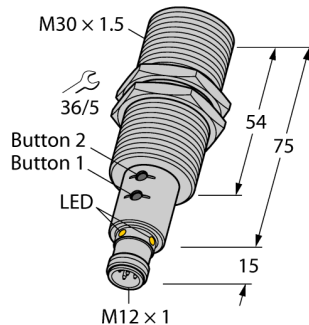


Ultrasonic Sensor

Diffuse Mode Sensor

RU300U-EM30E-LIU2PN8X2T-H1151/3GD



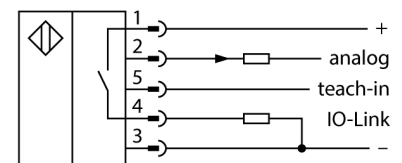
Type designation	RU300U-EM30E-LIU2PN8X2T-H1151/3GD
Ident-No.	1610074

Function	Ultrasonic diffuse mode sensor
Range	300...3000 mm
Resolution	1 mm
minimum measuring range	250 mm
minimum switching range	25 mm
Ultrasound frequency	120 kHz
Repeat accuracy	0.15 % of full scale
Temperature drift	1.5% of full scale
Linearity error	≤ ± 0.5 %
Edge lengths of the nominal actuator	100 mm
Approach speed	≤ 11 m/s
Pass speed	≤ 4.2 m/s

Operating voltage	15...30 VDC
Residual ripple	10 % U _{in}
DC rated operational current	≤ 150 mA
No-load current I ₀	≤ 50 mA
Load resistance	≤ 1000 Ω
Residual current	≤ 0.1 mA
Response time typical	190 ms
Readiness delay	300 ms
Communication protocol	IO-Link
Output function	NO/NC, PNP/NPN, analog output
Output 1	Switching output or IO-Link mode
Output 2	Analog output
Current output	4...20 mA
Load resistance, current output	≤ 0.5 kΩ
Voltage output	0...10V
Load resistance voltage output	≥ 1 kΩ
Switching frequency	3.3 Hz
Hysteresis	≤ 25 mm
Voltage drop at I ₀	≤ 2.5 V
Short-circuit protection	yes/ Cyclic
Reverse polarity protection	yes
Wire breakage protection	yes

- Smooth sonic transducer face
- Cylindrical housing M30, potted
- Connection via M12 x 1 male
- Measuring range adjustable via teach button/Easy-Teach
- Temperature compensation
- Blind zone: 30 cm
- Range: 300 cm
- Resolution: 1 mm
- Sonic cone angle: 15°
- 1 x switching output, PNP/NPN
- 1 x analog output, 4...20 mA / 0...10V / additional switching output, PNP/NPN
- NO/NC programmable
- Transmission of process value and parametrization via IO-link
- ATEX II 3 G approval
- Gases and vapors IIC group, zone 2
- IIIC group, zone 22, dusts
- When used in hazardous areas, the special conditions of the approval must be observed
- Safety clips to prevent inadvertent detachment of live cable included

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.

The sonic cone diagram indicates the detection range of the sensor. In accordance with standard EN 60947-5-7, quadratic targets in a range of sizes (20 x 20 mm, 100 x 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

Ultrasonic Sensor

Diffuse Mode Sensor

RU300U-EM30E-LIU2PN8X2T-H1151/3GD

IO-Link

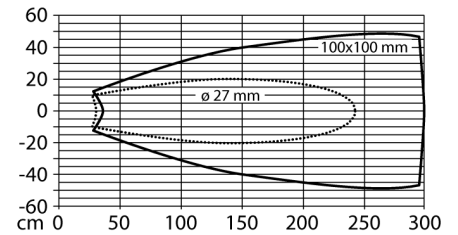
IO-Link specification	V 1.1
IO-Link port type	Class A
Communication mode	COM 2 (38.4 kBaud)
Process data width	16 bit
Measured value information	15 bit
Switchpoint information	1 bit
Frame type	2.2
Minimum cycle time	2 ms
Function Pin 4	IO-Link
Function Pin 2	DI
Maximum cable length	20 m
Profile support	Smart Sensor Profil
Included in the SIDI GSDML	Yes

Design

Radiation direction	Threaded barrel, M30 straight
Dimensions	89 x Ø 30 mm
Housing material	Stainless steel, V4A 1.4404 (AISI 316L)
Transducer material	Plastic, Epoxyd resin and PU foam
Electrical connection	Connector, M12 x 1, 5-wire
Protection class	IP67
Ambient temperature	-25...+45 °C
Storage temperature	-40...+80 °C
Declaration of conformity EN ISO/IEC	EN 60947-5-7
Vibration resistance	IEC 60068-2
MTTF	191 years
MTTF note	acc. to SN 29500 (Ed. 99) 40 °C
Device marking	II 3G Ex nA nC IIC T6 Gc/II 3D Ex tc IIIC T70 °C Dc

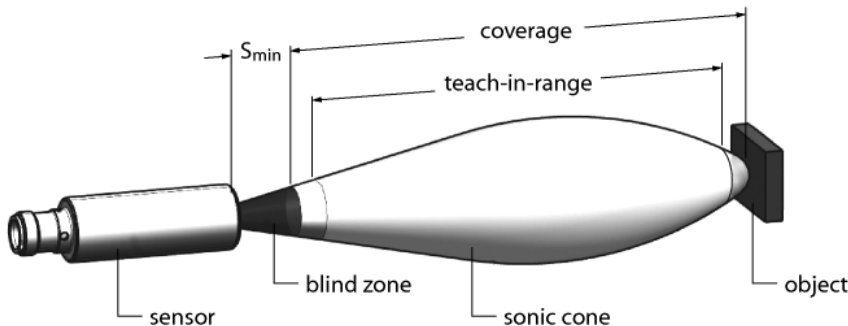
Switching state

LED, Yellow	
Object detected	LED, Green



Ultrasonic Sensor Diffuse Mode Sensor RU300U-EM30E-LIU2PN8X2T-H1151/3GD

Mounting instructions/Description



Setting the limit values

The ultrasonic sensor can be parameterized in such a way that you can either set a teachable measuring and switching range via an analog and a switching output, or switching ranges via two switching outputs. These settings are done with the Easy-Teach adapter or with the buttons at the sensor. The green and yellow LEDs indicate whether the sensor has detected the object.

Various functions such as single switchpoint, window mode or reflection mode to a fixed target can be taught. Further information is described in the operating instructions. How to set the window mode by teaching two limits is described below. These two limits form the switching window and can be selected freely within the detection range.

Easy-Teach

- Connect the teach adapter TX1-Q20L60 between the sensor and connection cable
- Position object for the first limit value
- Press and hold the select button for output 1 or 2 for 2 or 8 s against Gnd
- Press and hold the select button for 8 s against Gnd to teach the first limit value
- Position object for the second limit value
- Press and hold button for at least 2 s against Gnd

Teach button

- Position object for the first limit value
- Press and hold button 1 to select output 1 or 2 for 2 or 8 s against Gnd
- Press and hold button 1 for at least 8 s
- Position object for the second limit value
- Press and hold button 1 for at least 2 s

LED response

Successful teaching is indicated by a fast flashing green LED. The sensor then automatically runs in normal operating mode. Unsuccessful teach-in is indicated by the LED flashing alternately green and yellow. In normal operating mode, both LEDs signal the switching state of output 1.

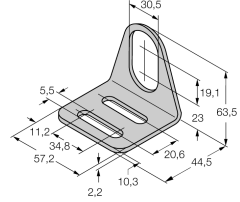
- Green: Object is within the detection range but not in the switching range
- Yellow: Object is within the switching range
- Off: Object is outside the detection range or signal loss

Ultrasonic Sensor

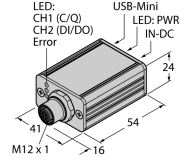
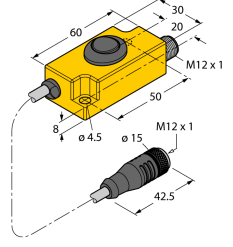
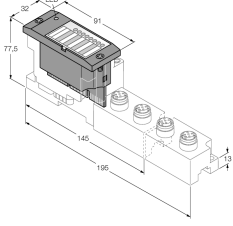
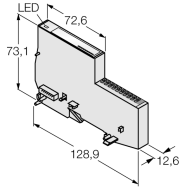
Diffuse Mode Sensor

RU300U-EM30E-LIU2PN8X2T-H1151/3GD

Accessories

Type code	Ident-No.	Description	Dimension drawing
MW-30	6945005	Mounting bracket for threaded barrel sensors; material: Stainless steel A2 1.4301 (AISI 304)	

Function accessories

Type code	Ident-No.	Description	Dimension drawing
USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port	
TX1-Q20L60	6967114	Teach adapter for inductive encoders, linear position, angle, ultrasonic and capacitive sensors	
BL67-4IOL	6827386	4-channel IO-Link Master module for the modular BL67 I/O-system	
BL20-E-4IOL	6827385	IO-Link master module for the modular BL20 I/O system, 4-channel	

Type code	Ident-No.	Description	Dimension drawing
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	Technical drawing of the TBEN-S2-4IOL module. The top view shows a rectangular module with dimensions 117.9 mm (length) and 54.3 mm (width). It features four circular connectors labeled P1, C3, C1, C2, M1, and P40. The side view shows a height of 12.6 mm and a mounting bracket with dimensions 117.9 mm and 54.3 mm.
BL20-E-4IOL-10	100001334	IO-Link master module for the modular BL20 I/O system, 4-channel	Technical drawing of the BL20-E-4IOL-10 module. The 3D perspective view shows a rectangular module with dimensions 128.9 mm (length), 73.1 mm (height), and 12.6 mm (width). It features an LED indicator and a mounting bracket with dimensions 128.9 mm and 73.1 mm.