

PACSystems™ RSTi-EP

PROFINET® SCANNER

(EPXPNS101)



Warning 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.

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

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Product 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 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	
System data			
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]		
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	<i>Spring style</i>		
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	V2.33 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.		

LED's

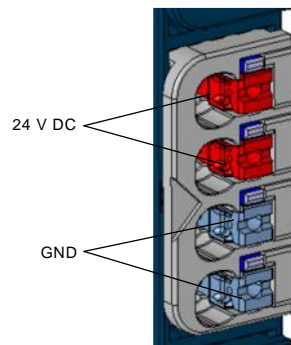
LED	Indication	LED State/Description
PWR	Power LED	Green: Supply voltage connected
SF	System fault	Red: Configuration error, or error in the PROFINET Scanner, or error in a module, or there is a new diagnostic report Red flashing: Station in Force mode
BF	Bus fault	Red: No connection to the fieldbus 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

 <p>The image shows the front panel of the Emerson EPXPNS101 module. It features two Ethernet ports labeled X 1 and X 2. To the right of these ports are several LED indicators: PWR (green), SF (red), BF (red), and MT (yellow). Below these are four more indicators: LINK1 (green), ACT1 (yellow), LINK2 (green), and ACT2 (yellow). At the bottom, there is a Service X 3 port. The module is labeled 'EMERSON' and 'EPXPNS101'. A MAC-Address of 00-15-7E-11-73-0D is printed on the panel.</p>	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.



Connector Block

Connector Specifications:

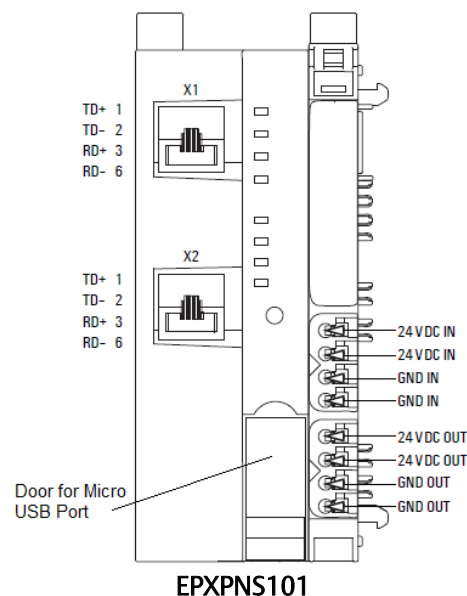
- Conductor cross-section 0.14 to 1.5 mm² (26 – 16 gauge)
- Maximum ampacity: 10 A
- 4-pole

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).

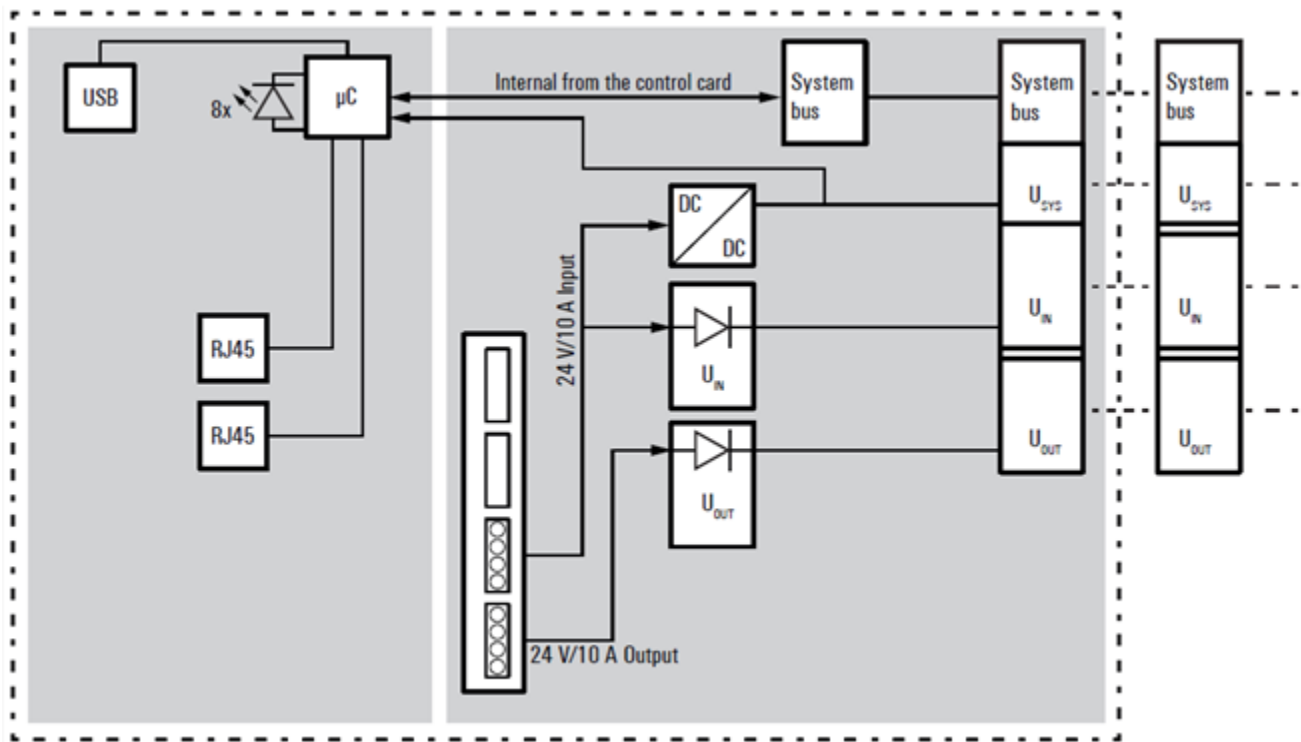
Refer to the RSTi-EP Slice I/O User Manual (GFK-2958) for additional information.

For technical assistance, go to <https://www.emerson.com/Industrial-Automation-Controls/support>.

Connection Diagrams



Connection Block Diagrams



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
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, Time stamp
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
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
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

Catalog Number	Module Description
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	Firmware Version	Date	Comments
EPXPNS101-ABAC	FW - 02.05.01 FSBL- 01.08.00	Nov 2020	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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:- <ul style="list-style-type: none"> - 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 th Sep-2018	<p>This revision enhances the minimum IO update rate specification for MRP bumpless operation to 16ms.</p> <p>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.</p>
EPXPNS101-AAAA	FW - 02.03.01 FSBL- 01.04.00	7 th 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-ABAC default factory image will be 02.05.01.

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-ABAC	FW - 02.05.01 FSBL- 01.08.00	EPXPNS101-0007675-02_05_01-9.zip which includes the following files:- a. EPXPNS101-0007675-02_05_01-9.bsc b. GSDML-V2.3-IntelligentPlatforms-EPXPNS101-20200820.zip c. IPI-GFK-3052D d. FW Upgrade Procedure The EPXPNS101-0007675-02_05_01-9.bsc files will automatically updates the Network Adapter FW - 02.05.01 & FSBL image - 01.08.00.

Functional Compatibility

FSBL[Ver]	FW Index [Ver]		
	AA [02.03.02]	AB [02.04.02]	AC [02.05.01]
AA [01.04.01]	OK	OK	OK
AB [01.08.00]	OK	OK	OK

Problems Resolved by this Release

Subject	Description
"Valid module substitution" fault on EPXPNS001	Valid Module Substitution fault shown in Fault table, when RSTi-EP node with FW 02.04 is downloaded to the controller. This issue is fixed in Latest version of FW -02.05.01

New Features and Enhancements

None

Known Restrictions and Open Issues

Subject	Description
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. Workaround 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 adaptor EPXPNS001/101 when used with Profinet Manager	When the EPXPNS001/101 are used in the profinet ring along with Profinet Manager SwitchIC095GLM064/082/104 specifically when RSTi-EP node is put

Subject	Description
SwitchIC095GLM064/082/104 MRP Ring status is not stable	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)

Technical Support & Contact Information:

Home link: <http://www.Emerson.com/Industrial-Automation-Controls>

Knowledge Base: <https://www.emerson.com/Industrial-Automation-Controls/support>

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