

Single head system



## **Dimensions**



Bore hole and countersinking for screws/hexagon M4



# **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. 380 kHz
Response delay	≤ 50 ms
Indicators/operating means	

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

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LED green       solid green: monitoring system green flashing: program function, object detected         LED yellow       solid yellow; chipest in the veluation range yellow; flashing: program function, object detected         LED red       flashing: program function; object detected permanently; program function to object detected permanently; program mode, object uncertain         Electrical specifications       1         Dorrating voltage       %         No-load supply current       %         Synchronization frequency       %         Synchronization frequency       1         Synchronization frequency       max. 100 Hz         Common mode operation       max. 100 Hz         Multiplex operation       5 100 / HZ, n = number of sensors         Input       1         Multiplex operation       5 100 / HZ, n = number of sensors         Input       1         Portup       1         Output type       9         Output type       1	Technical Data		
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LED red         flashing: program function: no object detected permanently: Program function: no object detected permanently: Program mode, object uncertain           Electrical specifications         Ua         1530 V DC, ripple 10 %ss           Doparating voltage         Ua         55 mA           Input/Output         55 mA           Synchronization         1 synchronous input 0 level: Ua+1 V, 1 level: 4440g, input fingedance: > 12 KOhm synchronization pubse: 0.18 ms           Synchronization frequency	-		green flashing: program function
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Default setting       evaluation limit A1: 50 mm evaluation limit A2: 500 mm         Resolution       0.11 mm         Deviation of the characteristic curve       ± 1 % of full-scale value         Repeat accuracy       ± 0.1 % of full-scale value         Load impedance       ≥ 1 kOhm         Temperature influence       ± 1.5 % of full-scale value         Compliance with standards and directives         Standard conformity       Image: Compliance with standards and directives         Standards       EN 60947-5-2:2007+A1:2012 EN 60947-5-7:2003 IEC 60947-5-7:2003         Approvals and certificates       EN CO1020/2011 TR CU 020/2011         EAC conformity       TR CU 020/2011 TR CU 037/2016         UL approval       cULus Listed, General Purpose         CSA approval       cCSA aus Listed, General Purpose         CCC approval       CCC approval / marking not required for products rated ≤36 V	Output		
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Standard conformity       Image: Conformity         Standards       EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012 EN 60947-5-7:2003 IEC 60947-5-7:2003         Approvals and certificates       TR CU 020/2011 TR CU 020/2011         EAC conformity       TR CU 020/2011 TR CU 037/2016         UL approval       cULus Listed, General Purpose         CSA approval       cCSAus Listed, General Purpose         CCC approval       CCC approval / marking not required for products rated ≤36 V	Temperature influence		± 1.5 % of full-scale value
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	CSA approval		cCSAus Listed, General Purpose
Ambient conditions	CCC approval		CCC approval / marking not required for products rated ≤36 V
And the conditions	Ambient conditions		
Ambient temperature -25 70 °C (-13 158 °F)	Ambient temperature		-25 70 °C (-13 158 °F)
Storage temperature -40 85 °C (-40 185 °F)			
Mechanical specifications	Mechanical specifications		
Connection type Connector plug M12 x 1 , 5-pin			Connector plug M12 x 1 , 5-pin
Degree of protection IP65			
Material			
Housing ABS	Housing		ABS
Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam	-		epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass 100 g	Mass		100 g

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

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## Connection

Standard symbol/Connections: (version U)

(	,	1	(BN)	• + U <sub>B</sub>
		2	(WH)	<ul> <li>Teaching input</li> </ul>
U		5	(GY)	<ul> <li>Synchronous</li> </ul>
		4	(BK)	
		3	(BU) 🗗	Analog output
		_		U <sub>D</sub>

Core colours in accordance with EN 60947-5-2.

# **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

Distance Y [m] 0.20 0.15 0.10 1 0.05 2 0.00 -0.05 -0.10 -0.15 -0.20 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 Distance X [m] Y . Х

Curve 1: flat surface 100 mm x 100 mm Curve 2: round bar, Ø 25 mm

## Programming the analog output mode



# UB-PROG2 Programming unit V15-G-2M-PVC Female cordset, M12, 5-pin, PVC cable

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



# **Additional Information**

### Synchronisation

The sensor features a synchronisation input for the suppression of mutual interference. If this input is not used, the sensor will operate using an internally generated clock rate. The synchronisation of multiple sensors can be realised as follows: External synchronisation:

The sensor can be synchronised by the external application of a square wave voltage. A synchronisation pulse at the synchronisation input starts a measuring cycle. The pulse must have a duration greater than 100  $\mu$ s. The measuring cycle starts with the falling edge of a synchronisation pulse. A low level > 1 s or an open synchronisation input will result in the normal operation of the sensor. A high level at the synchronisation input disables the sensor.

Two operating modes are available:

1. Multiple sensors can be controlled by the same synchronisation signal. The sensors are synchronised.

2. The synchronisation pulses are sent cyclically to individual sensors. The sensors operate in multiplex mode.

## Internal synchronisation:

The synchronisation connections of up to 5 sensors capable of internal synchronisation are connected to one another. When power is applied, these sensors will operate in multiplex mode.

The response delay increases according to the number of sensors to be synchronised.

Synchronisation cannot be performed during TEACH-IN and vice versa. The sensors must be operated in an unsynchronised manner to teach the evaluation limits.

### Note:

If the option for synchronisation is not used, the synchronisation input has to be connected to ground (0V) or the sensor has to be operated via a V1 cable connector (4-pin).

### Adjusting the evaluation range (analogue output)

The ultrasonic sensor has an analogue output with programmable evaluation limits. These are set by applying the supply voltage  $-U_B$  or  $+U_B$  to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. The lower evaluation limit A1 is taught with  $-U_B$ , A2 with  $+U_B$ .

Two different output functions can be set:

- 1. Analogue value increases with rising distance to object (rising ramp)
- 2. Analogue value falls with rising distance to object (falling rampe)

## TEACH-IN rising ramp (A1 > A2)

- Position object at lower evaluation limit
- TEACH-IN lower limit A1 with UB
- · Position object at upper evaluation limit
- TEACH-IN upper limit A2 with + U<sub>B</sub>

## TEACH-IN falling ramp (A1 > A):

- Position object at lower evaluation limit
- TEACH-IN lower limit A2 with + UB
- Position object at upper evaluation limit
- TEACH-IN upper limit A1 with U<sub>B</sub>

#### **LED Displays**

Displays in dependence on operating mode	Red LED	Yellow LED	Green LED
TEACH-IN evaluation limit Object detected No object detected Object uncertain (TEACH-IN invalid)	off flashes on	flashes off off	flashes flashes flashes
Normal mode (evaluation range)	off	on	on
Fault	flashes	previous state	off

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