



## Triangulation sensor (BGS) OBT600-R200-2EP-IO-V1-L



- Medium 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

Laser diffuse mode sensor with adjustable background suppression



**IO-Link**

### Function

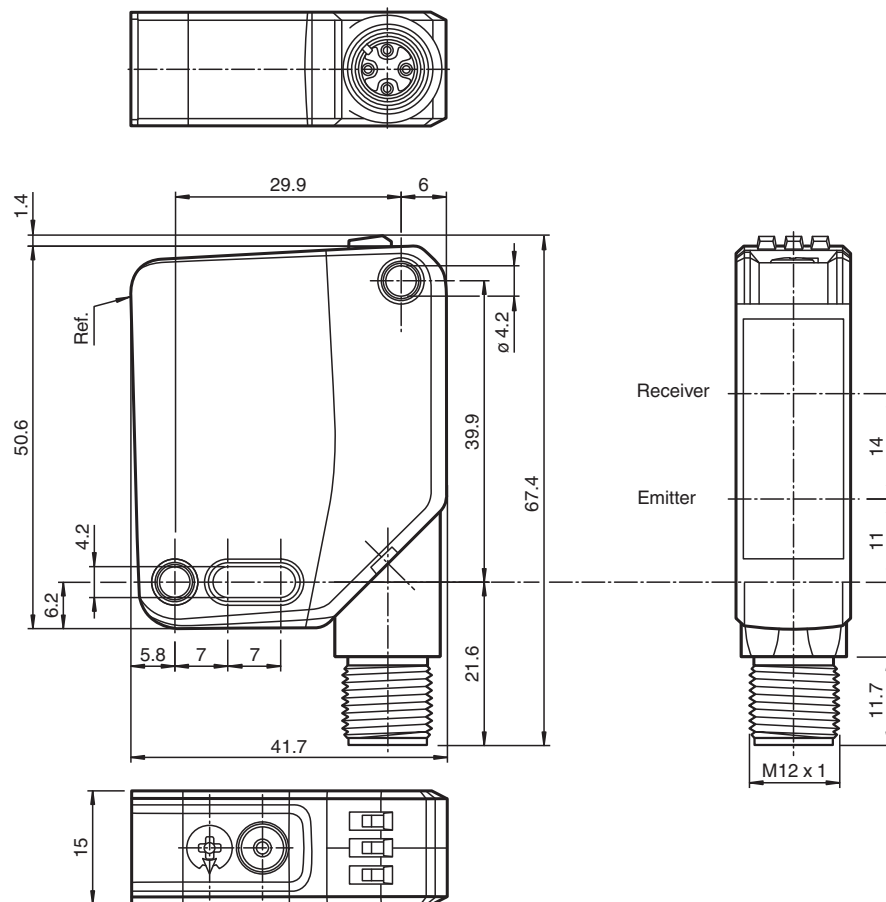
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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

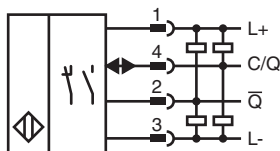
|                                             |                |                                                                                                                                                                                                                                       |
|---------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General specifications</b>               |                |                                                                                                                                                                                                                                       |
| Detection range                             |                | 40 ... 600 mm                                                                                                                                                                                                                         |
| Detection range min.                        |                | 40 ... 90 mm                                                                                                                                                                                                                          |
| Detection range max.                        |                | 40 ... 600 mm                                                                                                                                                                                                                         |
| Adjustment range                            |                | 90 ... 600 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 < 2,8 mm in the range of 350 mm ... 800 mm                                                                                                                                                                              |
| Pulse length                                |                | 3 µs                                                                                                                                                                                                                                  |
| Repetition rate                             |                | approx. 13 kHz                                                                                                                                                                                                                        |
| max. pulse energy                           |                | 10.4 nJ                                                                                                                                                                                                                               |
| Black-white difference (6 %/90 %)           |                | < 5 % at 300 mm                                                                                                                                                                                                                       |
| Diameter of the light spot                  |                | approx. 2.5 mm at a distance of 600 mm                                                                                                                                                                                                |
| Opening angle                               |                | approx. 0.3 °                                                                                                                                                                                                                         |
| Ambient light limit                         |                | EN 60947-5-2 : 70000 Lux                                                                                                                                                                                                              |
| <b>Functional safety related parameters</b> |                |                                                                                                                                                                                                                                       |
| MTTF <sub>d</sub>                           |                | 560 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 - 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 <sub>B</sub> | 10 ... 30 V DC                                                                                                                                                                                                                        |
| Ripple                                      |                | max. 10 %                                                                                                                                                                                                                             |
| No-load supply current                      | I <sub>0</sub> | < 15 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                                   |                | 0x111603 (1119747)                                                                                                                                                                                                                    |
| 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                                                                                                                              |

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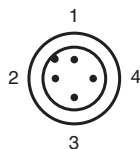
Technical Data

|                                   |                |                                                                                                                                      |
|-----------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                                                                               |
| <b>Conformity</b>                 |                |                                                                                                                                      |
| Communication interface           |                | IEC 61131-9                                                                                                                          |
| Product standard                  |                | EN 60947-5-2                                                                                                                         |
| Laser safety                      |                | EN 60825-1:2014                                                                                                                      |
| <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                                                                         |
| 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 |
| <b>Ambient conditions</b>         |                |                                                                                                                                      |
| Ambient temperature               |                | -40 ... 60 °C (-40 ... 140 °F)                                                                                                       |
| Storage temperature               |                | -40 ... 70 °C (-40 ... 158 °F)                                                                                                       |
| <b>Mechanical specifications</b>  |                |                                                                                                                                      |
| Housing width                     |                | 15 mm                                                                                                                                |
| Housing height                    |                | 50.6 mm                                                                                                                              |
| Housing depth                     |                | 41.7 mm                                                                                                                              |
| Degree of protection              |                | IP67 / IP69 / IP69K                                                                                                                  |
| Connection                        |                | 4-pin, M12 x 1 connector, 90° rotatable                                                                                              |
| Material                          |                |                                                                                                                                      |
| Housing                           |                | PC (Polycarbonate)                                                                                                                   |
| Optical face                      |                | PMMA                                                                                                                                 |
| Mass                              |                | approx. 37 g                                                                                                                         |

Connection



Connection Assignment



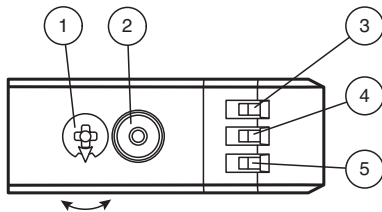
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## Connection Assignment

Wire colors in accordance with EN 60947-5-2

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

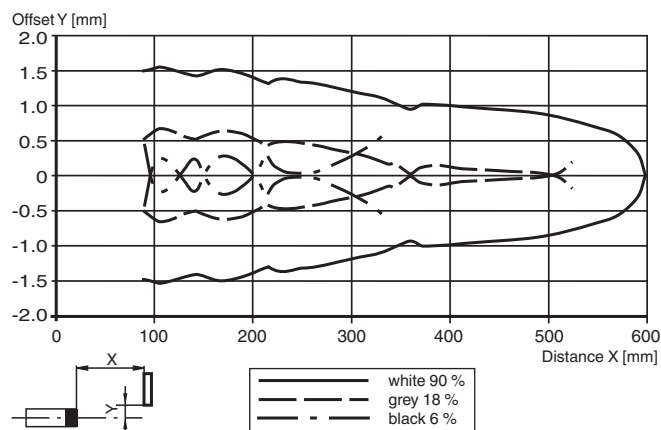
## Assembly



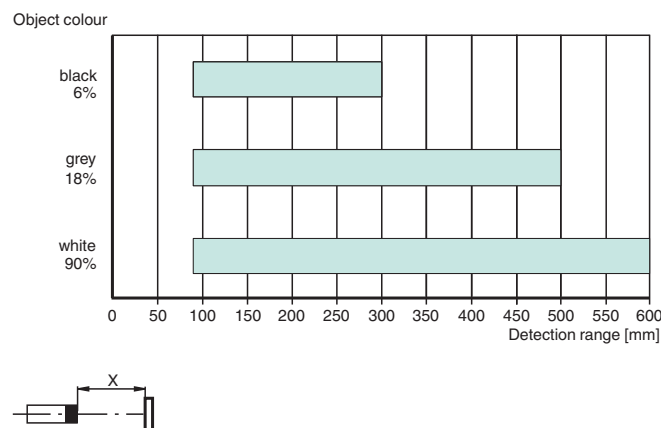
|   |                                      |    |
|---|--------------------------------------|----|
| 1 | Sensitivity adjustment               |    |
| 2 | Light-on / dark-on changeover switch |    |
| 3 | Operating indicator / dark on        | GN |
| 4 | Signal indicator                     | YE |
|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

## Characteristic Curve

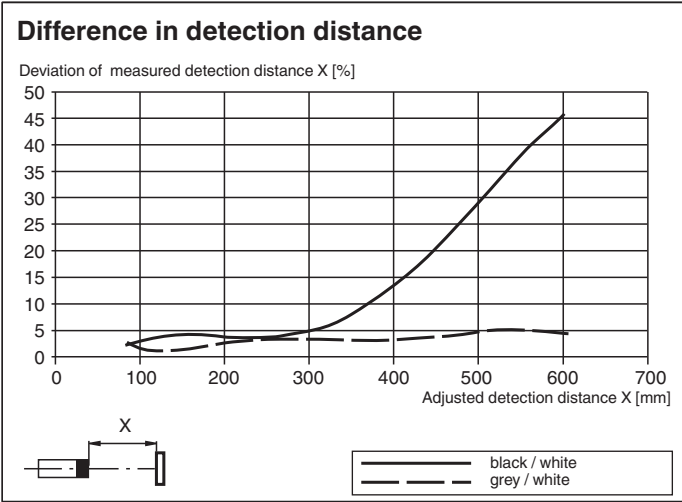
### Characteristic response curve



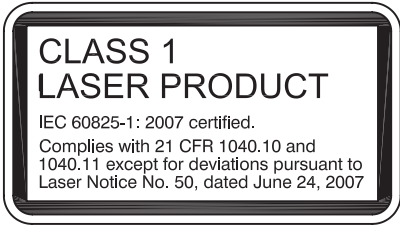
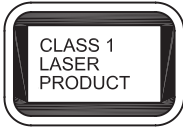
### Detection ranges



Characteristic Curve



Safety Information



Accessories

|  |                      |                                                                         |
|--|----------------------|-------------------------------------------------------------------------|
|  | <b>V1-G-2M-PUR</b>   | Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey |
|  | <b>V1-W-2M-PUR</b>   | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey   |
|  | <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           |

## Accessories

|                                                                                     |                             |                                                                                                              |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|    | <b>OMH-MLV12-HWK</b>        | Mounting bracket for series MLV12 sensors                                                                    |
|    | <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                                                             |
|    | <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                               |

## 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°.