



# Laser retroreflective sensor OBR25M-R200-EP-IO-V3-L



- Medium design with versatile mounting options
- DuraBeam Laser Sensors - durable and employable like an LED
- Extended temperature range  
-40 °C ... 60 °C
- High degree of protection IP69K
- IO-Link interface for service and process data

Laser retroreflective sensor



# IO-Link

## Function

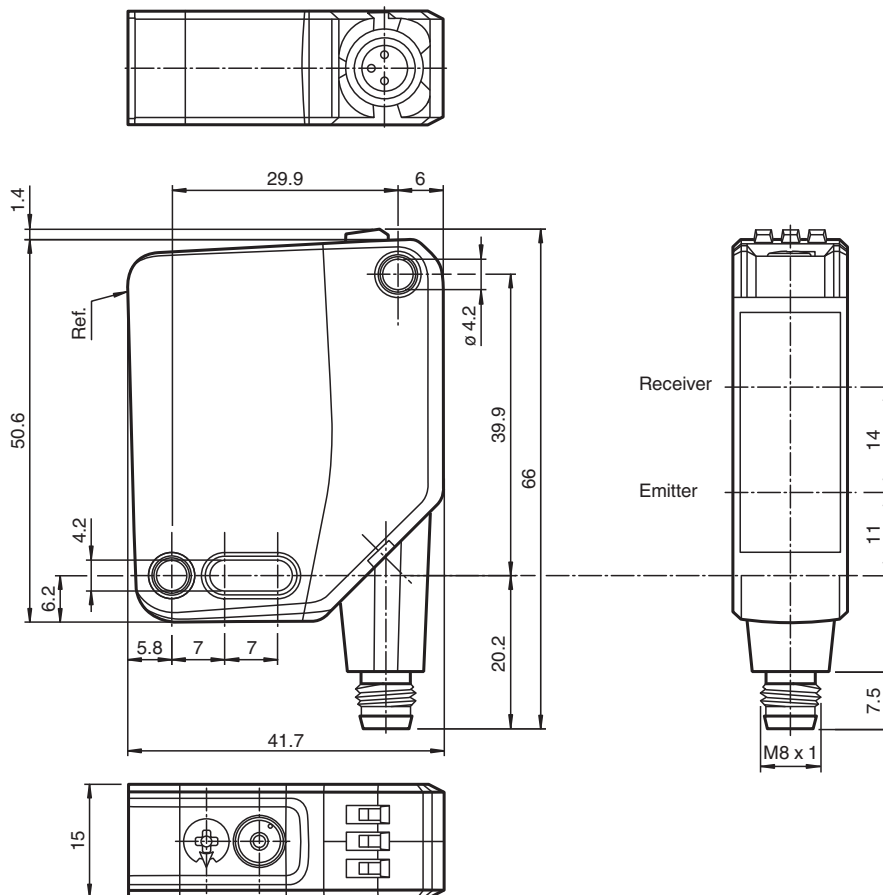
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The entire series enables sensors to communicate via IO-Link.

The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

Multi Pixel Technology (MPT) ensures that the standard sensors are flexible and can be adapted to the application environment.

## Dimensions



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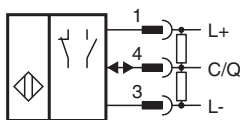
## Technical Data

| General specifications               |                |   |
|--------------------------------------|----------------|---|
| Effective detection range            |                | 0 ... 25 m  |
| Reflector distance                   |                | 0.5 ... 25 m  |
| Threshold detection range            |                | 33 m  |
| Reference target                     |                | H85-2 reflector   |
| Light source                         |                | laser diode   |
| Light type                           |                | modulated visible red light   |
| Polarization filter                  |                | yes   |
| Laser nominal ratings                |                |   |
| Note                                 |                | LASER LIGHT , DO NOT STARE INTO BEAM  |
| Laser class                          |                | 1   |
| Wave length                          |                | 680 nm  |
| Beam divergence                      |                | > 5 mrad d63 < 2 mm in the range of 250 mm ... 750 mm   |
| Pulse length                         |                | 1.6 $\mu$ s   |
| Repetition rate                      |                | max. 17.6 kHz   |
| max. pulse energy                    |                | 9.6 nJ  |
| Diameter of the light spot           |                | approx. 50 mm at a distance of 25 m   |
| Opening angle                        |                | approx. 0.1 °   |
| Ambient light limit                  |                | EN 60947-5-2 : 60000 Lux  |
| Functional safety related parameters |                |   |
| MTTF <sub>d</sub>                    |                | 672 a   |
| Mission Time (T <sub>M</sub> )       |                | 20 a  |
| Diagnostic Coverage (DC)             |                | 0 %   |
| Indicators/operating means           |                |   |
| Operation indicator                  |                | LED green:<br>constantly on - power on<br>flashing (4Hz) - short circuit<br>flashing with short break (1 Hz) - IO-Link mode                                 |
| Function indicator                   |                | Yellow LED:<br>Permanently lit - light path clear<br>Permanently off - object detected<br>Flashing (4 Hz) - insufficient operating reserve                  |
| Control elements                     |                | Light-on/dark-on changeover switch  |
| Control elements                     |                | sensitivity adjustment  |
| Electrical specifications            |                |   |
| Operating voltage                    | U <sub>B</sub> | 10 ... 30 V DC  |
| Ripple                               |                | max. 10 %   |
| No-load supply current               | I <sub>0</sub> | < 15 mA at 24 V Operating voltage   |
| Protection class                     |                | III   |
| Interface                            |                |   |
| Interface type                       |                | IO-Link ( via C/Q = pin 4 )   |
| IO-Link revision                     |                | 1.1   |
| Device profile                       |                | Identification and diagnosis<br>Smart Sensor type 2.4   |
| Device ID                            |                | 0x111202 (1118722)  |
| Transfer rate                        |                | COM2 (38.4 kBit/s)  |
| Min. cycle time                      |                | 2.3 ms  |
| Process data width                   |                | Process data input 2 Bit<br>Process data output 2 Bit   |
| SIO mode support                     |                | yes   |
| Compatible master port type          |                | A   |
| Output                               |                |   |
| Switching type                       |                | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link |
| Signal output                        |                | 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected   |
| Switching voltage                    |                | max. 30 V DC  |

## Technical Data

|                                   |       |   |
|-----------------------------------|-------|---|
| Switching current                 |       | max. 100 mA , resistive load  |
| Usage category                    |       | DC-12 and DC-13   |
| Voltage drop                      | $U_d$ | $\leq 1.5$ V DC   |
| Switching frequency               | f     | 2000 Hz   |
| Response time                     |       | 250 $\mu$ s   |
| <b>Conformity</b>                 |       |   |
| Communication interface           |       | IEC 61131-9   |
| Product standard                  |       | EN 60947-5-2  |
| Laser safety                      |       | EN 60825-1:2014   |
| <b>Approvals and certificates</b> |       |   |
| UL approval                       |       | E87056 , cULus Listed , class 2 power supply , type rating 1  |
| CCC approval                      |       | CCC approval / marking not required for products rated $\leq 36$ 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               |       | -40 ... 60 °C (-40 ... 140 °F)  |
| Storage temperature               |       | -40 ... 70 °C (-40 ... 158 °F)  |
| <b>Mechanical specifications</b>  |       |   |
| Degree of protection              |       | IP67 / IP69 / IP69K   |
| Connection                        |       | Connector plug, M8 x 1, 3 pin, rotatable by 90°   |
| Material                          |       |   |
| Housing                           |       | PC (Polycarbonate)  |
| Optical face                      |       | PMMA  |
| Mass                              |       | approx. 35 g  |
| Dimensions                        |       |   |
| Height                            |       | 50.6 mm   |
| Width                             |       | 15 mm   |
| Depth                             |       | 41.7 mm   |

## Connection



## Connection Assignment

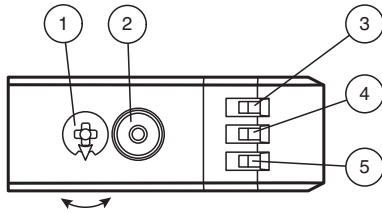


## Connection Assignment

Wire colors in accordance with EN 60947-5-2

- 1 | BN (brown)
- 3 | BU (blue)
- 4 | BK (black)

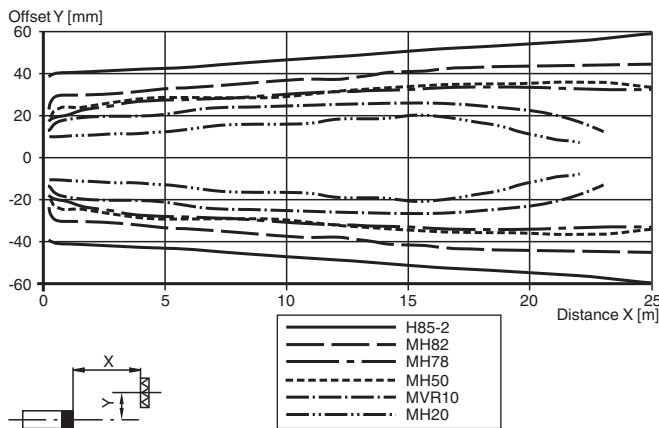
## Assembly



|   |                                      |    |
|---|--------------------------------------|----|
| 1 | Sensitivity adjustment               |    |
| 2 | Light-on / dark-on changeover switch |    |
| 3 | Operating indicator / dark on        | GN |
| 4 | Signal indicator                     | YE |
| 5 | Operating indicator / light on       | GN |

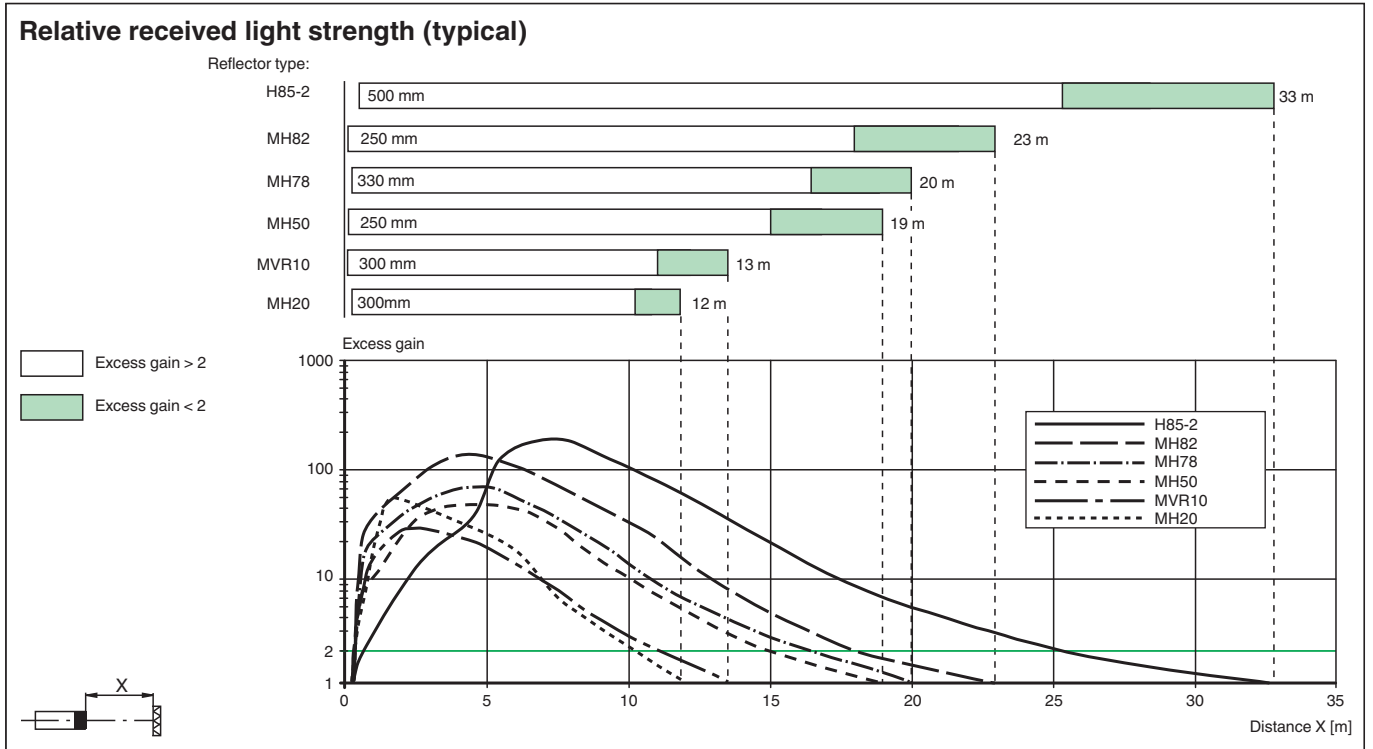
## Characteristic Curve

### Characteristic response curve

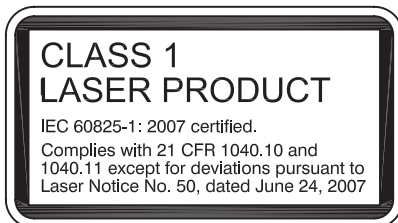


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## Characteristic Curve



## Safety Information



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## Commissioning

To unlock the adjustment functions turn the sensing range / sensitivity adjuster for more than 180 degrees.

### Sensing Range / Sensitivity

Turn sensing range / sensitivity adjuster clockwise to increase sensing range / sensitivity.  
 Turn sensing range / sensitivity adjuster counter clockwise to decrease sensing range / sensitivity.  
 If the end of the adjustment range is reached, the signal indicator starts flashing with 8 Hz.

### Light-on / Dark-on Configuration

Press the light-on / dark-on changeover switch for more than 1 second (less than 4 seconds). The light-on / dark-on mode changes and the operating indicators are activated accordingly.

## Commissioning

If you press the light-on / dark-on changeover switch for more than 4 seconds, the light-on / dark-on mode changes back to the original setting. On release of the light-on / dark-on changeover switch the current state is activated.

### Restore Factory Settings

Press the light-on / dark-on changeover switch for more than 10 seconds (less than 30 seconds) until all LEDs turn off. On release of the light-on / dark-on changeover switch the signal indicator turns on. After 5 seconds the sensor resumes operation with factory default settings.

After 5 minutes of inactivity the sensing range / sensitivity adjustment is locked. In order to reactivate the sensing range / sensitivity adjustment, turn the sensing range / sensitivity adjuster for more than 180 degrees.