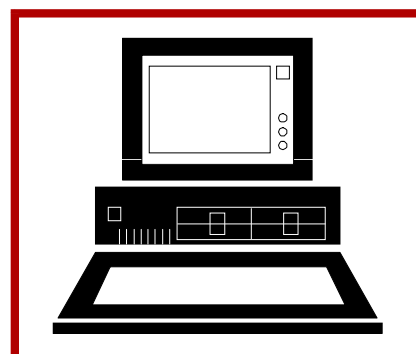
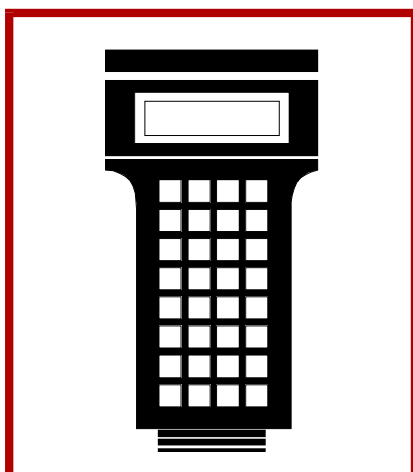
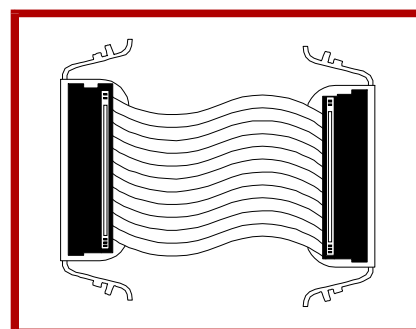
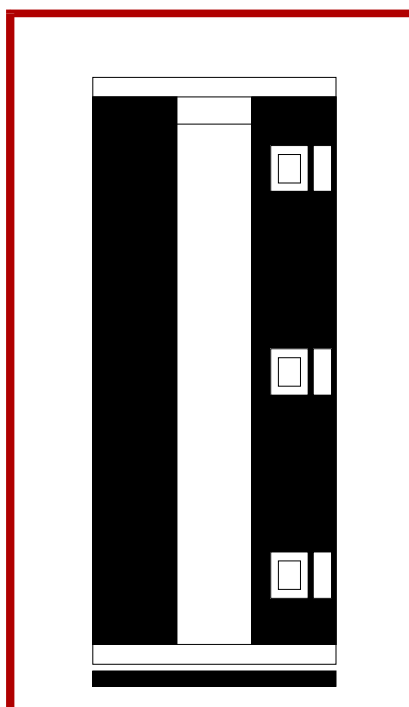
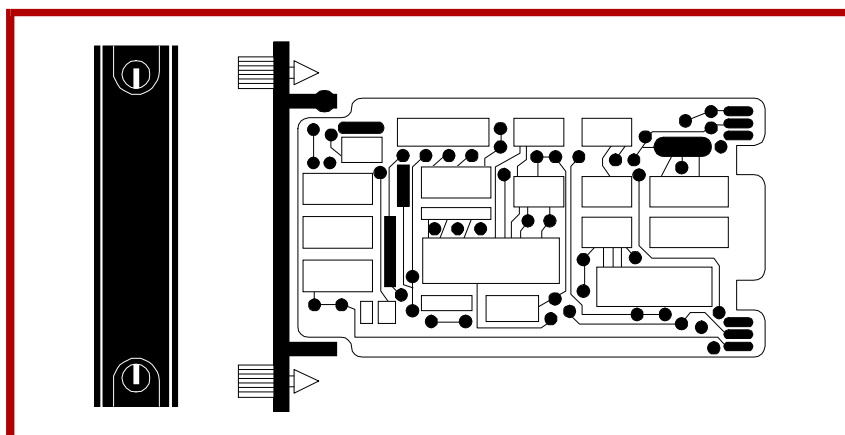
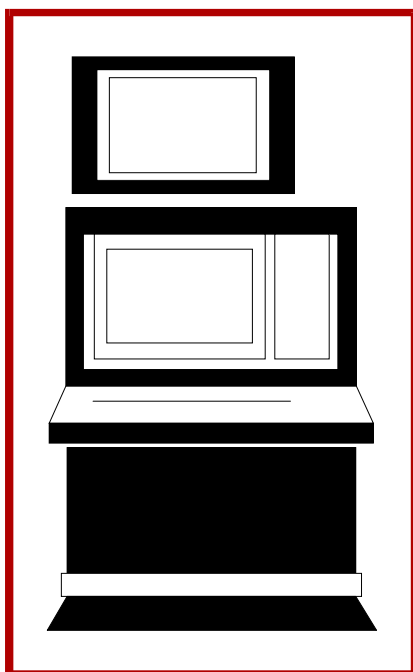


E96-403

Bailey®  
**infi 90**

# Instruction

## Thermocouple Input Termination Unit (NTAI02)



**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

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Termination units provide an input connection from the plant equipment to the INFI 90<sup>®</sup> process modules. The Thermocouple Analog Input Termination Unit (NTAI02) interfaces the Thermocouple Analog Input Slave Module (IMASM02) and field wiring.

This manual explains how to install and use the NTAI02 on the INFI 90 system. It has sections that describe the setup and cabling. The appendix contains information about the IMASM02.

## List of Effective Pages

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Total number of pages in this manual is 26, consisting of the following:

<b>Page No.</b>	<b>Change Date</b>
Preface	Original
List of Effective Pages	Original
iii through vi	Original
1-1 through 1-5	Original
2-1 through 2-8	Original
3-1	Original
4-1 through 4-3	Original
5-1	Original
A-1	Original
Index-i	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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## Safety Summary

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### **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. 2-5, 4-1)

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. 2-6, 4-1)

We strongly recommend turning off cabinet power before doing any termination unit wiring. Failure to do so could result in equipment damage. Do not apply power without verifying all wire connections. (p. 2-6)

It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any termination unit wiring. Failure to do so could result in equipment damage. Do not apply power until all connections are verified. (p. 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. 2-5, 4-1)

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. 2-6, 4-1)

Il est fortement recommandé de débrancher l'alimentation électrique du cabinet avant d'effectuer toute connexion aux cartes de raccordement des unités. Des dommages aux équipements pourraient survenir dans le cas contraire. Ne pas rebrancher l'alimentation avant que toutes les connexions aient été vérifiées. (p. 2-6)

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. 4-1)

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# SECTION 1 - INTRODUCTION

---

## OVERVIEW

One Thermocouple Input Termination Unit (NTAI02) can connect one or two Thermocouple Slave Modules (IMASM02) through separate cables. Each NTAI02 can input 16 thermocouple or millivolt signals from field equipment to the thermocouple input slave modules. These signals pass through the slave module to the Analog Master Module (IMAMM03). Up to four NTAI02s can be interconnected together allowing the IMAMM03 to monitor local cold junction reference signals and route internal calibration voltages to eight IMASM02s. This manual explains the purpose, setup, handling precautions and steps to install the NTAI02 unit.

---

## INTENDED USER

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

---

## TERMINATION UNIT DESCRIPTION

The NTAI02 is a single printed circuit board that mounts in a Field Termination Panel (NFTP01). It has five connectors that are used for communication to the IMAMM03 master, IMASM02 slave, and other NTAI02 slave termination units. The internal and external test points and the calibration select switch are used for calibration. Cold junction reference RTDs for thermocouple inputs and terminal blocks for field wiring are also on the TU. Figure 1-1 shows an application example for the NTAI02.

---

## FEATURES

The design of the NTAI02, as with all INFI 90 devices, allows for flexibility in creating a process management system. Refer to the **NOMENCLATURE** entry of this section for the list of devices that can be used with the TU in an INFI 90 system.

- A standard factory-wired cable connects the TU to the IMASM02 slave module.
- On-board terminal blocks accept field input wiring.
- Each TU fits in a standard field termination panel.
- Field wire termination for 16 thermocouple and millivolt inputs.

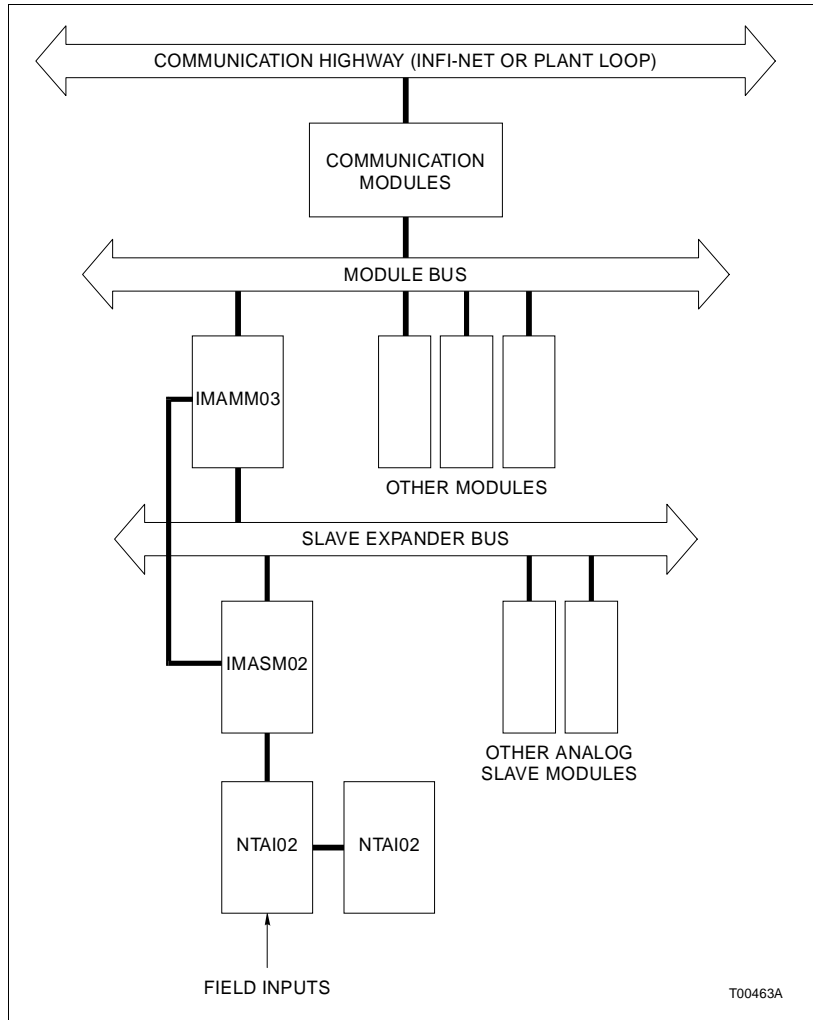


Figure 1-1. Application Example for NTAI02

- Input signal routing to the IMASM02.
- Source of the local cold junction reference.
- A dedicated calibration socket for performing entire slave calibration with internal or external source.
- A calibration switch selects internal or external calibration voltage source.
- EXT. test input posts for connecting an external calibration voltage source.
- INT. test output posts for access to internal calibration voltage sources from the IMAMM03.

## INSTRUCTION CONTENT

This manual has five sections and an appendix.

### Introduction

Contains an overview of the features, specifications and a description of the NTAI02.

- Installation** Describes cautions to observe when handling the TU. It shows the steps to install and connect the terminal wiring before applying power.
- Maintenance** Provides a maintenance schedule.
- Repair/Replacement Procedures** Details how to replace a TU.
- Support Services** Describes the support services (repair parts, training, documentation, etc.) available from Bailey Controls Company.
- Appendix** Shows the Thermocouple Slave Input Module (IMASM02).

---

**HOW TO USE THIS MANUAL**

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

1. Read **Section 2** before connecting the NTAIO2.
2. Refer to **Appendix A** for the IMASM02 slave unit.
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*

<b>Term</b>	<b>Definition</b>
Cold Junction Reference	The ambient temperature at the bimetallic junction at the termination point of thermocouple wires.
FTP	Field Termination Panel. A panel inside the INFI 90 cabinet on which to mount termination units.
Slave Module	One of a series of modules designed to perform high or low level operations as directed by a master module.
Thermocouple	A bimetallic sensor used for temperature measurements.
TU	Termination Unit. Provides input/output connection between plant equipment and the INFI 90/Network 90 <sup>®</sup> modules.

---

<sup>®</sup> Registered trademark of Eltag Bailey Process Automation.

---

**REFERENCE DOCUMENTS**

Table 1-2 contains the reference documents for the NTAI02.

*Table 1-2. Reference Documents*

Document Number	Description
I-E96-205	Analog Master Module and Analog Slave Modules (IMAMM03 and IMASM01/02/03/04)
I-E96-406	Analog Master Module Termination Unit (NTAM01)
I-E96-500	Site Planning and Preparation

---

**SPECIFICATIONS**

Refer to Table 1-3 for the specifications of the NTAI02 Termination Unit.

*Table 1-3. Specifications*

Property	Characteristic/Value
Power Requirements	+24 VDC, 10mA per IMASM02.
Mounting	Mounts in the Field Termination Panel (NFTP01).
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 90% ± 5% up to 55° C (131° F) (noncondensing). 5% to 40% ± 5% up to 70° C (158° 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.
Surge Protection	Meets IEEE-472-1974 Surge Withstand Capability Test.
Certification	CSA certified for use as process control equipment in an ordinary (nonhazardous) location.

Specifications are subject to change without notice.

---

**NOMENCLATURE**

Table 1-4 contains the modules and equipment that can be used with the NTAIO2 unit.

*Table 1-4. Nomenclature*

<b>Nomenclature</b>	<b>Description</b>
IMASM02	Thermocouple Input Slave Module
NFTP01	Field Termination Panel
NKAI01	Cable, Termination Module (Interconnect)
NKTU01	Cable, Termination Module (PVC)
NKTU11	Cable, Termination Module (non-PVC)
NTAM01	Analog Master Module Termination Unit

---

## SECTION 2 - INSTALLATION

---

### INTRODUCTION

This section explains how to install the Thermocouple Analog Input Termination Unit (NTAI02). Read, understand, and complete the steps in the order they appear before using the NTAI02 unit.

---

### 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 a 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 Bags.** 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 the cabinet chassis ground.

---

## UNPACKING AND INSPECTION

These are steps to follow for general handling:

1. Examine the unit 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 unit.
5. Store the unit in a place with clean air; free from extremes of temperature and humidity.

---

## SETUP/PHYSICAL INSTALLATION

This section explains how to configure and install the NTAI02. The required procedures are installing the termination unit into the FTP, and connecting the field wiring and cables.

---

### Fuses

The TU has a Fuse (F1) for the +24 volt supply. It is a 0.25 amp, 250 volt fuse (Bailey part number 194776A12500). The TU is shipped with the fuse installed in fuse holder F1.

---

### Termination Unit Configuration

No configuration is necessary to operate the TU. Switch S1 is used for internal or external calibration of input circuits. To calibrate the TU, follow the procedure in the **Analog Master Module and Analog Slave Modules (IMAMM03 and IMASM01/02/03/04)** manual.

---

### Termination Unit Installation

The TU mounts on a standard Field Termination Panel (NFTP01). Figure 2-1 shows how to secure the termination unit to the FTP.

To install the termination unit:

1. Make sure power is off to the cabinet.
2. Insert the termination unit tabs into the slots in the outside edge of the termination panel.
3. Mount the TU to the field termination panel with the two, number 10,  $\frac{3}{4}$  inch screws. Do not over-tighten the screws.

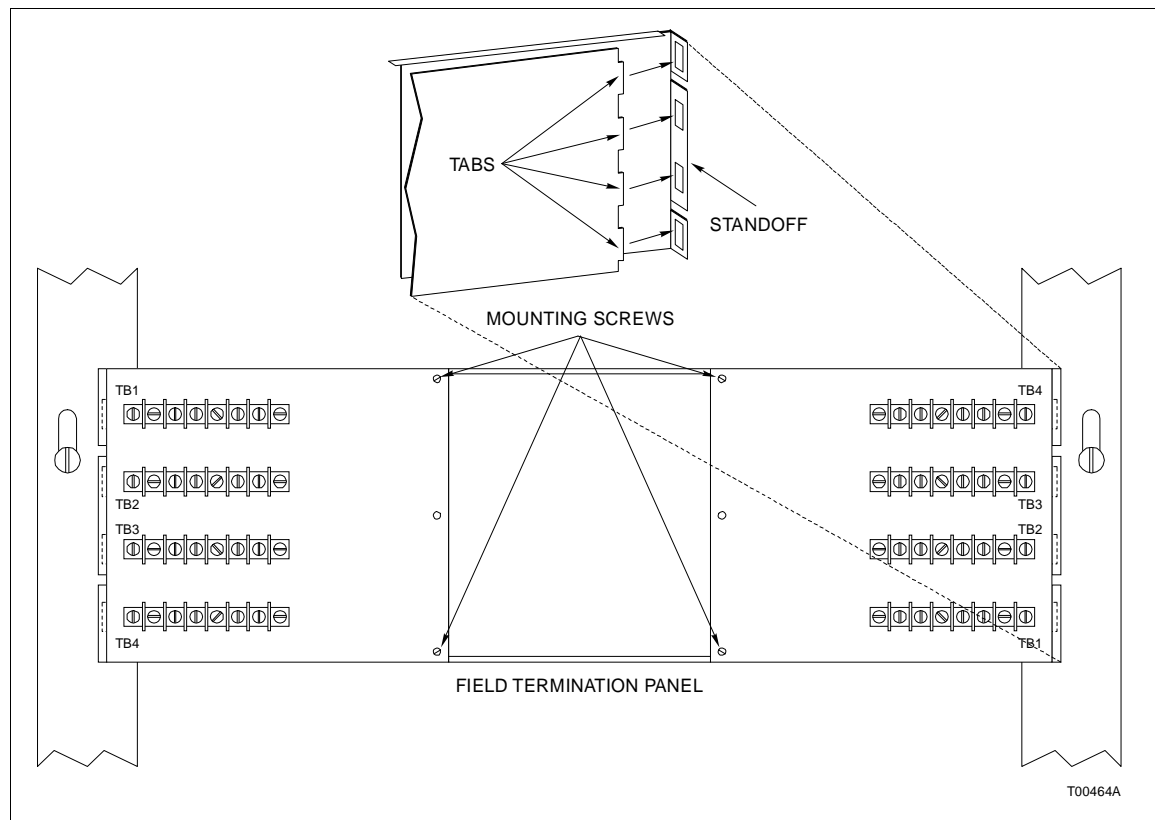


Figure 2-1. Installation for NTAI02

### Cable Connections

The NTAI02 has five cable connectors. Connector P1 and P2 connect separate NKTU01/11 TU cables to two slave modules for input signal routing. Connector P3 is only used for full scale calibration of IMASM02 modules connected to P1 and P2. Connector P4 is labeled IN and connects to the IMAMM03 or NTAM01, or it can be used to interconnect from another NTAI02 through the NKAI01 cable. Connector P5 is labeled OUT and connects to another NTAI02.

The NKTU01/11 is a round, shielded cable that connects the TU to the IMASM02 slave module or IMAMM03 master module. The NKTU01 and NKAI01 cables have a PVC jacket rated for 80 degrees celsius at 300 volts (UL rated type CL2). The NKTU11 and NKAI01 cables have a non-PVC jacket rated for 90 degrees celsius at 300 volts (UL rated type PLTC). The NKAI01 cable is a round, shielded cable that connects the TU to an NTAM01 TU when redundant IMAMM03s are used or to another NTAI02 TU. See Figure 2-2 for the cable connections from the termination unit to the slave modules. Table 2-1 lists the NTAI02 cable applications.



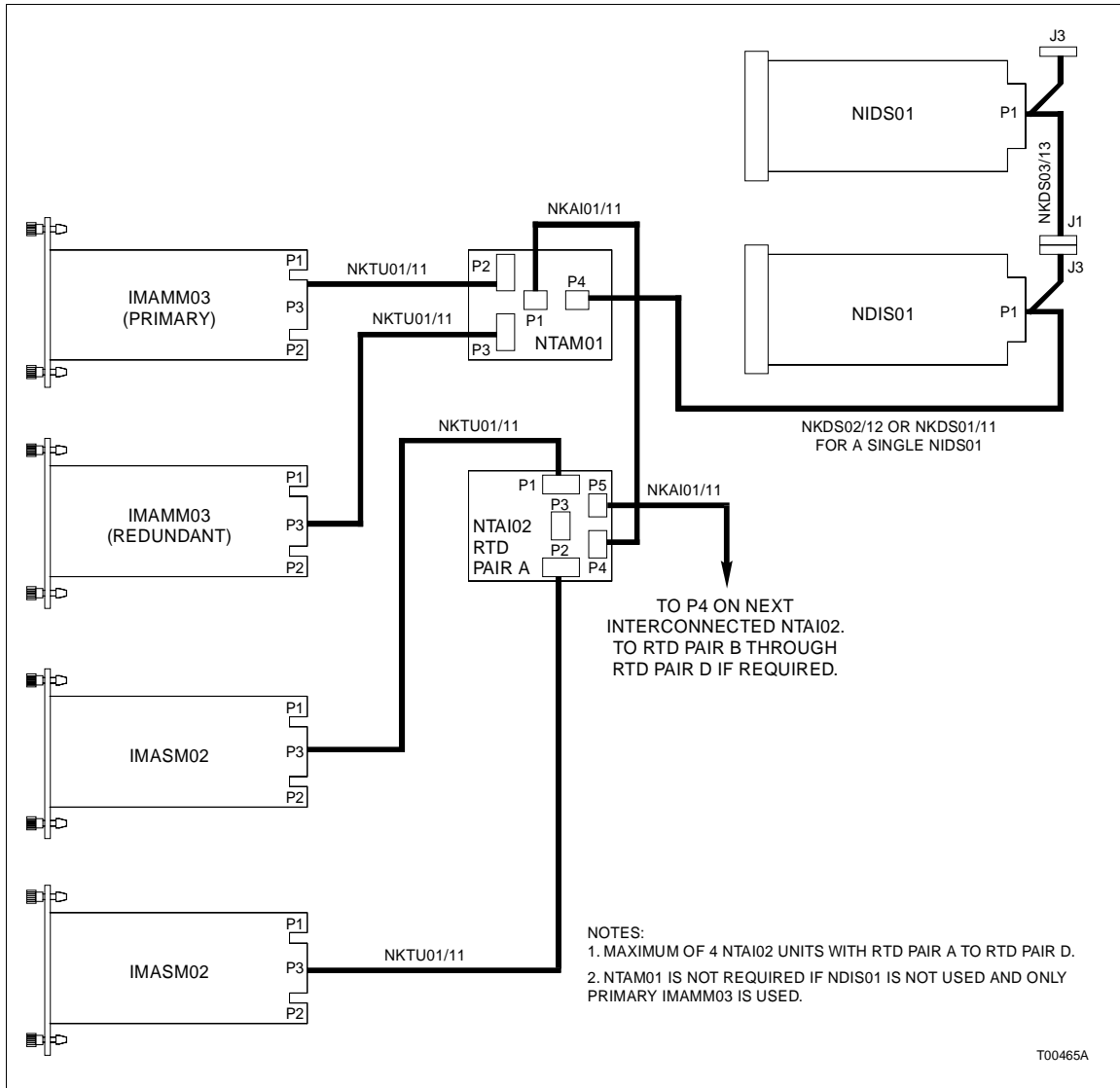


Figure 2-2. Cable Connections for NTAI02

Table 2-1. NTAI02 Cable Applications

Nomenclature/Description	Application	Connector	Maximum Length
NKTU01 (PVC Jacket)	Connects NTAI02 to IMASM02.	P1 and P2 on NTAI02 to MMU backplane.	61 m (200 ft)
	Connects NTAI02 to IMAMM03.	P4 on NTAI02 to MMU backplane.	
NKTU11(non-PVC Jacket)	Connects NTAI02 to IMASM02.	P1 and P2 on NTAI02 to MMU backplane.	
	Connects NTAI02 to IMAMM03.	P4 on NTAI02 to MMU backplane.	
NKAI01 (PVC Jacket)	Connects NTAI02 to NTAI02 or NTAM01.	P1 on NTAM01 to P4 on NTAI02.	1.5 m (5 ft)
		P5 on NTAI02 to P4 on next NTAI02.	
NKAI11 (non-PVC Jacket)	Connects NTAI02 to NTAI02 or NTAM01.	P1 on NTAM01 to P4 on NTAI02.	
		P5 on NTAI02 to P4 on next NTAI02.	

**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 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.

Make connections to the TU after it is mounted in the field termination panel. To install the cable follow these steps:

1. Verify IMASM02 and IMAMM03 are unplugged from the MMU backplane.
2. Insert the hooded end of an NKTU01/11 cable into the module mounting unit 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.
3. Insert the male 36 pin connector end of the NKTU01/11 cable from the first slave module into the P1 connector of the TU. The cable should latch securely in place.
4. Insert the male 36 pin connector end of the NKTU01/11 cable from the second slave module into the P2 connector of the TU. The cable should latch securely in place.
5. For nonredundant IMAMM03 operation, insert the hooded end of the NKTU01/11 cable into the module mounting unit backplane slot assigned to the master module. The cable should latch securely in place.
6. Insert the male 36 pin connector end of the NKTU01/11 cable from the master module into the P4 connector of the NTAI02. The cable should latch securely in place.
7. If this is the (second or above) interconnected TU, insert the male 36 pin connector end of the NKAI01/11 cable into the P5 connector of the TU. The cable should latch securely in place.
8. If this is the (second or above) interconnected TU, insert the male 24 pin connector end of the NKAI01/11 cable into the P4 connector of the next interconnected TU closer to the master module. The cable should latch securely in place.
9. Slide each IMASM02 into the MMU until the module is fully seated and the faceplate is flush with the front of the rack.

10. For redundant IMAMM03 master operation, connect an NKAIO1 cable from P4 of the NTAIO2 to P1 of the NTAM01.

11. Slide the IMMAM03 into the MMU until the module is fully seated and the faceplate is flush with the front of the rack.

**Terminal Block Wiring**

To connect field wiring, the terminal block covers must be removed. Connect the wiring from the thermocouples to the TU terminals. See Figure 2-3 for terminal block assignments and wiring polarity. Field wiring should be 12 to 22 AWG wire. Refer to the **Site Planning and Preparation** manual for information on field wiring such as noise immunity and spacing requirements.

<b>CAUTION</b>	<b>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.</b>
<b>ATTENTION</b>	<b>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.</b>

<b>CAUTION</b>	<b>We strongly recommend turning off cabinet power before doing any termination unit wiring. Failure to do so could result in equipment damage. Do not apply power without verifying all wire connections.</b>
<b>ATTENTION</b>	<b>Il est fortement recommande de debrancher l'alimentation electrique du cabinet avant d'effectuer tout connexion aux cartes de raccordement des units. Des dommages aux equipments pourraient survenir dans le cas contraire. Ne pas rebrancher l'alimentation avant que toutes les connexions aient ete verifiees.</b>

To connect field wiring to the NTAIO2, follow these steps:

1. Remove power from the cabinet.
2. Remove the terminal block covers.
3. Connect the thermocouple or millivolt wires to the terminal blocks.
4. Replace the terminal block covers to maintain thermocouple accuracy.

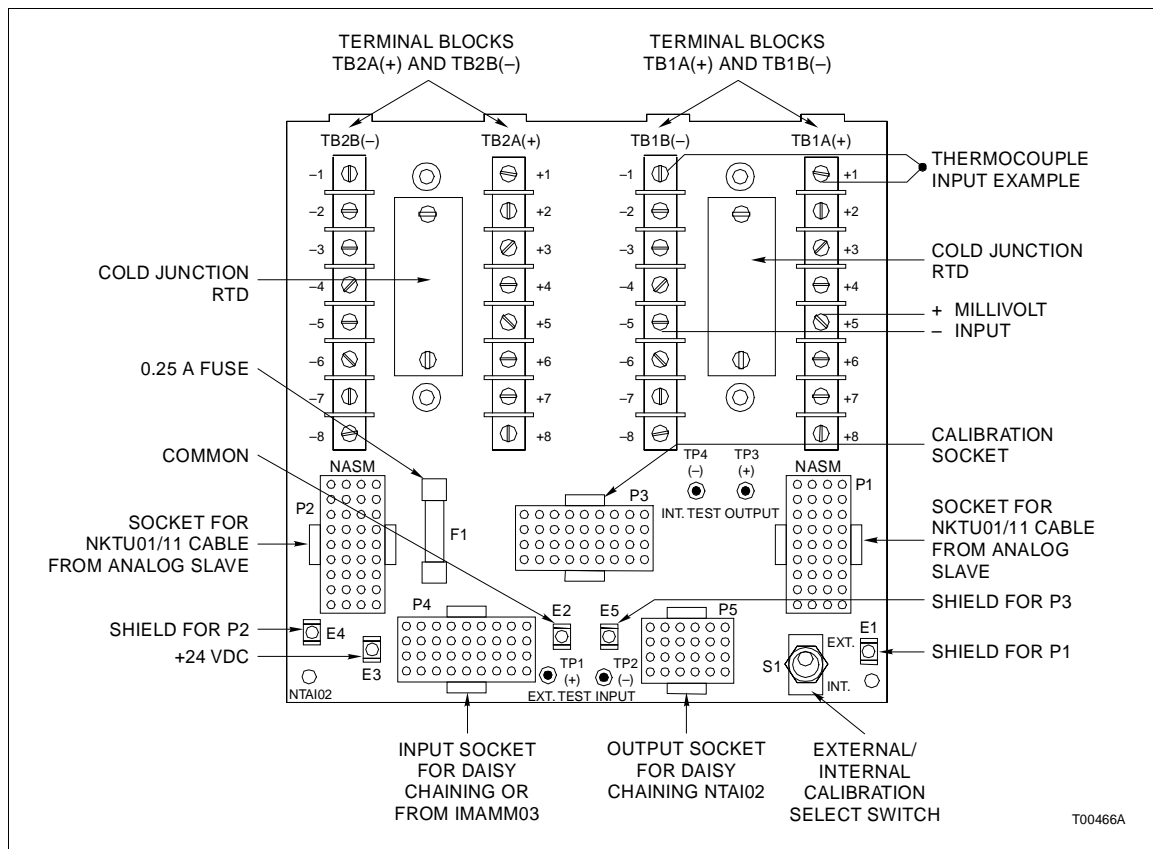


Figure 2-3. Terminal Assignments and Input Example for NTAI02

**Power Wiring**

There are five terminals that provide power and ground connections. See Figure 2-3 for terminal locations. Terminal E3 is the +24 VDC power connection. Terminal E2 is the I/O common. Terminal E1, E4 and E5 are shield connections.

Make power connections to the TU after it is mounted in the NFTP01. Make sure cabinet and I/O power are turned off before connecting ground and power wiring. Refer to the following steps when installing the TU into a modular power supply system.

1. Attach a 14 AWG wire from the +24 VDC power source within the cabinet or an external +24 VDC source to the E3 terminal on the TU.
2. Attach a 14 AWG wire from the DC bus bar at the bottom of the cabinet to the E2 terminal of the TU.
3. Attach the E1 shield to the shield bus bar in the cabinet.
4. Attach the E4 shield to the shield bus bar in the cabinet.
5. Attach the E5 shield to the shield bus bar in the cabinet.

The NTAI02 is ready for operation if:

1. The circuit board is mounted in the field termination panel.
2. All required cables are connected to the termination unit.
3. All required field wires are connected to the termination unit and have been verified.
4. Terminal block covers are installed.
5. Power is connected and applied to the termination unit.

---

## SECTION 3 - MAINTENANCE

---

### **INTRODUCTION**

The NTAIO2 Analog Input Termination Unit 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*

<b>Task</b>	<b>Interval</b>
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: Field Termination Panel. Termination Units.	
Be sure terminal block covers are in place for thermocouple applications.	

---

## SECTION 4 - REPAIR/REPLACEMENT PROCEDURES

---

### INTRODUCTION

This section explains the replacement procedures for the NTAI02 Analog Input Termination Unit. No special tools are required to replace the unit.

---

### REPLACEMENT PROCEDURES

If an NTAI02 is faulty, replace it with a new one. **Do not** try to repair the module. Replacing components may affect performance and certification.

**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.

**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.

**CAUTION**

It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any termination unit 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.

To replace an NTAI02 termination unit:

1. Turn **off** the INFI 90 cabinet power.  
**NOTE:** The I/O power supplies providing the power to the TU may not be located in the same cabinet as the TU. Make sure to turn **off** power to any external supplies providing I/O power.
2. Remove terminal block covers.
3. Label and remove all field wiring from the terminal blocks.
4. Label and disconnect all cables connected to the TU.
5. Label and disconnect system I/O power and ground from the terminals.
6. Remove the two screws securing the TU to the field termination panel and remove the TU.
7. Insert the tabs of the replacement termination unit into the proper slots of the field termination panel standoff and slide it into position.
8. Secure the termination unit circuit board to the field termination panel with two screws. Do not overtighten.
9. Remove terminal block covers from the replacement TU.
10. Connect all field wiring removed in Step 3.
11. Connect the system I/O power wires and system ground wires removed in Step 5 and verify connections.
12. Connect all cables removed in Step 4.
13. Install terminal block covers.
14. Energize the cabinet power supply that provides power to the TU.
15. Turn on any external power supplies providing I/O power.
16. Calibrate the replacement TU by following the procedure in the IMAMM03 product instruction. Refer to Section 1 for the current manual identification number.

---

### **Replacing Fuses**

Fuse F1 is shipped installed on the TU. It is a 0.25 amp, 250 volt (Bailey part number 194776A12500). The fuse is in fuse holder F1.



Replace the fuse by following these steps:

1. Turn off INFI 90 cabinet power.
2. Install the replacement 0.25 amp fuse into fuse holder F1.
3. Turn on power to the termination unit.

---

## 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 F1	0.25 A 250 V 0.64 x 31.25 mm (0.25 x 1.25 in.)	194776A12500

---

### 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.

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### 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 - THERMOCOUPLE/MILLIVOLT SLAVE INPUT MODULE (IMASM02)

## INTRODUCTION

The Thermocouple Analog Slave Input Module (IMASM02) uses an NTAI02 for termination. Each NTAI02 accepts up to eight thermocouple/millivolt inputs for the IMASM02. Two IMASM02 slave modules can connect through separate cables to the NTAI02. Up to four NTAI02s can be interconnected together allowing eight IMASM02s to connect to the IMAMM03. This appendix contains a figure and table that shows the dipswitch location on the IMASM02 and its settings. This information is provided as a quick reference guide for personnel installing the NTAI02. Figure A-1 shows the address select switch (SW1). Table A-1 lists the binary addresses for setting SW1. Refer to the IMAMM03 instruction for more detailed information to install and configure the slave. Refer to the slave calibration procedure in the IMASM02 product instruction manual.

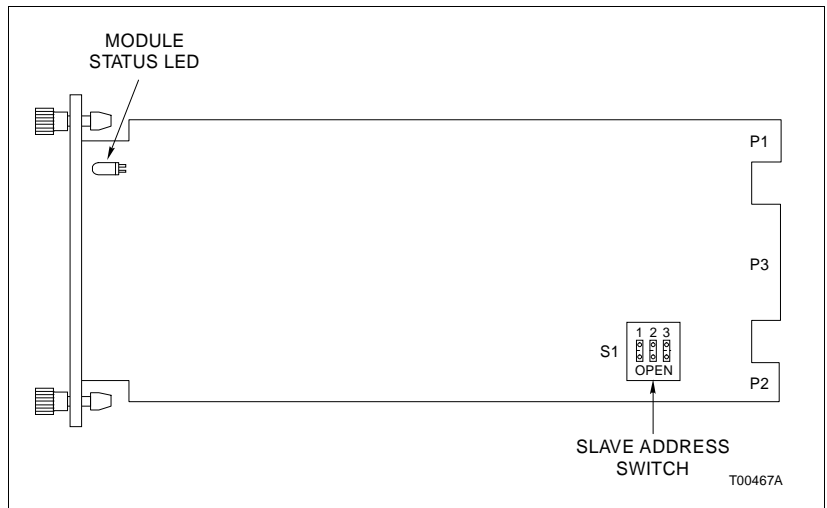


Figure A-1. Address Select Switch (SW1)

Table A-1. Address Switch Settings (SW1)

Addr	MSB			LSB			
	1	2	3	Addr	MSB	LSB	
					1	2	3
0	0	0	0	4	1	0	0
1	0	0	1	5	1	0	1
2	0	1	0	6	1	1	0
3	0	1	1	7	1	1	1

OPEN = OFF = 1  
CLOSED = ON = 0

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**AMERICAS**

29801 Euclid Avenue  
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Gateway East #20-04  
Singapore 189721  
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Telefax 65-292-9011

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16154 Genoa, Italy  
Telephone 39-10-6582-943  
Telefax 39-10-6582-941

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D-60487 Frankfurt Main  
Germany  
Telephone 49-69-799-0  
Telefax 49-69-799-2406