



## Diffuse mode sensor OBD1000-R100-EP-IO-V3



- 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

Diffuse mode sensor



### Function

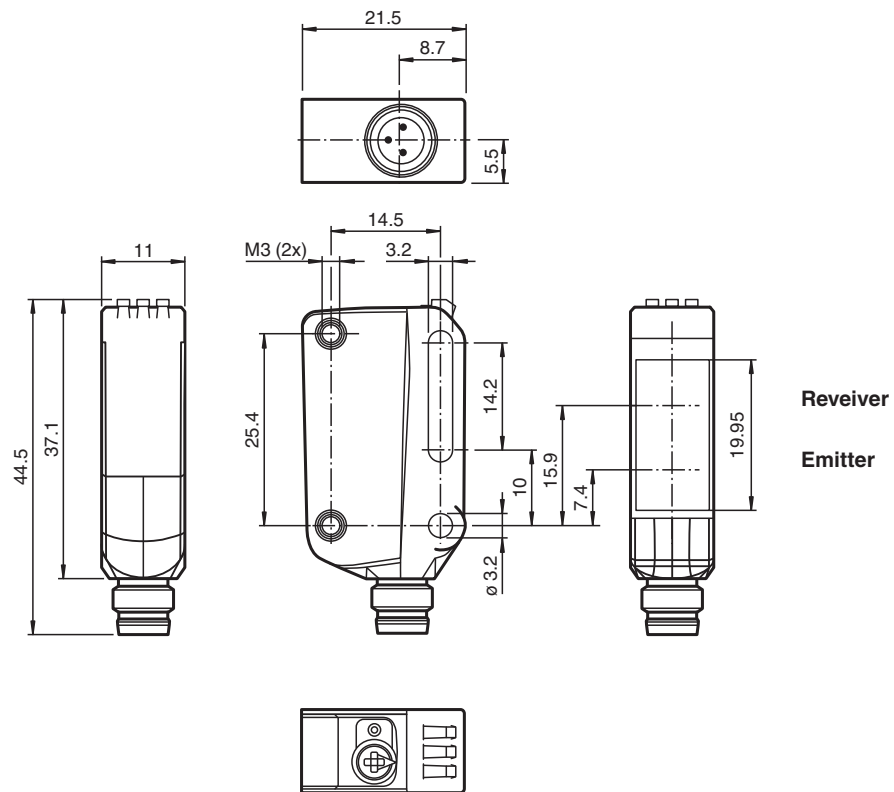
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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



## 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 <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  | LED yellow:<br>constantly on - object detected<br>constantly off - object not detected                                      |
| Control elements    | Light-on/dark-on changeover switch                                                                                          |

## Technical Data

|                                   |                                                                                                                                                             |                                                       |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Control elements                  | Sensing range adjuster                                                                                                                                      |                                                       |
| <b>Electrical specifications</b>  |                                                                                                                                                             |                                                       |
| 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                                                   |
| <b>Interface</b>                  |                                                                                                                                                             |                                                       |
| Interface type                    |                                                                                                                                                             | IO-Link ( via C/Q = pin 4 )                           |
| IO-Link revision                  |                                                                                                                                                             | 1.1                                                   |
| Device ID                         |                                                                                                                                                             | 0x110101 (1114369)                                    |
| Transfer rate                     |                                                                                                                                                             | COM2 (38.4 kBaud)                                     |
| Min. cycle time                   |                                                                                                                                                             | 2.3 ms                                                |
| Process data width                |                                                                                                                                                             | Process data input 1 Bit<br>Process data output 2 Bit |
| SIO mode support                  |                                                                                                                                                             | yes                                                   |
| Compatible master port type       |                                                                                                                                                             | A                                                     |
| <b>Output</b>                     |                                                                                                                                                             |                                                       |
| Switching type                    | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally open / light-on, PNP normally closed / dark-on, IO-Link |                                                       |
| Signal output                     | 1 push-pull (4 in 1) output, 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                      | $U_d$                                                                                                                                                       | $\leq 1.5$ V DC                                       |
| Switching frequency               | $f$                                                                                                                                                         | 1000 Hz                                               |
| Response time                     |                                                                                                                                                             | 0.5 ms                                                |
| <b>Conformity</b>                 |                                                                                                                                                             |                                                       |
| Communication interface           | IEC 61131-9                                                                                                                                                 |                                                       |
| Product standard                  | EN 60947-5-2                                                                                                                                                |                                                       |
| <b>Approvals and certificates</b> |                                                                                                                                                             |                                                       |
| EAC conformity                    | TR CU 020/2011                                                                                                                                              |                                                       |
| 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                    | 37.1 mm                                                                                                                                                     |                                                       |
| Housing depth                     | 21.5 mm                                                                                                                                                     |                                                       |
| Degree of protection              | IP67 / IP69 / IP69K                                                                                                                                         |                                                       |
| Connection                        | M8 x 1 connector, 3-pin                                                                                                                                     |                                                       |
| Material                          |                                                                                                                                                             |                                                       |
| Housing                           | PC (Polycarbonate)                                                                                                                                          |                                                       |
| Optical face                      | PMMA                                                                                                                                                        |                                                       |
| Mass                              | approx. 10 g                                                                                                                                                |                                                       |

Release date: 2021-09-07 Date of issue: 2021-09-07 Filename: 267075-100042\_eng.pdf

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

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www.pepperl-fuchs.com

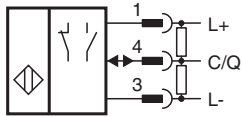
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## Connection



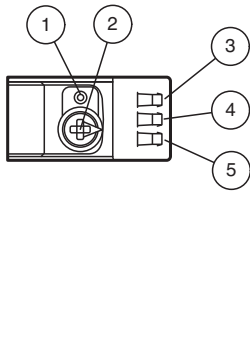
## Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

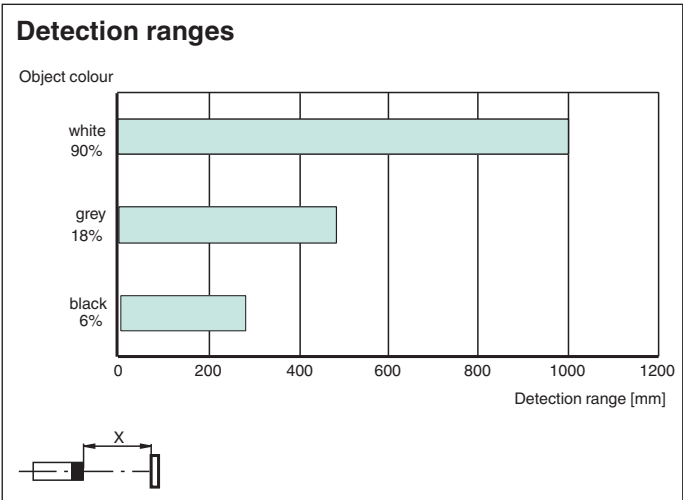
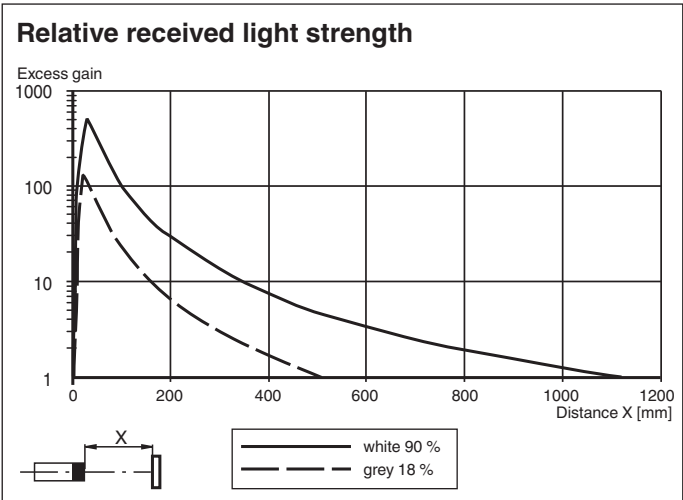
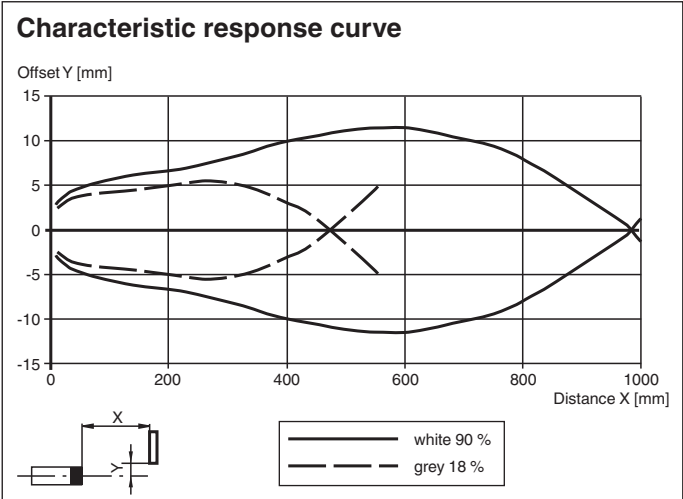
## Assembly






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

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## Characteristic Curve











## Accessories

|                                                                                     |                             |                                                                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|  | <b>OMH-ML100-09</b>         | Mounting aid for round steel $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm                                    |
|  | <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>OMH-R10X-01</b>          | Mounting bracket                                                                                             |

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## Accessories

|                                                                                   |                      |                                                                                |
|-----------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------|
|  | <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 $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm      |
|  | <b>OMH-ML100-031</b> | Mounting aid for round steel $\varnothing$ 10 ... 14 mm or sheet 1 mm ... 5 mm |
|  | <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           |
|  | <b>V3-WM-2M-PUR</b>  | Female cordset single-ended M8 angled A-coded, 3-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.