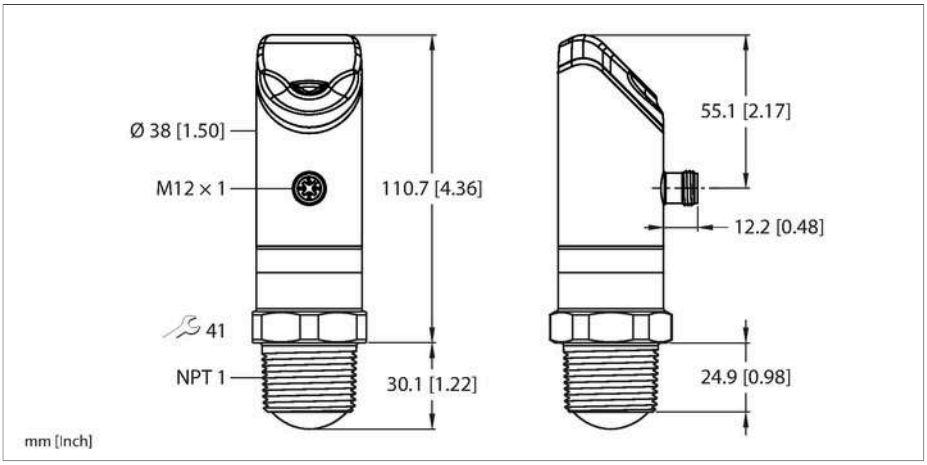
# LRS510-10-57-2UPN8-H1141
# Radar – Level Control





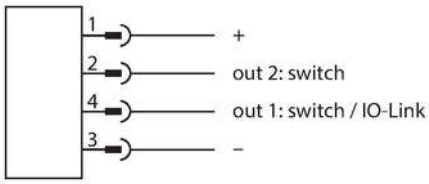

## Technical data

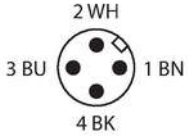
| | |
|---|---|
| Type | LRS510-10-57-2UPN8-H1141 |
| ID no. | 100012726 |
| **Radar data** | |
| Frequency range | 122 - 123 GHz |
| Range | 35…1000 cm |
| Resolution | 1 mm |
| Minimum measuring range | 500 mm |
| Minimum switching range | 50 mm |
| Linearity error | ≤ ± 0.1 % |
| Edge lengths of the nominal actuator | 100 mm |
| Output power EIRP | 10 dBm |
| Cone angle | 6 ° |
| Repeatability | 2 mm |
| Hysteresis | ≤ 50 mm |
| **Electrical data** | |
| Operating voltage | 18…33 VDC |
| Residual ripple | < 10 % $U_{ss}$ |
| DC rated operational current | ≤ 250 mA |
| No-load current | ≤ 100 mA |
| Residual current | ≤ 0.1 mA |
| Short-circuit protection | yes / Cyclic |
| Reverse polarity protection | yes |
| Communication protocol | IO-Link |
| Output function | NO/NC programmable, PNP/NPN |
| Output 2 | Switching output |
| Voltage drop at $I_e$ | ≤ 2 V |

## Features

- Range: 10 m
- Blind zone: 35 cm
- Resolution: 1 mm
- Cone angle of the radar beam: ±3°
- Distance, level, volume or % output
- Approved according to ETSI 305550-2
- Approved according to FCC/CFR. 47 Part 15.
- Male connector, M12 × 1, 4-pin
- Operating voltage 18…33 VDC
- Switching output switchable between PNP/NPN
- IO-Link
- 4-digit, 2-colored, 14-segment display
- Housing is rotatable by 180° after mounting the process connection
- Process connection NPT 1"
- Pressure resistance -1…16 bar rel.

## Wiring diagram




## Functional principle

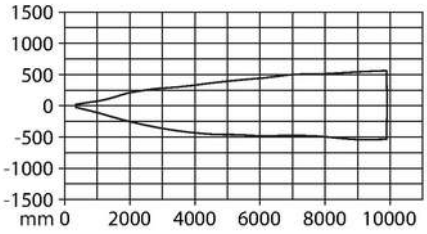
FMCW radar stands for frequency modulated continuous wave radar. FMCW is the English abbreviation for Frequency Modulated

LRS510-10-57-2UPN8-H1141| 27-04-2021 14-32 | Technical modifications reserved

## Technical data

| | |
|---|---|
| Switching frequency | ≤ 10 Hz |
| Response time typical | < 10 ms |
| **IO-Link** | |
| IO-Link specification | V 1.1 |
| IO-Link port type | Class A |
| Communication mode | COM 2 (38.4 kBaud) |
| Process data width | 32 bit |
| Measured value information | 28 bit |
| Switchpoint information | 2 bit |
| Frame type | 2.2 |
| Minimum cycle time | 5 ms |
| Function Pin 4 | IO-Link |
| Function Pin 2 | DI |
| Maximum cable length | 20 m |
| Profile support | Smart Sensor Profil |
| **Mechanical data** | |
| Design | With display, LRS |
| Dimensions | Ø 38 x 127.1 mm |
| Housing material | Stainless-steel/Plastic, 1.4404 (AISI 316L)/polyacrylamide 50 % GF UL 94 V-0 PEEK |
| Max. tightening torque of housing nut | 45 Nm |
| Electrical connection | Connectors, M12 × 1 |
| Process connection | 1" NPT |
| Ambient temperature | -25…+65 °C |
| Storage temperature | -40…+85 °C |
| Protection class | IP67<br>IP69K |
| | Not assessed by UL |
| Switching state | 2 × LEDs, Yellow |
| Vibration resistance | 20 g (10…2000 Hz), EN 600068-2-6 |
| Shock test | EN 60068-2-27 |
| Shock resistance | 50 g (11 ms) |
| EMV | EN 61000-6-2:2019<br>ETSI EN 301489-3 v.1.6.1 |
| Approvals | CE, ETSI, FCC, UL |

Continuous Wave. Non-modulated continuous wave radars have the disadvantage that they cannot measure distances due to lack of time reference. Such a time reference for distance measurement of stationary objects can be generated by means of frequency modulation. Using this method, a signal is emitted which continually changes the frequency. A periodic, linear frequency which varies upwards and downwards is used to limit the frequency range and to simplify the signal evaluation. The factor for the rate of change df/dt remains constant. If an echo signal is received, then this has a runtime delay as with the pulse radar, and thus a different frequency that is proportional to the distance.

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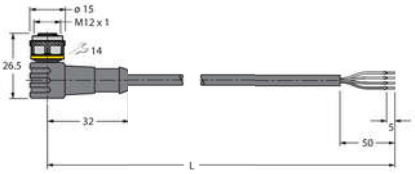
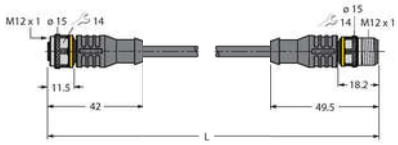
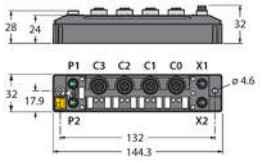
## Accessories

| Dimension drawing | Type | ID no. | |
|---|---|---|---|
|  | RKC4.4T-2/TEL | 6625013 | Connection cable, female M12, straight, 4-pin, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com |
|  | WKC4.4T-2/TEL | 6625025 | Connection cable, female M12, angled, 4-pin, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com |
|  | RKC4.4T-2-RSC4.4T/TEL | 6625208 | Connection cable, M12 female plug, straight, 4-pin, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com |

## Accessories

| Dimension drawing | Type | ID no. | |
|---|---|---|---|
|  | 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 |

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