## Model Number

**OBE20M-R100-S2EP-IO-IR**

Thru-beam sensor

with fixed cable

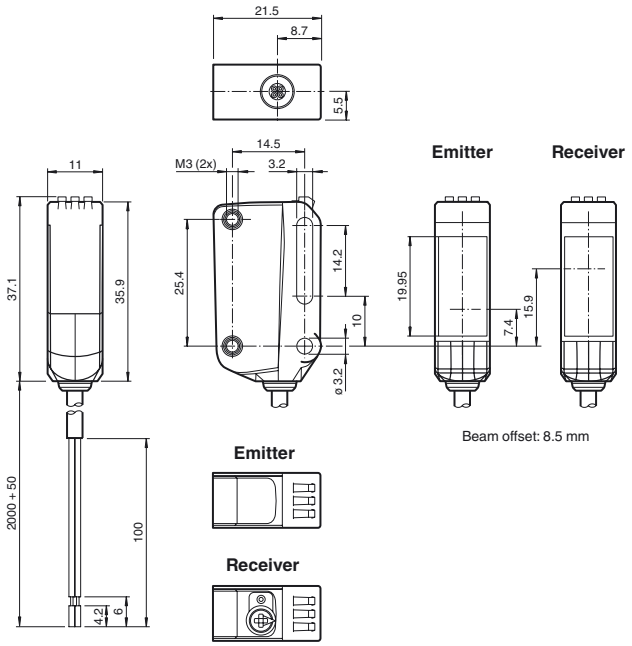
## Features

- Miniature design with versatile mounting options
- IO-link interface for service and process data
- Various frequencies for avoiding mutual interference (cross-talk immunity)
- Extended temperature range -40°C ... 60°C
- High degree of protection IP69K

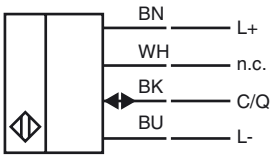
## Product information

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.

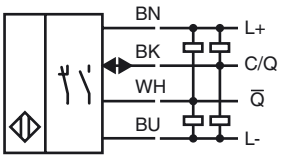
## Dimensions




## Electrical connection emitter

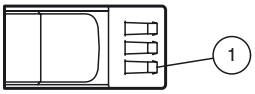



## Electrical connection receiver



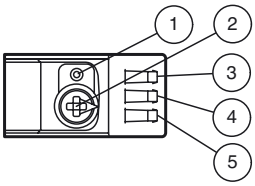

## Indicators/operating means

**Emitter**




| | |
|---|---|
| 1 | Operating indicator |

**Receiver**




| | |
|---|---|
| 1 | Light-on/Dark-on changeover switch |
| 2 | Sensitivity adjuster |
| 3 | Operating indicator / dark on |
| 4 | Signal indicator |
| 5 | Operating indicator / light on |

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## Technical data

| | | |
|---|---|---|
| **System components** | | |
| Emitter | | OBE20M-R100-S-IO-IR |
| Receiver | | OBE20M-R100-2EP-IO-IR |
| **General specifications** | | |
| Effective detection range | | 0.2 ... 20 m |
| Threshold detection range | | 25 m |
| Light source | | LED |
| Light type | | modulated infrared light |
| LED risk group labelling | | exempt group |
| Diameter of the light spot | | approx. 100 mm at a distance of 1 m |
| Angle of divergence | | 5.4 ° |
| Ambient light limit | | EN 60947-5-2 : 30000 Lux |
| **Functional safety related parameters** | | |
| $MTTF_d$ | | 462 a |
| Mission Time ($T_M$) | | 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 | | Receiver: light/dark switch |
| Control elements | | Receiver: sensitivity adjustment |
| Parameterization indicator | | IO link communication: green LED goes out briefly (1 Hz) |
| **Electrical specifications** | | |
| Operating voltage | $U_B$ | 10 ... 30 V DC |
| Ripple | | max. 10 % |
| No-load supply current | $I_0$ | Emitter: ≤ 14 mA<br>Receiver: ≤ 13 mA at 24 V supply voltage |
| Protection class | | III |
| **Interface** | | |
| Interface type | | IO-Link ( via C/Q = pin 4 ) |
| Transfer rate | | COM 2 (38.4 kBaud) |
| IO-Link Revision | | 1.1 |
| Min. cycle time | | 2.3 ms |
| Process data witdh | | Emitter:<br>Process data output: 2 Bit<br>Receiver:<br>Process data input: 2 Bit<br>Process data output: 2 Bit |
| SIO mode support | | yes |
| Device ID | | Emitter: 0x110401 (1115137)<br>Receiver: 0x110301 (1114881) |
| Compatible master port type | | A |
| **Input** | | |
| Test input | | emitter deactivation at $+U_B$ |
| **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 |
| Switching current | | max. 100 mA , resistive load |
| Usage category | | DC-12 and DC-13 |
| Voltage drop | $U_d$ | ≤ 1.5 V DC |
| Switching frequency | f | 1000 Hz |
| Response time | | 0.5 ms |
| **Conformity** | | |
| Communication interface | | IEC 61131-9 |
| Product standard | | EN 60947-5-2 |
| **Ambient conditions** | | |
| Ambient temperature | | -40 ... 60 °C (-40 ... 140 °F) , fixed cable<br>-25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains |
| Storage temperature | | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | | |
| Housing width | | 11 mm |
| Housing height | | 37.1 mm |
| Housing depth | | 21.5 mm |

## Accessories

**IO-Link-Master02-USB**
IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

**OMH-R10X-01**
Mounting bracket

**OMH-R10X-02**
Mounting bracket

**OMH-R10X-04**
Mounting bracket

**OMH-R10X-10**
Mounting bracket

**OMH-ML100-03**
Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

**OMH-ML100-031**
Mounting aid for round steel
ø 10 ... 14 mm or sheet 1 mm ... 5 mm

Other suitable accessories can be found at

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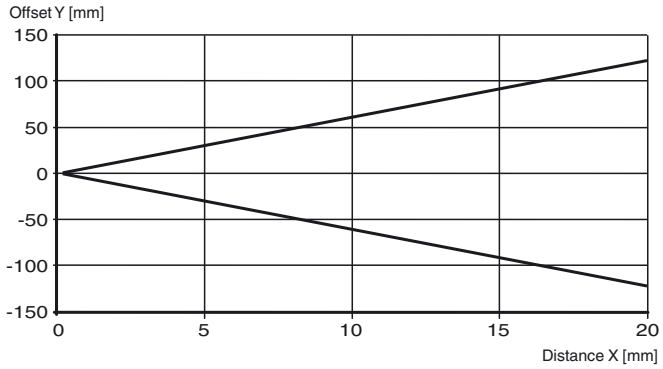
| | |
|---|---|
| Degree of protection | IP67 / IP69 / IP69K |
| Connection | 2 m fixed cable |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Mass | Emitter: approx. 10 g receiver: approx. 10 g |
| Cable length | 2 m |

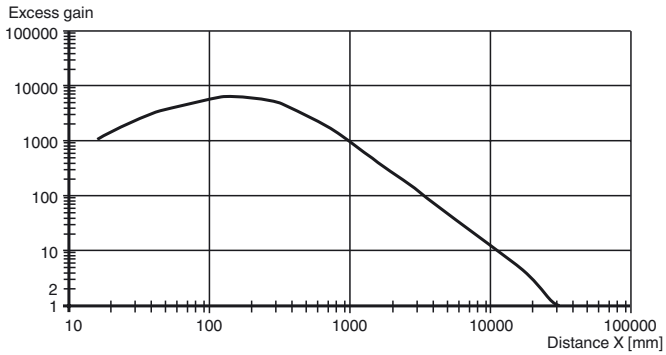
| | |
|---|---|
| **Approvals and certificates** | |
| UL approval | E87056 , cULus Listed , class 2 power supply , type rating 1 |

## Curves/Diagrams

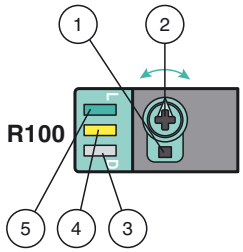
### Characteristic response curve




### Relative received light strength




## Functions and Operation




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.

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## 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.

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