

Ultrasonic sensor

UB500-F42-EP-IO-V15

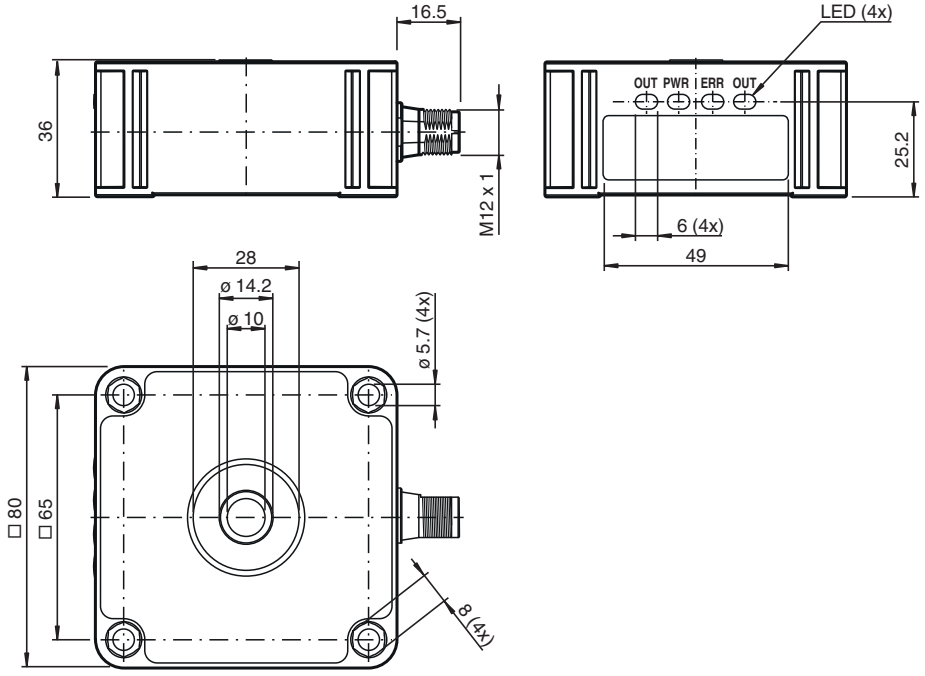
- IO-Link Interface for process data, parameterization and diagnosis
- Selectable sound lobe width
- TEACH-IN
- Synchronization options
- Push-pull output
- Degree of protection IP67

Ultrasonic sensor with IO-Link interface in cubic design and 1 push-pull output

Function

The ultrasonic sensor combines versatility with a wide range of functions and a universal measuring principle.
All functions can be conveniently parameterized via IO-Link. The adjustable sound beam width enables optimal adaptation to your application without loss of range. Process and service data can be transmitted via IO-Link, enabling easy integration into Industry 4.0 applications.

Dimensions



Technical Data

General specifications	
Sensing range	30 ... 500 mm
Adjustment range	50 ... 500 mm
Dead band	0 ... 30 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 400 kHz
Response delay	40 ms

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Technical Data

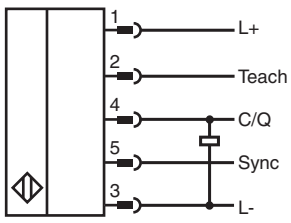
Sensor cycle time		≥ 10 ms
Temperature influence		≤ ± 0,75 % of the full-scale value 20 min after switching on
Memory		
Non-volatile memory		EEPROM
Write cycles		300000
Indicators/operating means		
LED green		solid: power on flashing: standby mode flashing with short break: IO-Link mode
LED yellow		solid: object in evaluation range flashing: switch point programming
LED red		solid: error flashing: switch point programming, object not detected fast flashes: short-circuit or overtemperature
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current	I_0	≤ 85 mA
Power consumption	P_0	≤ 1200 mW
Time delay before availability	t_v	≤ 300 ms
Interface		
Interface type		IO-Link
IO-Link revision		1.1.4
Device profile		Smart Sensor - SSP 4.1.1
Process data		Input: 32 Bit - measurement value 16 Bit - scale 8 Bit - switching signals 2 Bit
Vendor ID		1 (0x0001)
Device ID		3147521 (0x300701)
Transfer rate		COM2 (38.4 kBit/s)
Min. cycle time		3.3 ms
SIO mode support		yes
Compatible master port type		Class A (use adapter cable listed in accesories) Class B (use 3-pole adapter or 3-wire cable)
Input/Output		
Input/output type		1 synchronization connection, bidirectional
0 Level		0 ... 1 V
1 Level		2.5 V ... U_B
Input impedance		> 22 kΩ
Output current		current source < 2.5 mA
Pulse length		≥ 1 ms with external control, low active
Synchronization frequency		
Common mode operation		≤ 100 Hz
Multiplex operation		≤ 100 Hz / n , n = number of sensors , n ≤ 10
Input		
Input type		1 program input
Level (evaluation limit 1)		0 ... 0.6 V
Level (evaluation limit 2)		3.7 V ... U_B
Input impedance		> 4.7 kΩ
Pulse length		≥ 1 s
Switching output		
Output type		1 push-pull output , short-circuit protected , reverse polarity protected
Rated operating current	I_e	200 mA , short-circuit/overload protected
Switching frequency		14 Hz
Voltage drop		≤ 2.5 V

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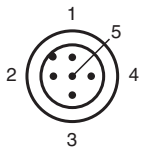
Repeat accuracy	≤ ± 0.1 % of full-scale value
Range hysteresis	1 % of the adjusted operating range (default settings), programmable , min. 1 mm
Off-state current	≤ 100 µA
Compliance with standards and directives	
Standard conformity	
Standards	EN 60947-5-2 IEC 61131-9 / IO-Link V1.1.4
Approvals and certificates	
UL approval	cULus Listed, Class 2 Power Source
CCC approval	CCC approval / marking not required for products rated ≤36 V
Ambient conditions	
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications	
Connection type	Connector plug
Degree of protection	IP67
Material	
Housing	PC-GF10
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Connector	
Threading	M12 x 1
Number of pins	5
Material	Diecast zinc
Mass	135 g
Tightening torque, fastening screws	max. 3 Nm
Dimensions	
Height	36 mm
Width	80 mm
Length	80 mm
Factory settings	
Output	near switch point: 50 mm far switch point: 500 mm Output mode: Window mode Output logic: normally open
Beam width	wide

Connection Assignment



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Connection Assignment

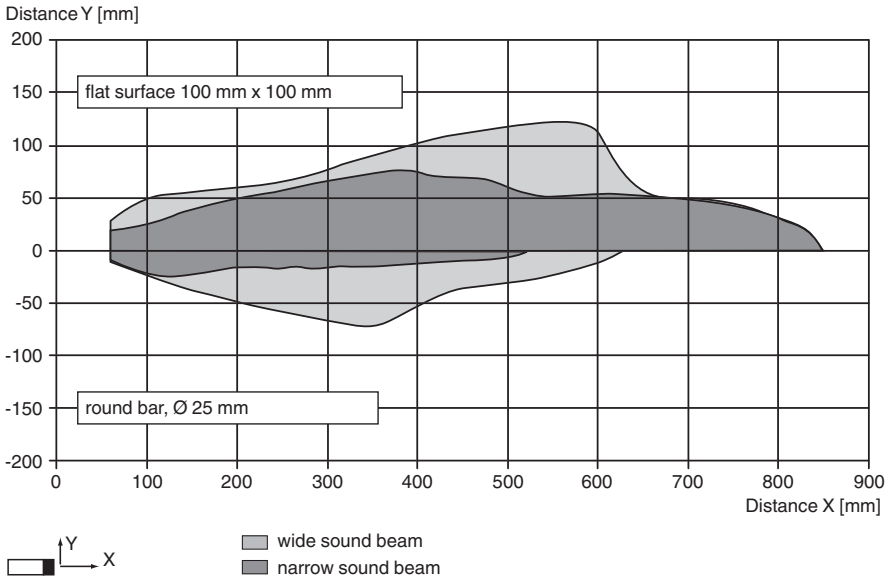


Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)
5	GY	(gray)

Characteristic Curve

Characteristic response curve

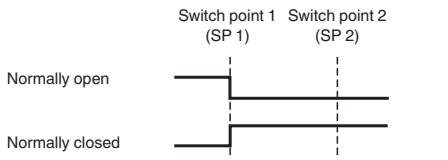


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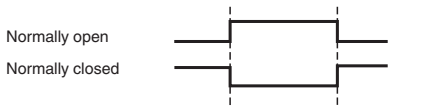
Characteristic Curve

Switching output modes

1. Switch point mode



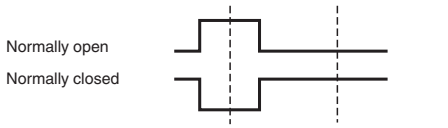
2. Window mode



3. Hysteresis mode



4. Retroreflective mode



Operation

The sensor features a synchronization input (Sync) for suppressing ultrasonic mutual interference („crosstalk“).
The following synchronization modes are available:
1. Automatic multiplex mode
2. Automatic common mode
3. Externally controlled synchronization

Documentation

For information on programming and synchronisation you may refer to the commissioning instruction.

Programming

The sensor features 1 switching output with 2 programmable switch points. Programming the switch points, the output mode, the output logic and the beam width can be done in 2 different ways:

- Using the sensor’s "Teach" input.
- Using the IO-link interface of the sensor.
  This method requires an IO-link master (e.g. IO-link-Master02-USB) and the associated software.
  The download link is available on the product page for the sensor at www.pepperl-fuchs.

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