## Model Number

**OBD1000-R101-2EP-IO**

Diffuse mode sensor
with fixed cable

## Features

- 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

## Product information

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.
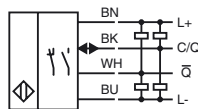
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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.
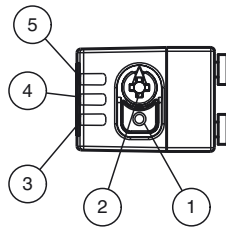
## Dimensions

Emitter

Receiver
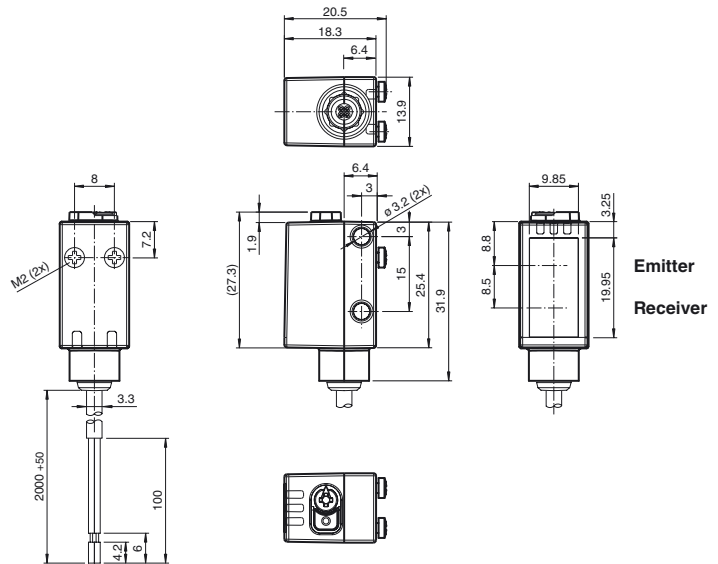
## Electrical connection

## Indicators/operating means

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

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

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## Technical data

**General specifications**

| | |
|---|---|
| Detection range | 2 ... 1000 mm |
| Detection range min. | 20 ... 50 mm |
| Adjustment range | 50 ... 1000 mm |
| Reference target | standard white, 100 mm x 100 mm |
| 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 1000 mm |
| Angle of divergence | 3.7 ° |
| Ambient light limit | EN 60947-5-2 |

**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 |
| Function indicator | LED yellow:<br>constantly on - object detected<br>constantly off - object not detected |
| Control elements | Light-on/dark-on changeover switch |
| Control elements | Sensing range  adjuster |

**Electrical specifications**

| | | |
|---|---|---|
| Operating voltage | $U_B$ | 10 ... 30 V DC |
| Ripple | | max. 10  % |
| No-load supply current | $I_0$ | < 25 mA at 24 V supply voltage |
| Protection class | | III |

**Interface**

| | |
|---|---|
| Interface type | IO-Link ( via C/Q = BK ) |
| Transfer rate | COM 2 (38.4 kBaud) |
| IO-Link Revision | 1.1 |
| Min. cycle time | 2.3 ms |
| Process data witdh | Process data input 1 Bit<br>Process data output 2 Bit |
| SIO mode support | yes |
| Device ID | 0x110101 (1114369) |
| 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 / light-on, PNP normally closed / dark-on, IO-Link<br>/Q - WH: NPN normally closed / dark-on, PNP normally open / light-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 | $U_d$ | ≤ 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 |

**Ambient conditions**

| | |
|---|---|
| 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) |

**Mechanical specifications**

| | |
|---|---|
| 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 |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Mass | approx. 10 g |
| Cable length | 2 m |

**Approvals and certificates**

## Accessories

**IO-Link-Master02-USB**
IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

**OMH-R101**
Mounting Clamp

**OMH-R101-Front**
Mounting Clamp

**OMH-4.1**
Mounting Clamp

**OMH-ML6**
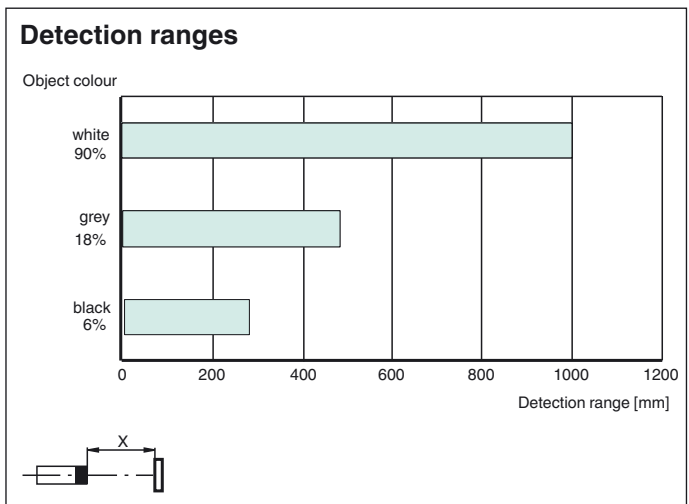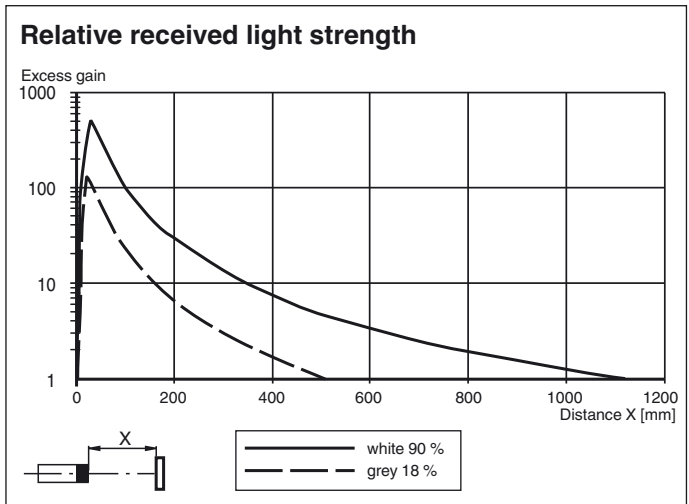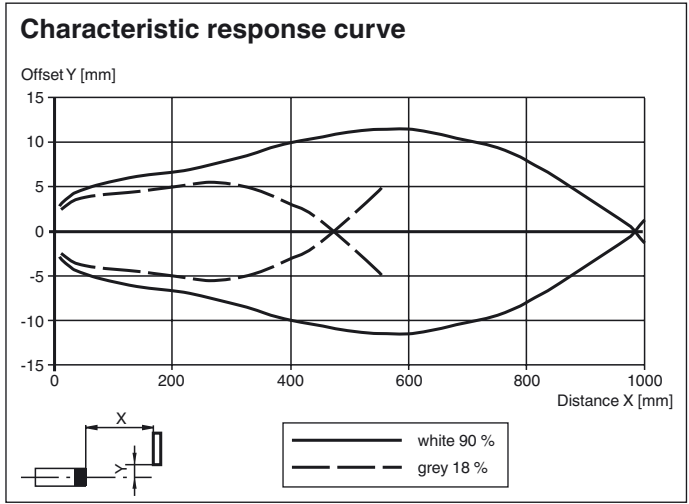Mounting bracket

**OMH-ML6-U**
Mounting bracket

**OMH-ML6-Z**
Mounting bracket

Other suitable accessories can be found at www.pepperl-fuchs.com

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

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UL approval                    E87056 , cULus Listed , class 2 power supply , type rating 1

## Curves/Diagrams

### Characteristic response curve

Offset Y [mm]



white 90 %
grey 18 %

### Relative received light strength

Excess gain



white 90 %
grey 18 %

### Detection ranges

Object colour

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

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## Functions and Operation

**R101**
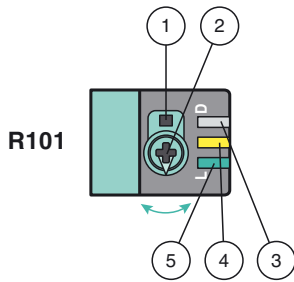
1 - Light-on / dark-on changeover switch
2 - Sensing range /sensitivity adjuster
3 - Operating indicator / dark on
4 - Signal indicator
5 - Operating indicator / light on

To unlock the adjustment functions turn the sensing range adjuster for more than 180 degrees.

### Sensing Range / Sensitivity

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

Turn sensing range /sensivity 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 / sensivity adjustment is locked. In order to reactivate the sensing range /sensivity adjustment, turn the sensing range / sensivity adjuster for more than 180 degrees.

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