starting character, number of a character position in a character string that is to be the first character displayed. Valid entry for this parameter depends on the number of characters returned by the command; the first character position in a string is 0. For example, to have the field present the first character in a returned character string as the starting character, then enter 0 as the starting character number. To have the field present the 17th character in a returned character string as the starting character, then enter 16 as the starting character number. When used with the character length (*charlength*) parameter, it allows specifying the starting character that is to appear on another or continuation line.
tag	Tag index number, index number of the tag for which the escape command is to associate. This must be the index number of a tag defined in the tag database.
trend	Trend index number, index number of the trend for which the escape command is to associate. This must be the index number of a trend defined in the trend database.
x coord or *xn coord*	X coordinate, x-axis position on the display to place the information presented by the escape command. Valid default x-coordinate range is from 400 to 9600.
y-coord or *yn coord*	Y coordinate, y-axis position on the display to place the information presented by the escape command. Valid default y-coordinate range is from 400 to 7200.

PROGRAM ESCAPE (pe)

PURPOSE:

The program escape command loads control and applications programs This escape provides control capabilities for INFI 90 display elements The command must be present in a display or symbol source file to enable process control actions through that display or symbol

Generally, any display without escape for control should ***not*** con tain the **pe** command This includes any menu display that does not require control action using either **ei 107,83** or **ei 108,83** and has only text and display selects using **ei 107,82** or **ei 108,82**

COMMAND.

pe *type,program-name~*

where

type	124 to identify the background task
program-name	CONTROL followed by a tilde (~)

Example **pe 124,CONTROL~**

SYMBOL (es)

PURPOSE:

The symbol command allows using a symbol created in a separate symbol source file as part of the current display In this way, a symbol can be created only once and used in several different displays with minimal modifications The command normally appears in the body of the file

COMMAND:

es *symbol-name~,color,x-coord,y-coord,tag*

where

symbol name	Name of a symbol file to be entered followed by a tilde (~)
color	Color index number from 0 to 63, refer to Table B 2 for color index numbers The color parameter changes the first of each color command en countered in the symbol file
tag	Optional, tag associated with the symbol If not used, enter a 0

Example **es MODLINE~,1,1600,5800,25**

ALARM STATUS COMMANDS

An alarm status command both displays alarm information and enables alarm indications An alarm status command must be present in a display source file to have the console present alarm indications for an exception reported analog value or digital state considered to be an alarm condition

NOTE Refer to Tab e B 3 for add t ona parameter def nit ons

Escape Alarm (ea 56)

PURPOSE:

The escape alarm command presents alarm indications and status information for a process tag A parameter of the command references a tag for which the command presents alarm status It also determines the type of alarm field used to present alarms

COMMAND.

ea 56,*subtype,tag x-coord,y coord,charsize,fgcolor,bgcolor,almcolor spacing*

where

subtype 32 presents a five character alarm status/quality/ group field

34 presents a single character alarm status field

Example **ea 56,32,1,1099,1065,124,7,0,7,1**

Node Type and Configuration Error (ea 64)

PURPOSE:

The node type and configuration error command presents a node type, and an error indication if there is a conflict between reported node type and the node type configured for a tag A parameter of the command references an N90STA tag for which it is to present this indication The command is normally used in system status displays The default indication presented to identify the error condition is an asterisk (*)

COMMAND:

ea 64,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor almcolor,spacing, charlength,start-char*

Example **ea 64,32,1,1000,1000,124,3,0,7,1,8,0**

Node Error Short Form (ea 65)

PURPOSE:

The node error short form command presents a single character indicator to identify the existence of a node off-line error, module error, communication error or node status error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented to identify each type of error condition are *O* for node off line, *M* for module error, *C* for communication error, and *S* for node status problem

COMMAND:

ea 65,50,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ea 65,50,1,1900,1000,124,7,0,7,1**

Node Error Long Form Off-Line (ea 65)

PURPOSE:

The node error long form off line command presents an indicator to identify the existence of a node off-line error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *offline* and *online*

COMMAND.

ea 65,51,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor almcolor,spacing*

Example **ea 65,51,1,1000,1000,124,3,0,7,1**

Node Error Long Form Module (ea 65)

PURPOSE:

The node error long form module command presents an indicator to identify the existence of a module error within the node A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *error* and *ok*

COMMAND:

ea 65,52,*tag x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ea 65,52,1,1000,1000,124,3,0,7,1**

Node Error Long Form Communications (ea 65)

PURPOSE:

The node error long form communications command presents an indicator to identify the existence of a communication error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays. The default indications presented by this command are *error* and *ok*

COMMAND·

ea 65,53,*tag x coord y-coord,charsize fgcolor,bgcolor almcolor,spacing*

Example **ea 65,53,1,1000,1000,124,3,0,7,1**

Node Error Long Form Node Status (ea 65)

PURPOSE:

The node error long form node status command presents an indicator to identify the existence of a status problem A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *problem* and *normal*

COMMAND.

ea 65,54,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor spacing*

Example **ea 65,54,1,1000,1000,124,3,0,7,1**

Module Type and Configuration Error (ea 68)

PURPOSE:

The module type and configuration error command presents a module type, and an error indication if there is a conflict between reported module type and the module type configured for a tag A parameter of the command references an N90STA tag for which it is to present this indication It is normallv used in system status displays *The default indication presented to identify the error* is an asterisk (*)

COMMAND:

ea 68,32,*tag,x-coord y coord charsize,fgcolor,bgcolor almcolor,spacing charlength,start-char*

Example **ea 68,32,1,1200,1000,124,3,0,7,1,8,0**

Module Mode (ea 69)

PURPOSE·

The module mode command presents a module mode indication A parameter of the command references an N90STA tag for which it is to present this information The command is normally used in system status displays The default mode indications presented by this command are *execut* (execute), *config* (configure), *error*, *stndby* and *failed*

COMMAND·

ea 69,32,*tag,x-coord,y coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ea 69,32,1,2200,1000,124,3,0,7,1**

Module Error Indicator (ea 70)

PURPOSE·

The module error indicator command presents a module error indicator to identify that a module has some error This is a general indication that only identifies the existence of an error A parameter of the command references an N90STA tag for which it is to present this indication The command is normally used in system status displavs The default indication presented bv this command is *ERR*

COMMAND.

ea 70,32,*tag,x-coord,y coord charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ea 70,32,1,3000,1000,124,3,0,7,1**

Device Status (ea 93)

PURPOSE:

The device status command presents status indications for a supported peripheral device A parameter of the command references a DEVSTAT tag for which it is to present these indications The command is normally used in device status displays The default indications presented by this command depend on the device the tag is defining. If supported by this console, the command can present status indications for its interface unit, clock, keyboards, annunciator display panels, CRTs, printers, touch screen and storage devices

COMMAND:

ea 93,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor, spacing,charlength,start-char*

Example **ea 93,32,1,1000,1000,124,3,0,7,1,8,0**

Alarm State (ea 114)

PURPOSE:

The alarm state command enables a two character text field to present the current alarm state of a tag The command works with any tag type The colors set during *Alarm Quality Option* configuration affect the alarm colors for this element

The default text strings presented by this command include

Blank no alarm	* - bad quality
L - low alarm	*N* - return to normal
2L two low alarm	*"* alarms suppressed
3L three low alarm	*HD* high deviation alarm
H high alarm	*LD* low deviation alarm
2H two high alarm	*HR* - high rate of change alarm
3H - three high alarm	*LR* low rate of change alarm
A digital, or N90STA, DEVSTAT or TEXTSTR alarm	

COMMAND:

ea 114,32,*tag,x-coord,y coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ea 114,32,23,4500,3600,124,3,0,7,1**

INTERACTIVE COMMANDS

An interactive command enables the operator to interact with the console through control select and display select features An interactive command defines either a key or key sequence, or touch point requirement

Keystroke select commands specify either a single or two key select sequence that must be performed to select a display item or enable element control Valid key select sequences include a single alpha, a numeric followed by ENTER, a numeric and alpha, and a numeric and numeric

Touch point select commands define an area of the screen that can be touched when using touch screen, or a mouse or trackball cursor must be placed to select a display item or enable element control

NOTE Refer to Table B 3 for additional parameter definitions

Touch Point Display Select (ei 107)

PURPOSE. The touch point display select command defines a touch point area on the screen used to call another display from the current display

COMMAND: **ei 107,82,***x1 coord y1 coord,x2-coord,y2-coord display-name~*

where

x1-coord,y1 coord	Lower left corner touch point coordinates
x2-coord y2 coord	Upper right corner touch point coordinates
display-name	Eight character name of the display to call after initiating a touch point select The display name must correspond to the name of an assembled display file (***.DU***) on the hard disk Followed by a tilde (~)

Example **ei 107,82,3694,6290,4494,6490,AREA1~**

Keystroke Display Select (ei 108)

PURPOSE:

The keystroke display select command defines a key or key sequence that must be pressed to call another display from the current display A **tx** command must be created to display the key characters defined in this command

COMMAND:

ei 108,82,*key1,key2,display-name~*

where

display-name	Eight character name of the display to call after pressing the select keys. The display name must correspond to the name of an assembled display file (***.DU***) on the hard disk Followed by a tilde (~)

Example **ei 108,82,65,0,AREA1~**

Touch Point Control Select (ei 107)

PURPOSE:

The touch point control select command defines a touch point area on the screen used to enable control of a tag element

COMMAND·

ei 107,83,*x1-coord y1-coord x2-coord y2-coord tag cntrl group cntrl option,x3-coord,y3 coord,x4-coord y4 coord,outline-color x5-coord,y5-coord*

where

x1-coord,y1-coord	Lower left corner touch point coordinates
x2-coord,y2-coord	Upper right corner touch point coordinates
cntrl-group	Control group selection, 32 RCM, 33 STATION, 34 RMSC, 36 DD, 36 MSDD, 37 RMCB, 38 DANG, 39 DADIG, 40 TEXTSTR This must match the type of the referenced tag
cntrl-option	Control prompt option, 32 prompt at bottom line, 33 prompt in box, 34 combination bottom line prompt with highlight box (not for TEXTSTR tags), 35 combination disjoint prompt with tag name and highlight box
x3 coord,y3 coord	Required only if *cntrl option* is set to 33, 34 or 35, defines the lower left corner of the highlight box
x4-coord,y4-coord	Required only if *cntrl-option* is set to 33, 34 or 35, defines the upper right corner of the highlight box

outline-color	Required only if *cntrl-option* is set to 33, 34 or 35; number of the color to use for the box outline when deselected Refer to Table B 2 for color index numbers
x5-coord y5-coord	Required only if *cntrl-option* is set to 35, defines the left justification coordinate

Example **ei 107,83,496,496,2676,2076,1,36,33,496,496,2676,2076,4**

Keystroke Control Select (ei 108)

PURPOSE:

The keystroke control select command defines a key or key sequence that must be pressed to enable control of a tag element A **tx** command must be created to display the key characters defined in this command

COMMAND:

ei 108,83,*key1,key2,tag,cntrl group,cntrl-option x1 coord y1 coord, x2 coord y2-coord outline color,x3-coord y3 coord*

where

cntrl-group	Control group selection, 32 RCM, 33 STATION, 34 RMSC, 36 DD, 36 MSDD, 37 RMCB, 38 DANG, 39 DADIG, 40 - TEXTSTR This must match the type of the referenced tag
cntrl-option	Control prompt option, 32 prompt at bottom line, 33 prompt in box, 34 combination bottom line prompt with highlight box (not for TEXTSTR tags), 35 combination disjoint prompt with tag name and highlight box
x1-coord y1-coord	Required only if *cntrl option* is set to 33, 34 or 35, defines the lower left corner of the highlight box
x2 coord,y2 coord	Required only if *cntrl-option* is set to 33, 34 or 35, defines the upper right corner of the highlight box
outline-color	Required only if *cntrl-option* is set to 33, 34 or 35; number of the color to use for the box outline when deselected Refer to Table B 2 for color index numbers
x3-coord,y3 coord	Required only if *cntrl option* is set to 35, defines the left justification coordinate

Example **ei 108,83,49,65,1,36,33,496,496,2676,2076,4**

Soft Touch Select (ei 107)

PURPOSE:

The soft touch command defines a touch point area on the screen used to call either a tuning, block details or module problem re port display, or to initiate a log printout from the current display The command can be defined to either contain parameters that define the input requirements necessary to directly initiate a function, or allow entering the necessary inputs after selection

COMMAND:

ei 107,85,*x1-coord,y1-coord,x2-coord,y2-coord,fcncode,p1,m1,p2,m2,p3,m3,p4,m4,p5,m5*

where

x1-coord,y1-coord	Lower left corner touch point coordinates
x2-coord,y2-coord	Upper right corner touch point coordinates
fcncode	0 tuning display, 1 block details display, 2 - not used, 3 log by name, 4 module problem report
pn	Parameters to be passed such as loop, PCU, and module address, tag index number, PID block address, etc Refer to Table B 4 for the number of parameters (*n*) required, which is dependent on the function code selected .
mn	Modify flag, 0 - allow modify after selection, 1 no modify Each *pn* parameter must have an *mn* parameter

Example **ei 107,85,1000,1000,1400,1400,4,1,1,2,1,4,1**

Table B 4 Soft Key Parameters

Function	Number of Parameters (*n*)	Parameter Description
Tuning	1	Tag index to tune
	4	PID block address
	5	Tag index and PID block
Block details	1	Tag index
	4	Block address Loop, PCU module, block
Log by name	2	Log index and retention
Module problem	3	Loop PCU, module address

Soft Key Select (ei 108)

PURPOSE:

The soft key command defines a key sequence used to either call a *tuning, block details or module problem report display, or to* initiate a log printout from the current display The command can be defined to either contain parameters that define the input re quirements necessary to directly initiate a function, or allow en tering the necessary inputs after selection A **tx** command must be created to display the key characters defined in this command

COMMAND:

ei 108,85,*key1,key2,fcncode,p1,m1,p2,m2,p3,m3 p4,m4,p5,m5*

where

fcncode 0 tuning display, 1 block details display, 2 not used, 3 log by name, 4 module problem report

pn Parameters to be passed such as loop, PCU, and module address, tag index number, PID block ad- dress, etc Refer to Table B 4 for the number of pa rameters (*n*) required, which is dependent on the function code selected

mn Modify flag, 0 allow modify after selection. 1 no modify Each *pn* parameter must have an *mn* parameter

Example **ei 108,85,48,52,4,1,1,2,1,4,1**

Trend Touch Point Control Select (ei 107)

PURPOSE:

The trend touch point control select command defines a touch point area on the screen used to enable a trend element for control There must be a select command for each of the number of trends defined in an **et 53** command

COMMAND:

ei 107,86,*x1 coord,y1-coord,x2-coord,y2-coord,trend,color,hi-scale low-scale*

where

x1-coord,y1-coord	Lower left corner touch point coordinates
x2-coord,y2-coord	Upper right corner touch point coordinates
color	Number of the color to use for the trend line associated with this command Refer to Table B 2 for color index numbers that can be as signed to a trend line
hi scale	High scale limit for the trend
low-scale	Low scale limit for the trend

Example **ei 107,86,8710,6290,9510,6490,20,2,100.00,0.0**

Trend Keystroke Control Select (ei 108)

PURPOSE:

The trend keystroke control select command defines a key or key sequence that must be pressed to enable trend element control There must be a select command for each of the number of trends defined in an **et 53** command A **tx** command must be created to display the key characters defined in this command

COMMAND.

ei 108,86,*key1,key2,trend,color,hi-scale,low-scale*

where

color	Number of the color to use for the trend line associ ated with this command Refer to Table B 2 for color index numbers that can be assigned to a trend line
hi scale	High scale limit for the trend
low-scale	Low scale limit for the trend

Example **ei 108,86,66,0,20,2,100.00,0.0**

Alarm Summary Touch Point Control Select (ei 107)

PURPOSE: The alarm summary touch point control select command defines a touch point area on the screen used to enable an alarm summary element for control

COMMAND: **ei 107,87**,*x1 coord y1-coord,x2-coord,y2-coord,x3 coord,y3-coord*

where

x1 coord y1-coord	Lower left corner touch point coordinates
x2-coord y2 coord	Upper right corner touch point coordinates
x3 coord y3-coord	Must match the coordinates defined in an **as** command

Example **ei 107,87,400,6650,9600,7200,400,400**

Alarm Summary Keystroke Control Select (ei 108)

PURPOSE: The alarm summary keystroke control select command defines a key or key sequence that must be pressed to enable operations performed through an alarm summary element

COMMAND: **ei 108,87**,*key1,key2,x-coord,y coord*

where

x coord,y-coord	Must match the coordinates defined in an **as** command

Example **ei 108,87,83,0,400,400**

Alarm Summary Primary Display Touch Point Select (ei 107)

PURPOSE:

The touch point display select command defines a touch point area on the screen used to call the primary display of a tag in the alarm summary list A tag in the list must have a primary display assigned in its configuration for this command to have any effect.

Define a command for each display select on an alarm line basis For example, if the summary is set up to display 16 entries, then define 16 select commands To use the interactive in an alarm summary, this **ei** command must follow an **as 82** or **as 83** command

COMMAND:

ei 107,88,*x1-coord,y1-coord,x2-coord,y2-coord*

where

x1-coord,y1-coord	Lower left corner touch point coordinates.
x2-coord,y2-coord	Upper right corner touch point coordinates

Example **ei 107,88,400,6294,9600,6641**

Alarm Summary Primary Display Keystroke Select (ei 108)

PURPOSE:

The alarm summary primary display keystroke select command defines a single key or a key sequence that must be pressed to call the primary display of a tag in the alarm summary list A tag in the list must have a primary display assigned in its configuration for this command to have any effect

Define a command for each display select on an alarm line basis For example, if the summary is set up to display 16 entries, then define 16 select commands A **tx** command must be created to display the key characters defined in this command To use the interactive in an alarm summary, this **ei** command must follow an **as 82** or **as 83** command

COMMAND.

ei 108,88,*key1,key2*

Example **ei 108,88,65,0**

Pop Up Element Touch Point Select (ei 107)

PURPOSE:

The pop up element touch point select command defines a touch point area on the screen used to call a pop up symbol to the screen The command contains parameters that define the loca tion on the screen where the symbol appears Make sure to leave this area clear to avoid overwriting a display area with a pop up

COMMAND:

ei 107,90,*x1-coord,y1 coord,x2-coord,y2 coord symbol name~,x3-coord, y3-coord*

where

x1-coord,y1 coord	Lower left corner touch point coordinates
x2-coord,y2 coord	Upper right corner touch point coordinates
symbol-name	Name of a pop up symbol file to be displayed followed by a tilde (~)
x3-coord y3 coord	Reference point coordinate to begin drawing the pop up symbol

Example **ei 107,90,1000,1000,1400,1400,DCS1POP~,3180,4256**

NOTE A max mum of 20 tags can be referenced in the pop up symbo

DISCUSSION.

Define the touch point area as the area of the screen used to se lect the pop up, ***not*** the area where the pop up appears This is *not a control select The control select should be defined as part of* the pop up symbol source file

Pop Up Element Keystroke Select (ei 108)

PURPOSE:

The pop up element keystroke select command defines a key or key sequence that must be pressed to call a pop up symbol to the screen The command contains parameters that define the loca- tion on the screen where the symbol appears Make sure to leave this area clear to avoid overwriting a display area with a pop up A **tx** command must be created to display the key characters defined in this command

COMMAND:

ei 108,90,*key1,key2 symbol-name~,x-coord,y-coord*

where

symbol-name	Name of a pop up symbol file to be displaved followed by a tilde (~)
x coord,y-coord	Reference point coordinate to begin drawing the pop up symbol

Example **ei 108,90,48,0,DCS1POP~,3180,4256**

NOTE A max mum of 20 tags can be referenced in the pop up symbo

Tag Index Substitution for Pop Up Element Touch Point Select (ei 107)

PURPOSE:

The tag index substitution command defines a tag index number that is to be substituted for the index number defined in a pop up symbol source file. This enables using the same symbol source file in several pop up commands instead of creating a dedicated source file for each select command It also has parameters that allow temporarily redefining the control keys defined in the pop up symbol file

COMMAND:

ei 107,91,*x1-coord,y1 coord,x2 coord,y2-coord,symbol-name~,x3-coord, y3-coord,tag,option,cskey1,cskey2*

where

x1-coord,y1-coord	Lower left corner touch point coordinates
x2-coord,y2-coord	Upper right corner touch point coordinates
symbol-name	Name of a pop up symbol file to be displayed followed by a tilde (~)
x3-coord,y3-coord	Reference point coordinate to begin drawing the pop up symbol
tag	Index number of the tag to substitute for tag index parameters in the pop up symbol
option	0 leave control select keys as is, 1 (future use) substitute keys *cskey1* and *cskey2*
cskey1	(Future use) ASCII character code for an al phanumeric key, substitutes for the *key1* control select key parameter in the source file. Refer to Table B-1 This defines the key to press in a single key select, or the first key in a two-key select sequence Used only if option parameter set to 1
cskey2	(Future use) ASCII character code for an alphanumeric key, substitutes for the *key2* con trol select key parameter in the source file Refer to Table B 1 This defines the second key in a two key select sequence Used only if option parameter set to 1

Example **ei 107,91,1000,1000,1400,1400,DCS1POP~,3180,4256/ 25,1,51,0**

Tag Index Substitution for Pop Up Element Keystroke Select (ei 108)

PURPOSE:

The tag index substitution command defines a tag index number that is to be substituted for the index number defined in a pop up symbol source file. This enables using the same symbol source file in several pop up commands instead of creating a dedicated source file for each select command It also has parameters that allow temporarily redefining the control keys defined in the pop up symbol file A **tx** command must be created to display the key characters defined in this command

COMMAND·

ei 108,91,*key1,key2,symbol-name~,x-coord,y-coord,tag,option,cskey1, cskey2*

where

symbol-name	Name of a pop up symbol file to be displayed followed by a tilde (~)
x coord,y-coord	Reference point coordinate to begin drawing the pop up symbol
tag	Index number of the tag to substitute for tag index parameters in the pop up symbol
option	0 leave control select keys as is, 1 (future use) substitute keys *cskey1* and *cskey2*
cskey1	(Future use) ASCII character code for an al phanumeric key, substitutes for the *key1* con trol select key parameter in the source file Refer to Table B 1 This defines the key to press in a single key select, or the first key in a two key select sequence Used only if option parameter set to 1
cskey2	(Future use) ASCII character code for an al phanumeric key, substitutes for the *key2* con trol select key parameter in the source file Refer to Table B 1 This defines the second key in a two-key select sequence Used only if op tion parameter set to 1

Example **ei 108,91,48,0,DCS1POP~,3180,4256,25,1,51,0**

Block Details Touch Point Control Select (ei 107)

PURPOSE: The block details touch point control select command defines a touch point area on the screen used to enable a block details element for control

COMMAND: **ei 107,95,***x1-coord,y1-coord,x2-coord,y2-coord,x3-coord,y3-coord*

where

x1-coord,y1-coord	Lower left corner touch point coordinates.
x2-coord,y2-coord	Upper right corner touch point coordinates
x3-coord,y3-coord	Must match the coordinates defined in a **bd** command

Example **ei 107,95,400,6650,9600,7200,400,400**

Block Details Keystroke Control Select (ei 108)

PURPOSE: The block details keystroke control select command defines a key or key sequence that must be pressed to enable operations performed through a block details element

COMMAND: **ei 108,95,***key1,key2,x-coord,y-coord*

where

x-coord,y-coord	Must match the coordinates defined in a **bd** command

Example **ei 108,95,83,0,400,400**

XY Plot Touch Point Control Select (ei 107)

PURPOSE: The XY plot touch point control select command defines a touch point area on the screen used to enable an XY plot element for control Define a command for each plot element of a display, maximum of four

COMMAND: **ei 107,96,***x1-coord,y1-coord,x2-coord,y2-coord,element,plot-index*

where

element	Number of a plot element from 1 to 4
plot index	Index number to associate with the plot element, 1 to 80

Example **ei 107,96,7874,6290,9510,6490,1,23**

Plot Keystroke Control Select (ei 108)

PURPOSE:

The plot keystroke control select command defines a key or key sequence that must be pressed to enable operations performed through an XY plot element Define a command for each plot element of a display, maximum of four A **tx** command must be created to display the key characters defined in this command

COMMAND:

ei 108,96,*key1,key2,element,plot index*

where

element	Number of a plot element from 1 to 4
plot-index	Index number to associate with the plot element, 1 to 80

Example **ei 108,96,48,0,1,23**

Tabular Trend Touch Point Control Select (ei 107)

PURPOSE:

The tabular trend touch point control select command defines a touch point area on the screen used to enable a tabular trend for control There must be a select command for each of the number of trends defined in an **et 52** command

COMMAND:

ei 107,97,*x1 coord y1-coord,x2-coord y2-coord,element trend*

where

x1 coord,y1 coord	Lower left corner touch point coordinates
x2-coord,y2-coord	Upper right corner touch point coordinates
element	Number of a tabular trend element This must match the element number identified in an associated **et 52** command

Example **ei 107,97,1186,6290,1950,6490,1,15**

Tabular Trend Keystroke Control Select (ei 108)

PURPOSE:

The tabular trend keystroke control select command defines a key or key sequence that must be pressed to enable a tabular trend for control There must be a select command for each of the number of trends defined in an **et 52** command A **tx** command must be created to display the key characters defined in this command.

COMMAND:

ei 108,97,*key1,key2,element,trend*

where

element Number of a tabular trend element This must match the element number identified in an associated **et 52** command

Example **ei 108,97,65,0,1,15**

CONFIGURATION DATA COMMANDS

The configuration data commands provide the capability to include tag information configured in the tag database, or configuration data retrieved from a function block referenced by a tag The data presented by these commands is static data (i e , not updated after initially being drawn)

NOTE Refer to Table B 3 for additional parameter definitions

Alarm Comment (ec 33)

PURPOSE: The alarm comment command retrieves and displays the alarm comment text string defined for a specified tag The comment that appears depends on the subtype parameter of the command

COMMAND: **ec 33,***subtype tag,x-coord,y-coord,charsize fgcolor bgcolor spacing, charlength,start-char*

where

subtype	32	alarm comment
	35	high alarm comment
	36	low alarm comment
	62	return to normal alarm comment
	63	low deviation alarm comment
	64	high deviation alarm comment
	65	two low alarm comment
	66	two high alarm comment
	67	three low alarm comment
	68	three high alarm comment
	69	low rate of change alarm comment
	70	high rate of change alarm comment

Examples **ec 33,32,6,1751,1572,124,7,0,1,22,0**
ec 33,32,6,1051,1432,124,7,0,1,22,22
ec 33,32,6,1051,1432,124,7,0,1,20,44

Tag Name (ec 34)

PURPOSE: The tag name command retrieves and displays the tag name text string defined in the tag database for a specified tag

COMMAND. **ec 34,32,***tag x coord y coord charsize,fgcolor bgcolor.spacing, char length,start character*

Example **ec 34,32,1,1439,2396,124,5,0,1,14,0**

Tag Descriptor (ec 35)

PURPOSE: The tag descriptor command retrieves and displays the tag descriptor text string defined in the tag database for a specified tag

COMMAND: **ec 35,32,***tag x-coord,y coord,charsize,fgcolor,bgcolor spacing, charlength,start-character*

Examples **ec 35,32,1,1342,2256,124,5,0,1,16,0**

ec 35,32,1,1342,2256,124,5,0,1,16,16

Customer Identifier (ec 36)

PURPOSE: The customer identifier command retrieves and displays the customer identifier text string defined in the tag database for a specified tag

COMMAND: **ec 36,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing, charlength,start-char*

Examples **ec 36,32,1,1342,2256,124,5,0,1,16,0**

ec 36,32,1,1342,2256,124,5,0,1,16,16

Logic State Descriptor (ec 37)

PURPOSE. The logic state descriptor command retrieves and displays the logic state descriptor defined for a specified tag Use this command for all digital type tags

COMMAND. **ec 37,***subtype,tag,x-coord,y-coord charsize,fgcolor,bgcolor,spacing*

where

subtype 33 - zero state, 34 - one state, 47 two state (MSDD), 48 - three state (MSDD)

Examples **ec 37,33,1,1289,1397,124,5,0,1**

ec 37,34,1,1289,1567,124,5,0,1

Engineering Unit (ec'38)

PURPOSE. The engineering unit command retrieves and displays the engineering unit reported for a specified tag

COMMAND: **ec 38,32,***tag x-coord,y coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 38,32,1,2109,1512,124,5,0,1**

Alarm Limit (ec 39)

PURPOSE:

The alarm limit command retrieves and displays either the high or low alarm limit being reported for a specified tag The value corresponds to an exception reported high alarm or low alarm limit value

COMMAND·

ec 39,*subtype,tag,x coord,y-coord charsize fgcolor,bgcolor,spacing charlength,decimal digits*

where

subtype 35 high alarm limit, 36 low alarm limit

Example **ec 39,35,11,2569,2002,124,5,0,1,6,2**

Alarm Limits - High and Low (ec 39)

PURPOSE·

The alarm limits (high and low) command retrieves and displays both the high and low alarm limit being reported for a specified tag The values correspond to the exception reported high alarm and low alarm limit values

COMMAND:

ec 39,*subtype tag x-coord,y coord,charsize,fgcolor,bgcolor,spacing charlength,decimal digits,scale*

where

subtype 39 vertical scale direction, 40 horizontal scale direction

x coord y coord Starting point which determines the lowest possible position of a low value Alarm limits are drawn proportional to the value range (i e , zero and span values), which is represented by x,y coordinate plus scale

scale Number of display units separating the high and low alarm limits The scale is referenced to the x,y coordinate starting point

Example **ec 39,39,1,2569,2002,124,5,0,1,6,2,1400**

Scale Limit (ec 40)

PURPOSE: The scale limit command retrieves and displays either the high or low scale limit being reported for a specified tag The value corresponds to either an exception reported zero or span value

COMMAND: **ec 40,***subtype,tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing, charlength,decimal-digits,variable-type*

where

subtype	35 high scale limit, 36 - low scale limit
variable-type	0 process variable, 1 set point

Example **ec 40,35,1,2569,1852,124,5,0,1,6,2,0**

Scale Limits - High and Low (ec 40)

PURPOSE: The scale limits (high and low) command retrieves and displays both the high and low scale limit being reported for a specified tag The values correspond to the exception reported zero and span values

COMMAND: **ec 40,***subtype,tag,x-coord,y-coord,charsize fgcolor bgcolor,spacing, charlength,decimal-digits,variable-type,scale*

where

subtype	39 vertical scale direction, 40 - horizontal scale direction
variable-type	0 process variable, 1 set point
scale	Number of display units separating the high and low scale limits (i e , represents zero and span values) The scale is referenced to the x,y coordinate starting point

Example **ec 40,39,1,2569,1852,124,5,0,1,6,2,0,1700**

Alarm Ticks - High and Low (ec 41)

PURPOSE:

The alarm ticks (high and low) command displays reference markers to identify the position of both the high and low alarm limits on a scale The position of the marks correspond to the exception reported high alarm and low alarm limit values

COMMAND:

ec 41,*subtype,tag,x-coord,y-coord,charsize,fgcolor bgcolor,scale*

where

subtype	39 vertical scale direction, 40 horizontal scale direction
x coord y-coord	Starting point which determines the lowest possible position of a low value Alarm limit tick marks are drawn proportional to the value range (i e , zero and span values), which is represented by x,y coordinate plus scale
scale	Number of display units separating the high and low alarm limits The scale is referenced to the x,y coordinate starting point

Example **ec 41,39,1,1669,2002,50,5,0,1400**

Node Number (ec 63)

PURPOSE:

The node number command retrieves and displays the node number address defined in the tag database for a specified tag

COMMAND:

ec 63,32,*tag x-coord y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 63,32,10,1700,6400,124,7,0,1**

Node Error Configuration Text - Node (ec 66)

PURPOSE.

This node error configuration text command displays the static text associated with node error status It is normally used in system status displays The default text presented by this command is *Node*

COMMAND:

ec 66,51,*tag,x coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 66,51,1,1200,6400,124,5,0,1**

Node Error Configuration Text - Module (ec 66)

PURPOSE: This node error configuration text command displays the static text associated with module status It is normally used in system status displays The default text presented by this command is *Module*

COMMAND: **ec 66,52,***tag,x coord,y-coord,charsize,fgcolor bgcolor,spacing*

Example **ec 66,52,1,2500,6400,124,5,0,1**

Node Error Configuration Text - Communication Status (ec 66)

PURPOSE. This node error configuration text command displays the static text associated with communication system status It is normally used in system status displays The default text presented by this command is *Communication System.*

COMMAND· **ec 66,53,***tag,x coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 66,53,1,4000,6400,124,5,0,1**

Node Error Configuration Text - Node Status (ec 66)

PURPOSE. This node error configuration text command displays the static text associated with node status It is normally used in system status displays The default text presented by this command is *Node Status*

COMMAND: **ec 66,54,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 66,54,1,6800,6400,124,5,0,1**

Module Address (ec 67)

PURPOSE: The module address command retrieves and displays the module address defined in the tag database for a specified tag

COMMAND. **ec 67,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 67,32,1,1200,1000,124,7,0,1**

Device Type (ec 96)

PURPOSE: The device type command retrieves and displays either the device type or device subtype defined in the tag database for a specified DEVSTAT tag.

COMMAND: **ec 96**,*subtype,tag,x coord,y-coord,charsize,fgcolor,bgcolor,spacing, charlength,start-char*

where.

subtype 59 - device type text, 60 device subtype text

Example **ec 96,59,1,4300,2600,124,3,0,1,12,0**

Device Number (ec 97)

PURPOSE: Each device type or subtype has an associated device number The device number command retrieves and displays this device number instead of the device name for a DEVSTAT tag defined in the tag database

COMMAND: **ec 97**,*subtype,tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

where

subtype 32 device number, 61 device subnumber

Example **ec 97,32,1,4300,2600,124,3,0,1**

Alarm Group (ec 104)

PURPOSE. The alarm group command enables a two character field that displays the alarm group number of a tag The command works with any tag type The field presents a *0* for no group assignment, *1* to *99*, *S* for system status group, or *D* for device status group

COMMAND **ec 104,32**,*tag x-coord,y-coord,charsize,fgcolor,bgcolor, spacing*

Example: **ec 104,32,40,1575,1600,124,3,0,1**

Data Acquisition Reference Value (ec 105)

PURPOSE:

The reference value command presents three floating point reference values These identify the low limit reference value, center reference value and high limit reference value set in the PCU control module The low reference value is placed at the x,y coordinate parameter of the command. The high reference value is positioned at the low reference value position plus the scale The center value is placed proportionally between the high and low reference values This command functions with a DANG tag type only

COMMAND:

ec 105,*subtype,tag x-coord,y-coord,charsize,fgcolor,bgcolor,spacing, charlength,decimal-digits,scale*

where.

subtype	39 vertical, 40 horizontal
x-coord,y-coord	Starting point which determines the lowest possible position of the scale The complete scale range is determined by the x,y coordinate plus the scale parameter The low reference value is drawn at this point The center reference value is drawn proportionally between the high and low reference values The high reference value is positioned at the x,y coordinate plus scale position
scale	Number of display units separating the high reference value and low reference value. The bottom of the scale starts at the x,y coordinate starting point

Example **ec 105,39,55,2569,2002,124,5,0,1,6,2,1400**

Data Acquisition Bar Graph Pivot Point Tick Mark (ec 106)

PURPOSE: The bar graph pivot point tick mark enables a horizontal or vertical line segment (tick mark) to identify the center reference value of the reference value scale The mark positions proportionally between the low reference value and high reference value This command functions with a DANG tag type only

COMMAND: **ec 106,***subtype,tag,x coord,y-coord charsize,color,scale*

where

subtype	39 - vertical, 40 horizontal
x coord y coord	Starting point which determines the lowest possible position of the scale The tick mark is drawn proportionally between the high reference value and low reference value The complete scale range is determined by the x,y coordinate plus the scale parameter
color	Index number of the color to use for the tick mark Refer to Table B 2 for color index numbers
scale	Number of display units separating the high reference value and low reference value The bottom of the scale starts at the x,y coordinate starting point

Example **ec 106,39,55,2569,2002,124,3,1400**

Console Text String Length (ec 124)

PURPOSE. The console text string length command indicates the length of the text string configured in the tag database for a TEXTSTR tag

COMMAND: **ec 124,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 124,32,15,2200,3000,124,3,0,1**

Block Text String Length (ec 125)

PURPOSE: The block text string length command indicates the length of the text string in the function code configured in a PCU module associated with a TEXTSTR tag

COMMAND **ec 125,32,***tag x coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ec 125,32,15,2200,3015,124,3,0,1**

DYNAMIC COMMANDS

Dynamic commands give the capability to include real-time process values and indicators in a display. The dynamic information presented by these commands reflects exception reported values and states, and operator process control actions

NOTE Refer to Table B 3 for additiona parameter definitions

Alarm Comment (ed 33)

PURPOSE: The alarm comment command presents alarm comment text corresponding to alarm conditions exception reported for a specified tag The descriptor that appears depends on both the alarm condition being reported and the alarm comment referenced during tag configuration

COMMAND. **ed 33,32,***tag,x-coord,y-coord,charsize fgcolor,bgcolor,spacing, charlength,start-char*

Examples **ed 33,32,2,1051,1432,124,7,0,1,22,0**
ed 33,32,2,1051,1432,124,7,0,1,22,22
ed 33,32,2,1051,1432,124,7,0,1,20,44

Logic State Descriptor (ed 37)

PURPOSE. The logic state descriptor command presents the logic state descriptor corresponding to the digital state exception reported for a specified tag The descriptor that appears depends on both the state being reported and the descriptor defined for that state during tag configuration

COMMAND: **ed 37,32,***tag x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 37,32,8,1599,1512,124,3,0,7,1**

Value (ed 42)

PURPOSE· The value presents the real value being exception reported for a specified tag

COMMAND: **ed 42,32,***tag,x coord,y coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength,decimal-digits,variable-type*

where

variable-type 0 process variable, 1 set point, 2 control output, 3 - ratio index

Example **ed 42,32,2,1754,1832,124,3 0,7,1,6,2,0**

Output Indicator (ed 43)

PURPOSE· The output indicator command presents an indicator to identify the output being requested from a device driver (DD) function block, or a remote control memory (RCM) function block The command can be defined to provide an indication for both the zero and one state requested output, zero state only or one state only

COMMAND: **ed 43,***subtype,tag x-coord,y-coord size,fgcolor,bgcolor almcolor*

where

subtype 32 zero and one state, 33 zero state only, 34 one state only

size Size of the indicator expressed in display units

Examples **ed 43,34,9,1849,1645,124,3,0,3**

ed 43,33,18,1499,1645,124,3,0,3

RCM Feedback Indicator (ed 44)

PURPOSE. The RCM feedback indicator command presents an indicator to verify the actual output of a remote control memory function block The command defines an indicator for the zero and one state feedback

COMMAND: **ed 44,***subtype,tag,x coord,y-coord,size fgcolor bgcolor,almcolor*

where

subtype 33 zero state only, 34 one state only, 32 zero and one state

size Size of the indicator expressed in display units

Example **ed 44,33,18,2399,1402,124,3,0,3**

RMCB Feedback Indicator (ed 44)

PURPOSE:

The RMCB feedback indicator command presents an indicator to verify the actual output of a remote motor control block function block The command provides an indication based on both feedback signals. A solid left-pointing arrow denotes one state A hollow left pointing arrow denotes zero state The one state indication displays only when both of the feedbacks for the tag are in their one state, otherwise, it is blank The zero state indication displays when either of the feedbacks is zero, otherwise, it is blank. Table B-5 shows the relationship between feedback state and indication

COMMAND:

ed 44,*subtype,tag,x-coord y-coord,size,fgcolor,bgcolor,almcolor*

where

subtype 33 feedback zero state, 34 feedback one state

size Size of the indicator expressed in display units

Example **ed 44,33,6,2099,1502,124,3,0,3**

Table B 5 RMCB Feedback Signal to Feedback Indicator Relationship

FB1 State	FB2 State	One State Indication	Zero State Indication
0	0	blank	hollow
0	1	blank	hollow
1	0	blank	hollow
1	1	filled	blank

RCM Set Permissive Indicator (ed 45)

PURPOSE:

The RCM set permissive indicator command presents a text indicator to identify either a set permissive or non permissive condition being reported by a remote control memory function block The default text presented by this command is *SP* and *NP*

COMMAND:

ed 45,*subtype,tag,x coord,y-coord,charsize,fgcolor,bgcolor,spacing*

where·

subtype 32 - set permissive and non permissive, 37 set permissive only, 38 set non permissive only

Example **ed 45,32,18,2800,1645,124 3,0,1**

RCM Override Indicator (ed 46)

PURPOSE:

The RCM override indicator command presents a text indicator to identify an override condition being reported by a remote control memory function block. The default text presented by this command is *OVR*.

COMMAND:

ed 46,32,*tag,x-coord,y coord,charsize,fgcolor,bgcolor,spacing*

Example· **ed 46,32,18,2800,1245,124,3,0,1**

Station Mode - Type 1 (ed 47)

PURPOSE:

The station mode command presents a text indication to identify the current operating mode being reported by a station function block The default text displayed by this command is *AUTO*, *MANUAL*, *BYPASS*, *CASC* or *RATIO*

COMMAND:

ed 47,32 *tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 47,32,15,1869,1202,124,3,0,1**

NOTE Do not intermix type 1 station commands with type 2 or 3 commands

Station Status - Type 1 (ed 48)

PURPOSE:

The station status command presents a text indication to identify the current operating status being reported by a station function block The default text displayed by this command is *LOCAL* or *CMPTR*

COMMAND:

ed 48,32 *tag,x-coord,y coord,charsize,fgcolor.bgcolor spacing*

Example **ed 48,32,15,2569,1202,124,3,0,1**

NOTE Do not intermix type 1 station commands with type 2 or 3 commands

Moving Value (ed 49)

PURPOSE:

The moving value command presents the real value being exception reported for a specified tag as a moving value This command can be used to present the value referenced to a scale, and have the value move up and down the scale proportionally. Use this command with an **ec 40** command to create a scaled presentation

COMMAND:

ed 49,*subtype,tag,x-coord,y coord,chars ze,fgcolor,bgcolor,almcolor, spacing,charlength,decimal-digits,variable-type,scale*

where.

subtype	39 - vertically moving, 40 horizontally moving
x coord y-coord	Starting point position of the value which corresponds to the lowest value returned The highest value position is this coordinate plus the number of scale parameter units
variable-type	0 - process variable, 1 - set point, 2 - control output
scale	Number of display units separating the high and low value positions The scale is referenced to the x,y coordinate starting point

Example **ed 49,40,5,1249,1402,124,3,0,3,1,4,1,2,1700**

Dynamic Bar (ed 50)

PURPOSE.

The dynamic bar command presents the real value being exception reported for a specified tag as an expanding and contracting bar This command can be used to present the value referenced to a scale, and have the bar expand and contract proportionally Use this command with an **ec 40** command to create a scaled presentation

COMMAND:

ed 50,*subtype,tag,x-coord,y-coord,width,fgcolor,bgcolor,almcolor variable-type,scale*

where

subtype	39 - vertical bar, 40 horizontal bar
x coord,y coord	Starting point position of the bar which corre sponds to the lowest value returned The bar expands to the highest value which is this co ordinate plus the number of scale parameter units
width	Width of the bar expressed in display units
variable-type	0 process variable, 1 set point, 2 control output
scale	Number of display units separating the high and low limits of the bar The scale is refer enced to the x,y coordinate starting point

Example **ed 50,40,5,1249,1567,40,3,0,3,2,1700**

Dynamic Pointer (ed 51)

PURPOSE:

The dynamic pointer command presents the real value being exception reported for a specified tag as a moving pointer This command can be used to present the value referenced to a scale, and have the pointer move up and down a scale proportionally Use this command with an **ec 40** command to create a scaled presentation

COMMAND:

ed 51,*subtype,tag x-coord,y-coord,size,fgcolor,bgcolor,almcolor, variable-type,scale*

where

subtype	41 vertically moving, left pointer, 42 - vertically moving, right pointer, 43 horizontally moving, up pointer, 44 - horizontally moving, down pointer
x-coord,y-coord	Starting point position of the pointer which corresponds to the lowest value returned The pointer moves to a highest value position which is this coordinate plus the number of scale parameter units
size	Size of the pointer expressed in display units
variable-type	0 process variable, 1 set point, 2 control output
scale	Number of display units separating the high and low positions of the pointer. The scale is referenced to the x,y coordinate starting point

Example **ed 51,41,5,1874,2002,100,3,0,3,1,1400**

RMSC Tracking Indicator (ed 57)

PURPOSE.

The RMSC tracking command presents a text indication to identify that a remote manual set constant function block has been set to tracking mode The default text displayed by this command is *T*

COMMAND:

ed 57,32,*tag x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 57,32,10,1099,1647,124,3,0,1**

DD or MSDD Override (ed 58)

PURPOSE: The DD or MSDD override indicator command presents a text indicator to identify an override condition being reported by a device driver (DD) function block or a multi-state device driver (MSDD) function block The default text presented by this command is *OVR*

COMMAND. **ed 58,32** *tag,x coord,y coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 58,32,9,2799,1245,124,3,0,1**

Feedback Indicator (ed 59)

PURPOSE: The feedback indicator command presents a logic state descriptor indication to verify the actual output of a device driver (DD) function block, a multi state device driver (MSDD) function block, or a remote motor control (RMCB) function block Either the zero state or one state descriptor defined in the tag database appears depending on the feedback state returned The command can be defined to provide an indication for either the feedback 1, feedback 2, feedback 3 or feedback 4 reported states

COMMAND. **ed 59,***subtype tag,x coord,y coord,charsize,fgcolor,bgcolor almcolor, spacing*

where

subtype 33 feedback 1, 34 feedback 2, 47 feedback 3 (MSDD), 48 feedback 4 (MSDD)

Examples **ed 59,33,9,2279,1402,124,3,0,3,1**

ed 59,48,8,2279,1397,124,3,0,7,1

Mode (ed 60)

PURPOSE· The mode command presents a text indication to identify the current operating mode being reported by a device driver function block The default text displayed by this command for a DD tag is *MANUAL*, *AUTO* or *REMOTE*

The mode command also presents a text indication to identify the current operating mode being reported by a multi state device driver function block The default text displayed by this command for an MSDD tag is *MANUAL* or *AUTO*

COMMAND **ed 60,32** *tag,x coord y coord,charsize,fgcolor bgcolor spacing*

Example **ed 60,32,9,1199,1245,124,3,0,3**

MSDD Output Indicator (ed 61)

PURPOSE: The MSDD output indicator command presents an indicator to identify the output being requested from a multi state device driver function block The command can be defined to provide an indication for the default, 1, 2 or 3 requested outputs

COMMAND: **ed 61**,*subtype,tag,x-coord,y-coord,size,fgcolor,bgcolor,almcolor*

where

subtype 33 - default output, 34 - output 1 indicator, 47 output 2 indicator, 48 output 3 indicator

size Size of the indicator expressed in display units

Example **ed 61,34,8,1289,1567,124,3,0,7**

MSDD Control Override (ed 62)

PURPOSE: The MSDD control override command presents a text indicator to identify a control override condition being reported by a multi state device driver function block.

COMMAND: **ed 62,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 62,32,8,2799,1227,124,3,0,1**

Node Type and Configuration Error (ed 64)

PURPOSE: The node type and configuration error command presents a node type, and an error indication if there is a conflict between reported node type and the node type configured for a tag A parameter of the command references an N90STA tag for which it is to present this indication The command is normally used in system status displays The default indication presented to identify the error condition is an asterisk (*)

COMMAND: **ed 64,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength,start-char*

Example **ed 64,32,1,1000,1000,124,3,0,7,1,8,0**

Node Error Short Form (ed 65)

PURPOSE.

The node error short form command presents a single character indicator to identify the existence of a node off line, module error, communication error or node status error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented to identify each type of error condition are *O* for node off line, *M* for module error, *C* for communication error, and *S* for node status problem

COMMAND:

ed 65,50,*tag.x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor spacing*

Example **ed 65,50,1,1900,1000,124,7,0,7,1**

Node Error Long Form Off-Line (ed 65)

PURPOSE:

The node error long form off line command presents an indicator to identify the existence of a node off line error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *offline* and *online*

COMMAND.

ed 65,51 *tag,x coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 65,51,1,1000,1000,124,3,0,7,1**

Node Error Long Form Module (ed 65)

PURPOSE:

The node error long form module command presents an indicator to identify the existence of a module error within the node A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *error* and *ok*

COMMAND.

ed 65,52,*tag,x coord,y coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 65,52,1,1000,1000,124,3,0,7,1**

Node Error Long Form Communications (ed 65)

PURPOSE·

The node error long form communications command presents an indicator to identify the existence of a communication error A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *error* and *ok*

COMMAND.

ed 65,53,*tag,x coord y-coord,charsize,fgcolor,bgcolor almcolor,spacing*

Example **ed 65,53,1,1000,1000,124,3,0,7,1**

Node Error Long Form Node Status (ed 65)

PURPOSE: The node error long form node status command presents an indicator to identify the existence of a status problem A parameter of the command references an N90STA tag for which it is to present these indications The command is normally used in system status displays The default indications presented by this command are *problem* and *normal*

COMMAND: **ed 65,54,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 65,54,1,1000,1000,124,3,0,7,1**

Module Type and Configuration Error (ed 68)

PURPOSE: The module type and configuration error command presents a module type, and an error indication if there is a conflict between reported module type and the module type configured for a tag A parameter of the command references an N90STA tag for which it is to present this indication It is normally used in system status displays The default indication presented to identify the error is an asterisk (*)

COMMAND. **ed 68,32,***tag,x coord,y coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength start-char*

Example. **ed 68,32,1,1200,1000,124,3,0,7,1,8,0**

Module Mode (ed 69)

PURPOSE: The module mode command presents a module mode indication A parameter of the command references an N90STA tag for which it is to present this information The command is normally used in system status displays The default mode indications presented by this command are *execut* (execute), *config* (configure), *error*, *stndby* and *failed*

COMMAND: **ed 69,32,***tag,x-coord,y-coord charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 69,32,1,2200,1000,124,3,0,7,1**

Module Error Indicator (ed 70)

PURPOSE: The module error indicator command presents a module error indicator to identify that a module has some error This is a general indication that only identifies the existence of an error. A parameter of the command references an N90STA tag for which it is to present this indication The command is normally used in system status displays The default indication presented by this command is *ERR*

COMMAND· **ed 70,32,***tag,x-coord,y coord,charsize,fgcolor,bgcolor almcolor,spacing*

Example **ed 70,32,1,3000,1000,124,3,0,7,1**

Module Status Bytes (ed 71)

PURPOSE: The module status bytes command presents the status bytes re turned by a module A parameter of the command references an N90STA tag for which it is to present the bytes The command is normally used in system status displays

COMMAND: **ed 71,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 71,32,200,6600,7000,124,3,0,1**

Station Mode - Type 2 (ed 74)

PURPOSE: The station mode command presents a text indication to identify the current operating mode being reported by a station function block The default text displayed by this command is *BYPASS, MANUAL, MANUAL/C, MANUAL/R, AUTO, AUTO/C* or *AUTO/R*

COMMAND: **ed 74,32,***tag,x coord,y coord,charsize,fgcolor bgcolor spacing*

Example **ed 74,32,25,1869,1202,124,3,0,1**

NOTE Do not intermix type 2 station commands with type 1 commands

Station Status - Type 2 (ed 75)

PURPOSE: The station status command presents a text indication to identify the current operating status being reported by a station function block The default text displayed by this command is *LOCAL, CMPTR, CASC* or *RATIO*

COMMAND. **ed 75,32,***tag,x-coord,y coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 75,32,25,2569,1202,124,3,0,1**

NOTE Do not intermix type 2 station commands with type 1 commands

Station Tracking - Type 2 (ed 76)

PURPOSE: The station tracking command presents a text indication to identify the implementation of control output or set point tracking in a station function block The command also presents an indication of a manual interlock set condition The default text displayed by this command is *COTR, SPTR* or *LOCK*

COMMAND **ed 76,32,***tag,x-coord,y-coord,charsize,fgcolor bgcolor spacing*

Example **ed 76,32,25,1249,1202,124,3,0,1**

NOTE The order of precedence should an overlap occur is COTR overrides MNLK MNLK overrides SPTR

Station Mode - Type 3 (ed 77)

PURPOSE: The station mode command presents a text indication to identify the current operating mode being reported by a station function block This is similar to type 2 except that instead of using the fixed text strings, it references text strings defined in a ***STNST-TXT.TX*** user file for a more concise description of station mode

COMMAND: **ed 77,32,***tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor, spacing,charlength,start-char*

Example **ed 77,32,25,1869,1202,124,3,0,7,1,10,0**

NOTE Do not intermix type 3 station commands with type 1 commands

Text Selector (ed 79)

PURPOSE: The text selector command presents the text string referenced by a text selector function block The actual message that displays depends on tag text selector configuration, refer to ***TAG TEXT SELECTOR*** in the ***OIS Configuration*** section for specifics

COMMAND: **ed 79,32,***tag,x-coord,y-coord,charsize,spacing charlength,start-char*

Examples **ed 79,32,17,2800,1245,124,1,20,0**

ed 79,32,17,2800,1245,124,1,20,20

RMCB Bad Start Text (ed 80)

PURPOSE: The RMCB bad start text command presents a text indication to identify a bad start being reported by a remote motor control function block The default text displayed by this command is *BAD START*

COMMAND: **ed 80.33,***tag x-coord y-coord charsize.fgcolor,bgcolor almcolor.spacing*

Example **ed 80,33,6,1200,1340,124,3 0,3,1**

RMCB Fault Indicator Text (ed 80)

PURPOSE. The RMCB fault indicator text command presents a text indication to identify a fault condition being reported by a remote motor control function block The default text displayed by this com mand is *FAULT*

COMMAND. **ed 80,34,***tag,x-coord,y-coord charsize,fgcolor,bgcolor,almcolor,spacing*

Example **ed 80,34,6,2200,1340,124,3,0,3,1**

RMCB Permissive Indicator (ed 81)

PURPOSE:

The RMCB permissive indicator command presents a logic state descriptor to identify the current permissive inputs to a remote motor control function block Either the zero state or one state descriptor defined in the tag database appears depending on the permissive state returned. The command can be defined to provide an indication for either the permissive 1 or permissive 2 reported states

COMMAND·

ed 81,*subtype,tag,x-coord,y-coord charsize,fgcolor bgcolor,almcolor, spacing*

where

subtype 33 permissive 1, 34 permissive 2

Example **ed 81,33,6,2280,1820,124,3,0,7,1**

RMCB Error Code Text (ed 92)

PURPOSE:

The RMCB error code text command presents a text string to identify an error code reported by a remote motor control function block The block can return one of up to 16 different codes The actual error code message that displays depends on remote motor control text configuration, refer to ***REMOTE MOTOR CONTROL TEXT*** in the ***OIS Configuration*** section for specifics

COMMAND·

ed 92,32,*tag x-coord y-coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength,start-char*

Example **ed 92,32,6,1200,1180,124,3,0,3,1,20,0**

Device Status Bytes (ed 94)

PURPOSE·

The device status byte command presents an error code when the interface unit is marked off line, or a storage device controller senses status bytes for the last I/O The error codes are shown as decimal integers, sense bytes as hexadecimal preceded by a pound sign (#) The command is normally used in device status displays

COMMAND:

ed 94,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 94,32,55,4300,2150,124,3,0,1**

Device Status Description (ed 95)

PURPOSE:

The device status description a text string associated with an error code, or storage device sense bytes The command is normally used in device status displays

COMMAND:

ed 95,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing,charlength,start-char*

Example **ed 95,32,55,4300,2350,124,3,0,7,1,40,0**

Deviation Bar - Type 1 (ed 98)

PURPOSE:

The deviation bar (type 1) command presents a deviation value being exception reported for a specified tag as an expanding and contracting bar The bar expands from a baseline or null point to show either a positive or negative deviation value

COMMAND:

ed 98,*subtype,tag,x-coord,y-coord,width fgcolor,bgcolor,almcolor,variable-type,scale,base value,abs max-deviation,option*

where

subtype 39 vertical bar, 40 - horizontal bar

x-coord,y-coord Starting point position of the bar The bar expands from this baseline position The baseline is an imaginary line at the specified y-coordinate parameter for a vertical bar, or at the x coordinate for a horizontal bar For a vertical bar, the left edge of the bar is defined by the x coordinate. For a horizontal bar, the lower edge of the bar is defined by the y coordinate

width Width of the bar expressed in display units.

variable-type 0 process variable, 1 set point, 2 control output

scale Number of screen units representing either full negative deviation or full positive deviation The entire screen space used by a bar is 2 × scale units This is in contrast to normal dynamic bars where scale is the number of screen units necessary to represent the entire span of the bar

base-value Real number that represents the baseline or null point of the bar When the value reported is equal to the base value, there is no deviation, deviation is zero *abs-max-deviation* Unsigned real value that defines the plus or minus (±) deviation to present It is expressed in engineering units The value should be equal to either the full-positive deviation or full negative deviation value For example, if the given screen space represents deviations from 3 0 to +3 0, the deviation should be specified as 3 0

option Direction of bar movement Up or down for vertical, and left or right for horizontal

0 positive deviation drawn upward (vertical subtype 39)

1 positive deviation drawn downward (vertical subtype 39)

0 positive deviation drawn right (horizontal subtype 40)

1 positive deviation drawn left (horizontal subtype 40)

Deviation Bar - Type 2 (ed 99)

PURPOSE: The deviation bar (type 2) command presents a deviation value being exception reported for a specified tag as an expanding and contracting bar The bar expands from a baseline or null point to show either a positive or negative deviation value Screen space for a type 2 deviation bar is always symmetrical about the base line Baseline is the current set point

COMMAND: **ed 99,***subtype tag x coord,y coord width,fgcolor,bgcolor,almcolor base-type scale,abs max deviation,option*

where

subtype 39 vertical bar, 40 horizontal bar

x coord,y coord Starting point position of the bar The bar expands from this baseline position The baseline is an imaginary line at the specified y coordinate parameter for a vertical bar, or at the x-coordinate for a horizontal bar. For a vertical bar, the left edge of the bar is defined by the x coordinate For a horizontal bar, the lower edge of the bar is defined by the y coordinate

width Width of the bar expressed in display units

base type 0 (reserved for future use)

22 44 22 04 10 07

scale Number of screen units representing either full negative deviation or full positive deviation The entire screen space used by a bar is 2 × scale units This is in contrast to normal dynamic bars where scale is the number of screen units necessary to represent the entire span of the bar

abs max-deviation Unsigned real value that defines the plus or minus (±) deviation to present It is ex pressed in engineering units The value should be equal to either the full positive deviation or full negative deviation value. For example, if the given screen space rep resents deviations from 3 0 to +3.0, the deviation should be specified as 3 0

option Direction of bar movement Up or down for ver tical, and left or right for horizontal

0 positive deviation drawn upward (vertical subtype 39)

1 positive deviation drawn downward (vertical subtype 39)

0 positive deviation drawn right (horizontal subtype 40)

1 - positive deviation drawn left (horizontal subtype 40)

Red Tag Status Text (ed 100)

PURPOSE: The red tag status text command presents a two character text indicator to identify the current red tag condition of a process device The default text displayed by this command is *RT*

COMMANDS· **ed 100,32,***tag,x-coord,y coord,charsize,fgcolor bgcolor,rtcolor, spacing,charlength,start-char*

where

rtcolor Index number of a color to use as the red tag color, refer to Table B-2 for color index numbers

Example. **ed 100,32,3,1020,3680,124,3,0,2,1,2,0**

Enhanced Module Status (ed 101)

PURPOSE:

The enhanced module status command presents the status bytes returned by a module A parameter of the command references an N90STA tag for which it is to present the bytes The command is normally used in system status displays It also gives the ability to present a backup module (*BKPBAD*), local I/O (*LIO*) or remote I/O (*RIO*) error status indicator

COMMAND:

ed 101,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor almcolor,spacing option*

where

option 51 backup module status indicator, 52 local I/O error indicator, 53 remote I/O error indicator

Example **ed 101,32,200,6600,7000,124,3,0,7,1,51**

Red Tag Status Outline (ed 102)

PURPOSE:

The red tag status outline command causes the outline of a symbol to change to a specified red tag color when a process device is in a red tag condition A lower left and upper right parameter in the command specifies the size of the outline The size should match the outline of the symbol, which is normally defined by a **pl** command

COMMAND:

ed 102,32,*tag,x1-coord,y1-coord,x2-coord y2 coord,rtcolor,nrmcolor*

where

x1-coord,y1-coord	Lower left corner x,y coordinates
x2 coord,y2-coord	Upper right corner x,y coordinates
rtcolor	Index number of a color to use as the red tag color, refer to Table B 2 for color index numbers
nrmcolor	Index number of a color to use as the normal or non red tag color, refer to Table B-2 for color index numbers

Example **ed 102,32,3,0000,0000,2180,1580,2,4**

Exception Report Text (ed 103)

PURPOSE:

The exception report text command presents a text string associ ated with certain status indications returned in an exception re port for an ANALOG, DIGITAL, DD, MSDD, RCM, RMCB, N90STA or TEXTSTR tag The actual text that appears depends on both the data option code defined in the command and the state being reported for that data type Table B 6 lists the data type indica tions that can be presented by this command

COMMAND:

ed 103,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength start-char,data-option*

where

data-option Refer to Table B-6 for valid option codes, and a de *scription of the text presented by the code*

Example **ed 103,32,45,2279,1907,124,3,0,7,1,15,0,3**

Table B 6 Exception Report Text Option Codes

Option Code	States Returned	Data Type	Tag Type
3	2	calibration qual ty	ANALOG
4	2	point disabled	ANALOG
6	2	state	D G TAL, RCM, DD MSDD RMCB
8	2	red tag status	ALL
9	2	set point track ng	STATION
10	2	bypass mode	STATION
11	2	mode interlock	STATION TEXTSTR
12	2	output tracking	STATION
13	2	ana og output status	STATION
14	2	computer status	STATION
15	2	station level	STATION
16	2	cascade ratio or normal	STATION
17	2	auto/manua	STAT ON TEXTSTR
18	2	logic set	RCM
19	2	set permiss ve	RCM
20	2	log c reset	RCM
21	2	override	RCM
22	2	feedback	RCM
23	2	set command	RCM
24	2	reset command	RCM
25	2	feedback status	DD MSDD
26	2	status override	DD MSDD
27	4	mode	DD
28	4	requested state	MSDD
29	2	last good state	MSDD
30	2	feedback 1 state	DD MSDD, RMCB
31	2	feedback 2 state	DD MSDD RMCB
32	2	feedback 3 state	MSDD
33	2	feedback 4 state	MSDD

Table B-6 Exception Report Text Option Codes (continued)

Option Code	States Returned	Data Type	Tag Type
35	2	contro overr de	MSDD
36	2	*mode*	MSDD
37	2	bad start	RMCB
38	2	fau t	RMCB
39	2	start perm ssive 1	RMCB
40	2	start permissive 2	RMCB
41	16	error code	RMCB
42	2	tracking	RMSC
43	2	PV status	STATION
51	2	*backup status*	N90STA
52	2	ocal I/O error	N90STA
53	2	*remote I/O error*	N90STA
65	2	echo contro	TEXTSTR
66	2	string interlock	TEXTSTR
67	2	truncated	TEXTSTR

Data Acquisition Constrained Value Indicator (ed 107)

PURPOSE:

The constrained value indicator command enables two triangular pointers to proportionally show the high constraint limit and low constraint limit set in the PCU control module The pointers can point up, down, left or right The pointers proportionally mark the position of the constrained limit values, but do not appear if the constraints have not been enabled Each pointer positions within the range between the low display reference value and the high display reference value The pointers remain hollow when the constrained value point has not been reached and fill when reached This command functions with a DANG tag type only

COMMAND

ed 107,*subtype,tag,x-coord y coord charsize,fgcolor,bgcolor scale*

where

subtype

41 vertical left pointer, 42 vertical right pointer, 43 horizontal up pointer,
44 horizontal down pointer

x coord,y-coord

Starting point which determines the lowest possible position of the scale The constrained value pointers are drawn proportionally between the high reference value and low reference value on the scale The complete scale range is determined by the x,y coordinate plus the scale parameter

charsize

Size of the pointer

scale — Number of display units separating the high reference value and low reference value The bottom of the scale starts at the x,y coordinate starting point

Example **ed 107,42,55,1669,2002,124,5,0,1400**

Data Acquisition Bidirectional Dynamic Bar (ed 108)

PURPOSE:

The bidirectional dynamic bar command enables a moving, dynamic bar that represents the current value being reported for a DANG tag The bar proportionally expands from or contracts to the center reference point depending on the reported value The colors set during *Alarm Quality Option* configuration affect the alarm colors for this element This command functions with a DANG tag type only

COMMAND·

ed 108,*subtype,tag,x-coord,y-coord,width fgcolor,bgcolor,almcolor,scale*

where

subtype — 39 - vertical bar, 40 horizontal bar

x-coord.y-coord — Starting point which determines the point at which the bar represents the lowest possible value The bar is drawn proportionally between the high reference value and low reference value on the scale The complete scale range is determined by the x,y coordinate plus the scale parameter

width — Width of the bar expressed in display units

scale — Number of display units separating the high reference value and low reference value The bottom of the scale starts at the x,y coordinate starting point

Example **ed 108,39,55,1669,2002,50,3,0,7,1400**

Data Acquisition Value Source and Lock Indicator (ed 109)

PURPOSE:

The value source and lock indicator command presents a text field that displays the current source for a value (DANG) or state (DADIG), and an indicator if that source is locked (select not enabled) The default text presented by this command is

Source Locked	**Source Unlocked**
NORM (L)	*NORM*
U/IN (L)	*U/IN*
ALT (L)	*ALT*

COMMAND·

ed 109,32,*tag,x-coord,y coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 109,32,55,5400,6200,124,3,0,1**

Data Acquisition Variable Alarm Type Indicator (ed 110)

PURPOSE:

The variable alarm type indicator command presents a variable length text field to indicate whether variable alarming is enabled in the PCU control module The default text string presented by this command is *VARIABLE* if alarming is enabled The field remains blank if not enabled This command functions with a DANG tag type only

COMMAND·

ed 110,32,*tag,x coord,y-coord,charsize,fgcolor,bgcolor, spacing charlength,start-char*

Example **ed 110,32,55,2300,2400,124,5,0,1,8,0**

Data Acquisition No Report Indicator (ed 111)

PURPOSE·

The no report indicator command enables a variable length text field to indicate that the tag is in a no report mode The default text string presented by this command is *NREPORT* if in a no report mode The field remains blank if the tag is in its reporting mode This command functions with a DANG or DADIG tag type

COMMAND.

ed 111,32,*tag,x-coord,y coord,charsize,fgcolor,bgcolor,spacing, charlength start char*

Example **ed 111,32,55,1200,550,124,5,0,1,2,0**

Quality Override Indicator (ed 112)

PURPOSE:

The quality override (driven) indicator presents a variable length text field to indicate whether the quality of the tag has been overridden (driven into another condition) The default text string presented by the command is *^QUALITY* if the quality has been overridden in the PCU control module. The field remains blank if not overridden This command functions with a DANG, DADIG or TEXTSTR tag type

COMMAND·

ed 112,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing, charlength,start-char*

Example **ed 112,32,55,1100,550,124,5,0,1,1,0**

Alarm Priority (ed 113)

PURPOSE:

The alarm priority command enables a variable length text field to present a text string that corresponds to the current alarm priority set for a tag The command works with any tag type and references the alarm priorities set for the tag to determine the text string to display The colors set during *Alarm Quality Option* configuration affect the alarm colors for this element The default text strings presented by this command. and the associated alarm priority for each text string include

(1) *DIRE*	(5) *WARNING*
(2) *CRUCIAL*	(6) *ADVISE*
(3) *CRITICAL*	(7) *NOTIFY*
(4) *ALERT*	(8) *INFORM*

COMMAND·

ed 113,32,*tag,x-coord,y coord charsize,fgcolor,bgcolor,almcolor,spacing, charlength,start char*

Example. **ed 113,32,20,2000,3000,124,3,0,7,1,8,0**

Alarm State (ed 114)

PURPOSE:

The alarm state command enables a two character text field to present the current alarm state of a tag The command works with any tag type The colors set during *Alarm Quality Option* configuration affect the alarm colors for this element The default text strings presented by this command include

Blank no alarm	* - bad quality
L - low alarm	*N* return to normal
2L two-low alarm	*''* alarms suppressed
3L three-low alarm	*HD* high deviation alarm
H high alarm	*LD* low deviation alarm
2H two high alarm	*HR* high rate of change alarm
3H three high alarm	*LR* low rate of change alarm

A digital, or N90STA, DEVSTAT or TEXTSTR alarm

COMMAND:

ed 114,32,*tag,x-coord y coord,charsize fgcolor,bgcolor almcolor,spacing*

Example **ed 114,32,23,4500,3600,124,3,0,7,1**

Data Acquisition Next Highest or Next Lowest Alarm State (ed 114)

PURPOSE.

The next highest or next lowest alarm state command enables a two character text field to display either the next high alarm condition or next low alarm condition for a tag This command functions with a DANG tag type only The default text strings and when they occur based on the current state include

Next High Field	***Current State***
H	blank or *N*
2H	*H*
3H	*2H*
blank	*3H* or all other states (*L, 2L, 3L, LD, HD, LR, HR*)
L	blank or *N*
2L	*L*
3L	*2L*
blank	*3H* or all other states (*H, 2H, 3H, LD, HD, LR, HR*)

COMMAND·

ed 114,*subtype,tag,x coord,y coord,charsize,fgcolor bgcolor,spacing*

where

subtype 35 - next high, 36 next low

Example **ed 114,35,55,4300,6250,124,3,0,1**

Quality (ed 115)

PURPOSE:

The quality command enables a variable length text field that presents the current quality being reported for a tag The command works with any tag type. The colors set during *Alarm Quality Option* configuration affect the alarm colors for this element The default text strings presented by this command include

GOOD	*xOFFSCAN*
?SUSPECT	*iINHIBIT*
**BAD*	*sSUBSTITUTED*

COMMAND.

ed 115,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing charlength,start-char*

Examples **ed 115,32,55,1250,2500,124,3,0,1,1,0**

ed 115,32,55,1250,2500,124,3,0,1,8,1

Data Acquisition Next Alarm Limit (ed 116)

PURPOSE:

The next alarm limit command presents a floating point alarm limit value to show either the next highest or next lowest alarm threshold level for the tag This shows the value at a fixed position on the display The field does not appear if the process control point is indicating a low or high rate of change alarm, or low or high deviation alarm This command functions with a DANG tag type only

COMMAND:

ed 116,*subtype,tag,x-coord,y-coord charsize,fgcolor,bgcolor,spacing, charlength,decimal-digits*

where

subtype 35 next high alarm limit, 36 next low alarm limit.

Example **ed 116,35,55,2569,2002,124,3,0,1,6,2**

Data Acquisition Moving Next Alarm Limit (ed 117)

PURPOSE:

The moving next alarm limit command presents two floating point alarm limit values that move up or down a scaled range The values are the next highest and next lowest alarm threshold level for the tag This shows the values proportionally within a scaled range This command functions with a DANG tag type only

COMMAND:

ed 117,*subtype,tag,x coord,y coord,charsize,fgcolor,bgcolor,spacing, charlength,decimal-digits,scale*

where

subtype — 39 vertical movement, 40 horizontal movement

x-coord y-coord — Starting point which determines the lowest possible position of the scale The alarm limit values are drawn proportionally between the high reference value and low reference value on the scale The complete scale range is determined by the x,y coordinate plus the scale parameter

scale — Number of display units separating the high reference value and low reference value The bottom of the scale starts at the x,y coordinate starting point

Example **ed 117,39,55,2569,2002,124,3,0,1,6,2,1400**

Data Acquisition Moving Next Alarm Limit Tick Marks (ed 118)

PURPOSE:

The moving next alarm limit tick marks command enables two horizontal or vertical line segments (tick marks) that move within a scaled range The line segments mark the proportional position of the next highest and next lowest alarm limits Each moves within the range of low reference value to high reference value set in the PCU control module This command functions with a DANG tag type only

COMMAND:

ed 118,*subtype tag x-coord y-coord,charsize fgcolor,bgcolor scale*

where

subtype	39 vertical movement, 40 horizontal movement
x-coord,y-coord	Starting point which determines the lowest possible position of the scale The alarm limit tick marks are drawn proportionally between the high reference value and low reference value on the scale The complete scale range is determined by the x,y coordinate plus the scale parameter
scale	Number of display units separating the high reference value and low reference value The bottom of the scale starts at the x,y coordinate starting point

Example **ed 118,39,55,2569,2002,124,3,0,1400**

Text String (ed 120)

PURPOSE:

The text string command presents a variable length text field (80 characters maximum) associated with a TEXTSTR tag It displays the current text string received for the tag

COMMAND:

ed 120,32,*tag,x-coord,y-coord,charsize,fgcolor,bgcolor,almcolor,spacing, charlength start-char,trunc-option*

where

trunc-option	0 no truncation, 1 truncate

Example **ed 120,32,15,1850,750,124,3,0,0,1,80,0,1**

Text String Interlock Indicator (ed 121)

PURPOSE:

The text string interlock command presents a lock status indication for a TEXTSTR tag The indication is either *USER TEXT LOCK* or blank When locked, the console and PCU module do not accept any operator entered text string

COMMAND:

ed 121,32,*tag x-coord,y coord,charsize,fgcolor,bgcolor,spacing, charlength,start-char,trunc option*

where

trunc opt on 0 - no truncation, 1 truncate

Example **ed 121,32,15,8059,1150,124,3,0,1,14,0,0**

Text String Truncation Indicator (ed 122)

PURPOSE:

The text string truncation indicator presents a *NO TRUNCATION* or *REMOTE TRUNC* indication for a TEXTSTR tag The indication allows determining whether or not remote (PCU module or interface unit level) truncation has occurred for the text string presented

COMMAND·

ed 122,32,*tag,x-coord,y-coord charsize,fgcolor bgcolor,spacing, charleng'h,start-char,trunc-option*

where

trunc-option 0 no truncation, 1 truncate

Example **ed 122,32,15,9000,950,124,3,0,1,4,0,0**

Received Text String Length (ed 123)

PURPOSE:

The received text string length command indicates the length of the text string received in an exception report for a TEXTSTR tag

COMMAND:

ed 123,32 *tag,x-coord,y-coord,charsize,fgcolor,bgcolor,spacing*

Example **ed 123,32,15,1500,2200,124,3,0,1**

BLOCK DETAILS DISPLAY (bd 126)

PURPOSE:

The block details display command can be used to create a block details display for a specific function block. The command contains a loop, PCU, module and block address parameter that dedicates the display to a certain function block A block details display provides the capability to perform process tuning

COMMAND:

bd 126,*x-coord,y-coord,size,loop,PCU,module block*

where

x-coord,y-coord	Lower left corner coordinates of the box
size	66 - small (6,725 × 3,456), any other number large (9,200 × 6,800) block

Example **bd 126,400,400,1,1,2,3,99**

ALARM SUMMARY ELEMENT COMMANDS

Alarm summary commands create and define the characteristics of an alarm summary element such as size, coordinate position, alarm line format and color. Depending on the command, it also determines whether the alarm entries are limited to tags within specific or a range of alarm groups, or those having specific or a range of priorities

NOTE Refer to Table B 3 for additional parameter definitions

Alarm Summary (as 82)

PURPOSE:

The alarm summary command creates an alarm summary element containing alarm entries for a defined range or individual alarm groups only, or both range and individual groups

COMMAND:

as 82,*grpoption,grpcount,start,end,grpnums,size,format,x-coord,y coord, outline color*

where

grpoption — Group option, 32 range only, 33 individual groups only, 34 range and individual groups

grpcount — Group count or number of individual alarm groups from 0 to 10, 0 if *grpoption* is 32

start — Starting group number in range from 1 to 99, S or D, not applicable if *grpoption* is 33 When specifying the entire alarm group range, set this to 1 as the starting group

end — Ending group number in range from 1 to 99, S or D, not applicable if *grpoption* is 33 When specifying the entire alarm group range, set this to D as the ending group

grpnums — Individual alarm group numbers, up to ten individual alarm groups can be specified No applicable if *grpoption* is 32

size —

32 full screen (100 × 100)

33 half screen (50 × 100)

34 quarter screen (25 × 100)

35 eighth screen (12 5 × 100)

format — Alarm line format, 0 to 4 if using the standard line entry formats provided, 5 to 105 if using a user-defined line format Refer to ***ALARM SUMMARY CONFIGURATION*** in the ***OIS Configuration*** section for further information *x-coord,y-coord* — Lower left corner x,y coordinate of alarm sum mary element.

outline-color — Index number of a color to use as the outline color when deselected, refer to Table B-2 for color index numbers

DISCUSSION: The size parameter affects other characteristics of the alarm summary element such as maximum number of alarm entries Refer to ***ALARM SUMMARY CONFIGURATION*** in the ***OIS Configuration*** section for further explanation

Examples Alarm group range only

as 82,32,0,1,D,32,0,400,400,4

Individual alarm groups only

as 82,33,5,12,16,33,88,D,32,0,400,400,4

Alarm group range and individuals

as 82,33,3,1,15,99,S,D,32,0,400,400,4

To create a complete alarm summary element, additional com mands are necessary including

1 Control select using both key (**ei 108,87**) and touch point (**ei 107,87**)

2 Primary display select using both key (**ei 108,88**) and touch point (**ei 107,88**) for each alarm line entry

3 Text descriptors (**tx**) for the control select key characters and each primary display select key character

4 Polyline (**pl**) for the element outline

Example

```
bm 0,almsum~
bp 0,almsum~,0
sm 1
bb
as 82,32,0,1,D,32,0,400,400,4
ei 108,87,83,0,400,400
ei 107,87,400,6650,9600,7200,400,400
ei 108,88,65,0
ei 108,88,66,0
ei 108,88,67,0
ei 108,88,68,0
ei 108,88,69,0
ei 108,88,70,0
ei 108,88,71,0
ei 108,88,72,0
```

```
ei 108,88,73,0
ei 108,88,74,0
ei 108,88,75,0
ei 108,88,76,0
ei 108,88,77,0
ei 108,88,78,0
ei 108,88,79,0
ei 108,88,80,0
ei 107,88,400,6294,9600,6641
ei 107,88,400,5946,9600,6293
ei 107,88,400,5598,9600,5945
ei 107,88,400,5250,9600,5597
ei 107,88,400,4728,9600,5075
ei 107,88,400,4380,9600,4727
ei 107,88,400,4032,9600,4379
ei 107,88,400,3684,9600,4031
ei 107,88,400,3162,9600,3509
ei 107,88,400,2814,9600,3161
ei 107,88,400,2466,9600,2813
ei 107,88,400,2118,9600,2465
ei 107,88,400,1596,9600,1943
ei 107,88,400,1248,9600,1595
ei 107,88,400,900,9600,1247
ei 107,88,400,552,9600,899
ch 124
cs 01
lc 4
fc 0
lt 0
pl 400,400,9200,0~
pl 400,400,0,6800~
pl 400,7200,9200,0~
pl 9600,400,0,6800~
bc 0,0
tc 2
tx 0,550,6490,A~
tx 0,550,6142,B~
tx 0,550,5794,C~
tx 0,550,5446,D~
tx 0,550,4924,E~
tx 0,550,4576,F~
tx 0,550,4228,G~
tx 0,550,3880,H~
tx 0,550,3358,I~
tx 0,550,3010,J~
tx 0,550,2662,K~
tx 0,550,2314,L~
tx 0,550,1792,M~
tx 0,550,1444,N~
tx 0,550,1096,O~
tx 0,550,748,P~
```

tc 5
tx 0,4000,6838,ALARM SUMMARY~
ep
em
%%
%%

Alarm Summary (as 83)

PURPOSE.

The alarm summary command creates an alarm summary element containing alarm entries for tags assigned to a certain alarm group, or having a certain priority assignment A parameter of the command determines whether the element limits the entries by alarm group or priority In either case, the command can also be set to limit the entries to a specified range only, a list of individuals only, or both range and individual alarm groups or priorities Unlike the **as 82** command, this command generates a complete alarm summary

COMMAND:

as 83,*grpoption,key-select,primkey-select,size,touch flag,primkey orientation,primkey color,format,x-coord,y coord,outline color,start, end,count,grp/prior-nums,grp/prior-filter,ack filter*

where

grpoption — Group option, 32 range only, 33 individual groups/priorities only, 34 range and individual groups/priorities

key select — Alarm element control select keys One or two alphanumeric characters (e g , 1A, A, 2X, etc), or 0 if not required

primkey-select — Primary display key select, alphanumeric character of the key to use as the first primary display select key. The rest of the selectors are generated from this entry One alpha character (e g , A, D, etc), or 0 if not required

size — 32 full screen (100 × 100)

33 - half screen (50 × 100)

34 - quarter screen (25 × 100)

35 eighth screen (12 5 × 100)

touch-flag — Touch point flag, 1 touch points desired, 0 no touch points

primkey-orientation — Primary display key select orientation, 1 place key selectors on right side of element, 0 place key selectors on left side of element

primkey color	Index number of the color to use for the primary display key select characters, refer to Table B 2 for color index numbers
format	Alarm line format number, 0 to 4 if using the standard line entry formats provided, 5 to 105 if using a user defined line format Refer to ***ALARM SUMMARY CONFIGURATION*** in the ***OIS Configuration*** section for further information
x coord,y-coord	Lower left corner x,y coordinate of alarm sum mary element
outline color	Index number of a color to use as the outline color when deselected, refer to Table B 2 for color index numbers
start	Starting alarm group/priority number in range, not applicable if *grpoption* is 33 Valid entry for alarm group is from 1 to 99, S or D, when specifying the entire alarm group range, set this to 1 as the starting group Valid entry for prior ity is 1 to 8
end	Ending alarm group/priority number in range, not applicable if *grpoption* is 33 Valid entry for alarm group is from 1 to 99, S or D, when specifying the entire alarm group range, set this to D as the ending group Valid entry for priority is 1 to 8
count	Number of individual alarm groups/priorities from 0 to 10, 0 if *grpoption* is 32
grp/prior nums	Individual alarm group or priority numbers, up to ten individual alarm groups or all priorities can be specified Not applicable if *grpoption* is 32 The *grp/prior-filter* parameter determines whether this parameter defines groups or priorities
grp/prior filter	Alarm groups or priorities filter, 0 limits alarm summary entries based on alarm group, 1 limits alarm summary entries based on priority
ack-filter	Acknowledged or unacknowledged alarm filter, 0 all acknowledged and unacknowledged alarms appear in the summary, 1 only ac knowledged alarms appear in the summary, 2 only unacknowledged alarms appear in the summary

DISCUSSION:

The size parameter affects other characteristics of the alarm summary element such as maximum number of alarm entries Refer to ***ALARM SUMMARY CONFIGURATION*** in the ***OIS Configuration*** section for further explanation.

Table B-7 shows the results of selecting certain *grp/prior filter* and *ack-filter* combinations.

Table B-7 Alarm Summary Filtering Options

grp/prior-filter	ack-filter	Result
0	0	Standard, summary contains selected alarm groups all alarms Summary operates the same as if using the **as 82** command
	1	Summary contains selected alarm groups, acknowledged alarms only
	2	Summary contains selected alarm groups unacknowledged alarms only
1	0	Summary contains selected priorities, all alarms
	1	Summary contains selected priorities acknowledged alarms only
	2	Summary contains selected priorities unacknowledged alarms only

Examples

Summary containing all unacknowledged alarms

as 83,32,1A,A,32,0,0,3,0,400,400,4,1,D,0,2

Summary of all acknowledged alarms

as 83,32,1A,A,32,0,0,3,0,400,400,4,1,D,0,1

Summary containing all acknowledged priority 1 alarms only

as 83,33,1A,A,32,0,0,3,0,400,400,4,1,1,1,2

Summary containing all unacknowledged priority 1 and 2 alarms only

as 83,33,1A,A,32,0,0,3,0,400,400,4,2,1,2,1,2

or

as 83,32,1A,A,32,0,0,3,0,400,400,4,1,2,1,2

TREND ELEMENT COMMANDS

Trend element commands create and define the characteristics of trend graph, tabular trend and XY plot elements

NOTE Refer to Tab e B 3 for add t ona parameter definit ons

Tabular Trend Element (et 52)

PURPOSE:

The tabular trend element command creates a trend element that presents the values collected for up to ten trends This type trend element shows the trended data in a tabular format (columns) The command defines overall characteristics of the element Other features of the element must be created using **su** commands

COMMAND:

et 52,*subtype element res period res units,numtrends,x1-coord y1-coord, x2 coord,y2 coord,outline color numsamples,time,limit color,y top x time*

where

subtype	32 distributed trend, 33 future use
element	Element number, assigns an element number from one to 30 to this tabular trend This number is referenced in associated **ei** and **su** commands
res period	Display resolution period, number of units
res units	Resolution units, 32 seconds, 33 minutes, 34 hours, 35 - days
numtrends	Number of trends in element from 1 to 10
x1-coord,y1 coord	Box lower left corner to highlight when control enabled
x2 coord,y2 coord	Box upper right corner to highlight when control enabled
outline-color	Return to normal color of element outline, index number of a color to use when control disabled Refer to Table B 2 for color index numbers
numsamples	Number of samples, number of displaved in tervals per trend (or number of rows) Re ten
time	Selects the displayed time format, 0 mm ss, 1 hh mm, 2 hh mm ss, 3 dd hh, 4 dd hh mm

NOTE The order of the time (and date) depends on time/date format configuration

limit-color	Reached high or low limit color, index number of a color to use when a trend value reaches either a high or low limit. Refer to Table B 2 for color index numbers
y-top	Y coordinate position of interval top line point (i e , top line of element)
x-time	X coordinate position of the time stamp column

Example **et 52,32,1,1,33,10,400,400,9600,6600,4,30,1,2,6290,450**

Trend Element (et 53)

PURPOSE:

The trend element command creates a single trend element that presents the values collected for up to five trends This type trend element shows the trended data on a graph as a continuous trend line The command defines the size, resolution, pan option, x,y coordinate position and deselected outline color of the element only Depending on the size chosen, up to four trend elements can appear in one display

COMMAND:

et 53,*option,res period,res-units numtrends,pan-option,x1-coord, y1-coord,x2-coord,y2-coord,outline-color*

where

option	32 100 × 100 with key select only 33 50 × 100 with key select only 34 100 × 50 with key select only 35 50 × 50 with key select only 40 100 × 100 with key and touch point select 41 50 × 100 with key and touch point select 42 - 100 × 50 with key and touch point select 43 50 × 50 with key and touch point select.
res period	Display resolution, normally 1 for one-minute resolution or 15 for 15-second resolution For enhanced trends, the display resolution set during definition of the trend overrides this parameter
res units	Resolution units, 32 seconds, 33 minutes

numtrends	Number of trends in element from 1 to 5
pan-option	32 pan with update window, 33 pan without update window
x1 coord y1 coord	Lower left corner x,y coordinate of the trend element
x2-coord,y2-coord	Upper right corner x,y coordinate of the trend element including the control box portion of the element
outline-color	Return to normal color, index number of a color to use when control disabled Refer to Table B 2 for color index numbers

DISCUSSION:

The *x1-coord,y1 coord* and *x2 coord,y2-coord* parameters indicate the lower left and upper right corner positions of the entire trend element including both the trend graph and control box portions of the element These must be accurate or the trend will not display properly The coordinates must reflect the size option chosen in the option parameter

To create a complete trend element, additional commands are necessary

1 An **es** command to access a trend symbol (e g , TRNDPVFL, TRNDCOFL, TRNDSPFL, etc) for each trend dependent on the number of trends defined in the *numtrends* parameter

2 Control select using both key (**ei 108,86**) and touch point (**ei 107,86**) for each trend of the element There should be one of each of these commands for the number of trends defined in the *num trends* parameter

3 A text descriptor (**tx**) for each control key select command (**ei 108,86**)

4 A text color (**tc**) for each key select character corresponding to the color defined in an associated trend symbol

The following example creates a display containing four 50 × 50 trend elements The conditions that exist for this example are

- Trend element one contains five active trends with a display resolution of one minute
- Trend element two contains only three active trends with the remaining two defined (dummied in) to provide the vertical spacing requirements only The display resolution is one minute
- Trend element three contains only three active trends with a display resolution of one minute

- Trend element four contains five active trends with a display resolution of 15 seconds

Example

```
bm 0,TREND6~
bp 0,TREND6~,0
sm 1
bb
lc 4
pl 7420,800,0,1200,2180,0,0,-1200,-2180,0~
rm -- Trend symbols for trend element 1
es TRNDPVHF~,1,7420,6600,141
es TRNDPVHF~,1,7530,7000,142
es TRNDPVHF~,1,7420,5400,74
es TRNDPVHF~,1,7420,4800,75
es TRNDPVHF~,1,7420,4200,76
rm -- Trend symbols for trend element 2
es TRNDPVHF~,1,7420,3200,118
es TRNDPVHF~,1,7420,2600,119
es TRNDPVHF~,1,7420,2000,120
rm -- Trend symbols for trend element 3
es TRNDPVHF~,1,2820,6600,132
es TRNDPVHF~,1,2820,6000,78
es TRNDPVHF~,1,2820,5400,133
rm -- Trend symbols for trend element 4
es TRNDPVHF~,1,2820,3200,123
es TRNDPVHF~,1,2820,2600,137
es TRNDPVHF~,1,2820,2000,138
es TRNDPVHF~,1,2820,1400,139
es TRNDPVHF~,1,2820,800,141
rm -- Control select key characters
ch 124
cs 01
tc 1
tx 0,7450,7010,A~
tc 2
tx 0,7450,6410,B~
tc 3
tx 0,7450,5810,C~
tc 4
tx 0,7450,5210,D~
tc 5
tx 0,7450,4610,E~
tc 6
tx 0,7450,3610,F~
tc 7
tx 0,7450,3010,G~
tc 8
tx 0,7450,2410,H~
tc 11
tx 0,2850,7010,K~
tc 12
tx 0,2850,6410,L~
```

```
tc 13
tx 0,2850,5810,M~
tc 16
tx 0,2850,3610,P~
tc 17
tx 0,2850,3010,Q~
tc 18
tx 0,2850,2410,R~
tc 19
tx 0,2850,1810,S~
tc 20
tx 0,2850,1210,T~
rm -- Trend element 1
et 53,35,1,33,5,32,5000,4200,9600,7200,4
ei 108,86,65,0,19,1,100.0,0.0
ei 108,86,66,0,20,2,100.0,0.0
ei 108,86,67,0,21,3,100.0,0.0
ei 108,86,68,0,22,4,100.0,0.0
ei 108,86,69,0,23,5,100.0,0.0
rm -- Trend element 2
et 53,35,1,33,5,33,5000,800,9600,3800,4
ei 108,86,70,0,11,6,40.0,180.0
ei 108,86,71,0,24,7,20.0,160.0
ei 108,86,72,0,12,8,0.0,140.0
ei 108,86,73,0,-1,9,-20.0,120.0
ei 108,86,74,0,-1,10,-40.0,100.0
rm -- Trend element 3
et 53,35,1,33,3,33,400,5400,5000,7200,4
ei 108,86,75,0,3,11,200.0,-20.0
ei 108,86,76,0,4,12,180.0,-40.0
ei 108,86,77,0,5,13,160.0,-60.0
rm -- Trend element 4
et 53,35,15,32,5,32,400,800,5000,3800,4
ei 108,86,80,0,8,16,-20.0,200.0
ei 108,86,81,0,16,17,-40.0,180.0
ei 108,86,82,0,17,18,-60.0,160.0
ei 108,86,83,0,18,19,-80.0,140.0
ei 108,86,84,0,19,20,-100.0,120.0
ep
em
%%
```

Tabular Trend Summary Information - High and Low Limits (su 152)

PURPOSE:

The tabular trend summary information high and low limits command defines the high and low limits of each trend

COMMAND:

su 152,110,*element,trend,x-coord,width,decimal-digits,0,color,hi-limit,low-limit*

where

element	Element number, associates this command with a tabular trend element (**et 52** command).
x-coord	X coordinate column position for the trend data, the y coordinate is the *y top* parameter in an associated **et 52** command
width	Column width expressed as number of digits
decimal-digits	Number of digits from 0 to 4 that are to appear after a decimal point
0	Required, spare parameter for future use
color	Index number of a color to use for this column of values, refer to Table B 2 for color index numbers
hi-limit	High limit, high limit value of the trend
low-limit	Low limit, low limit value of the trend

Example. **su 152,110,1,12,1186,8,2,0,3,60.0,0.0**

Tabular Trend Summary Information - High Limit of Column (su 152)

PURPOSE:

The tabular trend summary information - high limit of column command displays the high limit value for each trend column in an element The value and y coordinate position for this command are derived from an **su 152,110** command

COMMAND:

su 152,101,*element,y coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command)

y coord Y-coordinate position to display the high limit value, the x coordinate position is taken from an **su 152,110** command

Example **su 152,101,1,1175**

Tabular Trend Summary Information - Low Limit of Column (su 152)

PURPOSE:

The tabular trend summary information low limit of column command displays the low limit value for each trend column The value and y coordinate position for this command are derived from an **su 152,110** command

COMMAND·

su 152,102,*element y-coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command)

y coord Y coordinate position to display the low limit value, the x coordinate position is taken from an **su 152,110** command

Example **su 152,102,1,1330**

Tabular Trend Summary Information - Maximum of Column (su 152)

PURPOSE:

The tabular trend summary information maximum of column command displays the highest value seen for each trend column The y-coordinate position for this command is derived from an **su 152,110** command

COMMAND:

su 152,103,*element,y-coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command)

y-coord Y coordinate position to display the maximum value, the x-coordinate position is taken from an **su 152,110** command

Example **su 152,103,1,555**

Tabular Trend Summary Information - Minimum of Column (su 152)

PURPOSE:

The tabular trend column command displays the lowest value seen for each trend column. The y coordinate position for this command is derived from an **su 152,110** command

COMMAND:

su 152,104,*element,y coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command)

y-coord Y coordinate position to display the minimum value, the x coordinate position is taken from an **su 152,110** command

Example **su 152,104,1,865**

Tabular Trend Summary Information - Average of Column (su 152)

PURPOSE:

The tabular trend summary information average of column command displays the average value seen for each trend column The y-coordinate position for this command is derived from an **su 152,110** command

COMMAND:

su 152,105,*element,y coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command

y-coord Y coordinate position to display the average value, the x-coordinate position is taken from an **su 152,110** command

Example **su 152,105,1,1730**

Tabular Trend Summary Information - Summation of Column (su 152)

PURPOSE:

The tabular trend summary information summation of column command displays the sum of all values seen for each trend column The y coordinate position for this command is derived from an **su 152,110** command

COMMAND:

su 152,106,*element,y-coord*

where

element Element number, associates this command with a tabular trend element (**et 52** command)

y-coord Y coordinate position to display the summation value, the x coordinate position is taken from an **su 152,110** command

Example **su 152,106,1,1730**

Example Tabular Trend Display

The following example creates a tabular trend display that presents the trended values for ten different trends The display presents these values in ten columns with 30 values displayed in each column

```
bm 0,CRTLOG~
bp 0,DIGTREND~
bb
rm -- Selector characters for trend elements 1 thru 10
tc 2
tx 0,1186,6445,A~
tx 0,2022,6445,B~
tx 0,2858,6445,C~
tx 0,3694,6445,D~
tx 0,4530,6445,E~
tx 0,5366,6445,F~
tx 0,6202,6445,G~
tx 0,7038,6445,H~
tx 0,7874,6445,I~
tx 0,8710,6445,J~
rm -- Tag names for trend elements 1 thru 10
ec 34,32,101,1376,6445,124,4,0,1,6,0
ec 34,32,102,2212,6445,124,4,0,1,6,0
ec 34,32,103,3048,6445,124,4,0,1,6,0
ec 34,32,104,3884,6445,124,4,0,1,6,0
ec 34,32,105,4720,6445,124,4,0,1,6,0
ec 34,32,106,5556,6445,124,4,0,1,6,0
ec 34,32,107,6392,6445,124,4,0,1,6,0
ec 34,32,108,7228,6445,124,4,0,1,6,0
ec 34,32,109,8054,6445,124,4,0,1,6,0
ec 34,32,110,8900,6445,124,4,0,1,6,0
rm -- Engineering units for trend elements 1 thru 10
ec 38,32,101,1186,6290,124,4,0,1
ec 38,32,102,2022,6290,124,4,0,1
ec 38,32,103,2858,6290,124,4,0,1
ec 38,32,104,3694,6290,124,4,0,1
ec 38,32,105,4530,6290,124,4,0,1
ec 38,32,106,5366,6290,124,4,0,1
ec 38,32,107,6202,6290,124,4,0,1
ec 38,32,108,7038,6290,124,4,0,1
ec 38,32,109,7874,6290,124,4,0,1
ec 38,32,110,8710,6290,124,4,0,1
rm -- Tabular trend element
lc 4
pl 400,400,0,6200,9200,0,0,-6200,-9200,0~
et 52,32,1,1,33,10,400,400,9600,6600,4,30,1,2,6290,450
rm -- Tabular trend column 1 (tag 101)
ei 108,97,65,0,1,1
ei 107,97,1186,6290,1950,6490,1,1
su 152,110,1,1,1186,8,2,0,3,60.0,0.0
```

```
rm -- Tabular trend column 2 (tag 102)
ei 108,97,66,0,1,2
ei 107,97,2022,6290,2822,6490,1,2
su 152,110,1,2,2022,82,0,3,60.0,0.0
rm -- Tabular trend column 3 (tag 103)
ei 108,97,67,0,1,3
ei 107,97,2858,6290,3658,6490,1,3
su 152,110,1,3,2858,8,2,0,3,60.0,0.0
rm -- Tabular trend column 4 (tag 104)
ei 108,97,68,0,1,4
ei 107,97,3694,6290,4494,6490,1,4
su 152,110,1,4,3694,8,2,0,3,60.0,0.0
rm -- Tabular trend column 5 (tag 105)
ei 108,97,69,0,1,5
ei 107,97,4530,6290,6330,6490,1,5
su 152,110,1,5,4530,8,2,0,3,60.0,0.0
rm -- Tabular trend column 6 (tag 106)
ei 108,97,70,0,1,6
ei 107,97,5366,6290,6166,6490,1,6
su 152,110,1,6,5366,8,2,0,3,60.0,0.0
rm -- Tabular trend column 7 (tag 107)
ei 108,97,71,0,1,7
ei 107,97,6202,6290,7002,6490,1,7
su 152,110,1,7,6202,8,2,0,3,60.0,0.0
rm -- Tabular trend column 8 (tag 108)
ei 108,97,72,0,1,8
ei 107,97,7038,6290,7838,6490,1,8
su 152,110,1,8,7038,8,2,0,3,60.0,0.0
rm -- Tabular trend column 9 (tag 109)
ei 108,97,73,0,1,9
ei 107,97,7874,6290,8674,6490,1,9
su 152,110,1,9,7874,8,2,0,3,60.0,0.0
rm -- Tabular trend column 10 (tag 110)
ei 108,97,74,0,1,10
ei 107,97,8710,6290,9510,6490,1,10
su 152,110,1,10,8710,8,2,0,3,60.0,0.0
rm -- Page summary
su 152,102,1,1330
su 152,101,1,1175
su 152,104,1,865
su 152,103,1,555
rm -- Summary headings
tc 4
tx 0,450,1330,LLim:~
tx 0,450,1175,HLim:~
tx 0,450,1015,Min.:~
tx 0,450,865,Time:~
tx 0,450,705,Max.:~
tx 0,450,555,Time:~
rm
ep
em
%%
```

XY Plot Element (et 154)

PURPOSE:

The XY plot element command creates an element that can be used to compare up to five variables against a sixth or five separate pairs of variables This type element shows the data on a graph as either a single point, multipoint or a continuous line The command defines the overall characteristics of the plot element. Other features of the element must be created using **su** commands

COMMAND.

et 154,32,*element,numplots,x1-coord,y1-coord,x2-coord,y2-coord, x3 coord,y3 coord,x4 coord,y4 coord,outline color,option,numx,numy, x5-coord y5-coord,x6-coord,y6-coord,XOR*

where

element	Element number, assigns an element number from 1 to 4 to this XY plot element This number is referenced in associated **ei** and **su** commands
numplots	Number of plots in element from 1 to 5
x1-coord,y1-coord	Lower left corner x,y coordinate of highlight box
x2-coord,y2 coord	Upper right corner x,y coordinate of highlight box
x3-coord,y3 coord	Lower left corner x,y coordinate of element outline box
x4-coord,y4 coord	Upper right corner x,y coordinate of element outline box
outline color	Return to normal color of element outline, index number of a color to use when control disabled Refer to Table B-2 for color index numbers
option	Grid option, 0 grid off, 1 - grid on
numx	Number of x axis grid divisions
numy	Number of y-axis grid divisions
x5-coord,y5-coord	X,y coordinate position of pan and zoom text (future use)
x6-coord,y6 coord	X,y coordinate position of *Target* prompt

XOR	Drawing mode, 0 - XOR mode enabled, 1 XOR mode disabled This parameter is ignored for a tag or trend data source plot.

NOTE When the console has an IMGC01 Multibus Graphics Controller Module disable XOR drawing mode

DISCUSSION:

The highlight coordinates defined in this element should not be the same as the box coordinates in the same escape due to border color conflicts If they are, the plot select highlight color will be unpredictable as the plot border color changes

When drawing in XOR mode, two colors that overlap produce a third color at the point of overlap Color A XORed with color B will produce some color C

To create a complete XY plot element, additional commands are necessary

1 Optionally, an **es** command to access an XY plot symbol (e g , XYAHF, XYDHF, XYSYM2 etc) for each plot dependent on the number of plots defined in the *numplots* parameter

2 Control select using both key (**ei 108,96**) and touch point (**ei 107,96**) for each plot of the element There should be one of each of these commands for the number of plots defined in the *numplots* parameter

3 A text descriptor (**tx**) for each control key select command (**ei 108,96**)

4 A text color (**tc**) for each key select character corresponding to the color defined in an associated plot symbol

Example **et 154,32,1,5,7420,1200,9600,7200,500,1200,7420,7200/ 4,1,10,10,7500,1000,7500,800,0**

XY Plot Summary Information - High and Low Limit (su 154)

PURPOSE:

The XY plot summary information high and low limits command defines the position of the high scale limit, low scale limit and last reported value fields for a pair of plotted variables - x-axis and y-axis variable

COMMAND.

su 154,110,*element,plot-index,color,x1-coord,y1-coord,x2-coord, y2-coord,x3-coord,y3-coord,x4-coord,y4-coord,x5-coord,y5-coord, x6-coord,y6-coord,x7-coord,y7-coord*

where

element	Element number, associates this command with an XY plot element (**et 154**
plot-index	Index number of a plot definition, identifies the plotted variables used in the element Valid entry is from 1 to 80 Refer to ***XY Plot Definition*** in the ***OIS Configuration*** section for additional information
color	Index number of a color to use to identify the plotted data, refer to Table B 2 for color index numbers
x1-coord,y1-coord	X axis variable low scale limit string x,y co ordinate position
x2-coord y2-coord	X-axis variable high scale limit string x,y co ordinate position
x3-coord,y3 coord	Y axis variable low scale limit string x,y co ordinate position
x4 coord y4-coord	Y axis variable high scale limit string x,y co-ordinate position
x5 coord,y5 coord	X axis variable last value string x,y coordinate position
x6-coord,y6-coord	Y axis variable last value string x,y coordinate position
x7-coord,y7-coord	Update mode indicator x,y coordinate position

Example **su 154,110,1,1,5,8880,6660 8880,6835,8880,6060,8880/ 6235,8160,6660,8160,6060,9400,7005**

XY Plot Summary Information - Value Per Grid Division (su 154)

PURPOSE:

The XY plot summary information - value per grid division command presents a value field to identify the value per grid division

The quantity will be calculated by

(x axis high limit x axis low limit) number x-axis grid divisions

- or -

(y axis high limit - y-axis low limit) number of y-axis grid divisions

COMMAND:

su 154,111,*element,plot-index,axis option,x1-coord,y1-coord x2 coord,y2 coord*

where

element	Element number, associates this command with an XY plot element (**et 154** command)
plot index	Index number of a plot definition, identifies the plotted variables used in the element Valid entry is from 1 to 80 Refer to ***XY Plot Definition*** in the ***OIS Configuration*** section for additional information
axis option	1 x axis divisions, 2 y axis divisions
x1 coord y1-coord	X,y coordinate position of the calculated value per grid division field
x2 coord y2-coord	X,y coordinate position of the engineering unit descriptor associated with the value per grid division quantity

XY Plot Summary Information - Plot Descriptor (su 154)

PURPOSE:

The XY plot summary information plot descriptor command defines the position, size and color of the plot title and the legend text strings. These strings are defined during plot definition; refer to ***XY Plot Definition*** in the ***OIS Configuration*** section

COMMAND.

su 154,112,*element,type,x coord,y-coord,charsize,fgcolor,bgcolor,spacing,charlength,start-char,orientation*

where

element	Element number, associates this command with an XY plot element (**et 154** command)
type	1 title, 2 x axis legend, 3 y axis legend
orientation	1 - horizontal, 2 vertical (future use)

XY Plot Summary Information - Reference Line Value (su 154)

PURPOSE:

The XY plot summary information reference line value command displays the value set for an x reference line or y-reference line of an MFC data source plot The command acquires the value from the MFC data file used in the plot Up to ten of these commands can be used in a single plot element The parameters in the data file this escape references are

```
float    x_refline[MAX REFLINES],
float    y refline[MAX REFLINES],
```

COMMAND:

su 154,114,*element,plot-index,ref-line,axis,x-coord,y-coord,charlength,decimal-digits,bgcolor,fgcolor*

where

element	Element number, associates this command with an XY plot element (**et 154** command)
plot-index	Identifies the plotted variables used in the element by plot index number, valid entry is from 1 to 80 Refer to ***XY Plot Definition*** in the ***OIS Configuration*** section for additional information.
ref-line	Reference line number from 1 to 5
axis	1 x axis, 2 y axis

Example

```
rm ------xref values--------------------
su 154,114,1,13,2,1,8150,6050,5,2,0,1
su 154,114,1,13,3,1,8150,6275,5,2,0,1
su 154,114,1,13,4,1,8925,6675,5,2,0,1
su 154,114,1,13,5,1,8925,5650,5,2,0,2
rm ------yref values-------------------
su 154,114,1,13,1,2,8150,6475,4,0,0,1
su 154,114,1,13,2,2,8150,6675,5,2,0,1
su 154,114,1,13,3,2,8150,5650,5,2,0,1
su 154,114,1,13,4,2,8150,5850,3,0,0,1
```

Example Tag or Trend XY Plot Display

The following example creates a full screen XY plot display con taining five plots

```
bm 0 XYPFL5.DT~
bp 0,XYPFL5.DT~,0
sm 1
bb
ch 124
cs 1
rm -- XY plot symbols for plot pairs 1 thru 5
es XYAHF~,1,7420,6600,1~
es XYAHF~,1,7420,6000,1~
es XYAHF~,1,7420,5400,145~
es XYAHF~,1,7420,4800,144~
es XYAHF~,1,7420,4200,13~
es XYAHF~,1,7420,3600,14~
es XYAHF~,1,7420,3000,8~
es XYAHF~,1,7420,2400,9~
es XYAHF~,1,7420,1800,140~
es XYAHF~,1,7420,1200,146~
rm -- Plot selector characters
tc 2
tx 0,7450,7005,A~
tc 3
tx 0,7450,5805,B~
tc 6
tx 0,7450,4605,C~
tc 7
tx 0,7450,3405,D~
tc 8
tx 0,7450,2205,E~
rm - XY plot element
et 154,32,1,5,7420,1200,9600,7200,500,1200,7420,7200,4,1,10,10/
7500 1000,7500,800,0
rm -- Interactive control for plots 1 thru 5
ei 108,96,65,0,1,1~
ei 108,96,66,0,1,3~
ei 108,96,67,0,1,2~
ei 108,96,68,0,1,4~
```

```
ei 108,96,69,0,1,5~
rm -- Summary information for plots 1 thru 5
su 154,110,1,1,2,8880,6660,8880,6835,8880,6060,8880/
6235,8160,6660,8160,6060,9400,7005~
su 154,110,1,3,3,8880,5460,8880,5635,8880,4860,8880/
5035,8160,5460,8160,4860,9400,5805~
su 154,110,1,2,6,8880,4260,8880,4435,8880,3660,8880/
3835,8160,4260,8160,3660,9400,4605~
su 154,110,1,4,7,8880,3060,8880,3235,8880,2460,8880/
2635,8160,3060,8160,2460,9400,3405~
su 154,110,1,5,8,8880,1860,8880,2035,8880,1260,8880/
1435,8160,1860,8160,1260,9400,2205~
ep
em
%%
%%
```

Example MFC Data Source XY Plot Element

The following example defines a single plot element of an XY plot display

```
rm *** Beginning XY Plot #1~
rm ***~
et 154,32,1,1,400,5500,8100,7000,400,5500,8100,7000,4,1,16,6,0,0/
4943,7050,1
su 154,112,1,1,950,7050,1,5,0,20,5,1,1
rm start of XY Plot - trace #1~
su 154,110,1,13,1,0,0,0,0,8125,5250,8125,7050,0,0,0,0,9325,7050
es XYSYM2~,1,400,5225,1
ei 108,96,65,0,1,13
rm ------xref values-------------------
su 154,114,1,13,2,1,8150,6050,5,2,0,1
su 154,114,1,13,3,1,8150,6275,5,2,0,1
su 154,114,1,13,4,1,8925,6675,5,2,0,1
su 154.114,1,13,5,1,8925.5650.5.2.0.2
rm ------yref values-------------------
su 154,114,1,13,1,2,8150,6475,4,0,0,1
su 154,114,1,13,2,2,8150,6675,5,2,0,1
su 154,114,1,13,3,2,8150,5650,5,2,0,1
su 154,114,1,13,4,2,8150,5850,3,0,0,1
ch 124
cs 20
tx 0,525,7025,A~
ei 107,96,400,5500,8100,7000,1,13
lw 0
fc 0
lc 6
pg 400,5500;0,1500;7700,0;0,-1500;-7700,0~
rm end of XY Plot trace #1~
```

DYNAMIC SYMBOLS

A dynamic symbol command can be used to create symbols (e g , valves, pumps, etc.) that change in appearance according to exception reported alarm condition, value, state or status of a process variable or device A dynamic symbol command requires additional supporting commands to call and display the symbols that *represent each reported condition*

NOTE Refer to Table B 3 for add t ona parameter defin tions

Analog Dynamic Symbol (ed 54)

PURPOSE. The analog dynamic symbol command creates a dynamic display element that changes according the value being reported by an analog value reporting function block The element can show whether the value returned by the function block is currently within a low, mid or high range

COMMAND: **ed 54,45,***tag,flash-option,variable-type,low-range mid-range*

where

flash option	0 no flash, 1 - flash; causes the displayed symbol to flash if in alarm and unacknowledged
variable type	0 - process variable, 1 set point, 2 control output, 3 ratio index
low-range	Maximum value for a low range indication, crossover point between low and mid range
mid range	Maximum value for a mid range indication, crossover point between mid and high range

DISCUSSION. This command requires an **sn** command defined to indicate each range (i e , low, mid and high) that a value may fall in, and an **sn** command for a bad quality condition returned by the function block The symbols required include:

- Low range, no alarm
- Low range, alarm
- Mid range, no alarm
- Mid range, alarm
- High range, no alarm
- High range, alarm
- Bad quality

Example

ed 54,45,17,1,0,25.0,50.0
rm -- Low range
sn LOWNA~,6000,5600,124,1,1
sn LOWALM~,6000,5600,124,1,2
rm -- Mid range
sn MIDNA~,6000,5600,124,1,3
sn MIDALM~,6000,5600,124,1,5
rm -- High range
sn HIGHNA~,6000,5600,124,1,6
sn HIGHALM~,6000,5600,124,1,9
rm -- Bad quality
sn BADQUAL~,6000,5600,124,1,7

Digital Dynamic Symbol (ed 54)

PURPOSE: The digital dynamic symbol command creates a dynamic display element that changes according to the current output state of a function block that reports a zero and one state change

COMMAND: **ed 54,46,***tag,flash option*

where

flash-option 0 no flash, 1 - flash, causes the displayed symbol to flash if in alarm and unacknowledged

DISCUSSION: This command requires an **sn** command defined for each of the possible states that can be returned by the function block (i e , zero and one state), and an **sn** command for a bad quality condition returned by the function block. The symbols required include

- Zero state, no alarm
- Zero state, alarm
- One state, no alarm
- One state, alarm
- Bad quality

Example

ed 54,46,20,1
rm -- Zero state
sn ZERONA~,6000,5600,124,1,1
sn ZEROALM~,6000,5600,124,1,2
rm -- One state
sn ONENA~,6000,5600,124,1,3
sn ONEALM~,6000,5600,124,1,5
rm -- Bad quality
sn BADQUAL~,6000,5600,124,1,7

Exception Report Discrete Dynamic Symbol (ed 54)

PURPOSE:

The exception report discrete dynamic symbol command creates a dynamic display element that changes according to certain status indications returned in a station, multi state device driver, device driver, remote motor control block and remote control memory function block exception report Refer to Table B 6 for the types of status indications that can be represented by this dynamic element

COMMAND:

ed 54,58,*tag,flash option,data-option*

where

flash option — 0 no flash, 1 flash, causes the displayed symbol to flash if in alarm and unacknowledged

data option — Refer to Table B 6 for valid option codes, and the data type represented by the code

DISCUSSION:

This command requires an **sn** command defined for each of the possible states that can be returned by the function block It also requires an **sn** command for both alarm and no alarm conditions for the state (i e , each state requires two symbols), and an **sn** command for a bad quality condition returned by the function block Table B 6 shows the number of states returned for each selected option code

Station mode example

```
ed 54,58,16,1,17
rm -- Zero state
sn MANUALNA~,6000,5600,124,1,1
sn MANULALM~,6000,5600,124,1,2
rm -- One state
sn AUTONA~,6000,5600,124,1,3
sn AUTOALM~,6000,5600,124,1,5
rm -- Bad quality
sn BADQUAL~,6000,5600,124,1,7
```

Red tag status example

```
ed 54,58,16,1,8
rm -- Not red tagged
sn NOTRTNA~,6000,5600,124,1,1
sn NOTRTALM~,6000,5600,124,1,2
rm -- Red tagged
sn REDTGNA~,6000.5600.124.1.3
sn REDTGALM~,6000,5600,124,1,5
rm -- Bad quality
sn BADQUAL~,6000,5600,124,1,7
```

Symbol Name (sn)

PURPOSE:

The symbol name command associates a symbol with a specified analog alarm condition or digital state when creating analog and digital dynamic symbols, or exception report discrete dynamic symbols Currently, **sn** commands must immediately follow an **ed 54,45** (analog dynamic symbol), **ed 54,46** (digital dynamic symbol) or **ed 54,58** (exception report discrete dynamic) command

COMMAND:

sn *symbol-name~,x coord,y-coord,size,color*

where

symbol-name	Name of a symbol file to be displayed followed by a tilde (~) The symbol defined here must not have any internal escapes
size	Use 1
color	Color index number from 0 to 63, refer to Table B 2 for color index numbers

Example

ed 54,46,1,0
sn NASTATE0~,500,2600,1,1
sn ALMSTATE0~,500,2600,1,2
sn NASTATE1~,500,2600,1,3
sn ALMSTATE1~,500,2600,1,5
sn BADQUAL~,500,2600,1,6

Advanced Analog Dynamic Symbol (ed 54)

PURPOSE:

The advanced analog dynamic symbol command creates a dynamic display element that changes according to value, alarm or quality conditions The element can show whether the value returned by an analog value reporting function block is currently within a certain range, or it is in a certain alarm condition or quality state

COMMAND:

ed 54,49,*tag,flash-option,variable-type,option,numranges*

where

flash-option	0 no flash, 1 - flash, causes the displayed symbol to flash if in alarm and unacknowledged
variable-type	0 process variable, 1 set point, 2 control output, 3 ratio index
option	1 both ranges and alarm/quality, 2 alarm/ quality only, 3 ranges only
numranges	Number of ranges from 1 to 25 to be specified

DISCUSSION:

This command requires an **rs** command defined for each desired range indication (up to 25), and each alarm condition or quality state that may be reported The command can be defined for range only, alarm only or both range and alarm A quality indication can also be incorporated Alarm indications and **rs** command requirements depend on the analog function block being referenced

Any quality symbol codes must appear after the state symbol codes Not all alarms and qualities have to be specified Any combination is accepted if option 1 or 2 is used

Example

ed 54,49,13,0,0,1,4
rm -- Ranges
rs 20.0,pump20~,6000,5600,1,1,0
rs 40.0,pump40~,6000,5600,1,2,0
rs 60.0,pump60~,6000,5600,1,3,0
rs 80.0,pump80~,6000,5600,1,5,0
rm -- Alarm conditions
rs 30.0,NOALM~,6000,5600,1,7,0
rs 31.0,LOWALM~,6000,5600,1,7,0
rs 32.0,HIGHALM~,6000,5600,1,7,0
rs 33 0,LOW2ALM~,6000,5600,1,7,0
rs 34 0,HIGH2ALM~,6000,5600,1,7,0
rs 35 0,LOW3ALM~,6000,5600,1,7,0
rs 36 0,HIGH3ALM~,6000,5600,1,7,0
rs 37 0,LOWDEV~,6000,5600,1,7,0
rs 38 0,HIGHDEV~,6000,5600,1,7,0
rm -- Qualities
rs 41 0,SUBSTIT~,6000,5600,1,8,0
rs 42 0,INHIBIT~,6000,5600,1,8,0
rs 43 0,DISESTAB~,6000,5600,1,8,0
RS 44.0,BADQUAL~,6000,5600,1,8,0
rs 45 0,SUSPECT~,6000,5600,1,8,0
rm

MSDD Dynamic Symbol - Current State (ed 54)

PURPOSE:

The MSDD dynamic symbol current state command creates a dynamic display element that changes according to the current output state being reported by a multi state device driver function block

COMMAND.

ed 54,56,*tag,flash-option*

where

flash-option 0 no flash, 1 flash, causes the displayed symbol to flash if in alarm and unacknowledged

DISCUSSION.

This command requires an **rs** command defined for each of the possible states that can be returned by the function block (i e , zero, one, two and three state), and an **rs** command can be defined for each quality returned if desired.

The state symbols required include

- Zero state, no alarm
- One state, no alarm
- Two state, no alarm
- Three state, no alarm
- Zero state, alarm
- One state, alarm
- Two state, alarm
- Three state, alarm

Any quality symbol codes must appear after the state symbol codes Not all qualities must be defined Normally, a quality symbol overrides a state symbol An exception to this is if a quality symbol is either not defined, or is missing a symbol name or color parameter for the reported quality. In this case, the last good state symbol displays

Example

```
ed 54,56,157,1
rm -- States 0 thru 3 - no alarm
rs 53.0,MSDLGS3~,6000,4000,1,1,0
rs 52.0,MSDLGS2~,6000,4000,1,1,0
rs 51.0,MSDLGS1~,6000,4000,1,1,0
rs 50.0,MSDLGS0~,6000,4000,1,1,0
rm -- States 0 thru 3 - alarm
rs 57.0,MSDLGS3~,6000,4000,1,3,0
rs 56.0,MSDLGS2~,6000,4000,1,3,0
rs 55.0,MSDLGS1~,6000,4000,1,3,0
rs 54.0,MSDLGS0~,6000,4000,1,3,0
rm -- Qualities
rs 45.0,ADVSYM45~,6000,5000,1,7,0
rs 44.0,ADVSYM44~,6000,5000,1,7,0
rs 43.0,ADVSYM43~,6000,5000,1,7,0
rs 42.0,ADVSYM42~,6000,5000,1,7,0
rs 41.0,ADVSYM41~,6000,6000,1,7,0
rm
```

MSDD Dynamic Symbol - Requested State (ed 54)

PURPOSE· The MSDD dynamic symbol requested state command creates a dynamic display element that changes according to the requested output state for a multi-state device driver function block

COMMAND: **ed 54,57,***tag.flash-option*

where

flash-option 0 no flash, 1 flash, causes the displayed sym bol to flash if in alarm and unacknowledged.

DISCUSSION. This command requires an **rs** command defined for each of the possible states that can be requested for the function block (i e , zero, one, two and three state), and an **rs** command can be defined for each quality returned if desired The state symbols required include

- Zero state, no alarm
- One state, no alarm
- Two state, no alarm
- Three state, no alarm
- Zero state, alarm
- One state, alarm
- Two state, alarm
- Three state, alarm

Any quality symbol codes must appear after the state symbol codes Not all qualities must be defined Normally, a quality sym bol overrides a state symbol An exception to this is if a quality symbol is either not defined, or is missing a symbol name or color parameter for the reported quality In this case, the last good state symbol displays

Example

```
ed 54,57,157,1
rm -- States 0 thru 3 - no alarm
rs 53.0,MSDRQS3~,6000,4000,1,1,0
rs 52.0,MSDRQS2~,6000,4000,1,1,0
rs 51.0,MSDRQS1~,6000,4000,1,1,0
rs 50.0,MSDRQS0~,6000,4000,1,1,0
rm -- States 0 thru 3 - alarm
rs 57.0,MSDRQS3 ,6000,4000,1,3,0
rs 56.0,MSDRQS2~,6000,4000,1,3,0
rs 55.0,MSDRQS1~,6000,4000,1,3,0
rs 54.0,MSDRQS0~,6000,4000,1,3,0
rm -- Qualities
rs 45.0,ADVSYM45~,6000,5000,1,7,0
rs 44.0,ADVSYM44~,6000,5000,1,7,0
```

rs 43.0,ADVSYM43~,6000,5000,1,7,0
rs 42.0,ADVSYM42~,6000,5000,1,7,0
rs 41.0,ADVSYM41~,6000,6000,1,7,0
rm

Range Symbol (rs)

PURPOSE:

The range symbol command associates a symbol with a specified analog range, or an alarm condition or digital state when creating advanced analog and MSDD dynamic symbols. Currently, **rs** commands must immediately follow either an **ed 54,49**, **ed 54,56**, **ed 54,57** and **ed 62,32** command The command can be defined in two different ways

The first method of defining this command can be used to associate a symbol with a specified range In this case, the console pre sents the designated symbol when a reported analog value is equal to, or less than the range value specified in the command When using ranges, the **rs** commands defining ranges must be placed in ascending order within the file This can be used for an advanced analog dynamic symbol only

COMMAND:

rs *range,symbol-name~,x-coord y coord,size color,***0**

where

range	A real number designating the upper boundary of this range The format for this parameter is NNN nnn, where NNN is the whole number and nnn is a decimal fraction A decimal point is required
symbol name	Name of a symbol file to be displayed followed by a tilde (~) The symbol defined here must not have any internal escapes
size	Use 1
color	Color index number from 0 to 63, refer to Table B 2 for color index numbers
0	Must be present (future use)

Example

ed 54,49,1,0,0,3,5
rs 10.0,RANGE1~,500,2600,1,1,0
rs 15.0,RANGE2~,500,2600,1,2,0
rs 20.0,RANGE3~,500,2600,1,3,0
rs 25.0,RANGE4~,500,2600,1,5,0
rs 30.0,RANGE5~,500,2600,1,6,0

The second method of defining this command can be used to associate a symbol with an alarm condition or digital state. In this case, the console presents the designated symbol when the alarm condition or digital state indicated in the code parameter of the command is reported.

COMMAND: **rs** *code,symbol name~,x-coord,y coord,size,color,***0**

where

code	A real number code which selects the alarm condition, digital state or quality the designated symbol is to represent. Refer to Table B-8 for valid codes. A code follows the same format as a specified range, therefore, if the entered code is not valid it will be treated as a range.
symbol-name	Name of a symbol file to be displayed followed by a tilde (~). The symbol defined here must not have any internal escapes.
size	Use 1.
color	Color index number from 0 to 63, refer to Table B-2 for color index numbers.
0	Must be present (future use).

Table B-8 Advanced Dynamic Symbol Codes

Code	Condition	Type
30.0	No alarm	Analog
31.0	Low	Analog
32.0	High	Analog
33.0	2-low	Analog
34.0	2-high	Analog
35.0	3-low	Analog
36.0	3-high	Analog
37.0	Low deviation	Analog
38.0	High deviation	Analog
41.0	Substituted	Analog, MSDD
42.0	Inhibited	Analog, MSDD
43.0	Disestablished	Analog, MSDD
44.0	Bad quality	Analog, MSDD
45.0	Suspect	Analog, MSDD
50.0	State 0 (no alarm)	MSDD
51.0	State 1 (no alarm)	MSDD
52.0	State 2 (no alarm)	MSDD
53.0	State 3 (no alarm)	MSDD
54.0	State 0 (alarm)	MSDD
55.0	State 1 (alarm)	MSDD
56.0	State 2 (alarm)	MSDD
57.0	State 3 (alarm)	MSDD

DISCUSSION:

When using the command to specify alarm conditions or states, quality conditions have precedence over alarm or state conditions If both an alarm or state and quality condition occur at the same time, the symbol representing the quality condition displays

Example

ed 54,56,1,0
rs 53.0,NASTATE3~,500,2600,1,1,0
rs 52.0,NASTATE2~,500,2600,1,2,0
rs 51.0,NASTATE1~,500,2600,1,3,0
rs 50.0,NASTATE0~,500,2600,1,5,0

Advanced dynamic symbols have the option of using a good quality or no alarm symbol in place of a bad quality or alarm symbol The **rs** lines can be coded to permit

1 The name or color of an alarm symbol to be replaced by the name or color of a range symbol

2 The name or color of a quality symbol to be replaced by the name or color of a range symbol, or the name or color of an alarm symbol depending on the value, alarm condition or quality being reported

To do this, an **rs** command for an alarm and quality symbol can be coded having a blank (or missing) symbol name to indicate that some previous symbol should be used for occurrences of that type alarm or quality condition Similarly, the color parameter for the **rs** command can be set to **-1** to indicate that the color should be taken from some previous symbol (color missing)

The order of precedence when selecting symbols or colors is quality over alarm, alarm over no alarm value (range) or state symbol Therefore, if a symbol name in a quality **rs** command is missing, the name is replaced with the name found in the alarm symbol if one is defined If a symbol name in an alarm **rs** command is missing, the name is replaced with the name found in the value according to range or state symbol The same holds true for a missing color

A missing symbol name parameter must be coded as **,~**, with the tilde present For example.

rs 34.0,~,500,2600,1,1,0

A missing color parameter must be coded as **,-1**, For example.

rs 34.0,SYMNAME~,500,2600,1,-1,0

Display File Example

The example ıs a complete dısplay source file The commands and escapes ın thıs example create the system status overvıew page shown ın Fıgure 13 1 Thıs dısplay defınes the statıc text and N90STA tags (nodes) whose status appear at the page. It also desıgnates the symbol fıles that dısplay the status ınformatıon for each of the defıned nodes, and the ınteractıve escape commands requıred to call the next status page ın a hıerarchy of status pages

```
bm 0,N90STAT1~
bp 0,N90STAT1~,0
sm 1
bb
is 1,1
lc 4
ch 124
cs 01
tc 6
pl 400,7185;9200,0;0,-6800;-9200,0;0,6800~
rm
tc 5
tx 0,4200,7000,System Status~
rm
rm --- OMCS legend
tx 0,6800,2000,O = Node Offline~
tx 0,6800,1800,M = Module Errors~
tx 0,6800,1600,C = Plant Comm. Problem~
tx 0,6800,1400,S = Node Status Problem~
rm
rm ---numbers for column 1 nodes
tx 0,500,6800,01~
tx 0,500,6600,02~
tx 0,500,6400,03~
tx 0,500,6200,04~
tx 0,500,6000,05~
tx 0,500,5600,06~
tx 0,500,5400,07~
tx 0,500,5200,08~
tx 0,500,5000,09~
tx 0,500,4800,10~
tx 0,500,4400,11~
tx 0,500,4200,12~
tx 0,500,4000,13~
tx 0,500,3800,14~
tx 0,500,3600,15~
tx 0,500,3200,16~
tx 0,500,3000,17~
tx 0,500,2800,18~
tx 0,500,2600,19~
tx 0,500,2400,20~
tx 0,500,2000,21~
tx 0,500,1800,22~
```

```
tx 0,500,1600,23~
tx 0,500,1400,24~
tx 0,500,1200,25~
rm
rm ---numbers for column 2 nodes
tx 0,3600,6800,26~
tx 0,3600,6600,27~
tx 0,3600,6400,28~
tx 0,3600,6200,29~
tx 0,3600,6000,30~
tx 0,3600,5600,31~
tx 0,3600,5400,32~
tx 0,3600,5200,33~
tx 0,3600,5000,34~
tx 0,3600,4800,35~
tx 0,3600,4400,36~
tx 0,3600,4200,37~
tx 0,3600,4000,38~
tx 0,3600,3800,39~
tx 0,3600,3600,40~
tx 0,3600,3200,41~
tx 0,3600,3000,42~
tx 0,3600,2800,43~
tx 0,3600,2600,44~
tx 0,3600,2400,45~
tx 0,3600,2000,46~
tx 0,3600,1800,47~
tx 0,3600,1600,48~
tx 0,3600,1400,49~
tx 0,3600,1200,50~
rm
rm ---numbers for column 3 nodes
tx 0,6600,6800,51~
tx 0,6600,6600,52~
tx 0,6600,6400,53~
tx 0,6600,6200,54~
tx 0,6600,6000,55~
tx 0,6600,5600,56~
tx 0,6600,5400,57~
tx 0,6600,5200,58~
tx 0,6600,5000,59~
tx 0,6600,4800,60~
tx 0,6600,4400,61~
tx 0,6600,4200,62~
tx 0,6600,4000,63~
rm
rm --- column 1 node status line symbols
rm --- node 1 thru 25
es NODLINE~,1,900,6800,01
es NODLINE~,1,900,6600,02
es NODLINE~,1,900,6400,03
es NODLINE~,1,900,6200,04
es NODLINE~,1,900,6000,05
es NODLINE~,1,900,5600,06
```

```
es NODLINE~,1,900,5400,07
es NODLINE~,1,900,5200,08
es NODLINE~,1,900,5000,09
es NODLINE~,1,900,4800,10
es NODLINE~,1,900,4400,11
es NODLINE~,1,900,4200,12
es NODLINE~,1,900,4000,13
es NODLINE~,1,900,3800,14
es NODLINE~,1,900,3600,15
es NODLINE~,1,900,3200,16
es NODLINE~,1,900,3000,17
es NODLINE~,1,900,2800,18
es NODLINE~,1,900,2600,19
es NODLINE~,1,900,2400,20
es NODLINE~,1,900,2000,21
es NODLINE~,1,900,1800,22
es NODLINE~,1,900,1600,23
es NODLINE~,1,900,1400,24
es NODLINE~,1,900,1200,25
rm
rm — column 2 node status line symbols
rm — node 26 thru 50
es NODLINE~,1,4000,6800,26
es NODLINE~,1,4000,6600,27
es NODLINE~,1,4000,6400,28
es NODLINE~,1,4000,6200,29
es NODLINE~,1,4000,6000,30
es NODLINE~,1,4000,5600,31
es NODLINE~,1,4000,5400,32
es NODLINE~,1,4000,5200,33
es NODLINE~,1,4000,5000,34
es NODLINE~,1,4000,4800,35
es NODLINE~,1,4000,4400,36
es NODLINE~,1,4000,4200,37
es NODLINE~,1,4000,4000,38
es NODLINE~,1,4000,3800,39
es NODLINE~,1,4000,3600,40
es NODLINE~,1,4000,3200,41
es NODLINE~,1,4000,3000,42
es NODLINE~,1,4000,2800,43
es NODLINE~,1,4000,2600,44
es NODLINE~,1,4000,2400,45
es NODLINE~,1,4000,2000,46
es NODLINE~,1,4000,1800,47
es NODLINE~,1,4000,1600,48
es NODLINE~,1,4000,1400,49
es NODLINE~,1,4000,1200,50
rm
rm — column 3 node status line symbols
rm — node 51 thru 63
es NODLINE~,1,7000,6800,51
es NODLINE~,1,7000,6600,52
es NODLINE~,1,7000,6400,53
es NODLINE~,1,7000,6200,54
```

```
es NODLINE~,1,7000,6000,55
es NODLINE~,1,7000,5600,56
es NODLINE~,1,7000,5400,57
es NODLINE~,1,7000,5200,58
es NODLINE~,1,7000,5000,59
es NODLINE~,1,7000,4800,60
es NODLINE~,1,7000,4400,61
es NODLINE~,1,7000,4200,62
es NODLINE~,1,7000,4000,63
rm
rm - ei display selects for node status displays
ei 108,82,48,49,NODSTA01~
ei 108,82,48,50,NODSTA02~
ei 108,82,48,51,NODSTA03~
ei 108,82,48,52,NODSTA04~
ei 108,82,48,53,NODSTA05~
ei 108,82,48,54,NODSTA06~
ei 108,82,48,55,NODSTA07~
ei 108,82,48,56,NODSTA08~
ei 108,82,48,57,NODSTA09~
ei 108,82,49,48,NODSTA10~
ei 108,82,49,49,NODSTA11~
ei 108,82,49,50,NODSTA12~
ei 108,82,49,51,NODSTA13~
ei 108,82,49,52,NODSTA14~
ei 108,82,49,53,NODSTA15~
ei 108,82,49,54,NODSTA16~
ei 108,82,49,55,NODSTA17~
ei 108,82,49,56,NODSTA18~
ei 108,82,49,57,NODSTA19~
ei 108,82,50,48,NODSTA20~
ei 108,82,50,49,NODSTA21~
ei 108,82,50,50,NODSTA22~
ei 108,82,50,51,NODSTA23~
ei 108,82,50,52,NODSTA24~
ei 108,82,50,53,NODSTA25~
ei 108,82,50,54,NODSTA26~
ei 108,82,50,55,NODSTA27~
ei 108,82,50,56,NODSTA28~
ei 108,82,50,57,NODSTA29~
ei 108,82,51,48,NODSTA30~
ei 108,82,51,49,NODSTA31~
ei 108,82,51,50,NODSTA32~
ei 108,82,51,51,NODSTA33~
ei 108,82,51,52,NODSTA34~
ei 108,82,51,53,NODSTA35~
ei 108,82,51,54,NODSTA36~
ei 108,82,51,55,NODSTA37~
ei 108,82,51,56,NODSTA38~
ei 108,82,51,57,NODSTA39~
ei 108,82,52,48,NODSTA40~
ei 108,82,52,49,NODSTA41~
ei 108,82,52,50,NODSTA42~
ei 108,82,52,51,NODSTA43~
```

```
ei 108,82,52,52,NODSTA44~
ei 108,82,52,53,NODSTA45~
ei 108,82,52,54,NODSTA46~
ei 108,82,52,55,NODSTA47~
ei 108,82,52,56,NODSTA48~
ei 108,82,52,57,NODSTA49~
ei 108,82,53,48,NODSTA50~
ei 108,82,53,49,NODSTA51~
ei 108,82,53,50,NODSTA52~
ei 108,82,53,51,NODSTA53~
ei 108,82,53,52,NODSTA54~
ei 108,82,53,53,NODSTA55~
ei 108,82,53,54,NODSTA56~
ei 108,82,53,55,NODSTA57~
ei 108,82,53,56,NODSTA58~
ei 108,82,53,57,NODSTA59~
ei 108,82,54,48,NODSTA60~
ei 108,82,54,49,NODSTA61~
ei 108,82,54,50,NODSTA62~
ei 108,82,54,51,NODSTA63~
rm
pe 124,CONTROL~
ep
em
%%
%%
```

Symbol File Examples

These examples are SYMBOLS, not complete displays Symbols do not require the **bm** and **em** commands found in display files

Analog Faceplate

The commands and escapes in this example create an analog value faceplate symbol This faceplate uses an ANALOG tag type

```
bp 1,analog1~,0
sm 1
bb
rm Beginning of emitted code~
rf 1000,1000
fc 1
lc 1
tc 1
lw 1
lc 4
pl 999,1002;2180,0;0,1580;-2180,0;0,-1580~
ec 34,32,1,1439,2396,124,5,0,1,14,0
ec 35,32,1,1342,2256,124,5,0,1,16,0
ec 35,32,1,1342,2116,124,5,0,1,16,16
ed 42,32,1,1489,1512,124,3,0,7,1,6,2,0
ec 38,32,1,2109,1512,124,5,0,1
ea 56,32,1,1099,1065,124,7,0,7,1
```

```
rm ***END*** of emitted code~
ep
%%
```

Digital Control Station

The commands and escapes in this example create a digital control station faceplate symbol This faceplate uses a STATION tag type

```
bp 1,dcsfull1~,0
sm 1
bb
rm Beginning of emitted code~
rf 1000,1000
fc 1
lc 1
tc 1
lw 1
lc 5
pl 1799,3402;100,0~
pl 1799,3262;50,0~
pl 1799,3122;50,0~
pl 1799,2982;50,0~
pl 1799,2842;50,0~
pl 1799,2702;75,0~
pl 1799,2562;50,0~
pl 1799,2422;50,0~
pl 1799,2282;50,0~
pl 1799,2142;50,0~
pl 1799,2002;100,0~
pl 1239,1652;0,100~
pl 1409,1652;0,50~
pl 1579,1652;0,50~
pl 1749,1652;0,50~
pl 1919,1652;0,50~
pl 2089,1652;0,75~
pl 2259,1652;0,50~
pl 2429,1652;0,50~
pl 2599,1652;0,50~
pl 2769,1652;0,50~
pl 2939,1652;0,100~
lc 4
pl 999,1002;2180,0;0,3256;-2180,0;0,-3256~
ec 34,32,1,1439,4056,124,5,0,1,14,0
ec 35,32,1,1342,3916,124,5,0,1,16,0
ec 35,32,1,1342,3756,124,5,0,1,16,16
ec 38,32,1,1074,3502,124,5,0,1
ec 41,39,1,1669,2002,50,5,0,1400
ec 40,39,1,2569,1852,124,5,0,1,6,2,0,1700
ed 49,39,1,1029,2002,124,3,0,7,1,6,2,0,1400
ed 49,39,1,1974,2002,124,3,0,3,1,6,2,1,1400
ed 51,41,1,1874,2002,100,3,0,3,1,1400
ed 50,39,1,1714,2002,40,3,0,7,0,1400
ed 50,40,1,1239,1567,40,3,0,3,2,1700
ed 47,32,1,1869,1202,124,3,0,1
```

```
ed 48,32,1,2569,1202,124,3,0,1
ed 49,40,1,1249,1402,124,3,0,3,1,4,1,2,1700
ea 56,32,1,1099,1065,124,7,0,7,1
ec 39,39,1,2569,2002,124,5,0,1,6,2,1400
bc 1,4
tc 5
ch 124
cs 20
tx 0,2989,1637,%~
ed 100,32,1,1020,3680,124,3,0,2,1,2,0
rm ***END*** of emitted code~
ep
%%
```

Multi-State Device Driver

The commands and escapes in this example create a multi state device driver faceplate symbol This faceplate uses an MSDD tag type

```
bp 1,msdevdr1~,0
sm 1
bb
rm Beginning of emitted code~
rf 1000,1000
fc 1
lc 1
tc 1
lw 1
lc 4
pl 999,1002;2180,0;0,1580;-2180,0;0,-1580~
ec 37,48,1,1289,1907,124,5,0,0,1
ec 37,47,1,1289,1737,124,5,0,0,1
ec 37,34,1,1289,1567,124,5,0,1
ec 37,33,1,1289,1397,124,5,0,1
ed 61,48,1,1899,1907,124,3,0,7
ed 61,47,1,1899,1737,124,3,0,7
ed 61,34,1,1899,1567,124,3,0,7
ed 61,33,1,1899,1397,124,3,0,7
ed 59,33,1,2279,1907,124,3,0,7,1
ed 59,34,1,2279,1737,124,3,0,7,1
ed 59,47,1,2279,1567,124,3,0,7,1
ed 59,48,1,2279,1397,124,3,0,7,1
ed 60,32,1,1719,1227,124,3,0,1
ed 58,32,1,2799,1227,124,3,0,1
ec 34,32,1,1439,2396,124,5,0,1,14,0
ec 35,32,1,1342,2256,124,5,0,1,16,0
ec 35,32,1,1342,2116,124,5,0,1,16,16
ea 56,32,1,1099,1065,124,7,0,7,1
ed 100,32,1,1025,1975,124,3,0,2,1,2,0
rm ***END*** of emitted code~
ep
%%
```

22 49 00 04 10 07

APPENDIX C - HARD DISK UTILIZATION

INTRODUCTION

An ımportant consıderatıon ın the configuratıon process ıs the amount of hard dısk space utılızed This appendıx explaıns how to calculate the amount of space a configuratıon wıll occupy on the hard dısk.

OIS software occupıes approxımately eıght megabytes

Displays - the total amount of hard dısk space to allocate for storage of amount of space to allow should be one megabyte To calculate the amount of hard dısk space consumed by dısplays, use the formula

No of dısp ays × (average dısplay sıze × retent on factor)

The amount of space needed for a sıngle dısplay varıes from four kılobytes for a sımple menu to up to 40 kılobytes for a complex dısplay The average dısplay sıze depends on the complexıty of the actual dısplay files Usıng a 40 kılobyte average dısplay sıze calculates a ***worst case*** amount The utılızatıon example gıven later ın thıs sectıon uses a 15 kılobyte average dısplay file sıze

When processıng a dısplay source file (***.DT***) and ıts assocıated symbol source files (***.DT***) for use at the console, the files can eıther be copıed to the hard dısk of the console or remaın on floppy dısk. In eıther case, these source files must be processed usıng the *Dısplay Generator* before they can be used ın normal operatıons The result of thıs processıng ıs a usable ***.DU*** dısplay file and assocıated ***.DL*** symbol files The ***.DU*** and ***.DL*** files occupy approxımately the same amount of dısk space as theır corre spondıng ***.DT*** source files

Both sets of dısplay files must be consıdered when calculatıng the amount of hard dısk space consumed by dısplays Thıs determınes the value used as the retentıon factor ın the dısplay calculatıon Once a dısplay ıs processed and has no errors, ıts assocıated ***.DT*** files can be removed from the hard dısk ıf desıred In the dısplay calculatıon, the retentıon factor should be one ıf only the ***.DU/.DL*** files are retaıned on the hard dısk, two ıf ***.DU/.DL*** and ***.DT*** files

Trend data the mınımum amount of space to allow ıs one megabyte The maxımum depends on the sıze of the hard dısk drıve and how much space ıs allocated for other functıons

Use the following formula to calculate the disk space usage for a standard trend (normal and fast)

(numsamples x 4 bytes) + 48 bytes

where

numsamples — Total number of samples collected over a certain period of time The number of samples is equal to.

time period   collection resolution

Table C 1 gives examples of calculated trend data disk space utilization for standard trends

Table C 1   Standard Trend Data Disk Space Utilization

Trend Type	Utilization per Trend
15 second trended over 1 day	23 040 + 48 bytes
15 second trended over 2 days	46 080 + 48 bytes
15 second trended over 3 days	69 120 + 48 bytes
15 second trended over 4 days	92,160 + 48 bytes
15 second trended over 5 days	115,200 + 48 bytes
15 second, trended over 6 days	138 240 + 48 bytes
15 second trended over 7 days	161 280 + 48 bytes
1 minute trended over 1 day	5 760 + 48 bytes
1 minute trended over 2 days	11,520 + 48 bytes
1 minute, trended over 3 days	17,280 + 48 bytes
1 minute, trended over 4 days	23,040 + 48 bytes
1 minute, trended over 5 days	28 800 + 48 bytes
1 minute trended over 6 days	34 560 + 48 bytes
1 minute trended over 7 days	40 320 + 48 bytes

Intermediate time frames can be calculated by interpolation For example, a 15 second trend, trended over eight hours

$\left(\frac{8}{24} \times 23,040\right) + 48$ 7,728 bytes per trend

500 one minute trends, trended over seven days

$(500 \times 40,320) + 48 \approx 20\ 2M$

The dısk space usage for enhanced trends depends on the varıable beıng trended Use one of the followıng formulas to calculate the dısk space usage for an enhanced trend

ANALOG	(numsamples × 10 bytes) + 48 bytes
DADIG	(numsamples × 8 bytes) + 48 bytes
DANG	(numsamples × 23 bytes) + 48 bytes
Dıgıtal type	(numsamples × 8 bytes) + 48 bytes
RMSC	(numsamples × 10 bytes) + 48 bytes
STATION	(numsamples × 23 bytes) + 48 bytes

where:

numsamples — Depends on the trend definıtıon The process engıneer sets the maxımum number of samples the console ıs to save on ıts hard dısk durıng definıtıon of a trend Refer to ***Trend Definition*** ın the ***OIS Configuration*** sectıon for specıfics.

Log data use the followıng formulas to calculate the dısk space for log files

1 Log definitıon files consume (approxımately)

[6 5 kbytes + (6 bytes × no of co umns) × no of rows] × no of ogs defined

2 Log retentıon fıles consume (approxımately)·

(no of rows × 132 characters) × total no of retentıons defined for all ogs

3 Log output files consume (approxımately)

(132 characters per row × no of rows) × n

where

n — Number of log output fıles Ranges from one log output file to possıbly 35 log output files per log (when logs are gen erated faster than the prınter can handle)

4 Log data files consume (approxımately)

(8 bytes per dynamıc value cel defined + 1 5 kbytes) × n

where

n — Number of log data files Ranges from one data file to possıbly 35 data fıles per log (when logs are generated faster than the prınter can handle)

SOE logs use the following formulas to calculate the disk space for SOE logs

1 Each data file consumes

   8 bytes × no of events

   Total = (8 × no of events) × no of SOE logs defined

2 Each output file consumes (approximately)

   132 characters × no of events

3 Each SOE retention consumes (approximately)

   132 characters × no of events

4 Each log is limited to nine retentions Its data files may range from one to 35 files per SOE log, similar for its output files

CONSIDERATIONS

The amount of hard disk space required by the console is dynamic The amount of space needed at any given time depends on the operations or tasks the console is performing Use the formulas in this appendix to calculate the requirements, then add the following percentages to accommodate for the dynamic needs of the console to insure optimum performance

- 20 percent if configured for logging
- 10 percent if not configured for logging

UTILIZATION EXAMPLE

The console in this example has the following attributes

- 5,000 tags
- 667 displays (15 kilobytes average display file size, ***.DU/.DL*** and ***.DT*** files retained on hard disk)
- 100 standard trends
- 67 megabyte formatted hard disk

  NOTE The console can use a variety of different hard disk drives The examples in this section use the 67-megabyte hard disk drive for calculations

Utilization Factors

System software	8 0M
Tag utilization	3 0M
Display utilization:	$667 \times (15k \times 2) \approx 20\ 0M$
Trend utilization	Consider the types of trends being configured Use the worst possible case for number of trends

Example 100 standard trends at 15-second intervals over 7 days

$100 \times 161{,}328 \approx 16\ 1M$ (trend data)

$67M \quad 16\ 1M = 50\ 9M$ (remaining hard disk space)

Summary

5,000 tags –	3 0M	
667 displays	20 0M	
OIS software	8 0M	
100 15 sec/7 day trends	16 1M	
Total disk usage –	47 1M	
Unused –	19 9M	(available for other functions, e g , archiving and logging)

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APPENDIX D - TASK CODES

INTRODUCTION

The interactive tasks listed in this section may appear in system generated messages of all types (error messages, screen messages, MON68K reports, etc) These messages help to identify and trace specific problems with the operator interface station (OIS) They also allow viewing the overall status of the system In either case, the console presents these task codes to identify a given function This section provides a list of task codes and their meaning separated into interactive tasks and resident tasks

CONFIGURATION AND OPERATION TASK CODES

The codes that apply to configuration programs and programs that interact with the operator include

ACC	Alarm comment file displays and verifies the contents of the alarm comment file
ADC	Automatic display configuration assigns DIGITAL tags, displays and pop up elements to automatic display tag sets
ADS	Annunciator display panel configuration assigns dis plays and key macros to annunciator display panel (ADP) pushbuttons
AGC	Alarm group configuration configures alarm groups for tones, relays, and tag ranges
ASF	Alarm summary format configuration - configures line formats, colors, and titles for periodic alarm summaries
CAL	Touch screen calibration calibrates Elographics touch screen controllers
CDT	Character definition - defines characters for complex languages
CEL	Report generator cell definition - defines the format of custom logs through a spreadsheet like interactive
CMD	Communication module details reports the specifica tions for selected communications modules This is part of the INFI NET diagnostics function
CTP	CIU task priority - sets the priority of transactions for the communications interface unit

DAC	Display archive data interaction - displays the directories of retrieved archive data
DED	Display generator translates console ***.DT*** display source files into binary ***.DU*** and ***.DL*** files
DLG	Display log displays custom logs and SOE logs on the screen It also enables viewing the continuous events log and the periodic events log
DMD	Display mask definition sets security levels for individual displays
DTR	Display translator used for converting text on menu displays (***.DS*** files)
DVT	Archive data type to volume definition assigns volume name, overwrite priority, and on or off status changes for archive volumes
EEC	Event and error counters reports the event and error counters for selected nodes This is part of the INFI NET diagnostics function
ELF	Event log format configuration configures event log item formats and colors
EUD	Engineering unit descriptors definition configures engineering unit descriptors
EVT	Event log configuration selects alarms, state changes, operator notes, operator actions, logical printer numbers, etc for event logs
GEN	Report generator configuration configures start times, completion times, log types, number of retentions, etc for custom logs
HIC	Tag historian defines groups of tag data to be archived
INH	Group alarm inhibit inhibits entire alarm groups by individual group or range of groups
KTA	Key to action assignment assigns displays and key macros to keyboard function keys
LCD	Logical CRT definition/console definition associates a logical CRT number with a specific console and screen This information is used with the password security function
LOG	Logging parameters configuration defines logging shift times

LSD	Logic state descriptors definition configures logic state descriptors
LST	Log status summary - displays current log status for all log types Allows activation, deactivation, and cancellation of log reports
LTR	Loop topology report - displays the topology of a loop. This is part of the INFI-NET diagnostics function
MAC	Key macro definition configures macros of key sequences to be processed when ADP pushbuttons or function keys are pressed
MCF	System configuration - configures primary system attributes.
MFR	Module firmware displays existing module firmware revision levels for the selected modules
MIS	Archive miscellaneous definitions defines disk space available for archive storage and retrieval, fullness warning level, and magnetic tape density
MPR	Module problem report displays module status bytes and module problem reports using soft key escapes
NTR	Node topology report reports the topology for selected nodes This is part of the INFI NET diagnostics function.
OCC	Operator configurable display configuration - assigns faceplate names, trend colors, etc for operator configurable displays
OCD	Operator configurable display builder - creates operator displays using faceplates for tags, trends, and alarm summaries
OTA	Operator assignable trend configuration assigns tags and INFI 90 function blocks for operator assignable two second-trend displays
PA	Printer assignment assigns logical printer numbers to actual physical printers
PAS	Alarm summary report definition - configures periodic and tag triggered alarm summary reports
PCM	Printer color maps defines text and line color substitution for hard copies on systems with color printers
PDF	Peripheral device failover - configures the failover device and method of failover for screens and printers

PENA	Trend pen general parameters
PENB	Trend pen device definition
PENC	Trend pen device assignment
PLS	PCU management downloads, saves and verifies PCU module configurations from the console
POI	PCU configuration configures INFI 90 function blocks, module mode changes, etc
PRM	Operating parameters displays the characteristics of a tag such as current value or state, alarm limits, alarm comment, etc. at a single display It also enables operations specific to certain types of tags such as manually inhibit, scan on or off, substitute value, etc
QPC	Queued print cancellation displays a list of files queued to a printer, and gives the ability to cancel any or all queued print requests
REL	Relay configuration - configures logical relays for duration, keyboard number, and actual relay number on keyboard
RET	Archive retrieval interaction retrieves archived trends, logs, events, PCU configurations, and tag data
RMC	RMCB text configuration configures text for remote motor control block error codes
SAT	System attribute configuration selects system attributes such as tag name, alarm comment, and tag descriptor for alternate languages
SDE	Show display errors retrieves errors encountered within a display source file (***.DT***) during processing of the file using the display generator
SMC	Security mask configuration - defines security level, access rights and key lock function, and logical CRT access
SOEA	SOE recorder configuration configures any parameters associated with sequence of event recorders
SOEB	SOE report definition configures any parameters associated with sequence of events reports
STO	Archive storage interaction enables demanding archival storage of events, logs, PCU configurations, trends, and tag data

TCF	Tag configuration configures attributes for all tag types such as tag name, descriptor, block address, etc
TDC	Trend definition configures attributes for distributed trends such as trend resolution, collection period, and block address
TDF	Time and date format defines the format to display the system time and date on the console.
TDP	Trend list to printer prints the trend database using different search constraints such as trend mode, hardware address, and wild card name options
TIM	Set time and date adjusts time and date for the console, which also propagates to the INFI 90 system through time synchronization
TLP	Tag list to printer - prints tag configuration using different search attributes such as tag type and wild card names
TON	Tone configuration configures logical tones for duration, keyboard number, volume, pitch, and actual tone number on keyboard
TSC	Text substitution - configures all ASCII text throughout the console
TST	Text selector block text configuration - configures text message numbers for support of the text selector block (function code 151)
TSU	Tag summaries - displays and prints tag data using data criteria such as tags in alarm, bad quality tags, off scan tags, and inhibited tags
UPD	User password definition defines user ID, password, security level, access to individual tag groups and regional access for individual passwords
VMD	Archive volume to media definition defines archival volume descriptors, media type, time span, and time of day to output
XCP	Exception statistics - reports the exception statistics for selected nodes This is part of the INFI NET diagnostics function
XYC	XY plot definition defines XY plot parameters such as status, plot type, and mode

RESIDENT TASK CODES

The codes that apply to background programs (data collection, I/O interfaces, etc) that make up the core of the system include

ADX	*Automatic display executive* handles the automatic callup of displays and pop up elements to the screen based on the state transition of a DIGITAL tag
AS	Alarm summary handles display of alarms in custom alarm summaries.
BTM	PCU configuration handles the reading of block data, deleting blocks, and writing blocks for INFI 90 module configuration
CCP	Keyboard interaction handles interfacing between the console and keyboard for input from the mylar keyboard, touch point, annunciator display panel, and auxiliary engineering keyboard
CHR	Chronological scheduler handles periodic scheduling of logs, periodic alarm summaries, and operator as signable trends
CIU	Communications interface task handles interfacing of the console with the IIMCP01 module Translates mes sages within the system (trend polls, control requests, tag connects, etc) into command and reply sequences for the interface unit Polls exception reports and routes the reports to database tasks
DBR	Database retrieval executive handles data retrieval for the tag historian.
DBS	Database storage management handles data storage for the tag historian
DDT	Diagnostic/debug terminal utility and diagnostic task used to create files, delete files, copy files, display memory, run command files, etc
DOT	Display optimizing translator handles optimization of user configured displays and real-time trend displays
DSU	Dynamic display manager handles dynamic updates of tag data on faceplates and any graphic displays
DSX	Display executive task handles the forwarding of display requests to all tasks that need to search the display file for dynamic items, escape sequences, trend elements, alarm elements, etc
ERR	Operator messages handles display of operator error messages on the bottom of the screen

EVL	Event log manager - handles formatting of event log items for print and storage to disk
FCP	Function code processor interfaces function block operation requests from the virtual module of the con sole to its communications interface unit
FST	File spooler
FT1	Timer task 1 CPU utilization task
FT2	Timer task 2 CPU utilization task
GPL	General polling data manager handles collection of tag exception report data and block output data for op erator assignable trends
INI	Initialization handles start-up of all console tasks, reading of database into memory, and initialization of various memory tables upon start-up
INT	Interactive program executive handles activation of any interactive type program or background task
IT*n*	Screen interactive loader handles relocation of any interactive program called for screen one (IT0) and screen two (IT1)
LDC	Logging data collector handles collection of tag and trend data for custom logs
M68K	Monitor 68K allows error messages displayed on the M68K terminal to be redirected to a circular file on the console for later review and printing
NCP	Node communications processor handles tag broad-cast messages to and from a global database manager work station, and display file transfers from a software, logging, database and graphics work station
OC*n*	Operator control handles operator control of process control and data acquisition tags for screen one (OC1) and screen two (OC2)
OPS	Operator status handles output of time, date, alarm groups, and keyboard status information on the screen.
ORA	Operator request for action handles display and in teraction with operator for action requests such as asking for a floppy disk to be installed in the drive for archive purposes
PRX	Periodic executive task - handles periodic scheduling of alarm summary and event logs

PST	Print spooler handles interfacing with printers for printing logs, events, screen copies, files, etc
PSX	Password security executive
RDF	Floppy disk data archive manager.
RDM	Magnetic tape data archive manager
RDO	Optical disk data archive manager
RDX	Archive executive task
RPT	Report format handles formatting of custom logs for print and archive
RRX	Archive retrieval executive task
RSX	Archive storage executive task
SCP	Segment control processor executes the function code blocks in the virtual module of the console It supports up to eight segment control blocks in the virtual module
SCT	Print screen - sets up the screen of the console for the copy screen function to capture
SDD	System device status handles detection and update of device status for monitors, printers, keyboards, etc
SEL	Sequence of events data collection handles collection of SOE data for SOE logs
SLC	Soft key select interactive - handles interfacing with operator for callup of a tuning display, block details display, operator assignable trends display, etc using the soft key escape
TD1	Trend display handles display of distributed trend data and operator assignable trend data It also handles panning, zooming, and time cursor movement on trend displays
TDD	Tag dynamic database manager handles alarm processing of exception reports, update of exception reports in database, and requests from within the system for tag dynamic data
TCD	Tag static database manager - handles connects and disconnects to the tag database to acquire static configuration data (names, descriptors, etc)
TRD	Trend data manager - handles trend definition changes and return of distributed trend data for display, logging, and archive purposes

VDI	Virtual display metafile interpreter - handles interface with the graphics card for display data on the screen. Also does translation of display commands into graphics card format
XYM	XY plot data manager handles data collection and management for XY plots
XYP	XY plot handles drawing and updating of XY plots

APPENDIX E - ERROR MESSAGES

INTRODUCTION

The operator interface station (OIS) presents the messages in this section to inform the operator of the status of a desired action. Some messages indicate errors, while others prompt for actions or provide information In the case of a prompt message, the console requires a response before continuing

ERROR MESSAGES

·ERR 1, *Invalid Operation Requested*

The attempted operation is not valid for the current display or function Refer to the appropriate section in the instruction for an explanation of valid operations

:ERR 2, *Value is Out of Range*

The entered value is not valid for the current display or function Refer to the appropriate section in the instruction for valid entries

ERR 3, *Wrong Set of Keys Being Used*

Contact Bailey Controls Company

ERR 4, *No Response to the requested action*

Unable to reset the configured RCM tag for the trend pen function Examine the module configuration (no feedback to the RCM tag)

ERR 5, *Unexpected Key*

1 Key entered in calculator sequence not allowed Enter the calculation with correct characters

2 Bottom line prompts for annunciator display panel received invalid key Try another key

ERR 6, *Invalid Denominator in Input Field*

Zero entered as the denominator in the calculator function Enter calculation with non zero denominator

ERR 7, Invalid Input

The input is not valid for the current display or function Refer to the appropriate section in the instruction for valid entries

ERR 8, Shift Times are not in ascending order

Modify logging parameters

MSG 9, Display File(s) is/are Being Processed

Informs that display processing has begun while using the display generator It may take a few minutes for this message to occur if entering a wild card request that satisfies several files No action required

MSG 10, File Not Processed Internal Error

The attempt to process a file failed because of an internal operating system error Wait a few minutes and try again

MSG 11, Log skeleton has been queued for print

Acknowledges request for print of log skeleton No operator action required

MSG 12, Invalid Tag Entered

1 The tag name or index number entered is not valid or not defined in the database Enter a valid tag name or index number

2 The entered tag is not of the correct type for the function Verify valid tag types used by the function

MSG 13, Loop failed to respond to the request

Mail to database failed for operator control (OC) Retry controlling the tag

MSG 14, Gathering tag static data failed

Obtaining static data of a tag from the database failed Retry controlling the tag

MSG 15, Gathering tag dynamic data failed

Obtaining dynamic data of a tag from the database failed Retry controlling the tag

ERR 16, Keyboard # n does not exist

Assigned a screen to a nonexistent keyboard Enter keyboard number that has a physical keyboard

ERR 17, CRT # n does not exist

Assigned a keyboard to a nonexistent screen or used a screen number of a nonexistent screen Enter a screen number that has a physical CRT.

ERR 18, Printer # n does not exist

Assigned a screen to a nonexistent printer Enter printer number that has a physical printer

MSG 19, All alarms on screen are acknowledged

Pressed an acknowledge alarm key while all alarms currently on the screen are acknowledged No action required

MSG 20, Cannot configure trends, max trends 0

The number of trends in system configuration is set to *0* Change the number of trends in system configuration to any valid number except zero

MSG 21, Invalid action for this type of station

Invalid control key for type of station being controlled Control the station with proper control keys (OC)

ERR 22, LEDG can only run on 1 CRT, press ESCAPE

The display generator function is active on another screen Press ESC and wait until display is finished on the other screen then try again

MSG 23, CRT is assigned to keyboard n

Displayed when SWITCH CRT is pressed This displays on the screen currently assigned to the keyboard being used No action required The operator can reassign the keyboard at this time

ERR 24, Configuration error

1 Configuration inconsistent for desired action Occurs when attempting a change to the configuration that is not valid Check the configuration

2 Tag type specified in the display is different than in the database Check the escapes for control in the display source file

3 This or another configuration is not correct to allow completion of the current configuration being performed

ERR 25, Cannot use alarm type, limit exceeded

The alarm type selected has a limit which was exceeded Check other tags for same alarm type

ERR 26, Tag name duplicated, see tag n

Tag name already used for another tag Check tag configuration for indicated tag with same name

ERR 27, Blank tag name invalid

A blank tag name or index number was entered Cannot use blank trigger tag in a currently active SOE log Enter a valid tag name or index number

ERR 28, Tag address duplicated, see tag n

The tag address keyed in is used for another tag Check tag configuration for indicated tag

ERR 29, Valid states are A, H, L, 2H, 2L, 3H, 3L

The alarm state entered was wrong Enter a valid alarm state If still wrong, refer to text substitution

ERR 30, Cannot enter tag

The tag name is blank but the tag type is not undefined Either set the tag type to undefined to clear the tag or enter a valid tag name

MSG 31, WARNING, ARE YOU SURE? ESCAPE IF NOT

The data entered can delete existing configuration Press ENTER if sure, ESC to prevent deletion

MSG 32, Update of Files In Progress, Please Wait

As a result of operator interaction, some files are being updated Wait until the message disappears to continue.

MSG 33, Restart System, Updates Have Been Done

A change in configuration requires a restart to be used by the console After completing configuration, reset the console

ERR 34, Invalid Log Name/Number Entered

Invalid log identification entered Retry with the correct log identification

ERR 35, Duplicate Log Name Entered

Log name entered has already been used for another log Enter a unique name

ERR 36, Invalid range, start not less than finish

Range for tags is not valid Enter a starting index number that is less than the ending index number

ERR 37, Ranges must contain same number of tags

The keyed in ranges have different number of tags Key in indexes with proper range of tags

ERR 38, Zero is invalid tag index

The tag index keyed in was zero Enter a valid tag index

ERR 39, Invalid display

The display name entered does not exist on the hard disk Enter the name of an existing display

MSG 40, There are no ADPs to configure

No annunciator display panels have been configured in system configuration Change the number of annunciator display panels in system configuration

ERR 41, Inconsistent # of Cells and Starting Cell

Number of trend cells overrun the number of cells left in the column or row Redefine the number of columns or rows, or redefine the trend cells

ERR 42, Inconsistent Time Units

Appears during trend cell definition if an invalid time unit is specified Check the definition

ERR 43, OIS Configuration Key Locked

Configuration operation requested cannot be used while the key lock is not in the CONFIG position Change the position of the key lock, then try again

ERR 44, LOG is already active or in transition

Log is either active or in transition of being active Wait for log to become active

ERR 45 LOG is already inactive or in transition

Log is either inactive or in transition of being inactive Wait for log to become inactive

MSG 46, Tag value request failed for LOG no n

Tag request during log collection failed Check the tag or log configuration

MSG 47 Trend value request failed for LOG no n

Trend request during log collection failed Check the trend definition or log configuration

MSG 48, LOG no n is active

Confirmation of log being active Proceed as desired

MSG 49, LOG no n is inactive

Confirmation of log being inactive Proceed as desired

MSG 50, Tag's Primary Display not configured

Operator requested the primary display from the operating parameters page for a tag that does not have one defined Configure a primary display for the tag if desired

MSG 51, Operator Request for xxxx Ignored

Display called up with the maximum number of displays presently up Check system configuration during start up

MSG 52, No Printer Configured

Use of a system printer requested when no system printers exist Check system printer, printer configuration, or connect a system printer

MSG 53, Undefined Group # n

Requested group of characters is undefined Check group in character definition

MSG 54, Group # must be Decimal format

Group number is not specified in decimal format Enter group number in decimal

.*MSG 55, Index # must be Hexadecimal format*

Character index must be keyed in hexadecimal format Enter character index in hexadecimal

MSG 56, Undefined Index # n

Character index is undefined Enter character index that exists

MSG 57, Raster size must be 8 or 16

Valid character raster size is 8 or 16 Enter a valid raster size.

MSG 58, Foreign Language is not enabled

1 Accessing foreign language configuration denied Enter OIS system configuration and change foreign language flag to *YES*, then retry

2 Cannot configure character set with foreign language disabled Enter OIS system configuration and change foreign language flag to *YES*, then retry

MSG 59, Source & Destination raster size mismatch

Source character is different raster size than destination Copy to different character

.*MSG 60, End idx must be greater than Start Idx*

The start index range must be smaller than the end Enter new indexes and try again

.*MSG 61, Duplicate definition*

1 Indexes the operator entered already exist Enter new indexes

2 In alarm summary format configuration (ASF), alarm summary element that the operator selected already exists Select another element

MSG 62, Trend is defined but is inactive

The current trend index has been defined in the database but has been marked inactive until restart No action except re start when trend definition is complete

ERR 63, Log must be inactive to reconfigure

Configuring an active log is not permitted Deactivate the log, then proceed

ERR 64, Internal error Log will not activate

File error on log being configured, try again If unsuccessful, delete the definition file for the log, then retry

ERR 65, Internal error Log file/memory error

LOGSTATS.LG or ***CRNTLOG.LG*** file may be corrupted Check the files, then retry They may need to be restored from default files

ERR 66, Internal error Log reset to inactive

Some internal error or file error encountered Check the ***.LF*** file for the log, then retry

ERR 67, Log is in transition Request ignored

Log is awaiting service by the logging data collector (LDC) task to be activated or deactivated Wait, then retry

ERR 68, File Not Found in given directory

The file name entered did not exist in the directory indicated Enter correct path name or copy the ***.DT*** file to the USN 54 directory

ERR 69, Cannot open storage file WILDCARD OP

The ***WILDCARD.OP*** file is a reserved file Do not try to open

ERR 70, No filename entered Please Continue

Did not enter a file name, which terminated processing Call up the display generator page again

ERR 71, Yellow files with asterisk not processed

One of the wild carded files processed by the display generator had some manner of processing error When wild carding is complete, examine the files and run them through the display generator individually File ***WILDCARD.OP*** contains a list of files with errors

ERR 72, Invalid command or syntax within file

The display source file had a bad command, invalid parame ters, etc Examine the file and fix errors

MSG 73, Processing Completed

No action required. Proceed as desired

ERR 74, Display config'd for another target sys

Run display file through the display generator

ERR 75, Problem reading or allocating file

1 Problem with ***.LF*** file being configured Check file in the directory, then retry or delete and retry

2 Problem with ***.DT*** file being run through the display generator, examine the file

ERR 76, LEDG session tracking file not opened

When a wild card file name is entered, this file is used to keep track of the display generator progress See if there is enough disk space for the file If the file ***WILDCARD.OP*** is present, try deleting it before continuing

ERR 77, DOT Configuration file not found, created

The default configuration file will be created No action required

ERR 78, Display/Window not called, over 800 tags

The display source file has more than 200 unique tag indexes as part of the display elements Reduce the number of tag in dexes in the display

MSG 79, Function Under TUNE Keylock Control

1. Operator tried to perform an action at the operating parameters function with the key lock not in the TUNE position Change the position of the key lock

2 Cannot tune from a block details or tuning display with the key lock not in the TUNE position Change the position of the key lock

.MSG 80, Function under CONF keylock control

Cannot perform any PCU or OIS configuration of any kind with the key lock not in the CONFIG position Change the position of the key lock

NOTE Messages 81 through 116 correspond to interface unit firmware codes 1 to 36 The appropriate reply message displays depending on which error occurred within the interface unit Check the NFI 90 module that was accessed and its configuration Refer to the ***Operator Interface Station, Hardware Manual*** for a list of error codes

ERR 81, Reply Error Waiting for Loop

ERR 82, Reply Error Improper Format

ERR 83, Reply Error Undefined Command

ERR 84, Reply Error Index Already Established

ERR 85, Reply Error Block Already Established

ERR 86, Reply Error Command Too Long

ERR 87, Reply Error Bad Reply from BTM

ERR 88, Reply Error Export Used as Import

ERR 89, Reply Error CIU Needs Another Restart

ERR 90, Reply Error Undefined Index

ERR 91, Reply Error Memory Full

ERR 92, Reply Error Communication Error

ERR 93, Reply Error BTM Not Responding

ERR 94, Reply Error Import Used as Export

·ERR 95, Reply Error Plant Loop Timeout

ERR 96, Reply Error - Number Out Of Range

ERR 97, Reply Error - Illegal Key

ERR 98, Reply Error - CIU Needs a Restart Command

ERR 99, Reply Error - Module Status Used as Import

ERR 100, Reply Error Message Active on Loop

:ERR 101, Reply Error Import/Export Used as Mod

ERR 102, Reply Error Exception Report Specs Lost

ERR 103, Reply Error - No Message Queue

ERR 104, Reply Error - Reply Too Large

ERR 105, Reply Error - Illegal Station Mode Command

ERR 106, Reply Error - Illegal Module Number to CIU Problem Report

ERR 107, Reply Error Timeout Between Bytes

ERR 108, Reply Error - Index Already Established

ERR 109, Reply Error Point Type Incom with Command

ERR 110, Reply Error Watchdog Timeout

ERR 111, Reply Error Checksum Compare

ERR 112, Reply Error Destination Node Offline

ERR 113, Reply Error Callup Command Required

ERR 114, Reply Error CIU Internal Error

ERR 115, Reply Error - CIU Busy

ERR 116, Reply Error BTM Offline

NOTE Messages 117 through 127 correspond to module bus reply codes 100 to 110 The appropriate messages display depending on which error occurred within the interface unit Check the INF 90 module that was accessed and its configuration Refer to the ***Operator Interface Station, Hardware Manual*** for a list of error codes

ERR 117, Module Error Undefined Message

ERR 118, Module Error - Busy

ERR 119, Module Error Mode Conflict

ERR 120, Module Error Illegal Data

ERR 121, Module Error Invalid Block Number

ERR 122, Module Error Undefined Block Number

ERR 123, Module Error Block Not Readable

ERR 124, Module Error - Invalid Function Code

ERR 125, Module Error Blk and F C Incompatible

ERR 126, Module Error Insuff Memory for Block

ERR 127, Module Error - Insuff Memory for Block

ERR 128, Communication Timeout Error

Interface unit request reply code 200 returned Check all communication links between the console and the loop

ERR 129, Communication Framing or Parity Error

Interface unit request reply code 201 returned Check all communication links between the console and the loop

ERR 130, Communication Checksum Error

Interface unit request reply code 202 returned Check all communication links between the console and the loop

ERR 131, Communication Overrun Error

Interface unit request reply code 203 returned Check all communication links between the console and the loop

ERR 132, MFC File Error Ok

ERR 133, MFC File Error Busy

ERR 134, MFC File Error No Buffer Available

ERR 135, MFC File Error - Buffers Too Small

ERR 136, MFC File Error File/Buffer Not Open

ERR 137, MFC File Error Write Protected

ERR 138, MFC File Error

ERR 139, MFC File Error - Already Opened

ERR 140, MFC File Error Invalid Operation

ERR 141, MFC File Error Wrong Mode

ERR 142, MFC File Error

ERR 143, MFC File Error - File Does Not Exist

ERR 144, MFC File Error

ERR 145, MFC File Error Can't Create File

ERR 146, Error n has occurred

Generic error message for any unknown error code that is returned from the interface unit Contact Bailey Controls Company

ERR 147, Module is Busy

Operation stopped because module is busy Try again

ERR 148, Loop range ıs [0 250]

Entered value ıs not ın the valıd range Enter a valıd number

ERR 149, PCU range ıs [0 - 250]

Entered value ıs not ın the valıd range Enter a valıd number

ERR 150, Module range ıs [0 31]

Entered value ıs not ın the valıd range Enter a valıd number

ERR 151, Block range ıs [0 - 9998]

Entered value ıs not ın the valıd range Enter a valıd number

ERR 152, Functıon code range ıs [1 210]

Entered value ıs not ın the valıd range Enter a valıd number

MSG 153, Loop/PCU/Module must be defined

1 Cannot do requested PCU module configuratıon operatıon (POI) whıle a loop, PCU, and module address ıs not entered Defıne the loop, PCU, and module to be tuned, configured or ınspected

2 PENB or PENC unable to attaın the module hardware ad dress No operator actıon requıred

MSG 154, Module must be ın CONFIGURE mode

Cannot do requested PCU module configuratıon operatıon whıle module ıs not ın confıgure mode Change module mode to confıgure

MSG 155, Module must be ın EXECUTE mode

Cannot do requested PCU module configuratıon operatıon whıle module ıs not ın execute mode Change module mode to execute

ERR 156, Block not defined

Need to specıfy a block number before an operatıon ınvolvıng that block ıs started Enter a valıd block number

ERR 157, Function code not defined

Need to specify a function code value before a search for a block with the given function code is started Enter a valid function code number

ERR 158, Source block not defined

Need to specify a source block before a copy operation is started. Enter a valid source block number

ERR 159, Target block not defined

Need to specify a target block before a copy operation is started Enter a valid target block number

ERR 160, Block values may not be equal

Cannot copy a block into itself Enter a source and target block number that are different

ERR 161, Invalid function code

Invalid string entered as a function code value (e g , alpha numeric string) Enter valid function code number.

ERR 162, Block already exists

Cannot add a block that is already in the module Enter a block number that is not currently used in this module

ERR 163, No tunable parameters in this block

Block details (BTM) specification list for this function code has no tunable specs. Cannot tune any block with this function code

ERR 164, Error while reading 'N90FUNC CF'

Error reading the data file containing the offset values for referencing the specification configurable text records Check if the file ***N90FUNC.CF*** exists on the hard drive, or if it is unreadable

ERR 165, Block does not exist

Unable to find the specified block defined in this module Enter a block number that is for a tune or modify operation

MSG 166, Press ENTER to send block, ESC to cancel

Confirmation required from the operator before the changed, tuned, or added block is sent to the module Proceed as desired

ERR 167, Destination Format Number not defined

Increase the number of format records in the file by using change number of formats option and try again

ERR 168, Requested Tag Is Not Station Type

The tag name or index number entered for a tuning request is not a STATION tag Enter a STATION tag or examine the configuration

ERR 173, Cannot Reserve The Selected Port

A software error Contact Bailey Controls Company

ERR 174, Selected Port Already in Use

A software error Contact Bailey Controls Company

ERR 175, Module is not On line

Attempted an operation on a module that is not on line or does not exist on this loop Use a module that is on line

MSG 176, Block move is in progress

Moving a block to another location in the module Wait until message is cleared or replaced

MSG 177, Block copy is in progress

Copying a block to another block in the module Wait until message is cleared or replaced

MSG 178, Block operation completed

Appears after completion of a function block copy Proceed as desired

MSG 179, Initializing selected module

Currently initializing the module Wait until message is cleared or replaced

.*MSG 180, Module initialization completed*

Appears after PCU module initialization is complete Proceed as desired

MSG 181, Block # n deleted

Appears after block is deleted from the current module Proceed as desired

·*MSG 182, Searching for block*

Currently searching for the specified block within this module Wait until message stops blinking and clears

.*MSG 183, Completed n adjusted spec(s)*

Displays the number of the specification value within the module that is being automatically changed to reflect the new location of a block that was just moved

MSG 184, Processing page n

Current page is being formatted to send to the printer Wait until the message disappears

MSG 185, Operation in progress, Please Wait

Currently requested operation is being performed, wait for completion.

ERR 186, End of Report, Page to reread problems

No action required

ERR 187, Log #n is not active; demand ignored

Demand of current log is ignored because the log is not active Activate the log, then demand the log after active confirmation.

·*ERR 188, Accessing log #n configuration failed*

Reading log configuration file failed, try again If it occurs again, check the file for cause of file access error

ERR 189, Log demand queue is full

Too many outstanding demanded logs (limit is nine) Wait for processing of a demanded log to finish, then try again

MSG 190, Processing demand log #n

Identifies the demanded log being processed No action required

MSG 191, Queued demand log #n

Acknowledges queued demand log for processing for a *Log By Name* request No operator action required

MSC 192, Internal error Demand log #n failed

Processing of a demanded log failed due to an existing error in the log Check log configuration and also tag or trend referenced in the log

ERR 193, Cannot Continue Processing Request

Generic internal processing error for soft key tag select (SLC) A soft key or hard key request failed Try the request again

ERR 194, Tuning requires a PID block

The function block specified in the tag name or index number is not a PID block The console presents a prompt for a PID block address

ERR 195, Log Retention is Out of Range

The entered log retention is not in the prescribed range Enter a valid retention number

ERR 196, Tag name/index not found

The tag name or index number does not exist in the database Check input or tag configuration

ERR 197, Invalid trend index (not found)

Contact Bailey Controls Company

ERR 198, Soft Key Default Parameter Out Of Range

The user configured soft key parameter was invalid Check the display source file from which the soft key was called

ERR 199, No log Name/Index entered

No log name or index number was entered in the *Log By Name* request so the program ignored the request Call *Log By Name* again

ERR 200, No Display Name entered

No display name was entered in the *Display by Name* request so the program ignored the request Call *Display by Name* again

ERR 201, No Trend Index entered

Contact Bailey Controls Company

ERR 202, No Log Retention entered

Did not fill in the log retention before pressing **ENTER** in a *Log By Name* request The console prompts again

ERR 203, Insufficient Parameters to Process

Pressed **ENTER** before all parameters were entered for *Log By Name*, module problem report, tuning or block details. The console prompts again Fill in remaining parameters and retry

ERR 204, Display Not Found

Display name entered in *Display by Name* request does not exist on disk Check disk or correct name

ERR 205, Log Index/Retention pair does not exist

The supplied retention does not exist for the entered log name or index number Examine the log configuration, or change the name or retention number

ERR 206, ABORT Soft Key Fixed default invalid

A soft key non modifiable default parameter was out of range Correct error in display source file containing soft key request

ERR 207, WARNING Soft Key default invalid

A soft key modifiable default parameter was out of range (initialized by SLC to zero) Correct error in display source file containing soft key request

ERR 208, Error creating EVENTS LG for n events

Generated by the event log manager (EVL) if a file cannot be allocated for the number of events set during event log configuration Change the number of events in event log configuration

ERR 209, Tag not defined for this index

Could not find a defined tag in the database with this index number Enter a valid index number

ERR 210, Maximum wait time exceeded

SOE log wait time exceeds the maximum allowable wait time (32,767 seconds) Enter a valid wait time

ERR 211, Invalid selection for this field

1 Invalid alphanumeric string was keyed in Enter a valid string

2 PENA - the text entry for the key lock check field is invalid Enter a valid string

3 PENC the text entry for the pen status field is invalid Enter a valid string

MSG 212, Please Enter PID Block Address

Accompanies the initial display of ERR 194 It asks for an ad dress Fill in supplied fields

ERR 213, Duplicate Address in SP, CO, or PV

Contact Bailey Controls Company

ERR 214, Maximum Number of Fast Trends Exceeded

Occurs after a tuning display request if the maximum number of fast trends (operator assignable) has been exceeded Call up the operator assignable trends function and delete a tuning tag

ERR 215 Previous Input Field Active

Request aborted because it requires an input field and there is already another input field active on the requesting screen Call a display that has no input field and reissue request, or escape from previous field and try again

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.MSG 216, Event Log Queued for Print

Acknowledges the completion of an event log request No action required

MSG 217, SOE Log Queued for Print

Acknowledges the completion of a sequence of events log request No action required

MSG 218, Keyboard # n Reset

A system keyboard has reset No action required, but a slight pause in system performance will be noticed

MSG 219, Specs Not Available Repeat Request later

Tuning request made, but the database has either its process variable or set point low and high values equal This implies the database specifications for the tag are incorrect Retry request from 30 seconds to 15 minutes later, or check the configuration for the block.

MSG 220, Request accepted File search in process

Output by the display generator after entering the file name to process No action required

ERR 221, SOE error # n See user manual

Error number corresponds to internal communication error codes Refer to the sequential events recorder manual and multi function processor or multi function controller manual. Check overall SOE configuration

ERR 222, SOE data lost Check age/wait time config

Wait time in the console is too long relative to the age time set in an MFP or MFC module Refer to the ***Sequential Events Recorder*** and ***Multi-Function Processor*** or ***Multi-Function Controller*** manuals Check wait times and overall SOE configuration

ERR 223, Problem at SER or with SER/MFC communication

Refer to the ***Sequential Events Recorder*** and ***Multi-Function Processor*** or ***Multi-Function Controller*** manuals Check overall SOE configuration and connections

ERR 224, EVENTS are not defined

Events have not been defined for archiving Check the *Data Type to Volume Definition* display

ERR 225, LOGS are not defined

Logs have not been defined for archiving display Check the *Data Type to Volume Definition* display

ERR 226, TAG DATA is not defined

Tags have not been defined for archiving Check the *Data Type to Volume Definition* display

ERR 227, TRENDS are not defined

Trends have not been defined for archiving Check the *Data Type to Volume Definition* display

ERR 228, Tag name, Tag number, Alarm Group all blank

At least one of these fields must be filled in to retrieve events Enter valid data in one of the fields

ERR 229, Auto Output is YES ENTER to override

Data type has already been defined to be archived automatically

ERR 230, Press ENTER to archive data

Press **ENTER** to continue

ERR 231, 'From' date later than 'To' date

Change date entry to continue

ERR 232, 'From' log greater than 'To' log

Change log entry to continue

ERR 233, Archive Index already defined in display

Contact Bailey Controls Company

ERR 234, Time value and units mismatch

Combination of value and units not allowed Check instruction for combinations allowed

·*MSG 236, Substitute by pressing desired State Key*

Press (ON) or (OFF) to substitute digital state, or press $\boxed{\text{ESC}}$ to exit substitution.

·*MSG 237, There are no other pages*

Pertains to *Operator Action Requests* and *Operator Information Events* display. No more pages of requests or information events to display No action required

MSG 238, Item already selected on CRT n

Pertains to *Operator Action Requests* display Item being se lected is already selected in another display Select another item

MSG 239, Item selected has become unnecessary

Pertains to *Operator Action Requests* display Action requested for selected item no longer needed or relevant Item is erased from display No action required

MSG 240, Update to Configuration is Complete

Changes made to configuration have been saved Proceed as desired

ERR 241, Exceeded Maximum Number of Trends

Tried to configure more than 20 fast trends (operator assign able) Delete other trends

ERR 242, Exceeded Maximum Number of Blocks Trended

Can trend a limited number of blocks through fast trends and the tuning display Delete unused fast trends from blocks or the tuning display

ERR 243, Cannot Delete Displayed Trend

Trend cannot be deleted while being trended. Terminate trending first

ERR 244, File Error Updating Configuration

Updating configuration file failed due to a file management system (FMS) error, either retry or correct the FMS problem

ERR 245, Error Retrieving Tag Configuration

Could be the result of bad tag configuration or FMS file error Retry or check database and FMS errors

ERR 246, High Limit must be Greater than Low Limit

When configuring fast trends, high limit must be greater than low limit Retry entering limits with correct values

MSG 247, No Trend Indices in given list

The soft key request to show a fast trend has no trend index number in it Check the display file and insure at least one fast trend index is non zero

ERR 248, Function not available, missing file

Have requested a soft key or tag select (SLC) function that has been turned off because a system error has occurred Press another key

ERR 249, No Fast Trend List Number Entered

Pressed ENTER but did not key in an index number to process for a fast trend request Enter an index number

MSG 250, Log Numbers and Name cannot all be blank

Fill in log number and name

ERR 251, Invalid Trend List Number

The trend list number must be zero to four (inclusive) A zero implies a non reference Check the ***.DT*** file for valid ranges

MSG 252, Press ENTER to save page, ESC if not

Prompt to save data on screen or escape to next screen without saving this data Proceed as desired

MSG 253, Cancel reports request serviced

Log status display notifies of completion of a request No ac tion required

ERR 254, Blank Tag is Invalid for Active SOE Rept

Enter a tag name or index number

MSG 255, Press ENTER to save data

Configuration has been modified; prompts to save before exiting Press ENTER to save or another key to exit

MSG 259, Press NEXT PAGE or PREV PAGE for more items

Notifies that there are more items that can be accessed by pressing PREV PAGE or NEXT PAGE

MSG 260, Operation aborted by user

1 PENB - download of the module configuration is aborted using ESC No action required

2 PENC - download of the module configuration is aborted using ESC No action required

MSG 261, SELECT a Cell Item from the Menu

Cell type selection mode is active Choose a cell type for the current cell

MSG 262, Press ENTER to delete cells, ESC to abort

Confirms deletion of cells Press ENTER for operation to proceed, press ESC to terminate

ERR 263, Number of Events to Save must be Non Zero

Enter a number from 1 to 1000

MSG 264, REPORT is already active

Operator is requesting to activate, from the log status display, a report that is already active No action required

MSG 265, REPORT is already inactive

Operator is requesting to deactivate, from the log status display, a report that is already inactive No action required

ERR 266, LOG/REPORT Type Requested Not Found

There are no logs or reports currently defined for the type re quested Make another selection

MSG 267, SEARCH IN PROGRESS

The console is processing a search request Wait for completion

ERR 268, LOG/REPORT Does Not Exist

The log or report requested does not exist Make another selection

NOTE Messages 269 through 283 correspond to internal y generated errors related to the interface un t of the conso e

ERR 269, Invalid logical unit

Contact Bailey Controls Company

ERR 270, Invalid index or CIU

Check total tags in system

ERR 271, Invalid CIU restart opt'n

Contact Bailey Controls Company

ERR 272, Invalid watchdg/delay cnt

Contact Bailey Controls Company

ERR 273, Invalid PCU, module or blk

Check tag configuration

ERR 274, Invalid point type

Check tag configuration

ERR 275, Invalid index range

Contact Bailey Controls Company

ERR 275, Invalid eng units code

Contact Bailey Controls Company

ERR 277, Invalid logical alarm spec

Contact Bailey Controls Company

ERR 278, Invalid module op mode

Contact Bailey Controls Company

ERR 279, Invalid function code

Contact Bailey Controls Company

ERR 280, Invalid block data count

Contact Bailey Controls Company

ERR 281, Invalid number of reports

Contact Bailey Controls Company

ERR 282. Offline

Check the interface unit and restart

ERR 283, Pending Reply Table Full

If error persists, contact Bailey Controls Company

ERR 284, No Tags in Range to Print w/ this Option

Tag list to printer function (TLP) could not find any tags within given range to print with the specified option Select another print option or a new tag range

MSG 285, Operator Action Log Queued for Print

Request to print operator action log has succeeded No action required .

ERR 286, Cannot Print Logs to Video Copier

Request to print a log to printer number zero is invalid Check printer assignment for screen and keyboard

MSG 287, Height Option not allowed for Line Opt 2

The user selected the double height option for a format which has the single line option specified If double height characters are desired, change the line option for the format to standard (0) or double (1)

ERR 288, Cannot Change Default Format (Fmt 0 - 4)

Cannot change format number zero through four No action required

ERR 289, LOG STATUS Changes Require ENTER key

Press ENTER to continue

ERR 290, Incorrect Keyboard Type

During touch screen calibration, this indicates an EMKI key board is required to calibrate the touch screen No calibration is possible

MSG 291, A Cursor Will Echo Each Touch Point

During touch screen calibration, this indicates how the cali bration text will occur When seen, testing of touch screen is possible

MSG 292, Touch the Lower Left Corner

During touch screen calibration, this is the next step in cali brating the screen Press the lower left corner of the screen where the intersecting lines display

ERR 293, Invalid Touch Screen

During touch screen calibration, this indicates the current touch screen cannot be calibrated due to its type. Touch screen calibration cannot occur

MSG 294, Touch the Upper Right Corner

During touch screen calibration, this is the next step in cali brating the screen Press the upper right corner of the screen where the intersecting lines display.

ERR 295, Not enough memory Request Aborted

Operation or display requested cannot be executed because there is not enough memory resources available Example display generator is active on another screen consuming much of the memory Exit unused displays in other screens to release resources and try operation or display again

·*MSG 296, Display not Found in System*

Primary display not found in system After tag is configured, implement the display.

MSG 297, ESC exits display Any other key resumes

Informs the operator that ESC exits from the cell configuration display back to the log menu.

MSG 298, Operation aborted, bottom line is in use

Control tried to access the busy bottom line. Escape from using bottom line (input field), try again

MSG 299, Parameter edits allowed only if YES FORLANG

Display attributes such as height, spacing, etc can only be changed after entering **YES** Change foreign language to **YES** if attributes are to be changed in the foreign language field

MSG 300, No Data Type to Volume Defined

No data types for archiving have been defined. Check data type to volume definition

·*MSG 301, Press ENTER to exit, ESC to return*

Edits were made and have not been saved Press ENTER to abort edits and continue the exit operation requested Press ESC to resume editing

MSG 302, Retrieve Archived Data request queued

Retrieve archived data has been requested Message informs that action has been taken

MSG 303, Retrieval queue full - Please try later

Operator made too many requests to retrieve archived data Wait for a period of time, then try to send request again

ERR 304, Line must be all blanks or filled in

Operator has filled in one or more but not all of media type, volume label or number If one is filled in, all must be filled in Fill in blank fields or blank out all fields

ERR 305, Invalid Alarm Group

Operator entered an invalid alarm group number or letter Valid entry is 1 through 99, S or D. Enter valid alarm group

ERR 305, Invalid Time or Date

Operator entered either an invalid time or date in the field Enter valid time or date.

ERR 307, All Event Types cannot be set to NO

Operator made a request to retrieve events with all event types set to *NO*. The console interprets this to mean do not retrieve any events Change desired event type to **YES**

ERR 308, Starting Tag number > Ending Tag number

Starting tag number must be less than or equal to ending tag number Enter a valid range.

ERR 309, Starting Alarm Group > Ending Alarm Group

Starting group number must be less than or equal to ending group number. Enter a valid range

ERR 310, Install Archive Volume and try again

No archiving volume installed in the device Put volume in device for desired directory, then try again

ERR 311, Retrieve Trends selected Try again later

Retrieve trends display is only allowed on one screen at a time Wait until the desired screen is free, then try again

MSG 312, Archiving Configuration change made

Change to archiving configuration has been made No action required

MSG 313, Directory has nothing to be displayed

The requested directory has no entries No action required

MSG 314, Archiving request queued

The operator has sent a request to store data No action required

MSG 315, Group Inhibit change queued

The operator has sent a request to inhibit or uninhibit all tags in alarm group No action required

.ERR 316, Disp. Request Not Operator Configurable

The operator has entered a display name that exists in a USN directory, but does not have an operator configurable display definition file Enter a different display name

MSG 317, Disp File being constructed, Please Wait

After configuring a display, this message appears to inform that the display is being built. No action required

MSG 318, Display Configured and Saved to Disk

When the operator configurable display (OCD) function has finished building the configured display, it outputs this message If the operator leaves the display before this message appears on the screen, changes are not saved No action required

ERR 319, Box Overlap, ENTER accept, ESC reject

A box has been chosen that overlaps an existing box or element This error message allows accepting or rejecting the new element Press ENTER to accept Press ESC to reject

ERR 320, Request Ignored - Active Function Overlap

Function requires exclusive access to the bottom line prompt area If one is active and another is called, the second request is ignored and this message appears Escape then try to recall this display

ERR 321, No Faceplate Available for this type

Tag index entered does not have a faceplate associated with its tag type Enter a tag index that has a faceplate associated with its tag type.

.ERR 322, Changes made ENTER to save, ESC to Abandon

Attempted to escape from a display which had been changed Press ENTER to save changes, ESC to leave operator configurable displays (OCD).

ERR 323, Hit ENTER to select box to edit

Informs that **ENTER** must be pressed to select a box to configure in the operator configurable displays function. Press **ENTER** to select a box to edit.

ERR 324, Trend System Cfg Error: Tag Type invalid

An attempt was made to get information about a tag from the database that was of unknown type, or is not defined. Enter a different trend index or check the trend definition file for valid index, then try again.

MSG 325, Station Tag, Please Select Trend Tag Type

The selected trend is associated with a STATION tag. Enter one of the following trend box types: PV, SP, RI or CO.

MSG 326, Enter printer number

Asks to enter the printer number which is to be assigned to the screen. Press the number associated with the printer to assign it to the screen.

MSG 327, Enter CRT number

Asks to enter the screen number that is to receive the next sequence of keys. Press the number associated with the screen.

MSG 328, Enter display number to RECALL

Asks to enter the number of the previously marked display to recall. Enter number of marked display.

MSG 329, Enter display number to MARK

Asks to enter the number to be associated with the display when that display is to be recalled by number. Enter number to associate with the display.

MSG 330, Press ENTER when done selecting else ESC

Asks to press keys associated with a retrieved trend that is to be deleted. Select letters to delete. Press **ENTER** when done, or **ESC**.

·*MSG 331, Press ENTER to delete page else ESC*

Press **ENTER** to delete all retrieved trends on the display, or **ESC**

MSG 332, Delete Retrieved Trend Files queued

The selected retrieved trend data files have been queued to be deleted No action required

·*MSG 333, Data Type is ON fill in Volume*

If a data type has been turned on to be archived, volume name cannot be left blank. Enter a volume name

MSG 334, Data Type previously defined cannot be blank

Once volume name has been defined in the system for a data type, the name cannot be blanked out Leave the name as is, or change to new name

·*MSG 335, X coordinate would cause line wraparound*

The x coordinate entered will cause the element text to exceed the display boundaries Decrease the x coordinate so that the element fits within the limits of the blue rectangle

MSG 336, DD Mode change invalid while in Remote

MAN/AUTO is locked out if DD is in remote mode When condition goes back to normal, the tag can be controlled

ERR 337, Control invalid while Block is Red Tagged

Before and during control of a tag, the red tag status is checked If red tag status exists, control of the point is aban doned. The tag can only be controlled when the condition is removed

ERR 338, Control invalid while in Manual Interlock

Only the control output or set point value can be set when in manual interlock mode No action required

ERR 339, Value Change invalid while in CO Tracking

Setting of control output while in control output tracking mode is not allowed. No action required

ERR 340, Value change invalid while in SP Tracking

Setting of set point while in set point tracking mode is not allowed No action required

ERR 341, Press set to enter the value

Press SET before entering a value

ERR 342, Control invalid while tag in Bad Quality

Before and during control of the tag, bad quality status is checked. If bad quality exists, control of the point is abandoned The tag can only be controlled when this condition is removed

MSG 343, Enter function to be canceled

Appears after pressing CANCEL It instructs to complete the key sequence by entering a key whose desired function is to be canceled Press the key of the function to cancel

MSG 344, Conversion is needed for log #n

Conversion program for SLDG created logs has not been run Run the conversion program for logs and try again

MSG 345, Log #n is not INACTIVE, request denied

Trying to copy data to a log that is active Change log to inactive, then try again

MSG 346, Printer Queue is Full, Try again Later

The requested print cannot be done Check printer status

MSG 347, First index not printed in request is n

No action required

MSG 348, Module firmware revisions queued to print

Appears from the time that a selection is made to print an entire loop until the print is finished. No action required

ERR 349, Destination ring off line

Satellite ring of INFI-NET system is off line or not there Check status of ring

ERR 350, Loop and PCU already have a pnnt queued

Appears when a selectıon to pnnt revısıon currently on dısplay ıs made but there ıs already a pnnt ın progress for the same loop and node Check to see ıf pnnter ıs workıng. Waıt untıl revısıon has been pnnted, then try agaın.

.MSG 351, Pnnt ın Progress. Please Waıt

Appears from the tıme that a selectıon ıs made to pnnt an entıre loop untıl the pnnt ıs finıshed No actıon requıred

ERR 352, Internal Error

Shown when there ıs an ınternal software error that may lead to the program not functıonıng properly If the error persısts after leavıng the functıon and tryıng ıt agaın, contact Baıley Controls Company

ERR 353, Loop and node must be selected

Shown whenever a request ıs made to pnnt or update the revısıons on dısplay, but there has been no selectıon of loop and node Select loop and node and try agaın

MSG 354, Fıle maxımum exceed Delete some files

Appears ıf the system has more than 25 operator configurable dısplay files Thıs ıs just a warnıng message No actıon requıred

ERR 355, Cannot add new file Too many exıst

Appears ıf attemptıng to create a new operator configurable dısplay file and there are already 25 files exıstıng Delete an exıstıng file (check the USN 53 dırectory for a lıst of ***.CF** file names) or reconfigure an exıstıng file

ERR 356, Max # of background files are on dısplay

A maxımum of two background curves may be placed on any gıven x,y graph Thıs message dısplays when attemptıng to place a thırd background curve on a graph Clear the two exıstıng background curves usıng one of the x,y control optıons before placement of the new curve ıs possıble

ERR 357, Plot must be ACTIVE ın order to contınue

Message appears whenever an operatıon ıs requested that ıs ınvalıd when the XY plot ındex ıs ınactıve Actıvate the plot ındex through plot definıtıon

·ERR 358, History request failed

Message appears whenever a request for historical trend data is made for an x,y plot but cannot be completed or displayed Retry the operation again

ERR 359, MFC Error not enough free memory

Check MFC configuration Delete extra files Reformat MFC

ERR 360, MFC Error no free files available

Check MFC configuration Delete extra files Reformat MFC

ERR 361, Floppy Disk Error or missing disk

No action required

MSG 363, Limited to one module at a time

Appears whenever an attempt is made to set the mode of a range of more than one module to configure Set the PCU management (PLS) module range to include one module only, then retry

MSG 364, Completed n config files deleted

Appears at the completion of an operation using option *H* to delete one or more entries of the current configuration file directory No action required

MSG 365, Sorting current directory Please wait

Appears whenever a sort of the current file directory is in process during a save operation or during a directory file deletion Wait until completion

MSG 366, Press ENTER to continue, ESC to stop

Displays whenever a verify error occurs Press **ENTER** to process next block. Press **ESC** to abort this module operation, proceed to next module.

ERR 367, File type and module type disagree

Displays during a load, save or verify whenever the module type within the file is not the same as the actual type of the current module

MSG 368, Processing module n, block m

Displays during a load, save, verify or print Gives the current module and block being processed It is updated at every fifth defined block

.MSG 369, Processing modules n thru m complete

Occurs at the end of every load, save, verify or print PCU operation

.ERR 370, Configuration file not found

Error displays during a load, verify or print whenever the cor responding module configuration file does not exist.

ERR 371, Address (l/p/m) of file & module disagree

Error displays whenever the hardware address in the configu ration file does not match that of the corresponding module

ERR 372, Internal error retrieving module type

No action required

MSG 373, Process BASIC/C for mod n? Y Yes, N No

Respond appropriately

ERR 374, Verify error - missing file block n

Appears during a module verification if a block in the module is not in the corresponding configuration file Message number 366 appears alongside this message Operator action proceeds as per message 366

ERR 375, Verify error - missing module block n

Appears during a module verification if a block in the configu-ration file is not in the corresponding module Message num-ber 366 appears alongside this message Operator action proceeds as per message number 366

ERR 376, Verify error disagreement on block n

Appears during a module verification if a block in the configu-ration file differs from its counterpart in the corresponding module (e g., different function codes, different specification parameter values) Message number 366 appears alongside this message

MSG 377, Grp Overflow-Up to Tagındex n process

The tag range specıfied up to the to tag ındex number was processed before the group became full No operator actıon ıs necessary unless the operator wants to add the unprocessed tags to the ındex

MSG 378, Edıts were made - Update Configuratıon

Any edıts made wıll be lost unless [ENTER] ıs pressed to save them to the hard dısk

MSG 379, Hıstorıan Group Configuratıon Updated

Hıstorıan group configuratıon updated after request No actıon requıred

ERR 380, Request Error No RDF name Specıfied

No RDF name was specıfied for tag hıstorıan retrıeval Enter a valıd RDF name and retry

ERR 381, Rqst Err No Wıldcard Pattern Specıfied

A blank wıld card pattern to search for ıs ınvalıd Enter a non blank wıld card pattern and retry

ERR 382, Illegal Entry - Tagındex Had Blank Tagname

Tag ındex entered had a blank tag name whıch ıs ınvalıd Enter a tag ındex that has a non blank tag name

ERR 383, Illegal Entry Duplicate Tag

Tag entered ıs already a member of the tag hıstorıan group Enter a tag whıch ıs not already ın the group

MSG 384, Assıgned to keyboard n, enter new CRT

Message appears on the new screen to whıch that keyboard ıs assıgned The numerıc parameter to the message wıll echo the keyboard number from whıch the operatıon orıgınated

·*MSG 385, Enter second key ın sequence after n*

The numerıc parameter to the message wıll be filled ın by the number representatıon of the numerıc key press whıch ınıtıated the key sequence

MSG 386, Selected RDF Has Been Queued To Print

Acknowledges request to print selected RDF file

.*MSG 387, Selected RDF Processing Has Been Aborted*

Acknowledges request to abort processing an RDF file

MSG 388, Selected RDF File Has Been Deleted

Acknowledges request to delete selected RDF file

MSG 389, Illegal Selection - Deleted RDF File

An RDF file which has already been deleted was selected from the menu This is illegal Select a file which does not have a status of deleted

MSG 390, Internal error!! Request ignored

The console had an internal error while processing the request it was sent This may occur if console software is not current Retry request and if it continues to occur, contact Bailey Controls Company

·*MSG 391, Illegal Entry, no RDF for Letter Selected*

A letter from the RDF directory was selected which did not have a defined RDF file Select a letter on the menu which has an RDF name defined

MSG 392, No Combination was selected Rqst Ignored

The operator entered **NO** for all possible RDF print formats before initiating request. No request was needed Answer **YES** to at least one of the three possible formats before initiating a request

MSG 393, Retrieval Request Queued

Acknowledges request to retrieve data to create an RDF file

MSG 394, RDF file limit reached, Request Ignored

Up to 50 RDF files are available This message occurs when 50 have previously been defined Delete existing RDF files before retrying to build a new RDF file

MSG 395, RDF file name not unique, Request Ignored

RDF file names must be unique Requests to build new RDF files will be ignored if another file with the same name exists To initiate the request, use a unique RDF name or delete the other file with that RDF name from the RDF directory and then retry

MSG 396, Request Rejected Check File Status

The request was rejected most likely because the RDF file already has a pending process in queue or another screen has changed the status of the RDF file Exit the RDF directory, then enter to see the status of the RDF file. Retry the function if appropriate

MSG 397, Request Queue Limit Reached, Request Ignored

The request queue to database retrieval is full at this time Try again later

MSG 398, No Items - Key request Ignored

Tried to select an item for which there was nothing to be selected

ERR 399, This module types needs a module # of 2

Because of the given module type entered when configuring this tag, the tag address for this tag must have a module number of two Enter a valid module number

ERR 400, This module type needs a module # > 1

Because of the given module type entered when configuring, the tag address for this tag must have a module number greater than one Enter a valid module number

ERR 401, This module type needs a module # < 2

Because of the given module type entered when configuring, this tag must have module number less than two Enter valid module number

ERR 402, Module status tags must have block # of 0

All tags configured with a N90STA tag type must have a block number of zero entered in their tag address Enter a block number of zero

ERR 403, This module type needs a module # of 0

Because of the given module type entered when configuring this tag, the address for this tag must have a module number of zero Enter a valid module number

ERR 404, This module type needs a module # of 3

Because of the given module type entered when configuring this tag, the tag address for this tag must have a module number of three. Enter valid module number

MSG 405, FIELD NOT APPLICABLE FOR THIS SYSTEM

The field currently being accessed is not used for this system Any input will not be used by the system Go to next field

MSG 406, FUNCTION NOT SUPPORTED FOR THIS SYSTEM

Appears when attempting to access a function not currently supported on this system

MSG 407, Enter Tag Name or Index

Prompt to enter a tag name or an index number

MSG 408, Saving Configured Data

During the configuration of relays or tones, informs the operator that the console is currently saving the configuration Perform no further actions until the message disappears

MSG 409, Test in Progress

During the testing of relays or tones, informs the operator that the console is currently performing a requested test If the test is to run until completion, perform no further actions until the message disappears Otherwise, press $\boxed{\text{ESC}}$ to terminate the test immediately

MSG 410, Physical Device Overlap

During the configuration of relays, informs the operator that the entered relay or keyboard value would cause overlapping use of a physical relay The offending relay or keyboard value should be entered in a manner such that it does not cause an overlap of a physical relay

MSG 411, Bad Logical Relay Value

During the configuration or testing of relays, informs the operator that the entered logical relay number does not exist Enter a legal logical relay number

MSG 412, Bad Physical Relay Value

During the configuration of relays, informs the operator that the entered physical relay number does not exist Enter a legal physical relay number

MSG 413, Bad Keyboard Value

During the configuration of relays or tones, informs the operator that the entered keyboard number does not exist Enter a legal keyboard number

MSG 414, Bad Time Duration Value

During the configuration or testing of relays or tones, informs the operator that the entered duration value (in seconds) is not legal The duration is too long or too short Enter a legal duration value

MSG 417, Bad Logical Tone Value

During the configuration or testing of tones, informs the operator that the entered logical tone number does not exist Enter a legal logical tone number

MSG 418, Bad Priority Value

During the configuration of tones, informs the operator that the entered tone priority value is not legal The priority is too high or too low Enter a legal tone priority value

MSG 419, Bad Pitch Value

During the configuration of tones, informs the operator that the entered tone pitch value is not supported Enter a legal tone pitch value

MSG 420, Bad Volume Value

During the configuration of tones, informs the operator that the entered tone volume value is not legal The volume is too high or too low Enter a legal tone volume value

·*MSG 421, Bad Broadcast Entry*

During the configuration of tones, informs the operator that the string entered to confirm tone broadcasts is incorrect Enter a **YES** or a **NO**

MSG 422, Bad Node List Value

During the configuration of tones, informs the operator that the entered node list number does not exist Enter a legal node list number

MSG 423, Software failure, please restart console

Message is seen as an operator actions request, and causes an operator actions indicator (i e , flashing *A*) to appear at the alarm indicators display line It occurs when one of the program tasks is not operating Enter the operator action request function, and initiate actions to restart the console

MSG 424, OPTION NOT AVAILABLE ON THIS SYSTEM

The option being attempted is not supported on this system

ERR 426, Insufficient user access rights

Currently logged in user does not have sufficient access rights to the selected function as defined through password security configuration

ERR 427, Unauthorized access attempted

Currently logged in user attempted to access a function without having sufficient access rights to the function as defined through password security configuration

ERR 428, Error Modifying RT ENTER to rtry, or ESC

This indicates that some error which prevents completion of a red tag status change has occurred Typically, this is an INFI 90 loop or module communication error View the diagnostic log to determine the module or loop error which has occurred

·*ERR 429, Display access restricted on this CRT*

Currently logged in user does not have sufficient display access rights to the selected display as defined through password security configuration, or during display creation

MSG 430, Plot is not of MFC Data Source Type

Appears at an XY plot display when attempting to redefine a tag or trend plot currently at that display as an MFC data source plot This only occurs while the XY plot is displaying at one screen and the XY plot definition page is displaying at another screen at the same time Disable the XY plot display before attempting to redefine a plot as an MFC type

MSG 431, No Assignment Possible one system CRT

When attempting to assign a keyboard to a screen, this informs the operator that the console has only one screen, therefore, the attempted keyboard assignment is invalid

MSG 432, Not All Tags ACKED

When using PAGE ACK to acknowledge alarms, not all alarms on the current page have been acknowledged This occurs when the currently logged in user does not have sufficient access rights to acknowledge an alarm for a certain tag or tags on that page

MSG 433, Insufficient access to ACK

Occurs when the currently logged in user does not have sufficient access rights to acknowledge an alarm (using ACK ALARM) for a selected tag

MSG 434, No Access to TAB

Occurs when the currently logged in user does not have sufficient access rights acknowledge an alarm condition for a tag The console does not allow tabbing to that tag after pressing ACK ALARM

ERR 435, Log In Failure Password Not Found

Password entered during password log in is not defined in password security configuration Verify the password is valid and try again

ERR 436, CRT Access Denied--Insufficient Rights

Currently logged in user does not have sufficient display access rights to the selected display as defined through password security configuration, or during display creation

:ERR 437, Alarm Inhibit Mode conflict at tag n

Occurs when attempting to redefine a tag that is being used to inhibit alarming for another tag or tags The tags being inhibited by this tag must be modified before this tag can be redefined.

ERR 438, Tag Update Failed - Duplicate Tagname

The tag change requested causes a duplicate tag name conflict In this case, there is already a tag with this name but having a different address Change the tag name and retry

ERR 439, Tag Update Failed Duplicate Address

The tag change requested causes a duplicate tag hardware address conflict In this case, there is already a tag with this address but having a different name Change the tag address and retry

ERR 440, Tag Update Failed

A general error message, it is most frequently due to the GDM or RDB work station not being on line, or a failure in the communication system exists Make sure the work station is on-line and that the node address configured at the *Broadcast Master* field is correct Consult the ***stb.log*** file at the work station for additional information

ERR 441, Tag Broadcast Failed, Local update only

Appears when a tag database change is made to identify that tag broadcasting is in local mode only. In this mode, the console can receive a tag list broadcast from a GDM or RDB work station, but does not broadcast changes made at the console to the work station Therefore, any changes made at the console do not affect the GDM or RDB tag database The change is, however, made locally to the tag database of the console.

ERR 442, Copy of 'blank' tag to tag n illegal

The tag type of the tag specified when performing a copy index operation at the tag configuration page is UNDEF A tag de fined as an UNDEF type cannot be copied to another index Only defined tags (any tag type except UNDEF) can be copied.

ERR 443, Invalid Copy attempt, 'blank' source tag

The tag type of the tag specified as the source tag when performing a copy index to range operation at the tag configuration page is UNDEF A tag defined as an UNDEF type cannot be copied to another index Only defined tags (any tag type except UNDEF) can be copied

MSG 447, Tag Update Failed RDB broadcasting tag

The GDM or RDB program has a rebroadcast pending on this tag Wait for the rebroadcast to complete and retry

MSG 448, Tag Update Failed - Ident Console differs

A tag exists in one identical console but not in another The consoles have become out of synchronization Refer to the GDM or RDB instruction for additional information

MSG 449, Tag Update Failed Existing tag mismatch

An attempt was made to add a tag that exists in another console without matching all of the common tag fields Make all of the common tag fields in the tag being added identical to the fields of the existing tag Refer to the GDM or RDB instruction for additional information

MSG 450, Tag Update Failed Tag not in RDB to del

An attempt has been made to delete a tag that is not in the GDM or RDB database for this console The program has become out of synchronization with the console Add the tag to the GDM or RDB database for this console by calling it up on the console and pressing **ENTER** to save, then retry the delete

MSG 451, Tag Update Failed Tag indx out of range

Occurs when a tag is added at another console that has a larger tag database than this console The GDM or RDB program has attempted to add the tag to this console at an index number that is invalid for this console

MSG 452, Tag Update Failed RDB move index error

While the console was in local broadcast mode, a tag was deleted and entered at a new index number The GDM or RDB program has become out of synchronization with the console Enter the tag name and address at the original index location, then delete it At the new index, press **ENTER** to save the tag at its new index and to update the GDM or RDB database

MSG 453, Tag Update Failed RDB taglst not loaded

No tag list loaded in the GDM or RDB program for this console Load the tag list

MSG 454, Tag Update Failed RDB has duplicate tag name

Informs the operator that the GDM or RDB database contains tags with the same name

MSG 455, Event and error counters were reset

Indicates that the console has successfully completed a request to reset the event and error counters for the selected node or nodes

ERR 456, Failed to reset event and error counters

Indicates that the console was unable to complete a request to reset the event and error counters for the selected node, or one or more of the selected nodes In most cases, this indicates that a node is off line or in error Use one of the INFI-NET diagnostics functions to check the status of the selected node or nodes

MSG 457, Exception statistics were reset

Indicates that the console has successfully completed a request to reset the exception statistics for a selected node or nodes

ERR 458, Failed to reset exception statistics

Indicates that the console was unable to complete a request to reset the exception statistics for the selected node, or one or more of the selected nodes In most cases, this indicates that a node is off line or in error Use one of the INFI NET diagnostics functions to check the status of the selected node or nodes

ERR 463, Output option must be PRINT or DISPLAY

The options for the *Print/Display* portion of the input prompt called by selecting *Log by Name* are **PRINT** or **DISPLAY** only Enter either of these

MSG 466, Maximum or Minimum Zoom reached

Appears if the requested zoom on a trend exceeds the resolution of the display This occurs when the operator attempts to zoom a trend display past its maximum or minimum resolution

ERR 467, Maximum number of save to disk configured

Informs the process engineer that the maximum number of save to disk trends have been configured while performing trend definition. No additional save to disk or archiving trends can be added

MSG 468, Enter YES or NO

Informs the operator that a **YES** or **NO** response is required to continue

MSG 469, Time change request has completed

Appears after the console finishes processing a time change request

ERR 470, Console's time has not been synchronized

Appears when the operator requests a change to the local (wall clock) time before the console begins processing time sync messages This can occur during approximately the first nine minutes after a console starts up The local time at the console will update, but the time will not be updated on the loop Wait a short period of time and try the change request again

ERR 471, Console's time has not been synchronized

Appears when the operator requests a change to GMT (system time) before the console begins processing time sync messages This can occur during approximately the first nine minutes after a console starts up Wait a short period of time and try the change request again

ERR 472, Internal error processing time request

Some internal error occurred that does not allow the console to process a time change request Reset the console and attempt the request again If this does not work, contact Bailey Controls Company

ERR 473, System has no satellite clock

One of the satellite clock options was chosen at the *Set Date and Time* function when the console is not equipped with a satellite receiver Select another option that does not set time using a satellite clock

ERR 474, Greenwich Mean Time is not established

One of the time maintenance options has not yet been used at this console to initialize time synchronization for the console and establish GMT Choose any of options *D* through *J* at the *Set Date and Time* function to initialize time synchronization before attempting to change the local (wall-clock) time This is required on all consoles on the loop at least once after start up to initialize time synchronization

ERR 475, Failure reading the satellite clock

The console is unable to read the date and time from its satellite receiver Verify the status of the satellite receiver.

ERR 476, Cannot change GMT before synchronized

The operator selected an option that allows the console to up date its time based on the loop time, but the loop has not been synchronized Choose an option from the *Set Date and Time* function that establishes GMT (system time) for the loop

ERR 477, Error in formula definition

During custom log cell definition, a formula was entered incorrectly

ERR 478, Invalid cell type in formula definition

An address of a cell that is not valid for the formula cell func tion was entered Refer to the formula cell option screen to identify valid cell types

ERR 479, Not enough operands in the formula definition

At least two operands must be entered for a formula definition.

MSG 480, No data from the module for plot index n

If the console has not yet received a data file for an MFC data source plot, the display remains blank and this message appears until the console has read the data from the module

ERR 496, Control Invalid While in String Interlock

Control actions cannot be performed at a TEXTSTR element while *USER TEXT LOCK* appears at the element The control scheme has been set to not allow input from the console

ERR 497, Response Is Invalid For Current Prompt

A mismatch between the current prompt or question appearing at a TEXTSTR element and a response to the prompt or question has occurred Enter a new response to the current prompt or question

.*ERR 498, Control Has Not Been Enabled*

A TEXTSTR element cannot be selected for control ıf the *Con trol Enable* field for the tag ıs set to *NO* ın the tag database

ERR 501, Same dısplay on CRT n cannot change plot

If the same MFC data source XY plot dısplay ıs called on a dıfferent screen, changıng plot ındex ıs not permıtted If an attempt ıs made to change the ındex, thıs message appears

ERR 502, Plot already on dısplay

Up to three MFC data source plots can appear on one dısplay screen at a tıme If the.entered plot ındex ıs already dısplayıng at the current screen, thıs message appears

APPENDIX F - XY PLOT MFC DATA SOURCE FILE STRUCTURE

MFC DATA SOURCE FILE LOCATION AND NAMING

The data for an MFC data source XY plot comes from a file created in a multi function processor (MFP) module The file is converted to a model 1, mode 2 float data file, refer to ***DATA FILE STRUCTURE*** in this section The management command system saves this converted file to its hard disk

A data file resides in the USN 59 directory, and is in the format

XYxxnnnn.IF

where

xx Plot index number

nnnn File ID as defined in the plot definition.

The XY plot data file in an MFP module read by the console must be created using a C program with the structures defined in the ***XYMFCFIL.H*** header file The C utility program (CUP) downloads this program to the MFP module A CUP version 1.0 022 or higher program is required to communicate with the MFP module For information about the CUP program, refer to the ***C Utility Program*** instruction

NOTE When configuring the CUP program, be sure to make the num ber of module bus fi e (MBF) buffers equal to the number of XY plot fi es to transfer and the size of each MBF buffer equa to the s ze of the argest XY plot f le

DATA FILE STRUCTURE

There are two file models, each having two modes of operation

Model 1 Alarm state information for each data point is pro vided in a character bit stream Only a high or low alarm condition can be represented

Model 2 Alarm state information for each data point is pro vided in a character array Alarm conditions are defined as stated in ***mcs$include:alarm_states.h***.

Mode 1 X data values (data sets) repeated only, with Y values determined by the file position of X data values

- or -

Y data values (data sets) repeated only, with X values determined by the file position of Y data values

Mode 2 Both X and Y data values (data sets) are repeated

A complete file structure for each model and mode consists of the following elements in the order shown

- Standard header.
- Data set

Each element must be the same model and mode The remaining part of this section shows the required data file structures when creating an MFC data source file

Standard Header Element for All File Models and Modes

```
#include "mcs$include:quality.h" /* include QGOOD and QBAD as          */
                                 /* quality indicators                 */

#define NUM_SPARE      6          /* number of spare bytes in ext headers */
#define MAX_REFLINES   5          /* number of x/y reference lines      */
#define CHAR_BQ        0x80       /* char bad quality value             */
#define SHORT_BQ       0x8000     /* short bad quality value            */
#define FLOAT_BQ       0x80000000 /* float bad quality value            */
#define NONE INSERTED  0
#define X_INSERTED     1
#define Y_INSERTED     2

#define CHAR_ELEM      0x00       /* char data element type             */
#define SHORT_ELEM     0x01       /* short data element type            */
#define FLOAT ELEM     0x02       /* float data element type            */
#define REAL2_ELEM     0x03       /* N90 real 2 element type            */
#define MODEL_1        0x00       /* file Model 1                       */
#define MODEL_2        0x10       /* file Model 2                       */
#define MODE 1X        0x00       /* file Mode 1, x data values only    */
#define MODE_1Y        0x01       /* file Mode 1, y data values only    */
#define MODE_2         0x02       /* file Mode 2, x and y data values   */
#define MDL1MOD1X      0x00       /* Model 1, Mode 1, x data values only  */
#define MDL1MOD1Y      0x01       /* Model 1, Mode 1, y data values only  */
#define MDL1MOD2       0x02       /* Model 1, Mode 2, x and y data values */
#define MDL2MOD1X      0x10       /* Model 2, Mode 1, x data values only  */
#define MDL2MOD1Y      0x11       /* Model 2, Mode 1, y data values only  */
#define MDL2MOD2       0x12       /* Model 2, Mode 2, x and y data values */


/*------  Standard Header information for all File Models and Modes  ----    */
typedef struct {
   unsigned char elem datatype;  /* element data type          */
                                 /*   0x00 = char              */
                                 /*   0x01 = short             */
                                 /*   0x02   float             */
                                 /*   0x03 - REAL2             */

   unsigned char file_MdlMod;    /* file Model and Mode                    */
                                 /* 0x00 Model 1, Mode 1, x data values only */
                                 /* 0x01 Model 1, Mode 1, y data values only */
                                 /* 0x02 Model 1, Mode 2, x and y data values*/
                                 /* 0x10 Model 2, Mode 1, x data values only */
                                 /* 0x11 Model 2, Mode 1, y data values only */
                                 /* 0x12 Model 2, Mode 2, x and y data values*/

   unsigned short num datasets;  /* Number of x elements, y elements,      */
                                 /* or xy element data sets in the file.   */
   unsigned char x_data_stat;  /* x Data Status              */
                               /*   0x00 - good quality      */
                               /*   0x01   bad quality       */

   unsigned char y_data stat, /* y Data Status               */
                              /*   0x00   good quality       */
                              /*   0x01   bad quality        */
```

Standard Header Element for All File Models and Modes (cont nued)

```
    unsigned char x_eng_unit;  /* Engineering Unit              */
    unsigned char y eng unit;  /* Engineering Unit              */

    float x average;           /* Average x data value          */
    float y_average;           /* Average y data value          */

    float x high lim;          /* X high limit                  */
    float y high lim;          /* Y high limit                  */
    float x_low_lim;           /* X low limit                   */
    float y low_lim;           /* Y low limit                   */

  float        x refline[MAX_REFLINES];    /* X horizonta  reference lines */
  float        y_refline[MAX REFLINES];    /* Y vertical reference lines   */

  unsigned char x refline drw[MAX REFLINES]; /* X reference line draw flag   */
  unsigned char y refline drw[MAX_REFLINES]; /* Y reference line draw flag   */

  unsigned char draw step;             /* 1 if to draw in step graph format */
                                       /* 0 connect the dots                */

  unsigned char val inserted;          /* 0 no values inserted        */
                                       /* 1 x values inserted        */
                                       /* 2 y values inserted  */
  unsigned char spare[NUM_SPARE];
} XYMFC HEADER;
```

Data Sets for Model 1, Mode 1

```
/* ---- -   ----   - ---- Data Set -----   ----  ----  ----         - --*/
/*---       ---   File Model 1, Mode 1, char data type - -----  --    --    -*/
typedef struct {
   unsigned char *alm_Hstate;   /* bit stream (num_datasets / 8) bits long   */
   unsigned char *alm_Lstate;   /* bit stream (num_datasets / 8) bits long   */

   char          *data;         /* num_datasets data value elements          */
} MDL1MOD1 DATASET_C;

/* --------- -----    - --- Data Set - ---  ------  - --- -   -     -      */
/*------   --- File Model 1, Mode 1, short/RFAL2 data type ----------------*/
typedef struct {
   unsigned char *alm Hstate;   /* bit stream (num_datasets / 8) bits long   */
   unsigned char *alm_Lstate;   /* bit stream (num datasets / 8) bits long   */

   short         *data;         /* num datasets data value elements          */
} MDL1MOD1 DATASET_S;

/* ------ - - ---   --- --- Data Set -----  ------ -----     ---------      */
/*-    ------     File Model 1, Mode 1, float data type  --           - ----*/
typedef struct {
   unsigned char *alm_Hstate;   /* bit stream (num datasets / 8) bits long   */
   unsigned char *alm Lstate;   /* bit stream (num_datasets / 8) bits long   */

   float         *data;         /* num datasets data value elements          */
} MDL1MOD1 DATASET_F;
```

Data Sets for Model 1, Mode 2

```
/*      ------ - ----       Data Set    -----  -    ---------- -- ------ */
/*--- -          -  File Model 1, Mode 2, char data type    -  ----------- ---*/
typedef struct {
   unsigned char *x_alm Hstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *x alm Lstate; /* bit stream (num_datasets / 8) bits long   */
   unsigned char *y_alm_Hstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *y_alm_Lstate; /* bit stream (num datasets / 8) bits long   */

   char          *x data;       /* num datasets x data value elements        */
   char          *y_data;       /* num_datasets y data value elements        */
} MDL1MOD2 DATASET C;

/*-        ------         -- Data Set       ---        - --  --              */
/*-- -        - File Model 1, Mode 2, short/REAL2 data type  -  -  --        */
typedef struct {
   unsigned char *x alm Hstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *x alm_Lstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *y_alm Hstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *y alm Lstate; /* bit stream (num datasets / 8) bits long   */

   short         *x data;       /* num datasets x data value elements        */
   short         *y_data;       /* num datasets y data value elements        */
} MDL1MOD2 DATASET S;

/*- ----       ----       --- Data Set   ---        --              - --     */
/*-  -   --- -    File Model 1, Mode 2, float data type     --- -            */
typedef struct {
   unsigned char *x alm Hstate; /* bit stream (num_datasets / 8) bits long   */
   unsigned char *x_alm Lstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *y alm Hstate; /* bit stream (num datasets / 8) bits long   */
   unsigned char *y_alm Lstate; /* bit stream (num datasets / 8) bits long   */

   float         *x_data;       /* num datasets x data value elements        */
   float         *y data;       /* num datasets y data value elements        */
} MDL1MOD2 DATASET F;
```

Data Sets for Model 2, Mode 1

```
/*  ------- ---------------- Data Set -----          - -----------     ---- */
/*----  -  --  -  File Model 2, Mode 1, char data type          ----     --*/
typedef struct {
   unsigned char *status;     /* num_datasets status bytes                  */

   char          *data;       /* X or Y data value elements                 */
} MDL2MOD1 DATASET_C;

/*------- --       ----  ---- Data Set ---       ---   ---- - - -     ------*/
/*---- - ----  File Model 2, Mode 1, short/REAL2 data type - --------      -*/
typedef struct {
   unsigned char *status;     /* num_datasets status bytes                  */

   short         *data;       /* X or Y data value elements                 */
} MDL2MOD1 DATASET S;

/*                  -         Data Set      ----      -                -   */
/*--------------  File Model 2, Mode 1, float data type ----  ------------ --*/
typedef struct {
   unsigned char *status;     /* num_datasets status bytes                  */

   float         *data;       /* X or Y data value elements                 */
} MDL2MOD1 DATASET_F;
```

Data Sets for Model 2, Mode 2

```
/* ----- -                    Data Set      --------  ---          -     - */
/*       -  ----- File Model 2, Mode 2, char data type ------- - -----  -----*/
typedef struct {
   unsigned char *x_status,     /* num_datasets status bytes              */
   unsigned char *y status;     /* num datasets status bytes              */

   char          *x data;       /* X or Y data value elements             */
   char          *y_data;       /* X or Y data value elements             */
} MDL2MOD2_DATASET C;

/*          ------------        Data Set      -- ----                   -*/
/*  ---------  File Model 2, Mode 2, short/REAL2 data type  ----  -------- */
typedef struct {
   unsigned char *x status;     /* num datasets status bytes              */
   unsigned char *y_status;     /* num datasets status bytes              */

   short         *x_data;       /* X or Y data value elements             */
   short         *y data;       /* X or Y data value elements             */
} MDL2MOD2 DATASET S,

/*-         ----- - -          Data Set ---          -------    ---       */
/*       -       File Model 2, Mode 2, float data type               -   -*/
typedef struct {
   unsigned char *x status;     /* num_datasets status bytes              */
   unsigned char *y_status;     /* num datasets status bytes              */

   float         *x_data,       /* X or Y data value elements             */
   float         *y data;       /* X or Y data value elements             */
} MDL2MOD2_DATASET F;
```

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