



# Retroreflective sensor

## OBR7000-R101-2EP-IO-1R-IR



- Miniature design with versatile mounting options
- Extended temperature range  
-40 °C ... 60 °C
- High degree of protection IP69K
- IO-Link interface for service and process data

Retroreflective sensor



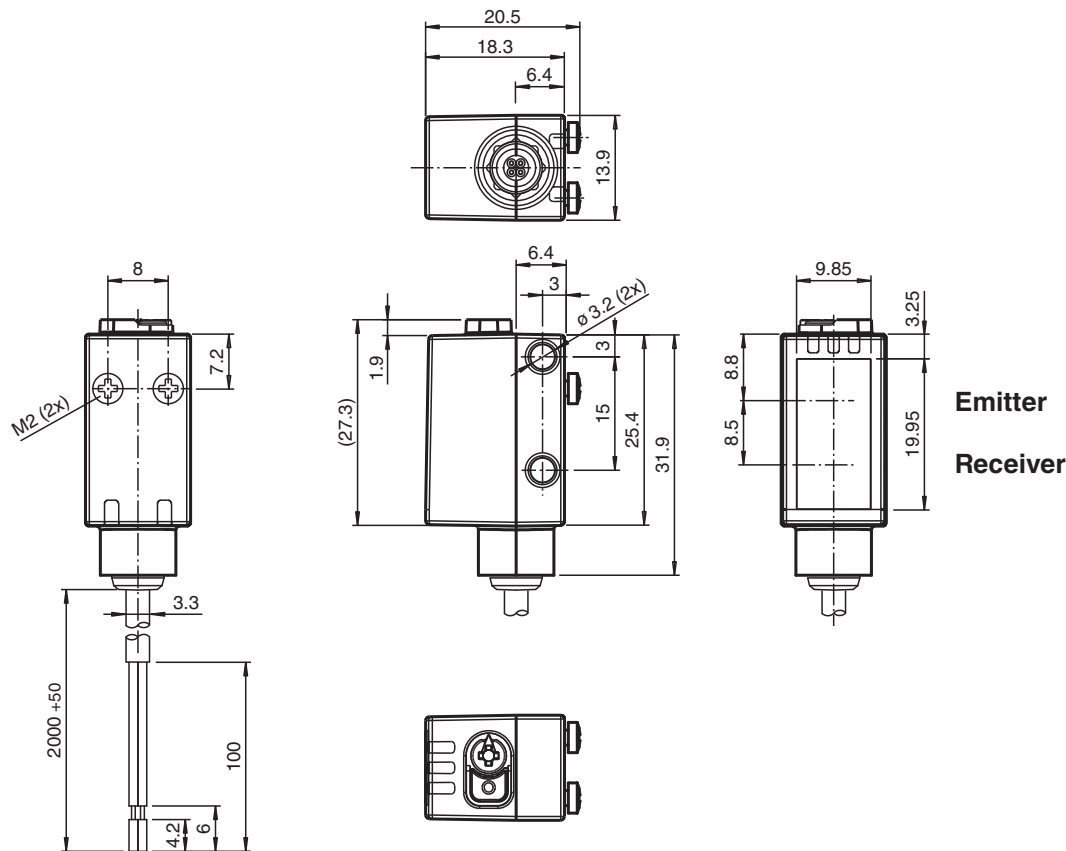
### Function

The 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 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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## Technical Data

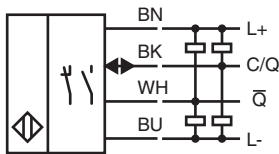
| General specifications               |                |   |
|--------------------------------------|----------------|---|
| Effective detection range            |                | 0 ... 7 m   |
| Reflector distance                   |                | 0.03 ... 7 m  |
| Threshold detection range            |                | 8.5 m   |
| Reference target                     |                | H85-2 reflector   |
| Light source                         |                | LED   |
| Light type                           |                | modulated infrared light 850 nm   |
| LED risk group labelling             |                | exempt group  |
| Polarization filter                  |                | no  |
| Diameter of the light spot           |                | approx. 100 mm at a distance of 1 m   |
| Opening angle                        |                | 5.4 °   |
| Ambient light limit                  |                | EN 60947-5-2  |
| Functional safety related parameters |                |   |
| MTTF <sub>d</sub>                    |                | 724 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> | < 25 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                            |                | 0x110201 (1114625)  |
| 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  |
| Switching current                    |                | max. 100 mA , resistive load  |
| Usage category                       |                | DC-12 and DC-13   |
| Voltage drop                         | U <sub>d</sub> | ≤ 1.5 V DC  |
| Switching frequency                  | f              | 1000 Hz   |
| Response time                        |                | 0.5 ms  |
| Conformity                           |                |   |
| Communication interface              |                | IEC 61131-9   |

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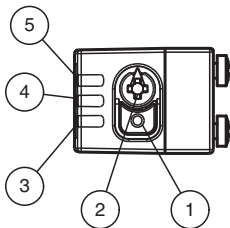
## Technical Data

|                                   |  |
|-----------------------------------|--|
| 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                     | 13.9 mm  |
| Housing height                    | 33.8 mm  |
| Housing depth                     | 18.3 mm  |
| Degree of protection              | IP67 / IP69 / IP69K  |
| Connection                        | 2 m fixed cable  |
| <b>Material</b>                   |  |
| Housing                           | PC (Polycarbonate)   |
| Optical face                      | PMMA   |
| Mass                              | approx. 36 g   |
| Cable length                      | 2 m  |

## Connection

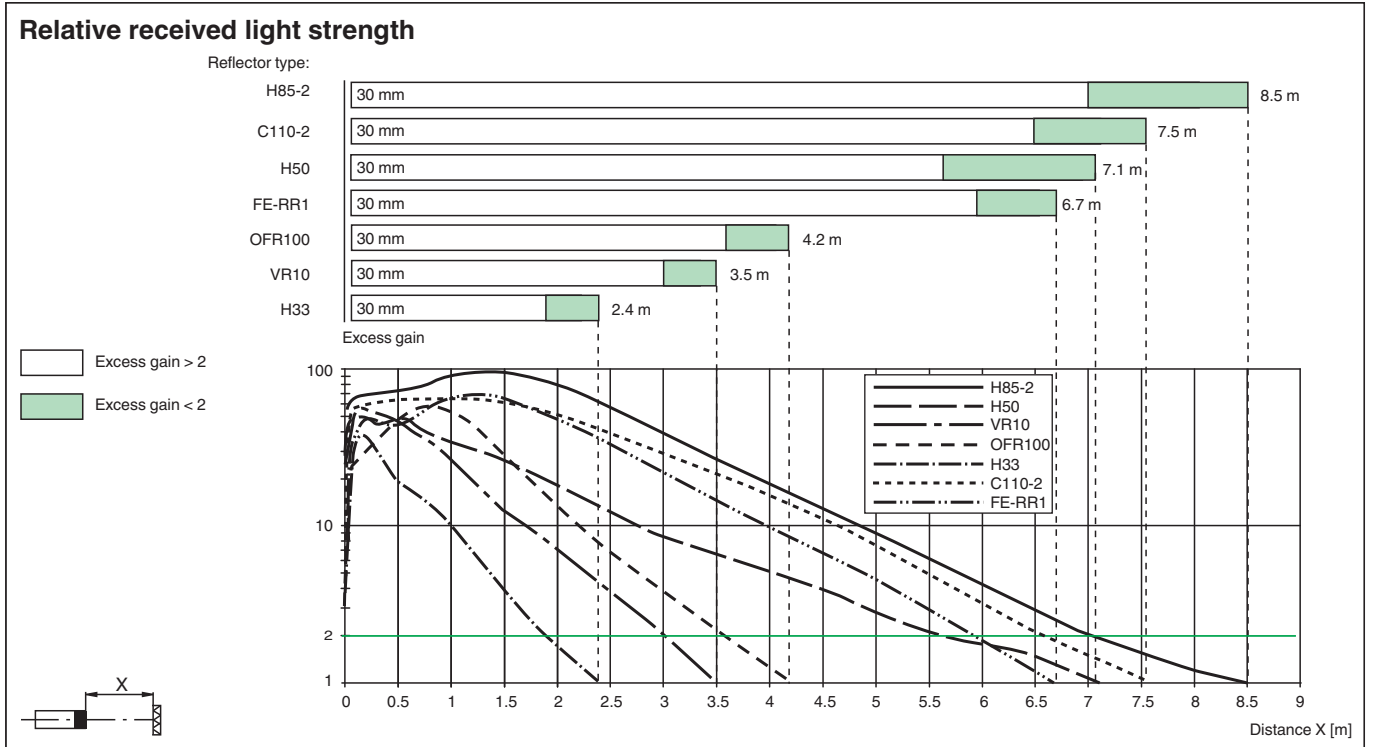
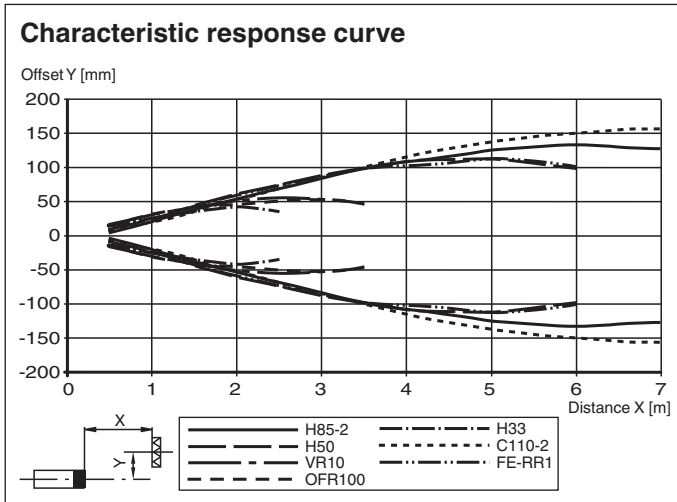


## Assembly



|   |                                    |
|---|------------------------------------|
| 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











Accessories

|  |                       |                  |
|--|-----------------------|------------------|
|  | <b>OMH-R101</b>       | Mounting Clamp   |
|  | <b>OMH-R101-Front</b> | Mounting Clamp   |
|  | <b>OMH-4.1</b>        | Mounting Clamp   |
|  | <b>OMH-ML6</b>        | Mounting bracket |
|  | <b>OMH-ML6-U</b>      | Mounting bracket |

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## Accessories

|   |                             |  |
|---|-----------------------------|--|
|    | <b>OMH-ML6-Z</b>            | Mounting bracket   |
|    | <b>OFR-100/100</b>          | Reflective tape 100 mm x 100 mm  |
|    | <b>REF-H33</b>              | Reflector with screw fixing  |
|    | <b>REF-H50</b>              | Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap   |
|    | <b>REF-H85-2</b>            | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes   |
|    | <b>REF-VR10</b>             | Reflector, rectangular 60 mm x 19 mm, mounting holes   |
|    | <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>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>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 |

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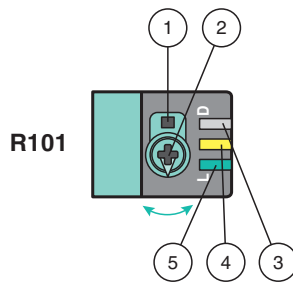
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## Configuration



- 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 for more than 180 degrees.

### Sensing Range / Sensitivity

Turn sensing range / sensitivity adjuster clockwise to increase sensing range / sensitivity.

Turn sensing range /sensitivity adjuster counterclockwise 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 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.