

Sensor Interface

FD0-BI-EX12.PA



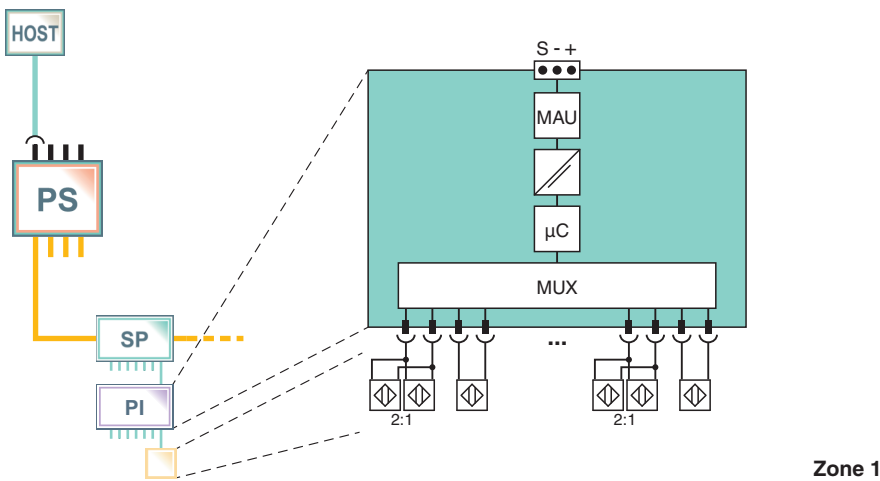
- For 12 intrinsically safe binary inputs
- Installation in Zone 1 and Zone 2
- Sensors in Zone 0
- Connection to fieldbus acc. to FISCO or Entity
- For PROFIBUS PA
- Galvanic separation between bus and sensors
- EMC acc. to NAMUR NE 21



Function

The binary input (BI) for outside installation connects up to twelve digital inputs to the DCS via fieldbus. It is installed close to the sensors in the hazardous area. Inputs include intrinsically safe NAMUR sensors or mechanical contacts. The BI communicates all data, configuration, and alarms via one fieldbus address to the DCS. System integration is possible through GSD files. Fieldbus powers the sensors and the binary interface itself, additional power or wiring is not required. Four inputs are connected directly, eight inputs are connected via 2:1 technology. See the list with compatible sensors online. The binary input monitors the sensors for proper function.

Connection



Zone 1

Technical Data

General specifications	
Design / Mounting	Outside installation
Fieldbus connection	
PROFIBUS PA	
Connection	Connection +, -
Rated voltage	9 ... 32 V
Rated current	max. 23 mA
Baud rate	31.25 kBit/s
Protocol	PROFIBUS DP V1
Terminal "S"	only for the connection of the cable screen (BUS) and/or the potential compensation
Terminal "PA"	only for the connection of the cable screen (sensor interface) and/or grounding

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

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Technical Data

Grounding plate	only for the connection of the potential compensation		
Field circuit			
Inputs			
Connection		4, for binary sensors: terminals 1+, 2-, 5+, 6-, 9+, 10-, 13+, 14- 8, for binary sensors: terminals 3, 4, 7, 8, 11, 12, 15, 16	
Sensor supply voltage		4, for binary sensors: 5.5 V 8, for binary sensors: 5 V	
Sensor supply current		4, for binary sensors: 4.5 mA 8, for binary sensors: ≤ 5 mA	
Time delay before availability		for 4 binary sensors, 1 s for 8 binary sensors, < 3 ms	
Max. cycle time		for binary 4 sensors, 4 x 1 s = 4 s for 8 binary sensors, 8 x 12.5 ms = 100 ms	
Directive conformity			
Electromagnetic compatibility			
Directive 2014/30/EU		EN 61326-1:2013	
Standard conformity			
Galvanic isolation		EN 60079-11	
Electromagnetic compatibility		NE 21:2006	
Degree of protection		IEC/EN 60529	
Fieldbus standard		EN 50170/2	
Ambient conditions			
Ambient temperature		-20 ... 70 °C (-4 ... 158 °F)	
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)	
Corrosion resistance		acc. to ISA-S71.04-1985, severity level G3	
Mechanical specifications			
Core cross section		Bus cable: Ø 5 mm ... 10 mm cable sensors: Ø 4 mm ... 8 mm	
Housing		187 mm x 129 mm x 46 mm	
Degree of protection		IP65	
Installation position		Cable glands downwards	
Mass		approx. 290 g	
Mounting		wall mounting	
Data for application in connection with hazardous areas			
EU-type examination certificate		PTB 98 ATEX 2210	
Marking		Ⓢ II 2G (1) Ex ia [ia Ga] IIC T4 Gb , Ⓢ II (1D) [Ex ia Da] IIIC , Ⓢ II 3G Ex ic IIC T4 Gc , Ⓢ II (3D) [Ex ic Dc] IIIC	
PROFIBUS PA			
Voltage	U_i	24 V	
Current	I_i	380 mA	
Power	P_i	5.32 W	
Rated voltage		9 ... 32 V	
Rated current		23 mA	
FDE (Fault Disconnect Equipment)		6.7 mA	
Terminal "S"		only for the connection of the cable screen (BUS) and/or the potential compensation	
Terminal "PA"		only for the connection of the cable screen (sensor interface) and/or grounding	
Grounding plate		only for the connection of the potential compensation	
Field-side			
Voltage U_o		9 V	
Current I_o		44 mA	
Power P_o		99 mW	
Directive conformity			
Directive 2014/34/EU		EN 60079-0:2012 , EN 60079-11:2012	
International approvals			

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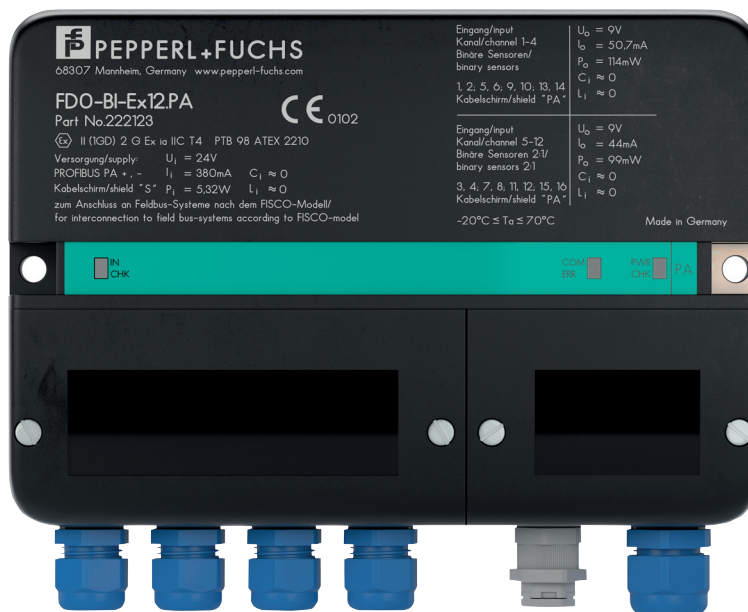
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Technical Data

IECEX approval	IECEX TUN 04.0002
Approved for	Ex ia [ia Ga] IIC T4 Gb , [Ex ia Da] IIIC , Ex ic IIC T4 Gc , [Ex ic Dc] IIIC
General information	
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



Additional Information

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Accessories

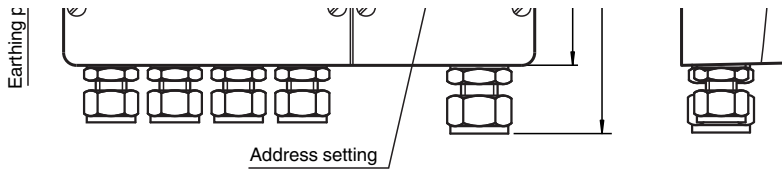
Electrical connection

Terminal 1	Sensor 1+
Terminal 2	Sensor 1-
Terminal 3	Sensor 2+, Sensor 3-
Terminal 4	Sensor 2-, Sensor 3+
Terminal 5	Sensor 4+
Terminal 6	Sensor 4-
Terminal 7	Sensor 5+, Sensor 6-
Terminal 8	Sensor 5-, Sensor 6+
Terminal 9	Sensor 7+
Terminal 10	Sensor 7-
Terminal 11	Sensor 8+, Sensor 9-
Terminal 12	Sensor 8-, Sensor 9+
Terminal 13	Sensor 10+
Terminal 14	Sensor 10-
Terminal 15	Sensor 11+, Sensor 12-
Terminal 16	Sensor 11-, Sensor 12+
Terminal +	PROFIBUS PA+
Terminal S	Shield
Terminal -	PROFIBUS PA-

Note

The device-specific master data file (DSF, German GSD) is required to be able to use this device. The file is available through the PROFIBUS User Organization or it can be downloaded from our homepage on the Internet (<http://www.pepperl-fuchs.com>).

Dimensions



LED-Assignment

- 1 CHK-centralised fault ind.
- 2 COM/ERR
- 3 PWR/CHK

Example address setting

	ON	OFF	
8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	not used
7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2^6
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2^5
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2^4
4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2^3
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2^2
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2^1
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2^0

The address setting on delivery is 40 (= $2^3 + 2^5$)

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Connectable sensors (2:1 procedure)

The 2:1 procedure allows to transfer two independent binary signals on a single wire pair without a bus system. To do this, the two sensors (or mechanical switches) are controlled and evaluated antiparallel in time multiplex mode. Due to the condition of time multiplex mode, not all NAMUR proximity switches can be operated using the 2:1 procedure.

For information regarding connectable sensor types, please contact Pepperl+Fuchs.

Some sensor types can be connected by means of additional external Polarity Reversal Protection.

Application example