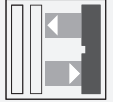




## Triangulation sensor (BGE)

### OBT350-R100-2EP-IO-V31-1T



- Miniature design with versatile mounting options
- Secure and gapless detection, even near the surface through background evaluation
- 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 evaluation



### Function

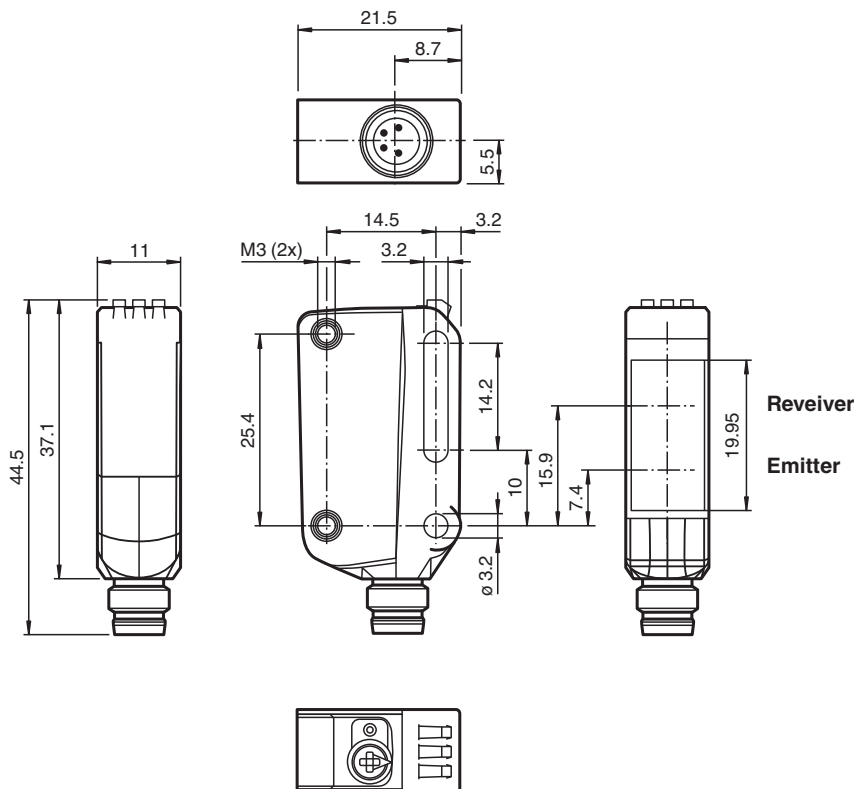
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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



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

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**PEPPERL+FUCHS**

## Technical Data

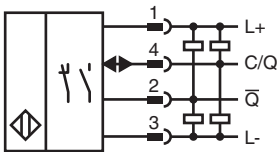
|                                             |                |                                                                                                                                                                                                                                       |
|---------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General specifications</b>               |                |                                                                                                                                                                                                                                       |
| Detection range                             |                | 5 ... 350 mm                                                                                                                                                                                                                          |
| Detection range min.                        |                | 5 ... 25 mm                                                                                                                                                                                                                           |
| Detection range max.                        |                | 5 ... 350 mm                                                                                                                                                                                                                          |
| Adjustment range                            |                | 25 ... 350 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                                                                                                                                                                                                                          |
| Black-white difference (6 %/90 %)           |                | < 15 % at 350 mm                                                                                                                                                                                                                      |
| Diameter of the light spot                  |                | approx. 20 mm at a distance of 350 mm                                                                                                                                                                                                 |
| Opening angle                               |                | approx. 3 °                                                                                                                                                                                                                           |
| Ambient light limit                         |                | EN 60947-5-2 : 40000 Lux                                                                                                                                                                                                              |
| <b>Functional safety related parameters</b> |                |                                                                                                                                                                                                                                       |
| MTTF <sub>d</sub>                           |                | 600 a                                                                                                                                                                                                                                 |
| Mission Time (T <sub>M</sub> )              |                | 20 a                                                                                                                                                                                                                                  |
| Diagnostic Coverage (DC)                    |                | 0 %                                                                                                                                                                                                                                   |
| <b>Indicators/operating means</b>           |                |                                                                                                                                                                                                                                       |
| 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 - background detected (object not detected)<br>constantly off - object detected                                                                                                                          |
| Control elements                            |                | Light-on/dark-on changeover switch                                                                                                                                                                                                    |
| Control elements                            |                | Sensing range adjuster                                                                                                                                                                                                                |
| <b>Electrical specifications</b>            |                |                                                                                                                                                                                                                                       |
| 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                                                                                                                                                                                                                                   |
| <b>Interface</b>                            |                |                                                                                                                                                                                                                                       |
| Interface type                              |                | IO-Link ( via C/Q = pin 4 )                                                                                                                                                                                                           |
| IO-Link revision                            |                | 1.1                                                                                                                                                                                                                                   |
| Device profile                              |                | Smart Sensor                                                                                                                                                                                                                          |
| Device ID                                   |                | 0x110701 (1115905)                                                                                                                                                                                                                    |
| 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                                                                                                                                                                                                                                     |
| <b>Output</b>                               |                |                                                                                                                                                                                                                                       |
| Switching type                              |                | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link<br>/Q - Pin2: NPN normally closed / light-on, PNP normally open / 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 <sub>d</sub> | ≤ 1.5 V DC                                                                                                                                                                                                                            |
| Switching frequency                         | f              | 500 Hz                                                                                                                                                                                                                                |
| Response time                               |                | 1 ms                                                                                                                                                                                                                                  |
| <b>Conformity</b>                           |                |                                                                                                                                                                                                                                       |

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Technical Data

|                            |  |                                                              |
|----------------------------|--|--------------------------------------------------------------|
| 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              |  | 11 mm                                                        |
| Housing height             |  | 44.5 mm                                                      |
| Housing depth              |  | 21.5 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                                                 |

Connection



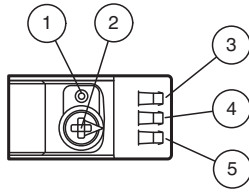
Connection Assignment



Wire colors in accordance with EN 60947-5-2

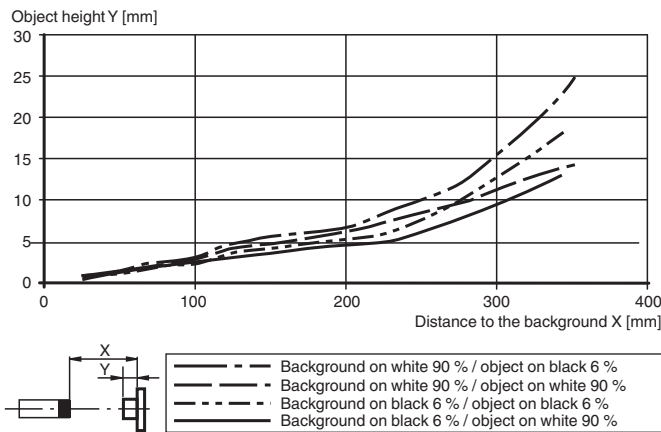
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

## 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       |

### Minimum object height



## Accessories

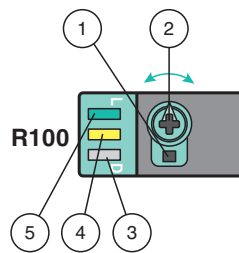
|  |                           |                                                                        |
|--|---------------------------|------------------------------------------------------------------------|
|  | <b>OMH-ML100-09</b>       | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm          |
|  | <b>OMH-R10X-01</b>        | Mounting bracket                                                       |
|  | <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 ø 12 mm or sheet 1.5 mm ... 3 mm          |
|  | <b>OMH-ML100-031</b>      | Mounting aid for round steel ø 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>ICE2-8IOL-G65L-V1D</b> | EtherNet/IP IO-Link master with 8 inputs/outputs                       |
|  | <b>ICE3-8IOL-G65L-V1D</b> | PROFINET IO-Link master with 8 inputs/outputs                          |

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## Accessories

|                                                                                   |                             |                                                                                                              |
|-----------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|  | <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 |

## 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.