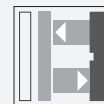




## Triangulation sensor (BGS) OBT650-R201-2EP-IO-0,3M-V31



- Medium 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

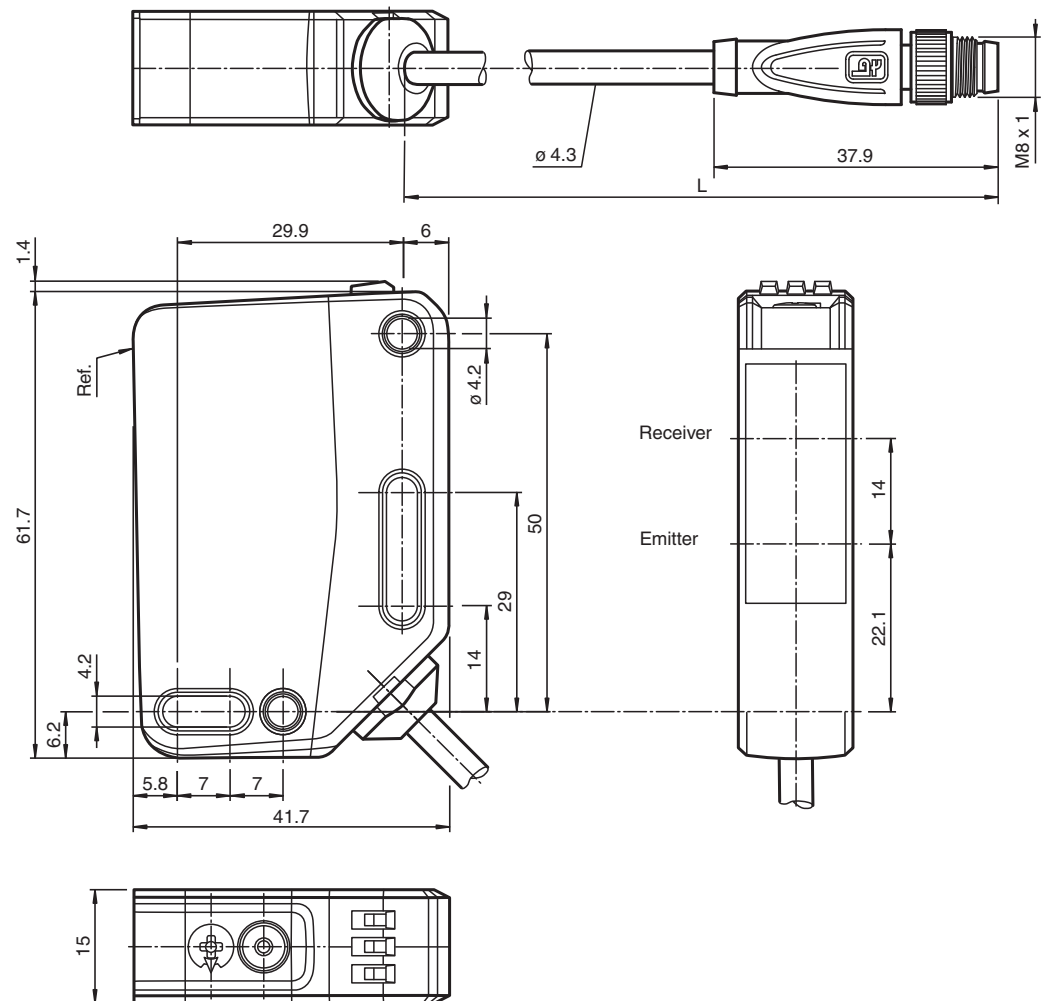
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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.

Multi Pixel Technology (MPT) ensures that the standard sensors are flexible and can be adapted to the application environment.

## Dimensions



## Technical Data

## General specifications

|                                   |                                               |
|-----------------------------------|-----------------------------------------------|
| Detection range                   | 10 ... 650 mm                                 |
| Detection range min.              | 10 ... 100 mm                                 |
| Detection range max.              | 10 ... 650 mm                                 |
| Adjustment range                  | 100 ... 650 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 %) | < 6 % at 650 mm                               |
| Diameter of the light spot        | approx. 20 mm x 20 mm at a distance of 650 mm |
| Opening angle                     | approx. 2 °                                   |
| Ambient light limit               | EN 60947-5-2 : 70000 Lux                      |

### Functional safety related parameters

|                                |       |
|--------------------------------|-------|
| MTTF <sub>d</sub>              | 600 a |
| Mission Time (T <sub>M</sub> ) | 20 a  |
| Diagnostic Coverage (DC)       | 0 %   |

### Indicators/operating means

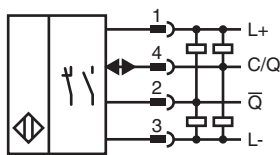
|                     |                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation indicator | <p>LED green:</p> <p>constantly on - power on</p> <p>flashing (4Hz) - short circuit</p> <p>flashing with short break (1 Hz) - IO-Link mode</p> |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|

## 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                                                                                                                                                                                                                |
| <b>Electrical specifications</b>  |       |                                                                                                                                                                                                                                       |
| 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                                                                                                                                                                                                                                   |
| <b>Interface</b>                  |       |                                                                                                                                                                                                                                       |
| Interface type                    |       | IO-Link ( via C/Q = pin 4 )                                                                                                                                                                                                           |
| IO-Link revision                  |       | 1.1                                                                                                                                                                                                                                   |
| Device profile                    |       | Identification and diagnosis<br>Smart Sensor type 2.4                                                                                                                                                                                 |
| Device ID                         |       | 0x111611 (1119761)                                                                                                                                                                                                                    |
| 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 / 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                      | $U_d$ | ≤ 1.5 V DC                                                                                                                                                                                                                            |
| Switching frequency               | $f$   | 500 Hz                                                                                                                                                                                                                                |
| Response time                     |       | 1 ms                                                                                                                                                                                                                                  |
| <b>Conformity</b>                 |       |                                                                                                                                                                                                                                       |
| Communication interface           |       | IEC 61131-9                                                                                                                                                                                                                           |
| Product standard                  |       | EN 60947-5-2                                                                                                                                                                                                                          |
| <b>Approvals and certificates</b> |       |                                                                                                                                                                                                                                       |
| UL approval                       |       | E87056 , cULus Listed , class 2 power supply , type rating 1                                                                                                                                                                          |
| CCC approval                      |       | CCC approval / marking not required for products rated ≤36 V                                                                                                                                                                          |
| <b>Ambient conditions</b>         |       |                                                                                                                                                                                                                                       |
| Ambient temperature               |       | -40 ... 60 °C (-40 ... 140 °F) , fixed cable<br>-20 ... 60 °C (-4 ... 140 °F) , movable cable not appropriate for conveyor chains                                                                                                     |
| Storage temperature               |       | -40 ... 70 °C (-40 ... 158 °F)                                                                                                                                                                                                        |
| <b>Mechanical specifications</b>  |       |                                                                                                                                                                                                                                       |
| Housing width                     |       | 15 mm                                                                                                                                                                                                                                 |
| Housing height                    |       | 61.7 mm                                                                                                                                                                                                                               |
| Housing depth                     |       | 41.7 mm                                                                                                                                                                                                                               |
| Degree of protection              |       | IP67 / IP69 / IP69K                                                                                                                                                                                                                   |
| Connection                        |       | fixed cable 300 mm with M8 x 1 male connector; 4-pin                                                                                                                                                                                  |
| Material                          |       |                                                                                                                                                                                                                                       |
| Housing                           |       | PC (Polycarbonate)                                                                                                                                                                                                                    |
| Optical face                      |       | PMMA                                                                                                                                                                                                                                  |
| Mass                              |       | approx. 52 g                                                                                                                                                                                                                          |
| Cable length                      |       | 0.3 m                                                                                                                                                                                                                                 |

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Connection



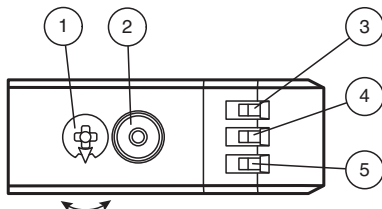
Connection Assignment



Wire colors in accordance with EN 60947-5-2

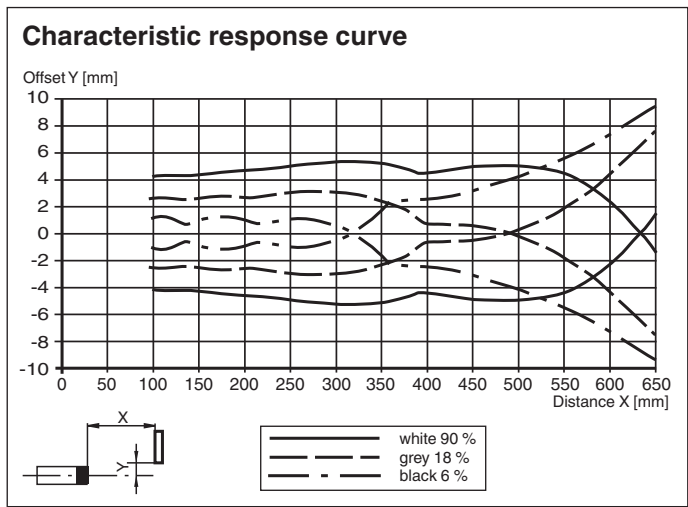
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

Assembly



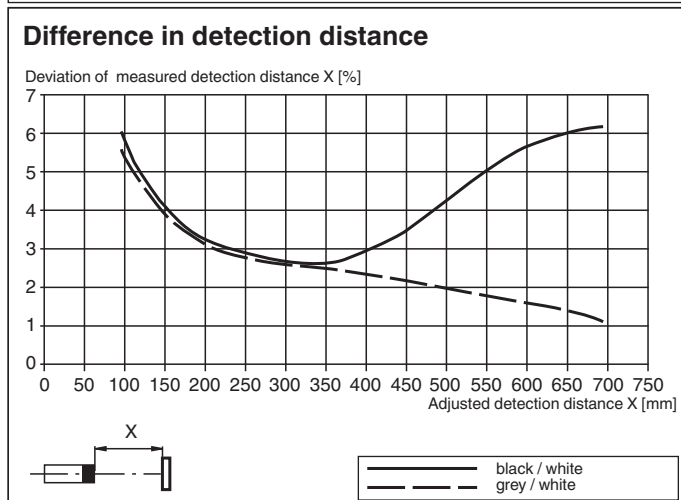
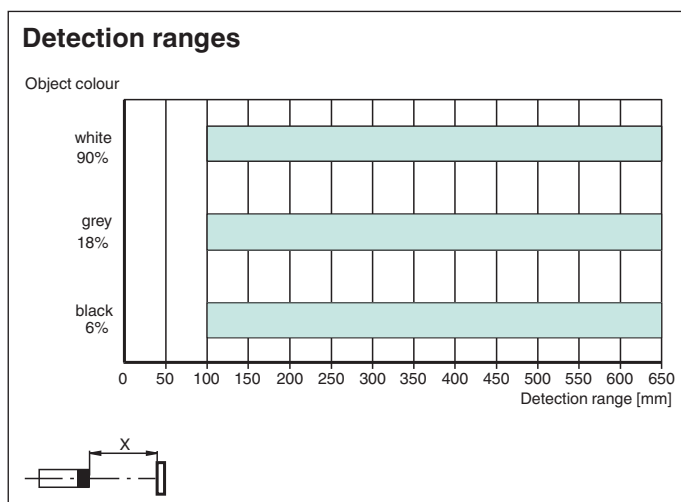
|   |                                      |    |
|---|--------------------------------------|----|
| 1 | Sensitivity adjustment               |    |
| 2 | Light-on / dark-on changeover switch |    |
| 3 | Operating indicator / dark on        | GN |
| 4 | Signal indicator                     | YE |
|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

Characteristic Curve



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## Characteristic Curve



## Accessories

|  |                             |                                                               |
|--|-----------------------------|---------------------------------------------------------------|
|  | <b>OMH-RL31-02</b>          | Mounting bracket narrow                                       |
|  | <b>OMH-RL31-03</b>          | Mounting bracket narrow                                       |
|  | <b>OMH-RL31-04</b>          | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
|  | <b>OMH-RL31-07</b>          | Mounting bracket including adjustment                         |
|  | <b>OMH-RL31-08</b>          | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
|  | <b>OMH-R20x-Quick-Mount</b> | Quick mounting accessory                                      |
|  | <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              |

## Accessories

|                                                                                    |                             |                                                                                                              |
|------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|   | <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>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>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                                         |

## Configuration

To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster by more than 180°.

### **Sensing Range/Sensitivity**

To increase the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster clockwise.

To reduce the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster counter-clockwise.

As soon as the end of the adjustment range is reached, the signal indicator flashes at 8 Hz.

### **Configuring Light On/Dark On**

Press the light-on/dark-on changeover switch for more than 1 second (but less than 4 seconds). "Light on/dark on" mode changes and the relevant operating indicator lights up.

If you press the light-on/dark-on changeover switch for longer than 4 seconds, the "light on/dark on" mode will switch back to the original setting. The current status is activated when the light-on/dark-on changeover switch is released.

### **Restoring Factory Settings**

Press the light-on/dark-on changeover switch for more than 10 seconds (but less than 30 seconds) until all LEDs go out. When the light-on/dark-on changeover switch is released, the signal indicator lights up. After 5 seconds, the sensor resumes operation with the factory settings.

The adjustment functions are locked after 5 minutes of inactivity. To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster again by more than 180°.