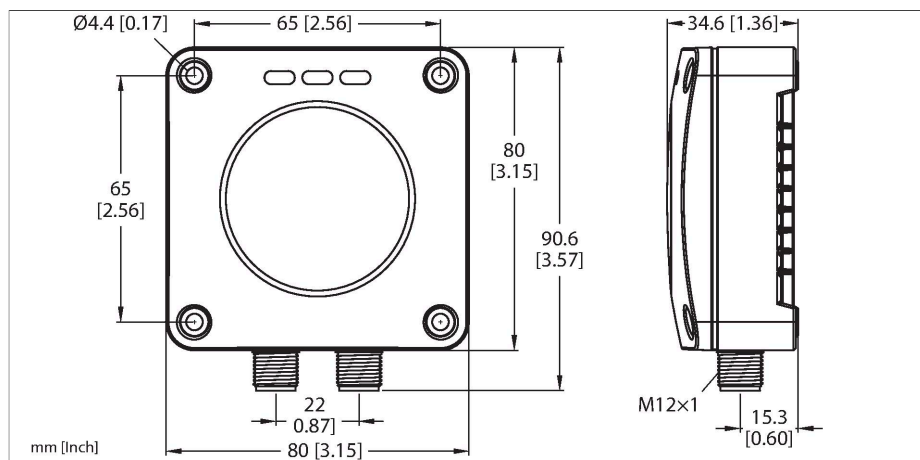


# MR15-Q80-IOLCJ-H1141

## Radar Sensor – Scanner for Object and Position Detection



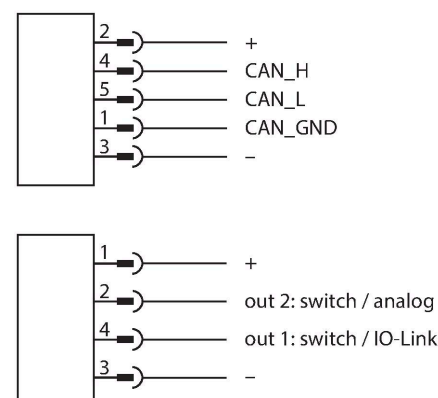
### Technical data

|                                      |                             |
|--------------------------------------|-----------------------------|
| Type                                 | MR15-Q80-IOLCJ-H1141        |
| ID                                   | 100041054                   |
| <b>Radar data</b>                    |                             |
| Function                             | Radar scanner               |
| Frequency range                      | 60–64 GHz                   |
| Range                                | 350...15000 mm              |
| Resolution                           | 1 mm                        |
| Minimum switching range              | 50 mm                       |
| Linearity error                      | ≤ ± 0.3 %                   |
| Edge lengths of the nominal actuator | 100 mm                      |
| Output power ERP                     | 10 dBm                      |
| Output power EIRP                    | 20 dBm                      |
| Cone angle                           | 120 °                       |
| Repeatability                        | 4 mm                        |
| <b>Electrical data</b>               |                             |
| Operating voltage $U_B$              | 9...33 VDC                  |
| Residual ripple                      | < 10 % $U_{ss}$             |
| DC rated operating current $I_o$     | ≤ 250 mA                    |
| No-load current                      | ≤ 400 mA                    |
| Short-circuit protection             | yes/Cyclic                  |
| Reverse polarity protection          | yes                         |
| Communication protocol               | IO-Link<br>SAE J1939        |
| Output function                      | NO/NC programmable, PNP/NPN |
| Output 2                             | Switching output            |
| Voltage drop at $I_o$                | ≤ 2 V                       |
| Switching frequency                  | ≤ 10 Hz                     |

### Features

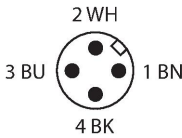
- Blind zone: 35 cm
- Range: 15 m
- Distance accuracy: ± 2 mm
- Angular accuracy: ±5°
- 3D sensing range: Adjustable max. 120°
- Information about distance, angle, and object speed
- Radius and zone evaluation
- Data visualization via Turck Radar Monitor
- Approved acc. to ETSI 305550-2
- Approved acc. to FCC/CFR 47 Part 15.
- 2 × M12 × 1, 1 × 4-pin, 1 × 5-pin
- Operating voltage 9...33 VDC
- Switching output switchable between PNP/ NPN
- IO-Link, SSP 4
- SAE J1939
- Rectangular 80 × 80
- Housing material PBT, AISi10Mg

### Wiring diagram



Technical data

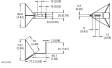
|                            |                                               |
|----------------------------|-----------------------------------------------|
| Readiness delay            | ≤ 300 ms                                      |
| Response time typical      | < 70 ms                                       |
| IO-Link                    |                                               |
| IO-Link specification      | V 1.1                                         |
| IO-Link port type          | Class A                                       |
| Communication mode         | COM 3 (230.4 kBaud)                           |
| Process data width         | 128 bit                                       |
| Measured value information | 128 bit                                       |
| Switchpoint information    | 17 bit                                        |
| Frame type                 | 2.2                                           |
| Minimum cycle time         | 3 ms                                          |
| Function pin 4             | IO-Link                                       |
| Function Pin 2             | DI                                            |
| Maximum cable length       | 20 m                                          |
| Profile support            | Smart Sensor Profile                          |
| Mechanical data            |                                               |
| Design                     | Rectangular, Q80                              |
| Dimensions                 | 90.6 x 80 x 34.6 mm                           |
| Housing material           | Plastic, PBT-GF20<br>Die-cast aluminum alloy  |
| Electrical connection      | Connector, M12 × 1                            |
| Ambient temperature        | -40...+85 °C                                  |
| Storage temperature        | -40...+85 °C                                  |
| Protection class           | IP67<br>IP68<br>IP69K                         |
|                            | Not assessed by UL                            |
| Power-on indication        | LED, Green                                    |
| Switching state            | 3-color LED, Yellow                           |
| 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                             |

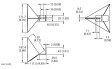


Functional principle

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 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

| Dimension drawing                                                                   | Type         | ID        |                                                                                                                                      |
|-------------------------------------------------------------------------------------|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------|
|  | 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                               |
|  | RR-6         | 100047726 | Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 60 mm, RadarCrossSection: 10 m² (cf. |

| Dimension drawing                                                                 | Type  | ID        |                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|-------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | RR-12 | 100047727 | automobile), reliable object detection up to 6.5 m<br>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                                                     |