



Model Number

OBE20M-R101-S2EP-IO-0,3M-V31-L

Laser thru-beam sensor
with fixed cable and 4-pin, M8 connector

Features

- Miniature design with versatile mounting options
- DuraBeam Laser Sensors - durable and employable like an LED
- IO-link interface for service and process data
- Various frequencies for avoiding mutual interference (cross-talk immunity)
- Extended temperature range -40°C ... 60°C
- High degree of protection IP69K

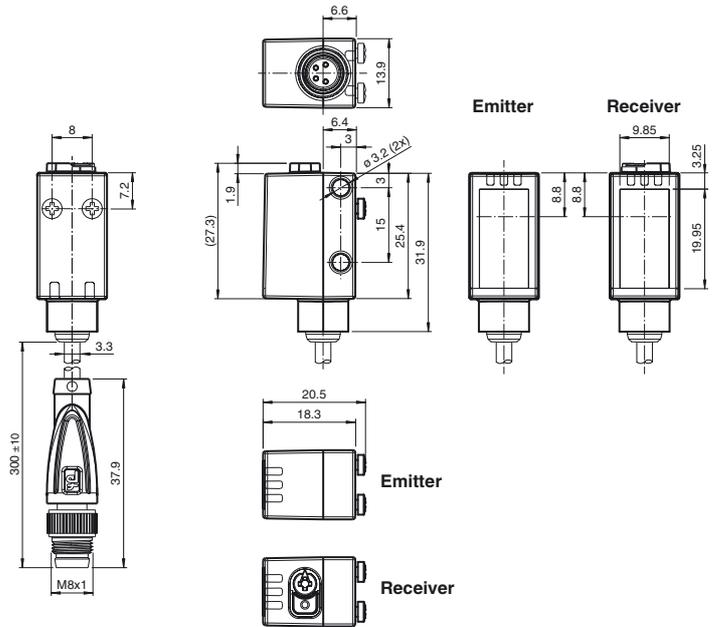
Product information

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.

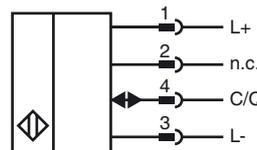
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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.

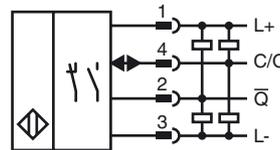
Dimensions



Electrical connection emitter



Electrical connection receiver



Pinout



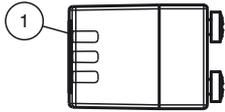
Wire colors in accordance with EN 60947-5-2

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

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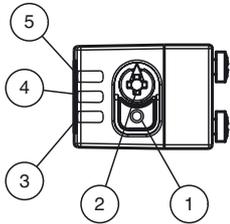
Indicators/operating means

Emitter



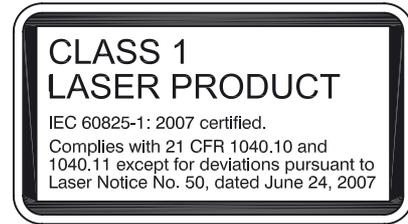
| | |
|---|---------------------|
| 1 | Operating indicator |
|---|---------------------|

Receiver



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

Laserlabel



Accessories

IO-Link-Master02-USB

IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

OMH-R101

Mounting Clamp

OMH-R101-Front

Mounting Clamp

OMH-4.1

Mounting Clamp

OMH-ML6

Mounting bracket

OMH-ML6-U

Mounting bracket

OMH-ML6-Z

Mounting bracket

V31-GM-2M-PUR

Female cordset, M8, 4-pin, PUR cable

V31-WM-2M-PUR

Female cordset, M8, 4-pin, PUR cable

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

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Technical data**System components**

| | |
|----------|-------------------------------|
| Emitter | OBE20M-R101-S-IO-0,3M-V31-L |
| Receiver | OBE20M-R101-2EP-IO-0,3M-V31-L |

General specifications

| | |
|----------------------------|---|
| Effective detection range | 0 ... 20 m |
| Threshold detection range | 30 m |
| 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 mm in the range of 250 mm ... 750 mm |
| Pulse length | 1.6 µs |
| Repetition rate | max. 17.6 kHz |
| max. pulse energy | 9.6 nJ |
| Diameter of the light spot | approx. 50 mm at a distance of 20 m |
| Angle of divergence | approx. 0.3 ° |
| Ambient light limit | EN 60947-5-2 : 30000 Lux |

Functional safety related parameters

| | |
|--------------------------------|-------|
| MTTF _d | 440 a |
| Mission Time (T _M) | 20 a |
| Diagnostic Coverage (DC) | 0 % |

Indicators/operating means

| | |
|----------------------------|--|
| Operation indicator | LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode |
| Function indicator | Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve |
| Control elements | Receiver: light/dark switch |
| Control elements | Receiver: sensitivity adjustment |
| Parameterization indicator | IO link communication: green LED goes out briefly (1 Hz) |

Electrical specifications

| | | |
|------------------------|----------------|--|
| Operating voltage | U _B | 10 ... 30 V DC |
| Ripple | | max. 10 % |
| No-load supply current | I ₀ | Emitter: ≤ 13 mA Receiver: ≤ 13 mA at 24 V supply voltage |
| Protection class | | III |

Interface

| | |
|-----------------------------|--|
| Interface type | IO-Link (via C/Q = pin 4) |
| Transfer rate | COM 2 (38.4 kBaud) |
| IO-Link Revision | 1.1 |
| Min. cycle time | 2.3 ms |
| Process data width | Emitter: Process data output: 2 Bit Receiver: Process data input: 2 Bit Process data output: 2 Bit |
| SIO mode support | yes |
| Device ID | Emitter: 0x110402 (1115138) Receiver: 0x110302 (1114882) |
| Compatible master port type | A |

Input

| | |
|------------|---|
| Test input | emitter deactivation at +U _B |
|------------|---|

Output

| | |
|---------------------|---|
| Switching type | The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link /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 _d ≤ 1.5 V DC |
| Switching frequency | f 1250 Hz |
| Response time | 0.4 ms |

Conformity

| | |
|-------------------------|-----------------|
| Communication interface | IEC 61131-9 |
| Product standard | EN 60947-5-2 |
| Laser safety | EN 60825-1:2014 |

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

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Ambient conditions

| | |
|---------------------|--|
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) , fixed cable -25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains |
| Storage temperature | -40 ... 70 °C (-40 ... 158 °F) |

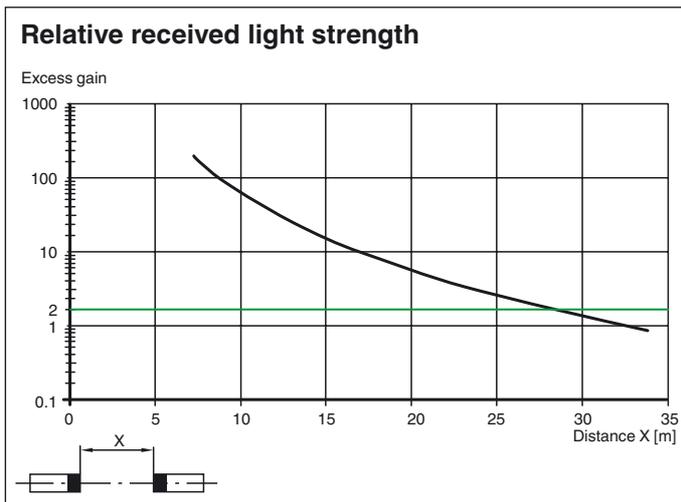
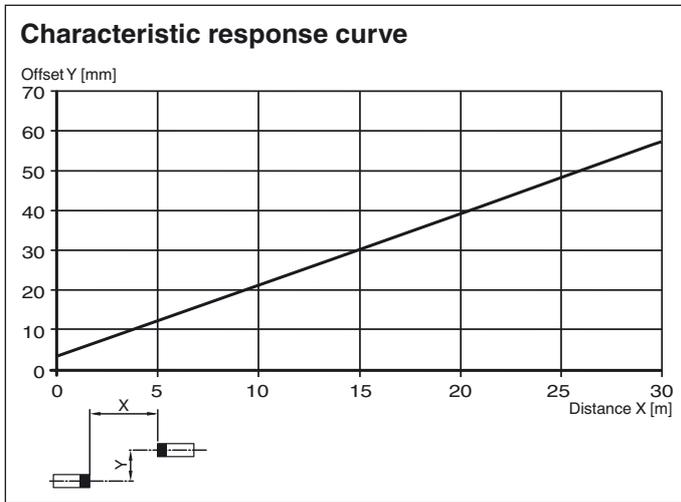
Mechanical specifications

| | |
|----------------------|--|
| Housing width | 13.9 mm |
| Housing height | 33.8 mm |
| Housing depth | 18.3 mm |
| Degree of protection | IP67 / IP69 / IP69K |
| Connection | fixed cable 300 mm with M8 x 1 male connector; 4-pin |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Mass | Emitter: approx. 10 g receiver: approx. 10 g |
| Cable length | 0.3 m |

Approvals and certificates

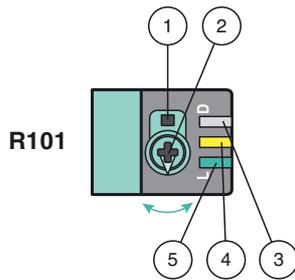
| | |
|--------------|--|
| UL approval | E87056 , cULus Listed , class 2 power supply , type rating 1 |
| FDA approval | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 |

Curves/Diagrams



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Functions and Operation



- 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 / sensivity adjuster clockwise to increase sensing range / sensitivity.

Turn sensing range /sensivity 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 / sensivity adjustment is locked. In order to reactivate the sensing range /sensitivity adjustment, turn the sensing range / sensivity adjuster for more than 180 degrees.