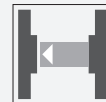




## Thru-beam sensor (pair)

OBE10M-R103-S2EP-IO-0,3M-V31



- 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



**IO-Link**

### Function

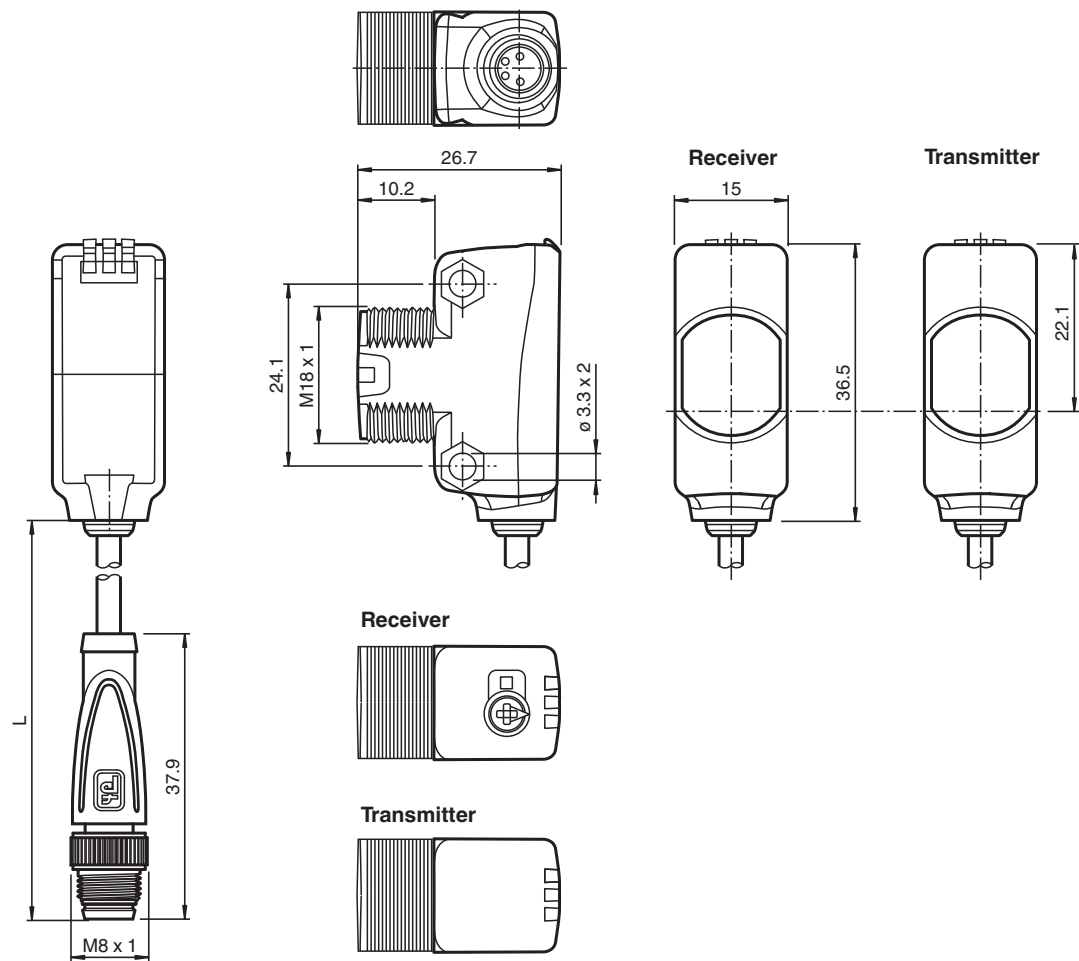
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation 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



Technical Data

|                                             |                                                                                                                             |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>System components</b>                    |                                                                                                                             |
| Emitter                                     | OBE10M-R103-S-IO-0,3M-V31                                                                                                   |
| Receiver                                    | OBE10M-R103-2EP-IO-0,3M-V31                                                                                                 |
| <b>General specifications</b>               |                                                                                                                             |
| Effective detection range                   | 0 ... 10 m                                                                                                                  |
| Threshold detection range                   | 12.5 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                                                                                                    |
| <b>Functional safety related parameters</b> |                                                                                                                             |
| MTTF <sub>d</sub>                           | 462 a                                                                                                                       |
| Mission Time (T <sub>M</sub> )              | 20 a                                                                                                                        |
| Diagnostic Coverage (DC)                    | 0 %                                                                                                                         |
| <b>Indicators/operating means</b>           |                                                                                                                             |
| Operation indicator                         | LED green:<br>constantly on - power on<br>flashing (4Hz) - short circuit<br>flashing with short break (1 Hz) - IO-Link mode |

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## Technical Data

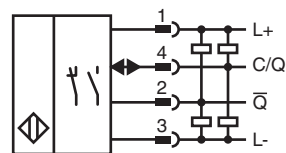
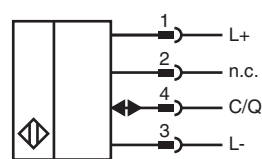
|                                                 |       |                                                                                                                                                                                                                                       |
|-------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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: 0x110403 (1115139) Receiver: 0x110303 (1114883)                                                                                                                                                                              |
| 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>                                   |       |                                                                                                                                                                                                                                       |
| 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<br>/Q - Pin2: 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                                    | $U_d$ | $\leq 1.5$ V DC                                                                                                                                                                                                                       |
| Switching frequency                             | $f$   | 1000 Hz                                                                                                                                                                                                                               |
| Response time                                   |       | 0.5 ms                                                                                                                                                                                                                                |
| <b>Compliance with standards and directives</b> |       |                                                                                                                                                                                                                                       |
| Directive conformity                            |       |                                                                                                                                                                                                                                       |
| EMC Directive 2004/108/EC                       |       | EN 60947-5-2:2007+A1:2012                                                                                                                                                                                                             |
| Standard conformity                             |       |                                                                                                                                                                                                                                       |
| Product standard                                |       | EN 60947-5-2:2007+A1:2012<br>IEC 60947-5-2:2007 + A1:2012                                                                                                                                                                             |
| Standards                                       |       | UL 60947-5-2: 2014<br>IEC 61131-9:2013<br>EN 62471:2008<br>EN 61131-9:2013                                                                                                                                                            |
| <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                                   |       | 15 mm                                                                                                                                                                                                                                 |
| Housing height                                  |       | 36.5 mm                                                                                                                                                                                                                               |

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Technical Data

|                      |                                                      |
|----------------------|------------------------------------------------------|
| Housing depth        | 26.7 mm                                              |
| Degree of protection | IP67 / IP69 / IP69K                                  |
| Connection           | fixed cable 300 mm with M8 x 1 male connector; 4-pin |
| Material             |                                                      |
| Housing              | PC (Polycarbonate)                                   |
| Optical face         | PMMA                                                 |
| Mass                 | Emitter: approx. 19 g receiver: approx. 19 g         |
| Cable length         | 0.3 m                                                |

Connection



Connection Assignment



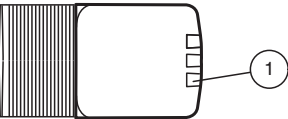
Wire colors in accordance with EN 60947-5-2

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

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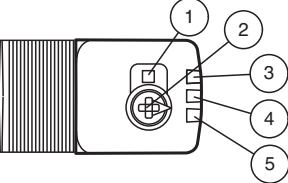
Assembly

Emitter



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

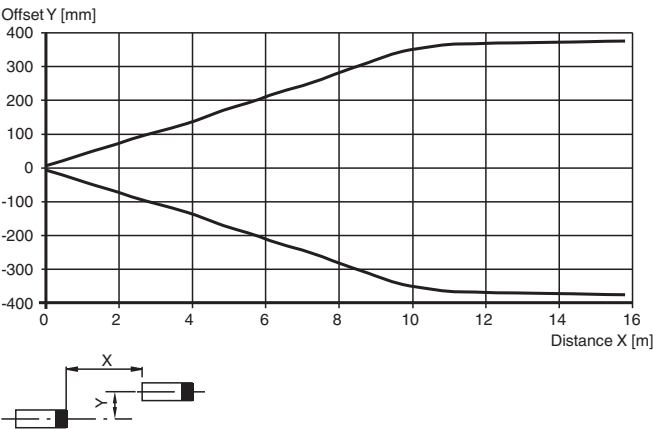
Receiver



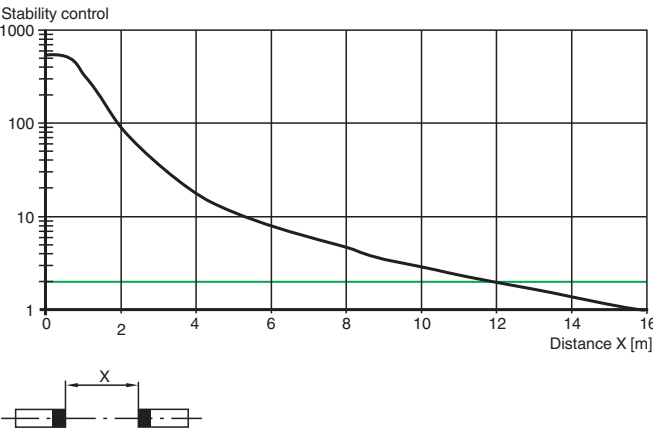
|   |                                |
|---|--------------------------------|
| 1 | Light-on/Dark-on switch        |
| 2 | Sensitivity adjuster           |
| 3 | Operating indicator / dark on  |
| 4 | Signal indicator               |
| 5 | Operating indicator / light on |

Characteristic Curve

Characteristic response curve



Relative received light strength



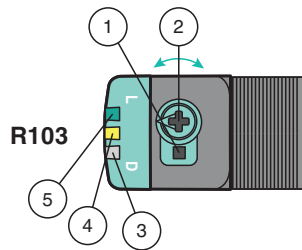
Accessories

|                                                                                     |                     |                                                                           |
|-------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------|
|  | <b>OMH-ML100-09</b> | Mounting aid for round steel $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm |
|  | <b>OMH-R103-01</b>  | Mounting bracket                                                          |

## Accessories

|                                                                                     |                             |                                                                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|    | <b>OMH-ML6</b>              | Mounting bracket                                                                                             |
|    | <b>OMH-ML6-U</b>            | Mounting bracket                                                                                             |
|    | <b>OMH-ML6-Z</b>            | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-01</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-04</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-10</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-ML100-031</b>        | Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 mm                                           |
|    | <b>OMH-ML100-03</b>         | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm                                                |
|   | <b>ICE2-8IOL-G65L-V1D</b>   | EtherNet/IP IO-Link master with 8 inputs/outputs                                                             |
|  | <b>ICE3-8IOL-G65L-V1D</b>   | PROFINET IO IO-Link master with 8 inputs/outputs                                                             |
|  | <b>ICE2-8IOL-K45S-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <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>V31-GM-2M-PUR</b>        | Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey                                       |
|  | <b>V31-WM-2M-PUR</b>        | Female cordset single-ended M8 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 adjuster / 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.