

Double sheet sensor

UDC-18GS-3EP1-IO-0,2M-V19

- Ultrasonic system for reliable detection of no, one, or two overlapping sheet materials
- Insensitive to printing, colors, and shining surfaces
- Very wide material spectrum, finest papers up to thin sheet metals as well as plastic- and metal foils
- Perpendicular or inclined sensor mounting relative to the sheet plane possible
- Integrated alignment aid
- IO-Link Interface for process data, parameterization and diagnosis
- Synchronization options
- No TEACH-IN required
- Short version



Function

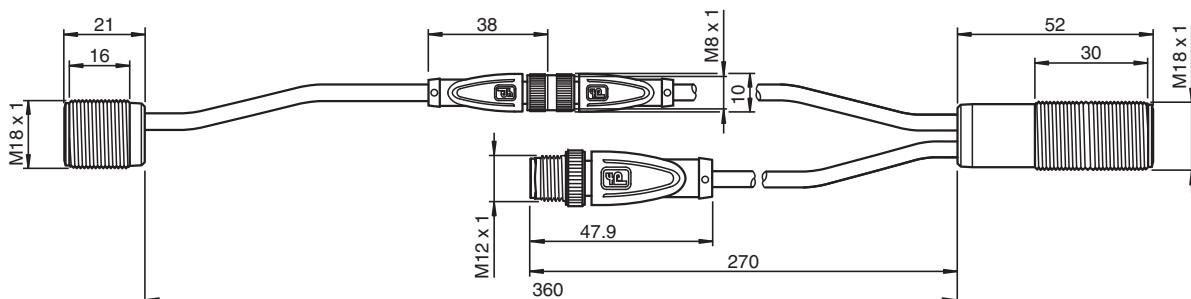
The ultrasonic double-sheet detector is used wherever automatic differentiation between single and double sheets is necessary to protect machines or prevent rejects. The double sheet detection is based on the ultrasonic thru-beam principle.

The following situations can be detected:

- No sheet, i. e. air
- Single sheet
- Double sheet or multiple sheets (a statement on the number of sheets is not possible here)

The signals are evaluated by a microprocessor system. As a result of the evaluation, corresponding switching outputs are set and the result of the evaluation is communicated via the IO-Link interface.

Dimensions



Technical Data

General specifications

Sensing range 20 ... 60 mm, optimal distance: 45 mm

Transducer frequency approx. 255 kHz

Memory

Non-volatile memory EEPROM

Write cycles 300000

Indicators/operating means

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

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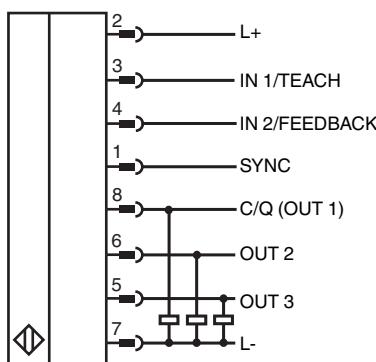
Technical Data

LED green	indication: single sheet detected flashing (1 Hz) - standby mode flashing with short break (1 Hz) - IO-Link mode	
LED yellow	indication: no sheet detected (Air)	
LED red	indication: double sheet detected flashing: device error	
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC , ripple 10 % _{SS}
No-load supply current	I_0	≤ 40 mA
Power consumption	P_0	≤ 550 mW
Time delay before availability	t_v	≤ 300 ms
Interface		
Interface type	IO-Link	
IO-Link revision	1.1	
Device profile	Identification and Diagnosis - I&D	
Process data	Input: 16 Bit - measurement value 8 Bit - selected threshold set 2 Bit - switching signals 3 Bit Output: 8 Bit - threshold set 2 Bit - disable transducer 1 Bit	
Vendor ID	1 (0x0001)	
Device ID	3148290 (0x300A02)	
Transfer rate	COM2 (38.4 kBit/s)	
Min. cycle time	2.8 ms	
SIO mode support	yes	
Compatible master port type	Class A (use adapter cable listed in accessories) Class B (use 3-pole adapter or 3-wire cable)	
Input/Output 1		
Designation	SYNC	
Input/output type	1 synchronization connection, bidirectional	
0 Level	0 ... 1 V	
1 Level	2.5 V ... U_B	
Input impedance	> 22 k Ω	
Output rated operating current	current source < 2.5 mA	
Pulse length	0.4 ... 3 ms with external control, low active	
Synchronization frequency		
Common mode operation	≤ 230 Hz	
Multiplex operation	≤ 230 Hz / n , n = number of sensors , $n \leq 10$	
Input/Output 2		
Designation	IN2/FEEDBACK	
Input/output type	input or output programmable via IO-Link : input for selection of a threshold set (factory default) output as feedback output	
Input type	digital input	
Signal	0-level: 0 ... +1 V 1-level: + U_B - 1 V ... + U_B	
Input impedance	≥ 60 k Ω	
Pulse length	≥ 100 ms	
Output type	PNP	
Rated operating current	I_e	8 mA
Voltage drop	< 3 V	
Fusing	reverse polarity protected , overload and short-circuit protected	
Input		
Designation	IN1/TEACH	
Input type	0-level: 0 ... +1 V 1-level: + U_B - 1 V ... + U_B	

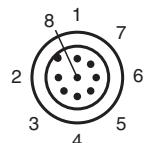
Technical Data

Pulse length	≥ 100 ms	
Impedance	≥ 60 kΩ	
Output		
Designation	OUT 1 ... 3	
Number	3	
Output function	OUT 1: single sheet detected OUT 2: double sheet detected OUT 3: no sheet detected (air)	
Output type	Push-pull (4 in 1) output , NC contact (programmable)	
Rated operating current	I _e	100 mA per output
Voltage drop	U _d	≤ 3 V
Switch-on delay	t _{on}	15 ms (programmable)
Switch-off delay	t _{off}	15 ms (programmable)
Pulse extension		can be activated (100 ms or IO-Link cycle time)
Fusing		reverse polarity protected , overload and short-circuit resistant
Compliance with standards and directives		
Standard conformity		
Standards	EN IEC 60947-5-2:2020 IEC 60947-5-2:2019 IEC 61131-9 / IO-Link V1.1.3	
Approvals and certificates		
UL approval	cULus Listed, General Purpose, Class 2 Power Source	
CCC approval	CCC approval / marking not required for products rated ≤36 V	
Ambient conditions		
Ambient temperature	0 ... 60 °C (32 ... 140 °F)	
Storage temperature	-25 ... 70 °C (-13 ... 158 °F)	
Mechanical specifications		
Connection type	fixed cable with plug	
Housing length		
Ultrasonic transmitter	21 mm	
Ultrasonic receiver	52 mm	
Housing diameter		
Ultrasonic transmitter	18 mm	
Ultrasonic receiver	18 mm	
Degree of protection	IP65	
Material		
Housing	Stainless steel 1.4305/AISI 303, polyamide plastic parts	
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam	
Connector		
Threading	M12 x 1	
Number of pins	8	
Cable		
Cable diameter	4.3 mm	
Bending radius	5 x diameter , fixed	
Material	PUR	
Color	black	
Length	L	approx. 200 mm
Mass		75 g
Tightening torque, fastening screws	max. 20 Nm	

Connection



Connection Assignment



Installation

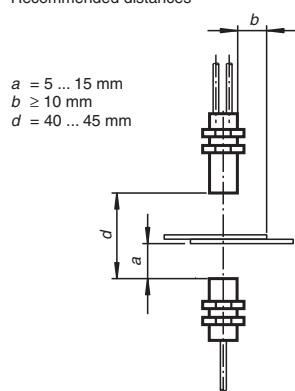
Hinweis

Only use the cables specified by Pepperl+Fuchs for this purpose to extend the connecting cable between the transmitter and receiver of the ultrasonic double sheet detectors. The use of other cables will result in impairment of the sensor function or even loss of function.

Mounting

Mounting/Adjustment

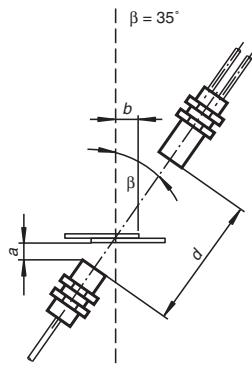
Recommended distances



Mounting

Mounting/Adjustment

(for very thick papers)



Angular misalignment



Sensor offset



Commissioning

Operating Modes

The measured object is a material inserted between the emitter and receiver. The sensor measures the damping of the emitted ultrasonic signal caused by the material.

The residual amplitude of the ultrasonic signal arriving at the receiver is evaluated in relation to the set threshold values and assigned to the corresponding state (= "air", "single sheet" or "double sheet"). The detected state is reported back via the switching outputs of the sensor and via the IO-Link process data. In the IO-Link process data, the measured amplitude is also made available as an analog value.

Depending on the application, the sensor can be operated in the following ways:

1. By selecting one of the 3 implemented threshold sets, each covering a very wide range of materials. The respective thresholds are preset but adjustable.
2. By teaching in a specific material or a specific material constellation for multi-layer materials.
3. In permanent IO-Link operation, a completely separate evaluation of the amplitude values measured by the sensor can be performed in the downstream, user-side controller in addition or as an alternative to the two aforementioned options.

Further Documentation

For detailed information on mounting, alignment and commissioning you may refer to the commissioning instruction of the sensor.

The sensor manual is also available as detailed overall documentation.

You can access the documents mentioned via the product detail page at www.pepperl-fuchs.com.

Accessories

	V19-G-BK2M-PUR-U	Female cordset single-ended M12 straight A-coded, 8-pin, PUR cable black, UL approved
	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection
	V19-G-BK0,6M-PUR-U-V1-G-YIOL	Cordset for IO-Link M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable
	MH-UDB01	Mounting bracket for double sheet monitor
	AA-UDB-18GM-01	alignment aid for double sheet sensor
	V31-GM-1M-PUR-V31-GM-UDB/UDC	Cordset M8 socket straight to M8 plug straight A-coded, 4-pin, PUR cable 3-core black, shielded, UL approved

Accessories

	V31-GM-2M-PUR- V31-GM-UDB/UDC	Cordset M8 socket straight to M8 plug straight A-coded, 4-pin, PUR cable 3-core black, shielded, UL approved
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