



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) / $V_S = 18 \dots 30 V_{DC}$ 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	$\leq \pm 0.5 \% \text{ FSO}$
Switching current (SIO-Mode)	max. 200 mA
Switching frequency	max. 200 Hz
Switching cycles	$> 100 \times 10^6$
Long term stability	$\leq \pm 0.3 \% \text{ FSO} / \text{year}$ at reference conditions
Turn-on time	SIO mode: ca. 20 msec
Response time	SIO mode: $< 4 \text{ msec}$
Measuring rate	400 Hz
¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)	
Thermal effects (offset and span) / Permissible temperatures	
Tolerance band	$\leq \pm 2 \% \text{ FSO}$ in compensated range 0 ... 50 °C
TC, average	$\leq \pm 0.4 \% \text{ FSO} / 10 \text{ K}$ 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

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		
<p>The wiring diagram shows a pressure switch symbol with a diagonal line and 'P' inside. It has three main input lines: 'supply +', 'supply -', and 'SIO / IO-Link'. The 'supply +' line connects to a terminal marked '+'. The 'supply -' line connects to a terminal marked '-'. The 'SIO / IO-Link' line connects to a terminal marked 'IO-Link Master' with a square-wave pulse symbol. A ground symbol is also shown connected to the IO-Link Master terminal. A voltage source V_s is indicated between the supply terminals.</p>		
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)		
<p>The mechanical drawings show the pressure switch from three perspectives: a side view, a front view, and a top view of the mechanical connections (view X). - Side view: Shows a total height of 13 [0.5] mm for the top section, a main body height of 36.5 [1.44] mm, and a base height of 9 [0.34] mm. The pressure port is M8x1. An LED is located 23.5 [0.93] mm from the top of the main body. The base diameter is 15.8 [0.62] mm. - Front view: Shows a diameter of $\varnothing 13.9$ [0.55] mm for the top section, a main body diameter of 51.5 [2.03] mm, and a base diameter of 25 [0.98] mm. The base has M4 mounting holes. The distance between the mounting holes is 19 [0.75] mm. - Mechanical connections (view X): Shows two top views of the connection plate. The upper view has a diameter of 19 [0.75] mm, G1/8" - 6.5 deep threads, and 4xM3 mounting holes. The lower view has a diameter of 19 [0.75] mm, M5 - 7 deep threads, and 4xM3 mounting holes. Both views show a distance of 10 [0.39] mm from the center to the mounting holes.</p>		

IO-Link interface									
1. General device information			4. Process data						
Baud rate	COM2 (38.4 kbit/s)		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.						
Input process data length	2 byte								
Minimum cycle time	5 msec								
IO-Link version	V 1.1								
SIO mode	yes	Signed Bit	15 bit	14 ... 2	1	0			
2. SIO mode (standard IO mode)			5. Error message						
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.			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					
3. IO-Link mode (communication mode)			6. Event codes						
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.					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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