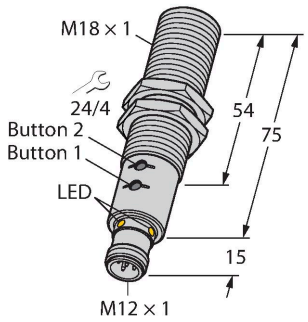
# RU130U-EM18E-LIU2PN8X2T-H1151/3GD
# Ultrasonic Sensor – Diffuse Mode Sensor



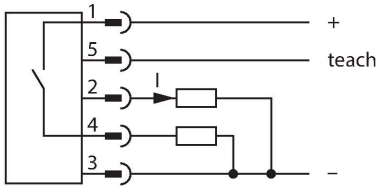
## Technical data

| | |
|---|---|
| Type | RU130U-EM18E-LIU2PN8X2T-H1151/3GD |
| ID | 1610072 |
| **Ultrasonic data** | |
| Function | Proximity switch |
| Range | 150…1300 mm |
| Resolution | 1 mm |
| Minimum measuring range | 100 mm |
| Minimum switching range | 10 mm |
| Ultrasound frequency | 200 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 | ≤ 10 m/s |
| Pass speed | ≤ 2 m/s |
| **Electrical data** | |
| Operating voltage $U_B$ | 15…30 VDC |
| Residual ripple | 10 % $U_{ss}$ |
| DC rated operating current $I_e$ | ≤ 150 mA |
| No-load current | ≤ 50 mA |
| Load resistance | ≤ 1000 Ω |
| Residual current | ≤ 0.1 mA |
| Response time typical | < 90 ms |
| Readiness delay | ≤ 300 ms |
| Communication protocol | IO-Link |
| Output function | NO/NC, PNP/NPN, analog output |

## Features

- Smooth sonic transducer face
- Cylindrical housing M18, potted
- Connection via M12 x 1 male
- Teach range adjustable via pushbutton or adapter
- Temperature compensation
- Blind zone: 15 cm
- Range: 130 cm
- Resolution: 1 mm
- Aperture angle of sonic cone: ±16 °
- 1 × switching output, PNP/NPN
- 1 × analog output, 4…20 mA / 0…10 V / 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, Group IIC, Zone 2
- Dust, Group IIIC, Zone 22
- When used in hazardous areas, the special conditions of the approval must be observed
- SC-M12/3GD safety clips are included in delivery and prevent inadvertent disconnection of the energized cable

## 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

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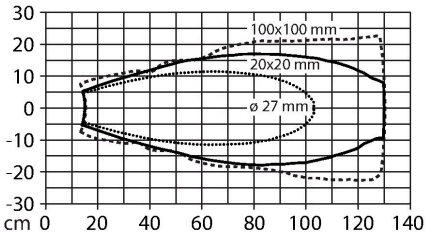
## Technical data

| | |
|---|---|
| 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…10 V |
| Load resistance voltage output | ≥ 1 kΩ |
| Switching frequency | ≤ 6.9 Hz |
| Hysteresis | ≤ 10 mm |
| Voltage drop at $I_e$ | ≤ 2.5 V |
| Short-circuit protection | yes/Cyclic |
| Reverse polarity protection | yes |
| Wire breakage protection | yes |
| Setting option | Push Button<br>Remote Teach<br>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 | Threaded barrel, M18 |
| Radiation direction | straight |
| Dimensions | Ø 18 x 90 mm |
| Housing material | Stainless steel, 1.4404 (AISI 316L) |
| Max. tightening torque of housing nut | 20 Nm |
| Transducer material | Plastic, Epoxyd resin and PU foam |
| Electrical connection | Connector, M12 × 1, 5-wire |
| Ambient temperature | -25…+45 °C |
| Storage temperature | -40…+80 °C |
| Pressure resistance | 0.5…5 bar |
| Protection class | IP67 |
| Switching state | LED, Yellow |

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 × 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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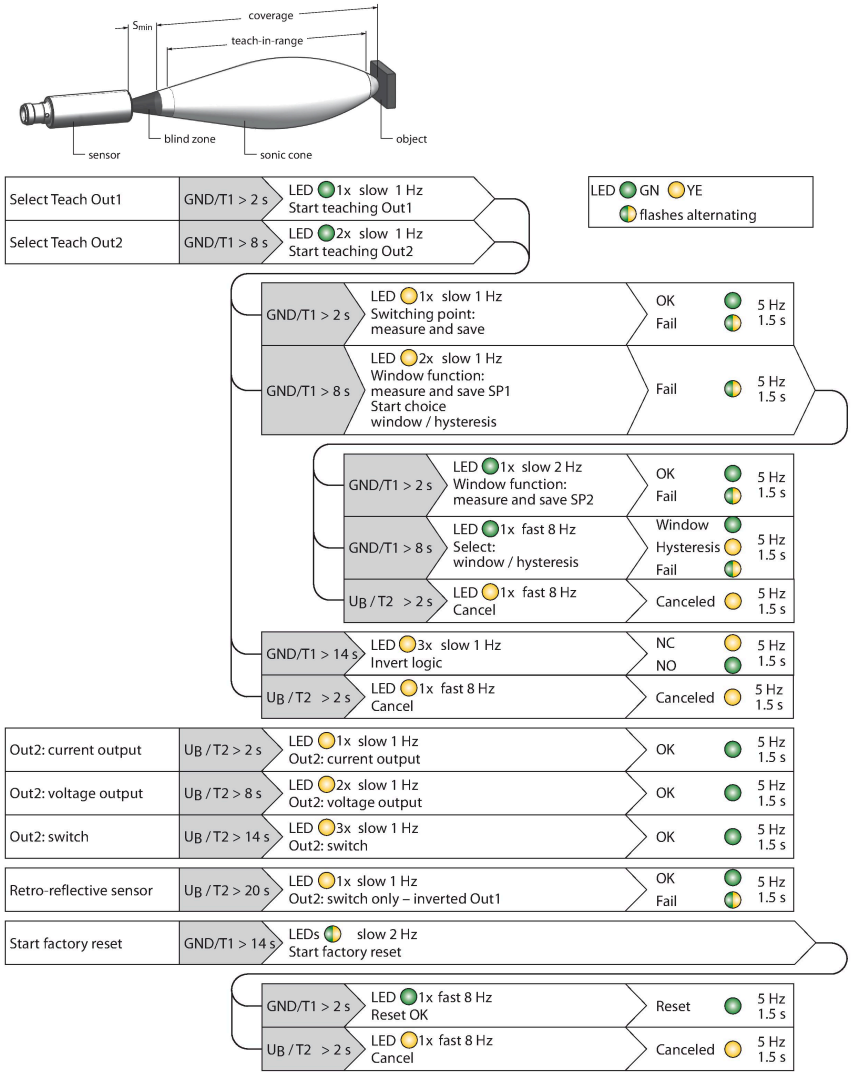
## Technical data

| | |
|---|---|
| Object detected | LED, Green |
| **Tests/approvals** | |
| MTTF | 202 years acc. to SN 29500 (Ed. 99) 40 °C |
| Declaration of conformity EN ISO/IEC | EN 60947-5-7 |
| Vibration resistance | 20 g, 10…55 Hz, sine, 3 axes, 30 min/axis according to IEC 60068-2-6 |
| Shock test | 30 g, 11 ms, half sine, 3 axes according to IEC 60068-2-27 |
| Approvals | CE<br>cULus<br>ATEX<br>IECEx |
| Device marking | II 3G Ex nA nC IIC T6 Gc/II 3D Ex tc IIIC T70 °C Dc |

## Mounting instructions

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.

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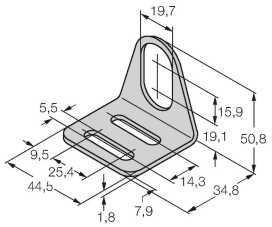
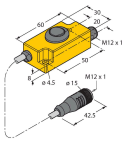
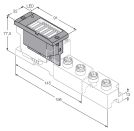
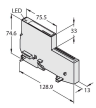
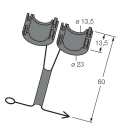
Unsuccessful teach-in is indicated by the LED flashing alternately green and yellow.
In normal operating mode, both LEDs signal the switching state of output 1.
• Green: Object is within the detection range but not in the switching range
• Yellow: Object is within the switching range
• Off: Object is outside the detection range or signal loss

## Accessories

| MW18 | 6945004 |
|---|---|
|  | Mounting bracket for threaded barrel sensors; material: Stainless steel A2 1.4301 (AISI 304) |

## Accessories

| Dimension drawing | Type | ID | |
|---|---|---|---|
| | 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 |
| | 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 |
|  | SC-M12/3GD | 6900390 | Captive safety clip for sensors with M12 x 1 connectors and approval acc. to ATEX II 3 G or II 3 D. |

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