



Universal Input/Output FB7204E3

- 4-channel
- Inputs Ex ia, Outputs Ex ia
- Installation in suitable enclosures in Zone 1
- Module can be exchanged under voltage (hot swap)
- Analog input, digital input, analog output, digital output
- Supply circuit 21.5 V (4 mA)
- HART communication via field bus or service bus
- Simulation mode for service operations (forcing)
- Line fault detection (LFD): one LED per channel
- Permanently self-monitoring
- Output with bus-independent safety shutdown

Universal input/output with HART communication and switch-off input



Function

The device is a configurable universal module. Each channel can operate in the following modes:

- As an analog input (AI) it feeds 2-wire transmitters.
- As an analog output (AO) it can drive proportional valves, I/P converters, or local indicators.
- As a digital input (DI) it reads dry contacts.
- As a digital output (DO) it can drive solenoids, sounders, or LED.

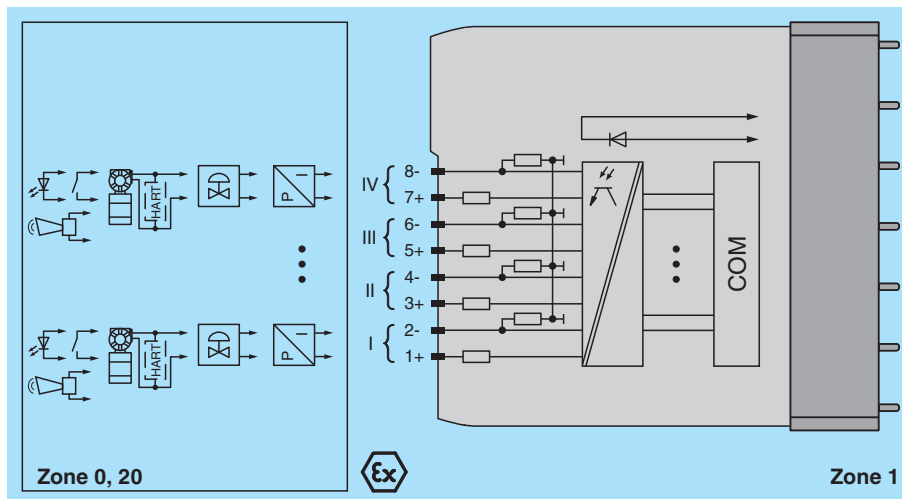
A combination of analog and digital I/O is possible.

Channel LEDs indicate the status of each channel. White LEDs indicate whether AI, AO, DI, DO are selected.

The outputs can be switched off via a contact. This can be used for bus independent safety applications.

The intrinsically safe signals are galvanically isolated from the bus and the power supply.

Wiring Diagram



Technical Data

Slots			
Occupied slots		1	
Functional safety related parameters			
Safety Integrity Level (SIL)		SIL 2	
Supply			
Connection		backplane bus	
Rated voltage	U _r	12 V DC , only in connection with the power supplies FB92**	

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical Data

Power dissipation	2 W
Power consumption	3 W
Internal bus	
Connection	backplane bus
Interface	manufacturer-specific bus to standard com unit
Analog input	
Number of channels	4
Suitable field devices	
Field device	pressure converter
Field device [2]	flow converter
Field device [3]	level converter
Field device [4]	Temperature Converter
Field device interface	
Connection	2-wire transmitter
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Transmitter supply voltage	min. 15 V at 20 mA ; 21.5 V at 4 mA
Input resistance	15 Ω
Line fault detection	can be switched on/off for each channel via configuration tool , configurable via configuration tool
Short-circuit	factory setting: > 21 mA Can be parameterized in the range 0 ... 22 mA
Open-circuit	factory setting: < 3.6 mA Can be parameterized in the range 0 ... 22 mA
HART communication	yes
HART secondary variable	yes
Analog output	
Number of channels	4
Suitable field devices	
Field device	Proportional Valve
Field device [2]	I/P converters
Field device [3]	on-site display
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Current	0 ... 20 mA short-circuit protected
Line fault detection	can be switched on/off for each channel via configuration tool , configurable via configuration tool
Short-circuit	factory setting: < 50 Ω configurable between 0 ... 26 mA
Open-circuit	deviation of preset output value > 0.5 mA
Load	max. 750 Ω at 20 mA
HART communication	yes
HART secondary variable	yes
Watchdog	output off 0.5 s after serious fault
Digital input	
Number of channels	4
Sensor interface	
Connection [2]	volt-free contact
Connection	terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-
Line fault detection	can be switched on/off for each channel via configuration tool
Connection	mechanical switch with additional resistors (see connection diagram)
Short-circuit	> 7 mA
Open-circuit	< 0.1 mA
Digital signals (active)	
Switching point: ON	> 2.1 mA
Switching point: OFF	< 1.2 mA
Digital output	
Number of channels	4
Suitable field devices	

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Technical Data

Field device		Solenoid Valve
Field device [2]		audible alarm
Field device [3]		visual alarm
Connection		terminals 1+, 2-, 3+, 4-, 5+, 6-, 7+, 8-
Drive capability		12 V / 22 mA
Internal resistor	R_i	385 Ω
Current limit	I_{max}	22 mA
Open loop voltage	U_s	min. 22.7 V
Line fault detection		can be switched on/off for each channel via configuration tool
Test current		0.4 mA
Short-circuit		< 50 Ω
Open-circuit		< 0.2 mA
Transfer characteristics		
Deviation		
After calibration		0.1 % of the signal range at 20 °C (68 °F)
Influence of ambient temperature		0.1 %/10 K of the signal range
Resolution		12 Bit (0 ... 26 mA)
Refresh time		approx. 100 ms (4 channels)
Indicators/settings		
LED indication		Power LED (P) green: supply Diagnostic LED (I) red: module fault , red flashing: communication error , white: fixed parameter set (parameters from com unit are ignored) , white flashing: requests parameters from com unit Status LED (1-4) red: line fault (lead breakage or short circuit) , yellow: state of digital I/O (0/1) Configuration LED (AI, AO, DI, DO) white: selected channel mode
Coding		optional mechanical coding via front socket
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
Conformity		
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529
Environmental test		EN 60068-2-14
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
Damaging gas		EN 60068-2-42
Relative humidity		EN 60068-2-78
Ambient conditions		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Relative humidity		95 % non-condensing
Shock resistance		shock type I, shock duration 11 ms, shock amplitude 15 g, number of shocks 18
Vibration resistance		frequency range 10 ... 150 Hz; transition frequency: 57.56 Hz, amplitude/acceleration ± 0.075 mm/1 g; 10 cycles frequency range 5 ... 100 Hz; transition frequency: 13.2 Hz amplitude/acceleration ± 1 mm/0.7 g; 90 minutes at each resonance
Damaging gas		designed for operation in environmental conditions acc. to ISA-S71.04-1985, severity level G3
Mechanical specifications		
Degree of protection		IP20 (module) , a separate housing is required acc. to the system description
Connection		removable front connector with screw flange (accessory) wiring connection via spring terminals (0.14 ... 1.5 mm ²) or screw terminals (0.08 ... 1.5 mm ²)
Mass		approx. 425 g
Dimensions		
Height		107 mm

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Technical Data

Width		28 mm
Depth		132 mm
Data for application in connection with hazardous areas		
EU-type examination certificate		Presafe 19 ATEX 14057U
Marking		Ⓔ II 2(1)G Ex db eb q [ia Ga] IIC Gb II (1)D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Supply		
Voltage	U_o	27 V
Current	I_o	87 mA
Power	P_o	575 mW (linear characteristic)
Input		
Voltage	U_o	27 V
Current	I_o	87 mA
Power	P_o	575 mW (linear characteristic)
Internal capacitance	C_i	0 nF
Internal inductance	L_i	0 mH
Output		
Voltage	U_o	27 V
Current	I_o	87 mA
Power	P_o	575 mW (linear characteristic)
Galvanic isolation		
Rated voltage	U_m	250 V field circuits to control and supply circuits
Input/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
Output/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 EN 60079-1:2014 EN 60079-5:2015 EN 60079-7:2015+A1:2018 EN 60079-11:2012
International approvals		
ATEX approval		Presafe 19 ATEX 14057U
IECEx approval		IECEx PRE 19.0012U
Approved for		Ex db eb q [ia Ga] IIC Gb [Ex ia Da] IIIC [Ex ia Ma] I
General information		
System information		The module has to be mounted in appropriate backplanes and housings (FB92**) in Zone 1, 2, 21, 22 or outside hazardous areas (gas or dust). Here, observe the corresponding EC-type examination certificate.
Supplementary information		EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com .

Assembly

Front view

