



## Retroreflective sensor OBR7500-R100-2EP-IO-V31



- 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 with polarization filter



### Function

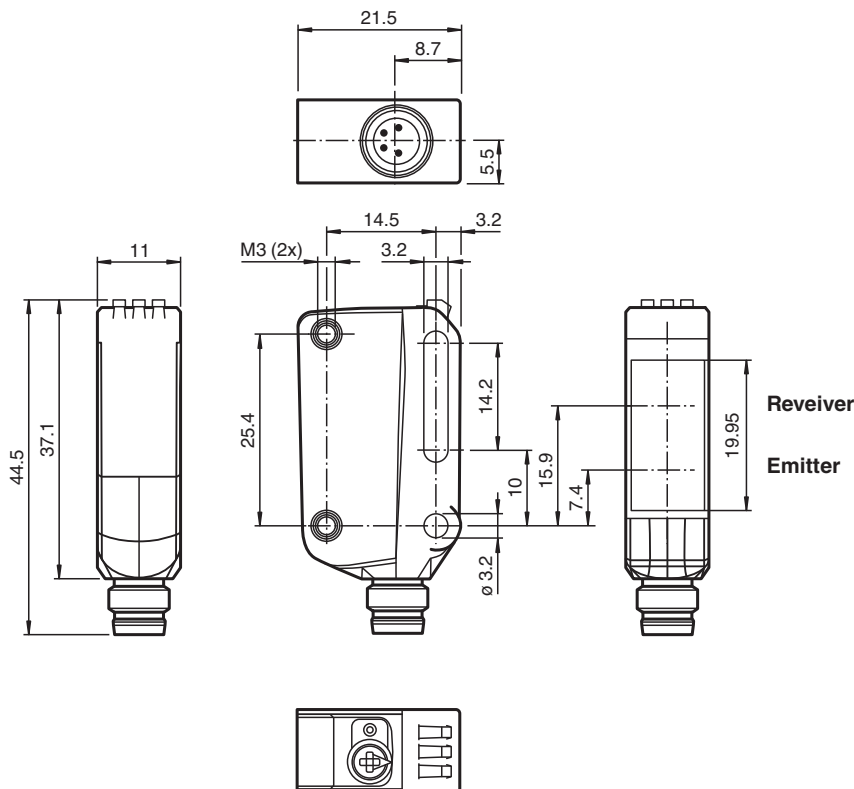
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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

### General specifications

|                            |                                    |
|----------------------------|------------------------------------|
| Effective detection range  | 0 ... 7.5 m                        |
| Reflector distance         | 0.03 ... 7.5 m                     |
| Threshold detection range  | 10 m                               |
| Reference target           | H85-2 reflector                    |
| Light source               | LED                                |
| Light type                 | modulated visible red light        |
| LED risk group labelling   | exempt group                       |
| Polarization filter        | yes                                |
| 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                       |

### 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 - 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 <sub>d</sub>                                                                                                                                                                                                                        | ≤ 1.5 V DC |
| Switching frequency | f                                                                                                                                                                                                                                     | 1000 Hz    |
| Response time       | 0.5 ms                                                                                                                                                                                                                                |            |

### Conformity

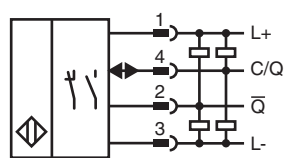
|                         |             |
|-------------------------|-------------|
| Communication interface | IEC 61131-9 |
|-------------------------|-------------|

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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)                               |
| Storage temperature               | -40 ... 70 °C (-40 ... 158 °F)                               |
| <b>Mechanical specifications</b>  |                                                              |
| Housing width                     | 11 mm                                                        |
| Housing height                    | 44.5 mm                                                      |
| Housing depth                     | 21.5 mm                                                      |
| Degree of protection              | IP67 / IP69 / IP69K                                          |
| Connection                        | M8 x 1 connector, 4-pin                                      |
| <b>Material</b>                   |                                                              |
| Housing                           | PC (Polycarbonate)                                           |
| Optical face                      | PMMA                                                         |
| Mass                              | approx. 10 g                                                 |

Connection



Connection Assignment

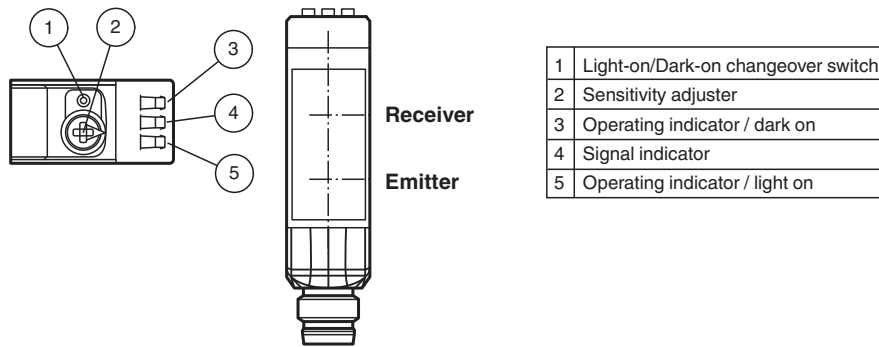


Wire colors in accordance with EN 60947-5-2

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

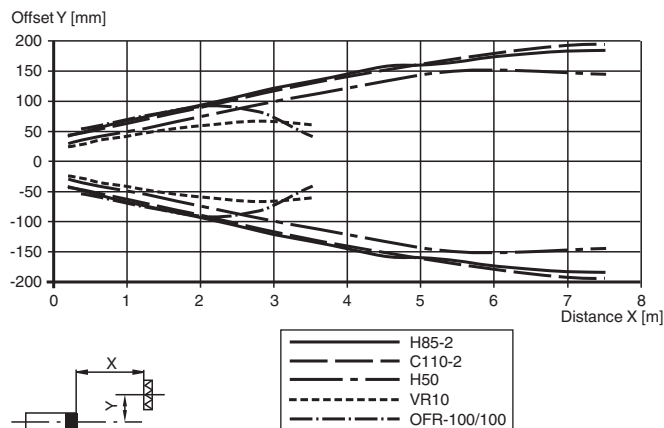
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## Assembly

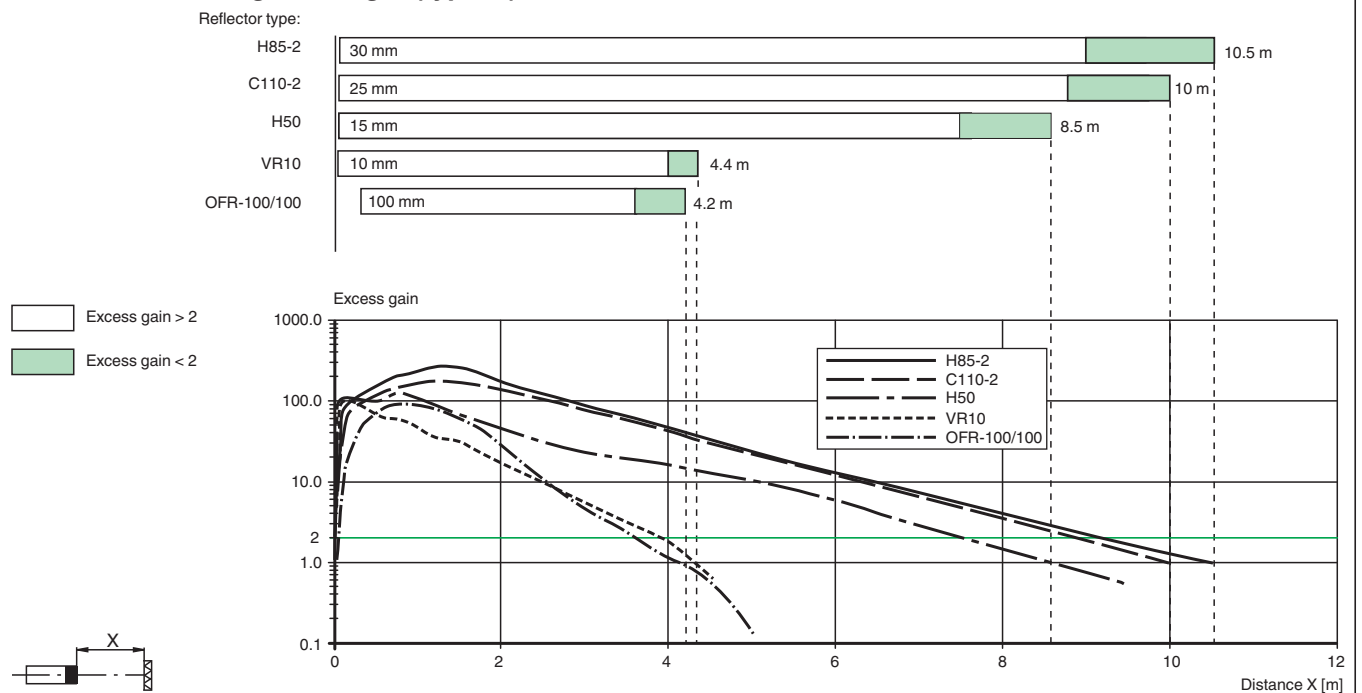


## Characteristic Curve

### Characteristic response curve



### Relative received light strength (typical)



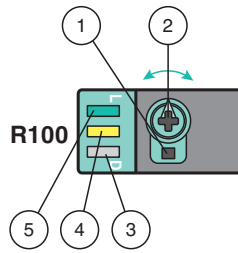
## Accessories

|                                                                                     |                            |                                                                                |
|-------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------|
|    | <b>OMH-ML100-09</b>        | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm                  |
|    | <b>REF-H33</b>             | Reflector with screw fixing                                                    |
|    | <b>REF-H85-2</b>           | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes                       |
|    | <b>REF-H50</b>             | Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap             |
|    | <b>REF-VR10</b>            | Reflector, rectangular 60 mm x 19 mm, mounting holes                           |
|    | <b>REF-MH82</b>            | Reflector with Micro-structure, rectangular 82 mm x 60 mm, mounting holes      |
|    | <b>REF-MH20</b>            | Reflector with Micro-structure, rectangular 32 mm x 20 mm, mounting holes      |
|    | <b>OFR-100/100</b>         | Reflective tape 100 mm x 100 mm                                                |
|    | <b>OMH-R10X-01</b>         | Mounting bracket                                                               |
|  | <b>OMH-R10X-02</b>         | Mounting bracket                                                               |
|  | <b>OMH-R10X-04</b>         | Mounting bracket                                                               |
|  | <b>OMH-R10X-10</b>         | Mounting bracket                                                               |
|  | <b>OMH-ML100-03</b>        | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm                  |
|  | <b>OMH-ML100-031</b>       | Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 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>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     |

## 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>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 /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.