



## Diffuse mode sensor OBD800-R103-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

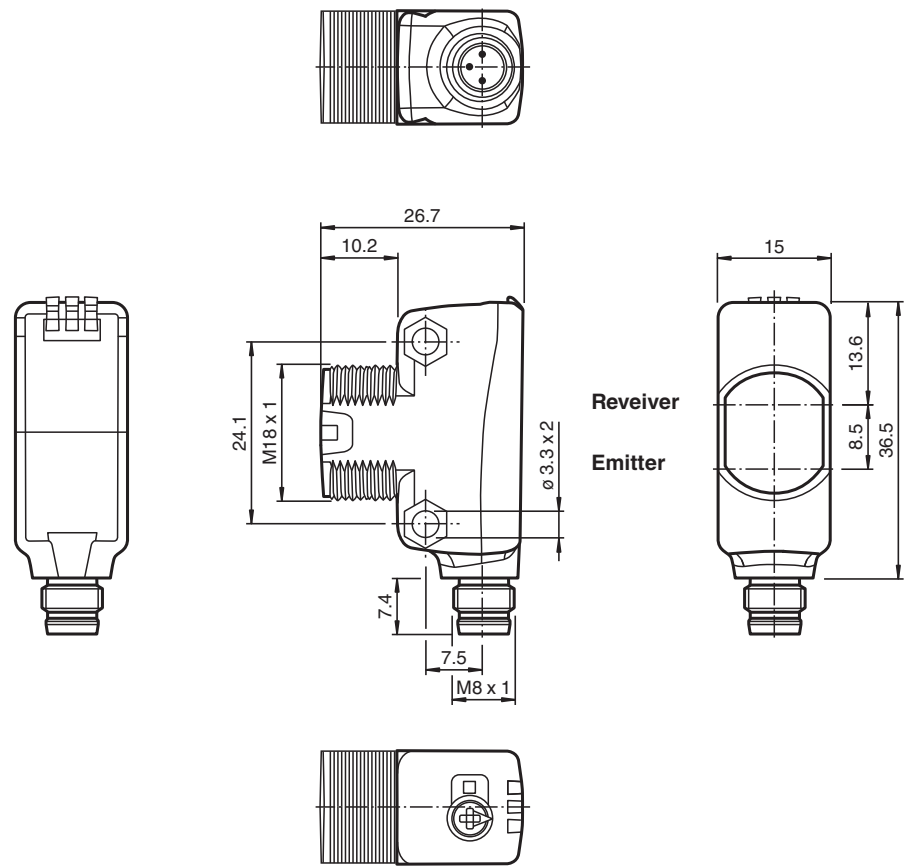
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation 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

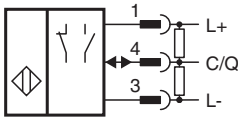
| General specifications               |  |                                                                                                                             |
|--------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------|
| Detection range                      |  | 2 ... 800 mm                                                                                                                |
| Detection range min.                 |  | 20 ... 40 mm                                                                                                                |
| Adjustment range                     |  | 40 ... 800 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. 55 mm at a distance of 800 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                                                                                          |

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

## Technical Data

|                             |                |                                                                                                                                                             |
|-----------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control elements            |                | sensitivity adjustment                                                                                                                                      |
| 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 = pin 4 )                                                                                                                                   |
| IO-Link revision            |                | 1.1                                                                                                                                                         |
| Device ID                   |                | 0x110103 (1114371)                                                                                                                                          |
| 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 |
| 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 <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  |                |                                                                                                                                                             |
| EAC conformity              |                | TR CU 020/2011                                                                                                                                              |
| UL approval                 |                | E87056 , cULus Listed , class 2 power supply , type rating 1                                                                                                |
| 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              |                | 43.9 mm                                                                                                                                                     |
| Housing depth               |                | 26.7 mm                                                                                                                                                     |
| Degree of protection        |                | IP67 / IP69 / IP69K                                                                                                                                         |
| Connection                  |                | M8 x 1 connector, 3-pin                                                                                                                                     |
| Material                    |                |                                                                                                                                                             |
| Housing                     |                | PC (Polycarbonate)                                                                                                                                          |
| Optical face                |                | PMMA                                                                                                                                                        |
| Mass                        |                | approx. 12 g                                                                                                                                                |

Connection



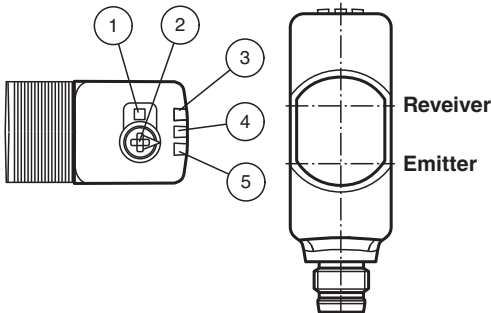
Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

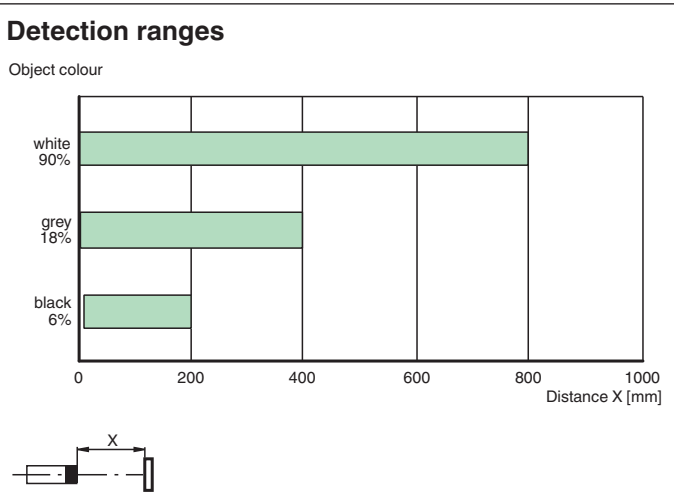
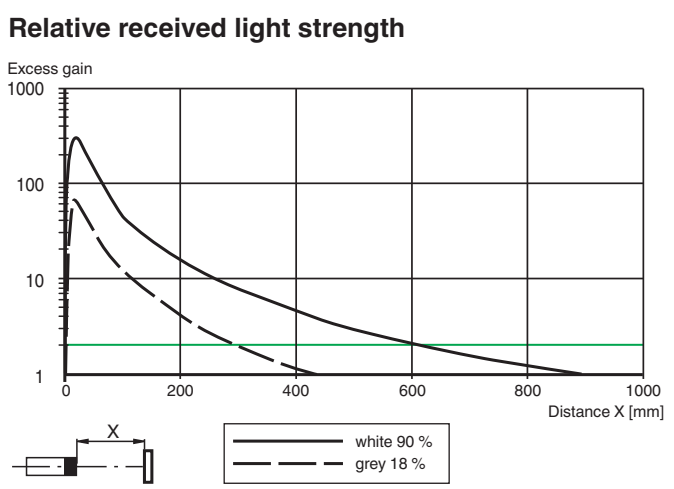
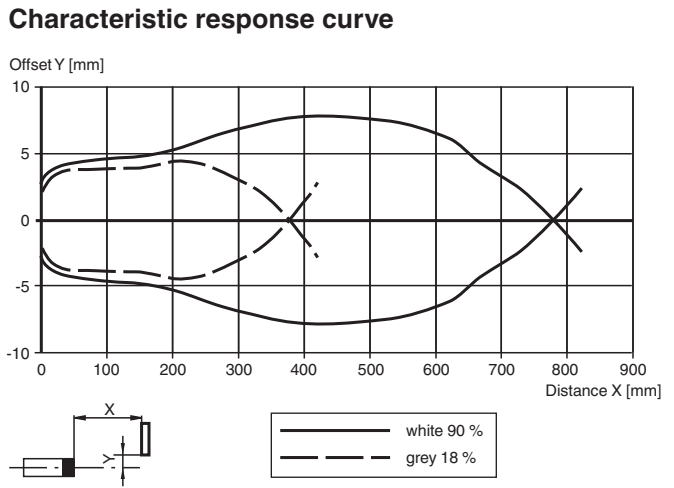
Assembly



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

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Characteristic Curve



Accessories

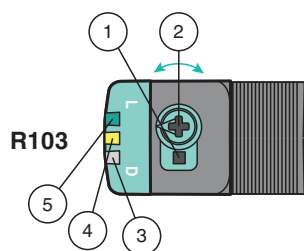
|                                                                                     |                      |                                                                        |
|-------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------|
|  | <b>OMH-ML100-09</b>  | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm          |
|  | <b>OMH-R103-01</b>   | Mounting bracket                                                       |
|  | <b>V31-GM-2M-PUR</b> | Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey |

## Accessories

|                                                                                     |                             |                                                                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|    | <b>V31-WM-2M-PUR</b>        | Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey                                         |
|    | <b>OMH-ML6</b>              | Mounting bracket                                                                                             |
|    | <b>OMH-ML6-U</b>            | Mounting bracket                                                                                             |
|    | <b>OMH-ML6-Z</b>            | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-01</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-04</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-R10X-10</b>          | Mounting bracket                                                                                             |
|    | <b>OMH-ML100-031</b>        | Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 mm                                           |
|    | <b>OMH-ML100-03</b>         | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm                                                |
|  | <b>ICE2-8IOL-G65L-V1D</b>   | EtherNet/IP IO-Link master with 8 inputs/outputs                                                             |
|  | <b>ICE3-8IOL-G65L-V1D</b>   | PROFINET IO IO-Link master with 8 inputs/outputs                                                             |
|  | <b>ICE1-8IOL-G30L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs                                                                |
|  | <b>ICE1-8IOL-G60L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs                                                                |
|  | <b>ICE2-8IOL-K45P-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors                               |
|  | <b>ICE2-8IOL-K45S-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <b>ICE3-8IOL-K45P-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals                                |
|  | <b>ICE3-8IOL-K45S-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <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>V3-GM-2M-PUR</b>         | Female cordset single-ended M8 straight A-coded, 3-pin, PUR cable grey                                       |
|  | <b>V3-WM-2M-PUR</b>         | Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey                                         |

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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 / 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.