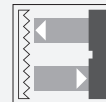




## Laser retroreflective sensor OBR12M-R100-2EP-IO-L



- Miniature 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

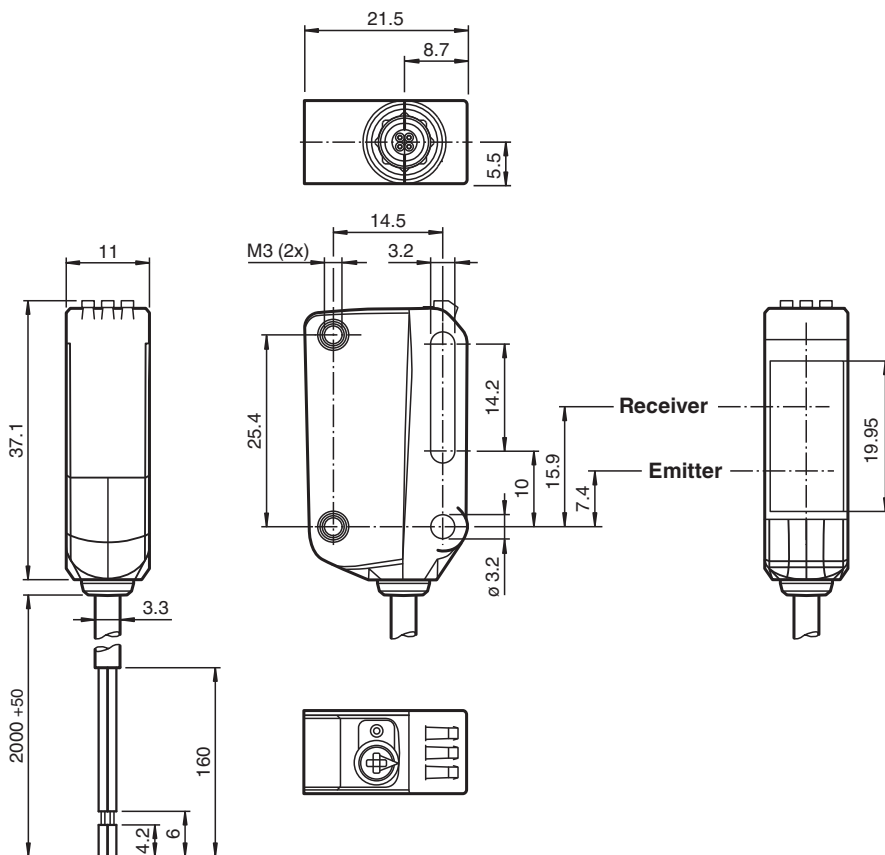
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation 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.

The use of Multi Pixel Technology gives the standard sensors a high level of flexibility and enables them to adapt more effectively to their operating environment.

### Dimensions



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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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**PEPPERL+FUCHS**

## Technical Data

### General specifications

|                            |   |
|----------------------------|---|
| Effective detection range  | 0 ... 12 m  |
| Reflector distance         | 0.2 ... 12 m  |
| Threshold detection range  | 15 m  |
| Reference target           | H50 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 µs  |
| Repetition rate            | max. 17.6 kHz   |
| max. pulse energy          | 9.6 nJ  |
| Diameter of the light spot | approx. 30 mm at a distance of 12 m                   |
| Opening angle              | approx. 0.3 °   |
| Ambient light limit        | EN 60947-5-2  |

### 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   |
| Parameterization indicator | IO link communication: green LED goes out briefly (1 Hz)   |

### Electrical specifications

|                        |                |                                |
|------------------------|----------------|--------------------------------|
| Operating voltage      | U <sub>B</sub> | 10 ... 30 V DC                 |
| Ripple                 |                | max. 10 %                      |
| No-load supply current | I <sub>0</sub> | < 20 mA at 24 V supply voltage |
| Protection class       |                | III                            |

### Interface

|                             |   |
|-----------------------------|---|
| Interface type              | IO-Link ( via C/Q = pin 4 )                           |
| IO-Link revision            | 1.1   |
| Device ID                   | 0x110202 (1114626)                                    |
| 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

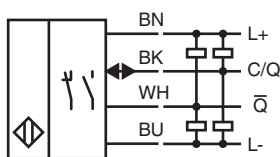
|                   |   |
|-------------------|---|
| Switching type    | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - BK: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link<br>/Q - WH: NPN normally closed / light-on, PNP normally open / dark-on |
| Signal output     | 2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected  |
| Switching voltage | max. 30 V DC  |

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## Technical Data

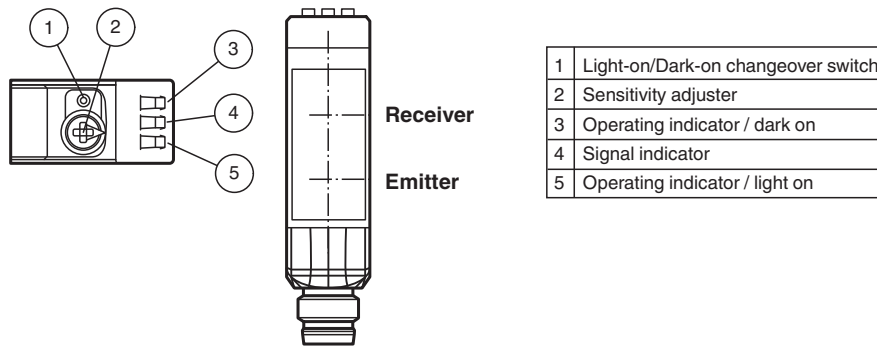
|                                   |       |   |
|-----------------------------------|-------|---|
| Switching current                 |       | max. 100 mA , resistive load  |
| Usage category                    |       | DC-12 and DC-13   |
| Voltage drop                      | $U_d$ | $\leq 1.5$ 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  |
| 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) , cable, fixed installation<br>-25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains            |
| Storage temperature               |       | -40 ... 70 °C (-40 ... 158 °F)  |
| <b>Mechanical specifications</b>  |       |   |
| Degree of protection              |       | IP67 / IP69 / IP69K   |
| Connection                        |       | 2 m fixed cable   |
| <b>Material</b>                   |       |   |
| Housing                           |       | PC (Polycarbonate)  |
| Optical face                      |       | PMMA  |
| Mass                              |       | approx. 36 g  |
| <b>Dimensions</b>                 |       |   |
| Height                            |       | 37.1 mm   |
| Width                             |       | 11 mm   |
| Depth                             |       | 21.5 mm   |
| Cable length                      |       | 2 m   |

## Connection



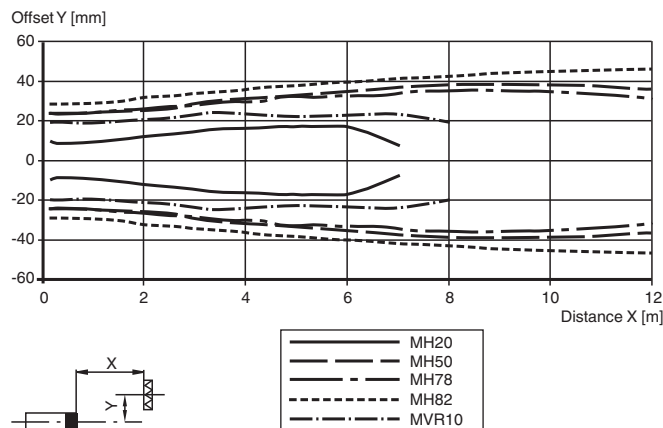
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## Assembly

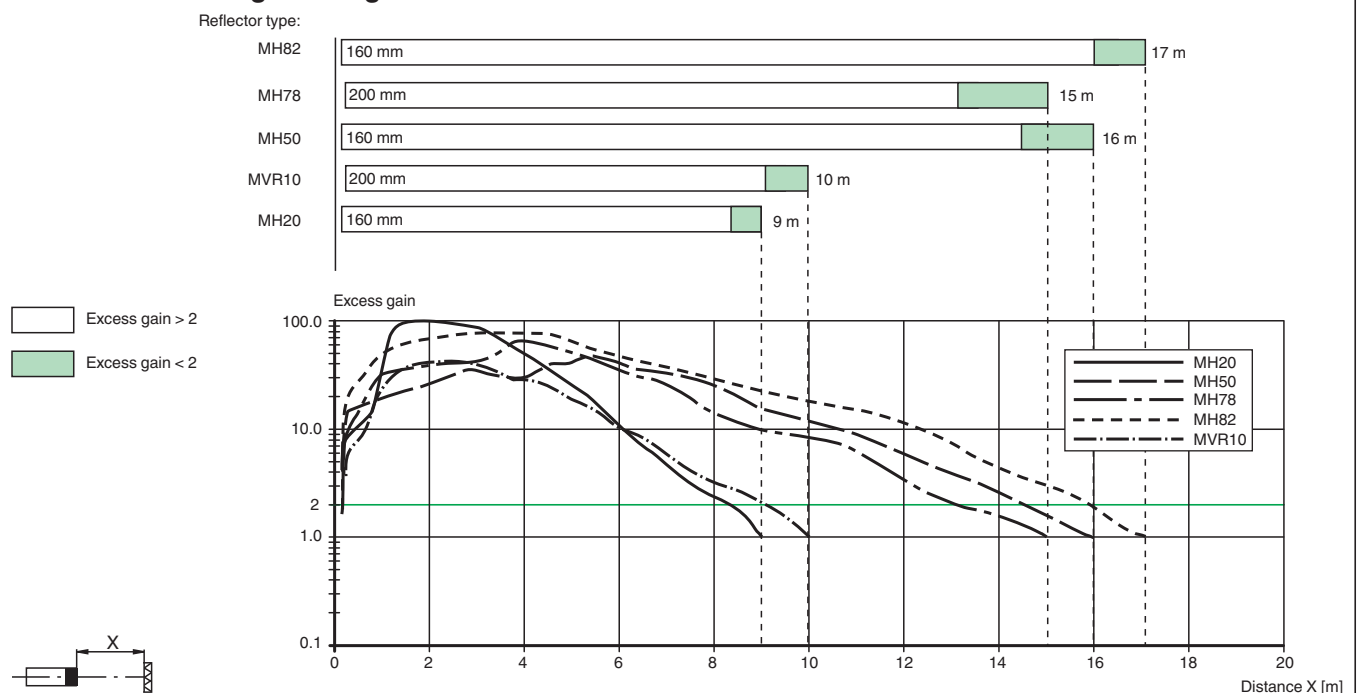


## Characteristic Curve

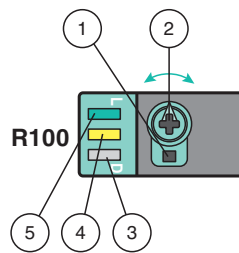
### Characteristic response curve



### Relative received light strength



## Configuration



- 1 - Light-on / dark-on changeover switch
- 2 - Sensing range / sensitivity adjuster
- 3 - Operating indicator / dark on
- 4 - Signal indicator
- 5 - Operating indicator / light on

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.

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.