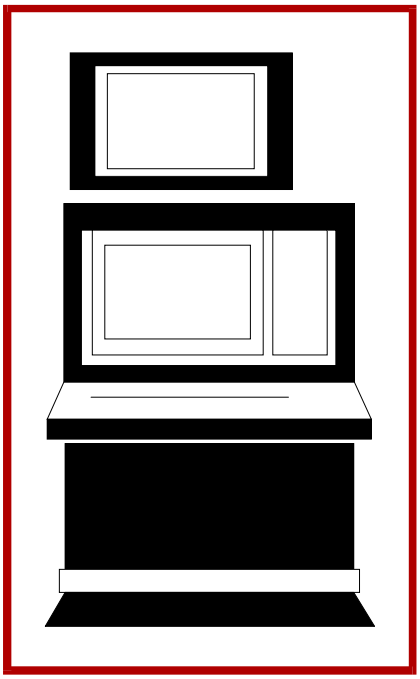
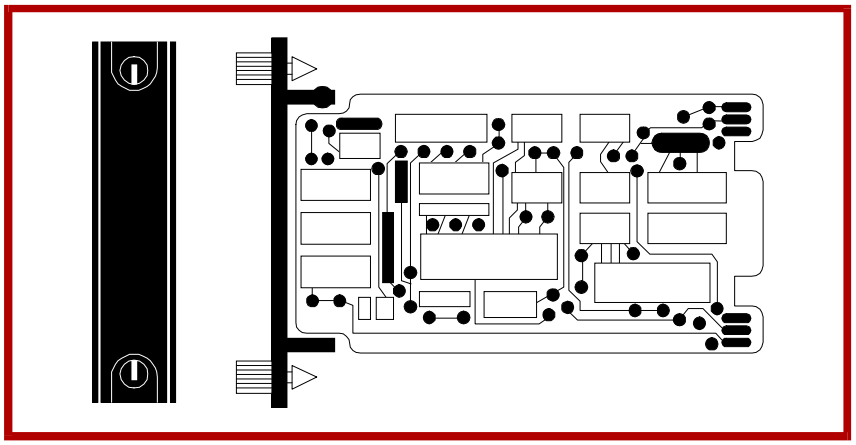
Bailey® infi 90®

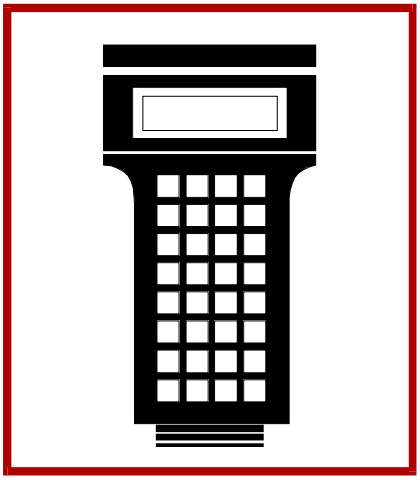
E96-406

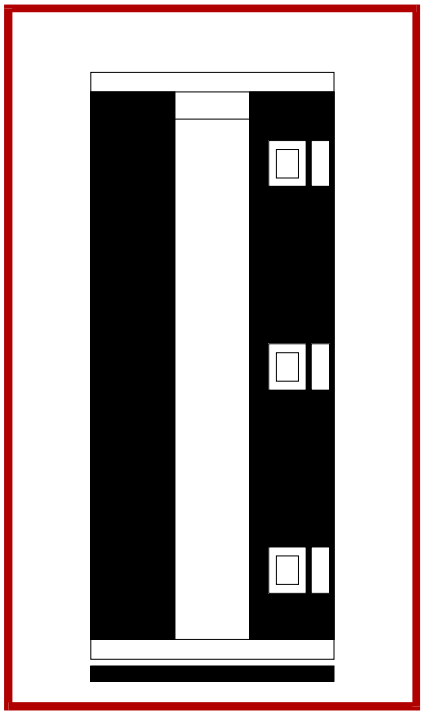
Instruction

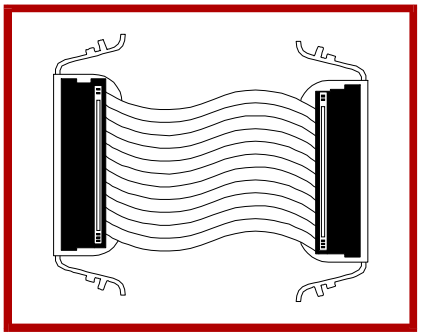
Analog Master Termination Unit
(NTAM01)

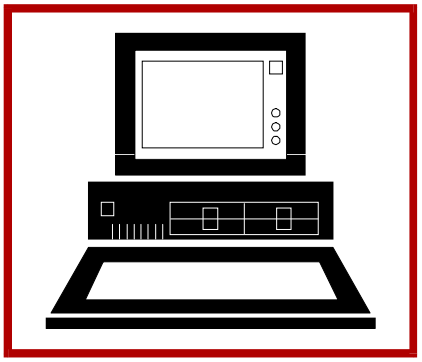












Bailey® Process Control and Automation Solutions from Elsag Bailey Group

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 MATÉREILS.

NOTICE

The information contained in this document is subject to change without notice.

Elsag Bailey, its affiliates, employees, and agents, and the authors and contributors to this publication specifically disclaim all liabilities and warranties, express and implied (including warranties of merchantability and fitness for a particular purpose), for the accuracy, currency, completeness, and/or reliability of the information contained herein and/or for the fitness for any particular use and/or for the performance of any material and/or equipment selected in whole or part with the user of/or in reliance upon information contained herein. Selection of materials and/or equipment is at the sole risk of the user of this publication.

Preface

Termination units provide an input connection from the plant equipment to the INFI 90® process modules. The NTAM01 Analog Master Termination Unit interfaces cold junction temperature compensation and internal calibration between the NTAI02 Thermocouple Analog Input Slave Termination Unit and redundant IMAMM03 Analog Master Modules. The NTAM01 unit is also used to provide a connection for NDIS01 Digital Indicator Stations.

This manual explains how to install and use the NTAM01 unit on the INFI 90 system. It has sections that describe the setup and cabling. The appendix contains information about the IMAMM03 module.

® INFI 90 is a registered trademark of Elsag Bailey Process Automation.

List of Effective Pages

Total number of pages in this manual is 26, 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 2-7	Original
3-1	Original
4-1 through 4-2	Original
5-1	Original
A-1 through A-2	Original
B-1	Original
Index-1	Original

NOTE: On an updated page, the changed text or table is indicated by a vertical bar in the outer margin of the page at 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. 2-6, 4-1) 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. 2-7) 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. 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 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. (p. 2-6, 4-1) Ll 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. (p. 2-7) 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. (p. 4-1)

Table of Contents

List of Figures

List of Tables

SECTION 1 - INTRODUCTION

OVERVIEW

The NTAM01 Analog Master Termination Unit is only required for redundant IMAMM03 Analog Master Modules using thermocouple slaves or to connect digital indicator stations. The NTAM01 unit can connect up to four NTAI02 units and up to four indicator stations. The cold junction temperature compensation and internal calibration signals pass through the master termination unit between the IMAMM03 Analog Master Module and the IMASM02 Thermocouple and Millivolt Slave Modules.

NTAM01 unit allows communication between redundant IMAMM03 Analog Master Modules. It can connect to an NDIS01 Digital Indicator Station, and passes slave calibration voltage from the IMAMM03 module to NTAI02 units.

This manual explains the purpose, setup, handling precautions and steps to install the NTAM01 unit. 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.

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.

UNIT DESCRIPTION

The NTAM01 unit is a single printed circuit board that mounts in an NFTP01 Field Termination Panel. The termination unit has cable connectors for NTAI02 units, IMAMM03 master modules, and an NDIS01 Digital Indicator Station. Figure 1-1 shows an application example for the NTAM01 unit.

FEATURES

The design of the NTAM01 unit, as with all INFI 90 devices, allows for flexibility in creating a process management system. Refer to the ***NOMENCLATURE*** entry in this section for the list of devices that can be used with the termination unit in an INFI 90 system.

- Standard factory-wired cables connect the NTAM01 unit to the IMAMM03 module and NTAI02 unit.

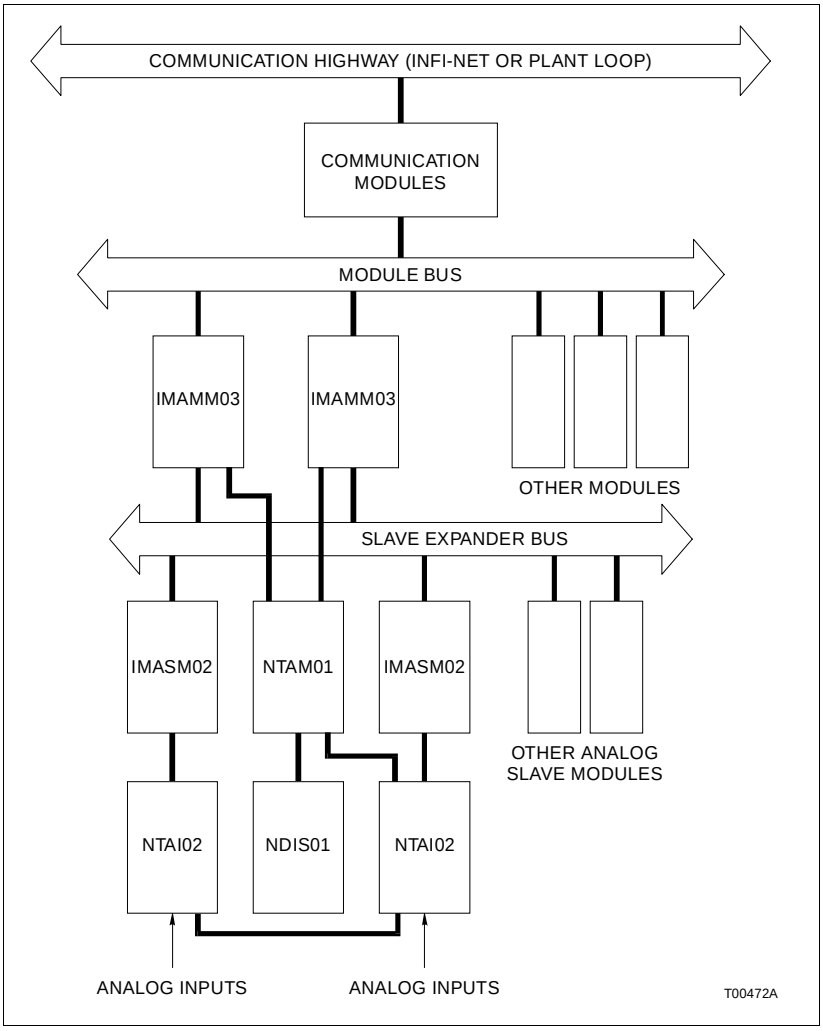


Figure 1-1. Application Example for NTAM01 Unit

- A standard factory-wired cable conn*Application Example for NTAM01 Unit*ects the termination unit to up to four NDIS01 Digital Indicator Stations.
- Each termination unit fits in a standard field termination panel.
- Connects up to four NTAI02 units.
- Routes internal calibration voltage from the IMAMM03 module to the NTAI02 unit.
- Passes all cold junction references from the NTAI02 unit to the IMAMM03 module.

INSTRUCTION CONTENT

This manual has five sections and two appendices.

Introduction — Is an overview of the features, description and specifications and a description of the NTAM01 unit.

Installation — Describes cautions to observe when handling the termination unit. 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 termination unit.

Support Services — Describes the support services (repair parts, training, documentation, etc.) available from Bailey Controls Company.

Appendix A — Shows the switch settings for the IMAMM03 Analog Master Module.

Appendix B — Shows the switch and jumper settings for the NDIS01 Digital Indicator Station.

HOW TO USE THIS MANUAL

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

1. Read Section 2 before connecting the NTAM01 unit.
2. Refer to Appendix A for the IMAMM03 master module.
3. Refer to Appendix B for the NDIS01 Digital Indicator Station.
4. Refer to Section 3 for the maintenance schedule.
5. 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.

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

Term	Definition
Dipswitch	A dual in-line package that contains switches.
DIS	Digital indicator station. A panel mounted operator interface device that monitors and displays digital values.
Master Module	One of a series of controller modules designed to direct field processes through a slave module. The multi-function processor is an example.
Slave Module	One of a series of modules designed to perform high or low level operations as directed by a master module.
TU	Termination unit. Provides input/output connection between plant equipment and the INFI 90/Network 90® modules.
FTP	Field termination panel. A panel inside the INFI 90 cabinet on which to mount termination units.

NOMENCLATURE

Table 1-2 contains the modules and equipment that can be used with the NTAM01 unit.

Table 1-2. Nomenclature

Nomenclature	Description
NDIS01	Digital indicator station
NKAI01	Cable, NTAM01 unit to NTAI02 unit (PVC)
NKAI11	Cable, NTAM01 unit to NTAI02 unit (non-PVC)
NKDS01	Cable, NDIS01 station to NTAM01 unit (PVC)
NKDS02	Cable, NDIS01 station to NTAM01 unit (PVC)
NKDS03	Cable, NDIS01 station to NKDS02 cable (PVC)
NKDS11	Cable, NDIS01 station to NTAM01 unit (non-PVC)
NKDS12	Cable, NDIS01 station to NTAM01 unit (non-PVC)
NKDS13	Cable, NDIS01 station to NKDS02 cable (non-PVC)
NKTU01	Cable, IMAMM03 module to NTAM01 unit (PVC)
NKTU11	Cable, IMAMM03 module to NTAM01 unit (non-PVC)
NTAI02	Termination unit/thermocouple input
NTFP01	Field termination panel

® Network 90 is a registered trademark of Elsag Bailey Process Automation.

REFERENCE DOCUMENTS

Table 1-3 contains the reference documents for the NTAM01 unit.

Table 1-3. Reference Documents

Number	Document
I-E96-116	Digital Indicator Station NDIS01
I-E96-205	Analog Master Module and Analog Slave Modules IMAMM03 and IMASM01/02/03/04
I-E96-403	Thermocouple Input Termination Unit NTAI02
I-E96-500	Site Planning and Preparation

SPECIFICATIONS

Refer to Table 1-4 for the specifications of the NTAM01 Termination Unit.

Table 1-4. Specifications

Property	Characteristic/Value
Power Requirements	
+24 VDC	325 mA for each NDIS01 station (4 maximum) 10 mA for each IMASM02 module (8 maximum) 17 mA for each NTAM01 unit
Mounting	Mounts in the NFTP01 Field Termination Panel.
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 mi)
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 (non-hazardous) location.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SECTION 2 - INSTALLATION

INTRODUCTION

This section explains how to install the NTAM01 Analog Master Termination Unit. Read, understand and complete the steps in the order they appear before using the NTAM01 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 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 Static Shielding Protective Bag***. Keep the modules in the static shielding bag until you are ready to install them in the system. Save the bag for future use.

2. ***Ground Bag 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 is connected to the cabinet chassis ground.

8. ***Do Not Use Lead Pencils to Set Dipswitches***. To avoid contamination of switch contacts that can result in circuit board malfunction, do not use a lead pencil to set a dipswitch.

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 of extremes of temperature and humidity.

SETUP/PHYSICAL INSTALLATION

This section explains how to install the NTAM01 unit. The required procedures are installing the termination unit into the field termination panel and connecting the communication cables.

Termination Unit Installation

The NTAM01 unit mounts on a standard NFTP01 Field Termination Panel. Figure 2-1 shows how to secure the termination unit to the NFTP01 panel.

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 termination unit to the field termination panel with two, number 10, ¾-inch screws. Do not overtighten the screws. See Figure 2-1.

Cable Installation

The NTAM01 unit has four cable connectors, P1 through P4, that connect to round, shielded cables. An NKTU01 and NKTU11 cable connects P2 to the primary IMAMM03 module. A second NKTU01 and NKTU11 cable connects P3 to the redundant IMAMM03 module, if it is used. Up to four NTAI02 units can be interconnected to P1 through NKAI01 and NKAI11 cables.

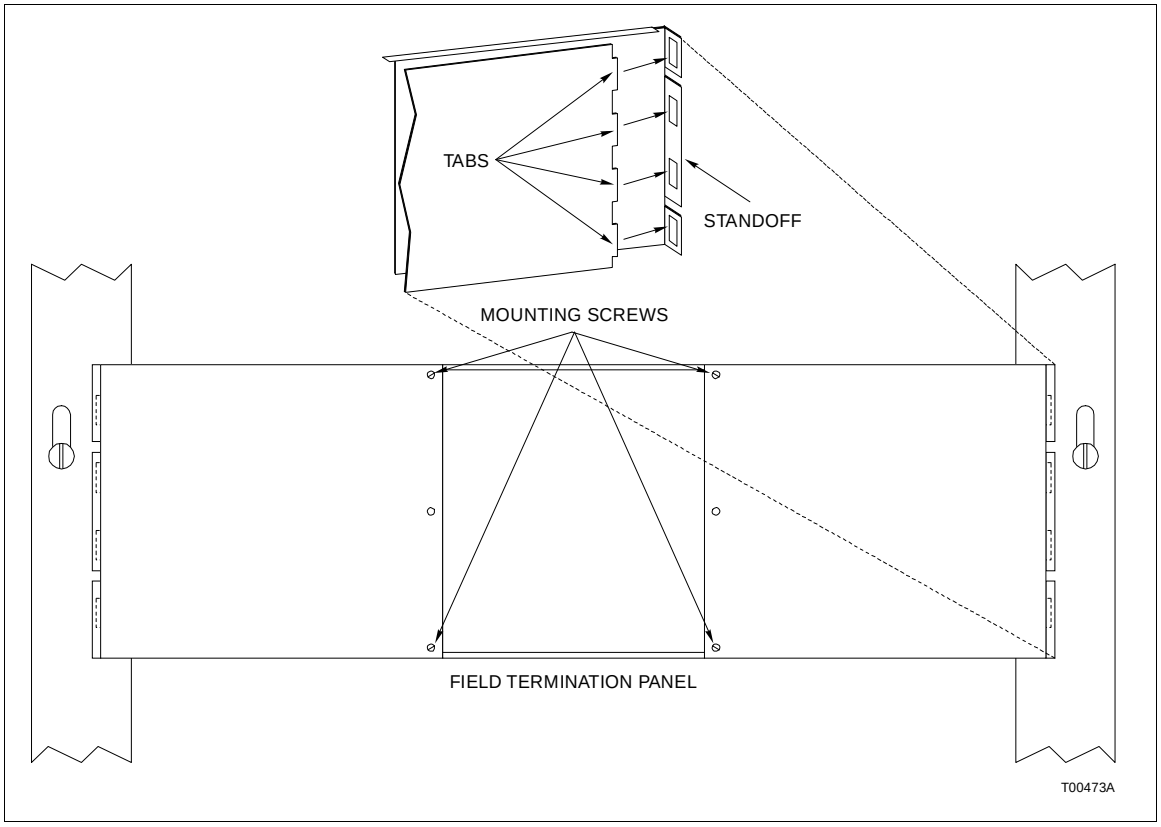


Figure 2-1. Installation for Termination Unit

An NKDS01 and NKDS11 cable connects P4 to a single NDIS01 Digital Indicator Station. Connect the cable to the left hand connector on the housing as viewed from the rear. An NKDS02 and NKDS12, and NKDS03 and NKDS13 cables connects P4 to multiple NDIS01 Digital Indicator Stations. Connect the cable to the left hand connector on the housing as viewed from the rear.

The NKTU01, NKAI01, NKDS01, NKDS02 and NKDS03 cables have a PVC jacket. The NKTU11, NKAI11, NKDS11, NKDS12 and NKDS13 cables have a non-PVC jacket.

See Figure 2-2 for the cable connections from the NTAM01 unit. Table 2-1 lists the cable applications for the NTAM01 unit. See Figure 2-3 for the cable connector locations on the NTAM01 unit.

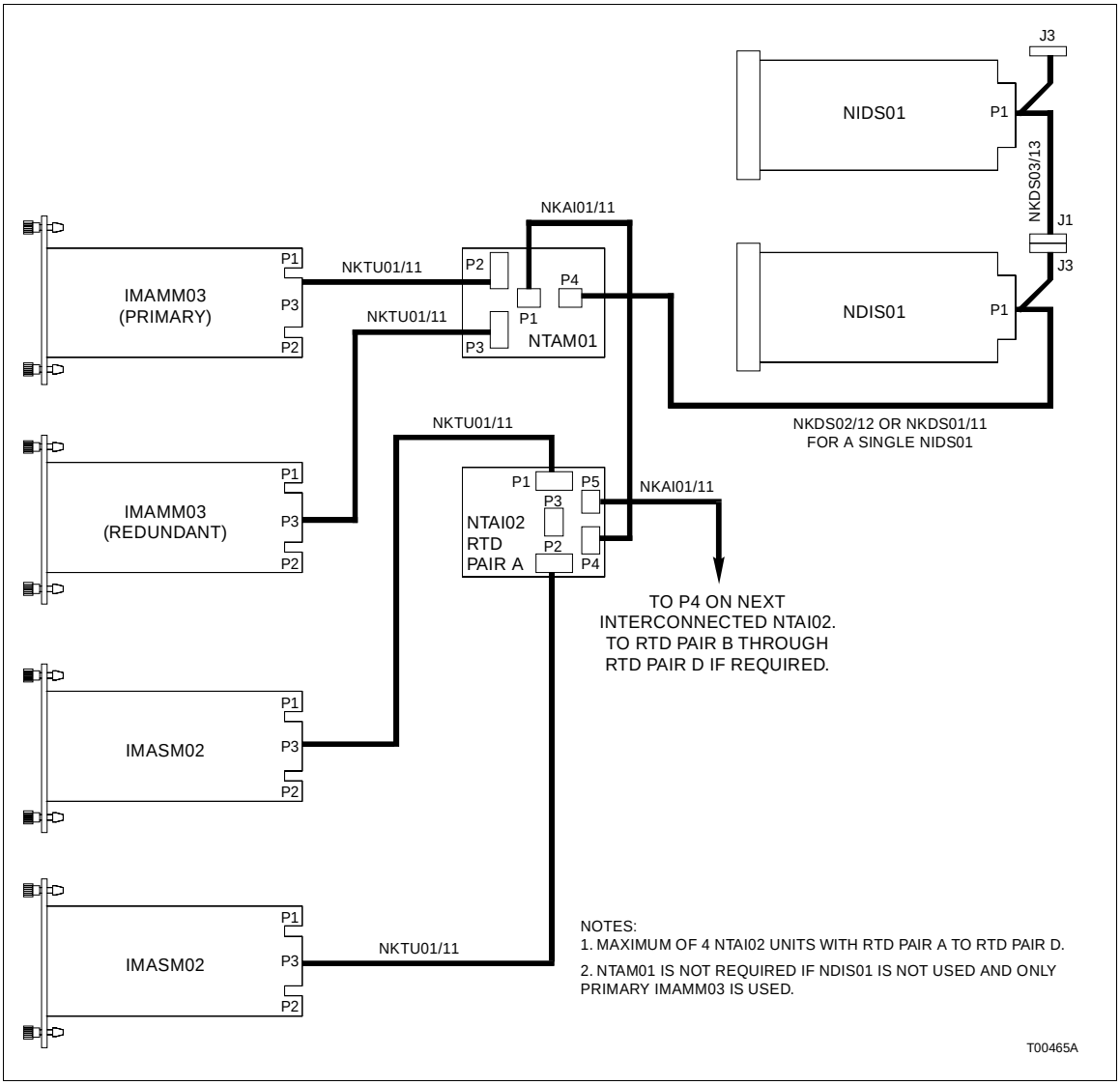


Figure 2-2. Cable Connections for NTAM01 Unit

Table 2-1. NTAM01 Cable Applications

Cable	Application	Connector	Maximum Length
NKTU01 (PVC)	Connects NTAM01 unit to primary IMAMM03 module	P2 on NTAM01 unit to MMU backplane	61 m (200 ft)
NKTU11 (non-PVC)			
NKTU01 (PVC)	Connects NTAM01 unit to redundant IMAMM03 module	P3 on NTAM01 unit to MMU backplane	61 m (200 ft)
NKTU11 (non-PVC)			
NKAI01 (PVC)	Connects NTAM01 unit to NTAI02 unit	P1 on NTAM01 unit to P4 on NTAI02 unit	1.5 m (5 ft)
NKAI11 (non-PVC)			
NKDS01 (PVC)	Connects NTAM01 unit to a single NDIS01 station	P4 on NTAM01 unit to P1[1] on NDIS01 station	120 m (400 ft)
NKDS11 (non-PVC)			

Table 2-1. NTAM01 Cable Applications (continued)

Cable	Application	Connector	Maximum Length
NKDS02 (PVC) NKDS12 (non-PVC)	Connects NTAM01 unit to the first NDIS01 station of up to four stations	P4 on NTAM01 unit to P1[1] on NDIS01 station	69 m (225 ft)
NKDS03 (PVC) NKDS13 (non-PVC)	Connects second, third or fourth NDIS01 station to NKDS02 cable	J1 of NKDS03/13 cable to J3 of NKDS02/12 cable and J2 of NKDS03/13 cable to P1 connector of the station	3 m (10 ft)

NOTE:
1. The P1 connector of the station is the left hand connector slot of the station housing as viewed from the rear of the unit.

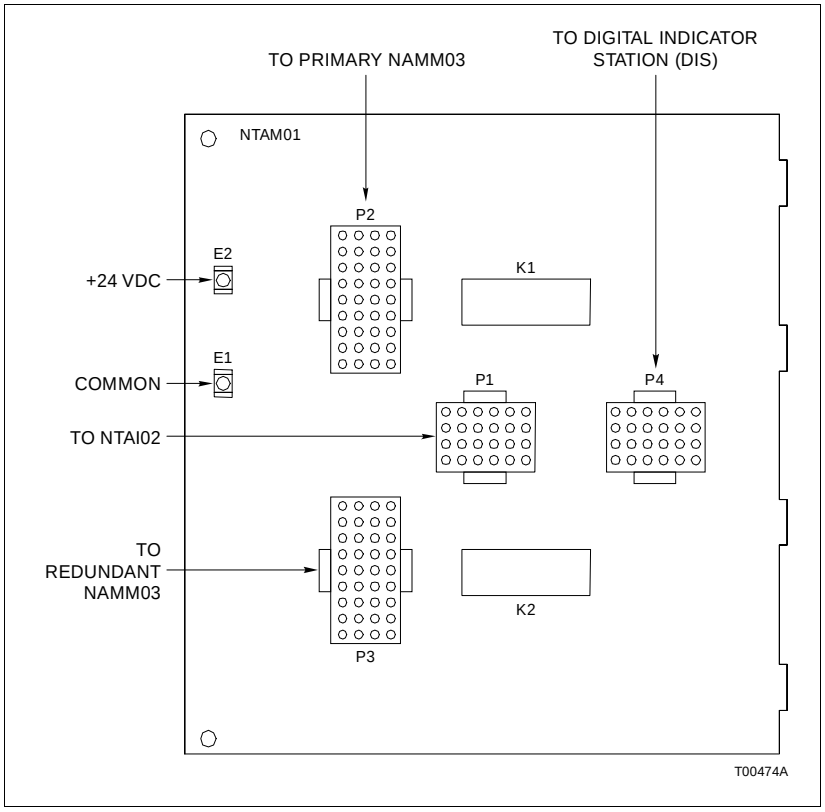


Figure 2-3. Cable Connector Locations for NTAM01 Unit

To install the cables follow these steps.

1. Pull the master modules several inches from the MMU backplane.

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.**

2. Insert the J2 end of the NKTU01 or NKTU11 termination unit cable into the MMU backplane slot assigned to the primary master module. The cable should latch securely in place. Card edge connector P3 of the master module connects to this end of the cable.

3. Insert the J1 end of the NKTU01 or NKTU11 cable into P2 on the NTAM01 unit. The cable should latch securely in place.

4. If the IMAMM03 module is nonredundant, go to Step 7.

5. Insert the J2 end of the NKTU01 or NKTU11 cable into the MMU backplane slot assigned to the redundant master module, if one is installed. The cable should latch securely in place. Card edge connector P3 of the master module connects to this end of the cable.

6. Insert the J1 end of the NKTU01 or NKTU11 cable into P3 on the NTAM01 unit. The cable should latch securely in place.

7. Insert the J1 end of the NKAI01 or NKAI11 cable into P1 on the NTAM01 unit. The cable should latch securely in place.

8. Connect the J2 end of the NKAI01 or NKAI11 cable into P4 on the first NTAI02 unit (this is the cold junction compensation pair A termination unit) interconnected with the NTAM01 unit. Up to four NTAI02 units can be interconnected with NKAI01 or NKAI11 cables.

9. If a single NDIS01 station is required, connect P4 of the NTAM01 unit to P1 of the NDIS01 station with an NKDS01 or NKDS11 cable. Connect the J1 end of the NKDS01 or NKDS11 cable to P4 of the termination unit and the J2 end of the NKDS01 or NKDS11 cable to the left slot on the station housing (P1 of the NDIS01 station).

10. If multiple NDIS01 stations are required, connect P4 of the NTAM01 unit to P1 of the first interconnected NDIS01 station

with an NKDS02 or NKDS12 cable. Connect the J1 end of the NKDS02 or NKDS12 cable to P4 of the termination unit and the J2 end of the NKDS02 or NKDS12 cable to the left slot on the station housing (P1 of the NDIS01 station). A total of four NDIS01 modules can be added by connecting the J3 end of the NKDS02 or NKDS12, or NKDS03 or NKDS13 cables to the J1 end of an NKDS03 or NKDS13 cable. Connect the J2 end of the cable to the left slot on the station housing (P1 of the NDIS01 station).

11. Plug in the master module to the MMU backplane.

Power Wiring

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.**

There are two terminals that provide power and ground connections. See Figure 2-3 for terminal locations. Terminal E1 is the ground. Terminal E2 is the +24 VDC power connection. Make power connections to the termination unit after it is mounted in the NFTP01 panel. Make sure cabinet and I/O power are turned off before connecting ground and power wiring. Refer to the following steps when installing the termination unit into a modular power supply system.

1. Attach a 14 AWG wire from the DC common bus bar at the bottom of the cabinet to the E1 terminal of the termination unit.

2. Attach a 14 AWG wire from the +24 VDC power source within the cabinet or an external +24 VDC source to the E2 terminal on the termination unit.

The NTAM01 unit is ready for operation if:

1. The circuit board is mounted in the termination mounting unit.

2. All required cables are connected to the termination unit.

3. The power and ground wiring is connected.

SECTION 3 - MAINTENANCE

INTRODUCTION

The NTAM01 Analog Master 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

Task	Interval
Clean and tighten all power and grounding connections.	Every 6 months or during plant shut-down, whichever occurs first.
Use a static safe vacuum cleaner to remove dust from: Field Termination Panel Termination Units	

SECTION 4 - REPAIR/REPLACEMENT PROCEDURES

INTRODUCTION

This section explains the replacement procedures for the NTAM01 Analog Master Termination Unit. No special tools are required to replace the module.

REPLACEMENT PROCEDURES

If an NTAM01 unit is faulty, replace it with a new one. ***Do not*** try to repair the module. Replacing components may affect performance and certification.

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	**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.**

To replace a termination unit:

1. Turn OFF the INFI 90 cabinet power.

   NOTE: The I/O power supplies providing the power to the termination unit may not be located in the same cabinet as the termination unit. Make sure to turn OFF power to any external supplies providing I/O power.

2. Pull the master modules out of the MMU backplane.

3. Label and remove all cables connected to the termination unit.

4. Label and disconnect system I/O power and ground wires from the terminals.

5. Remove the two number 10 screws securing the termination unit to the field termination panel.

6. Insert the tabs of the replacement circuit board into the proper slots of the field termination panel stand-off and slide the circuit board into position.

7. Secure the termination unit circuit board to the field termination panel with the two number 10 screws.

8. Connect the system I/O power and ground.

9. Connect all cables removed and verify connections.

10. Plug in the master modules to the MMU backplane.

11. Energize the cabinet power supply that provides power to the termination unit.

12. 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.

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 - IMAMM03 ANALOG MASTER MODULE

INTRODUCTION

The IMAMM03 Analog Master Module uses an NTAM01 unit for termination when running redundant IMAMM03 modules or to run NDSI01 indicator stations. Each NTAM01 unit accepts up to four NTAI02 units. This appendix contains figures and tables that show the dipswitch location on the IMAMM03 module and its settings. This information is provided as a quick reference guide for personnel installing the NTAM01 unit. The hardware configuration switch (SW2) sets the hardware operating states (run modes or diagnostic modes) and module address of the IMAMM03 module. Table A-1 lists the run modes that can be set with dipswitch positions 1 through 3. Table A-2 lists the binary addresses that can be set with dipswitch positions 4 through 8. Figure A-1 shows the location of SW2. Refer to the ***Analog Master Module and Analog Slave Modules IMAMM03 and IMASM01/02/03/04*** instruction manual for more detailed information to install and configure the slave.

Table A-1. Run Mode Settings (SW2)

Mode	Settings		
	1	2	3
Normal or backup	0	0	0
Configuration lock	0	0	1
Initialize NVRAM	0	1	0
Inhibit checksums	0	1	1
Primary	1	0	0
Primary and configuration lock	1	0	1
Unused	1	1	0
Unused run mode (sets diagnostic mode)	1	1	1

NOTE: open = OFF = 1, closed = ON = 0.

Table A-2. IMAMM03 Address Switch Settings (SW2)

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	22	0	0	0	1	0	1	1	0
9	0	0	0	0	1	0	0	1	25	0	0	0	1	1	0	0	1
16	0	0	0	1	0	0	0	0	29	0	0	0	1	1	1	0	1
20	0	0	0	1	0	1	0	0	31	0	0	0	1	1	1	1	1

NOTE: open = OFF = 1, closed = ON = 0.

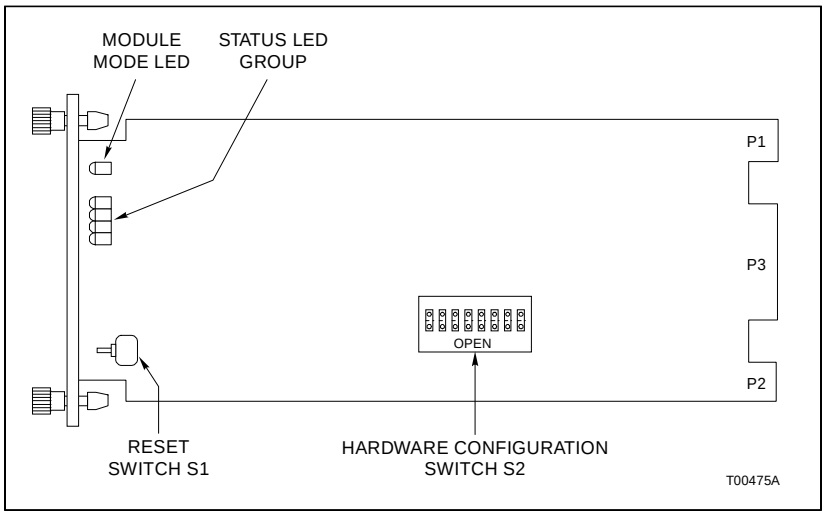
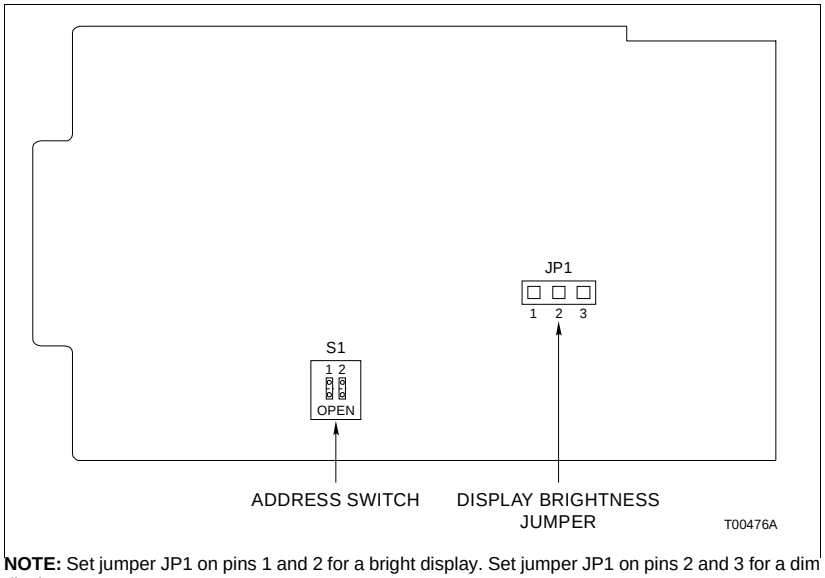


Figure A-1. IMAMM03 Address Select Switch (SW2)

APPENDIX B - NDIS01 DIGITAL INDICATOR STATION

INTRODUCTION

The NDIS01 Digital Indicator Station uses an NTAM01 unit for termination to an IMAMM03 master module. This appendix contains the dipswitch location on the NDIS01 station and intensity jumpers and their settings. This information is provided as a quick reference guide for personnel installing the NTAM01 unit. Figure B-1 shows the address select switch (SW1). Table B-1 lists the binary addresses for setting SW1. Refer to the ***Digital Indicator Station NDIS01*** instruction manual for more detailed information to install and configure the digital indicator station.



NOTE: Set jumper JP1 on pins 1 and 2 for a bright display. Set jumper JP1 on pins 2 and 3 for a dim display.

Figure B-1. NDIS01 Address Select Switch (SW1)

Table B-1. NDIS01 Address Switch Settings (SW1)

Address	Pole	
	1	2
8	0	0
9	0	1
10	1	0
11	1	1

NOTE:
open = OFF = 1, closed = ON = 0

Index

Visit Elsag Bailey on the World Wide Web at http://www.bailey.com

Our worldwide staff of professionals is ready to meet *your* needs for process automation.
For the location nearest you, please contact the appropriate regional office.

AMERICAS
29801 Euclid Avenue
Wickliffe, Ohio USA 44092
Telephone 1-216-585-8500
Telefax 1-216-585-8756

ASIA/PACIFIC
152 Beach Road
Gateway East #20-04
Singapore 189721
Telephone 65-391-0800
Telefax 65-292-9011

EUROPE, AFRICA, MIDDLE EAST
Via Puccini 2
16154 Genoa, Italy
Telephone 39-10-6582-943
Telefax 39-10-6582-941

GERMANY
Graefstrasse 97
D-60487 Frankfurt Main
Germany
Telephone 49-69-799-0
Telefax 49-69-799-2406

Form I-E96-406A Litho in U.S.A. 992