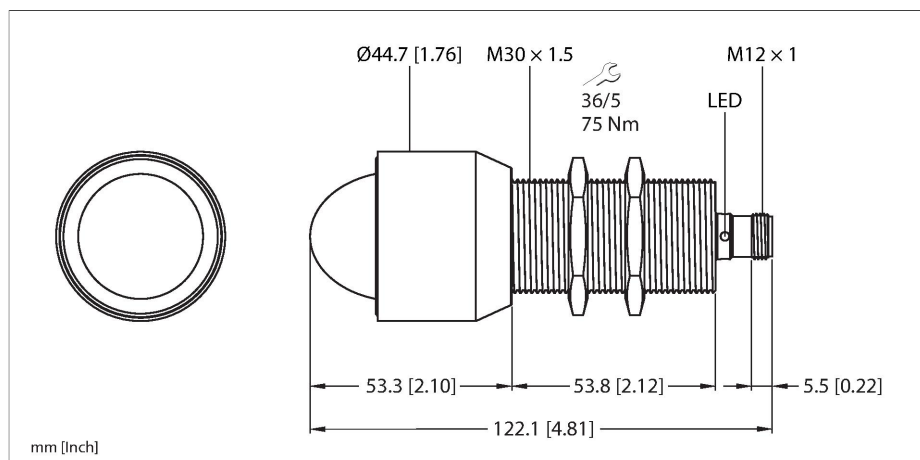


# DR30N-M30E-2UPN8X2-H1141

## Radar Sensor – Distance/Object Detection



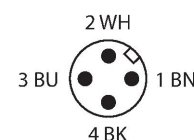
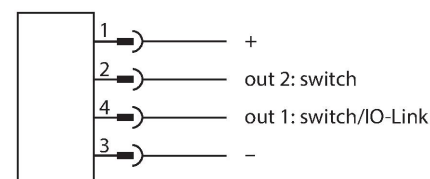
### Technical data

|                                      |                             |
|--------------------------------------|-----------------------------|
| Type                                 | DR30N-M30E-2UPN8X2-H1141    |
| ID                                   | 100030153                   |
| <b>Radar data</b>                    |                             |
| Function                             | Radar scanner               |
| Frequency range                      | 122 - 123 GHz               |
| Range                                | 350...30000 mm              |
| Resolution                           | 1 mm                        |
| Minimum measuring range              | 500 mm                      |
| Minimum switching range              | 50 mm                       |
| Linearity error                      | $\leq \pm 0.1 \%$           |
| Edge lengths of the nominal actuator | 100 mm                      |
| Output power ERP                     | 10 dBm                      |
| Output power EIRP                    | 20 dBm                      |
| Cone angle                           | 5 °                         |
| Repeatability                        | 2 mm                        |
| Hysteresis                           | $\leq 50$ mm                |
| <b>Electrical data</b>               |                             |
| Operating voltage $U_B$              | 18...33 VDC                 |
| Residual ripple                      | $< 10 \% U_{ss}$            |
| DC rated operating current $I_o$     | $\leq 250$ mA               |
| No-load current                      | $\leq 150$ mA               |
| Residual current                     | $\leq 0.1$ 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            |

### Features

- Blind zone: 35 cm
- Range: 30 m
- Resolution: 1 mm
- Cone angle of the radar beam: Narrow  $\pm 2.5^\circ$
- Approved acc. to ETSI 305550-2
- Approved acc. to FCC/CFR 47 Part 15.
- M12 x 1 male connector, 4-pin
- Operating voltage 18...33 VDC
- Operating voltage 10...33 VDC (in SIO mode)
- Switching output switchable between PNP/ NPN
- IO-Link
- M30 cylindrical design, stainless steel

### Wiring diagram



### Functional principle

FMCW radar stands for frequency modulated continuous wave radar. FMCW is the English abbreviation for Frequency Modulated Continuous Wave. Non-modulated continuous wave radars have the disadvantage that they cannot measure distances due to lack of time

## Technical data

|                                |          |
|--------------------------------|----------|
| Load resistance current output | ≤ 0.5 kΩ |
| Load resistance voltage output | ≥ 2 kΩ   |
| Voltage drop at I <sub>e</sub> | ≤ 2 V    |
| Switching frequency            | ≤ 10 Hz  |
| Readiness delay                | ≤ 450 ms |
| Response time typical          | < 10 ms  |

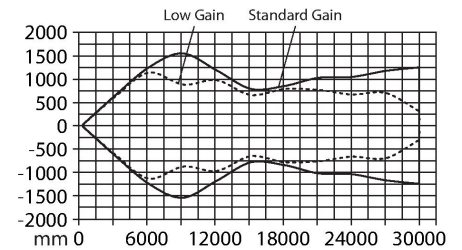
### IO-Link

|                            |                      |
|----------------------------|----------------------|
| IO-Link specification      | V 1.1                |
| IO-Link port type          | Class A              |
| Communication mode         | COM 2 (38.4 kBaud)   |
| Process data width         | 48 bit               |
| Measured value information | 32 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 Profile |

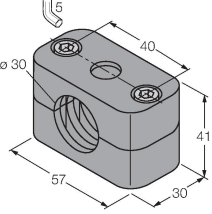
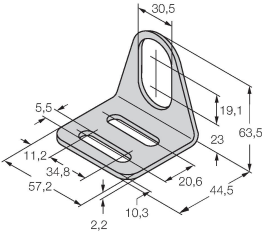
### Mechanical data

|                                       |                                               |
|---------------------------------------|-----------------------------------------------|
| Design                                | Threaded barrel, M30E                         |
| Dimensions                            | Ø 44.7 x 113.9 mm                             |
| Housing material                      | Stainless steel, 1.4401 (AISI 316)<br>PTFE    |
| Lens                                  | plastic, PTFE                                 |
| Max. tightening torque of housing nut | 75 Nm                                         |
| Electrical connection                 | Connector, M12 × 1                            |
| Ambient temperature                   | -25...+65 °C                                  |
| Storage temperature                   | -40...+85 °C                                  |
| Protection class                      | IP67<br>IP69K                                 |
|                                       | Not assessed by UL                            |
| Power-on indication                   | LED, Green                                    |
| Switching state                       | 2-color LED, Yellow                           |
| MTTF                                  | 187 years                                     |
| Vibration resistance                  | 20 g (10...2000 Hz), EN 60068-2-6             |
| Shock test                            | EN 60068-2-27                                 |
| Shock resistance                      | 100 g (11 ms)                                 |
| EMV                                   | EN 61000-6-2:2019<br>ETSI EN 301489-3 v.1.6.1 |
| Approvals                             | CE, ETSI, FCC, UL, UKCA                       |

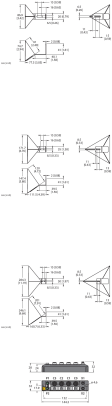
reference. Such a time reference for distance measurement of stationary objects can be generated by means of frequency modulation. Using this method, a signal is emitted which continually changes the frequency. A periodic, linear frequency which varies upwards and downwards is used to limit the frequency 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.



Accessories

|                                                                                   |         |                                                                                              |         |
|-----------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------|---------|
| BSS-30                                                                            | 6901319 | MW30                                                                                         | 6945005 |
| Mounting clamp for smooth and threaded barrel sensors; material: Polypropylene    |         | Mounting bracket for threaded barrel sensors; material: Stainless steel A2 1.4301 (AISI 304) |         |
|  |         |            |         |

Accessories

| Dimension drawing                                                                  | Type         | ID        |                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|--------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | RR-6         | 100047726 | Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 60 mm, RadarCrossSection: 10 m² (cf. automobile), reliable object detection up to 6.5 m |
|                                                                                    | RR-12        | 100047727 | Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 120 mm, RadarCrossSection: 250 m² (cf. HGV), reliable object detection up to 15 m       |
|                                                                                    | RR-20        | 100047728 | Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 200 mm, RadarCrossSection: 1115 m² (cf. ship), reliable object detection up to 25 m     |
|                                                                                    | 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                                                                                  |