



**Model Number**

**OBT250-R103-EP-IO-V3-L**

Triangulation sensor (BGS)  
with 3-pin, M8 x 1 connector

**Features**

- Miniature design with versatile mounting options
- DuraBeam Laser Sensors - durable and employable like an LED
- Extended temperature range -40°C ... 60°C
- High degree of protection IP69K
- IO-link interface for service and process data

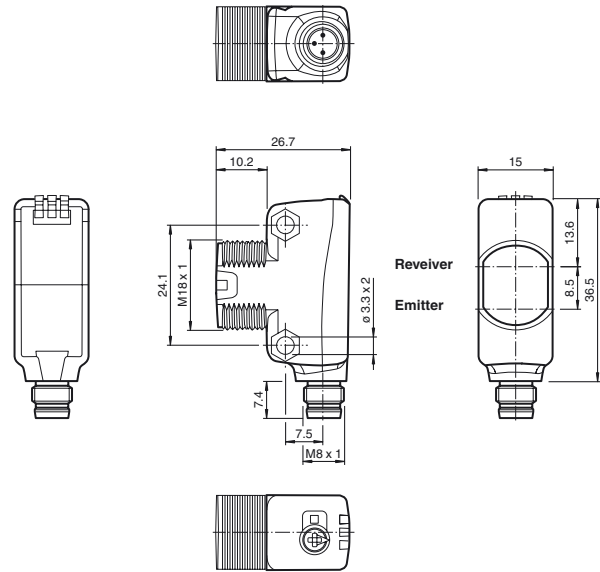
**Product information**

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.

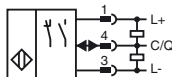
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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**



**Electrical connection**



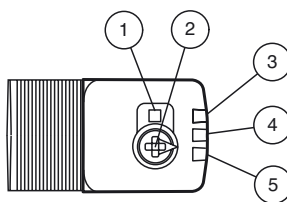
**Pinout**



Wire colors in accordance with EN 60947-5-2

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

**Indicators/operating means**



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

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

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**Technical data**
**General specifications**

|                                 |   |
|---------------------------------|---|
| Detection range                 | 7 ... 250 mm  |
| Detection range min.            | 7 ... 25 mm   |
| Detection range max.            | 7 ... 250 mm  |
| Adjustment range                | 25 ... 250 mm   |
| Reference target                | standard white, 100 mm x 100 mm                       |
| Light source                    | laser diode   |
| Light type                      | modulated visible red light                           |
| Laser nominal ratings           |   |
| Note                            | LASER LIGHT , DO NOT STARE INTO BEAM                  |
| Laser class                     | 1   |
| Wave length                     | 680 nm  |
| Beam divergence                 | > 5 mrad d63 < 1 mm in the range of 150 mm ... 250 mm |
| Pulse length                    | 3 µs  |
| Repetition rate                 | approx. 13 kHz  |
| max. pulse energy               | 10.4 nJ   |
| Black/White difference (6%/90%) | < 5 % at 120 mm                                       |
| Diameter of the light spot      | approx. 1 mm at a distance of 200 mm                  |
| Angle of divergence             | approx. 0.3 °   |
| Ambient light limit             | EN 60947-5-2 40000 Lux                                |

**Functional safety related parameters**

|                                |       |
|--------------------------------|-------|
| MTTF <sub>d</sub>              | 560 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> | < 20 mA at 24 V supply voltage |
| Protection class       |                | III                            |

**Interface**

|                             |   |
|-----------------------------|---|
| Interface type              | IO-Link ( via C/Q = pin 4 )                           |
| Device profile              | Smart Sensor  |
| Transfer rate               | COM 2 (38.4 kBaud)                                    |
| IO-Link Revision            | 1.1   |
| Min. cycle time             | 2.3 ms  |
| Process data width          | Process data input 1 Bit<br>Process data output 2 Bit |
| SIO mode support            | yes   |
| Device ID                   | 0x110605 (1115653)                                    |
| 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   | 1650 Hz    |
| Response time       |   | 300 µs     |

**Conformity**

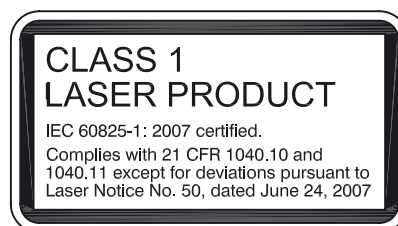
|                         |                 |
|-------------------------|-----------------|
| Communication interface | IEC 61131-9     |
| Product standard        | EN 60947-5-2    |
| Laser safety            | EN 60825-1:2014 |

**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 |

**Laserlabel**

**Accessories**
**IO-Link-Master02-USB**

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

**V3-WM-2M-PUR**

Cable socket, M8, 3-pin, PUR cable

**OMH-R103-01**

Mounting bracket

**V31-GM-2M-PUR**

Female cordset, M8, 4-pin, PUR cable

**V31-WM-2M-PUR**

Female cordset, M8, 4-pin, PUR cable

**OMH-R101-Front**

Mounting Clamp

**OMH-R101**

Mounting Clamp

**OMH-4.1**

Mounting Clamp

**OMH-ML6**

Mounting bracket

**OMH-ML6-U**

Mounting bracket

**OMH-ML6-Z**

Mounting bracket

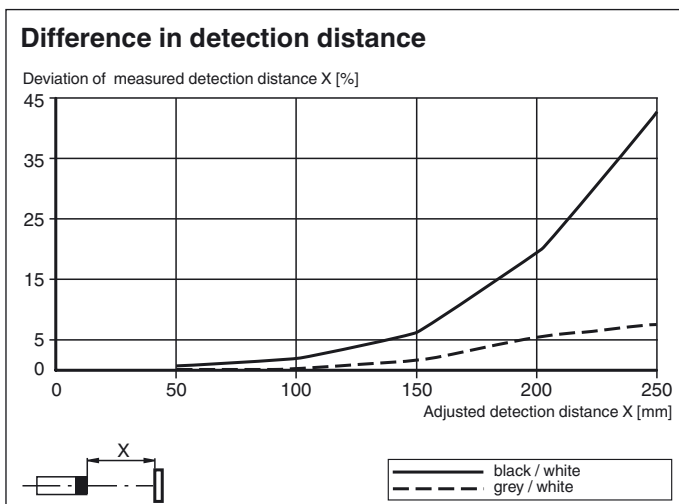
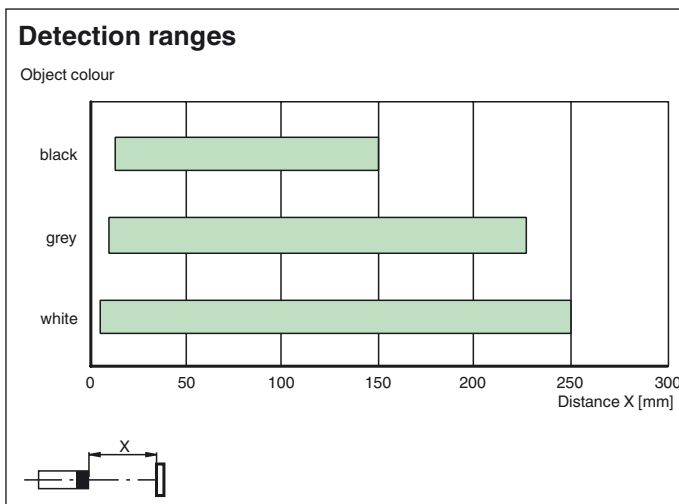
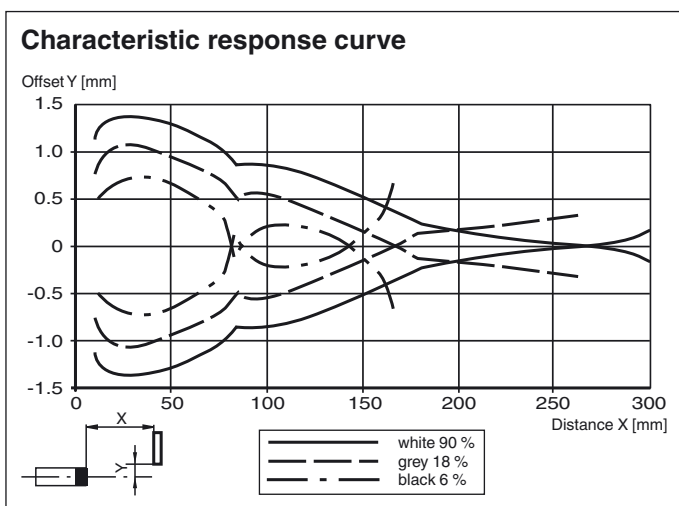
Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

|                      |                         |
|----------------------|-------------------------|
| 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            |

**Approvals and certificates**

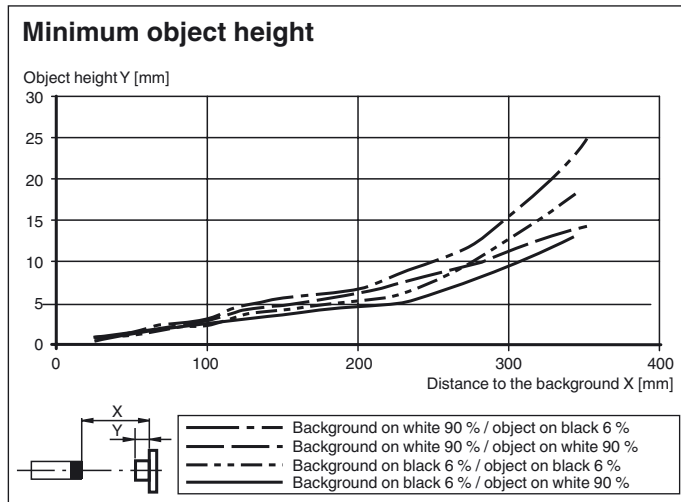
|              |  |
|--------------|--|
| UL approval  | E87056 , cULus Listed , class 2 power supply , type rating 1   |
| FDA approval | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 |

**Curves/Diagrams**

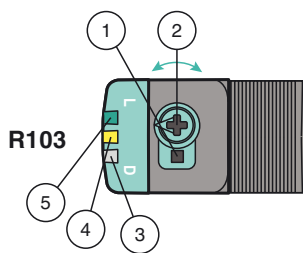


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**Functions and Operation**



- 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 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.

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