

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected OEM Reference

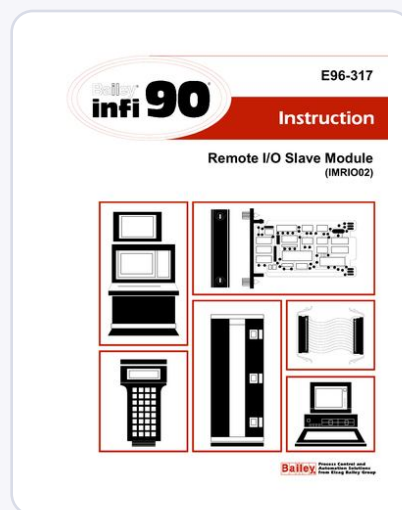
Procurement, maintenance and technical review package

PRODUCT BRAND

ABB Bailey

PRODUCT MODEL

IMRIO02



SOURCE DOCUMENT

Bailey Remote I/O Slave Module (IMRIO02)

Instruction E96-317 / Manual I-E96-317A

Selected source pages: 1, 10, 11, 12, 15, 20, 21, 25, 27, 29, 30

DOCUMENT SCOPE

Selected model-specific pages are reproduced from the archived Bailey manual.

Use current controlled ABB documentation and approved site procedures for service work.

[OPEN ARCHIVED SOURCE](#)

[PRODUCT PAGE](#)

[AMIKONG.COM](#)

Amikon Product Support

+86-18020776786

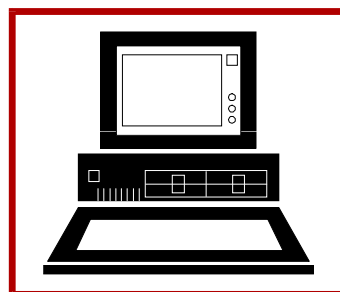
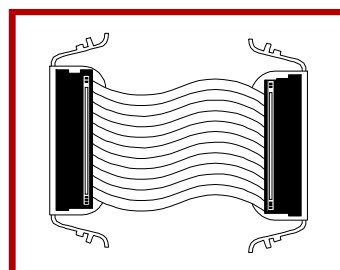
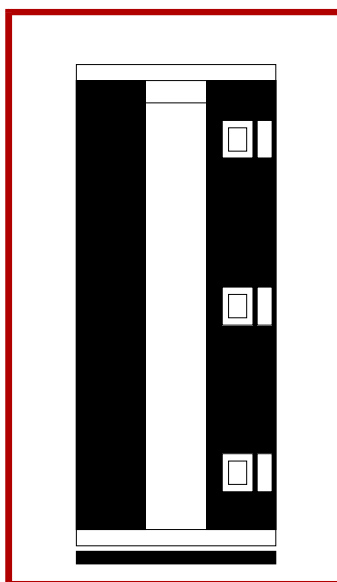
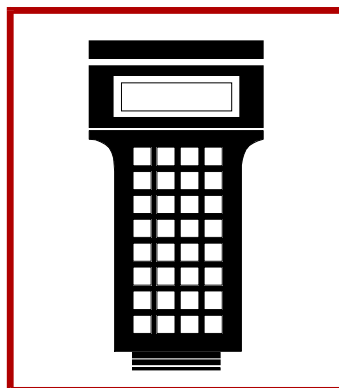
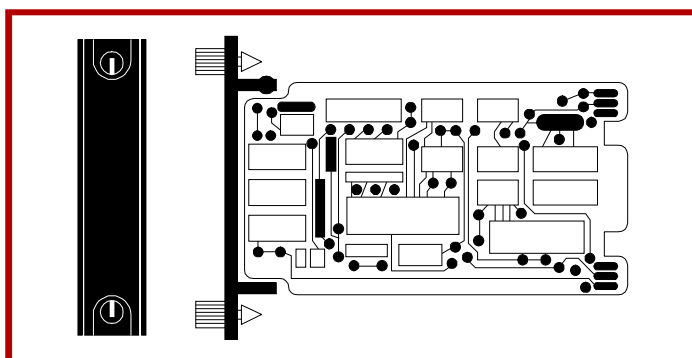
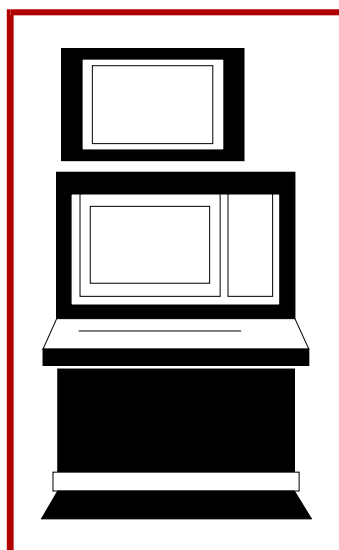
INFO@AMIKON.CN



E96-317

Instruction

Remote I/O Slave Module (IMRIO02)



Bailey Process Control and
Automation Solutions
from Elsag Bailey Group

SECTION 1 - INTRODUCTION

OVERVIEW

The Remote I/O Module (IMRIO02) operates with the Bailey Multi-Function Processor (IMMFP01/02/03) to provide powerful control capabilities on a plant wide scale. The Remote I/O module is designed for communication between an MFP and remotely located slave modules.

INTENDED USER

System engineers and technicians should carefully read and understand this manual before installing and placing the RIO Module into service. Once familiar with the operation of the RIO, the tables and illustrations in this manual provide a concise reference of information.

MODULE DESCRIPTION

The RIO occupies one slot in the Module Mounting Unit (MMU). Dipswitches on the RIO configure user options and module addresses. LEDs on the front panel provide operating status. Two captive screws on the module faceplate secure it to the MMU. The user connects the communication cabling to the termination unit/module which is connected to the RIO.

FEATURES

The Remote Input/Output Module (RIO02) provides communication between the Multi-Function Processor and remote slave modules at a rate of one Megabit per second. A RIO on each end of the link supports communication up to 10,000 feet (3,000 meters) to the farthest remote drop. The remote link can be coaxial, twinaxial or fiber optic cable. The RIO also has internal diagnostics which ensure module and communication link integrity. The RIO hardware provides the capability to add redundant modules and communication hardware.

MODULE APPLICATION

The Remote I/O Module (IMRIO02) provides the multi-function processors with remote process control capability. The RIO allows central control of slave modules up to 10,000 feet (3,000 meters) from the MFP (see Figures 1-1 and 1-2). Limitations on this maximum distance depend on the cable type of the system (refer to [Section 3](#)). The Remote I/O Module also supplies additional links between the MFP and Digital Indicator Stations.



INTRODUCTION

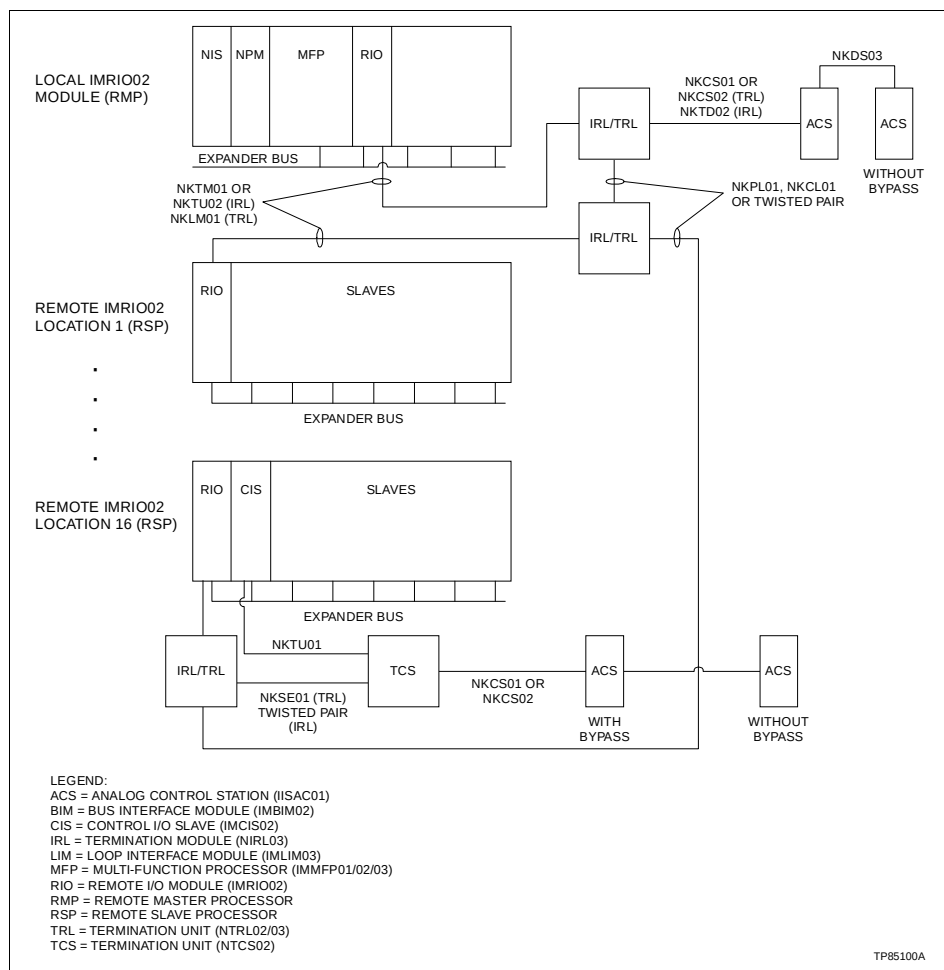


Figure 1-1. Communications Scheme for Remote I/O Modules

MODULE APPLICATION

1 - 2

I-E96-317A

INTRODUCTION

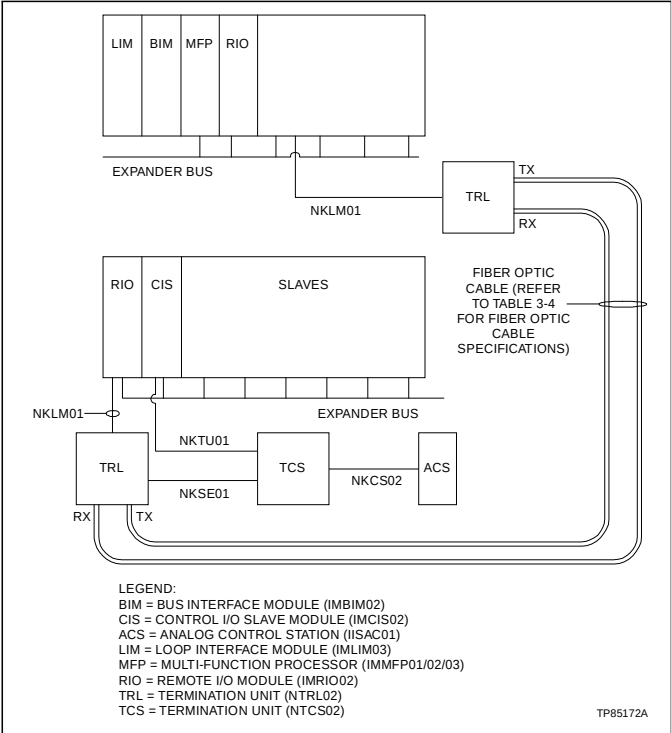


Figure 1-2. Remote I/O Modules Using Fiber Optic Cable

MODULE APPLICATION



INTRODUCTION

SPECIFICATIONS

Power Requirements	
Operating	+ 5 VDC, 1.45 amps typ., 1.80 amps max. + 15 VDC, 17.5 mA typ., 20 mA max. - 15 VDC, 80.0 mA typ., 90 mA max.
Consumption:	+ 5 VDC, 7.25 watts typ., 9.0 watts max. + 15 VDC, 0.26 watts typ., 0.30 watts max. - 15 VDC, 1.20 watts typ., 1.35 watts max.
Data Rates	
Serial Link:	1 Mbit/sec
Memory Capacity	
Static RAM	8 kbytes
Static RAM	8 kbytes (shared with MFP)
ROM	32 kbytes
Mounting	Uses one slot in Infi 90 Module Mounting Unit.
Environmental	
Ambient Temperature	0° to 70° C (32° to 158° F)
Relative Humidity	5% to 90% RH (± 5%) up to 55° C (131° F) non-condensing 5% to 40% (± 5%) at 70° C (158° F) non-condensing
Atmospheric Pressure	Sea level to 3 km (1.86 miles)
Air Quality	Noncorrosive
Certification	CSA certified for ordinary (nonhazardous) locations.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SPECIFICATIONS

1 - 6

I-E96-317A

SECTION 3 - INSTALLATION

INTRODUCTION

This section provides information on handling, packing, setup and installation of the modules. Tables are also included that list address dipswitch settings and jumper settings.

SPECIAL HANDLING

NOTE: Always use Bailey's Field Static Kit (P/N 1948385A2 - consists of wrist strap, ground cord assembly, alligator clip) when working with modules. The kit is designed to connect a technician and the static dissipative work surface to the same ground point to prevent damage to the modules by electrostatic discharge.

The IMRIO02 uses Electrostatic Sensitive (ESD) devices. Follow these handling procedures:

1. Keep the module in the special antistatic bag until you are ready to install it in the system. Save the bag for future use.
2. Ground the antistatic bag before opening.
3. Verify that all devices connected to the module are properly grounded before using them.
4. Avoid touching the circuitry when handling the modules.

NOTE: Grounding straps (field static kits) must be used when installing or removing modules to configure or change switch settings.

UNPACKING AND INSPECTION

1. Examine the module immediately to verify that no damage has occurred in transit.
2. Notify the nearest Bailey Controls Sales/Service Office of any damage.
3. File a claim for any damage with the transportation company that handled the shipment.
4. Use the original packing material and/or container to store the module.
5. Store the module in an environment of good air quality, and free from temperature and moisture extremes.



INSTALLATION

SETUP AND INSTALLATION

Prior to inserting the modules into the Module Mounting Unit (MMU), there are four dipswitches that must be set (see Figure 3-1 for switch locations). Switch S1 has two functions depending on the use of the RIO.

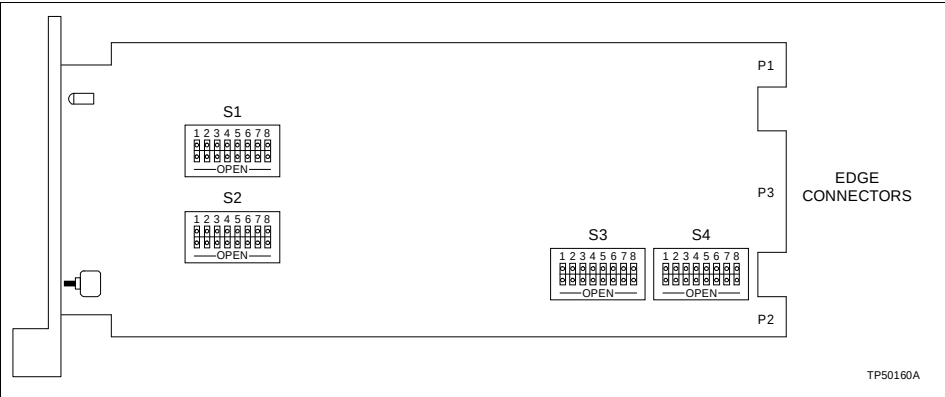


Figure 3-1. IMRIO02 Switch and Connector Locations

S1 Mode Options

LOCAL MODE RMP (Remote Master Processor).

In local mode, S1 sets the slave address on the Expander Bus. Valid addresses range between 0 and 63 (refer to Table 3-1). The slave address must be unique for redundant RIOs on the MFP Expander Bus.

REMOTE MODE RSP (Remote Slave Processor).

In remote mode, S1 sets the node address. Valid addresses range between 0 and 63 (refer to Table 3-1). The node address must be identical for redundant RIOs in the same remote node. The maximum number of slaves on the Expander Bus is 64 and the maximum number of drops on the serial link is 16.

Address Switch Settings

Table 3-1 gives the switch settings that select module or node addresses. The maximum expander bus and node address permitted is 63. A switch position of 1 represents an open switch; a switch position of 0 represents a closed switch.

SECTION 4 - OPERATING PROCEDURES

INTRODUCTION

This section provides information for day-to-day operation of the RIO Module. Observe the front panel LED indicator to verify that the module is operating properly.

INITIALIZATION/START-UP PROCEDURES

RIO Module start-up is fully automatic. The following operations are performed before the RIO comes on line:

1. The MFP downloads the configuration into the shared memory of the RIO.
2. The green LED blinks during configuration and turns solid green when the configuration is complete.

If the module fails to operate properly, refer to Table 5-1 in Section 5 for corrective action.

Status LED

The front panel has a red/green LED that indicates the states shown in Table 4-1 (see Figure 4-1).

Table 4-1. Status LED Display

LED Status	Comments
Off	No power or no communication with MFP.
Blinking Green	Any error or non-executing state except as above.
Solid Green	Normal execute mode.
Solid Red	Machine Fault Timer has timed out.

Redundancy LED

The front panel also has a red LED which, when lit, indicates the active module of a redundant pair (see Figure 4-1).

SECTION 5 - TROUBLESHOOTING

INTRODUCTION

While RIO modules are dependable, error situations can occur. Table 5-1 provides a troubleshooting guide with step-by-step procedures to follow should an error situation arise. Tables 5-2, 5-3, and 5-4 list the pin connections for P1, P2, and P3.

ERROR INDICATIONS

Table 5-1 shows the condition status LED can have and what action to take.

Table 5-1. Troubleshooting the RIO

Problem	Suggested Action
Status LED remains off after start-up.	Local RIO: 1. Check the MFP configuration to verify the RIO address assignment. 2. Check the RIO address switch. It must match the address configured in the MFP. 3. Check the status of other slaves n the local Expander Bus. If their status is okay, then a probable defect exists in the RIO, or its connection to the local Expander Bus. 4. Check S2 dipswitch to ensure it is set for local operation. Remote RIO: 1. Check the local RIO to verify it is operating. 2. Check the local RIO to verify the RIO address assignment. 3. Check the RIO address switch. It must match the address configured in the MFP. 4. Check S2 dipswitch to ensure it is set for remote operation. 5. Check cable connections between local and remote node.
Status LED remains red after start-up.	1. Replace the RIO.

Table 5-2. RIO P1 Pin Connections

Pin No.	Signal	Pin No.	Signal
1	+ 5 VDC	7	+ 15 VDC
2	+ 5 VDC	8	- 15 VDC
3	N/C	9	PFI
4	N/C	10	PFI
5	Ground	11	Module Bus
6	Ground	12	Module Bus

N/C = Not Connected
PFI = Power Fail Interrupt

SECTION 6 - MAINTENANCE

INTRODUCTION

The Remote Input/Output module requires limited maintenance. This section contains a maintenance schedule.

MAINTENANCE SCHEDULE

Perform the tasks in Table 6-1 at the specified intervals.

Table 6-1. Maintenance Schedule

Task	Interval
Clean and tighten all power and ground connection.	Every 6 months or during plant shutdown, whichever occurs first.
Use a static safe vacuum cleaner to remove dust from: Modules Module Mounting Unit Fan Assembly Power Entry Panel	Every 6 months or during plant shutdown, whichever occurs first.

SECTION 7 - REPAIR/REPLACEMENT PROCEDURES

INTRODUCTION

This section explains the replacement procedures for the RIO module. There are no special tools required to replace the module.

MODULE REPAIR/REPLACEMENT

If you determine that the module is faulty, replace the faulty module with a new one. **DO NOT** try to repair the module; replacing components may affect the module performance. You can remove the module while system power is supplied. To remove and replace a module:

WARNING

The RIO module **MUST** be stopped before removal. The output status of slaves may incorrectly change if an active RIO is removed before being properly stopped.

AVERTISSEMENT

Le module RIO doit être placé en mode arrêt avant d'être retiré du châssis. L'état des sorties des modules asservis pourrait changer de façon erronée si un module RIO actif est retiré avant d'être placé en mode arrêt.

1. Push and turn the two front panel captive retaining screws one half turn to unlatch the module. It is unlatched when the slots on the screws are vertical and the open end of the slots face away from the module.
2. Gently slide the module out of the MMU. One of the following situations occurs when the RIO is removed from the MMU:
 - a. When the RIO is located on the local expander bus, all remote modules go to a default setting.

OR

 - b. When the RIO is located on a remote expander bus, the remote node is marked off-line. All associated remote slave modules go to the default setting.
3. Configure the replacement module switch and jumper settings. Ensure they are set the same as the original module.
4. In the same slot assignment as the original module, align the replacement module with the guide rails in the MMU; gently slide it in until the front panel is flush with the top and bottom of the MMU frame.