



## Diffuse mode sensor

### OBD1000-R101-2EP-IO-0,3M-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

Diffuse mode sensor



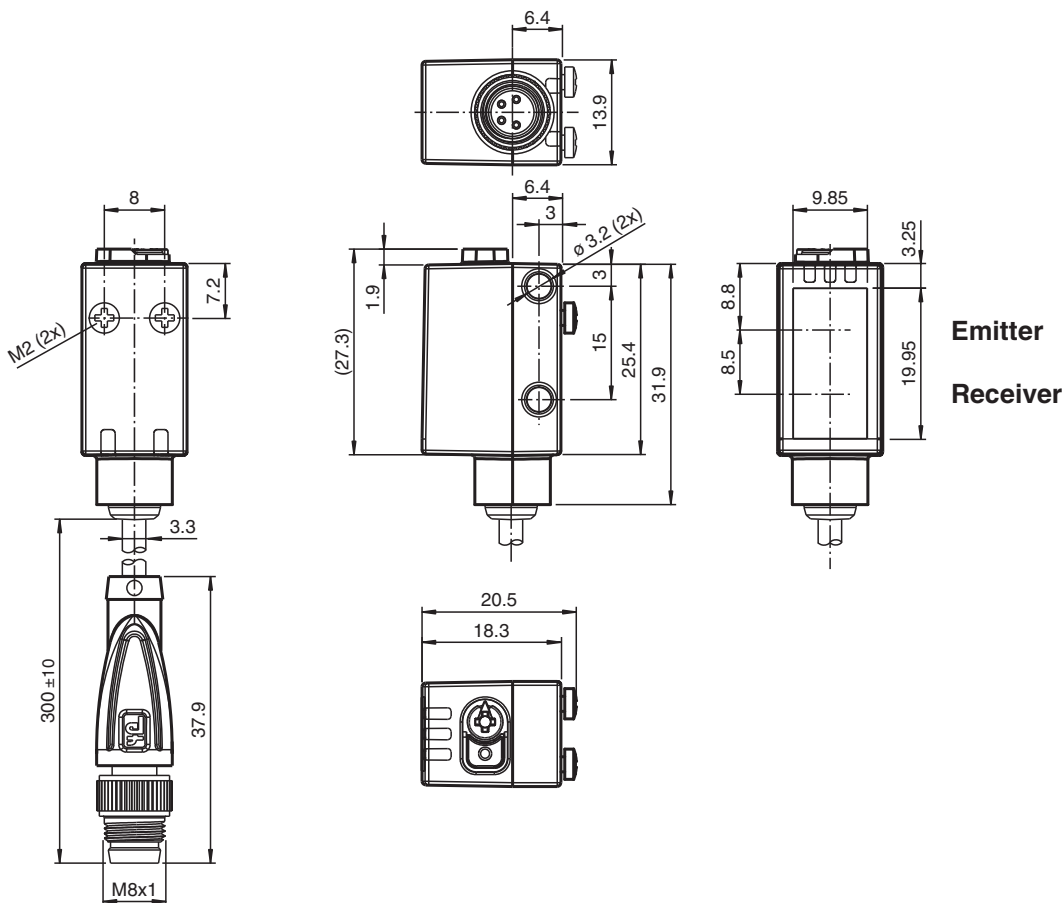
### Function

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



Release date: 2023-10-23 Date of issue: 2023-10-23 Filename: 267075-100045\_eng.pdf

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 |
| 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  | 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 <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                   |  | 0x110101 (1114369)                                    |
| Transfer rate               |  | COM2 (38.4 kBit/s)                                    |
| 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                                                     |

### Output

|                     |                                                                                                                                                                                                                                       |            |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 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<br>/Q - Pin2: 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 <sub>d</sub>                                                                                                                                                                                                                        | ≤ 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 |

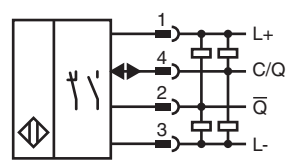
### Approvals and certificates

Release date: 2023-10-23 Date of issue: 2023-10-23 Filename: 267075-100045\_eng.pdf

Technical Data

|                                  |  |                                                                                                                                    |
|----------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------|
| UL approval                      |  | E87056 , cULus Listed , class 2 power supply , type rating 1                                                                       |
| <b>Ambient conditions</b>        |  |                                                                                                                                    |
| 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)                                                                                                     |
| <b>Mechanical specifications</b> |  |                                                                                                                                    |
| Housing width                    |  | 13.9 mm                                                                                                                            |
| Housing height                   |  | 33.8 mm                                                                                                                            |
| Housing depth                    |  | 18.3 mm                                                                                                                            |
| Degree of protection             |  | IP67 / IP69 / IP69K                                                                                                                |
| Connection                       |  | fixed cable 300 mm with M8 x 1 male connector; 4-pin                                                                               |
| <b>Material</b>                  |  |                                                                                                                                    |
| Housing                          |  | PC (Polycarbonate)                                                                                                                 |
| Optical face                     |  | PMMA                                                                                                                               |
| Mass                             |  | approx. 10 g                                                                                                                       |
| Cable length                     |  | 0.3 m                                                                                                                              |

Connection



Connection Assignment

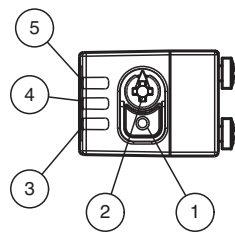


Wire colors in accordance with EN 60947-5-2

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

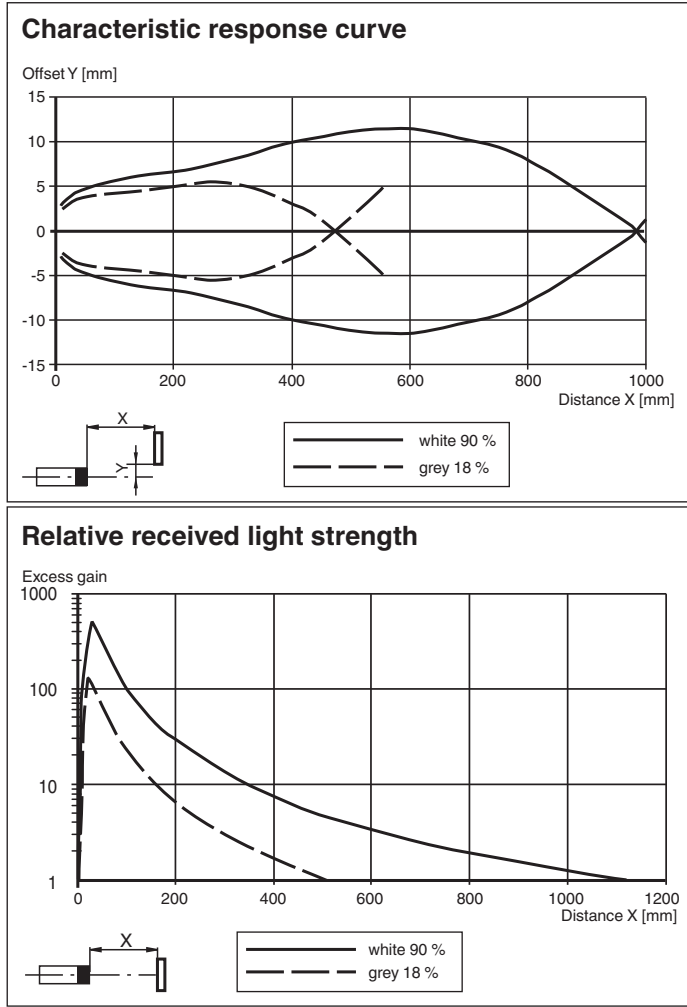
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Assembly



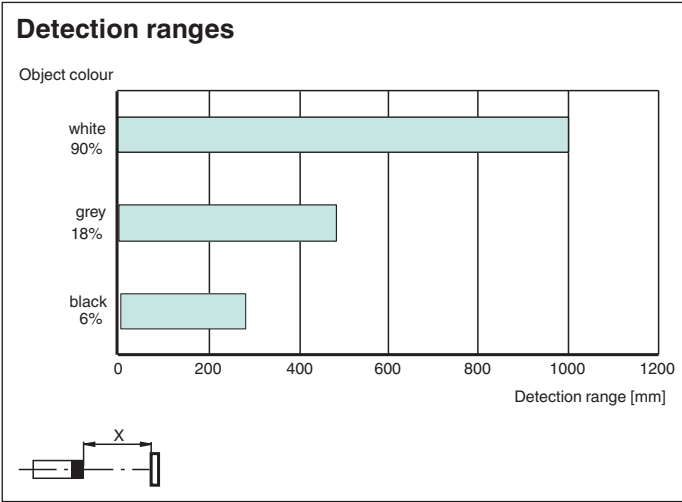
|   |                                    |
|---|------------------------------------|
| 1 | Light-on/dark-on changeover switch |
| 2 | Sensitivity adjuster               |
| 3 | Operating indicator / dark on      |
| 4 | Signal indicator                   |
| 5 | Operating indicator / light on     |

Characteristic Curve



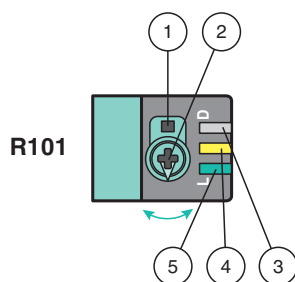
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Characteristic Curve



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## 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 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 counterclockwise 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 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.