



## Triangulation sensor (BGS) OBT650-R200-2EP-IO-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

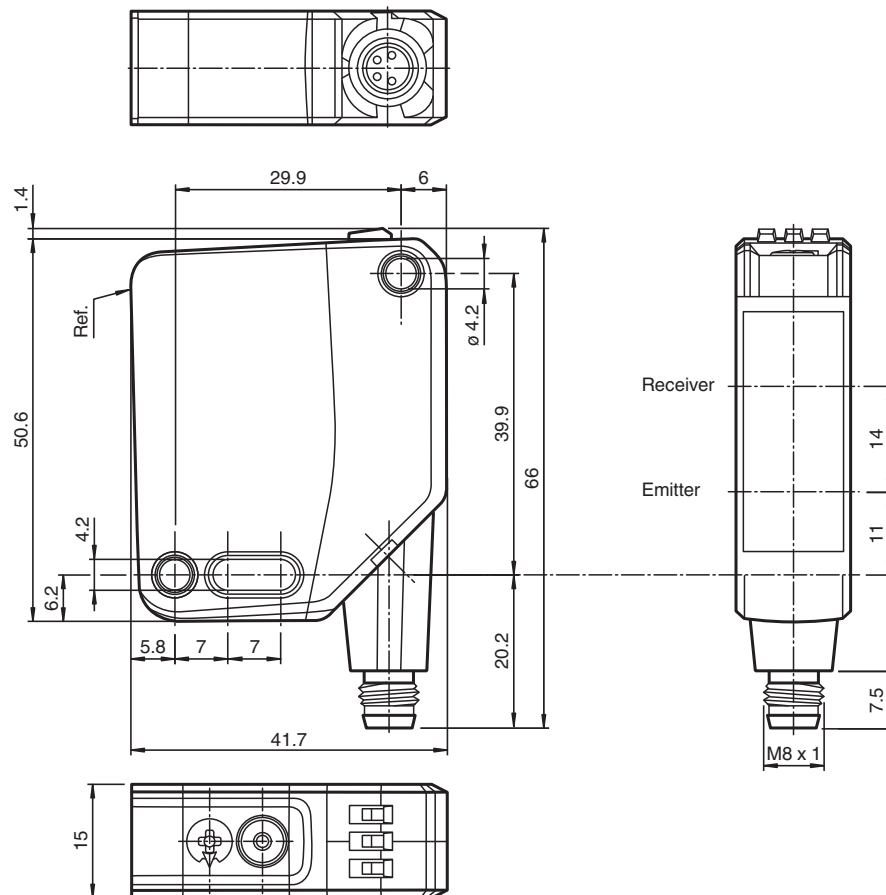
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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 | 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> | < 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              | Identification and diagnosis<br>Smart Sensor type 2.4 |
| Device ID                   | 0x111601 (1119745)                                    |
| 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<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 <sub>d</sub> | ≤ 1.5 V DC                                                                                                                                                                                                                            |
| Switching frequency | f              | 500 Hz                                                                                                                                                                                                                                |
| Response time       |                | 1 ms                                                                                                                                                                                                                                  |

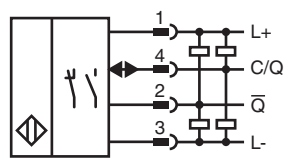
### Conformity

Release date: 2023-01-24 Date of issue: 2023-01-24 Filename: 295670-100109\_eng.pdf

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 |
| CCC approval               | CCC approval / marking not required for products rated ≤36 V |
| 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             | 50.6 mm                                                      |
| Housing depth              | 41.7 mm                                                      |
| Degree of protection       | IP67 / IP69 / IP69K                                          |
| Connection                 | 4-pin, M8 x 1 connector, 90° rotatable                       |
| Material                   |                                                              |
| Housing                    | PC (Polycarbonate)                                           |
| Optical face               | PMMA                                                         |
| Mass                       | approx. 35 g                                                 |

Connection



Connection Assignment

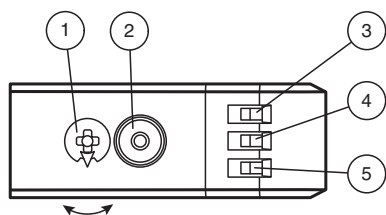


Wire colors in accordance with EN 60947-5-2

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

Release date: 2023-01-24 Date of issue: 2023-01-24 Filename: 295670-100109\_eng.pdf

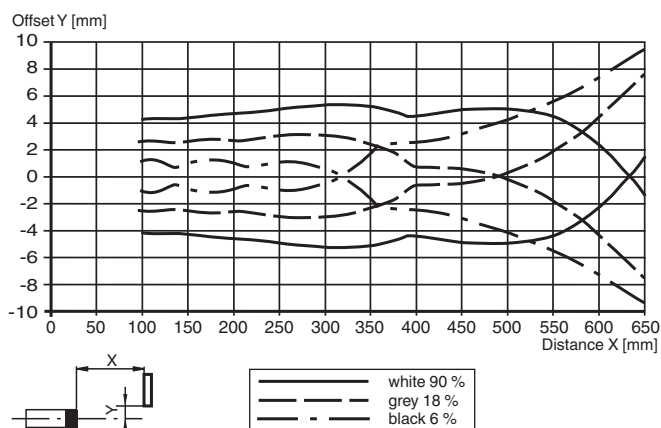
## Assembly



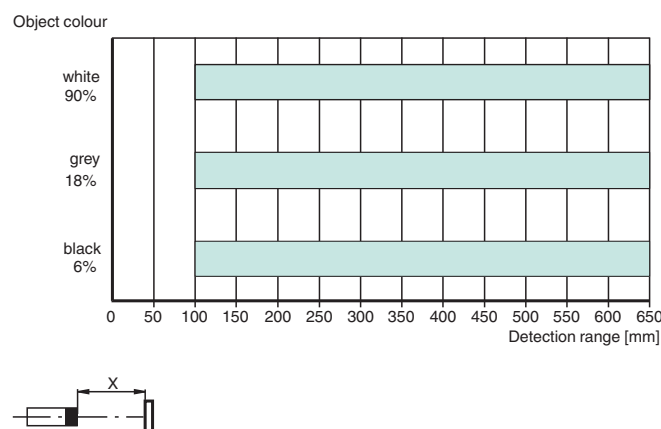
|   |                                      |    |
|---|--------------------------------------|----|
| 1 | Sensitivity adjustment               |    |
| 2 | Light-on / dark-on changeover switch |    |
| 3 | Operating indicator / dark on        | GN |
| 4 | Signal indicator                     | YE |
|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

## Characteristic Curve

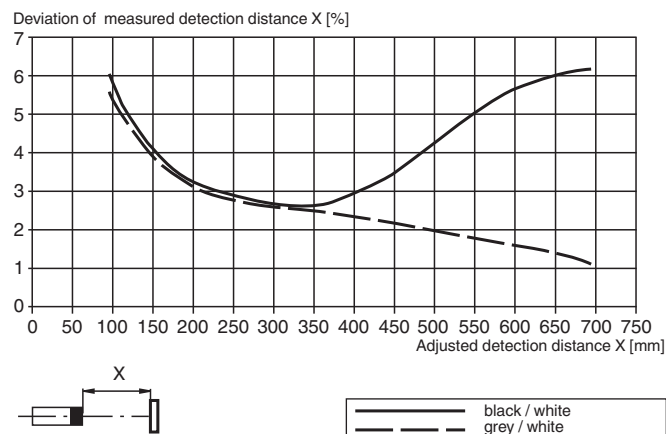
### Characteristic response curve



### Detection ranges



### Difference in detection distance



## Accessories

|                                                                                     |                             |                                                                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|    | <b>OMH-MLV12-HWG</b>        | Mounting bracket for series MLV12 sensors                                                                    |
|    | <b>OMH-R200-01</b>          | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm                                                |
|    | <b>OMH-MLV12-HWK</b>        | Mounting bracket for series MLV12 sensors                                                                    |
|    | <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>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°.