PACSystems™ RSTi-EP

PROFINET® SCANNER

(EPXPNS001)

PWR, SF, BF, MT, LINK 1, ACT 1, LINK 2, and ACT 2 LEDs

Ethernet Ports

Power Supply LED

EMERSON

Door for Micro USB Port

EMERSON.
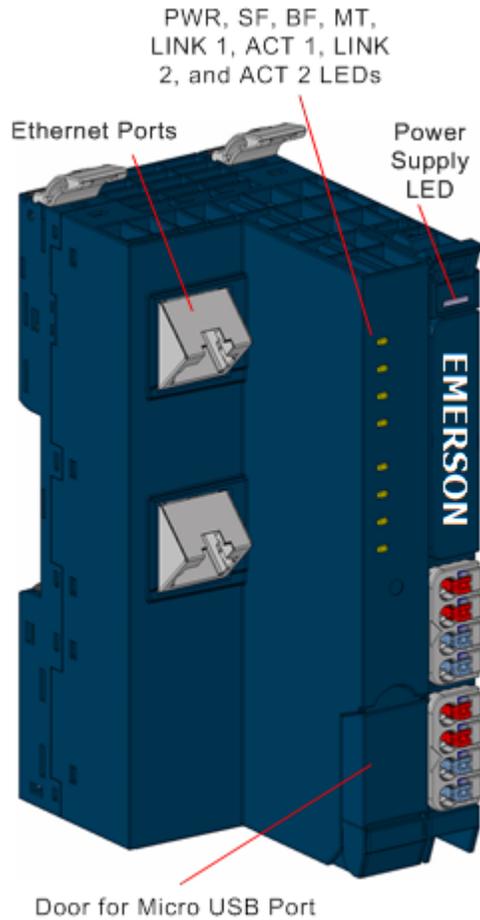
Warnings and Caution Notes as Used in this Publication

⚠ WARNING

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

⚠ CAUTION

Caution notices are used where equipment might be damaged if care is not taken.

Note: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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Product Description

The EPXPNS001 PROFINET Scanner is a PROFINET I/O device certified by the PROFINET user organization. The network adapter is the head module for the RSTi-EP system bus, to which up to 64 active RSTi-EP modules can be connected. The PROFINET network adapter has two Ethernet ports and an integrated switch.

The PROFINET Scanner can be accessed with a system-independent web server application via the USB service interface or the Ethernet. Thus, all information, such as diagnostics, status values, and parameters, can be read and all connected modules can be simulated or forced.

The station's main power supply is integrated with the PROFINET Scanner. Power is supplied via two 4-pole connectors, separated into the input and output current paths.

Caution, the RSTi-EP station is usually installed on a horizontally positioned DIN rail. Installation on vertically positioned DIN rails is also possible. However, the heat dissipation is reduced such that the derating values change (refer to the section, Thermal Derating).

Modules should be allowed to de-energize for a minimum of 10 seconds after powering down, before starting any maintenance activity. The PROFINET Scanner cannot be hot-swapped.

Refer to the RSTi-EP Slice I/O User Manual (GFK-2958) for additional information.

Refer to the RSTi-EP Power Supply Reference Guide, a software utility available on PAC Machine Edition(PME) V9.00, for detailed power-feed requirements.

Module Features

- Supports up to 64 active RSTi-EP modules
- *Spring-style* technology for ease of wiring
- DIN rail mounted
- Double-click installation for positive indication of correct installation
- Built-in Web Server for diagnostic information and firmware update through Ethernet and micro USB port
- Supports Media Redundancy Protocol (MRP) Client mode operation
- Support for daisy-chain/line, star, or ring (MRP) technologies
- Two switched Ethernet ports; 8-conductor RJ-45 shielded twisted pair 10/100 Mbps copper interfaces
- Fast start-up < 500 ms with a maximum of 10 modules

Ordering Information

Module	Description
EPXPNS001	RSTi-EP Slice I/O PROFINET IRT Network Adapter

Specifications

Specifications	EPXPNS001	
System data		
Connection	2 x RJ-45	
Fieldbus protocol	PROFINET Version 2.3 Class C I/O Device (IRT, RT)	
Process image	Input data width	max. 512 bytes
	Output data width	max. 512 bytes
	Parameter data	max. 4362 bytes
	Diagnostic data	max. 1408 bytes
Number of modules	max. 64 active	
Configuration interface	Micro USB 2.0	
Transfer rate	Fieldbus	Max. 100 Mbps
	RSTi-EP system bus	Max. 48 Mbps
Data format	Default: Motorola	Configurable: Intel
PROFINET I/O Update Rate	Configurable selections: 1ms, 2ms, 4ms, 8ms, 16ms, 32ms, 64ms, 128ms, 256ms, and 512ms	
Supports MRP	Yes * [Minimum I/O Update Rate for bumpless operation in an MRP ring topology is 32ms and slower for EPXPNS001]	
Supply		
Supply voltage for system and inputs	20.4V – 28.8V	
Supply voltage for outputs	20.4V – 28.8V	
Max. feed-in current for input modules	10 A	
Max. feed-in current for output modules	10 A	
Current consumption from system current path I_{SYS}	116 mA	
Connection data		
Type of connection	*Spring style*	
Conductor cross-section	Single-wired, fine-wired	0.14 – 1.5 mm^2 (AWG 26 – 16)
General data		
Operating temperature	-20°C to +60°C (-4 °F to +140 °F)	
Storage temperature	-40°C to +85°C (-40 °F to +185 °F)	
Air humidity (operation/transport)	5% to 95%, noncondensing as per DIN EN 61131-2	
Width	52 mm (2.05 in)	
Depth	76 mm (2.99 in)	
Height	120 mm (4.72 in)	
Weight	220 g (7.76 oz)	
Configuration	V2.3 GSDML file is available on the Support website https://www.emerson.com/Industrial-Automation-Controls/support for download and import into PAC Machine Edition. The GSDML supporting a firmware release is part of the firmware upgrade kit available on the Support website.	

LEDs

LED Status Indicators

LED	Indication	LED State/Description
PWR	Power LED	**Green:** Supply voltage connected
SF	System fault	**Red:** Configuration error, or error in the PROFINET Scanner, or error in a module, or there is a new diagnostic report **Red flashing:** Station in Force mode
BF	Bus fault	**Red:** No connection to the Fieldbus **Red flashing:** Configuration error, no connection to the control unit, or error in the parameter set
MT	Maintenance Required	**Yellow:** Error on the system bus or Fieldbus
LINK 1	Connection	**Green:** Connection established between port 1 of the PROFINET Scanner and another field device
ACT 1	Active	**Yellow flashing**: Data being exchanged on port 1
LINK 2	Connection	**Green:** Connection established between port 2 of the PROFINET Scanner and another field device
ACT 2	Active	**Yellow flashing**: Data being exchanged on port 2

LED Indicators

| LED	EPXPNS101
Power Supply	**Green:** Supply voltage > 18 V DC **Red:** At least one current path < 18 V

3.1	**Green:** Input current path supply voltage > 18 V DC
3.2	**Red:** Input current path supply voltage < 18 V DC
3.3	
3.4	**Red:** Internal fuse defective
4.1	**Green:** Output current path supply voltage > 18 V DC
4.2	**Red:** Output current path supply voltage < 18 V DC
4.3	
4.4	**Red:** Internal fuse defective

Field Wiring

The connection frame has one connector, and two 24 V DC wires can be connected to each connector, along with two ground connections. Those four connectors are used as shown in the following figure. The Spring style technology allows either finely stranded or solid wire with crimped wire-end ferrules or ultrasonically welded wires, each with a maximum cross-section of 1.5 mm² (16 gauge), to be inserted easily through the opening in the clamping terminal without having to use tools. To insert fine stranded wires without wire-end ferrules, the pusher must be pressed in with a screwdriver and released to latch the wire.

Figure 1: Connector Block
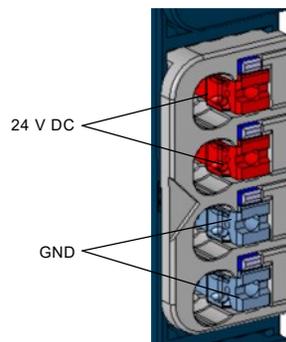
Connector Specifications:

- Conductor cross-section 0.14 to 1.5 mm² (26 – 16 guage)
- Maximum ampacity: 10 A
- 4-pole

The modules do not have a fused sensor/activator power supply. All cables to the connected sensors/actuators must be fused corresponding to their conductor cross-sections (as per Standard DIN EN 60204-1, section 12).

Refer to the RSTi-EP Slice I/O User Manual (GFK-2958) for additional information.
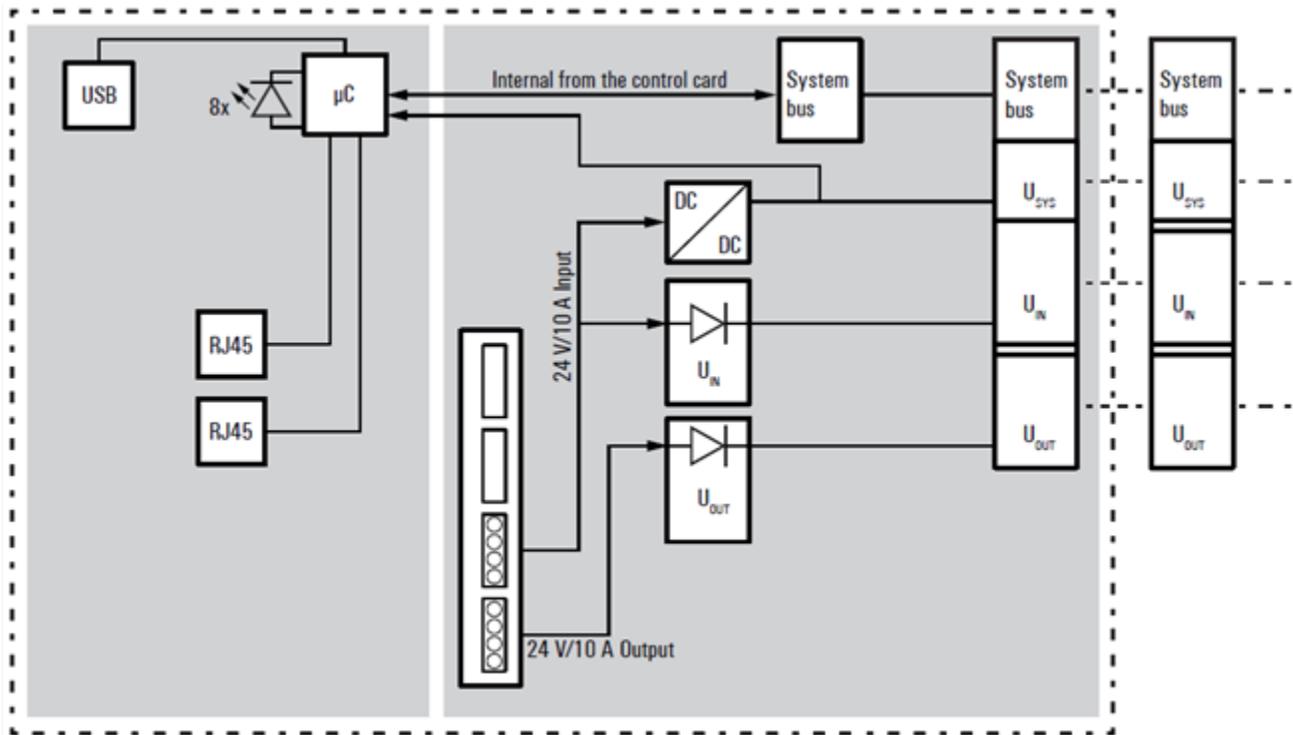
For technical assistance, go to https://www.emerson.com/Industrial-Automation-Controls/support

Connection Diagrams

Figure 2: EPXPNS001
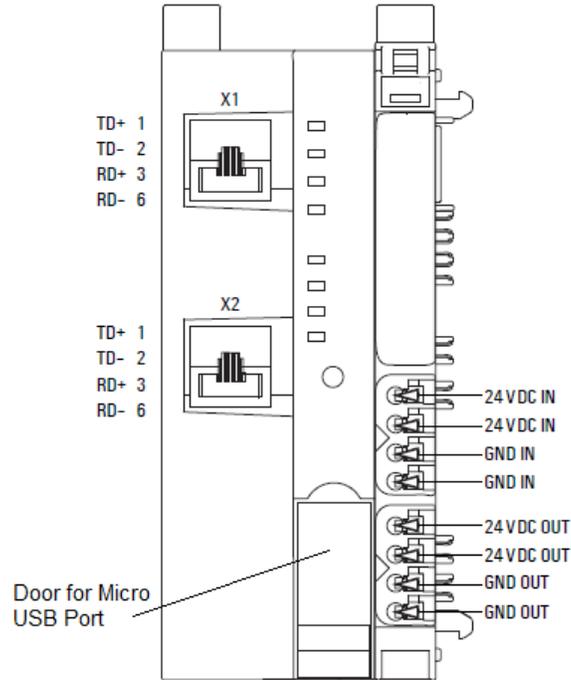
Connection Block Diagrams

Figure 3: EPXPNS001

Installation in Hazardous Areas

⚠ **WARNING**

- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C & D, DIV. 2 HAZARDOUS AREAS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS AREAS ONLY

- EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;

- EXPLOSION HAZARD – WHEN IN HAZARDOUS AREAS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND

- EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.

ATEX Marking

⟨Ex⟩ II 3 G Ex Na IIC T4 Gc

Ta: -20°C to +60°C (-4° F to +140 °F)

Thermal Derating

The power supply is restricted according to the temperature. The following values apply for the horizontal and vertical positioning of the RSTi-EP station:

Temperature-dependent Values for the Power Supply

Power Supply	Horizontal	Vertical
Network adapter power supply	60°C (140 °F) : 2 x 8 A 55°C (131 °F) : 2 x 10 A	55°C (131 °F) : 2 x 6 A 50°C (122 °F) : 2 x 8 A
Power-feed module power supply	60°C (140 °F) : 1 x 10 A	55°C (131 °F) : 1 x 8 A

Refer to the RSTi-EP Slice I/O Module User Manual (GFK-2958) for additional information.

Supported Modules and Power Supplies

The following modules can be used with this release of the RSTi-EP PROFINET Network Adapter :

Catalog Number	Module Description
Digital Input Modules	
EP-1214	Digital Input, 4 Points, Positive Logic 24VDC, 2,3, or 4 Wire
EP-1218	Digital Input, 8 Points, Positive Logic, 24VDC 2 Wire
EP-1318	Digital Input, 8 Points, Positive Logic, 24VDC 3 Wire
EP-125F	Digital Input, 16 Points, Positive Logic, 24VDC, 1 Wire
EP-153F	Digital Input, 16 Points, Negative Logic, 24VDC, 1 Wire
EP-12F4	Digital Input, 4 Points, Positive Logic 24VDC, 2,3, or 4 Wire, Timestamp
EP-1804	Digital Input, 4 Points 110/230 VAC (65 – 277 VAC), 2 Wire, Isolated
Digital Output Modules	
EP-2214	Digital Output, 4 Points, Positive Logic 24VDC, 0.5A, 2,3, or 4 Wire
EP-2614	Digital Output, 4 Points, Positive Logic 24VDC, 2.0A, 2,3, or 4 Wire
EP-2634	Digital Output, 4 Points, Positive/Negative Logic 24VDC, 2.0A, 2,3, or 4 Wire
EP-2218	Digital Output, 8 Points, Positive Logic, 24VDC, 0.5A, 2 Wire
EP-225F	Digital Output, 16 Points, Positive Logic, 24VDC, 0.5A, 1 Wire
EP-291F	Digital Output, 16 Points, Negative Logic, 24VDC, 0.5A, 1 Wire
Digital Relay Output Modules	
EP-2714	Digital Relay Output, 4 Points, Positive Logic, 24 - 220 VDC/VAC, 6A, 2 Wire
EP-2814	Solid-state Relay Output Module
Analog Input Modules	
EP-3164	Analog Input, 4 Channels Voltage/Current 16 Bits 2, 3, or 4 Wire
EP-3264	Analog Input, 4 Channels Voltage/Current 16 Bits with Diagnostics 2, 3, or 4 Wire
EP-3124	Analog Input, 4 Channels Voltage/Current 12 Bits 2, 3, or 4 Wire
EP-3368	Analog Input, 8 Channels Current 16 Bits 2, 3, or 4 Wire
EP-3468	Analog Input, 8 Channels Current 16 Bits 2, 3, or 4 Wire, Channel Diagnostic
EP-3704	Analog Input, 4 Channels RTD 16 Bits with Diagnostics 2, 3, or 4 Wire

Catalog Number	Module Description
EP-3804	Analog Input, 4 Channels TC 16 Bits with Diagnostics 2, 3, or 4 Wire
EP-1813	Power Measurement Module, 8 Channels
Analog Output Modules	
EP-4164	Analog Output, 4 Channels Voltage/Current 16 Bits 2, 3, or 4 Wire
EP-4264	Analog Output, 4 Channels Voltage/Current 16 Bits with Diagnostics 2, 3, or 4 Wire
Speciality Modules	
EP-5111	1 Channel High Speed Counter, AB 100 kHz 1 DO 24VDC, 0.5A
EP-5112	2 Channel High Speed Counter, AB 100 kHz
EP-5212	2 Channel Frequency Measurement, 100 kHz
EP-5261	1 Channel Serial Communications, 232, 422, 485
EP-5311	1 Channel SSI Encoder, BCD or Gray-Code Format, 5/24 VDC
EP-5422	2 Channels PWM Output, Positive Logic, 24VDC, 2.0 A
EP-5442	2 Channels PWM Output, Positive Logic, 24VDC, 0.5 A
EP-5324	IO-Link Communication Module, 4 Channels
Power Feed Modules for Input Current Path	
EP-7631	Power Module, 1 Channel 24VDC Input Flow 10A
Power Feed Modules for Output Current Path	
EP-7641	Power Module, 1 Channel 24VDC Output Flow 10A
Safe Feed-input Modules	
EP-1901	1 Safe Feed-Input, 24 VDC
EP-1902	2 Safe Feed-Inputs, 24 VDC, Programmable Delay
EP-1922	2 Safe Feed-Inputs, 24 VDC
Potential Distribution Modules	
EP-711F	Power Module, 16 Channels 24VDC Potential Distribution +24 VDC from Input Current Path
EP-751F	Power Module, 16 Channels 24VDC Potential Distribution +24 VDC from Output Current Path
EP-700F	Power Module, 16 Channels 24VDC Potential Distribution Functional Earth
EP-710F	Power Module, 16 Channels 24VDC Potential Distribution +0VDC from Input Current Path
EP-750F	Power Module, 16 Channels 24VDC Potential Distribution +0VDC from Output Current Path

Release History

Catalog Number	Hardware Version	Firmware Version	Date	Comments
EPXPNS001-ADAJ	02.00.00	02.06.02	June 22	Firmware release 02.06.02
EPXPNS001-ADAH	02.00.00	02.05.03	Dec 21	- Release of Firmware modified with increased startup timeout to support IO-link devices having longer startup times
EPXPNS001-ADAH	02.00.00	02.05.01 FSBL: 01.08.00	Nov 20	- Release of FW file with integrated FSBL image for EPXPNS001. - Error fixes-"Valid module substitution" fault on EPXPNS001 - when the node is downloaded to the controller.
EPXPNS001-ADAG	02.00.00	02.04.02 FSBL: 01.08.00	Mar 20	EPXPNS001 is released with HW version 02.00.00 & with FW 02.04.02, the same as EPXPNS101.
EPXPNS001-ACAF	01.05.00	02.03.01	Dec 19	Support for two newly introduced IO modules EP-1813 (Power Measurement module) and EP-5324 (IO-Link Communication Module) with only IPI update.
EPXPNS001-ACAF	01.05.00	02.03.01	Dec 19	Firmware corrected for the display of appropriate Device Type for EPXPNS001 for "Explore Profinet" and "Profinet DCP" Tools in Machine Edition.
EPXPNS001-ACAE	01.05.00	02.03.00	Sep 19	- Following Emerson's acquisition of this product, changes have been made to apply appropriate branding and registration of the product with required certification agencies. No changes to the material, process, form, fit, or functionality. - Support for new Negative logic Digital Input module(EP-153F) & Digital Output Module (EP-291F) - Updates to webserver - Ordering data is removed from General information section of Emerson branded products. - Brand labeling of Web Application to EMERSON.
EPXPNS001-ABAD	01.05.00	02.02.00	Mar 18	The product revision is updated to be usable in marine/shipbuilding applications and pass marine certification tests. [DNV-GL & Lloyd's Register] Enhancements and updates to Web Application : - Reset button appears automatically when changes in parameter settings require a restart to take effect - Added display of slot numbers to list of compatible modules after selecting a firmware file in multi-update view. - Added password policy and weak password check - default username and password will remain the same. - New languages for Web Server available [Korean, French, Spanish, Portuguese and Italian] - Support for EP-3664 Issue Fixes : - Fixed issue that live module unplug/replug sometimes corrupts I/O mapping - Fixed issue that re-installation attempt of language files sometimes causes an error message
EPXPNS001-AAAC	01.04.00	02.01.00	Nov 17	Enhancements and updates to Web Application - Web Application: a. Added Tooltips for Coupler LEDs

Catalog Number	Hardware Version	Firmware Version	Date	Comments
				b. Improved arrangement of module parameters & general information c. Display of raw process data next to physical value d. Web application performance improved - "Disappearing" Diagnosis is not sent via Fieldbus when the module in front is pulled - New parameter to group the power supply error, filter return of submodule alarms - Filter diagnosis messages for bus error on hot plug
EPXPNS001-AAAB	01.04.00	01.00.04	Sep 16	- Support for three new modules, EP-1804, EP-5261, and EP-5311 - Resolves a problem, see section *Problems Resolved by this Release* for more information
EPXPNS001-AAAA	01.04.00	01.00.04	Dec 15	Documentation update only added known issues
EPXPNS001-AAAA	01.04.00	01.00.04	Nov 15	Initial Release

Important Product Information for this Release

Updates

EPXPNS001-ADAJ default factory image will be 02.06.02.

The product may be upgraded in the field using the Web firmware upgrade kit, which can be downloaded from https://www.emerson.com/Industrial-Automation-Controls/support.

Module	Firmware Version	Upgrade Kit & GSDML File
EPXPNS001-ADAJ	FW - 02.06.02	EPXPNS001-0007675-02_06_02-7.zip which includes the following files:- a. EPXPNSx01-0007675-02_06_02-7.bsc b. GSDML-V2.3-IntelligentPlatforms-EPXPNS001-20220211.xml c. IPI-GFK-2965M d. FW Upgrade Procedure

Functional Compatibility

HW Index [Ver]	FW Index [Ver]									
	AA [01.00.00]	AB [02.00.00]	AC [02.01.00]	AD [02.02.00]	AE [02.03.00]	AF [02.03.01]	AG [02.04.02]	AH [02.05.01]	AH [02.05.03]	AJ [02.06.02]
AA [01.04.00]	OK	OK	OK	OK	OK	OK	NO	NO	NO	NO
AB [01.05.00]	NO	NO	NO	OK	OK	OK	NO	NO	NO	NO
AC [01.05.00]	NO	NO	NO	OK	OK	OK	NO	NO	NO	NO
AD[02.00.00]	NO	NO	NO	NO	NO	NO	OK	OK	OK	OK

Problems Resolved by this Release

Maintenance release

New Features and Enhancements

None

Known Restrictions and Open Issues

Subject	Description
Channel diagnostics faults are reported during hot-swapping of the modules	During hot-swap of an I/O module, the network adapter may report additional channel diagnostics messages in addition to the expected *Loss of Module* or *Addition of Module* fault
Behavior during hot removal when similar modules are configured consecutively	Where similar modules are configured consecutively in the remote I/O node, a shift in input data occurs when one of the consecutive modules is removed from the node. For example, when there are 6 RTD modules EP-3704, configured consecutively in the node, slots 1 - 6, on hot-removal of the module from slot 4, data from modules 5 and 6 would be reflected on variables configured for slots 4 and 5, respectively, with *Loss of Module* reported for slot 6.

Operational Notes

Subject	Description
Output behavior during hot-swapping	During hot insertion or removal of IO modules, a transient Loss of Power up to 500 ms may occur on the network adapter and IO modules, during which all of the outputs may drop to zero. This system behavior should be verified against the application requirements before hot insertion or removal of the IO module is done.

Product Documentation

RSTi-EP Slice I/O Module User Manual (GFK-2958)

RSTi-EP Slice I/O Functional Safety Module User Manual (GFK-2956)

General Contact Information

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