# Retroreflective sensor

## OBR15M-R201-A5-IO-V31

- Medium 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
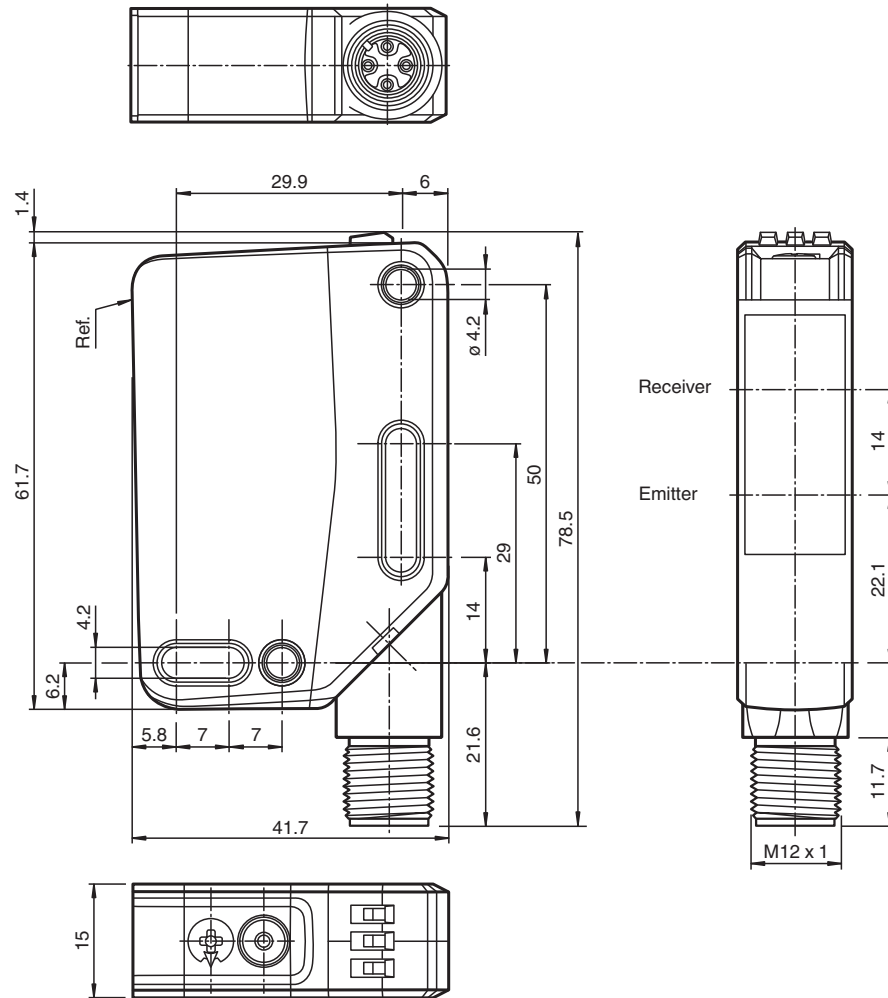
CE  c(UL)us LISTED  ◈ **IO**-Link

## Function

The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. 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.
Multi Pixel Technology (MPT) ensures that the standard sensors are flexible and can be adapted to the application environment.

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Dimensions



## Technical Data

**General specifications**

| | |
|---|---|
| Effective detection range | 0 ... 15 m |
| Reflector distance | 0.02 ... 15 m |
| Threshold detection range | 18.5 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. 520 mm at a distance of 15 m |
| Opening angle | 2 ° |
| Ambient light limit | EN 60947-5-2 : 60000 Lux |

**Functional safety related parameters**

| | |
|---|---|
| $MTTF_d$ | 724 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 |

## 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 | | Light-on/dark-on changeover switch |
| Control elements | | sensitivity adjustment |
| **Electrical specifications** | | |
| Operating voltage | $U_B$ | 10 ... 30 V DC |
| Ripple | | max. 10 % |
| No-load supply current | $I_0$ | < 18 mA at 24 V Operating voltage |
| Protection class | | III |
| **Interface** | | |
| Interface type | | IO-Link ( via C/Q = pin 4 ) |
| IO-Link revision | | 1.1 |
| Device profile | | Identification and diagnosis<br>Smart Sensor type 2.4 |
| Device ID | | 0x111217 (1118743) |
| 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: PNP normally open / dark-on, IO-Link<br>/Q - Pin2: PNP normally closed / light-on |
| Signal output | | 2 PNP outputs, short-circuit-proof, reverse polarity protection, surge-proof |
| 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 |
| **Approvals and certificates** | | |
| UL approval | | E87056 , cULus Listed , class 2 power supply , type rating 1 |
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |
| **Ambient conditions** | | |
| Ambient temperature | | -40 ... 60 °C (-40 ... 140 °F) |
| Storage temperature | | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | | |
| Housing width | | 15 mm |
| Housing height | | 61.7 mm |
| Housing depth | | 41.7 mm |
| Degree of protection | | IP67 / IP69 / IP69K |
| Connection | | 4-pin, M8 x 1 connector, 90° rotatable |
| Material | | |
|   Housing | | PC (Polycarbonate) |
|   Optical face | | PMMA |
| Mass | | approx. 47 g |

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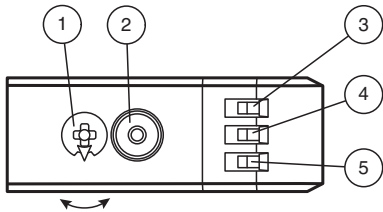| Pepperl+Fuchs Group<br>www.pepperl-fuchs.com | USA: +1 330 486 0001<br>fa-info@us.pepperl-fuchs.com | Germany: +49 621 776 1111<br>fa-info@de.pepperl-fuchs.com | Singapore: +65 6779 9091<br>fa-info@sg.pepperl-fuchs.com | PEPPERL+FUCHS | 3 |
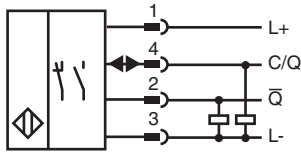
## Connection



## Connection Assignment
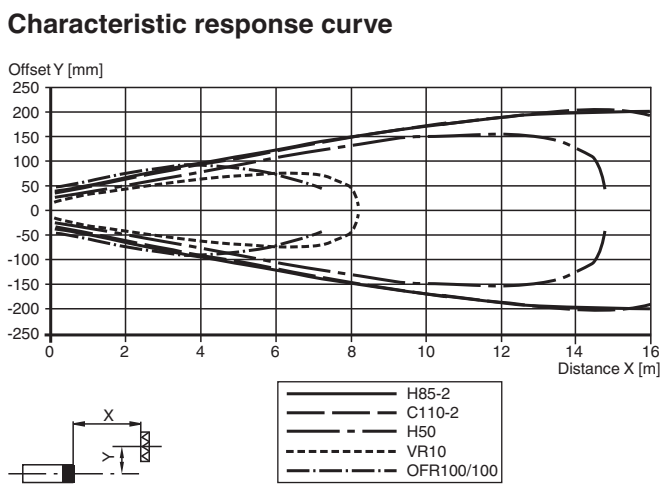


Wire colors in accordance with EN 60947-5-2

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

## Assembly



| | | |
|---|---|---|
| 1 | Sensitivity adjustment | |
| 2 | Light-on / dark-on changeover switch | |
| 3 | Operating indicator / dark on | GN |
| 4 | Signal indicator | YE |
| 5 | Operating indicator / light on | GN |

## Characteristic Curve

**Characteristic response curve**

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## Characteristic Curve

**Relative received light strength (typical)**

Reflector type:

| Reflector | | |
|---|---|---|
| H85-2 | 20 mm | 18.5 m |
| C110-2 | 20 mm | 18 m |
| H50 | 20 mm | 13.5 m |
| VR10 | 25 mm | 7 m |
| OFR-100/100 | 250 m | 6.3 m |

Excess gain > 2

Excess gain < 2

Excess gain

1000

100

10

2

1

H85-2
C110-2
H50
VR10
OFR-100/100

0          5          10          15          20

Distance X [m]

X
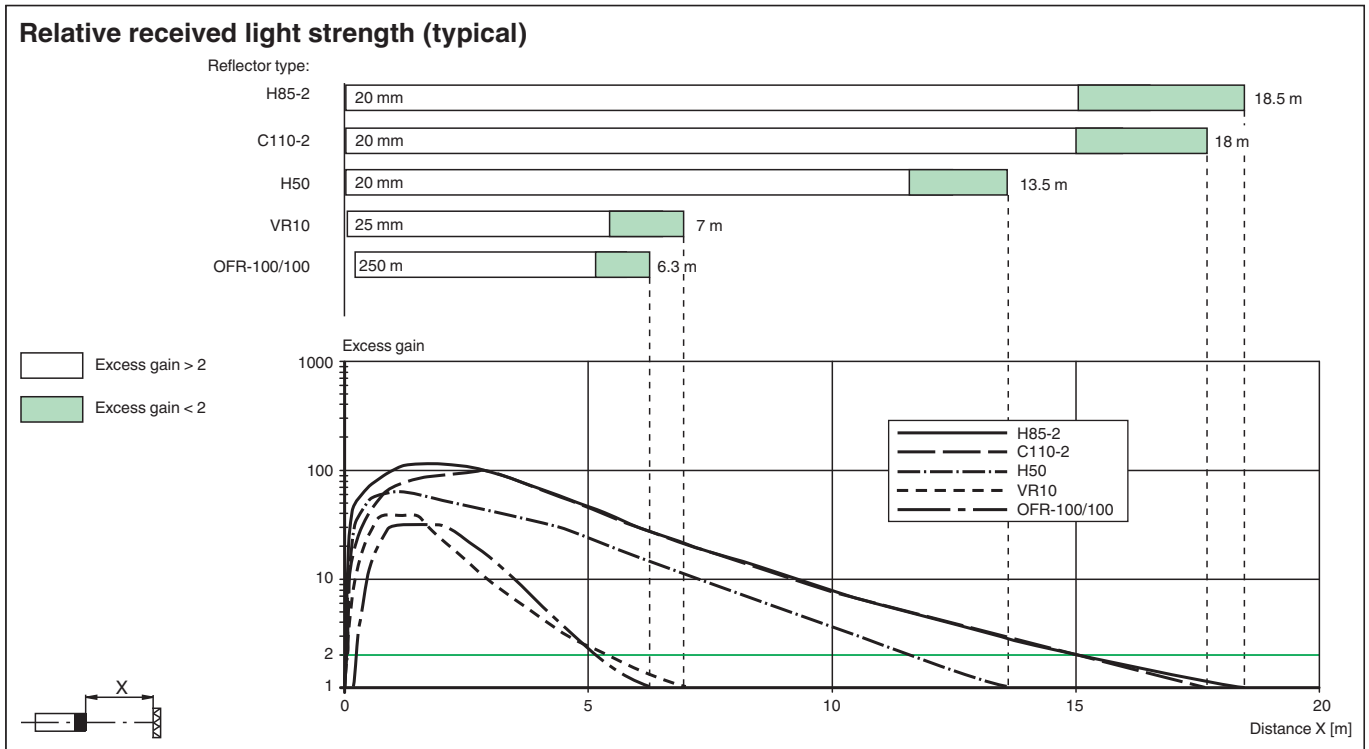
## Commissioning

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.

## Accessories

| | | |
|---|---|---|
| | **REF-H50** | Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap |
| | **REF-VR10** | Reflector, rectangular 60 mm x 19 mm, mounting holes |
| | **OFR-100/100** | Reflective tape 100 mm x 100 mm |
| | **IO-Link-Master02-USB** | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |
| | **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| | **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |

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## Accessories

| | | |
|---|---|---|
| | **V1-W-2M-PUR** | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey |
| | **V1-G-2M-PUR** | Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey |
| | **OMH-RL31-02** | Mounting bracket narrow |
| | **OMH-RL31-03** | Mounting bracket narrow |
| | **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| | **OMH-RL31-07** | Mounting bracket including adjustment |
| | **OMH-RL31-08** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| | **OMH-R20x-Quick-Mount** | Quick mounting accessory |

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