



## Thru-beam sensor (pair) OBE12M-R100-SE5F-IO-0,3M-V1



- 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



### Function

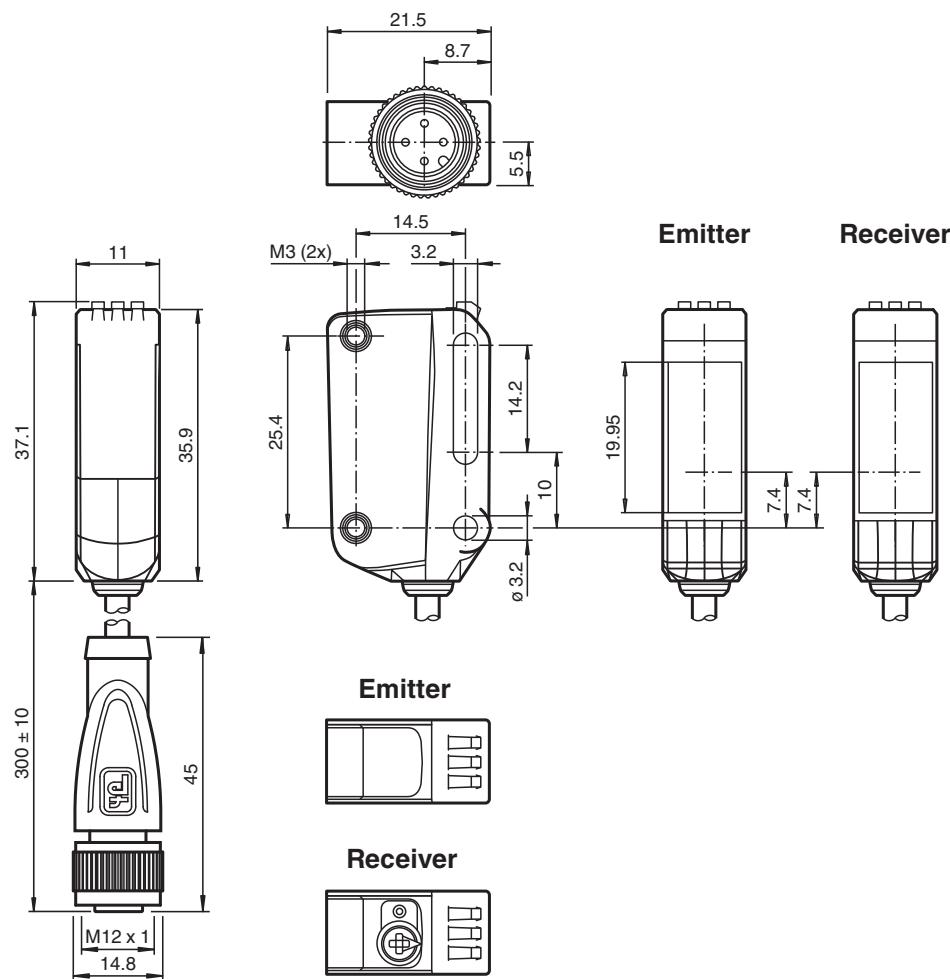
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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



## Technical Data

| System components                    |   |
|--------------------------------------|---|
| Emitter                              | OBE12M-R100-S-IO-0,3M-V1  |
| Receiver                             | OBE12M-R100-E5F-IO-0,3M-V1  |
| General specifications               |   |
| Effective detection range            | 0 ... 12 m  |
| Threshold detection range            | 15 m  |
| Light source                         | LED   |
| Light type                           | modulated visible red light   |
| LED risk group labelling             | exempt group  |
| Diameter of the light spot           | approx. 65 mm at a distance of 1 m  |
| Opening angle                        | 3.7 °   |
| Ambient light limit                  | EN 60947-5-2 : 30000 Lux  |
| Functional safety related parameters |   |
| MTTF <sub>d</sub>                    | 462 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 |

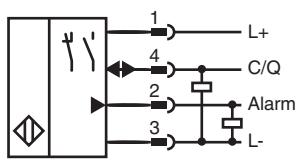
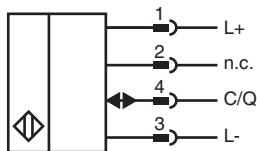
## Technical Data

|                                   |  |   |
|-----------------------------------|--|---|
| 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)   |   |
| <b>Electrical specifications</b>  |  |   |
| Operating voltage                 | $U_B$  | 10 ... 30 V DC  |
| Ripple                            |  | max. 10 %   |
| No-load supply current            | $I_0$  | Emitter: $\leq 14$ mA<br>Receiver: $\leq 13$ mA at 24 V supply voltage  |
| Protection class                  |  | III   |
| <b>Interface</b>                  |  |   |
| Interface type                    |  | IO-Link ( via C/Q = pin 4 )   |
| IO-Link revision                  |  | 1.1   |
| Device ID                         |  | Emitter: 0x110401 (1115137)<br>Receiver: 0x11030B (1114891)   |
| Transfer rate                     |  | COM2 (38.4 kBit/s)  |
| Min. cycle time                   |  | 2.3 ms  |
| Process data width                |  | 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   |
| Compatible master port type       |  | A   |
| <b>Input</b>                      |  |   |
| Test input                        |  | emitter deactivation at $+U_B$  |
| <b>Output</b>                     |  |   |
| Stability alarm output            |  | 1 PNP, inactive when level falls below function reserve after approx. 5 s.<br>Immediately inactive if the beam is interrupted 4 times during the flashtime.             |
| Switching type                    |  | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: PNP normally open / dark-on, IO-Link<br>Alarm output - Pin2: PNP normally closed |
| Signal output                     |  | 1 PNP, short-circuit protected, reverse polarity protected  |
| Switching voltage                 |  | max. 30 V DC  |
| Switching current                 |  | max. 100 mA, resistive load   |
| Usage category                    |  | DC-12 and DC-13   |
| Voltage drop                      | $U_d$  | $\leq 1.5$ V DC   |
| Switching frequency               | $f$  | 1000 Hz   |
| Response time                     |  | 0.5 ms  |
| <b>Conformity</b>                 |  |   |
| Communication interface           |  | IEC 61131-9   |
| Product standard                  |  | EN 60947-5-2  |
| <b>Approvals and certificates</b> |  |   |
| UL approval                       |  | E87056, cULus Listed, class 2 power supply, type rating 1   |
| <b>Ambient conditions</b>         |  |   |
| 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)  |
| <b>Mechanical specifications</b>  |  |   |
| Housing width                     |  | 11 mm   |
| Housing height                    |  | 37.1 mm   |
| Housing depth                     |  | 21.5 mm   |
| Degree of protection              |  | IP67 / IP69 / IP69K   |
| Connection                        |  | 300 mm fixed cable with M12 x 1, 4-pin connector  |
| Material                          |  |   |

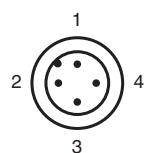
## Technical Data

|              |  |
|--------------|--|
| Housing      | PC (Polycarbonate)                           |
| Optical face | PMMA   |
| Mass         | Emitter: approx. 10 g receiver: approx. 10 g |
| Cable length | 0.3 m  |

## Connection



## Connection Assignment



Wire colors in accordance with EN 60947-5-2

|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

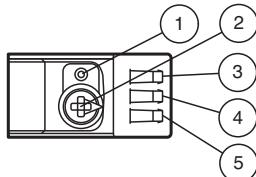
## Assembly

### Emitter



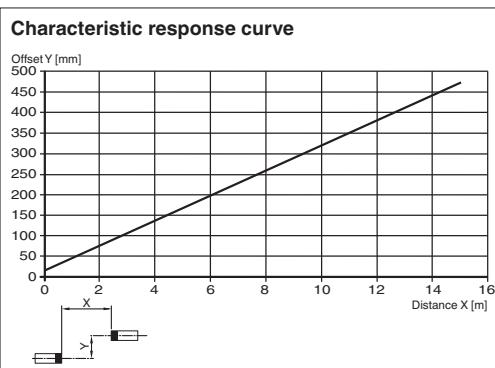
|   |                     |
|---|---------------------|
| 1 | Operating indicator |
|---|---------------------|

### Receiver

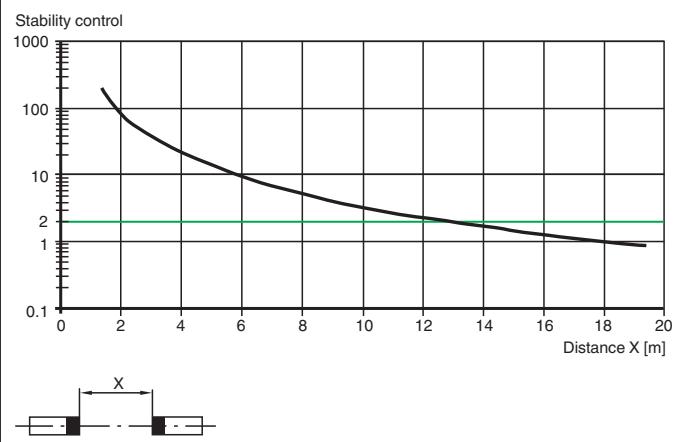


|   |                                    |
|---|------------------------------------|
| 1 | Light-on/Dark-on changeover switch |
| 2 | Sensitivity adjuster               |
| 3 | Operating indicator / dark on      |
| 4 | Signal indicator                   |
| 5 | Operating indicator / light on     |

## Characteristic Curve



## Relative received light strength



## Accessories



ICE2-8IOL-G65L-V1D

EtherNet/IP IO-Link master with 8 inputs/outputs



ICE3-8IOL-G65L-V1D

PROFINET IO IO-Link master with 8 inputs/outputs



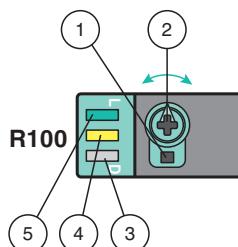
ICE2-8IOL-K45S-RJ45

EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal

## Accessories

|   |                             |  |
|---|-----------------------------|--|
|  | <b>ICE3-8IOL-K45P-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals                                |
|  | <b>ICE3-8IOL-K45S-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <b>IO-Link-Master02-USB</b> | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |
|  | <b>ICE1-8IOL-G30L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs  |
|  | <b>ICE1-8IOL-G60L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs  |
|  | <b>ICE2-8IOL-K45P-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors                               |
|  | <b>V1-G-2M-PUR</b>          | Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey                                      |
|  | <b>V1-W-2M-PUR</b>          | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey  |

## 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.