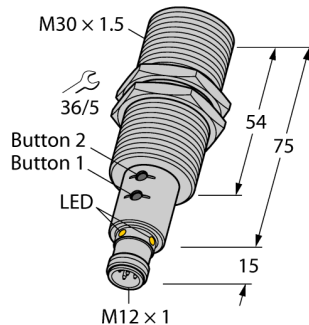


# Ultrasonic Sensor

## Diffuse Mode Sensor

### RU300U-M30E-LIU2PN8X2T-H1151



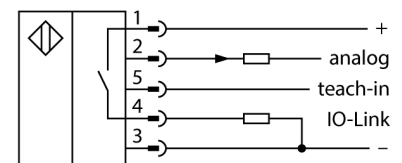
- Smooth sonic transducer face
- Cylindrical housing M30, potted
- Connection via M12 x 1 male
- Measuring range adjustable via teach button/Easy-Teach
- Temperature compensation
- Blind zone: 30 cm
- Range: 300 cm
- Resolution: 1 mm
- Sonic cone angle: 15°
- 1 x switching output, PNP/NPN
- 1 x analog output, 4...20 mA / 0...10V / additional switching output, PNP/NPN
- NO/NC programmable
- Transmission of process value and parametrization via IO-link

**Type designation** RU300U-M30E-LIU2PN8X2T-H1151  
**Ident-No.** 1610048

**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 %  $U_n$   
**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

#### Wiring Diagram



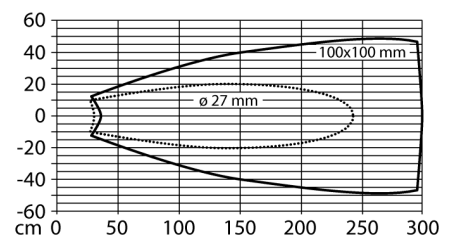
#### Functional principle

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-M30E-LIU2PN8X2T-H1151

## 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

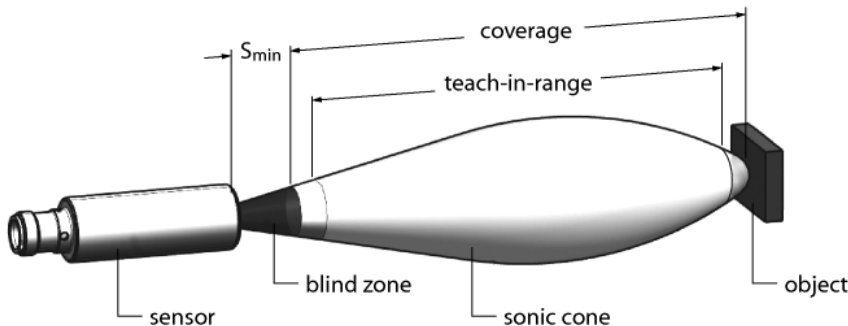
|                                      |                                   |
|--------------------------------------|-----------------------------------|
| Radiation direction                  | Threaded barrel, M30<br>straight  |
| Dimensions                           | 89 x Ø 30 mm                      |
| Housing material                     | Metal, CuZn, Nickel-plated        |
| Transducer material                  | Plastic, Epoxyd resin and PU foam |
| Electrical connection                | Connector, M12 × 1, 5-wire        |
| Protection class                     | IP67                              |
| Ambient temperature                  | -25...+70 °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   |

## Switching state

|                 |             |
|-----------------|-------------|
| LED, Yellow     | LED, Yellow |
| Object detected | LED, Green  |

# Ultrasonic Sensor Diffuse Mode Sensor RU300U-M30E-LIU2PN8X2T-H1151

## 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.

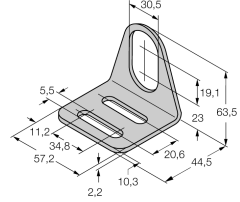
- Green: Object is within the detection range but not in the switching range
- Yellow: Object is within the switching range
- Off: Object is outside the detection range or signal loss

# Ultrasonic Sensor

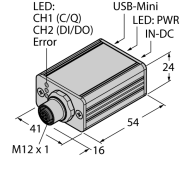
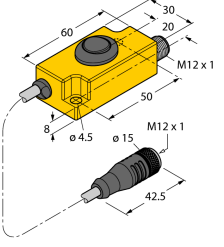
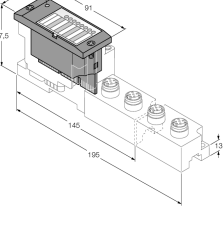
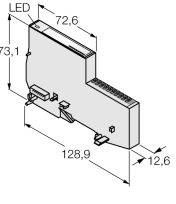
## Diffuse Mode Sensor

### RU300U-M30E-LIU2PN8X2T-H1151

#### Accessories

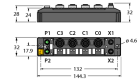
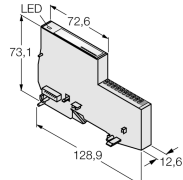
| Type code | Ident-No. | Description                                                                                  | Dimension drawing                                                                   |
|-----------|-----------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 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                                |  |

# Ultrasonic Sensor Diffuse Mode Sensor RU300U-M30E-LIU2PN8X2T-H1151

## Function accessories

| 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 |  |
| BL20-E-4IOL-10 | 100001334 | IO-Link master module for the modular BL20 I/O system, 4-channel                                       |  |