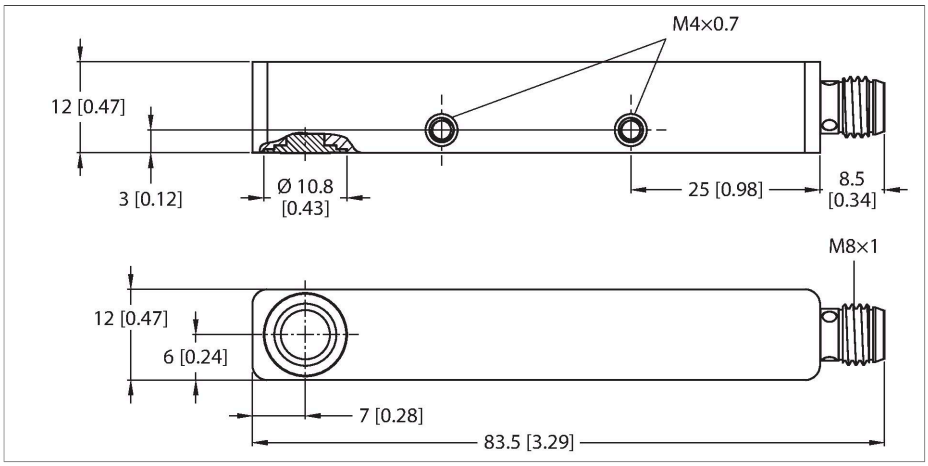
RU20U-Q12S-UN8X-V1141
Ultrasonic Sensor – Diffuse Mode Sensor



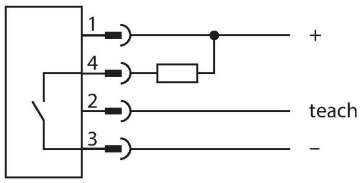
Technical data

Type	RU20U-Q12S-UN8X-V1141
ID	100005606
Ultrasonic data	
Function	Proximity switch
Range	20…200 mm
Resolution	1 mm
Minimum switching range	5 mm
Ultrasound frequency	300 kHz
Repeat accuracy	≤ 0.25 % of full scale
Temperature drift	± 1 % of full scale
Linearity error	≤ ± 0.8 %
Approach speed	≤ 3 m/s
Pass speed	≤ 0.6 m/s
Electrical data	
Operating voltage U_B	18…30 VDC
Residual ripple	10 % U_{ss}
No-load current	≤ 40 mA
Load resistance	≤ 1000 Ω
Residual current	≤ 0.1 mA
Response time typical	< 100 ms
Readiness delay	≤ 300 ms
Communication protocol	IO-Link
Output function	NO/NC, NPN
Output 1	Switching output or IO-Link mode
Switching frequency	≤ 20 Hz
Hysteresis	≤ 2 mm
Voltage drop at I_e	≤ 2 V

Features

- Smooth sonic transducer face
- Rectangular housing Q12S, potted
- Lateral light emission
- Connection via M8 × 1 male connector
- Teach range adjustable via connection cable or via IO-Link
- Blind zone: 2 cm
- Range: 20 cm
- Resolution: 1 mm
- Aperture angle of sonic cone: ±9 °
- Switching output, NPN
- NO/NC programmable
- IO-Link

Wiring diagram



Functional principle

Ultrasonic sensors capture a multitude of objects contactlessly and wear-free with ultrasonic waves. It does not matter whether the object is transparent or opaque, metallic or non-metallic, firm, liquid or powdery. Even environmental conditions such as spray, dust or rain hardly affect their function.

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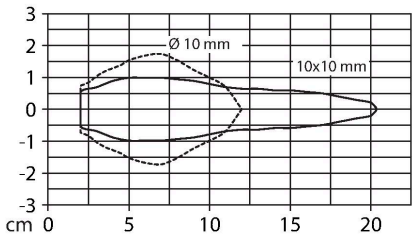
Technical data

Short-circuit protection	yes
Reverse polarity protection	yes
Setting option	Remote Teach IO-Link
IO-Link	
IO-Link specification	V 1.1
IO-Link port type	Class A
Communication mode	COM 2 (38.4 kBaud)
Process data width	16 bit
Measured value information	15 bit
Switchpoint information	1 bit
Frame type	2.2
Minimum cycle time	2 ms
Function pin 4	IO-Link
Function Pin 2	DI
Maximum cable length	20 m
Profile support	Smart Sensor Profile
Included in the SIDI GSDML	Yes
Mechanical data	
Design	Rectangular, Q12
Radiation direction	side
Dimensions	82 x 12 x 12 mm
Housing material	Metal, AL, Anodized
Transducer material	Plastic, Epoxyd resin and PU foam
Electrical connection	Connector, M8 × 1, 4-wire
Ambient temperature	-25…+70 °C
Storage temperature	-25…+70 °C
Pressure resistance	0.5…5 bar
Protection class	IP67
Switching state	LED, Yellow
Tests/approvals	
MTTF	578 years acc. to SN 29500 (Ed. 99) 40 °C
Declaration of conformity EN ISO/IEC	EN 60947-5-2
Shock test	30 g, 11 ms/10…55 Hz, 1.0 mm shock/vibration according to EN 60947-5-2
Approvals	CE cULus

The sonic cone diagram indicates the detection range of the sensor. In accordance with standard EN 60947-5-2, quadratic targets in a range of sizes (20 × 20 mm, 100 × 100 mm) and a round rod with a diameter of 27 mm are used.
Important: The detection ranges for other targets may differ from those for standard targets due to the different reflection properties and geometries.

Sonic Cone



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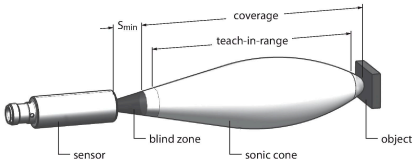
Mounting instructions

Mounting instructions/Description



Setting the switching point
The ultrasonic sensor features a switching output with a teachable switching point. The yellow LED indicates whether the sensor has detected the object.

One switching point is taught. This must be within the detection range. In this operating mode the background is suppressed.

Teach
• Position the object at the beginning of the switching range
• Bridge pin 2 with the Ub for 2…7 seconds
• Position the object at the end of the switching range
• Bridge pin 2 with the Ub for 8…11 seconds

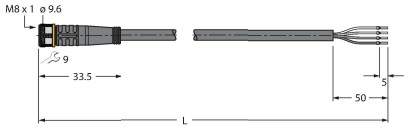
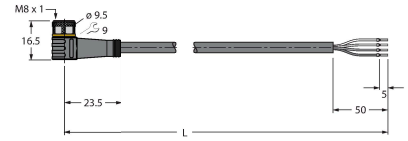
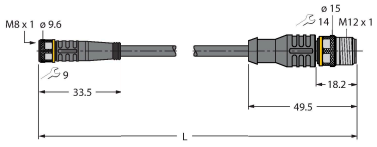
After a successful teach-in, the yellow LED flashes at 2 Hz and the sensor runs automatically in normal operating mode.

Inverting the output function
• Bridge pin 2 with the Ub for 12…17 seconds

After a successful teach-in, the yellow LED flashes at 2 Hz (NO contact) or 5 Hz (NC contact) and the sensor runs automatically in normal operating mode.

LED behavior
In normal operating mode, the LED signals the switching state of the sensor.
• Yellow: object within the switching range
• Off: object outside the detection range or signal loss

Accessories

Dimension drawing	Type	ID	
	PKG4M-2/TEL	6625061	Connection cable, M8 female connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval
			
	PKW4M-2/TEL	6625067	Connection cable, M8 female connector, angled, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval
			
	PKG4M-2-RSC4.4T/TXL	6627063	Extension cable, M8 female connector, straight, 4-pin to M12 male connector, straight, 4-pin, cable length: 2 m, jacket material: PUR, black; cULus approval
			

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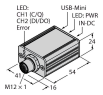
Accessories

Dimension drawing	Type	ID	
	TBEN-S2-4IOL	6814024	Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A
	USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port