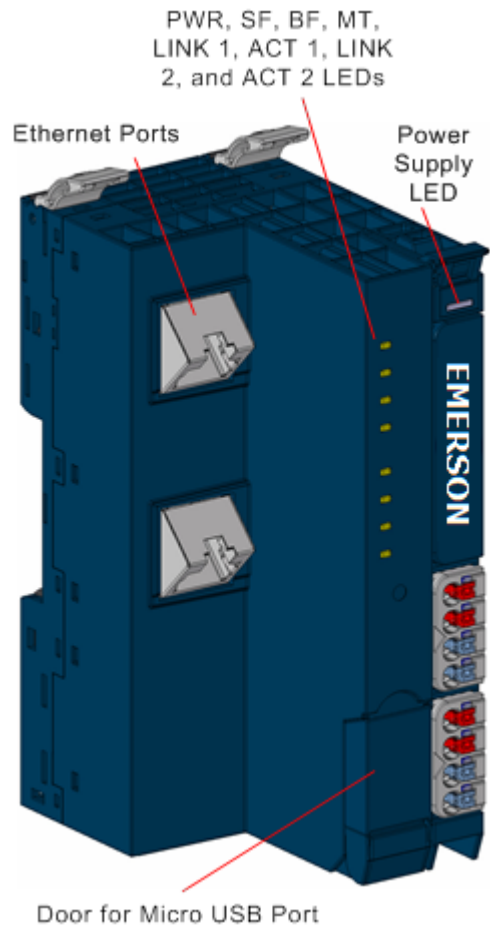


# PACSystems™ RSTi-EP

PROFINET® SCANNER

(EPXPNS101)





## 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.

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met during installation, operation, and maintenance. The information is supplied for informational purposes only, and Emerson makes no warranty as to the accuracy of the information included herein. Changes, modifications, and/or improvements to equipment and specifications are made periodically and these changes may or may not be reflected herein. It is understood that Emerson may make changes, modifications, or improvements to the equipment referenced herein or to the document itself at any time. This document is intended for trained personnel familiar with the Emerson products referenced herein.

Emerson may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not provide any license whatsoever to any of these patents.

Emerson provides the following document and the information included therein as-is and without warranty of any kind, expressed or implied, including but not limited to any implied statutory warranty of merchantability or fitness for particular purpose.



# Introduction

## Description

The EPXPNS101 PROFINET Scanner is a PROFINET I/O device supporting S-1 PROFINET Simplex and S-2 PROFINET System redundancy. 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 in 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 to be allowed to de-energize for a minimum 10 seconds after power down, prior to 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 PME V9.00, for detailed power-feed requirements.

## Module Features

- Supports up to 64 active RSTi-EP modules
- Supports PROFINET RT (only) for Redundancy and Non Redundancy mode
- Spring-style technology for ease of wiring
- DIN rail mounted
- Double-click installation for positive indication of correct installation
- Built-in Web Server (HTTP & HTTPS) for diagnostic information and firmware update through Ethernet and micro USB port
- Supports Type S2 System Redundancy operation
- 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
EPXPNS101	RSTi-EP Slice I/O PROFINET Network Adapter 2CU RJ45 PORTS

# Specifications

Specifications		EPXPNS101	
<b>System data</b>			
Connection	2 x RJ-45		
Fieldbus protocol	PROFINET Version 2.3 Class C I/O Device (RT Only)		
PROFINET System Redundancy Support	Redundantly controlled operation conforms to PROFINET V2.3 Type S-2 System Redundancy		
Application Relations Supported	1 Simplex AR or 1 SR-AR set made of 2 SR-ARs		
Number of Application Relations Supported	1 Simplex AR or 1 SR-AR set made of 2 SR-ARs		
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	
	RTSi-EP system bus	Max. 48 Mbps	
Data format	Default: Motorola	Configurable: Intel	
Status Bits	16 Input Status Bits		
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 16ms and slower for EPXPNS101]		
<b>Supply</b>			
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		
<b>Connection data</b>			
Type of connection	Spring style		
Conductor cross-section	Single-wired, fine-wired	0.14 – 1.5 mm <sup>2</sup> (AWG 26 – 16)	
<b>General data</b>			
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		

Specifications	EPXPNS101
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	V2.33 GSDML file is available on the Support website <a href="https://www.emerson.com/Industrial-Automation-Controls/support">https://www.emerson.com/Industrial-Automation-Controls/support</a> 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	Indication	LED State/Description
PWR	Power LED	<b>Green:</b> Supply voltage connected
SF	System fault	<b>Red:</b> Configuration error, or error in the PROFINET Scanner, or error in a module, or there is a new diagnostic report <b>Red flashing:</b> Station in Force mode
BF	Bus fault	<b>Red:</b> No connection to the fieldbus <b>Red flashing:</b> Configuration error, no connection to the control unit, or error in the parameter set
MT	Maintenance Required	<b>Yellow:</b> Error on the system bus or fieldbus
LINK 1	Connection	<b>Green:</b> Connection established between port 1 of the PROFINET Scanner and another field device
ACT 1	Active	<b>Yellow flashing:</b> Data being exchanged on port 1
LINK 2	Connection	<b>Green:</b> Connection established between port 2 of the PROFINET Scanner and another field device
ACT 2	Active	<b>Yellow flashing:</b> Data being exchanged on port 2

# LED Indicators



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

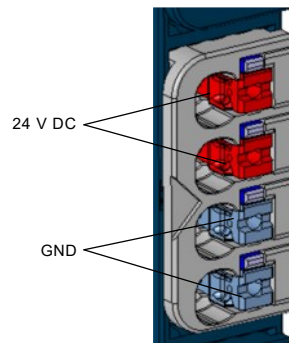
3.1	<b>Green:</b> Input current path supply voltage > 18 V DC
3.2	<b>Red:</b> Input current path supply voltage < 18 V DC
3.3	
3.4	<b>Red:</b> Internal fuse defective
4.1	<b>Green:</b> Output current path supply voltage > 18 V DC
4.2	<b>Red:</b> Output current path supply voltage < 18 V DC
4.3	
4.4	<b>Red:</b> 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 mm<sup>2</sup> (16 guage), 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 mm<sup>2</sup> (26 – 16 guage)
- Maximum ampacity: 10 A
- 4-pole

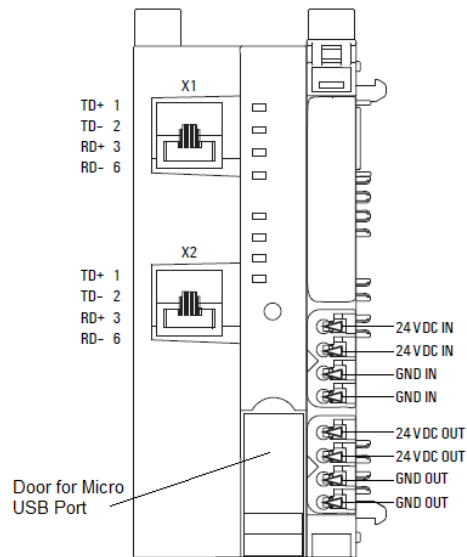
The modules do not have a fused sensor/activator power supply. All cables to the connected sensors/actuators must be fused corresponding to their conductor cross-sections (as per Standard DIN EN 60204-1, section 12).

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>.

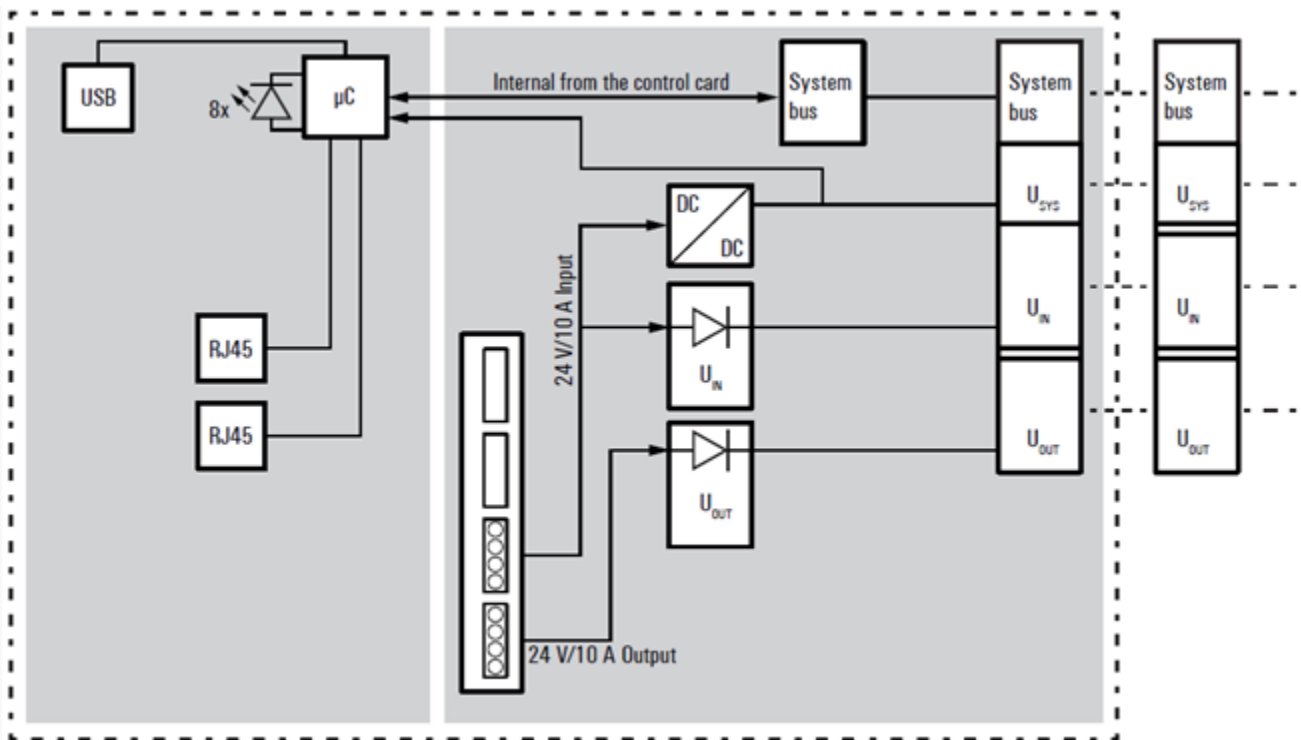
# Connection Diagrams

Figure 2: EPXPNS101



# Connection Block Diagrams

Figure 3: EPXPNS101



# Installations 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

⊕ 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 Adaptor :

Catalog Number	Module Description
<b>Digital Input Modules</b>	
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, Time stamp
EP-1804	Digital Input, 4 Points 110/230 VAC (65 – 277 VAC), 2 Wire, Isolated
<b>Digital Output Modules</b>	
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
<b>Digital Relay Output Modules</b>	
EP-2714	Digital Relay Output, 4 Points, Positive Logic, 24 - 220 VDC/VAC, 6A, 2 Wire
EP-2814	Solid-state Relay Output Module
<b>Analog Input Modules</b>	
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
EP-3804	Analog Input, 4 Channels TC 16 Bits with Diagnostics 2, 3, or 4 Wire
EP-3664	Analog Input, 4 Channels Voltage/Current 16 Bits with Diagnostics 2, 3, or 4 Wire, Differential Input

Catalog Number	Module Description
EP-1813	Power Measurement Module, 8 Channels
<b>Analog Output Modules</b>	
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
<b>Speciality Modules</b>	
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
<b>Power Feed Modules for Input Current Path</b>	
EP-7631	Power Module, 1 Channel 24VDC Input Flow 10A
<b>Power Feed Modules for Output Current Path</b>	
EP-7641	Power Module, 1 Channel 24VDC Output Flow 10A
<b>Safe Feed-input Modules</b>	
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
<b>Potential Distribution Modules</b>	
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	Firmware Version	Date	Comments
EPXPNS101-ABAD	02.06.02	June 22	- Release of firmware which includes a fix for RSTI EPXPNS101 intermittent instability when working with embedded PROFINET controller on CPE330
EPXPNS101-ABAC	02.05.03	Dec 21	- Release of Firmware modified with increased startup timeout to support IO-link devices having longer startup times
EPXPNS101-ABAC	FW - 02.05.01 FSBL- 01.08.00	Nov 2020	- Release of FW file with integrated FSBL image for EPXPNS101. - Error fixes-"Valid module substitution" fault on EPXPNS101 -when node is downloaded to the controller.
EPXPNS101-ABAB	FW - 02.04.02 FSBL- 01.08.00	Dec 2019	Support for two newly introduced IO modules EP-1813 (Power Measurement module) and EP-5324 ( IO-Link Communication Module) with only IPI update.
EPXPNS101-ABAB	FW - 02.04.02 FSBL- 01.08.00	Nov 2019	- 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 material, process, form, fit or functionality. - Support for new Negative logic modules (EP-153F-Digital Input Module, 16 channel, 1 wire & EP-291F-Digital Output Module, 16 channel, 1 wire. - Updates to webserver:- - Ordering data' is removed from General information Section of Emerson branded products. - Brand labeling of Web Application to EMERSON
EPXPNS101-AAAA	FW - 02.03.02 FSBL- 01.04.01	28 <sup>th</sup> Sep-2018	This revision enhances the minimum IO update rate specification for MRP bumpless operation to 16ms.  The units delivered prior to this release date are advised to use the webserver for upgrading to the latest firmware kit : EPXPNS101-0007675-02_03_02-0.ZIP which includes two files FW-02.03.02 and FSBL-01.04.01 . This upgrade is not necessary for MRP applications running at 128ms or slower.
EPXPNS101-AAAA	FW - 02.03.01 FSBL- 01.04.00	7 <sup>th</sup> Sep-2018	Initial Release. This revision (and later) is usable in Marine Application and pass the Marine certification tests. Refer GFK-2958 for certification details.

# Important Product Information for this Release

## Updates

EPXPNS101-ABAD default factory image will be 02.06.02

**Note :** 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
EPXPNS101-ABAD	FW - 02.06.02	EPXPNS101-0007675-02_06_02-7.zip which includes the following files:- a. EPXPNSx01-0007675-02_06_02-7.bsc b. GSDML-V2.33-IntelligentPlatforms-EPXPNS101-20220519.xml c. IPI-GFK-3052F d. FW Upgrade Procedure

## Functional Compatibility

HW / FSBL[Ver]	FW Index [Ver]				
	AA [02.03.02]	AB [02.04.02]	AC [02.05.01]	AC [02.05.03]	AD [02.06.02]
AA[01.04.01]	OK	OK	OK	OK	OK
AB[01.08.00]	OK	OK	OK	OK	OK
AB[01.11.00]	OK	OK	OK	OK	OK

## Problems Resolved by this Release

Subject	Description
Intermittent instability when working with embedded PROFINET controller on CPE330	In a profinet redundant system, when EPXPNS101 station is power cycled, the station does not respond and communication does not happen.  This issue is fixed in Latest version of FW-02.06.02

## New Features and Enhancements

None

## Known Restrictions and Open Issues

Subject	Description
SF LED stays ON after firmware is deployed on the profinet adapter only on the webserver interface.	When one or more counter modules are assembled with profinet coupler module and after a successful firmware download, it happens that SF LED on the profinet adapter stays ON and module status LED turns red on the EP-5111/5112 module. The error effects only the module status and has no impact on the functionality of the station. This occurs when the power supply of the coupler and the power supply of the input power feed module(EP-7631) are switched on one after the other.
Channel diagnostics faults are reported during hot-swap 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.
GSDML update forces EP-225F and EP-125F channel length of 32 instead of 16 for existing projects.	When EPXPNS101 nodes in existing PME Project, is updated with latest version of GSDML (02.04.01):- [using "change GSDML" option], it is observed that PME displays warning message indicating on issues with addressing of IO modules – EP-125F and EP-225F. The latest GSDML forces the Modules EP-225F and EP-125F to consume 32 bytes address space rather than the existing 16-byte space. <b>Workaround</b> The user needs to delete the IO modules (EP-225F and EP-125F), import the latest GSDML and reconfigure the removed modules.
RSTi-EP -Profinet adoptor EPXPNS001/101 when used with Profinet Manager SwitchIC095GLM064/082/104 MRP Ring status is not stable	When the EPXPNS001/101 are used in the profinet ring along with Profinet Manager SwitchIC095GLM064/082/104 specifically when RSTi-EP node is put between the GLM Switches MRP Ring status is not stable and Loss of PNIO's observed. This issue will be fixed in Latest FW version of Profinet Manager SwitchIC095GLM064/082/104 (Version > V00.00.06 )



## Operational Notes

Subject	Description
PNIO Alarms behavior when RSTi-EP PNS is used with RX3i PNC/CPE330/CPE400	The PNIO alarms for the IO-Device do not show up in the "I/O Fault Table" of PAC Machine Edition after PLC is started or Configuration is downloaded, even if the fault condition -like for e.g. open wire at channel etc. pre-exists. This is the behavior when RSTi-EP PNS is configured with RX3i PNC/CPE330/CPE400. However, once system is powered on, subsequent PNIO alarms from RSTi-EP PNS are logged in the "I/O Fault table" in PAC Machine Edition appropriately during runtime.
Output behavior during hotswap	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)

PACSystems RX3i & RSTi-EP PROFINET IO-Controller User Manual (GFK-2571)

PACSystems Hot Standby CPU Redundancy User Manual (GFK-2308)

# General Contact Information

Home link: <http://www.emerson.com/industrial-automation-controls>

Knowledge Base: <https://www.emerson.com/industrial-automation-controls/support>

## Technical Support

### Americas

Phone: 1-888-565-4155  
1-434-214-8532 (If toll-free option is unavailable)

Customer Care (Quotes/Orders>Returns): [customercare.mas@emerson.com](mailto:customercare.mas@emerson.com)  
Technical Support: [support.mas@emerson.com](mailto:support.mas@emerson.com)

### Europe

Phone: +800-4444-8001  
+420-225-379-328 (If toll-free option is unavailable)  
+39-0362-228-5555 (from Italy - if toll-free 800 option is unavailable or dialing from a mobile telephone)

Customer Care (Quotes/Orders>Returns): [customercare.emea.mas@emerson.com](mailto:customercare.emea.mas@emerson.com)  
Technical Support: [support.mas.emea@emerson.com](mailto:support.mas.emea@emerson.com)

### Asia

Phone: +86-400-842-8599  
+65-6955-9413 (All other Countries)

Customer Care (Quotes/Orders>Returns): [customercare.cn.mas@emerson.com](mailto:customercare.cn.mas@emerson.com)  
Technical Support: [support.mas.apac@emerson.com](mailto:support.mas.apac@emerson.com)

Any escalation request should be sent to: [mas.sfdcescalation@emerson.com](mailto:mas.sfdcescalation@emerson.com)

**Note:** If the product is purchased through an Authorized Channel Partner, please contact the seller directly for any support.

Emerson reserves the right to modify or improve the designs or specifications of the products mentioned in this manual at any time without notice. Emerson does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson product remains solely with the purchaser.

© 2022 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their respective owners.

