SECTION 1 - INTRODUCTION

OVERVIEW

The NTRL02 Fiber Optic Remote Link Termination Unit and NTRL03 Electrical Remote Link Termination Unit provide connections for IMRIO02 slave modules, communication cables, control stations (no analog output bypass capability), and digital indicator stations. NTRL02 and NTRL03 termination units (TRL) can be connected to the NTCS04 termination unit. This enables the IMRIO02 slave module to communicate over the station link to stations for analog output bypass capability and allows the connection of additional stations. Figure 1-1 shows an example NTRL02 and NTRL03 termination unit application.

INTENDED USER

System engineers and technicians should read this manual before installing and placing the NTRL02 or NTRL03 termination unit into operation. Personnel installing this module should have a basic knowledge of fiber optic cables and connections.

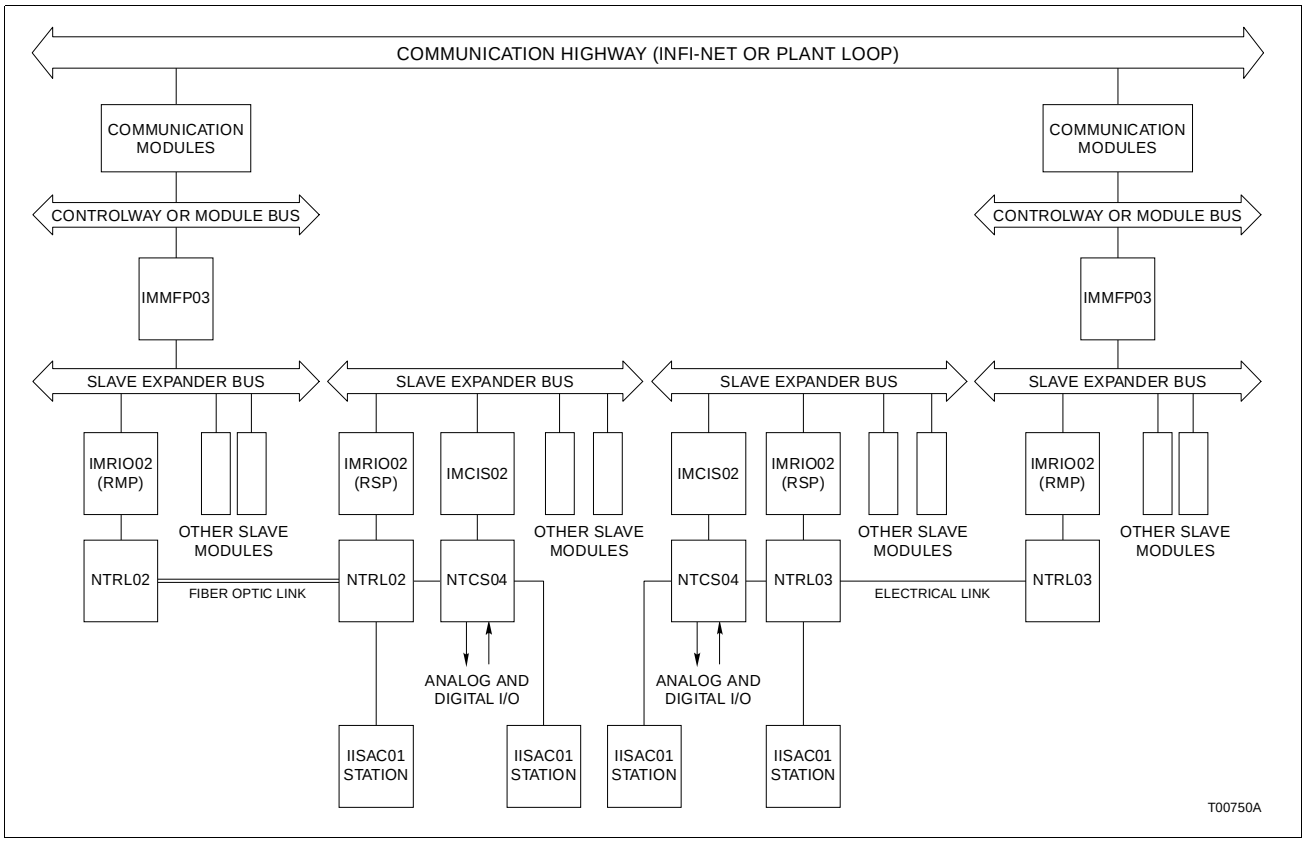

Figure 1-1. Possible NTRL02 and NTRL03 Termination Unit Applications

HARDWARE DESCRIPTION

The NTRL02 termination unit is a single printed circuit board that attaches to a NFTP01 Field Termination Panel located inside the INFI 90 cabinet. The NTRL02 termination unit has three socket connectors (P1, P2, and P3), two fiber optic cable connectors (TX and RX), and two terminal blocks (TB1 and TB2).

- Connector P1 allows the passage of signals from the termination unit to an IMRIO02 Remote I/O Slave Module.
- Connector P2 provides a station link (with analog bypass capability) to an NTCS04 termination unit.
- Connector P3 provides a station link to single or multiple control stations (no analog bypass capability) and/or indicator stations.
- The TX and RX connectors enable communication over fiber optic cable between local (master) and remote (slave) NTRL02 termination units. This communication link, using Bailey Controls recommended fiber optic cable, can have a maximum length of three kilometers (10,000 feet). The TX connector couples the output optical signals from the termination unit to the fiber optic cable. The RX connector couples the input optical signals from the fiber optic cable to the termination unit. Refer to the ***FIBER OPTIC POWER BUDGET CALCULATION*** in Section 2 for more information about maximum fiber optic cable lengths and allowable number of connections.
- Terminal block TB1 connects a station link between redundant NTRL02 termination units together. Terminal block TB2 is not used.

The NTRL03 termination unit is a single printed circuit board that attaches to a NFTP01 Field Termination Panel located inside the INFI 90 cabinet. The NTRL03 termination unit has three socket connectors (P1, P2, and P3), two coaxial cable connectors (J1 and J2), and two terminal blocks (TB1 and TB2).

- Connector P1 connects a cable from an IMRIO02 Remote I/O Slave Module that passes signals to the termination unit.
- Connector P2 provides a station link (with analog bypass capability) to a NTCS04 termination unit.
- Connector P3 provides a station link to single or multiple control stations (no analog bypass capability) and/or indicator stations.

- The J1 (IN) and J2 (OUT) connectors enable communication between a local (master) NTRL03 termination unit and one or more (a maximum of 16) remote (slave) NTRL03 termination units. The total communication link can have a maximum length of three kilometers (10,000 feet). The J1 connector couples input data from the cable to the termination unit. The J2 connector couples output data from the termination unit to the cable.

- Terminal block TB1 allows the wiring of the output communication signals (same output as connector J2).

- Terminal block TB2 allows the wiring of the input communication signals (same input as connector J1). TB2 is also used to connect station links between redundant NTRL03 termination units.

INSTRUCTION CONTENT

This manual contains five sections and four appendices:

Introduction — Contains an overview of the features, specifications and a description of the TRL termination units.

Installation — Describes precautions to observe when handling units and setup procedures required before unit operation. This section discusses jumper settings and installation procedures.

Maintenance — Provides a maintenance schedule.

Repair/Replacement Procedures — Details how to replace a TRL termination unit.

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

Appendices A through D — Provides quick reference information necessary for configuring stations and associated 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 a TRL termination unit. Refer to the table of contents or index to find specific information after the termination 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
Analog	Continuously variable as opposed to discretely variable.
Bus	A channel or path for transferring data, electrical signals and power.
CIS	Control I/O slave module.
DCS	Digital control station. A panel mounted operator device that provides monitoring and allows manipulation of a single process control loop.
DIS	Digital indicator station. A panel mounted device that monitors and displays digital values.
Fiber Optic Cable	A data transmission cable made up of one or more tiny fibers of glass or plastic that transmit data, in the form of light pulses, at the speed of light.
FTP	Field termination panel. A panel inside the INFI 90 cabinet on which to mount termination units.
MFC	Multi-function controller module. A multiple loop controller with data acquisition and information processing capabilities.
MFP	Multi-function processor module. A multiple loop controller with data acquisition and information processing capabilities.
MMU	Module mounting unit. A card cage that provides electrical and communication support for INFI 90/Network 90® modules.
QRS	Quick response slave module.
RMP	Remote master processor.
RSP	Remote slave processor.
SAC	Analog control station.
Termination Unit	Provides input/output connection between plant equipment and INFI 90/ Network 90 modules.

NOMENCLATURE

Table 1-2 is a list of related hardware.

Table 1-2. Nomenclature

Nomenclature	Description
IISAC01	Analog control station
IMCIS02	Control I/O slave module
IMQRS02	Quick response slave module
IMRIO02	Remote I/O slave module
NDCS03	Digital control station
NDIS01	Digital indicator station
NFTP01	Field termination panel
NKCL01	INFI-NET® coaxial cable (PVC)

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

Table 1-2. Nomenclature (continued)

Nomenclature	Description
NKCL11	INFI-NET coaxial cable (non-PVC)
NKCS01	Station cable (PVC)
NKCS02	Station cable with series connector (PVC)
NKCS11	Station cable (non-PVC)
NKCS12	Station cable with series connector (non-PVC)
NKDS01	Station cable (PVC)
NKDS02	Station cable with series connector (PVC)
NKDS03	Station cable with series connector (PVC)
NKDS11	Station cable (non-PVC)
NKDS12	Station cable with series connector (non-PVC)
NKDS13	Station cable with series connector (non-PVC)
NKLM01	Loop interface cable (PVC)
NKLM11	Loop interface cable (non-PVC)
NKPL01	Plant loop twinaxial cable (PVC)
NKPL11	Plant loop twinaxial cable (non-PVC)
NKSE01	Serial extension cable (PVC)
NKSE11	Serial extension cable (non-PVC)
NKTL01	INFI-NET coaxial termination cable
NTCS04	Controller/station termination unit
NTRL02	Fiber optic remote link termination unit
NTRL03	Electrical remote link termination unit

REFERENCE DOCUMENTS

Table 1-3 lists the documents referenced in this instruction.

Table 1-3. Reference Documents

Number	Document
I-E93-902-1	NDCS03 Digital Control Station
I-E96-116	NDIS01 Digital Indicator Station
I-E96-117	IISAC01 Analog Control Station

Table 1-3. Reference Documents

Number	Document
I-E96-306	IMCIS02 Control I/O Slave Module
I-E96-316	IMQRS02 Quick Response Slave Module
I-E96-317	IMRIO02 Remote I/O Slave Module
I-E96-442	NTCS04 Controller/Station Termination Unit

SPECIFICATIONS

Refer to Table 1-4 for a list of the specifications of the NTRL02 and NTRL03 termination unit. Table 1-5 lists the specifications of the fiber optic cable required by the NTRL02 termination unit.

Table 1-4. NTRL02 and NTRL03 Termination Unit Specifications

Property	Characteristic/Value
Power Requirements NTRL02 NTRL03	 +24 VDC (170 mA maximum) from the 24 VDC bus +24 VDC (118 mA maximum) from the 24 VDC bus
Inputs	Communication link from another TRL termination unit Station serial communication link
Fiber Optic Receiver Signal Limits (NTRL02 only)	-30 dBm minimum -10 dBm maximum
Outputs	Communication link to another termination unit. (Minimum power output of the NTRL02 fiber optic transmitter is -15 dBm). Station serial communication link 24 VDC power to attached stations
Cable Insulation Specifications PVC (UL Rating CL2) Non-PVC (UL Rating PLTC)	 80°C (176°F) at 300 V 90°C (194°F) at 300 V
Mounting	Occupies one space in a standard INFI 90 field termination panel.
Electromagnetic/Radio Frequency Interference	Values are not available at this time. Keep the cabinet doors closed. Do not use communication equipment any closer than 2 m from the cabinet.
Ambient Temperature	0° to 70°C (32° to 158°F)
Relative Humidity	0% to 95% up to 55°C (131°F) (noncondensing) 0% to 45% up to 70°C (158°F) (noncondensing)

Table 1-4. NTRL02 and NTRL03 Termination Unit Specifications (continued)

Property	Characteristic/Value
Air Quality	Noncorrosive
Certification	CSA certified for use as process control equipment in an ordinary (nonhazardous) location.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Table 1-5. Fiber Optic Cable Specifications[1]

Property	Characteristic/Value
Fiber size	62.5/125 µm
Fiber attenuation	-3.3 dB/km (maximum)
Index	Graded
Wavelength	850 nm
Bandwidth	100 MHz/km
Connector type	Amphenol® 905 and 906 SMArt Series
Maximum supported link distance	3 km (10,000 ft)
Transmission mode	Multimode

NOTE:
1. Follow the cable manufacturers instructions for installation, testing, and maintenance of the fiber optic cable.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

® Amphenol is a registered trademark of Amphenol Corporation.