



## 2-D LiDAR Sensor

OMD60M-R2000-B23-V1V1D-HD-1L



- High operating range
- High angle resolution
- Infrared light
- Measuring method PRT (Pulse Ranging Technology)
- Flexible measured data filter

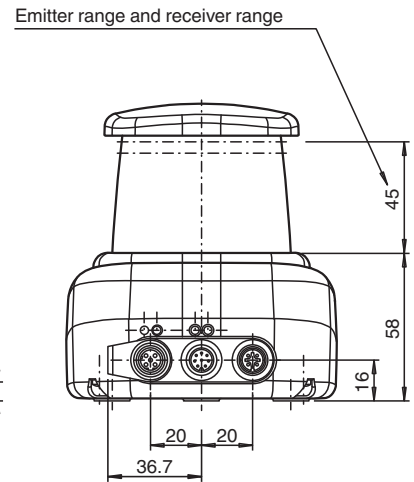
R2000 UHD, 2-D LiDAR sensor for precise and highly dynamic positioning, measuring range to object up to 60 m, Ethernet



### Function

Based on Pulse Ranging Technology (PRT), the sensor is powerful for measurements with a long range and a small light spot. The device scans its environment over the complete measuring angle of 360°. Due to the high scanning frequency, this sensor type is suitable for advanced applications. The device meets laser class 1 and is eye safe. Additional precautions to protect the operating personnel are not required. The interactive all-round display integrated in the optical surface can freely display individual texts and graphics. A wide range of accessories enables the sensor to be used in different applications. A PACTware device type manager (DTM) specially developed for this series offers extensive configuration and diagnostic options.

## Dimensions



## Technical Data

### General specifications

|                            |                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------|
| Measuring range            | 0.1 ... 20 m (black 10 %)<br>0.1 ... 60 m (white 90 %)<br>0.1 ... 120 m (reflector)<br>Min. reflectivity 1.8 % |
| Light source               | laser diode                                                                                                    |
| Light type                 | modulated infrared light                                                                                       |
| Laser nominal ratings      |                                                                                                                |
| Note                       | LASER RADIATION , DO NOT STARE INTO BEAM                                                                       |
| Laser class                | 1                                                                                                              |
| Wave length                | 905 nm                                                                                                         |
| Beam divergence            | transversal 2 mrad , longitudinal 10 mrad                                                                      |
| Pulse length               | 5 ns                                                                                                           |
| Repetition rate            | 250 kHz                                                                                                        |
| max. pulse energy          | < 94 nJ                                                                                                        |
| Measuring method           | Pulse Ranging Technology (PRT)                                                                                 |
| Scan rate                  | 10 ... 50 s <sup>-1</sup>                                                                                      |
| Scanning angle             | 360°                                                                                                           |
| Diameter of the light spot | 25 mm x 105 mm at 10 m                                                                                         |
| Filter                     | Maximum, average, median, reflectivity                                                                         |
| Ambient light limit        | 50000 Lux                                                                                                      |
| Resolution                 | 1 mm                                                                                                           |

| Functional safety related parameters |
|--------------------------------------|
|--------------------------------------|

## Technical Data

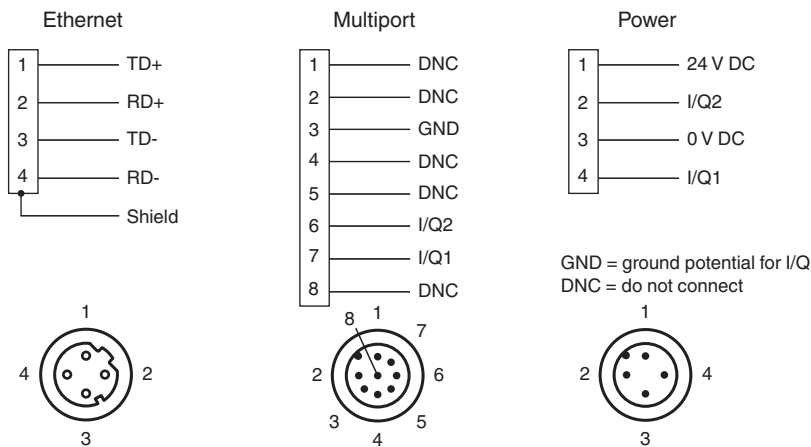
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|-----------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MTTF <sub>d</sub>                 |                | 75 a                                                                                                                                                        |
| Mission Time (T <sub>M</sub> )    |                | 10 a                                                                                                                                                        |
| Diagnostic Coverage (DC)          |                | 0 %                                                                                                                                                         |
| <b>Indicators/operating means</b> |                |                                                                                                                                                             |
| Operation indicator               |                | LED green                                                                                                                                                   |
| Data flow indicator               |                | LED yellow: active ethernet<br>LED green: Ethernet link                                                                                                     |
| Function indicator                |                | LED red: fault<br>LED yellow: Q1 + Q2                                                                                                                       |
| Control elements                  |                | 2 Button                                                                                                                                                    |
| Parameterization indicator        |                | 24 x 252 pixels , red                                                                                                                                       |
| <b>Electrical specifications</b>  |                |                                                                                                                                                             |
| Operating voltage                 | U <sub>B</sub> | 10 ... 30 V                                                                                                                                                 |
| Ripple                            |                | 10 % within the supply tolerance                                                                                                                            |
| No-load supply current            | I <sub>0</sub> | ≤ 400 mA / 24 V DC                                                                                                                                          |
| Power consumption                 | P <sub>0</sub> | < 10 W                                                                                                                                                      |
| Time delay before availability    | t <sub>v</sub> | < 40 s                                                                                                                                                      |
| <b>Interface</b>                  |                |                                                                                                                                                             |
| Interface type                    |                | Fast Ethernet, 2 switching outputs                                                                                                                          |
| Protocol                          |                | HTTP , TCP/IP and UDP/IP                                                                                                                                    |
| <b>Input/Output</b>               |                |                                                                                                                                                             |
| Input/output type                 |                | 2 Inputs/Outputs , Independently configurable , short circuit/reverse polarity protected                                                                    |
| <b>Output</b>                     |                |                                                                                                                                                             |
| Switching threshold               |                | low: U <sub>a</sub> < 1.5 V,<br>high: U <sub>a</sub> > U <sub>b</sub> - 2 V                                                                                 |
| Switching current                 |                | 100 mA per output                                                                                                                                           |
| <b>Conformity</b>                 |                |                                                                                                                                                             |
| Product standard                  |                | IEC 61000-6-2                                                                                                                                               |
| Shock resistance                  |                | EN 60068-2-27                                                                                                                                               |
| Vibration resistance              |                | EN 60068-2-6                                                                                                                                                |
| Laser safety                      |                | EN 60825-1:2014                                                                                                                                             |
| <b>Measurement accuracy</b>       |                |                                                                                                                                                             |
| Measuring speed                   |                | 84000 measurements per second                                                                                                                               |
| Measured value noise              |                | typ. ± 9 mm<br>(1 Sigma; max. 20 mm)<br>with measured value filter deactivated                                                                              |
| Angle resolution                  |                | 0.042 °                                                                                                                                                     |
| Absolute accuracy                 |                | < 0.5 m: typ. ± 40 mm<br>> 0.5 m: typ. ± 30 mm                                                                                                              |
| Repeat accuracy                   |                | < 12 mm                                                                                                                                                     |
| <b>Approvals and certificates</b> |                |                                                                                                                                                             |
| Protection class                  |                | III                                                                                                                                                         |
| UL approval                       |                | cULus Listed, Class 2 Power Source, Type 1 enclosure                                                                                                        |
| CCC approval                      |                | CCC approval / marking not required for products rated ≤36 V                                                                                                |
| FDA approval                      |                | IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice 56, dated May 8, 2019. |
| <b>Ambient conditions</b>         |                |                                                                                                                                                             |
| Ambient temperature               |                | -10 ... 50 °C (14 ... 122 °F)                                                                                                                               |
| Storage temperature               |                | -20 ... 70 °C (-4 ... 158 °F)                                                                                                                               |
| Relative humidity                 |                | 95 % , no moisture condensation                                                                                                                             |
| <b>Mechanical specifications</b>  |                |                                                                                                                                                             |
| Degree of protection              |                | IP65                                                                                                                                                        |
| Connection                        |                | 4-pin, M12x1 connector, standard (supply) ,<br>8-pin, M12x1 connector, A-coded (MultiPort) ,<br>4-pin, M12x1 socket, D-coded (LAN)                          |

Release date: 2026-04-16 Date of issue: 2026-04-16 Filename: 70193784\_eng.pdf

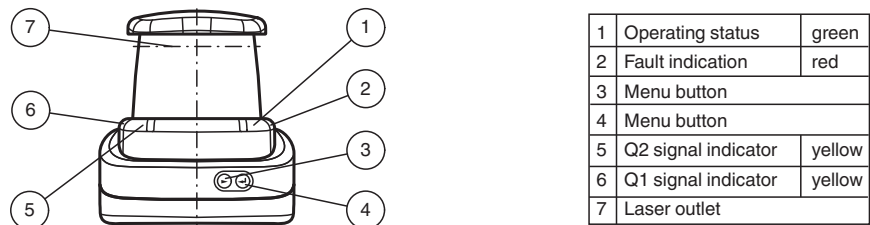
Technical Data

|              |                     |
|--------------|---------------------|
| Material     |                     |
| Housing      | ABS + PC + Aluminum |
| Optical face | PMMA                |
| Mass         | approx. 0.8 kg      |
| Dimensions   |                     |
| Height       | 116.5 mm            |
| Width        | 106 mm              |
| Length       | 106 mm              |

Connection Assignment



Assembly



Characteristic Curve

