# Triangulation sensor (BGS)

## OBT150-R101-2EP1-IO-V31-IR

- Miniature design with versatile mounting options
- Best background suppressor in its class
- Precision object detection, almost irrespective of the color
- Extended temperature range
  -40°C ... 60°C
- High degree of protection IP69K
- IO-link interface for service and process data

Triangulation sensor with background suppression

## 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.

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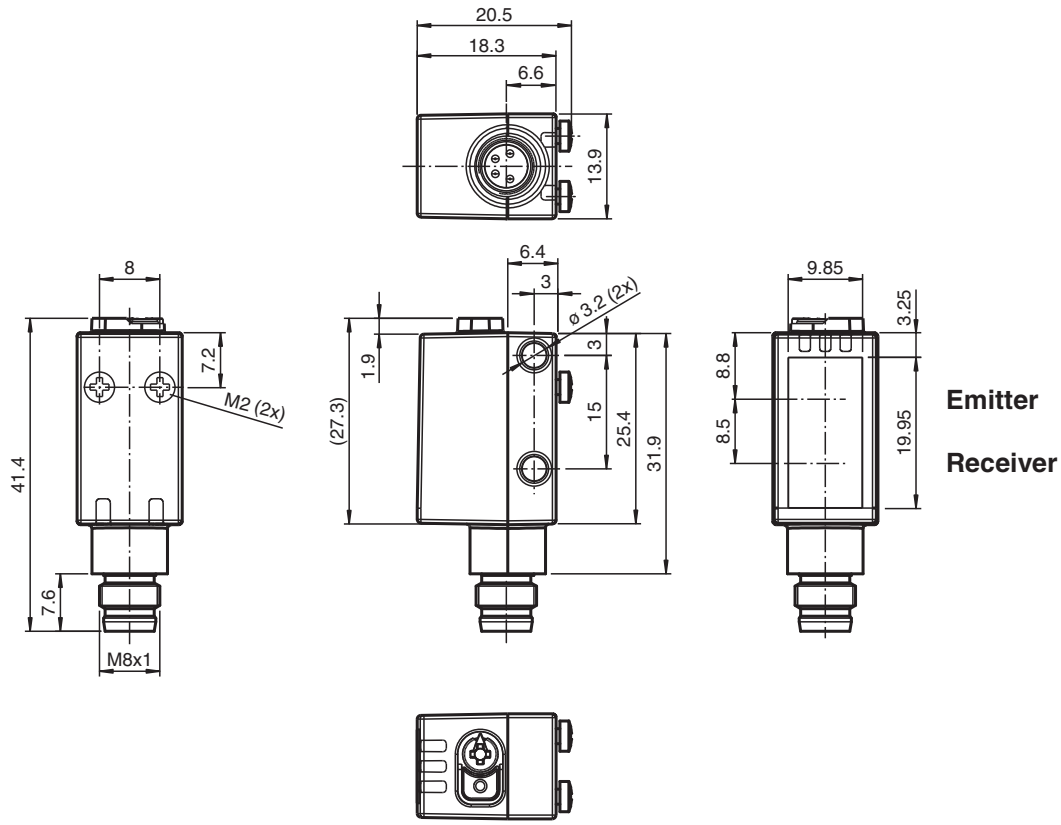
## Dimensions




## Technical Data

| | |
|---|---|
| **General specifications** | |
| Detection range | 5 ... 150 mm |
| Detection range min. | 5 ... 25 mm |
| Detection range max. | 5 ... 150 mm |
| Adjustment range | 25 ... 150 mm |
| Reference target | standard white, 100 mm x 100 mm |
| Light source | LED |
| Light type | modulated infrared light 850 nm |
| LED risk group labelling | exempt group |
| Black/White difference (6 %/90 %) | < 5 % at 150 mm |
| Diameter of the light spot | approx. 12 mm at a distance of 150 mm |
| Angle of divergence | approx. 4 ° |
| Ambient light limit | EN 60947-5-2 : 40000 Lux |
| **Functional safety related parameters** | |
| $MTTF_d$ | 600 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 |

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## Technical Data

| | | |
|---|---|---|
| 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/Q = pin 4 ) |
| IO-Link Revision | | 1.1 |
| Device profile | | Smart Sensor |
| Device ID | | 0x110611 (1115665) |
| Transfer rate | | COM 2 (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 |
| **Output** | | |
| Switching type | | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally closed / dark-on, PNP normally open / light-on, IO-Link<br>/Q - Pin2: NPN normally open / light-on, PNP normally closed / dark-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 | 500 Hz |
| Response time | | 1 ms |
| **Conformity** | | |
| Communication interface | | IEC 61131-9 |
| Product standard | | EN 60947-5-2 |
| **Approvals and certificates** | | |
| 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 | | 13.9 mm |
| Housing height | | 33.8 mm |
| Housing depth | | 18.3 mm |
| Degree of protection | | IP67 / IP69 / IP69K |
| Connection | | M8 x 1 connector, 4-pin |
| Material | | |
| Housing | | PC (Polycarbonate) |
| Optical face | | PMMA |
| Mass | | approx. 10 g |

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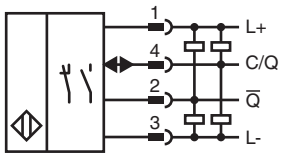
## Connection Assignment

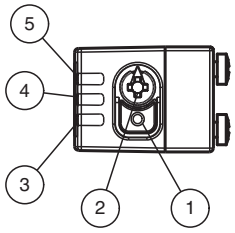



## Connection Assignment


Wire colors in accordance with EN 60947-5-2

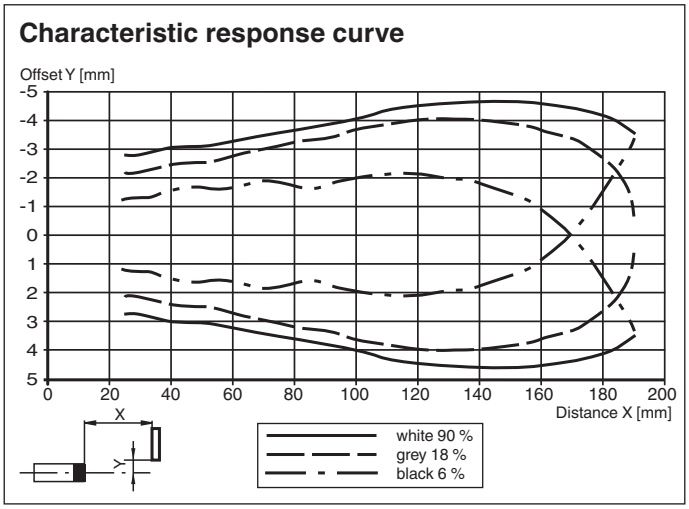
| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

## Assembly




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

## Characteristic Curve

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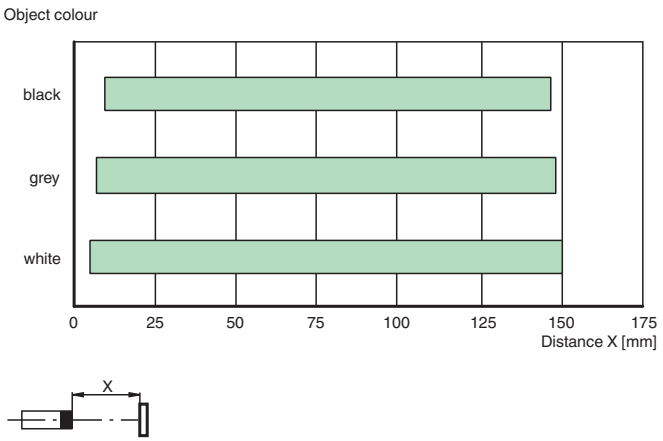
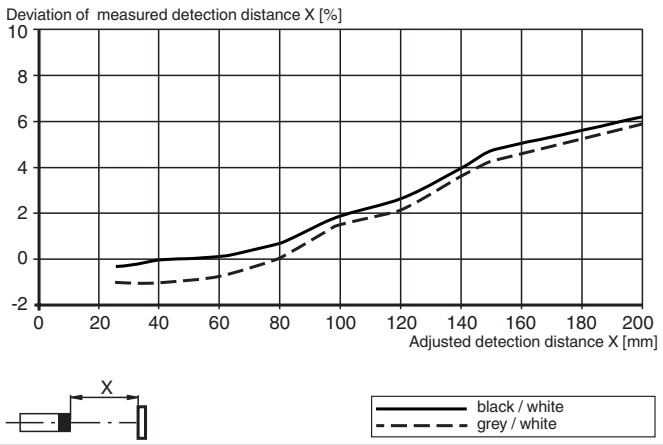
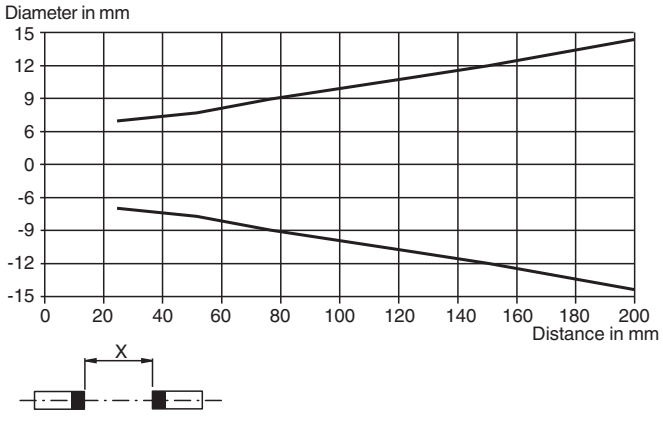
## Detection ranges




## Difference in detection distance




## Light spot diameter




## Accessories

| | | |
|---|---|---|
|  | **V31-GM-2M-PUR** | Female cordset single-ended, M8, 4-pin, PUR cable |
|  | **V31-WM-2M-PUR** | Female cordset single-ended, M8, 4-pin, PUR cable |
|  | **IO-Link-Master02-USB** | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |

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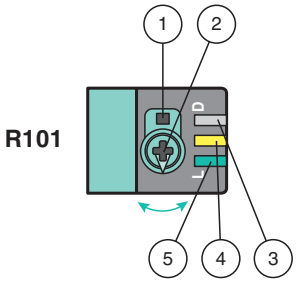
## Configuration




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.

## Accessories

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

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