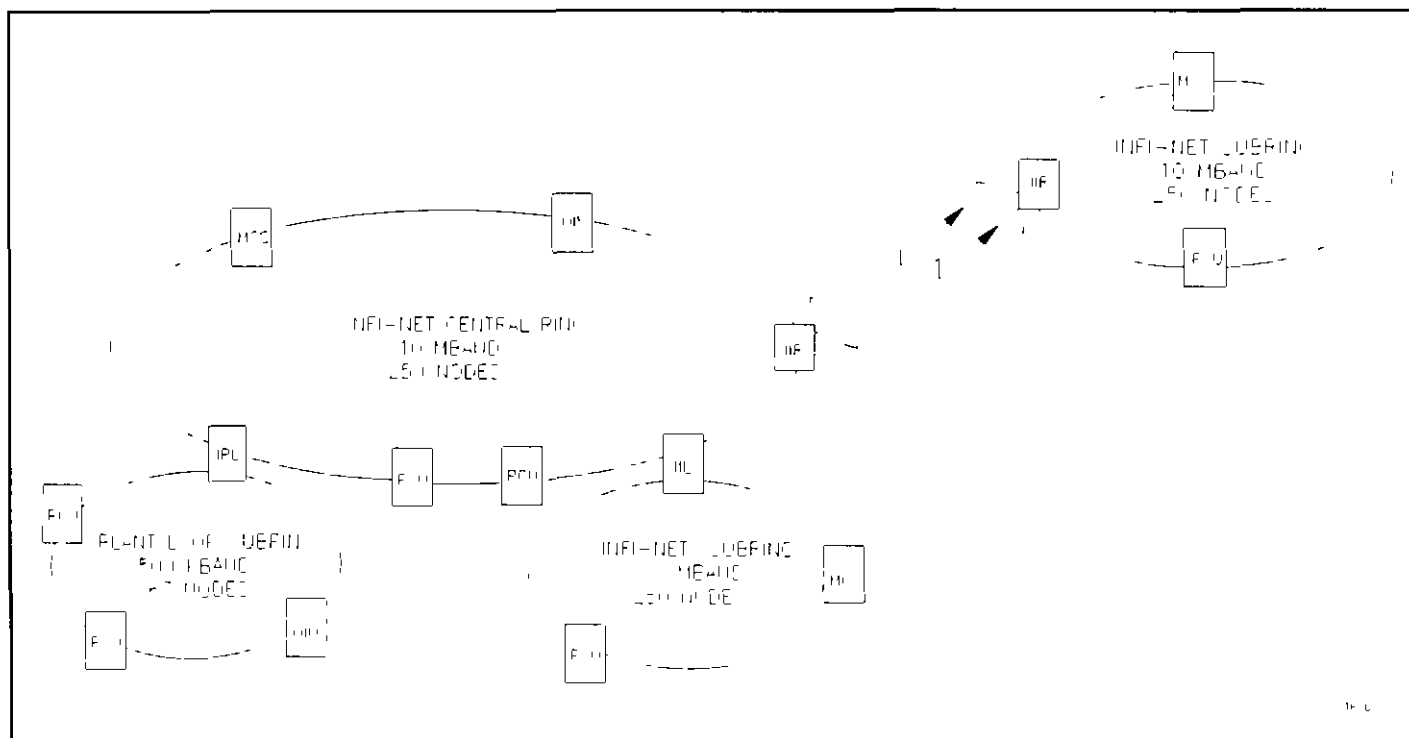


# Bailey<sup>®</sup> infi 90<sup>®</sup>

# Specification

## E96-601

## INFI-NET Communication System



### Features

- INFI-NET provides a plant-wide communication network
- Response time is fast. Ten megabaud rate gives timely information exchange
- Message packing and multiple addressing increases data handling efficiency and throughput
- INFI-NET time synchronizes the control process plant-wide
- Requires no traffic director, every node is its own master
- Multiple self check features including positive message acknowledgment and cyclical redundancy checks ensure data integrity
- Provides localized start-up/shutdown on power failure without operator intervention

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Seamless, Real-Time  
Process Management  
Solutions

## Introduction

INFI-NET is a unidirectional, high-speed serial data highway shared by all INFI 90 nodes. The central ring supports up to 250 nodes. Multiple subrings link to the central ring through local and remote interfaces (shown on cover). Each subring supports up to 250 nodes. Interfacing a maximum 250 subrings from the central ring gives a total system capacity of 62,500 nodes.

INFI-NET provides sophisticated interfaces for data exchange. These network interface units use state-of-the-art INFI 90 modules. Refer to RELATED HARDWARE for a list of INFI-NET modules that make up each interface.

## Related Hardware

Process Control Unit Interface		
Interface	Modules	Hardware Description
PCU	INNPM01	Network Processing Module
	INNIS01	Network Interface Slave Module

INFI-NET to Computer Interface		
Interface	Modules	Hardware Description
INIC101	INICT01	INFI-NET to Computer Transfer Module
	INNIS01	Network Interface Slave Module

INFI-NET to INFI-NET Local Interface		
Interface	Modules	Hardware Description
INIIL01	INIIT01	INFI-NET to INFI-NET Transfer Module
	INNIS01	Network Interface Slave Module

INFI-NET to INFI-NET Remote Interface		
Interface	Modules	Hardware Description
INIIR01	INIIT02	INFI-NET to INFI-NET Transfer Module
	INNIS01	Network Interface Slave Module

INFI-NET to Plant Loop Local Interface		
Interface	Modules	Hardware Description
INIPL01	INIPT01	INFI-NET to Plant Loop Transfer Module
	INNIS01	Network Interface Slave Module

## Process Control Unit Interface (PCU)

The Process Control Unit Interface (Figure 1) consists of the Network Interface Slave (INNIS01) and the Network Processing Module (INNPM01). Through this interface the PCU has access to INFI-NET. The NIS links the node to INFI-NET, while the NPM, communicating to the master modules via the Controlway, holds the Process Control Unit database.

The NPM polls all modules for Exception Reports. It has user-selectable poll rates with a maximum of 4 poll cycles/second. The NPM packages messages by grouping

those with a common destination. Transmission of packaged messages maximizes data throughput.

The NIS and NPM execute module security checks of hardware and software. Error detection takes the node off-line without interrupting the loop (this is true for all INFI-NET interfaces).

The PCU Interface can support hardware redundancy (Figure 2). In a redundant configuration, there are two NIS and two NPM modules. One pair of modules is the primary. If the primary fails, the backup comes on-line.



A0901

FIGURE 1 — Process Control Unit Interface

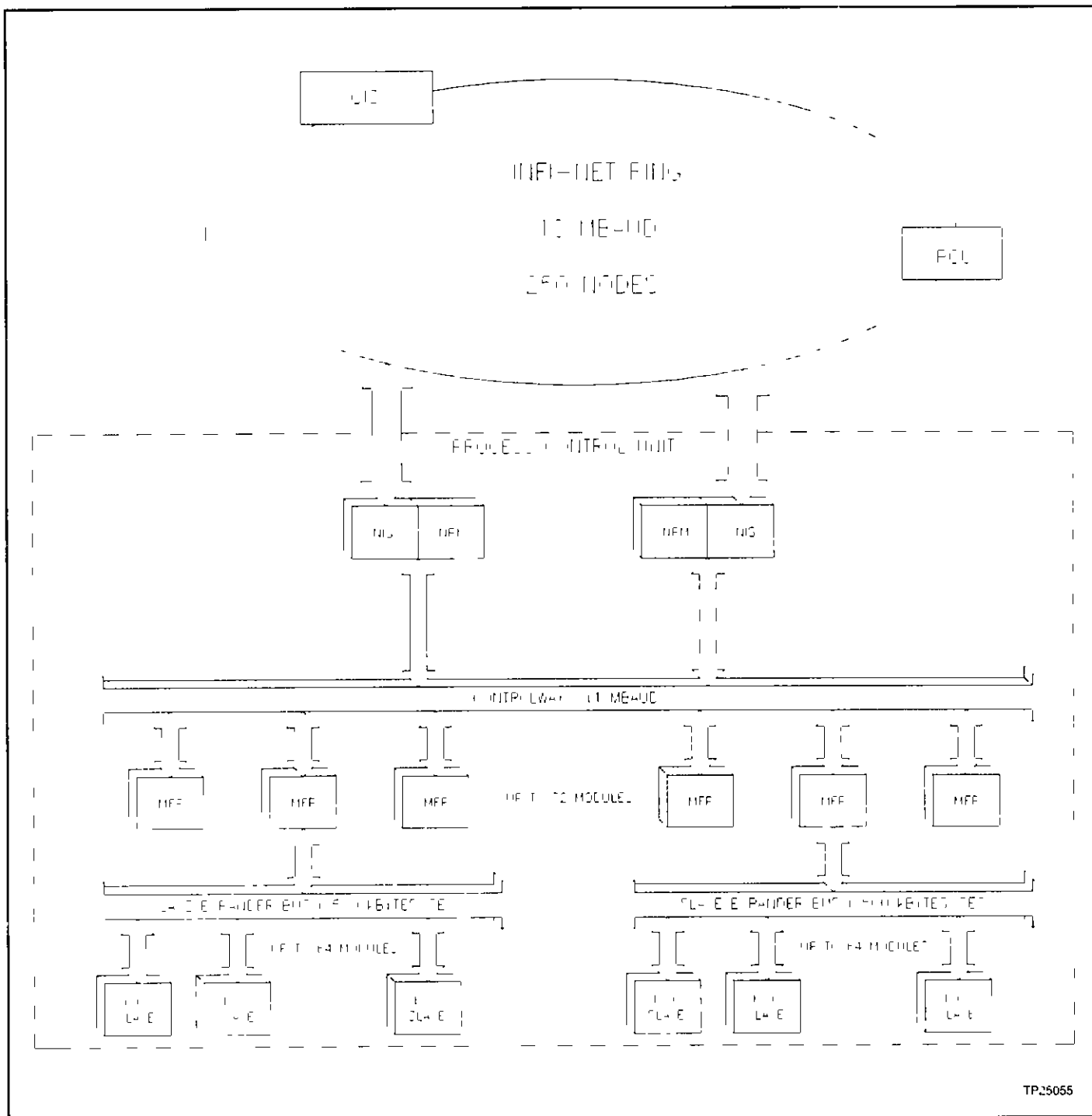


FIGURE 2 — Redundant Process Control Unit Interface

## INFI-NET to Computer Interface (ICI)

The INFI-NET to Computer Interface (Figure 3) consists of a Network Interface Slave Module (INNIS01), an INFI-NET to Computer Transfer Module (INICT01) and related support hardware. It gives a host computer access to point data. Point data is available through a RS-232-C serial link at standard rates up to 19.2 kbaud.

The INFI-NET to Computer Interface is command driven through software on the host computer. The ICI receives a command from the host, executes it and then replies to the host.

### Data Acquisition

The host computer builds a database (up to 10,000 points) in the ICI. The host has access to the database with data acquisition commands.

### Configuration

The ICI can download control strategy configurations to INFI 90 modules. It also allows the user to tune and read block outputs using an operator console or host computer.

### Process Control

The command list enables a host computer to handle analog and digital process requirements such as changing setpoints and control outputs. The ICI can supply control commands, in addition to data values that are in exception report form, to INFI 90 modules.

### Security

The ICT and NIS do continuous hardware and software checks to ensure module security. The user has the option of assigning a password to prevent unauthorized configuration changes or data acquisition.

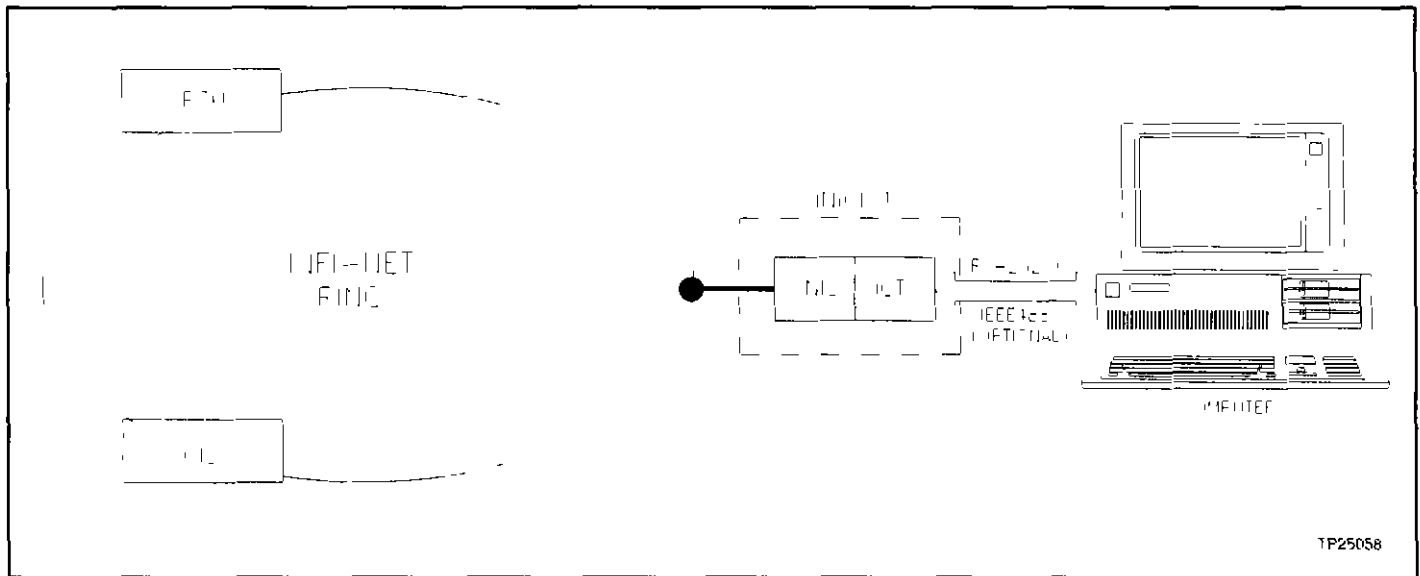


FIGURE 3 — INFI-NET to Computer Interface

## INFI-NET to INFI-NET Local Interface (IIL)

The INFI-NET to INFI-NET Local Interface (Figure 4 and cover) provides a communication path from a central INFI-NET ring to a satellite INFI-NET ring. The interface consists of an INFI-NET to INFI-NET Transfer Module (INIIT01), two NIS modules and related hardware. Both rings must terminate within 150 feet when using a local interface.

### Data Flow

When a NIS receives a message, it notifies the IIT. The IIT acknowledges and receives the message, and stores it in its exception report database (random access memory).

When the interface receives a message, it takes responsibility for that message and verifies it reaches its destination. Messages include exception reports, configuration data, control data and system status.

### Redundancy

Interface redundancy uses a full set of duplicate modules (Figure 5). Handshaking occurs over the Controlway (operating at 83.3 kbaud). The secondary module monitors the primary for a failure. If a failure occurs, the secondary takes over and operation continues.

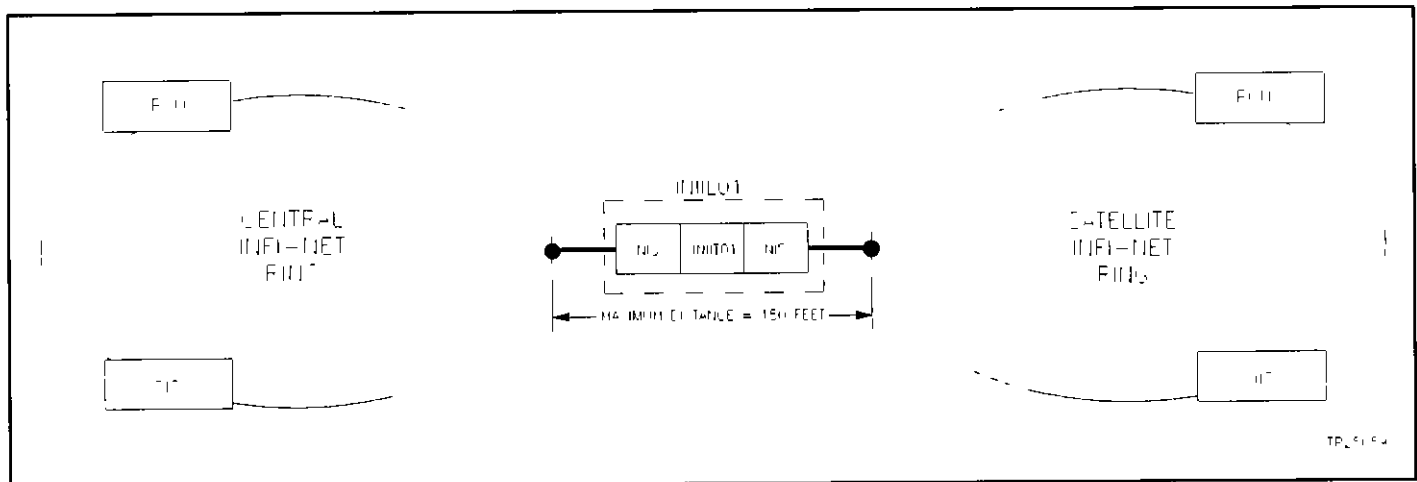


FIGURE 4 — INFI-NET to INFI-NET Local Interface

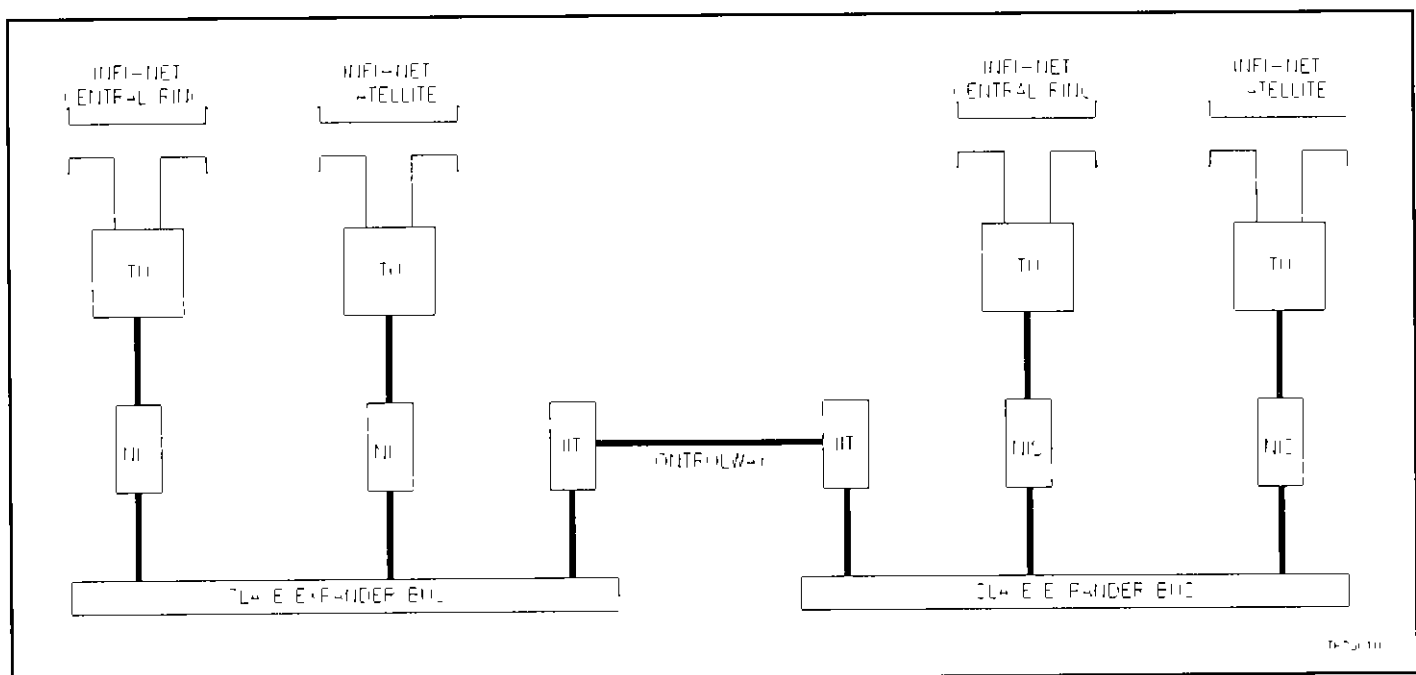


FIGURE 5 — Redundant INFI-NET to INFI-NET Local Interface

## INFI-NET to INFI-NET Remote Interface (IIR)

The INFI-NET to INFI-NET Remote Interface (Figure 6 and cover) links a satellite INFI-NET ring to a central INFI-NET ring. The interface consists of a NIS module, the INFI-NET to INFI-NET Transfer Module (INIIT02) and related hardware. Both rings (central and satellite) have a set of interface modules. All system data is available to the satellite subring through the IIR. This interface supports

complete bi-directional data transfer. The IIR is similar to the local interface, but uses RS-232-C ports to support satellite communication. The IIR can use a variety of means to link a satellite INFI-NET ring to a central INFI-NET ring such as modems and microwave transceivers.

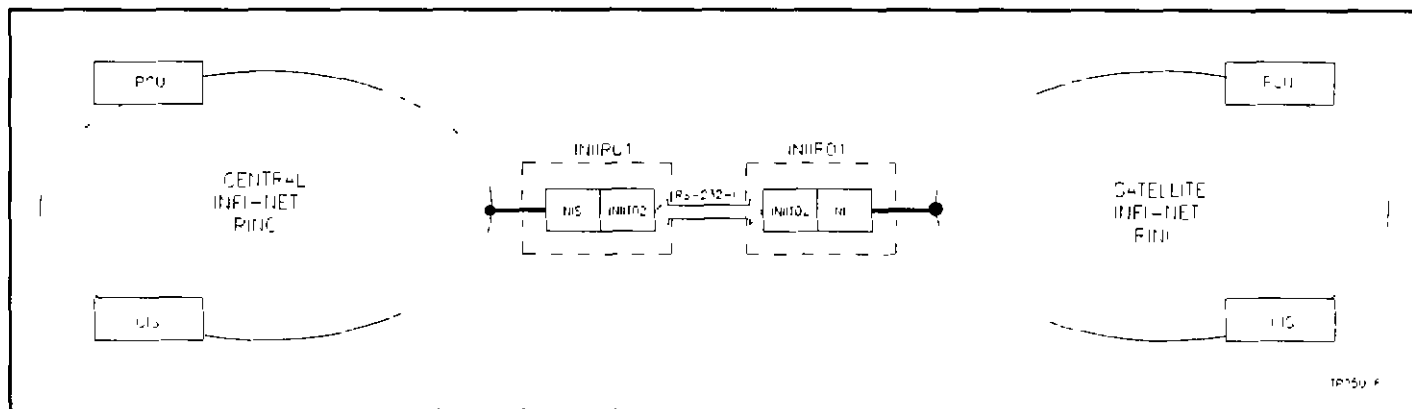


FIGURE 6 — INFI-NET to INFI-NET Remote Interface

## INFI-NET to Plant Loop Local Interface (IPL)

The INFI-NET to Plant Loop Local Interface (Figure 7 and cover) allows the INFI-NET central ring to interface with INFI 90 Plant Loop. This interface converts data from the central ring so that it is usable by the Plant Loop. The Plant Loop to INFI-NET Transfer Module (INIPT01) links the NIS module in the Plant Loop to the NIS module in the INFI-NET ring. The Network Interface Slave emulates a Loop Interface Module on the Plant Loop side of the interface.

### Data Flow

When a NIS receives a message, it notifies the IPT. The IPT acknowledges and receives the message, and stores it in its exception report database (random access memory). When the interface receives a message, it takes

responsibility for that message and verifies it reaches its destination. Messages include exception reports, configuration data, control data and system status.

### Redundancy

Interface redundancy uses a full set of duplicate modules. Handshaking occurs over the Controlway (operating at 83.3 kbaud). The secondary module monitors the primary for a failure. If a failure occurs the secondary takes over and operation continues.

### Trending

The INFI-NET side of the gateway trends automatically. The Plant Loop side trending process is semi-automatic.

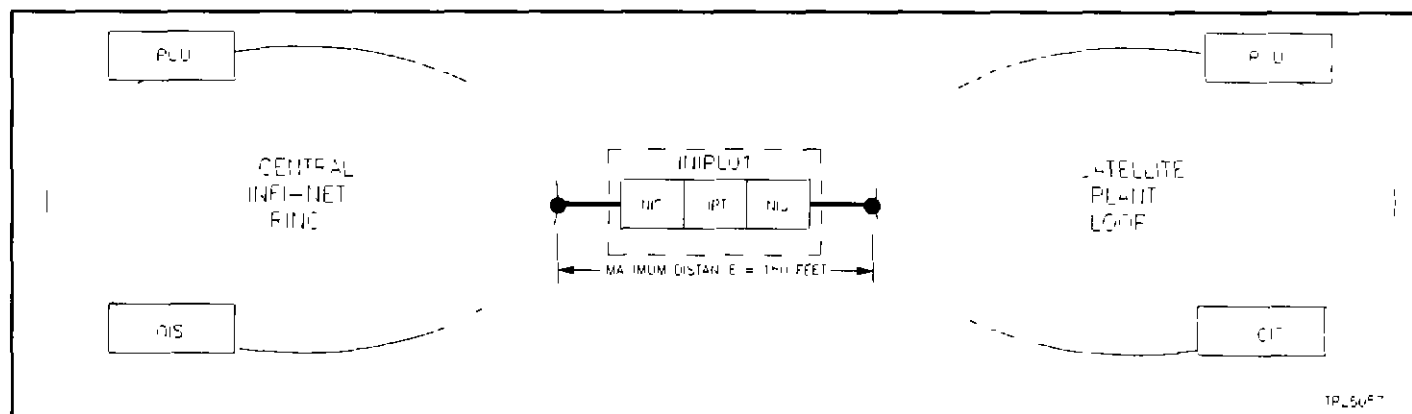


FIGURE 7 — INFI-NET to Plant Loop Local Interface

## Specifications

	INNIS01	INNPM01	INICT01	INIIT01	INIIT02	INIPT01
Memory RAM ROM NVRAM	128 kbytes 64 kbytes _____	512 kbytes 256 kbytes _____	512 kbytes 256 kbytes 80 kbytes	512 kbytes 256 kbytes _____	512 kbytes 256 kbytes 256 kbytes	512 kbytes 256 kbytes 80 kbytes
Power + 5 V dc  +15 V dc  -15 V dc	1 15 amps 5 75 watts  6 5 mA 0 97 watts  288 mA 4 32 watts	2 amps 10 watts _____ _____ _____	4 6 amps 31 4 watts  44 4 mA 0 6 watts  21 6 mA 0 3 watts	4 6 amps 31 4 watts  44 4 mA 0 6 watts  21 6 mA 0 3 watts	2 amps 10 watts	4 6 amps 31 4 watts  44 4 mA 0 6 watts  21 6 mA 0 3 watts
Communication Rates	2 Mbaud or 10 Mbaud	_____	Up to 19 2 kbaud	_____	Up to 19 2 kbaud	_____
Communication Ports	_____	_____	(2) RS-232	_____	(2) RS-232	_____
Communication Rates vs Max Cable Distance		INFI-NET		Plant Loop		
Coaxial Twinax Cable NIS to TU		<b>10 Mbaud</b> 2000m 1000m 25m	<b>2 Mbaud</b> 4000m 2000m 25m	<b>500 kbaud</b> 4000m 2000m 25m		
Maximum Length Difference for Redundant Cables (Twinax or Coaxial)	800 meters (2,625 ft)					
System Capability	250 nodes on a central ring, 250 nodes on a subring, 62 500 system nodes maximum Any combination of OIS, MCS, PCU, ICI, IIL, or IIR					
Environmental Electromagnetic/Radio Frequency Interference	Values are not available at this time Keep cabinet doors closed Do not use communication equipment any closer than 2 meters from the cabinet					
Ambient Temperature Relative Humidity	0° to 70°C (32° to 158°F) internal to cabinet 0° to 55°C (32° to 131°F) external to cabinet 0 to 95% up to 55°C (131°F) (non-condensing) 0 to 45% up to 70°C (158°F) (non-condensing)					
Atmospheric Pressure Air Quality	Sea level to 3 km (1 86 miles) Noncorrosive					
Certification	All modules have been CSA certified for use as process control equipment in an ordinary (non-hazardous) environment					

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