

## Model Number

**OBD1000-R100-2EP-IO-V31**

Diffuse mode sensor
with 4-pin, M8 x 1 connector

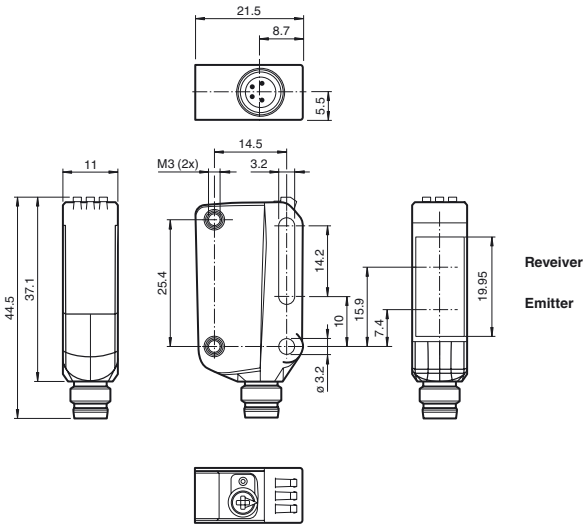
## Features

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

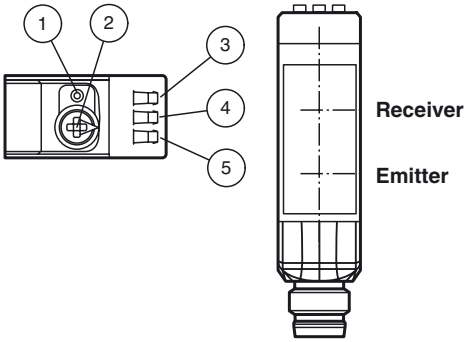
## Product information

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

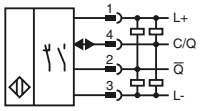



## Indicators/operating means




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

## Electrical connection




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## Technical data

| | | |
|---|---|---|
| **General specifications** | | |
| Detection range | | 2 ... 1000 mm |
| Detection range min. | | 20 ... 50 mm |
| Detection range max. | | 5 ... 1000 mm |
| Adjustment range | | 75 ... 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 = pin 4 ) |
| 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>Q Pin4: NPN "NO contact" function/light on, PNP "NC contact" function/dark on<br>Q/ Pin2: NPN "NC contact" function/dark on, PNP "NO contact" function/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 |
| **Ambient conditions** | | |
| Ambient temperature | | -40 ... 60 °C (-40 ... 140 °F) |
| Storage temperature | | -40 ... 75 °C (-40 ... 167 °F) |
| **Mechanical specifications** | | |
| Degree of protection | | IP67 / IP69 / IP69K |
| Connection | | M8 x 1 connector, 4-pin |
| Material | | |
| Housing | | PC (Polycarbonate) |
| Optical face | | PMMA |
| Mass | | approx. 10 g |
| **Compliance with standards and directives** | | |
| 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 |

## Accessories

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

**V31-WM-2M-PUR**
Female cordset, M8, 4-pin, PUR cable

**V31-GM-2M-PUR**
Female cordset, M8, 4-pin, PUR cable

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

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
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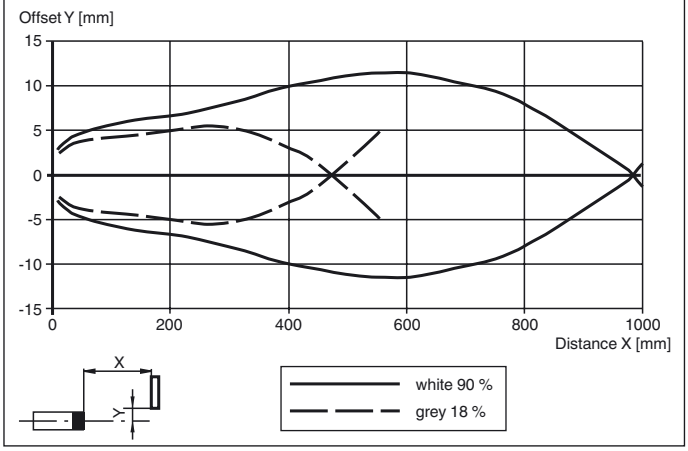
| | |
|---|---|
| Standards | UL 60947-5-2: 2014<br>IEC 61131-9:2013<br>EN 62471:2008<br>EN 61131-9:2013 |

**Approvals and certificates**

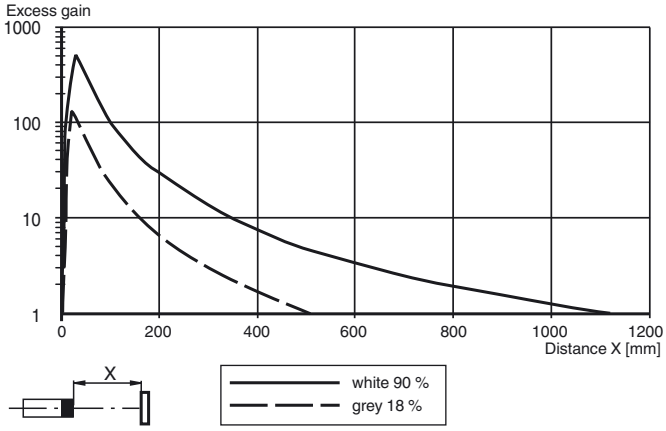
| | |
|---|---|
| UL approval | E87056 , cULus Listed , class 2 power supply , type rating 1 |

## Curves/Diagrams

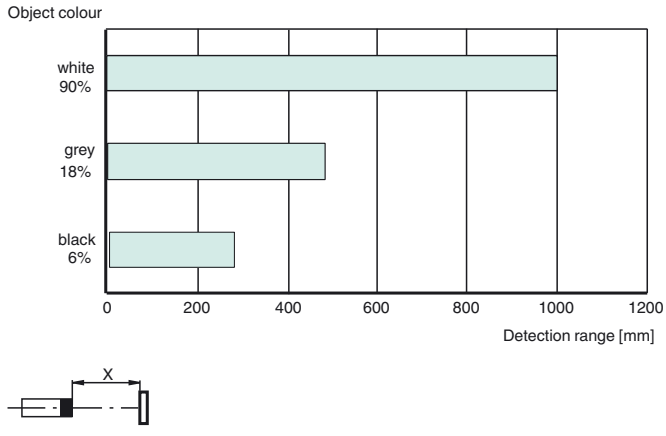
### Characteristic response curve




### Relative received light strength

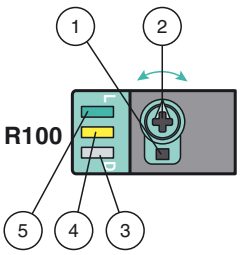



### Detection ranges




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## Functions and Operation




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.

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