BD SENSORS
pressure measurement

iS 4

Electronic OEM Pressure Switch Pneumatics with IO-Link Interface



Applications:

- Pneumatics
- Vacuum technology

Characteristics:

- nominal pressure range 0 ... 10 bar
- compact design
- IO-Link according to specification V 1.1

Technical Data

Input pressure range		
Nominal pressure gauge	[bar]	10
Overpressure	[bar]	13

Output signal / Supply	
Standard	IO-Link (measured value and status transmission) / V_S = 18 ... 30 V_{DC} SIO (switching output), status indication via LED (green)
IO-Link	V 1.1 / Slave / Smart Sensor Profile
Data transfer	COM2 38.4 kbit/s
Mode	SIO / IO-Link (COMx)
Standard	IEC 61131-2, IEC 61131-9

Performance			
Accuracy [1]	≤ ± 0.5 % FSO		
Switching current (SIO-Mode)	max. 200 mA		
Switching frequency	max. 200 Hz		
Switching cycles	> 100 x 10^6		
Long term stability	≤ ± 0.3 % FSO / year at reference conditions		
Turn-on time	SIO mode: ca. 20 msec		
Response time	SIO mode: < 4 msec		
Measuring rate	400 Hz		
[1] accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)			
Thermal effects (offset and span) / Permissible temperatures			
Tolerance band	≤ ± 2 % FSO	in compensated range 0 ... 50 °C	
TC, average	≤ ± 0.4 % FSO / 10 K	in compensated range 0 ... 50 °C	
Permissible temperatures	medium / electronics / environment: -25 ... 85 °C		storage: -40 ... 85 °C
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no function		
Electromagnetic compatibility	emission and immunity according to EN 61326		

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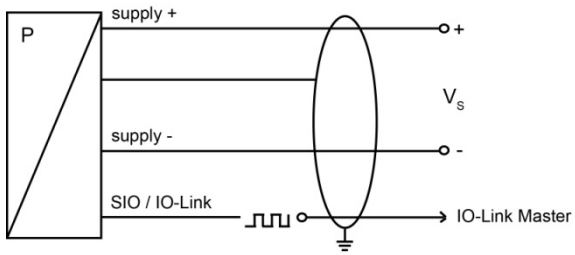
Mechanical stability		
Vibration	20 g RMS / 10 ... 2000 Hz	according to DIN EN 60068-2-6
Shock	500 g / 1 msec half sine	according to DIN EN 60068-2-27
Materials		
Pressure port	aluminium	
Housing	PA 6.6 black	
Seal	NBR	
Sensor	silicon, RTV	
Media wetted parts	pressure port, seal, sensor	
Miscellaneous		
Media	compressed air, non-aggressive gases	
Weight	approx. 25 g	
Current consumption	max. 15 mA	
Operational life	100 million load cycles	
Installation position	any	
Ingress protection	IP 54	
CE-conformity	EMC Directive: 2014/30/EU	

Wiring diagram

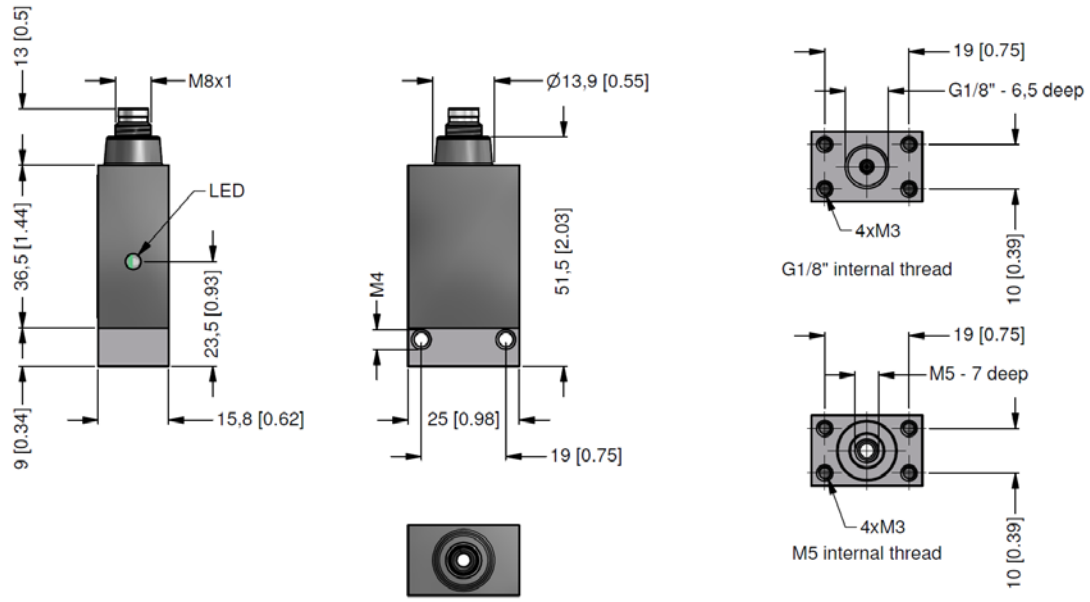


Pin configuration

Electrical connection		M8x1 / metal (4-pin)
(L+)	Supply +	1
(L-)	Supply –	3
C/Q	IO-Link (COMx) / SIO	4
	Shield	housing

Dimensions (mm / in)

Mechanical connections (view X)



IO-Link interface

1. General device information

Baud rate	COM2 (38.4 kbit/s)
Input process data length	2 byte
Minimum cycle time	5 msec
IO-Link version	V 1.1
SIO mode	yes

2. SIO mode (standard IO mode)

In this mode the sensor operates like a normal pressure sensor with standard output signals. The digital output is always on Pin 4 of the connector plug.

3. IO-Link mode (communication mode)

The pressure sensor switches into IO-Link communication mode when operating under an IO-Link master. IO-Link communication is only possible via Pin connector.

4. Process data

The process data length of the sensor is 16 bits. The switch state (BCD1) as well as the current measured values are transmitted. The 14 bits of the measured value are scaled according to the measuring range.

15 bit	14 … 2	1	0
Signed Bit	measurement	0	BCD1 / output 1

5. Error message

Error Codes	Description
0x8011	Index not available
0x8012	Subindex not available
0x8023	Access Denied
0x8030	Parameter Value out of Range
0x8033	Parameter length overrun
0x8034	Parameter length underrun

6. Event codes

	Event-Codes IO-Link 1.1	Event-Codes IO-Link 1.0	Device status	Type
No malfunction	0x0000	0x0000	0	Notification
General malfunction-unknown error	0x1000	0x1000	4	Error
Process variable range over-run - Process Data uncertain	0x8C10	0x8C10	2	Warning
Process variable range under-run. Process Data uncertain	0x8C30	0x8C10	2	Warning

7. Parameter data (The parameter data for the pressure sensor correspond to the Smart Sensor profile.)

Index hex	Subindex hex	Object name	Single Value	Default	Comment
0x02	0x00	System Commands	0x81 = delete Min-/Max-Wert 0x82 = res 0xA0 = Set0		The action is executed by writing in the subindex
0x03	0x00	Data Storage Index	0x01: Upload Start 0x02: Upload End 0x03: Download Start 0x04: Download End 0x05: Datastorage Break		
0x0C	0x00	Device Access Lock	0x00: Unlocked 0x01: IO-Link Lock 0x02: Datastorage Lock 0x04: Parameterization Lock 0x08: User Interface Lock 0x03: IO-Link Lock + Datastorage Lock 0x05: IO-Link Lock + Parameterization Lock 0x09: IO-Link Lock + User Interface Lock 0x06: Datastorage Lock + Parameterization Lock 0x0A: Datastorage Lock + User Interface Lock 0x07: Datastorage Lock + IO-Link Lock + Parameterization Lock 0x0B: Datastorage Lock + IO-Link Lock + User Interface Lock	0x00: Unlocked	
0x24	0x00	Device Status	0x00 Device is operating properly 0x02 Out-of-Specification 0x04 Failure		
0x3D	0x02	Switch Point mode	0x80: Hysteresis NO 0x81: Hysteresis NC 0x82: Window NO 0x83: Window NC	0x80: HNo	

Index hex	Subindex hex	Object name	Access	Length	Value Range	Gradient	Unit	Default
0x3C	0x01	SetPoint 1 = SP	R/W	2 Byte	Process Data			100%
0x3C	0x02	SetPoint 2 = rP	R/W	2 Byte	Process Data			0%
0xD0	0x00	Delay Switching Time	R/W	2 Byte	0 ... 500	0.1	sec	0
0xD1	0x00	Delay Back Switching Time	R/W	2 Byte	0 ... 500	0.1	sec	0
0xD5	0x00	Min Pressure Value	R	2 Byte	Process Data			
0xD6	0x00	Max Pressure Value	R	2 Byte	Process Data			
0xD7	0x00	Measure damping	R/W	2 Byte	0…1000 in 10 ms steps	1	msec	0

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Ordering code iS 4

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Pressure																	
gauge	6	8	S														
Input	**[bar]**																
10				1	0	0	2										
customer				9	9	9	9										consult
Signal output																	
IO-Link / SIO								IO									
Electrical connection																	
M8x1 (4-pin) / metal									Q	0	0						
customer									9	9	9						consult
Mechanical connection																	
G1/8" internal thread												Q	0	0			
M5 internal thread with slot for O-ring [1]												R	0	0			
customer												9	9	9			consult
Seals																	
NBR															5		
customer															9		consult
Special version																	
standard																0 0 0	
customer																9 9 9	consult

[1] suitable for flange installation

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