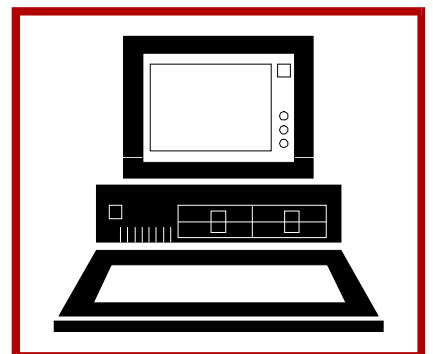
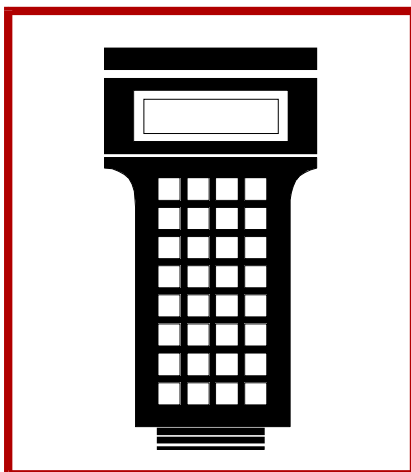
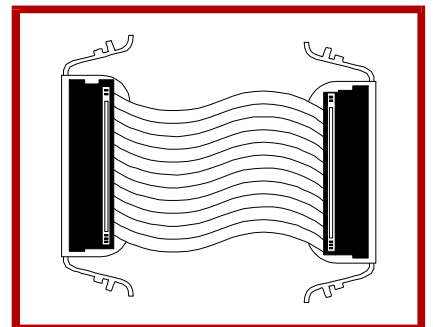
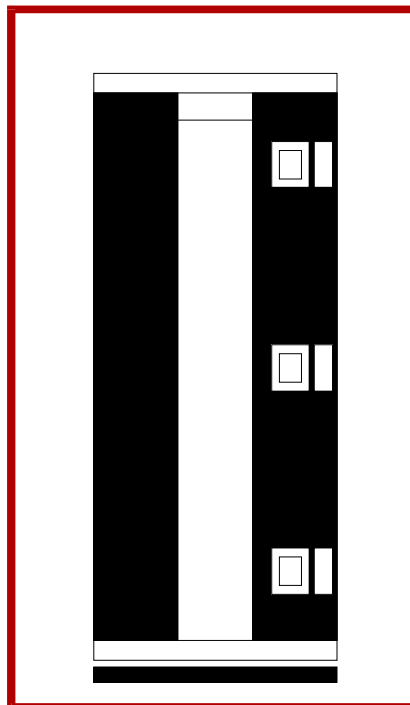
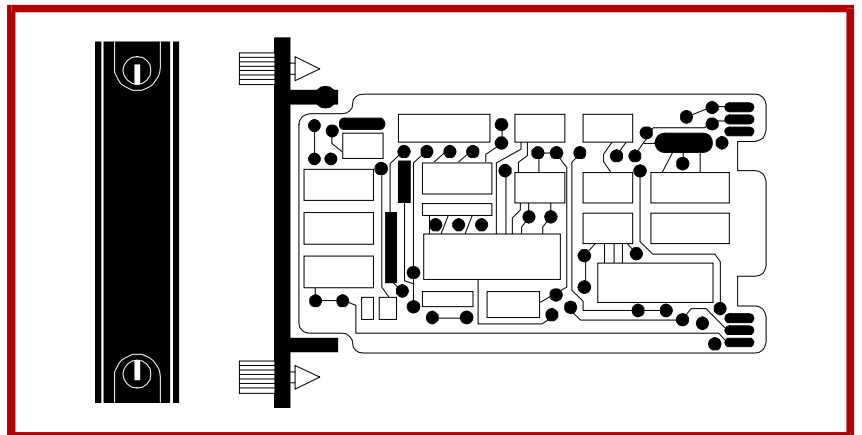
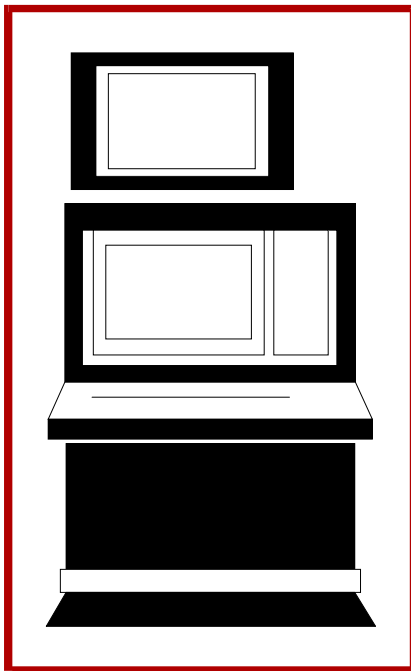


E96-441

Bailey®
infi 90

Instruction

Analog Input Termination Module (NIA105)



WARNING notices as used in this instruction apply to hazards or unsafe practices that could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices that could result in property damage.

NOTES highlight procedures and contain information that assists the operator in understanding the information contained in this instruction.

WARNING

INSTRUCTION MANUALS

DO NOT INSTALL, MAINTAIN, OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING, AND FOLLOWING THE PROPER **Elsag Bailey** INSTRUCTIONS AND MANUALS; OTHERWISE, INJURY OR DAMAGE MAY RESULT.

RADIO FREQUENCY INTERFERENCE

MOST ELECTRONIC EQUIPMENT IS INFLUENCED BY RADIO FREQUENCY INTERFERENCE (RFI). CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA AROUND SUCH EQUIPMENT. PRUDENT PRACTICE DICTATES THAT SIGNS SHOULD BE POSTED IN THE VICINITY OF THE EQUIPMENT CAUTIONING AGAINST THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT.

POSSIBLE PROCESS UPSETS

MAINTENANCE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AND ONLY AFTER SECURING EQUIPMENT CONTROLLED BY THIS PRODUCT. ADJUSTING OR REMOVING THIS PRODUCT WHILE IT IS IN THE SYSTEM MAY UPSET THE PROCESS BEING CONTROLLED. SOME PROCESS UPSETS MAY CAUSE INJURY OR DAMAGE.

AVERTISSEMENT

MANUELS D'OPÉRATION

NE PAS METTRE EN PLACE, RÉPARER OU FAIRE FONCTIONNER L'ÉQUIPEMENT SANS AVOIR LU, COMPRIS ET SUIVI LES INSTRUCTIONS RÉGLEMENTAIRES DE **Elsag Bailey**. TOUTE NÉGLIGENCE À CET ÉGARD POURRAIT ÊTRE UNE CAUSE D'ACCIDENT OU DE DÉFAILLANCE DU MATÉRIEL.

PERTURBATIONS PAR FRÉQUENCE RADIO

LA PLUPART DES ÉQUIPEMENTS ÉLECTRONIQUES SONT SENSIBLES AUX PERTURBATIONS PAR FRÉQUENCE RADIO. DES PRÉCAUTIONS DEVRONT ÊTRE PRISES LORS DE L'UTILISATION DU MATÉRIEL DE COMMUNICATION PORTATIF. LA PRUDENCE EXIGE QUE LES PRÉCAUTIONS À PRENDRE DANS CE CAS SOIENT SIGNALÉES AUX ENDROITS VOULUS DANS VOTRE USINE.

PERTURBATIONS DU PROCÉDÉ

L'ENTRETIEN DOIT ÊTRE ASSURÉ PAR UNE PERSONNE QUALIFIÉE EN CONSIDÉRANT L'ASPECT SÉCURITAIRE DES ÉQUIPEMENTS CONTRÔLÉS PAR CE PRODUIT. L'AJUSTEMENT ET/OU L'EXTRACTION DE CE PRODUIT PEUT OCCASIONNER DES À-COUPS AU PROCÉDÉ CONTRÔLE LORSQU'IL EST INSÉRÉ DANS UNE SYSTÈME ACTIF. CES À-COUPS PEUVENT ÉGALEMENT OCCASIONNER DES BLESSURES OU DES DOMMAGES MATÉRIELS.

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Preface

Termination modules terminate and connect plant equipment to the INFI 90[®] process modules. The Analog Input Termination Module (NIAI05) terminates field wiring for the Universal Analog Input Slave Module (IMASIO3).

This manual explains how to install and use the NIAI05 on the INFI 90 system. It has sections that describe the setup and cabling. The appendix contains quick reference information about the IMASIO3 module.

List of Effective Pages

Total number of pages in this manual is 32, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through vi	Original
1-1 through 1-5	Original
2-1 through 2-14	Original
3-1	Original
4-1 through 4-2	Original
5-1	Original
A-1 through A-2	Original
Index-1	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.

Safety Summary

GENERAL WARNINGS

Equipment Environment

All components, whether in transportation, operation or storage, must be in a noncorrosive environment.

Electrical Shock Hazard During Maintenance

Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.

SPECIFIC CAUTIONS

Remove modules from their module mounting unit slots before installing or removing a cable assigned to that slot. Failure to do so could result in damage to the module. (p. 2-7, 4-1)

We strongly recommend turning off power before doing any termination module wiring. Failure to do so could result in equipment damage. Do not apply power without verifying all wire connections. (p. 2-10)

If input or output circuits are a shock hazard after disconnecting system power at the power entry panel, then the door of the cabinet containing these externally powered circuits must be marked with a warning stating that multiple power sources exist. (p. 2-10, 2-12)

It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any termination module wiring. Failure to do so could result in equipment damage. Do not apply power until all connections are verified. (p. 2-12, 4-1)

Sommaire de Sécurité

**AVERTISSEMENTS
D'ORDRE
GÉNÉRAL****Environnement de l'équipement**

Ne pas soumettre les composants à une atmosphère corrosive lors du transport, de l'entreposage ou l'utilisation.

Possibilité de chocs électriques durant l'entretien

Débrancher l'alimentation ou prendre les précautions pour éviter tout contact avec des composants sous tension durant l'entretien.

**ATTENTIONS
D'ORDRE
SPÉCIFIQUE**

Retirer le module de son emplacement dans le châssis de montage des modules avant d'installer ou de retirer un câble assigné à cet emplacement. Un manquement à cette procédure pourrait endommager le module. (p. 2-7, 4-1)

Il est fortement recommandé de débrancher l'alimentation électrique avant d'effectuer toute connexion aux cartes de raccordement des modules. Des dommages aux équipements pourraient survenir dans le cas contraire. Ne pas rebrancher l'alimentation avant que toutes les connexions aient été vérifiées. (p. 2-10)

Si des circuits d'entrée ou de sortie sont alimentés à partir de sources externes, ils présentent un risque de choc électrique même lorsque l'alimentation du système est débranchée du panneau d'entrée l'alimentation. Le cas échéant, un avertissement signalant la présence de sources d'alimentation multiples doit être apposé sur la porte de l'armoire. (p. 2-10, 2-12)

Il est fortement recommandé que toutes les alimentations (armoire, E/S, etc.) soient coupées avant d'effectuer quelque raccord que ce soit sur une carte de raccordement. Un manquement à ces instructions pourrait causer des dommages à l'équipement. Ne pas rebrancher les alimentations avant d'avoir vérifié tous les raccords. (p. 2-12, 4-1)

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SECTION 1 - INTRODUCTION

OVERVIEW

Two Analog Input Termination Modules (NIAI05) are required for each Universal Analog Slave Module (IMASI03). Each NIAI05 can input eight analog signals from field equipment to the universal analog input slave module. The signals pass through the slave module to the Multi-Function Processor (IMMFP01/02/03). This manual explains the purpose, setup, handling precautions and steps to install the NIAI05 module.

INTENDED USER

System engineers and technicians should read this manual before installing and using the termination module (TM). Put the module into operation only after reading and understanding this instruction. Refer to the **Table of Contents** to find the information. Refer to **HOW TO USE THIS MANUAL** to get started.

TERMINATION MODULE DESCRIPTION

The NIAI05 is a single printed circuit board that uses one slot in a Termination Mounting Unit (NTMU01/02). The termination module (TM) has one card edge connector, P1. It connects to the slave module through a cable. The terminal blocks for field wiring are on the TM.

The jumpers on the NIAI05 module set the input type for the module. Figure 1-1 shows an application example for the NIAI05.

The NIAI05 pair handles up to 16 analog inputs. Each voltage input may be differential or single ended. The IMASI03 can input these analog signal ranges:

- -100 to +100 millivolts.
- 1 to 5 VDC.
- 0 to 5 VDC.
- 0 to 10 VDC.
- -10 to +10 VDC or user specified range within ± 10 VDC.
- System powered 4 to 20 milliamps DC.
- External powered 4 to 20 milliamps DC.
- Three-wire RTD.
- Thermocouples.

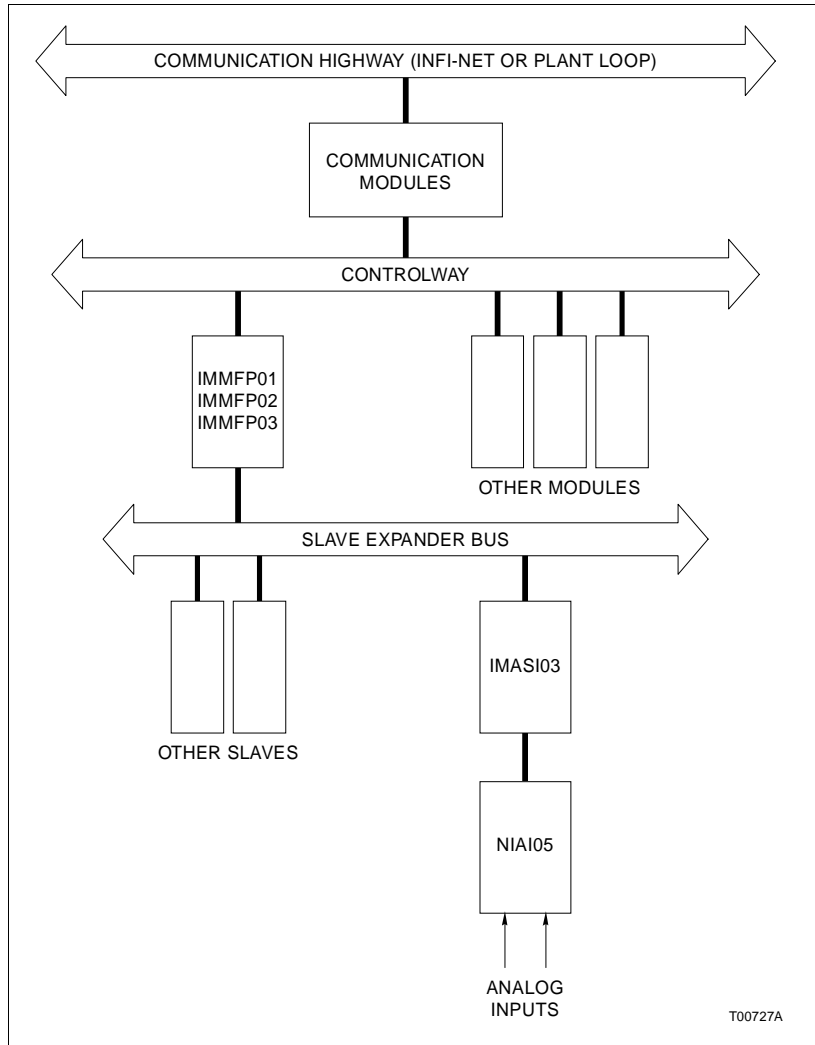


Figure 1-1. Application Example for NIAI05

FEATURES

The design of the NIAI05, as with all INFI 90 devices, allows for flexibility in creating a process management system. Refer to **NOMENCLATURE** for a list of devices that can be used with the TM in an INFI 90 system.

- A standard factory-wired cable connects the TM to the slave module.
- On-board terminal blocks accept field wiring for eight inputs.
- Each TM fits in a standard termination mounting unit.
- 4 to 20 milliamp inputs may be either system or externally powered.
- Input channel transient and surge protection.
- Analog input signal routing to the IMASI03.

- Jumper configured input signal types:
 - System powered 4 to 20 milliamp inputs have individually fused channels.
 - Field powered 4 to 20 milliamp.
 - Single ended voltage inputs have the minus input terminal jumpered directly to I/O COM on the NIAI05.
 - Differential voltage inputs and 3-wire RTDs have the plus and minus and C terminals isolated with respect to I/O COM and module common.
- NIAI05 is the source of the local cold junction reference for thermocouple inputs.
- Termination point for the overall shield of the NKAS02 and NKAS12 cable.
- The NIAI05 can be located up to 60 meters (200 feet) from the IMASI03.

INSTRUCTION CONTENT

This manual has five sections and an appendix.

Introduction	Contains an overview of the features, description and specifications and a description of the NIAI05.
Installation	Describes cautions to observe when handling the TM. It shows the steps to follow to install and connect the module before applying power. This section also presents jumper settings.
Maintenance	Provides a maintenance schedule.
Repair/Replacement Procedures	Details how to replace a TM.
Support Services	Describes the support services (spare parts, training, documentation, etc.) available from Bailey Controls Company.
Appendix	Shows the jumper settings for the Universal Analog Slave Input Module (IMASI03).

HOW TO USE THIS MANUAL

Read this manual before handling the TM. Refer to the sections in this list as needed for more information.

1. Read **Section 1** before connecting the NIAI05.
2. Refer to **Appendix A** for the IMASI03 slave module.
3. Refer to **Section 3** for a maintenance schedule.
4. Refer to **Section 4** and **Section 5** when needed.

GLOSSARY OF TERMS AND ABBREVIATIONS

Table 1-1 contains the glossary of terms for this manual.

Table 1-1. Glossary of Terms and Abbreviations

Term	Definition
Analog	Continuously variable as opposed to discretely variable.
Cold Junction Reference	The ambient temperature at the bimetallic junction at the termination point of thermocouple wires.
RTD	Resistance temperature detector. A sensing device that changes resistance with changes in temperature.
Slave Module	One of a series of modules designed to perform input/output operations as directed by a master module.
Thermocouple	A bimetallic sensor used for temperature measurements.
TM	Termination Module. Provides input/output connection between plant equipment and the INFI 90/Network 90 [®] modules.
TMU	Termination Mounting Unit. A card cage that provides housing for INFI 90/Network 90 termination modules.

REFERENCE DOCUMENTS

Table 1-2 contains the reference documents for the NIAI05.

Table 1-2. Reference Documents

Document Number	Description
I-E96-301	Universal Analog Input Slave Module (IMASI03)
I-E96-500	Site Planning and Preparation

NOMENCLATURE

Table 1-3 contains the modules and equipment that can be used with the NIAI05 module.

Table 1-3. Nomenclature

Nomenclature	Description
IMASI03	Universal Analog Input Slave Module
NKAS02	Cable, Termination Module (PVC)
NKAS12	Cable, Termination Module (non-PVC)
NTMU01/02	Termination Mounting Unit
258436A1	Round Cable Retaining Kit

SPECIFICATIONS

Refer to Table 1-4 for the specifications of the NIAI05 Termination Unit.

Table 1-4. Specifications

Property	Characteristic/Value
Power Requirements	+24 VDC 320 mA maximum total current 20 mA current each input
Mounting	Slides into a single slot in the termination mounting unit NTMU01/02.
Environmental	
Electromagnetic/Radio Frequency Interference	No values available at this time. Keep cabinet doors closed. Do not use communication equipment closer than 2 meters from the cabinet.
Ambient Temperature	0° to 70° C (32° to 158° F).
Relative Humidity	5% to 95% up to 55° C (131° F) (noncondensing).
Atmospheric Pressure	Sea level to 3 km (1.86 miles).
Air Quality	Noncorrosive.
Cooling Requirements	No cooling is necessary when used in Bailey Controls cabinets and operated within stated limits.
Certification	CSA certified for use as process control equipment in an ordinary (nonhazardous) location.

Specifications are subject to change without notice.

SECTION 2 - INSTALLATION

INTRODUCTION

This section explains how to install the Analog Input Termination Module (NIAI05). Read, understand, and complete the steps in the order they appear before using the NIAI05 module.

SPECIAL HANDLING

Observe these steps when handling electronic circuitry:

NOTE: Always use the Bailey Controls Field Static Kit (part number 1948385A1 - consisting of two wrist straps, ground cord assembly, alligator clip, and static dissipating work surface) when working with modules. The kit is designed to connect the technician and the static dissipating work surface to the same ground point to prevent damage to the modules by electrostatic discharge.

Use the static grounding wrist strap when installing and removing modules. Static discharge may damage MOS devices on modules in the cabinet. Use grounded equipment and static safe practices when working with modules.

1. **Use Antistatic Bag.** Keep the modules in the antistatic bag until you are ready to install them in the system. Save the bag for future use.
2. **Ground Bags Before Opening.** Before opening a bag containing an assembly with CMOS devices, touch it to the equipment housing or ground to equalize charges.
3. **Avoid Touching Circuitry.** Handle assemblies by the edges; avoid touching the circuitry.
4. **Avoid Partial Connection of CMOS Device.** Verify that all devices connected to the modules are properly grounded before using them.
5. **Ground Test Equipment.**
6. **Use an Antistatic Field Service Vacuum.** Remove dust from the module if necessary.
7. **Use a Grounded Wrist Strap.** Connect the wrist strap to the appropriate grounding plug on the power entry panel. The grounding plug on the power entry panel is connected to chassis ground.

UNPACKING AND INSPECTION

These are steps to follow for general handling:

1. Examine the module to make sure that no damage has occurred in transit.
2. Notify the nearest Bailey Controls sales office of any damage.
3. File a claim for any damage with the shipping company that handled the shipment.
4. Use the original packing material or container to store the module.
5. Store the module in a place with clean air; free from extremes of temperature and humidity.

SETUP/INSTALLATION

This section explains how to configure and install the NIAI05. The required procedures are setting jumpers, installing the termination module, connecting cables, and termination wiring. There are two revisions of the NIAI05. Revision A hardware (assembly number 6639362A1) has only power resistors mounted on both sides of the jumpers. Revision B hardware (assembly number 6639362B1) has fuses, filter capacitors and a chassis ground connection.

Each NIAI05 termination module (two are required, even if only eight inputs or less are used) has an RTD which measures the temperature of the termination module. This temperature is used to compensate for the cold junction effect on thermocouple inputs.

When using the built-in cold junction reference, the termination module front cover should be in place. The cover encloses both the terminal blocks and the RTD. It helps maintain the same temperature around the terminal blocks and the RTD. Maintaining both at the same temperature allows maximum accuracy for thermocouple inputs.

To apply the built-in cold junction reference for thermocouple inputs, refer to the Universal Analog Input Slave Module (IMASI03) product instruction manual.

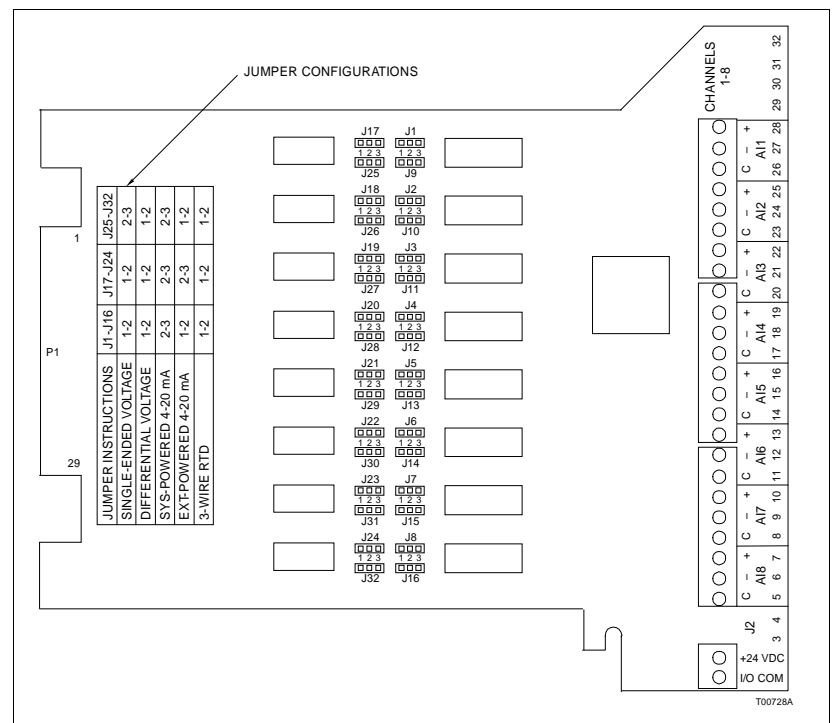
Fuses

The revision A NIAI05 (assembly number 6639362A1) does not have any on-board fuses. Revision B NIAI05s (assembly number 6639362B1) are shipped with a 31.25 milliamp, 125 volt fuse (Bailey part number 1945820A10310). The fuses are shipped installed on revision B termination modules in fuse holders F1 to F8.

Jumper Settings

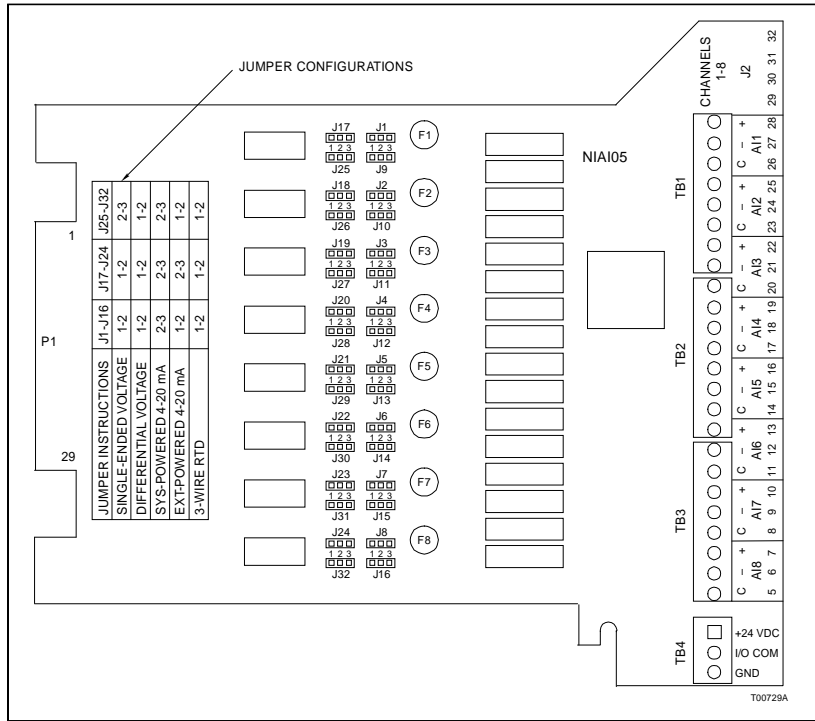
Jumpers on the termination module configure each of the eight analog inputs to match the signal type of the device connected to that input. Each channel is independent. The selection includes: voltage or current input, differential or single ended voltage, system externally powered, 4 to 20 milliamps, or three-wire RTD inputs. Set the jumpers according to the tables in this section. To enable the input type, short the appropriate pins together with a jumper.

Figure 2-1 shows the jumper locations on a module with revision A hardware. Check jumpers before installing the NIAI05. Figure 2-2 shows the jumper locations on a module with revision B hardware. Figure 2-3 shows a typical input circuit for the revision A hardware NIAI05. Figure 2-4 shows a typical input circuit for the revision B hardware NIAI05. Table 2-1 lists the jumper configurations for the NIAI05. The jumper configuration table lists the possible input types shown in the A and B revision termination module figures. Table 2-2 lists the inputs that the NIAI05 accepts. Table 2-3 describes the NIAI05 input types.



NOTE: J2 refers to the cable connector that plugs into this module

Figure 2-1. Jumper Locations for Revision A Hardware NIAI05 (Assembly Number 6639362A1)



NOTE: J2 refers to the cable connector that plugs into this module.

Figure 2-2. Jumper Locations for Revision B Hardware NIAI05 (Assembly Number 6639362B1)

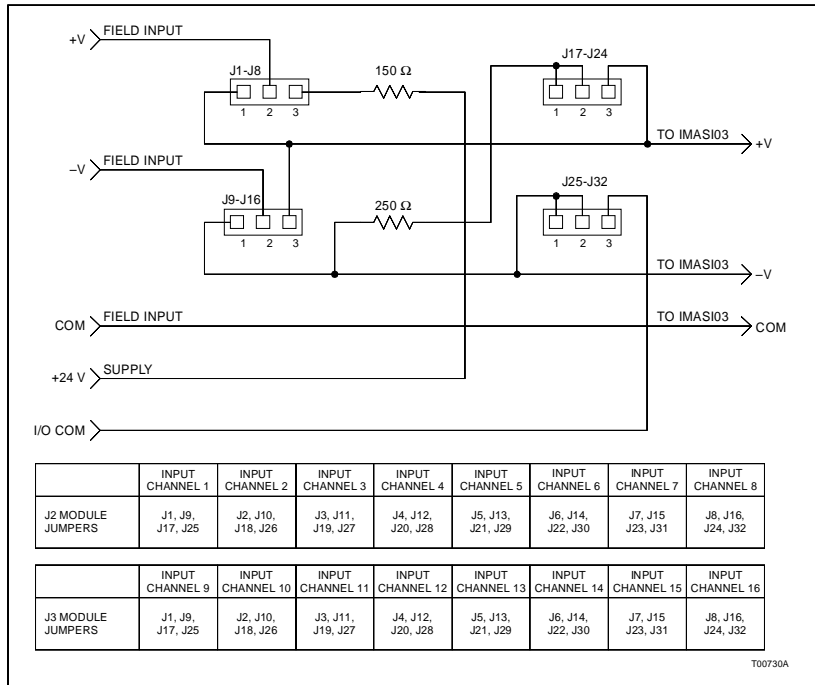


Figure 2-3. Typical Input Circuit for Revision A Hardware NIAI05

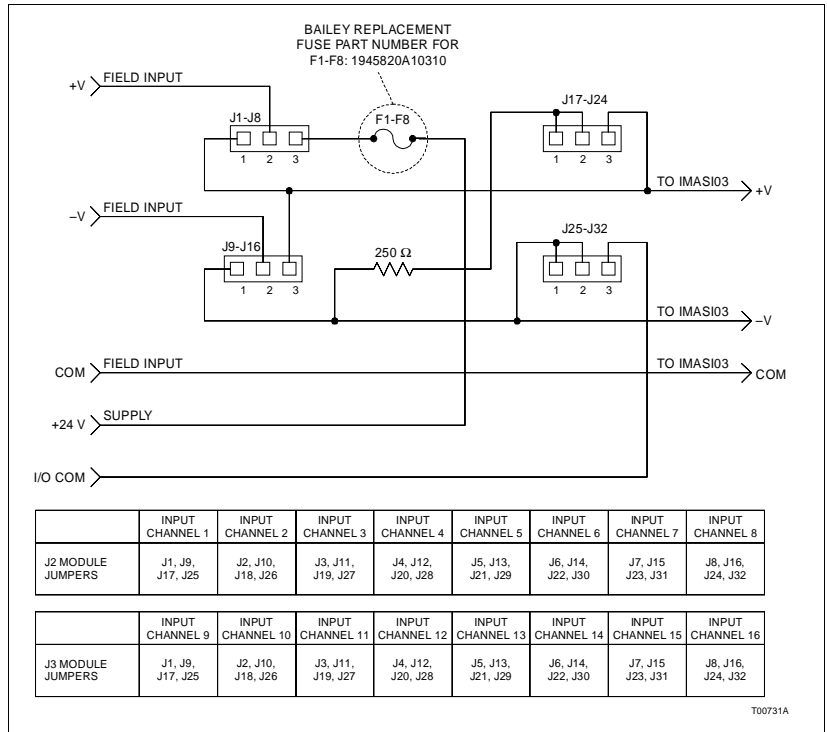


Figure 2-4. Typical Input Circuit for Revision B Hardware NIAI05

Table 2-1. NIAI05 Jumper Configurations

Input Type	Jumper Number		
	J1-J16	J17-J24	J25-J32
Single Ended Voltage	1-2	1-2	2-3
Differential Voltage	1-2	1-2	1-2
System Powered 4-20 mA	2-3	2-3	2-3
External Powered 4-20 mA	1-2	2-3	1-2
3-wire RTD	1-2	1-2	1-2

Table 2-2. NIAI05 Input Types

Input Type	Signal Type
Thermocouple	TC Types: E, J, K, L, N (14 AWG), N (28 AWG), R, S, T, U, Chinese E, Chinese S
Millivolt	mV range: -100 to +100 mV
High Level	H.L. range: -10 V to +10 V
Current	4 to 20 mA, external or system powered
3-wire RTD	10, 100, 120 ohms, Chinese 53 ohms

Table 2-3. NIAI05 Input Type Descriptions

Input Type	Input Description
Single Ended Voltage	This jumper configuration connects the minus (-) input terminal to I/O COM on the NIAI05. The IMASI03 measures the voltage at the plus (+) input terminal with respect to the I/O COM terminal. No connection to the C terminal is necessary. I/O COM terminal must be connected.
Differential Voltage	This jumper configuration connects the plus (+) and minus (-) inputs directly to IMASI03 differential input. Channel to channel and channel to system signal isolation is achieved for all voltage input types, including high level voltage, millivolts and thermocouples. No connection to the C terminal is necessary.
System Powered 4-20 mA	This jumper configuration connects the plus (+) input terminal to system +24 VDC through a current limiting resistor on NIAI05 modules with revision A hardware (revision B hardware replaces the resistor with a fuse). The minus (-) input terminal connects to a precision resistor that generates a single ended voltage (1 to 5 VDC) for the IMASI03 to measure. No connection to the C terminal is necessary. The INFI 90 system must have +24 VDC (system power) and I/O COM installed.
External Powered 4-20 mA	This jumper configuration connects the plus (+) input terminal to one end of a precision resistor and the minus (-) input to the other end of the same precision resistor in the NIAI05. An isolated 1 to 5 VDC is generated for the IMASI03 to measure. No connection to the C terminal is necessary.
3-Wire Resistance	This jumper configuration connects the plus (+) and minus (-) inputs and the C input directly to IMASI03 three-wire input. Channel to channel and channel to system signal isolation is maintained. The two common leads of the RTD element should be connected across the plus (+) and common (C) terminals, and the third lead should be connected to the minus (-) terminal.

Cable Installation

Install the module connector cable (NKAS02 or NKAS12) to connect the TM pair to the slave. The NKAS02 cable has a PVC jacket and is rated for 80 degrees Celsius (176 degrees Fahrenheit) at 300 volts (UL rated type CL2). The NKAS12 cable has a non-PVC jacket and is rated for 90 degrees Celsius (194 degrees Fahrenheit) at 300 volts (UL rated type PLTC). The J2 termination module (for inputs 1-8) connects to the NKAS02 (or NKAS12) connector labeled J2. The J3 termination module (for inputs 9-16) connects to the NKAS02 (or NKAS12) J3 connector. Figure 2-5 shows the cabling from the NIAI05 to the IMASI03. Table 2-4 lists the NKAS02/12 cable applications.

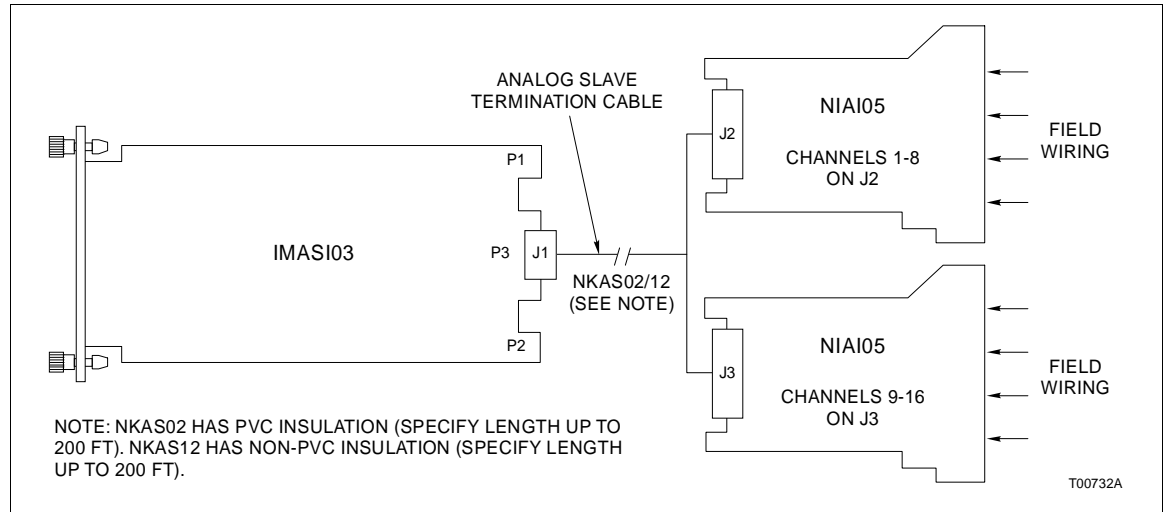


Figure 2-5. Cable Connections for NIAI05

Table 2-4. NIAI05 Cable Applications

Nomenclature/Description	Application	Connector	Maximum Length
NKAS02 (PVC jacket)	Connects TM to IMASI03	P1 (J2) Input 1-8 and P1 (J3) Input 9-16 to MMU (J1) backplane.	61 m (200 ft)
NKAS12 (non-PVC jacket)			

CAUTION	<p>Remove modules from their module mounting unit slots before installing or removing a cable assigned to that slot. Failure to do so could result in damage to the module.</p>
ATTENTION	<p>Retirer le module de son emplacement dans le chassis de montage des modules avant d'installer ou de retirer un câble assigné à cet emplacement. Un manquement à cette procédure pourrait endommager le module.</p>

To install the NKAS02/12 cable:

1. Remove the slave module from the MMU.
2. Remove the NIAI05 module from the TMU.

3. If round cables have been installed in the TMU, remove the cable retaining bracket.
4. Insert the J1 end of the cable into the MMU backplane slot assigned to the slave module. The cable should latch securely in place. Card edge connector P3 of the slave module connects to this end of the cable.
5. Plug the J2 connector end of the cable into the TMU slot that is assigned to the TM having input channels 1-8. Plug the J3 connector end of the cable into the TMU slot that is assigned to the TM having input channels 9-16. Snap the latches securely into place.
6. Align each TM with the guide rails of their assigned slot in the TMU. Carefully slide the termination module into its slot until it is flush with the top and bottom of the TMU frame.
7. Replace or add the cable retaining bracket if round type cables are installed in the TMU.

Installing the Termination Module

The NIAI05 inserts into a standard INFI 90 termination mounting unit (TMU) and occupies one slot. The two NIAI05 termination modules should be installed next to each other in the same termination mounting unit or directly above and below each other in two separate TMUs. The distance between termination modules is limited by the distance between J2 and J3 on the NKAS02 (or NKAS12) connector cable.

Channel designation labels are provided with each NIAI05. This allows the user to configure one NIAI05 as the J2 termination module for channels 1 through 8 and configure a second NIAI05 as the J3 termination module for channels 9 through 16. The TM occupies one slot in a standard INFI 90 Termination Mounting Unit (NTMU01/02).

To install the TM:

NOTE: Ensure all jumpers are configured prior to installation.

1. Verify slot assignment of the NIAI05 module.
2. Remove the front cover.
3. Verify the slot placement of the termination module.
4. Align the NIAI05 module with the guide rails in the TMU and partially insert the module.
5. Install cables on the termination unit.

6. Verify cable connection.
7. Align each TM with the guide rails of their assigned slot in the TMU. Carefully slide the termination module into its slot until it is flush with the top and bottom of the TMU frame.
8. Replace the front cover.

Terminal Block Wiring

Connect the wiring from the process input devices to the TU terminals. Field wiring should be 14 to 22 AWG wire. Refer to the **Site Planning and Preparation** manual for information on field wiring such as noise immunity and spacing requirements.

Figure 2-6 shows the revision A hardware terminal assignments and the jumpers used for each input. Figure 2-7 shows the revision B hardware terminal assignments and the jumpers used for each input.

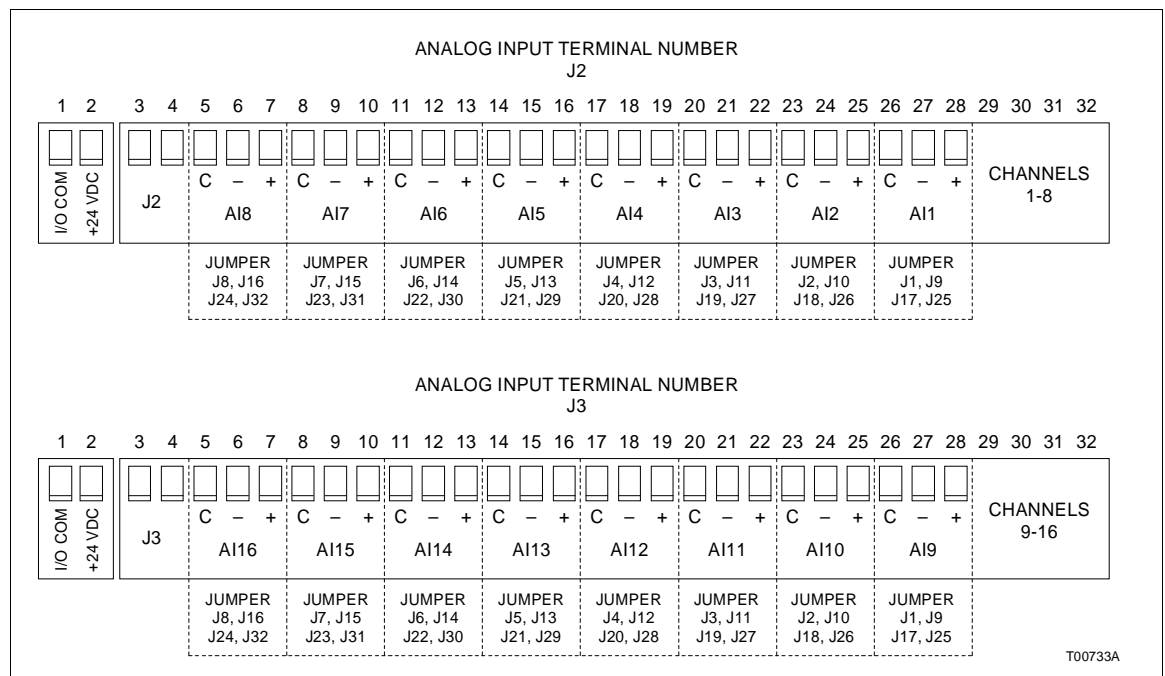


Figure 2-6. Terminal Assignments for Revision A Hardware NIAI05

CAUTION

We strongly recommend turning off power before doing any termination module wiring. Failure to do so could result in equipment damage. Do not apply power without verifying all wire connections.

ATTENTION

Il est fortement recommande de debrancher l'alimentation electrique avant d'effectuer tout connexion aux cartes de raccordement des modules. Des dommages aux equipments pourraient survenir dans le cas contraire. Ne pas rebrancher l'alimentation avant que toutes les connexions aient ete verifiees.

CAUTION

If input or output circuits are a shock hazard after disconnecting system power at the power entry panel, then the door of the cabinet containing these externally powered circuits must be marked with a warning stating that multiple power sources exist.

ATTENTION

Si des circuits d'entree ou de sortie sont alimentes a partir de sources externes, ils presentent un risque de choc electrique meme lorsque l'alimentation du systeme est debranchee du panneau d'entree l'alimentation. Le cas echeant, un avertissement signalant la presence de sources d'alimentation multiples doit etre appose sur la porte de l'armoire.

Figure 2-8 shows field input termination examples for revision A hardware NIAI05. Figure 2-9 shows field input termination examples for revision B hardware NIAI05. Figure 2-10 shows NIAI05 connection examples. Field and power wiring must be connected to the terminal strip. To connect field and power wiring:

NOTE: Proper polarity of DC voltage signals must be maintained.

1. Remove the front cover.
2. Ensure the NIAI05 module is pulled out far enough to gain access to the terminal strip.
3. Feed the field wiring into the terminal strip area.
4. Connect field wiring to the appropriate terminals.
5. Insert the module until it locks securely into place.
6. Replace the front cover.

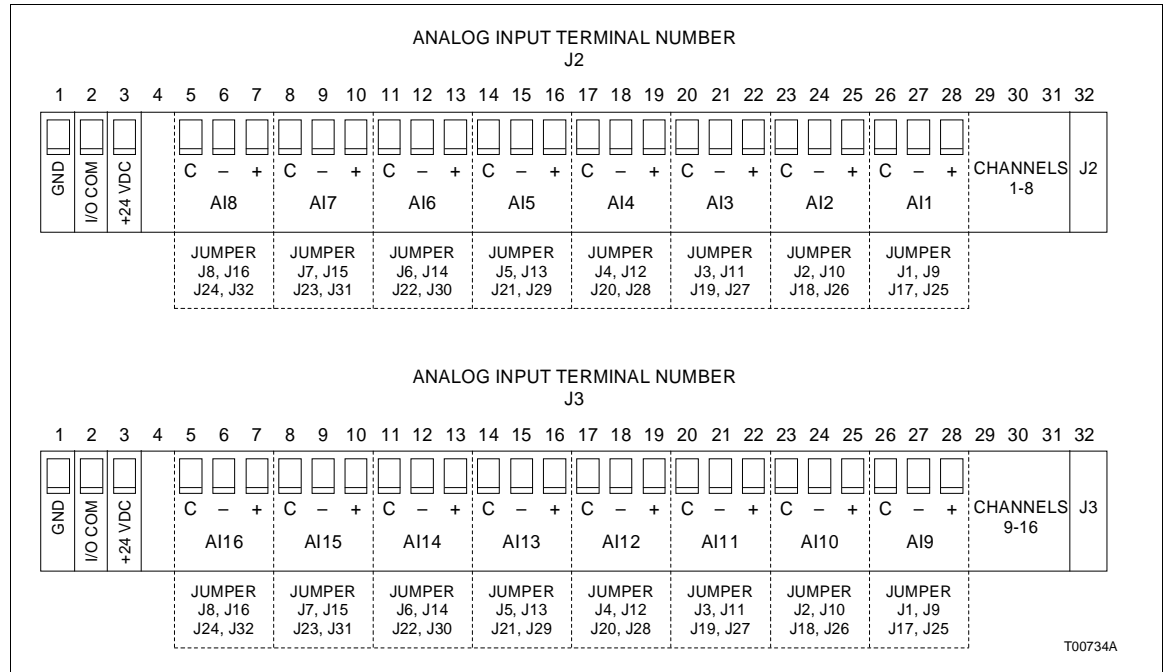


Figure 2-7. Terminal Assignments for Revision B Hardware NIAI05

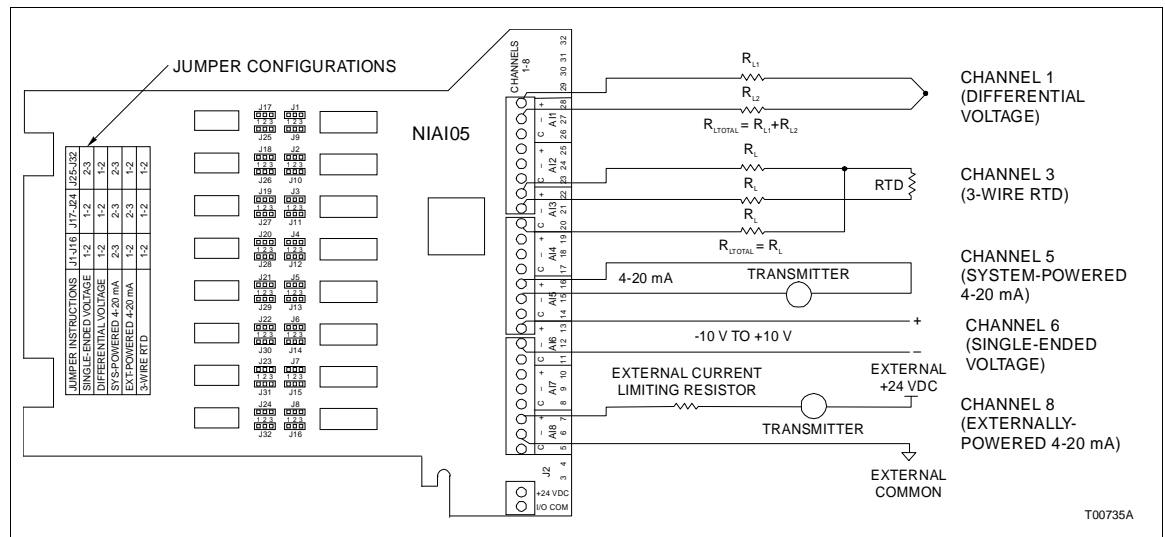


Figure 2-8. Field Input Termination Examples for Revision A Hardware NIAI05

Power Wiring

There is one terminal block (TB1) that connects to +24 VDC and system common. Figures 2-1 and 2-2 show the terminal block location on the module. Use 18 AWG wire for power wiring. To connect power to the termination module in a system using modular power supplies, follow these steps:

CAUTION

It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any termination module wiring. Failure to do so could result in equipment damage. Do not apply power until all connections are verified.

ATTENTION

Il est fortement recommande que toutes les alimentations (armoire, E/S, etc.) soient coupées avant d'effectuer quelque raccord que ce soit sur une carte de raccordement. Un manquement a ces instructions pourrait causer des dommages a l'equipment. Ne pas rebrancher les alimentations avant d'avoir verifie tous les raccordements.

CAUTION

If input or output circuits are a shock hazard after disconnecting system power at the power entry panel, then the door of the cabinet containing these externally powered circuits must be marked with a warning stating that multiple power sources exist.

ATTENTION

Si des circuits d'entree ou de sortie sont alimentes a partir de sources externes, ils presentent un risque de choc electrique meme lorsque l'alimentation du systeme est debranchee du panneau d'entree l'alimentation. Le cas echeant, un avertissement signalant la presence de sources d'alimentation multiples doit etre appose sur la porte de l'armoire.

1. Remove the front cover.
2. Ensure the NIAI05 module is pulled out far enough to gain access to the terminal strip.
3. Attach an 18 AWG wire from the +24 VDC on the TMU power bus bar to the +24 VDC terminal of the NIAI05 if system power 4 to 20 milliamps is to be used.
4. Attach an 18 AWG wire from the I/O common on the TMU power bus to the I/O COM terminal of the NIAI05.
5. On revision B assembly only, connect the chassis ground.
6. Insert the module until it locks securely into place.
7. Replace the front cover.

The NIAI05 is ready for operation if:

1. The required jumpers are set.
2. The circuit board is mounted in the termination module mounting unit.
3. All required cables are connected to the termination module.
4. All required field wires are connected to the termination module and have been verified.
5. The termination module cover is installed for the cold junction reference.
6. Power is connected and applied to the termination module.

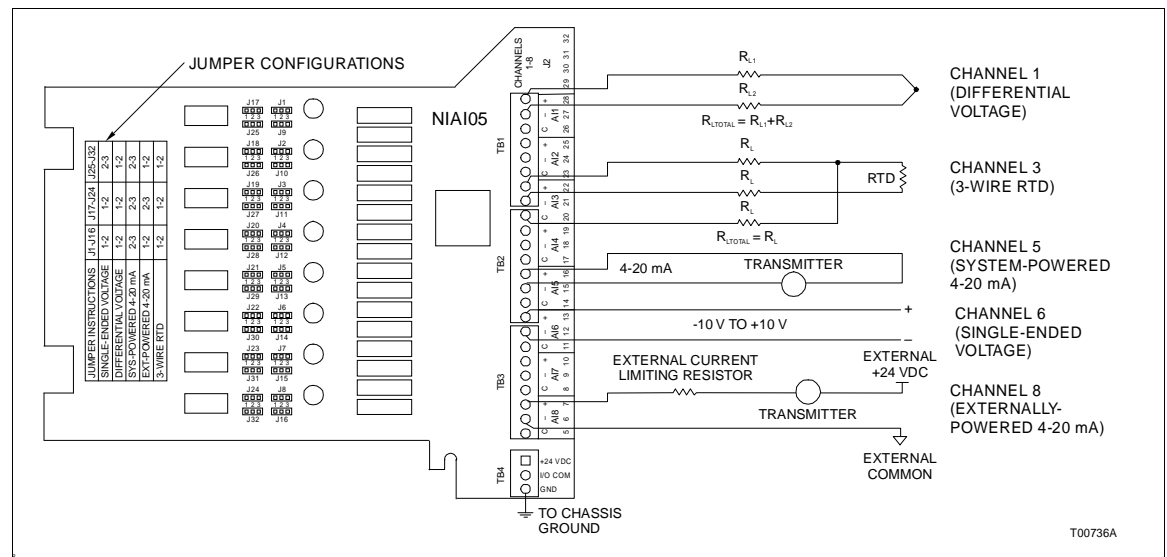


Figure 2-9. Field Input Termination Examples for Revision B Hardware NIAI05

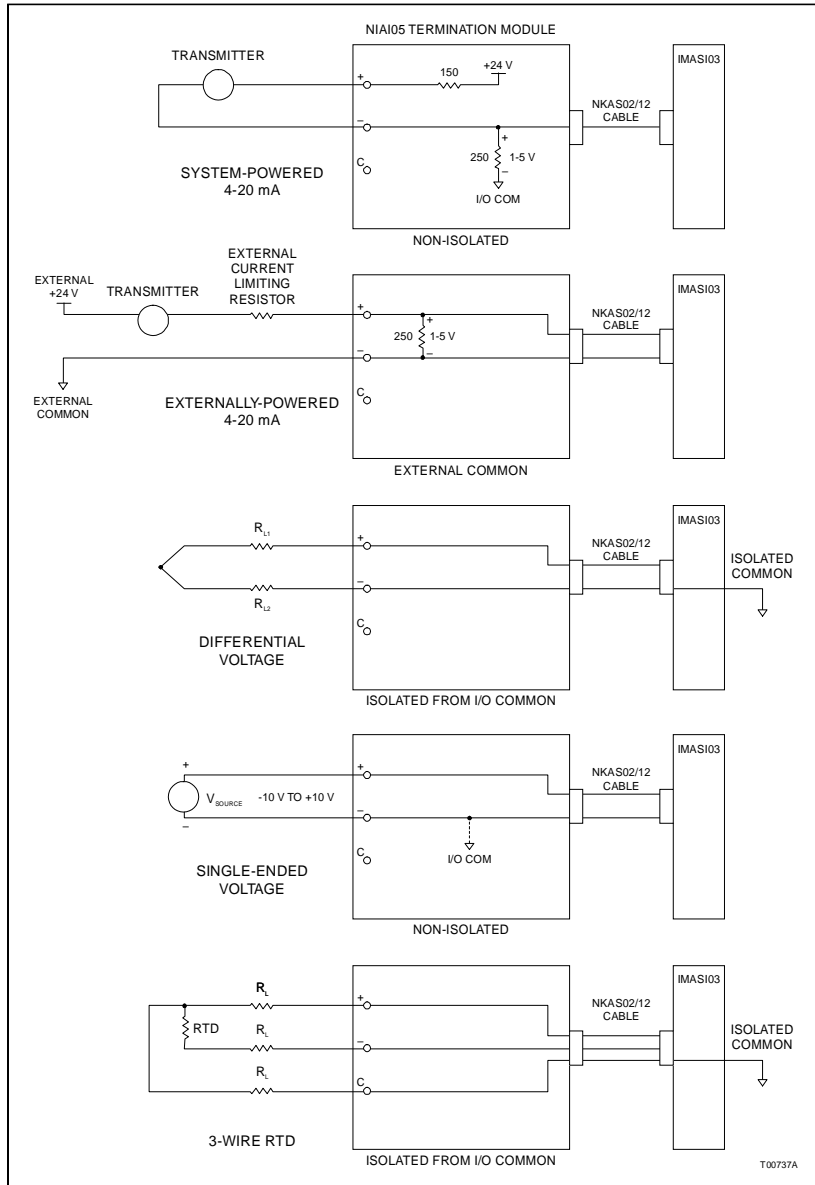


Figure 2-10. NIAI05 Connection Examples

SECTION 3 - MAINTENANCE

INTRODUCTION

The Analog Input Termination Module (NIAI05) requires limited maintenance. This section contains a maintenance schedule.

MAINTENANCE SCHEDULE

Execute the tasks in Table 3-1 at the specified intervals.

Table 3-1. Maintenance Schedule

Task	Interval
Clean and tighten all power and grounding connections.	Every 6 months or during plant shutdown, whichever occurs first.
Use a static safe vacuum cleaner to remove dust from: Termination Mounting Unit. Termination Modules.	

SECTION 4 - REPAIR/REPLACEMENT PROCEDURES

INTRODUCTION

This section explains the replacement procedures for the Analog Input Termination Module (NIAI05). No special tools are required to replace the module.

REPLACEMENT PROCEDURES

If an NIAI05 is faulty, replace it with a new one. **Do not** try to repair the module. Replacing components may affect performance and certification.

CAUTION

It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any termination module wiring. Failure to do so could result in equipment damage. Do not apply power until all connections are verified.

ATTENTION

Il est fortement recommande que toutes les alimentations (armoire, E/S, etc.) soient coupees avant d'effectuer quelque raccord que ce soit sur une carte de raccordement. Un manquement a ces instructions pourrait causer des dommages a l'equipment. Ne pas rebrancher les alimentations avant d'avoir verifie tous les raccordements.

CAUTION

Remove modules from their module mounting unit slots before installing or removing a cable assigned to that slot. Failure to do so could result in damage to the module.

ATTENTION

Retirer le module de son emplacement dans le chassis de montage des modules avant d'installer ou de retirer un câble assigne a cet emplacement. Un manquement à cette procédure pourrait endommager le module.

To replace an NIAI05 termination module:

1. Turn off power to the INFI 90 cabinet.
2. Remove (pull straight off) the front cover.
3. Pull the termination module several inches from the TMU backplane.
4. Label and remove all field wiring from the terminal blocks.
5. Slide the TM out of the cabinet.

6. Install the jumpers on the new module according to the installation instructions. Verify the jumpers on the replacement TM.
7. Slide the new TM into the same slot as the module that was removed.
8. Connect all field wiring removed in Step 3.
9. Verify that wiring and cabling to the TM is correct.
10. Fully insert the termination module into the TMU.
11. Replace (snap on) the front cover.
12. Turn on the cabinet power supply that provides power to the TM.
13. Turn on any external power supplies providing I/O power.

Replacing Fuses

Fuses F1 to F8 are shipped installed in the TM. They are 31.25 milliamp, 125 volt (Bailey part number 1945820A10310). The fuses are shipped installed in fuse holders F1 to F8.

Replace the fuses by following these steps:

1. Remove (pull straight off) the front cover.
2. Pull the termination module from the TMU backplane to allow access to the fuses.
3. Remove power to the module either by turning off power to the TMU or lifting the wires to the NIAI05.
4. Replace the fuse.
5. Fully insert the termination module into the TMU.
6. Replace (snap on) the front cover.
7. Turn on the cabinet power supply that provides power to the TM or attach the power wires.
8. Turn on any external power supplies providing I/O power.

SECTION 5 - SUPPORT SERVICES

INTRODUCTION

Bailey Controls Company is ready to help in the use, application and repair of its products. Contact the nearest sales office to make requests for sales, applications, installation, repair, overhaul and maintenance contract services.

REPLACEMENT PARTS AND ORDERING INFORMATION

When making repairs, order replacement parts from a Bailey Controls sales office. Provide this information:

1. Part description, part number and quantity.
2. Model and serial numbers (if applicable).
3. Bailey instruction manual number, page number and reference figure that identifies the part.

Order parts without commercial descriptions from the nearest Bailey Controls Company sales office.

Table 5-1. Spare Parts List

Component	Description	Bailey Controls Part Number
Fuse	31.25 mA, 125 V diameter: 6.35 mm (0.25 in.) height: 8.89 mm (0.35 in.)	1945820A10310

TRAINING

Bailey Controls has a modern training facility available for training your personnel. On-site training is also available. Contact a Bailey Controls sales office for specific information and scheduling.

TECHNICAL DOCUMENTATION

Additional copies of this manual, or other Bailey Controls Company manuals, can be obtained from the nearest Bailey Controls Company sales office at a reasonable charge.

APPENDIX A - UNIVERSAL ANALOG SLAVE INPUT MODULE (IMASI03)

INTRODUCTION

Two Universal Analog Input Termination Modules (NIAI05) are required for each Universal Analog Slave Module (IMASI03). Jumpers on the NIAI05 termination module pair configure up to 16 analog inputs for the IMASI03. Each NIAI05 accepts up to eight analog inputs for either system powered 4 to 20 milliamps, external powered 4 to 20 milliamps, three-wire RTD, differential or single ended voltage.

This appendix contains figures and tables that show the dipswitch location on the IMASI03 and its settings. This information is provided as a quick reference guide for personnel installing the NIAI05.

Figure A-1 shows the address select switch (SW1) and jumper locations. Table A-1 lists the binary addresses for setting SW1. Table A-2 lists the jumper configurations for the IMASI03. Table A-3 lists the jumpers set to configure each channel on the IMASI03. Refer to the IMASI03 product instruction for more information.

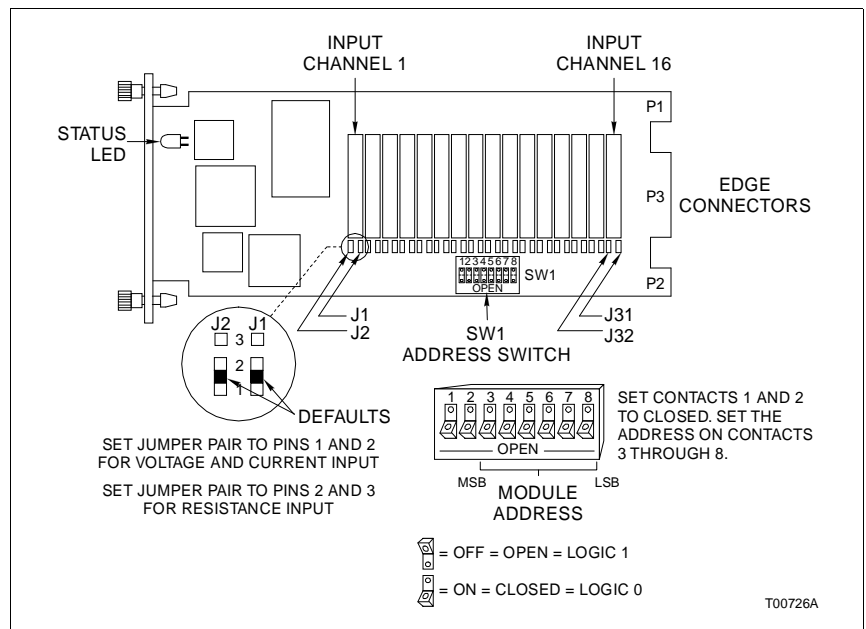


Figure A-1. Address Select Switch (SW1) and Jumper Locations

Table A-1. IMASI03 Address Switch Settings (SW1)

Address Example	MSB				LSB				Address Example	MSB				LSB			
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0	0	32	0	0	1	0	0	0	0	0
9	0	0	0	0	1	0	0	1	41	0	0	1	0	1	0	0	1
16	0	0	0	1	0	0	0	0	48	0	0	1	1	0	0	0	0
31	0	0	0	1	1	1	1	1	63	0	0	1	1	1	1	1	1

Table A-2. IMASI03 Jumper Configurations

Analog Input Type	Jumper Position	Jumper Number
Current Thermocouples: High Level Voltage Low Level Voltage	1-2	J1-J32 (Analog Input 1 through Analog Input 16)
Three-Wire RTD	2-3	J1-J32 (Analog Input 1 through Analog Input 16)

Table A-3. IMASI03 Jumpers Used for Each Channel

Channel Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Jumper Numbers	J1 J2	J3 J4	J5 J6	J7 J8	J9 J10	J11 J12	J13 J14	J15 J16	J17 J18	J19 J20	J21 J22	J23 J24	J25 J26	J27 J28	J29 J30	J31 J32

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