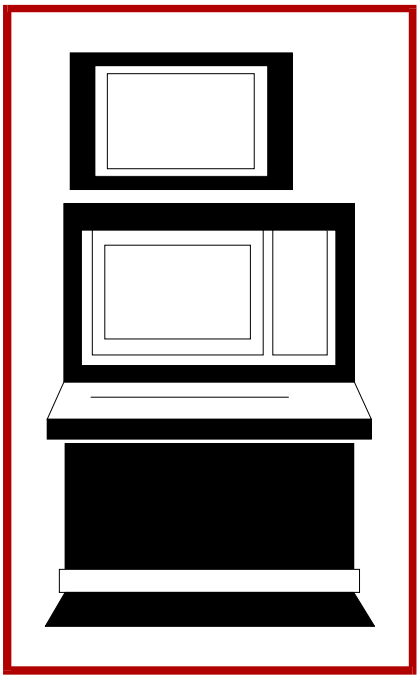
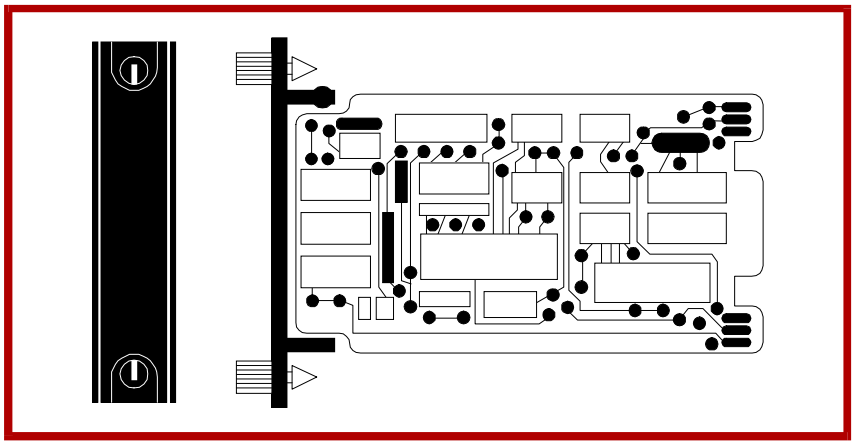
Bailey® infi 90®

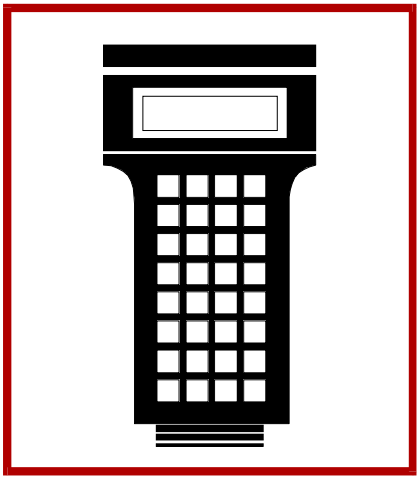
E96-427

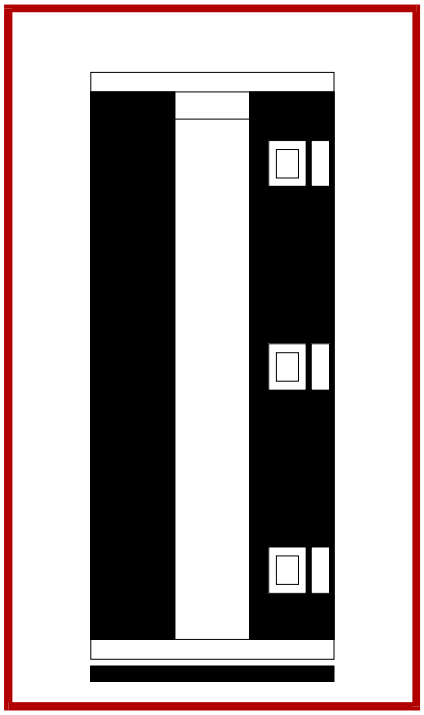
Instruction

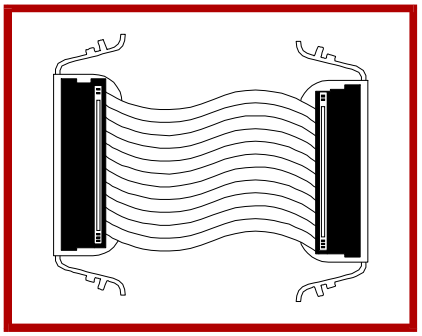
Multi-Function Controller Termination Unit
(NTMF01)

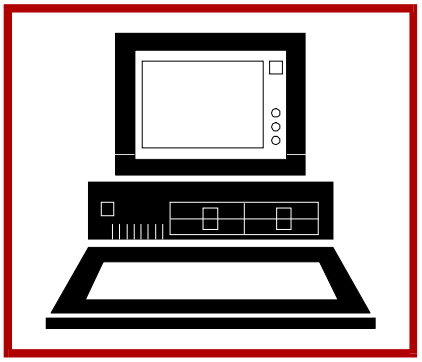












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WARNING notices as used in this instruction apply to hazards or unsafe practices that could result in personal injury or death.

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.

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

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Preface

Termination units provide a connection from the plant equipment to the INFI 90® process modules. The NTMF01 Multi-Function Controller Termination Unit terminates a multi-function controller, INFI-NET® to computer transfer module, Plant Loop to Plant Loop transfer module or Plant Loop to computer transfer module. The NTMF01 Multi-Function Controller Termination Unit provides a termination point for two separate RS-232-C ports plus a serial link to connect a control station through an NTCS04 Control I/O Termination Unit. This product instruction explains how to install and use the NTMF01 Multi-Function Termination Unit.

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

SECTION 1 - INTRODUCTION

OVERVIEW

The NTMF01 Multi-Function Controller Termination Unit (TMF) terminates two RS-232-C ports for the IMMFC03 Multi-Function Controller, INICT01 INFI-NET to Computer Transfer Module, INPPT01 Plant Loop to Plant Loop Transfer Module and INPCT01 Plant Loop to Computer Transfer Module. When terminating an IMMFC03 module (or redundant IMMFC03 modules), it enables the IMMFC03 module to communicate to a computer, terminal, printer or sequential events recorder through the serial ports (see Figure 1-1). It also provides a serial link for an NDCS03 Digital Control Station or

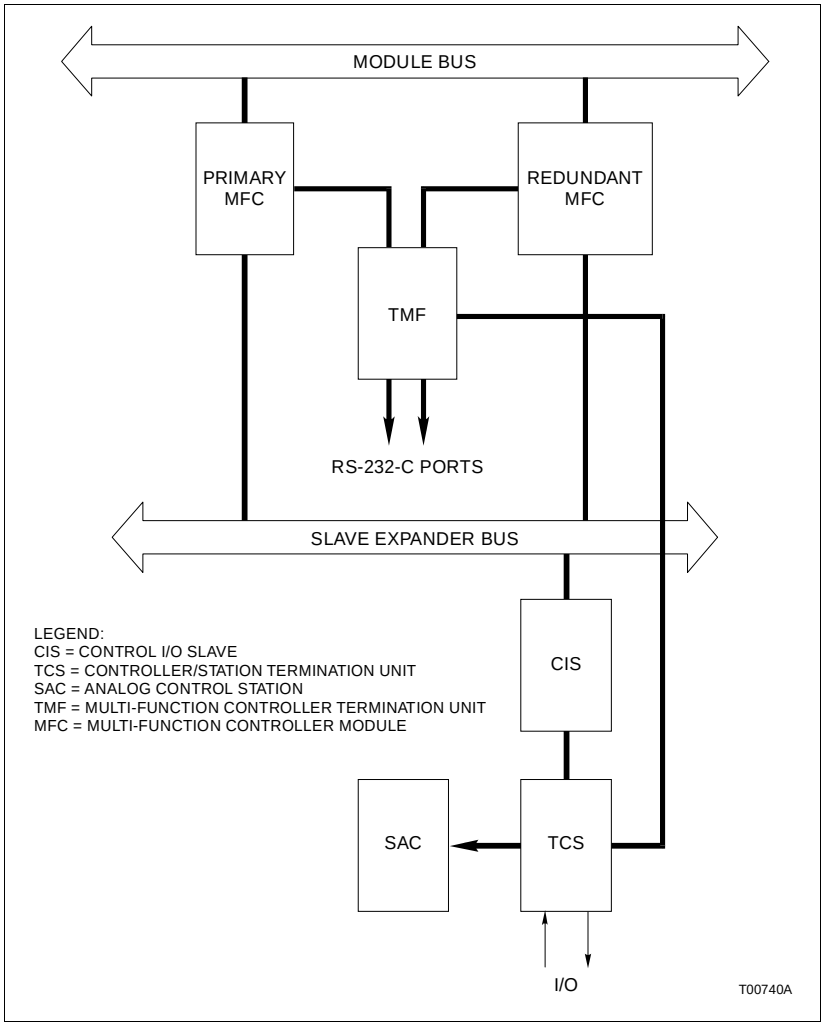

Figure 1-1. Example Redundant TMF Application

IISAC01 Analog Control Station through an NTCS04 Control I/O Termination Unit. The IMMFC04 and IMMFC05 Multi-Function Controllers use the NTMF01 termination unit to terminate a station link an7d connect to a redundant controller.

The INICT01 INFI-NET to Computer Interface Module is part of the INICI01 INFI-NET to Computer Interface. The INPCT01 Plant Loop to Computer Interface Module is part of the INPCI02 Plant Loop to Computer Interface. Figure 1-2 shows an example Plant Loop to computer interface application. The two modules use the TMF termination unit to terminate the connection of a mainframe, computer, terminal or modem to the INFI-NET or Plant Loop communication networks respectively. The INPPT01 Plant Loop to Plant Loop Transfer Module is part of an INPPR01 Plant Loop to Plant Loop Remote Interface. Figure 1-3 shows an example Plant Loop to Plant Loop interface module application. Each PPT (one local, one remote) module connects to the other through the NTMF01 termination unit.

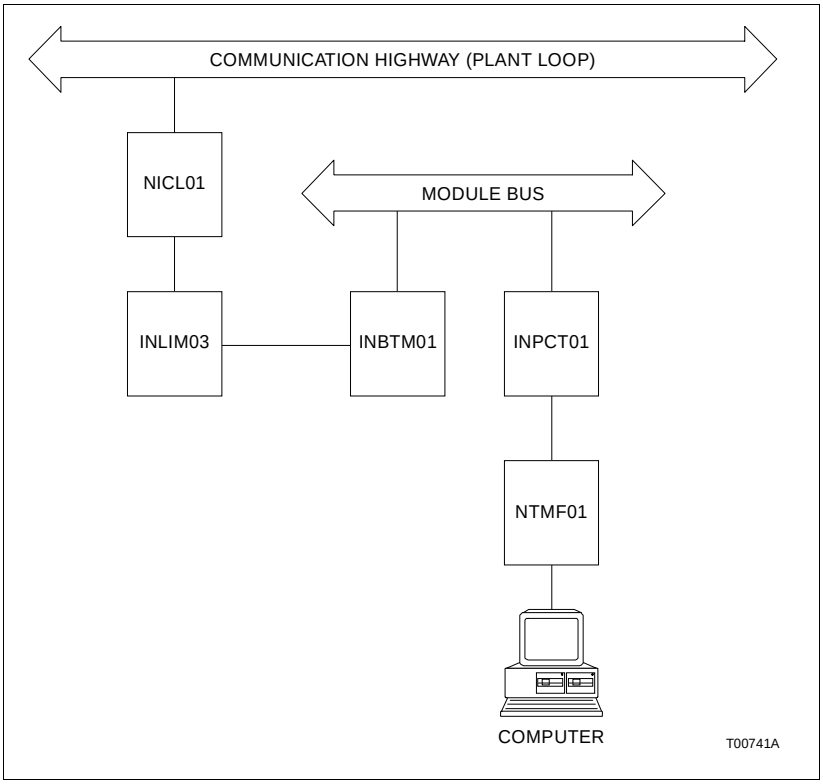

Figure 1-2. Example Plant Loop to Computer Interface Module Application

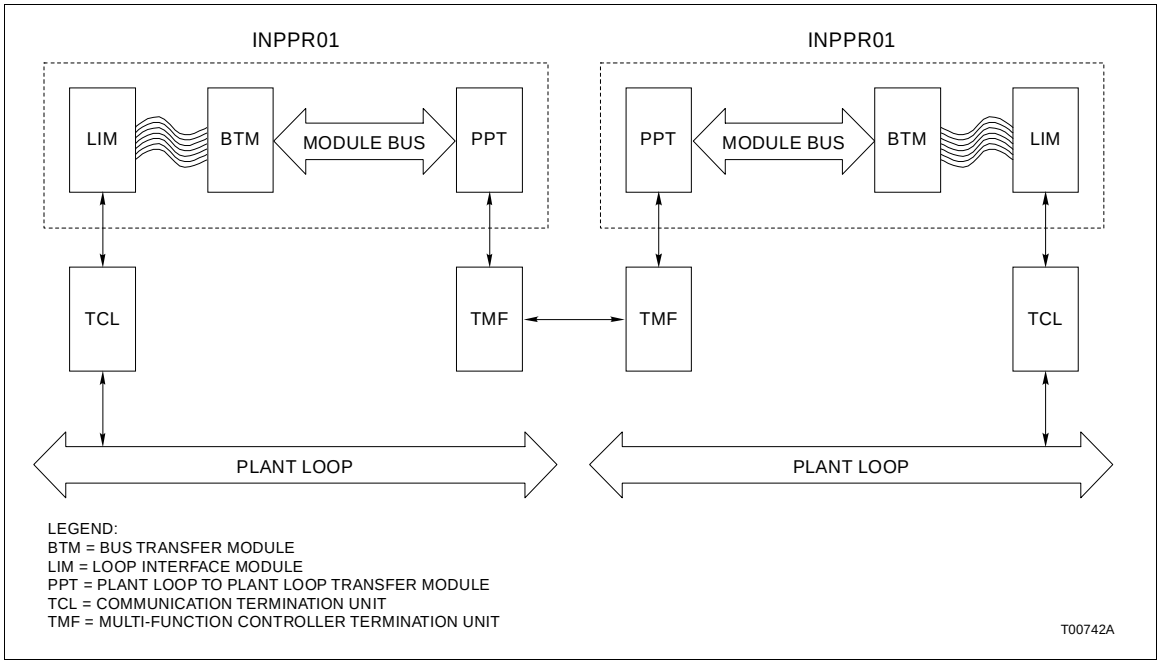

Figure 1-3. Example Plant Loop to Plant Loop Application

INTENDED USER

Anyone who installs, operates and maintains the NTMF01 Multi-Function Controller Termination Unit should read and understand this manual before placing the termination unit into service. Installation and troubleshooting require a technician or engineer with electrical experience and a working knowledge of the RS-232-C standard.

HARDWARE DESCRIPTION

The multi-function termination unit is a seven-by-seven inch square printed circuit board. It mounts on the NFTP01 Field Termination Panel inside an INFI 90 cabinet. The board contains:

- Two DB-25 connectors.
- Relays.
- Connector sockets.
- Dipshunts.
- Fuse.
- Light emitting diodes (LED).
- Faston connectors for power and DC common.

FEATURES

The multi-function controller termination unit (TMF) provides a place to connect two RS-232-C cables with DB-25 connec-

tors. Dipshunts allow either port of the termination unit to be configured to operate as DTE or DCE devices. This feature allows the termination unit to terminate a number of computers or terminals. One serial link connection on the termination unit enables a multi-function controller module to communicate to an NDCS03 Digital Control Station or IISAC01 Analog Control Station.

INSTRUCTION CONTENT

This manual has five sections and six appendices.

Introduction — Provides an overview of the termination unit.

Installation — Explains the physical installation, wiring and cable requirements, dipshunt settings and handling of the termination unit.

Maintenance — Contains a maintenance schedule.

Repair/Replacement Procedure — Explains how to replace the fuse or the termination unit.

Support Services — Explains how to order parts and other services available from Bailey Controls Company.

Appendices — Briefly discuss the modules that use the termination unit and provide a cross-reference of dipswitch and jumper settings for those modules.

HOW TO USE THIS MANUAL

Read this manual through in sequence. Read the installation section thoroughly. Do the steps in order. Complete all steps in the installation section before using the termination unit. Refer to the Table of Contents or Index to find specific information after the unit is operating.

GLOSSARY OF TERMS AND ABBREVIATIONS

Table 1-1 lists definitions of the terms and abbreviations used in this instruction.

Table 1-1. Glossary of Terms and Abbreviations

Term	Definition
DCE	Data communication equipment or data circuit-terminating equipment. Equipment that establishes and terminates a communication link between two devices. In RS-232-C communication systems,, the DCE nomenclature indicates the signals that appear at specified cable connection contacts. A modem is an example of this type of device.
Dipshunt	Dual in-line package with shorting straps.

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

Term	Definition
DTE	Data terminal equipment. Equipment comprising the data source,, data sink or both that provides the communication control function. In RS-232-C communication systems,, the DTE nomenclature indicates the signals that appear at specified cable connection contacts. Terminals and printers are examples of this type of device.
FTP	Field termination panel. A panel inside the INFI 90 cabinet on which to mount termination units.
MMU	Module mounting unit. A card cage that provides electrical and communication support for INFI 90/ Network ® modules.

REFERENCE DOCUMENTS

Table 1-2 lists the documents referenced in this instruction.

Table 1-2. Reference Documents

Number	Description
I-E93-902-1	NDCS03 Digital Control Station
I-E96-117	IISAC01 Analog Control Station
I-E96-211	IMMFC03 Multi-Function Controller Module
I-E96-212	IMMFC04 Multi-Function Controller Module
I-E96-213	IMMFC05 Multi-Function Controller Module
I-E96-442	NTCS04 Controller/Station Termination Unit
I-E96-500	Site Planning and Preparation
I-E96-601	INFI-NET Communications Modules
I-E96-621	INPCI02 Plant Loop to Computer Interface
I-E96-624	INPPR01 Plant Loop to Plant Loop Remote Interface

NOMENCLATURE

Table 1-3 is a list of related hardware.

Table 1-3. Nomenclature

Nomenclature	Description
IISAC01	Analog control station
IMMFC03 IMMFC04 IMMFC05	Multi-function controller module
INICT01	INFI-NET to computer transfer module
INPCT01	Plant Loop to computer transfer module

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Table 1-3. Nomenclature (continued)

Nomenclature	Description
INPPT01	Plant Loop to Plant Loop transfer module
NDCS03	Digital control station
NFTP01	Field termination panel
NKSE01	Station serial extension cable (PVC)
NKSE11	Station serial extension cable (non-PVC)
NKTU01	Termination unit cable (PVC)
NKTU11	Termination unit cable (non-PVC)
NTCS04	Control/station termination unit

SPECIFICATIONS

Refer to Table 1-4 for the specifications of the NTMF01 termination unit.

Table 1-4. NTMF01 Termination Unit Specifications

Property	Characteristic/Value
Power Requirements	+24 VDC 160 mA current consumption,, maximum (LED consumes 10 mA)
Communication	2 RS-232-C serial ports 1 control station serial link
Cable Insulation Specifications:	
PVC (UL Rating CL2)	80°C (176°F) at 300 V|
Non-PVC (UL Rating PLTC)	90°C (194°F) at 300 V
Mounting	Screw mounts on the field termination panel
Environmental	
Electromagnetic/Radio Frequency Interference	Values are not available at this time. Keep cabinet doors closed. Do not use communication equipment any closer than 2 meters from the cabinet.
Operating Temperature	0° to 70°C (32° to 158°F)
Relative Humidity	5% to 90% (±5%) up to 70°C (158°F) (noncondensing)
Altitude	Sea level to 3 km (1.86 mi)
Air Quality	Bailey equipment should be operated and stored in a noncorrosive environment.
Cooling Requirements	No cooling necessary when used in Bailey cabinets and operated within stated environmental limits.
Certification	All termination units are CSA certified as process control equipment for use in an ordinary (nonhazardous) location.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

SECTION 2 - INSTALLATION

INTRODUCTION

This section lists the steps to properly install the NTMF01 Multi-Function Controller Termination Unit (TMF). The installation procedure includes physical installation, dipshunt configuration, cable connection, power wiring and handling. To properly install the TMF termination unit do the steps in this section in the order they appear.

SPECIAL HANDLING

Observe these steps when handling electronic circuitry:

> **NOTE:** Always use Bailey's field static kit (part number 1948385A1 - consisting of two wrist straps, ground cord assembly, alligator clip, and static dissipative work surface) when working with the modules. The kit grounds a technician and the static dissipative work surface to the same ground point to prevent damage to the modules by electrostatic discharge.

1. ***Use Static Shielding 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 a 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 earth grounding electrode system through the AC safety ground.

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

Table 2-1. TMF Cable Applications, Connections and Length Requirements

Cable	Connections				Maximum Length Meters (Feet)
	From		To		
	Device	Connector	Device	Connector	
HCBL01	DCE or DTE device	DB-25	NTMP01	P5 or P6	15 (50)[1]
NKSE01 or NKSE11	NTMF01	P2	NTCS04	P4 or P5	61 (200)
NKTU01 or NKTU11	NTMF01	P1	Primary module	P3	61 (200)
		P3	Redundant module		

NOTE:

1. The specified maximum length only applies to the HCBL01 cable. The performance of INFI 90 modules does not place a restriction on the maximum length of the RS-232-C cable. Follow industry-wide accepted RS-232-C practices and rules when selecting a suitable RS-232-C cable for your system.

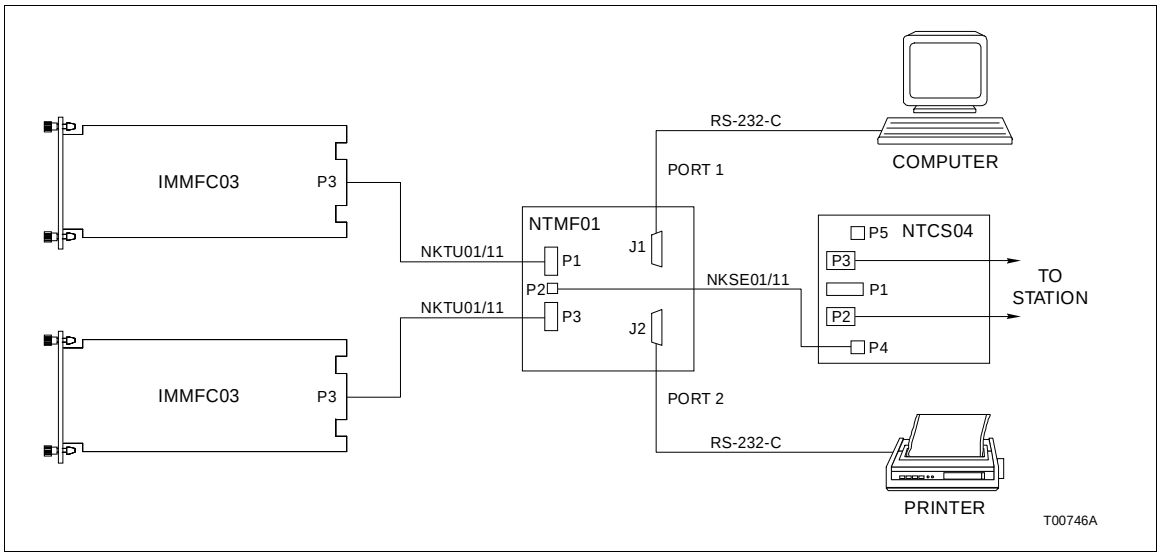

Figure 2-13. Cable Connections with Redundant MFC Modules, Serial Link to a Station and Serial Ports

To connect power to the termination unit in a system using modular power supplies:

1. Attach a 14 AWG wire from a source of +24 VDC within the cabinet to the E2 faston on the termination unit.

2. Attach a 14 AWG wire from the I/O common bus bar at the bottom of the cabinet to the E3 faston of the termination unit.

The NTMF01 termination unit is ready for operation if:

1. The fuse is installed.

2. The dipshunts are installed for the correct communication application.

3. The circuit board is mounted on the field termination panel.

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

5. Power is connected and applied to the termination unit.

SECTION 3 - MAINTENANCE

INTRODUCTION

The NTMF01 Multi-Function Controller 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 field wiring connections.	Every 6 months or during plant shutdown, whichever occurs first.
Use a static safe vacuum cleaner to remove dust from: Termination units. Field termination panel.	

SECTION 4 - REPAIR/REPLACEMENT PROCEDURES

INTRODUCTION

Repair procedures are limited to fuse and termination unit replacement. If the NTMF01 Multi-Function Controller Termination Unit fails, remove it and replace it with another one.

FUSE REPLACEMENT

If the fuse (F1) opens, replace it with a fuse having an equivalent rating. Table 4-1 describes the fuse and lists its Bailey part number. To replace a fuse:

1. Turn off power to the cabinet.
2. Remove the blown fuse from its holder (F1).
3. Replace the blown fuse with a 0.25 amp fuse.
4. Turn on power to the cabinet.

Table 4-1. Recommended Spare Parts List

Description	Part Number
Fuse, 0.25 A, 250 V	194776A12500

TERMINATION UNIT REPLACEMENT

CAUTION	**Remove modules from their assigned module mounting unit slots before installing or removing a cable connected 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 cable assigne a cet emplacement. Un manquement a cette procedure pourrait endommager le module.**

If you determine that the termination unit is faulty, replace it with a new one. ***Do not*** try to repair the unit; replacing components may affect the unit performance and certification. When replacing a termination unit, observe the special handling guidelines listed in Section 2.

NOTE: Turn off power to the field device before removing the RS-232-C cables from the TMF unit.