GFK-2962B
August 2016

Specialty Modules
EP-5111, EP-5112, EP-5212, EP-5261, EP-5311, EP-5422, EP-5442

Specialty Module

GE provides several RSTi-EP specialty modules, which can be used to meet specific needs in your system. Each module has a Module Status LED and each channel has a LED for visual indication of connectivity.

The counter module EP-5111 can read one square-wave signal (1 channel) (for example, from an incremental encoder) with a maximum input frequency of 100 kHz. The 32-bit counter can count up or down within a predetermined range of values.

The digital counter module EP-5112 can read two square-wave signals (2 channels) (for example, from an incremental encoder) with a maximum input frequency of 100 kHz. Depending on the operating mode, both 32-bit counters can count up or down independent of each other in a preset range of values. The counters can be controlled via software by setting the appropriate control word.

The digital counter module EP-5212 can read frequency of one square-wave signal (1 channel) from one or two external sensors with a maximum input frequency of 100 kHz. Frequencys to be counted are applied to channel CH0 and/or channel CH1, the measurement will be started via control word 1 and 2 respectively. Measuring cycles can be defined in µs. The longer the measuring cycle the more exactly the measurement.

The digital pulse width modulation modules EP-5422 and EP-5442 are used for the control of small motors with current requirements of 0.5 A up to 2 A which can also be used for the control of valve flaps. The switching frequencies are adjustable up to 40 kHz and, in addition to this, the push/pull output levels can be used for motor activation; for example: change of rotation direction. As with all modules of the RSTi-EP system, the characteristics are outstanding – from the modular design and the interchangeable electronics to the removable plug-in terminal strip.

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 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

- *Spring style* technology for ease of wiring
- DIN rail mounted
- Double-click installation for positive indication of correct installation
- Compatible for 2 and 3 wire connection
- 32-bit counter, 24 V DC
- Counting frequency 100 kHz max (A/B channel, 1/2/4- times sampling or pulse and direction, invertible)
- Gate input (hardware gate, HW gate), reset input, digital output controlled by an internal comparator
- Alarm and diagnostic function with µs time stamp
- Digitally adjustable input filter to suppress interferences(17 filter frequencies gradually adjustable between 3 Hz and 187 kHz)
- SSI Encoder Interface Serial Communication module
- Digital pulse width modulation modules can control from 0.5A to 2A

Ordering Information

Module	Description
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-5422	2 Channels PWM Output, Positive Logic, 24VDC, 2.0 A
EP-5442	2 Channels PWM Output, Positive Logic, 24VDC, 0.5 A
EP-5261	1 Channel Serial Communications, 232, 422, 485
EP-5311	SSI Encoder, BCD or Gray-Code Format, 5/24 VDC

Specifications

Item	EP-5111	EP-5112	EP-5212
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		
Galvanic isolation	--	500 V DC between the current paths	
Inputs			
Number of counter inputs	1	2	2
Type	Incremental encoders and other input characteristics for sensor types 1 and 3 are in accordance with EN 61131-2		--
Input filter	Filter time adjustable from 0,01 to 1 ms		Adjustable between 3 Hz and 187 kHz (333 ms and 5 µs)
Low input voltage	< 5 V		
High input voltage	> 11 V		
Max. input current per channel	3.5 mA		
Sensor supply	Yes		
Sensor connection	2-wire and 3-wire		
Reverse polarity protection	Yes		
Module diagnostics	Yes		
Individual channel diagnostics	Yes	Yes	No
Counter width	32 bits		
Maximum input frequency	100 kHz		
Latch, gate, reset input	Yes	--	--
Mode of operation	Pulse and direction / AB mode with 1-, 2-, 4-times sampling	Pulse and direction / AB mode with 1-, 2-, 4-times sampling	Pulse rising edge
Status, alarm, diagnostics			
Status indicator	Yes		
Process alarm	Yes, parametrizable	Yes, parametrizable	--
Diagnostic alarm	Yes	Yes	--
Outputs			
Number	1	--	--
Output Current	0.5 A	--	--
Reverse polarity protection	Yes	--	--
Module diagnosis	Yes	--	--
Individual channel diagnosis	Yes	--	--

	EP-5111	**EP-5112**	**EP-5212**
Supply			
Supply voltage	20.4V – 28.8V		
Current consumption from system current path I_{SYS}	8 mA		
Current consumption from output current path I_{in}	35 mA plus output current for the digital output	35 mA	35 mA plus sensor supply current
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)	72 g (2.54 oz)	83 g (2.93 oz)

EP-5261	
System data	
Data	Process, parameter and diagnostic data depend on the network Adapter used (refer to the table in the section, *Order and Arrangement of the Modules*)
Interface	RSTi-EP I/O communication bus
System bus transfer rate	48 Mbps
Serial Interface	
Number	1
Type	RS-232, RS-485, RS-422, parameterizable
Transfer rate	300 – 115200 Bps, parameterizable
Supply voltage	5VDC or 24VDC
Current of power supply output	max. 500 mA
Standards RS232	DIN 66020, DIN 66259, EIA-RS232C, CCITT V.24/V.28
Standards RS485/RS422	120 Ω, parameterisable
Short-cicuit proof	Yes
Module diagnosis	Yes
Individual channel diagnosis	Yes
Supply	
Supply voltage	20.4V – 28.8V
Current consumption from system current path I_{SYS},	8 mA
Current consumption from input current path I_{in}	16 mA + load
General Data	
Weight	92 g (3.25 oz)
For additional general data, refer to the section, *General Technical Data for I/O Modules*.	

EP-5311	
System Data	
Data	Process, parameter and diagnostic data depend on the network Adapter used (refer to the table in the section, *Order and Arrangement of the Modules*)
Interface	RSTi-EP I/O communication bus
System bus transfer rate	48 Mbps
Number of channels	1
Type	SSI (Differential RS-422)
SSI transfer rate	125 kHz – 2 MHz
Delay time	1 µs – 64 µs
Data width	8 – 32 Bit
Data format	Binary / Gray-Code
SSI mode	Listening / Master
Sensor supply	500 mA (24 V DC) / 400 mA (5 V DC)
Reverse polarity protection	Yes
Module diagnosis	Yes
Individual channel diagnosis	No
Cable length	max. 320 m (1049.(ft) at 125 kHz; shielded
Supply	
Supply voltage	20.4V – 28.8V
Current consumption from system current path I_{SYS},	8 mA
Current consumption from input current path I_{in}	25 mA + sensor supply current
General Data	
Weight	87 g (3.07 oz)
For additional general data, refer to the section, *General Technical Data for I/O Modules*.	

	EP-5422		EP-5442	
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		48 Mbps	
Outputs				
Number	2		2	
Type	PN output stage		PN output stage	
Response time	< 0.1 µs		< 0.1 µs	
Period duration	25 µs t o 175 ms (40 kHz to 6 Hz)			
Max. output current	per channel	0.5 A	per channel	2 A
	per module	1 A	per module	4 A
Switching frequency	Resistive load (min. 47 Ω)	static, 6 Hz to 40 kHz	Resistive load (min. 12 Ω)	6 Hz to 40 kHz
	Inductive load (DC 13)	static, 6 Hz to 40 kHz	Inductive load (DC 13)	6 Hz to 40 kHz
	Lamp load (12 W)	static, 6 Hz to 40 kHz	Lamp load (48 W)	6 Hz to 40 kHz
Actuator connection	2-wire, 3-wire, 3-wire + FE			
Actuator supply	max. 2 A per plug, total max. 4 A		max. 2 A per plug, total max. 8 A	
Pulse/period ratio	0–100 % PN-switching or P-switching, adjustable			
Short-circuit-proof	Yes			
Response time of the protective circuit	< 100 µs			
Module diagnosis	Yes			
Individual channel diagnosis	No			
Reactionless	Yes			
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}	40 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			
Width	11.5 mm (0.45 in)			
Depth	76 mm (2.99 in)			
Height	120 mm (4.72 in)			
Weight	77 g (2.72 oz)		82 g (2.89 oz)	

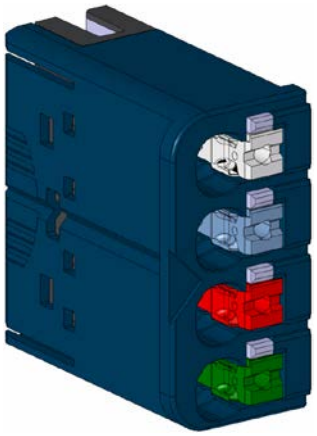
LEDs

LED	EP-5111	EP-5112	EP-5212	EP-5261	EP-5311
Module Status	**Green**: Communication over the system bus **Red:** Module System Fault or Diagnostic Fault				
1.1	**Yellow:** A/pulse controlled	**Yellow:** CH0 A pulse controlled		**Yellow:** RS-232 parameterized **Yellow flashing:** Data are being recieved	**Yellow:** Data In active
1.2				**Yellow:** RS-232 parameterized **Yellow flashing:** Data are being transmitted	
1.3					
1.4	**Yellow:** B/direction controlled	**Yellow:** CH0 B direction controlled	**Yellow:** CH0 active (1-level)		
2.1	**Yellow:** output set				**Yellow:** Clock In active
2.2					
2.3					
2.4	**Yellow:** reset input controlled				
3.1	**Yellow:** latch input controlled	**Yellow:** CH1 A pulse controlled		3.1 – 3.4 **Yellow:** RS-422 parameterized 3.1 + 3.2 **Off**, 3.3 + 3.4 **Yellow:** RS-485 parameterized 3.3 **Yellow flashing:** Data are being recieved 3.4 **Yellow flashing:** Data are being transmitted	**Yellow:** Clock Out active
3.2					
3.3					
3.4	**Yellow:** gate input (HW gate) controlled		**Yellow:** CH0 active (1-level)		
4.1		**Yellow:** CH1 B direction controlled		**Green:** Supply voltage +5VDC	**Green:** Power supply sensor +5VDC
4.2					
4.3				**Green:** Supply voltage +24VDC	**Green:** Power supply sensor +24VDC
4.4					

LED	EP-5422	EP-5442
Module Status	**Green**: Communication over the system bus **Red:** Module System Fault or Diagnostic Fault	
1.1	**Yellow:** PWM output 0 – 100%, P-switching **Yellow flashing at 2 Hz**: PWM output 0 is > 0 and < 100%, PN-switching or P-switching	**Yellow:** PWM output 0 – 100%, P-switching **Yellow flashing at 2 Hz:** PWM output 0 is > 0 and < 100%, PN-switching or P-switching
1.2		
1.3		
1.4		
2.1		
2.2		
2.3		
2.4		
3.1	**Yellow:** PWM output 1 – 100%, P-switching **Yellow flashing at 2 Hz:** PWM output 0 is > 0 and < 100%, PN-switching or P-switching	**Yellow:** PWM output 1 – 100%, P-switching **Yellow flashing at 2 Hz:** PWM output 0 is > 0 and < 100%, PN-switching or P-switching
3.2		
3.3		
3.4		
4.1		
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 Block with Four Wire Connectors

Connector Specifications:

- conductor cross-section 0.14 to 1.5 mm² (26 – 16 guage)
- max. ampacity: 10 A
- 4-pole

The pushers are color-coded for the following connections:

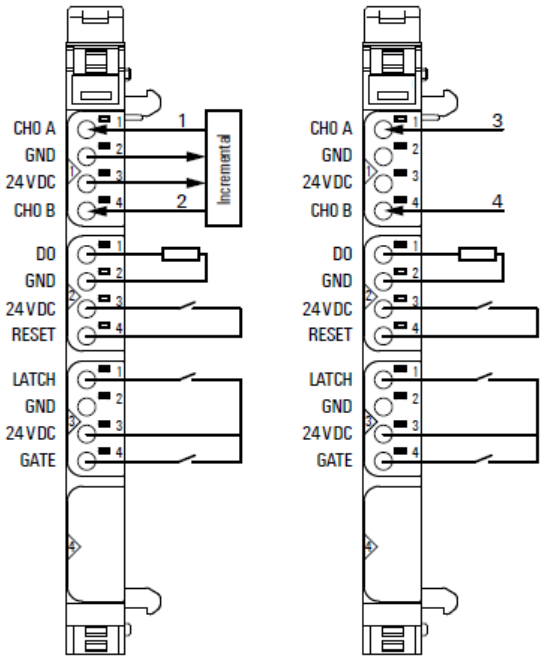
- White Signal
- Blue GND
- Red 24 V DC
- Green Functional earth (FE)

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).

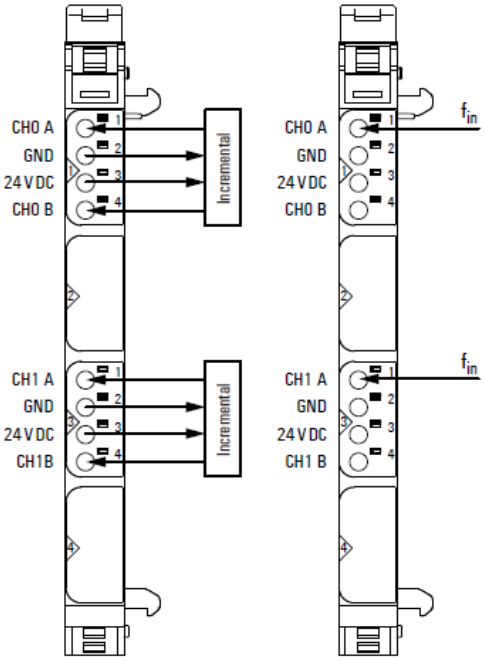
Refer to the *RSTi-EP Slice I/O User Manual* (GFK-2958) for additional information.

For technical assistance, go to *http:/support.ge-ip.com*.

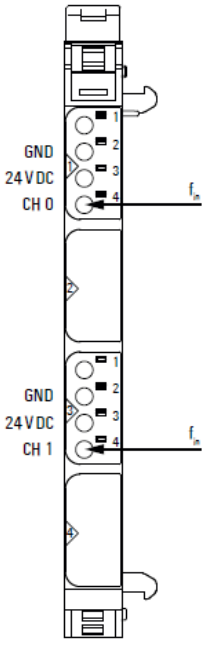
Connection Diagrams



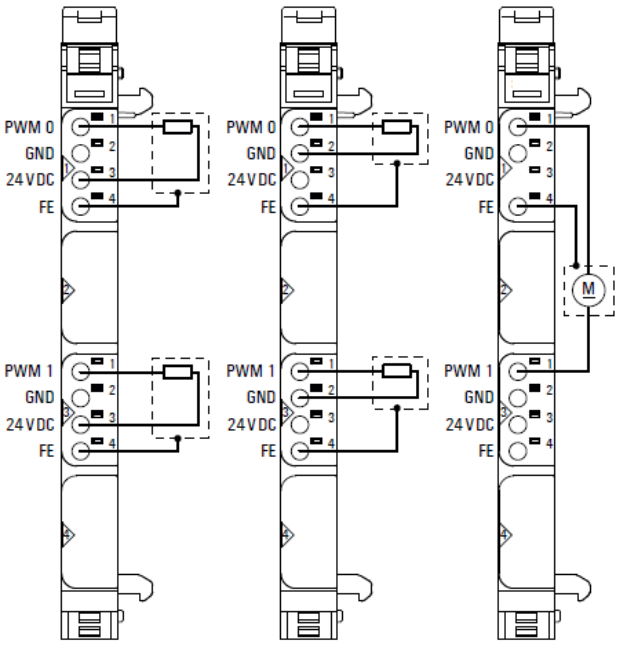
EP-5111



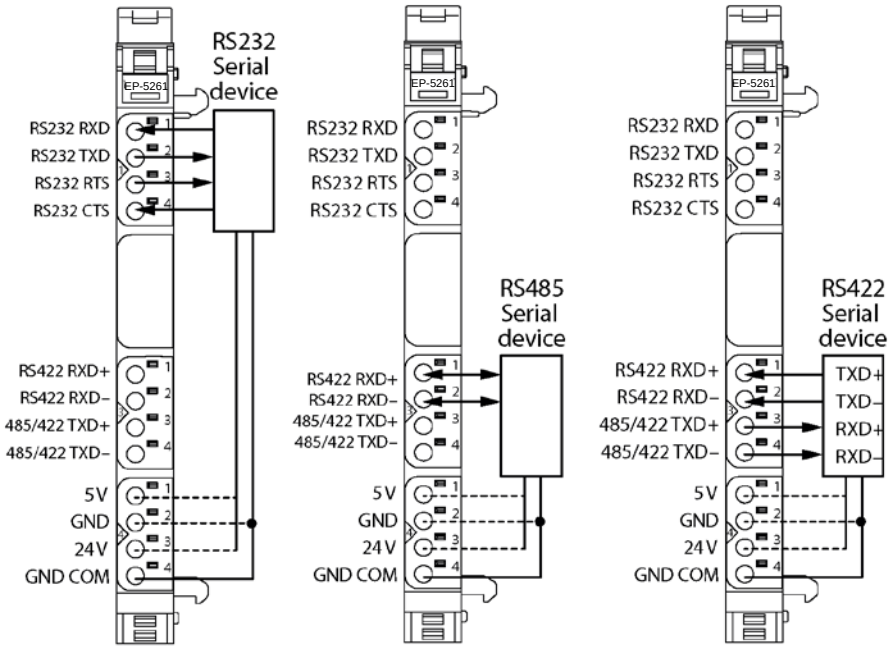
EP-5112



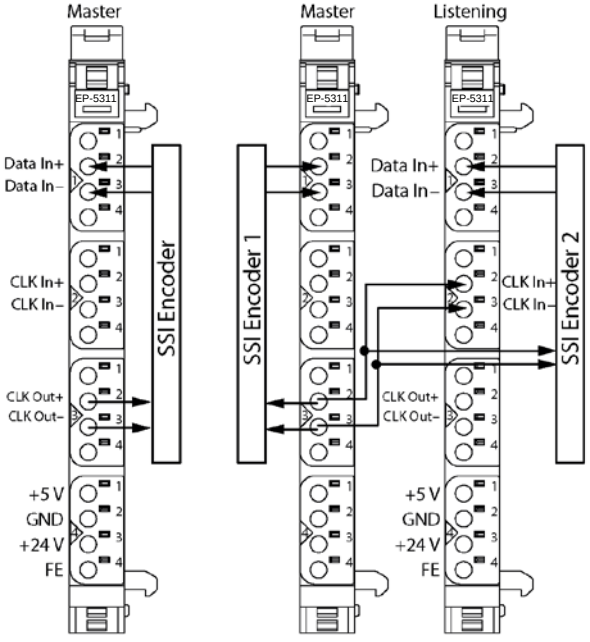
EP-5212



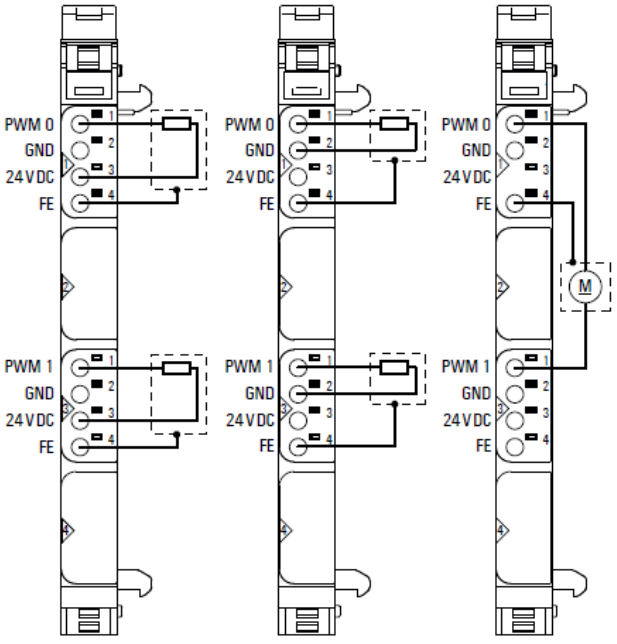
EP-5422



EP-5261

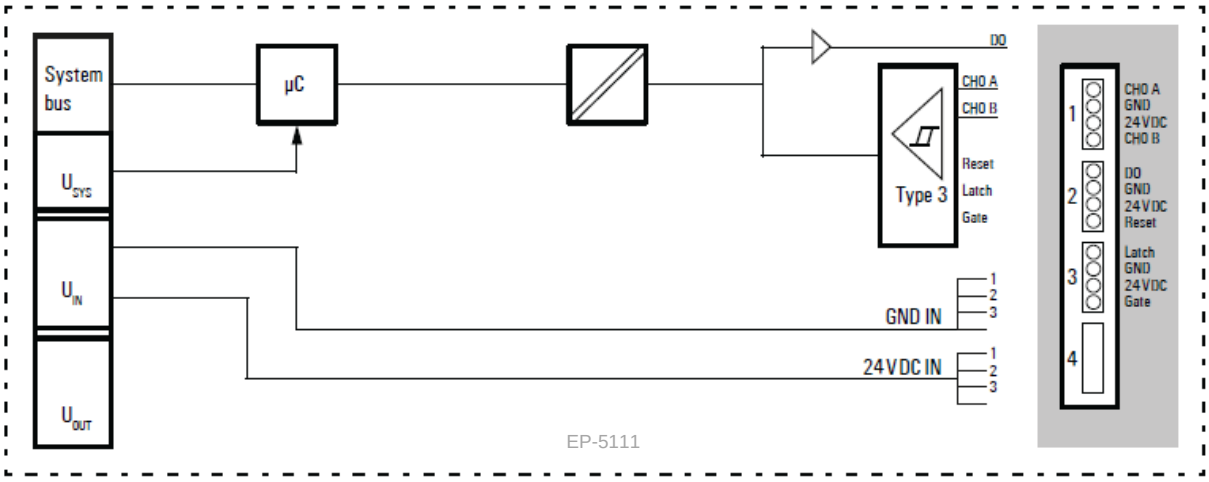


EP-5311

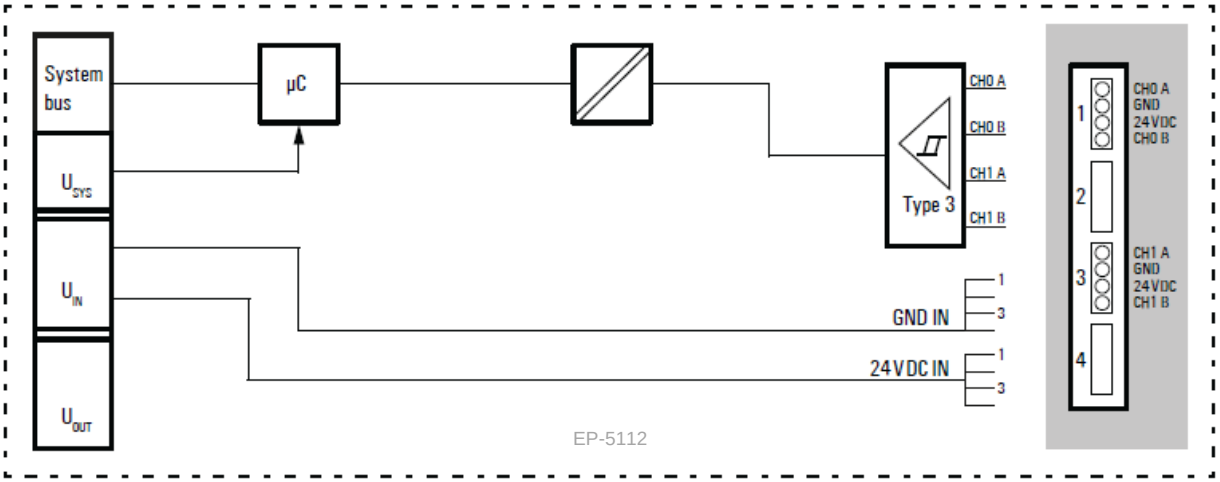


EP-5442

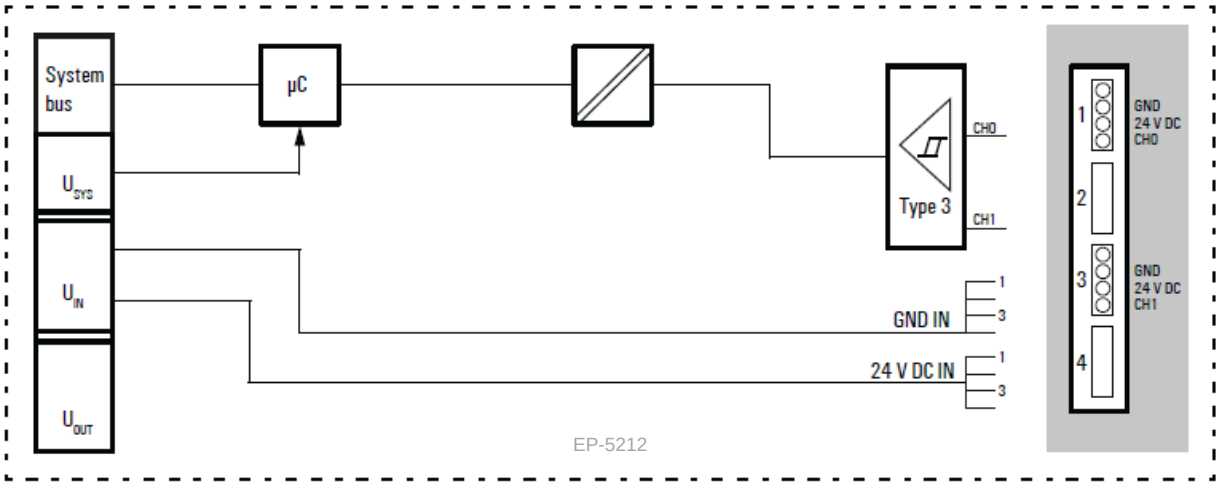
Connection Block Diagrams



EP-5111

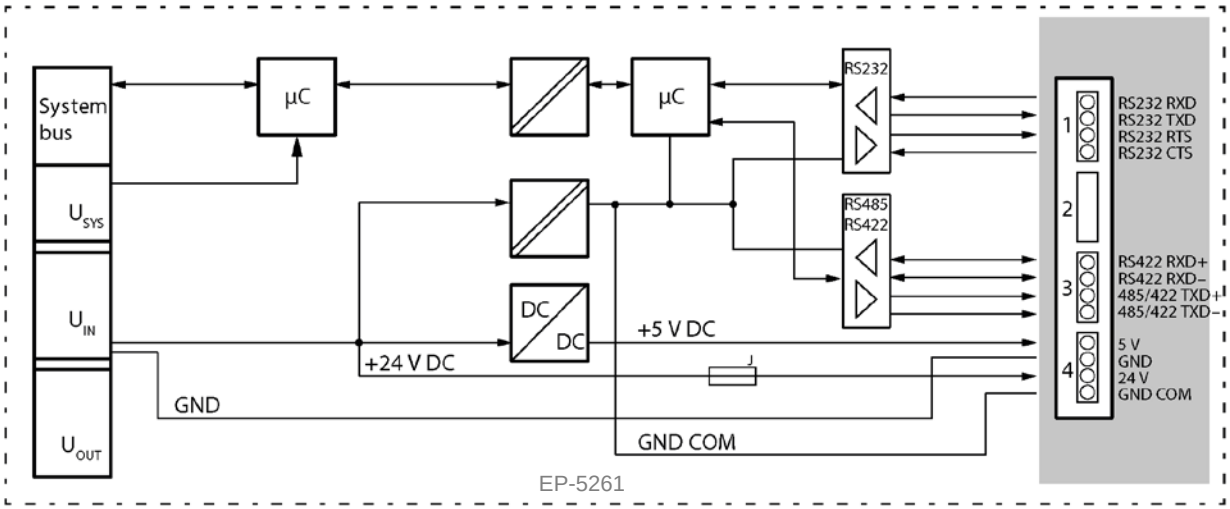


EP-5112

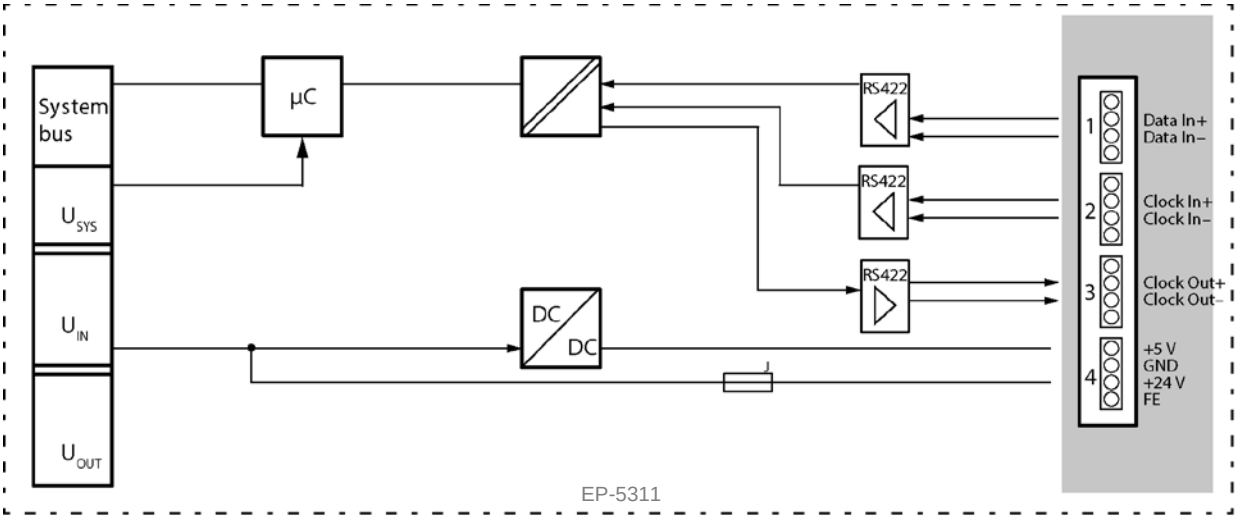


EP-5212

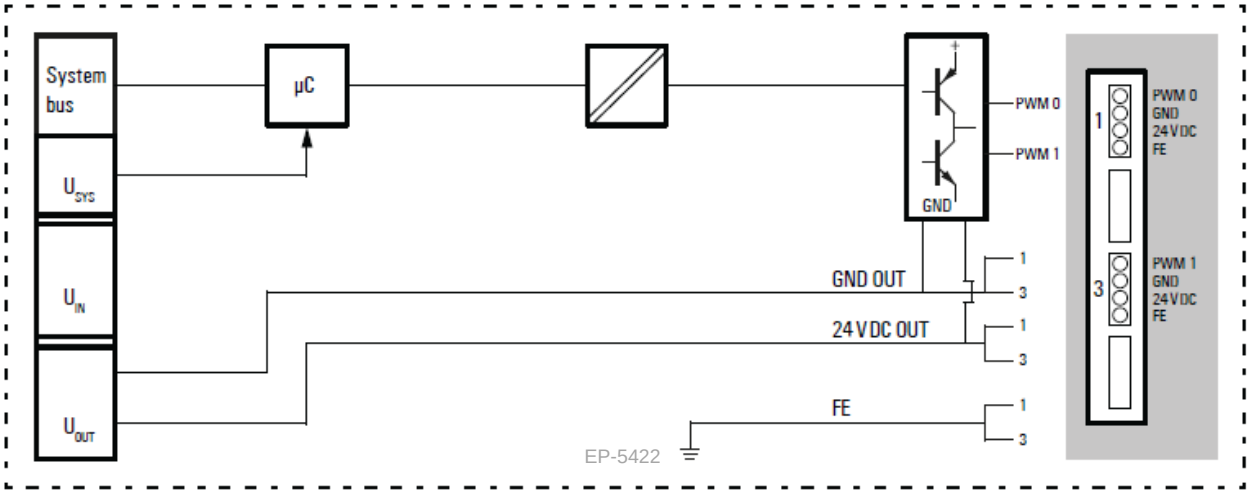
For public disclosure



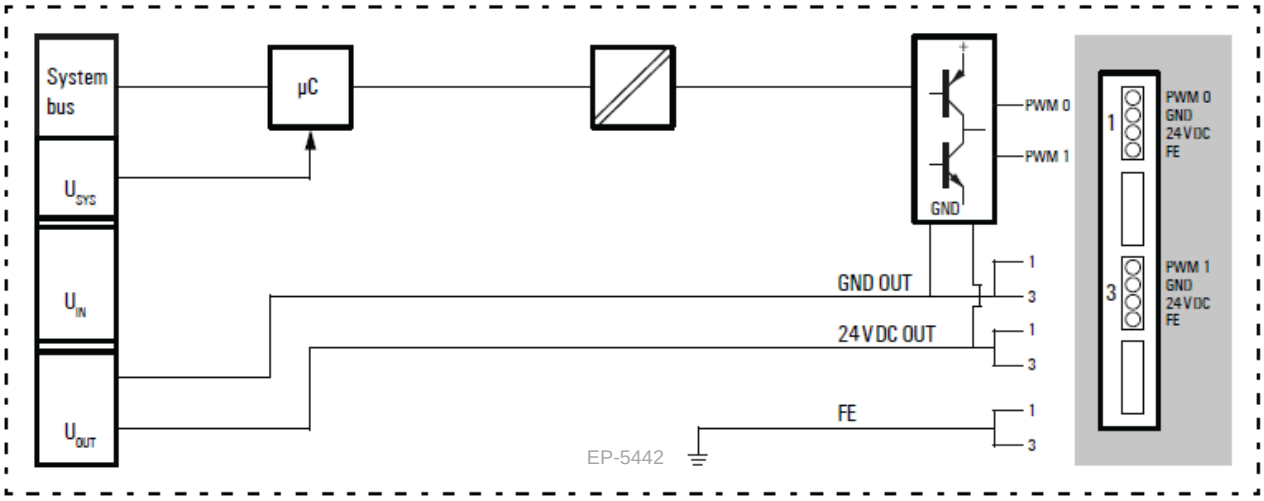
EP-5261



EP-5311



EP-5422



EP-5442

Installation in Hazardous Areas

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR ZONE 2;

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

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

ATEX Marking

Ⓔx 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-5261, EP-5311	N/A	Aug-2016	Added Phase-2 modules
EP-5111, EP-5112, EP-5212, EP-5422, EP-5442	N/A	Dec-2015	Documentation update only
EP-5111, EP-5112, EP-5212, EP-5422, EP-5442	N/A	Nov-2015	Initial Release

Important Product Information for this Release

Updates

Added two new modules: EP-5261 and EP-5311

Functional Compatibility

N/A

Problems Resolved by this Release

None

New Features and Enhancements

None

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)