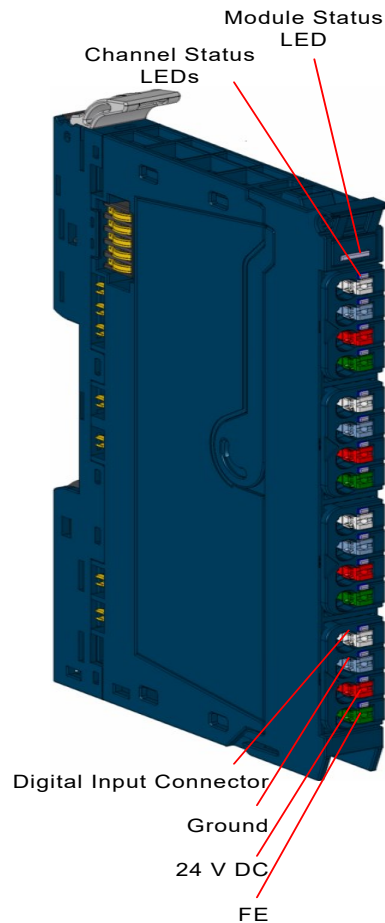


PACSystems™ RSTi-EP

RELAY OUTPUT MODULE - EP-2714

SOLID STATE RELAY OUTPUT MODULE - EP-2814

DIGITAL OUTPUT MODULES (EP-2214, EP-2614, EP-2634,
EP-2218 EP-225F & EP-291F)



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.

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Introduction

Emerson provides a range of RSTi-EP digital output modules with 4, 8 or 16 outputs, which are primarily used for the incorporation of decentralized actuators.

All outputs are designed for DC-13 discrete outputs according to DIN EN 60947-5-1 and IEC 61131-2 specifications. Frequencies of up to 1 kHz are possible except for relay and SSR output modules. Protection of the outputs ensures maximum system safety (Relay and SSR modules do not support short circuit protection). This consists of an automatic restart following a short-circuit.

The digital relay output module EP-2714 can control up to 4 discrete outputs, each with a maximum of 6 A. Each connector features a potential-free changeover contact. The relay coils are supplied with power from the output current path (I_{OUT}).

The solid-state relay output module EP-2814 uses four semiconductor switches to control up to 4 discrete outputs, each with a maximum of 1A at 255 V AC. The switching characteristics of the semiconductor switch have it as being closed when the voltage crosses zero and open when the current crosses zero. Each connector features a potential-free NO (Normally Open) contact.

The wiring connectors on each module are color coded for ease of wiring. Refer to the section “Field Wiring” for additional information..

Each module features a type plate, which includes identification information, the key technical specifications, and a block diagram. In addition, a QR code allows for direct online access to the associated documentation. The software for reading the QR code must support inverted QR codes.

Markers are available as accessories for labelling equipment. Each I/O module can be labelled using the markers to ensure clear identification when replacing individual modules or electronic units.

A green Module Status LED indicates there is communication on the system bus. Additionally, there are Yellow LEDs for each input to indicate when it is active. Refer to the section, LED's for additional information.

The RSTi-EP station is usually installed on a horizontally positioned DIN rail. Installation on vertically positioned DIN rails is also possible.

Modules should to be allowed to de-energize for a minimum 10 seconds after power down, prior to starting any maintenance activity.

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

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

Module Features

- Positive or Negative Logic
- EP-2634 also supports Negative Logic
- Spring style technology for ease of wiring
- DIN rail mounted
- Double-click installation for positive indication of correct installation
- Up to 16 outputs
- Compatible with type-1 and type-3 sensor inputs
- Supports hot insertion and extraction

Ordering Information

Module	Description
EP-2214	Digital Output, 4 Points, Positive Logic 24VDC, 0.5A, 2,3, or 4 Wire
EP-2218	Digital Output, 8 Points, Positive Logic, 24VDC, 0.5A, 2 Wire
EP-2614	Digital Output, 4 Points, Positive Logic 24VDC, 2.0A, 2,3, or 4 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
EP-2634	Digital Output, 4 Points, Positive/Negative Logic 24VDC, 2.0A, 2,3, or 4 Wire
EP-2714	Digital Relay Output, 4 Points, Positive Logic, 24 - 220 VDC/VAC, 6A, 2 Wire
EP-2814	Digital Output, 4 Points, Positive Logic, 230 VAC, 1A

Specifications

Specifications	EP-2214	EP-2614	EP-2634	EP-2218	EP-225F	EP-291F
System Data						
Data	Process, parameter and diagnostic data depend on the network adapter used.					
Interface	RSTi-EP system bus					
System bus transfer rate	48 Mbps					
Outputs						
Number	4	4	4	8	16	16
Type	P-Logic		Switchable P- or N-Logic	P-Logic		N-Logic
Type of load	ohmic, inductive, lamp load					
Response time	low » high max. 100 µs; high » low max. 250 µs					
Max. output current						
per channel	0.5 A	2 A	2 A	0.5 A	0.5 A	0.5 A
per module	2 A	8 A	8 A	4 A	8 A	8 A
Breaking energy (inductive)	150 mJ per channel					
Switching frequency						
Resistive load (min. 47 Ω)	1 kHz					
Inductive load (DC 13)	0.2 Hz without free-wheeling diode 1 kHz with suitable free-wheeling diode					
Lamp load (12 W)	1 kHz					
Actuator connection	2-wire, 3-wire, 3-wire + FE			2-wire	1-wire	1-wire
Actuator supply	max. 2 A per plug, total max. 8 A			--	--	--
Short-circuit-proof	Yes					
Protective circuit	Constant current with thermal switch-off and automatic restart					
Response time of the current limiting circuit	< 100 µs					
Module diagnostics	Yes					
Individual channel diagnostics	No					

Specifications	EP-2214	EP-2614	EP-2634	EP-2218	EP-225F	EP-291F
Reactionless	Yes	--	Yes	Yes	Yes	Yes
Can be used with EP-19xx	Yes	Yes	Yes	--	--	Yes
	EP-2214	EP-2614	EP-2634	EP-2218	EP-225F	EP-291F
Supply						
Supply voltage	20.4V – 28.8V					
Current consumption from system current path I _{sys}	8 mA					
Current consumption from output current path I _{out}	20 mA + load	25 mA + load	20 mA + load	35 mA + load	25 mA + load	30 mA + load
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 IEC 61131-2					
Dimensions						
Width	11.5 mm (0.45 in) 76 mm (2.99 in) 120 mm (4.72 in)					
Depth						
Height						
Weight	86 g (3.03 oz)	86 g (3.03 oz)	86 g (3.03 oz)	86 g (3.03 oz)	83 g (2.93 oz)	89 g (3.14 oz)
Specifications		EP-2714			EP-2814	
System Data						
Data	Process, parameter, and diagnostic data depend on the network adapter used.					
Interface	RSTi-EP system bus					
System bus transfer rate	48 Mbps					
Outputs						
Number	4					
Type	Relay from – C			SSR / triac		
Material for power and data contacts	Ni-Au, 3 µm			--		
Switching characteristic	--			Closing when the voltage crosses zero, Opening when the current crosses zero		
Response time	20 ms			10 ms		
Minimum switching current	--			50 mA per channel		
Maximum switching current	--			1 A per channel		
	--			4 A per module		
Max. Output current	5 A at 60°C (140 °F) / 6 A at 55°C (131 °F) per channel			--		
	20 A at 60°C (140 °F) / 24 A at 55°C (131 °F) per module			--		
Holding current	--			25 mA		
Switching frequency	max. 5 Hz			up to 20 Hz		
Short-circuit-proof	No					

Specifications	EP-2214	EP-2614	EP-2634	EP-2218	EP-225F	EP-291F
Defined trip behaviour of the prescribed external fuse	--			1 A super quick-acting		
Protective circuit	External fusing with 6 A prescribed			--		
Service life with AC-15 load and 1-A switching current	> 300.000 switching cycles			--		
Max. Switching voltage	255 V AC, UL: 277 V AC, DC corresponding to the derating curve			255 V AC, UL: 277 AC		
Reactionless	Yes					
Diagnosis						
Module diagnosis	Yes					
Individual channel diagnostics	No					
Supply						
Supply voltage	20.4V – 28.8V					
Current consumption from system current path I _{sys}	8 mA			11 mA		
Current consumption from output current path I _{out}	20 mA			--		
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 IEC 61131-2					
Width	11.5 mm (0.45 in)					
Depth	76 mm (2.99 in)					
Height	120 mm (4.72 in)					
Weight	83 g (2.93 oz)					

Current Demand for Digital Output Modules

Product	ISYS	IIN	IOUT	IS	IL
EP-2214	8 mA	--	20 mA	--	x
EP-2614	8 mA	--	25 mA	--	x
EP-2714	8 mA	--	20 mA	--	--
EP-2814	11 mA	--	--	--	--
EP-2634	8 mA	--	20 mA	--	x
EP-2218	8 mA	--	35 mA	--	--
EP-225F	8 mA	--	25 mA	x	--
EP-291F	8 mA	--	30 mA		x
I_{SYS} Current consumption from the system current path I_{IN} Power consumption from input current path I_{OUT} Power consumption from output current path I_S Current demand of the connected sensors I_L Current demand of the connected actuators x Must be included when calculating the power supply					

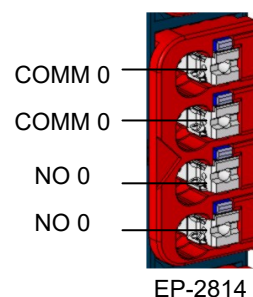
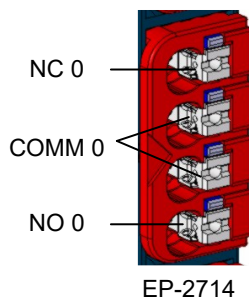
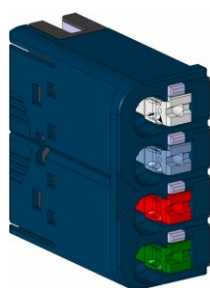
LED'S

LED	EP-2214	EP-2614	EP-2634	EP-2218	EP-225F	EP-291F
Module Status	Green: Communication over the system bus Red: Module System Fault or Diagnostic Fault					
1.1	Yellow: Output 0 active	Yellow: Output 0 active	Yellow: Output 0 active	Yellow: Output 0 active	Yellow: Output 0 active	Yellow: Output 0 active
1.2	--	--	--	--	Yellow: Output 1 active	Yellow: Output 1 active
1.3	--	--	--	Yellow: Output 1 active	Yellow: Output 2 active	Yellow: Output 2 active
1.4	--	--	--	--	Yellow: Output 3 active	Yellow: Output 3 active
2.1	Yellow: Output 1 active	Yellow: Output 1 active	Yellow: Output 2 active	Yellow: Output 2 active	Yellow: Output 4 active	Yellow: Output 4 active
2.2	--	--	--	--	Yellow: Output 5 active	Yellow: Output 5 active
2.3	--	--	--	Yellow: Output 3 active	Yellow: Output 6 active	Yellow: Output 6 active
2.4	--	--	--	--	Yellow: Output 7 active	Yellow: Output 7 active
3.1	Yellow: Output 2 active	Yellow: Output 2 active	Yellow: Output 3 active	Yellow: Output 4 active	Yellow: Output 8 active	Yellow: Output 8 active
3.2	--	--	--	--	Yellow: Output 9 active	Yellow: Output 9 active
3.3	--	--	--	Yellow: Output 5 active	Yellow: Output 10 active	Yellow: Output 10 active
3.4	--	--	--	--	Yellow: Output 11 active	Yellow: Output 11 active
4.1	Yellow: Output 3 active	Yellow: Output 3 active	Yellow: Output 4 active	Yellow: Output 6 active	Yellow: Output 12 active	Yellow: Output 12 active
4.2	--	--	--	--	Yellow: Output 13 active	Yellow: Output 13 active
4.3	--	--	--	Yellow: Output 7 active	Yellow: Output 14 active	Yellow: Output 14 active
4.4	--	--	--	--	Yellow: Output 15 active	Yellow: Output 15 active
LED	EP-2714			EP-2814		
Module Status	Green: Communication over the system bus Red: No communication on system bus or diagnostic message displayed			Green: Communication over the system bus Red: Collective error diagnostic		
1.1	Yellow: Output 0 active			Yellow: Output 0 active		
1.2	--			--		
1.3	--			--		
1.4	--			--		
2.1	Yellow: Output 1 active			Yellow: Output 1 active		
2.2	--			--		
2.3	--			--		
2.4	--			--		

LED	EP-2714	EP-2814
3.1	Yellow: Output 2 active	Yellow: Output 2 active
3.2	--	--
3.3	--	--
3.4	--	--
4.1	Yellow: Output 3 active	Yellow: Output 3 active
4.2	--	--
4.3	--	--
4.4	--	--

Field Wiring

The connection frame can take up to four connectors, and four wires can be connected to each connector. The Spring style technology allows for 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 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.



Connector with Four Wire Connectors

COMM 0 Connector Block (for Relay/SSR Modules)

Connector Specifications:

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

The pushers are color-coded for the following connections:

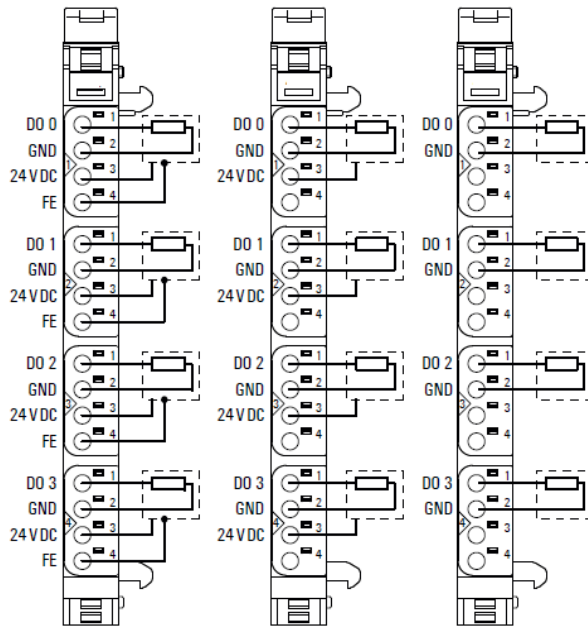
- White Signal
- Blue GND
- Red 24 V DC
- Green Functional earth (FE)

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).

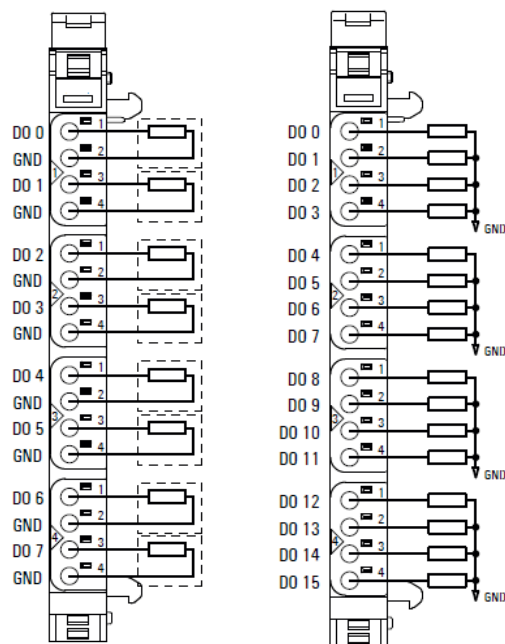
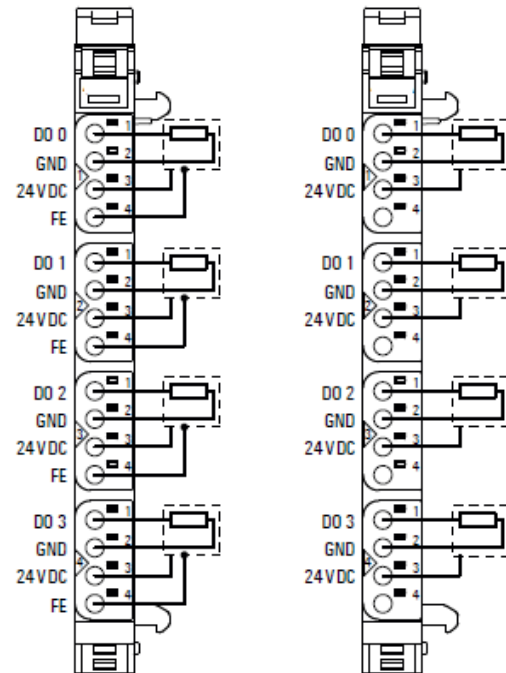
Refer to the RSTi-EP Slice I/O User Manual (GFK-2958) for additional information.

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

Connection Diagrams

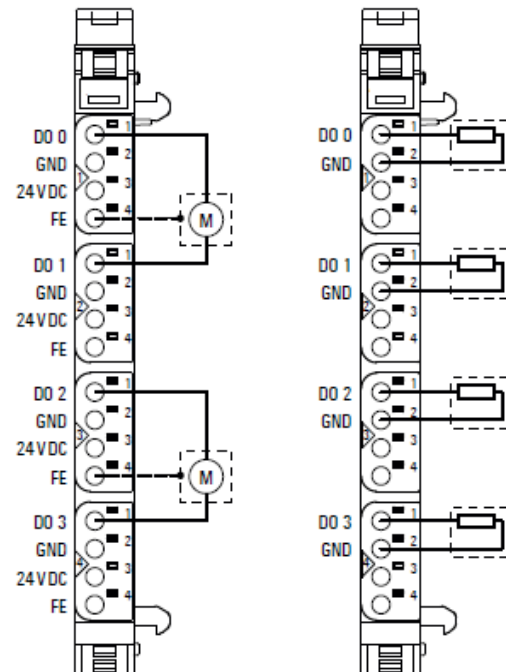


EP-2214 and EP-2614

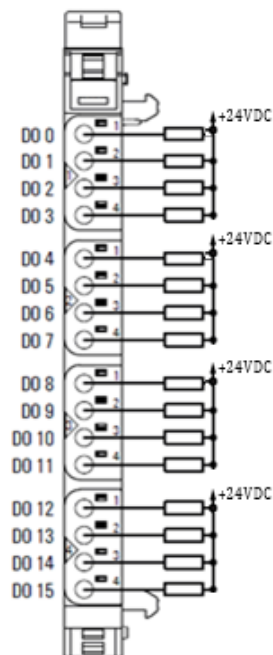


EP-2218

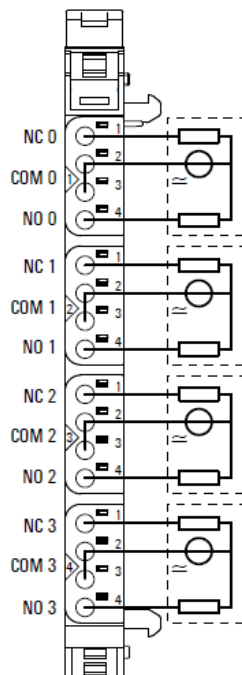
EP-225F



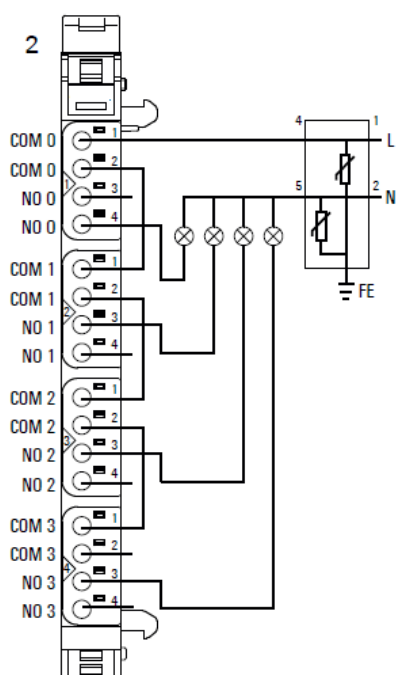
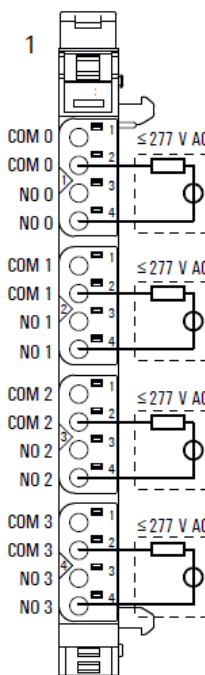
EP-2634



EP-291F

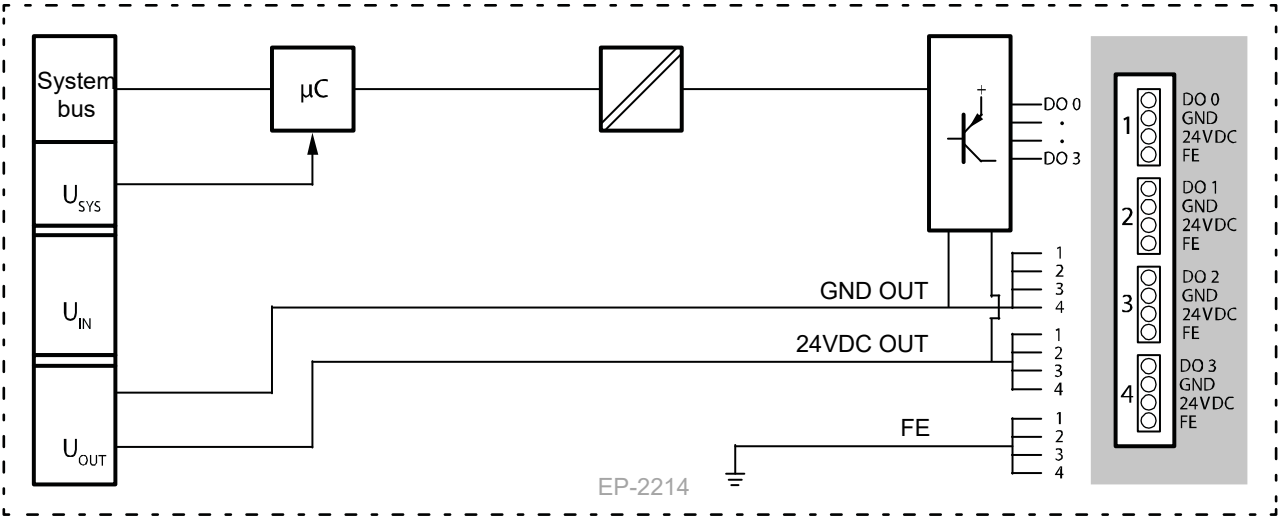


EP-2714

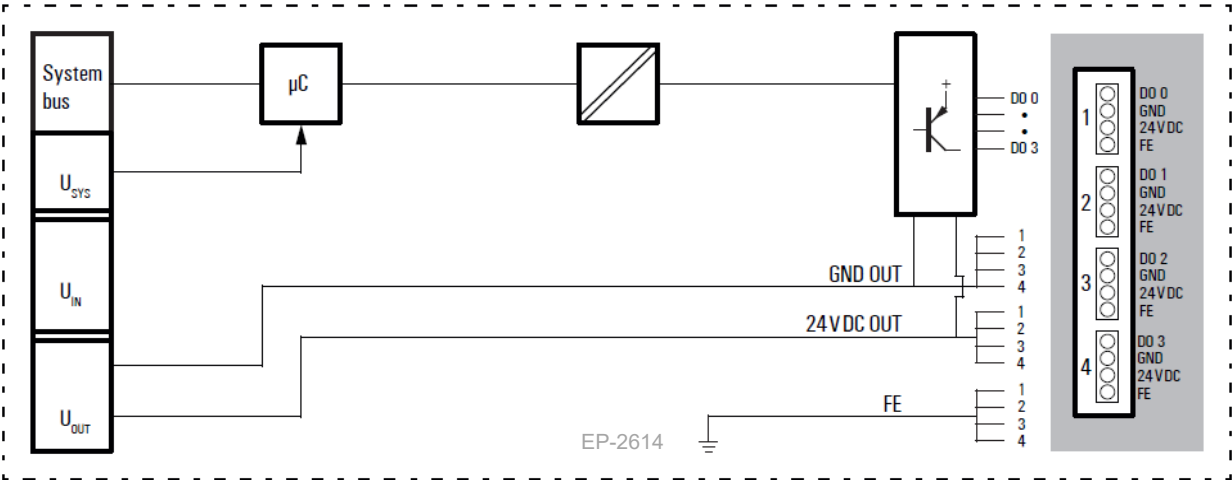


EP-2814

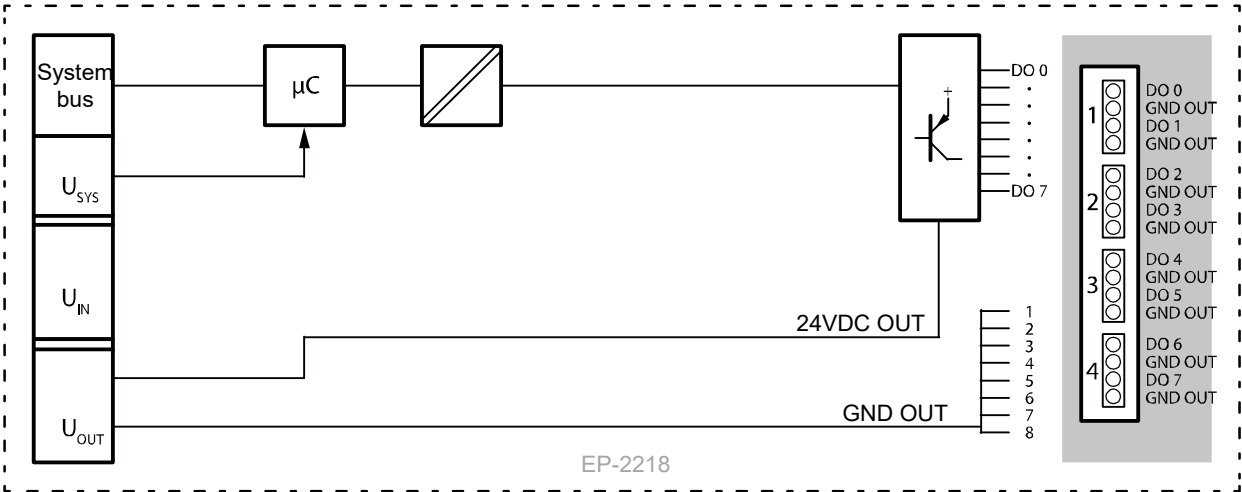
Connection Block Diagrams



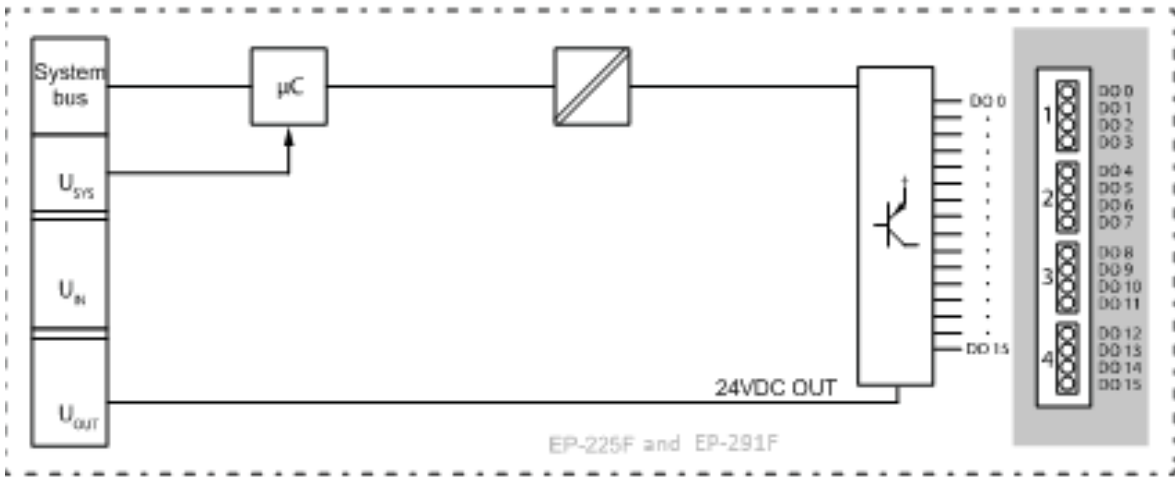
EP-2214



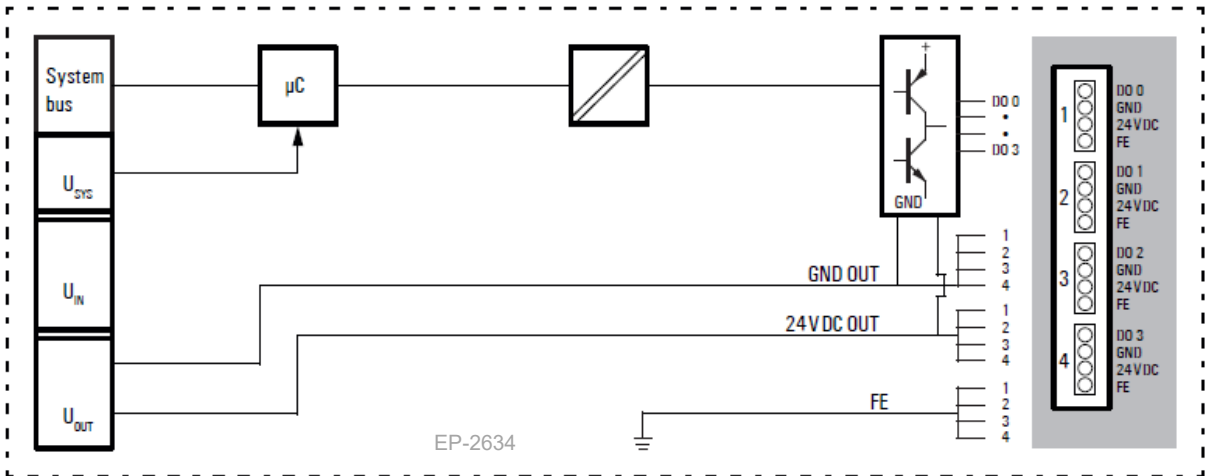
EP-2614



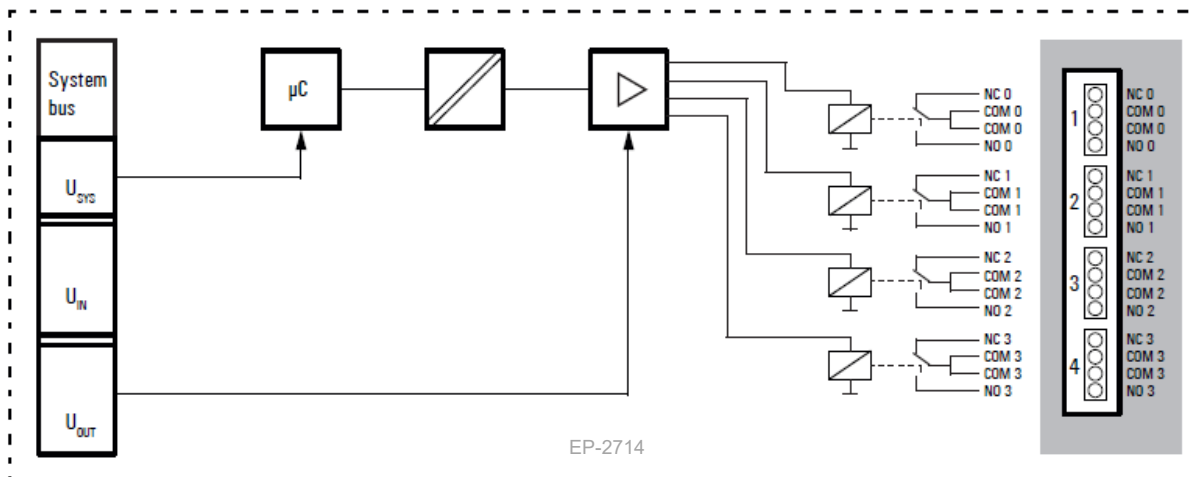
EP-2218



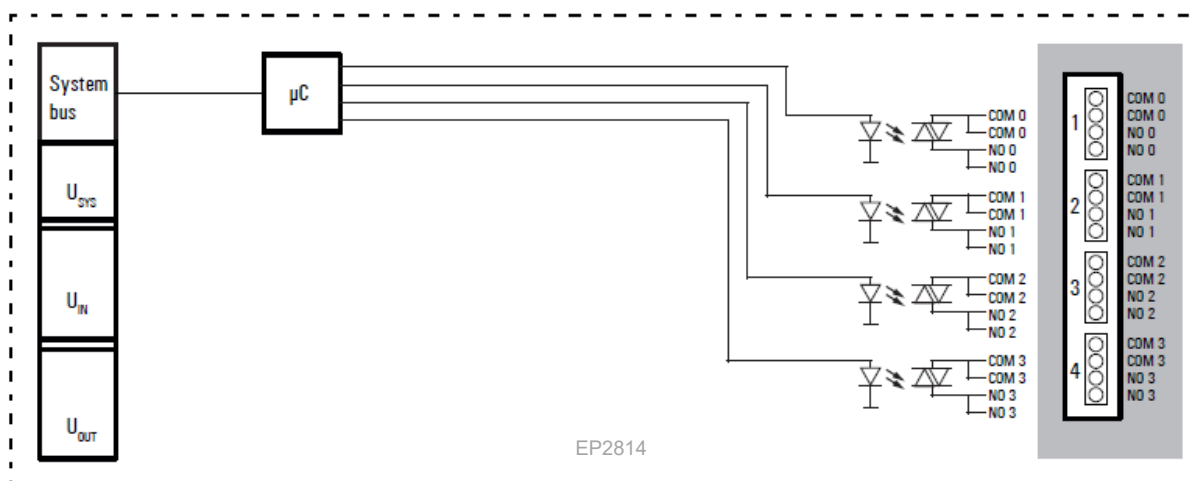
EP-225F and EP-291F



EP-2634



EP-2714



EP-2814

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

II 3 G Ex nA IIC T4 Gc

- Ta: -20°C to +60°C (-4° F to +140 °F)

Release History

Catalog Number	Firmware Version	Date	Comments
EP-2714-D EP-2814-D EP-2214-E EP-2614-E EP-2634-D EP-2218-F EP-225F-G EP-291-B	N/A	Jan 2024	Updated product markings to include UKCA, CCC & Morocco.
EP-2218-E EP-225F-G EP-2214-D EP-2614-D EP-2634-C EP-2218-D EP-225F-D EP-2714-C EP-2814-C EP-291F	N/A	Sep-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. - Added new Digital Output Negative logic Module
EP-2218-D	N/A	Aug-2018	Minor revision updates- No Change to Form, Fit and Function.
EP-225F-D EP-225F-E	N/A	Aug-2018	Minor Revision updates. No change to form, fit and functionality
EP-2214-C EP-2614-C EP-2634-B EP-2218-C EP-225F-C EP-2714-B EP-2814-B	N/A	Apr-2018	These product revisions are updated to be usable in Marine application and pass marine certification tests. Refer GFK-2958 for certification details.
EP-225F-B	N/A	Nov-2017	Fix to avoid logging of repeated diagnostic messages for error condition on module. [HW Version: 01.11.00]
EP-2214 EP-2614 EP-2634 EP-2218 EP-225F EP2714 EP-2814	N/A	Dec-2015	Documentation update only
EP-2214 EP-2614 EP-2634 EP-2218 EP-225F EP2714 EP-2814	N/A	Oct-2015	Initial Release

Important Product Information for this Release Updates

None

Functional Compatibility

N/A

Problems Resolved by this Release

None - Documentation update only

New Features and Enhancements

Modules	Description
EP-291F	New Digital Output Negative logic Module EP-291F added to RSTi-EP IO product line

Known Restrictions and Open Issues

None

Operational Notes

None

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

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

Knowledge Base: <https://www.emerson.com/iac-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
Technical Support: 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
Technical Support: support.mas.emea@emerson.com

Asia

Phone: +86-400-842-8599
+65-3157-9591 (All other Countries)

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

Any escalation request should be sent to mas.sfdcescalation@emerson.com

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

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