



Model Number

OBE20M-R101-S2EP-IO-L

Laser thru-beam sensor
with fixed cable

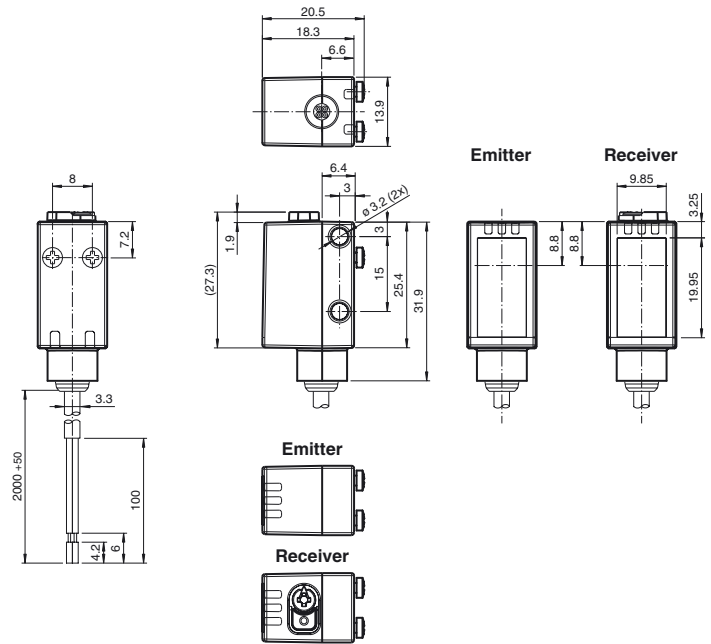
Features

- 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

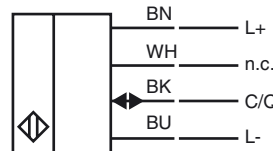
Product information

The R101 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.

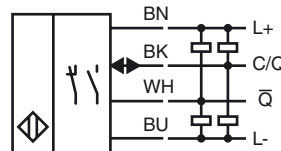
Dimensions



Electrical connection emitter

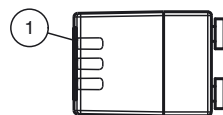


Electrical connection receiver



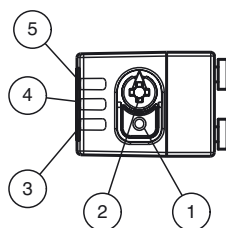
Indicators/operating means

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 |

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

Technical data**System components**

| | |
|----------|----------------------|
| Emitter | OBE20M-R101-S-IO-L |
| Receiver | OBE20M-R101-2EP-IO-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 250 ... 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)—operating reserve not reached |
| 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

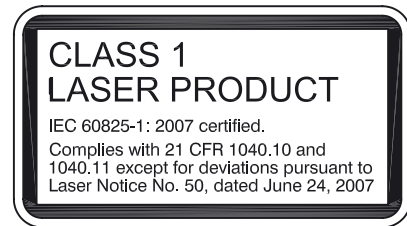
| | |
|------------|---|
| Test input | emitter deactivation at +U _B |
|------------|---|

Output

| | |
|---------------------|---|
| Switching type | The switching type of the sensor is adjustable. The default setting is: C/Q - BK: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link /Q - WH: 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 |

Ambient conditions

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|---------------------|--|
| 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) |

Laserlabel**Accessories****IO-Link-Master02-USB**

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

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

Mechanical specifications

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|----------------------|--|
| Degree of protection | IP67 / IP69 / IP69K |
| Connection | 2 m fixed cable |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Mass | Emitter: approx. 10 g receiver: approx. 10 g |
| Cable length | 2 m |

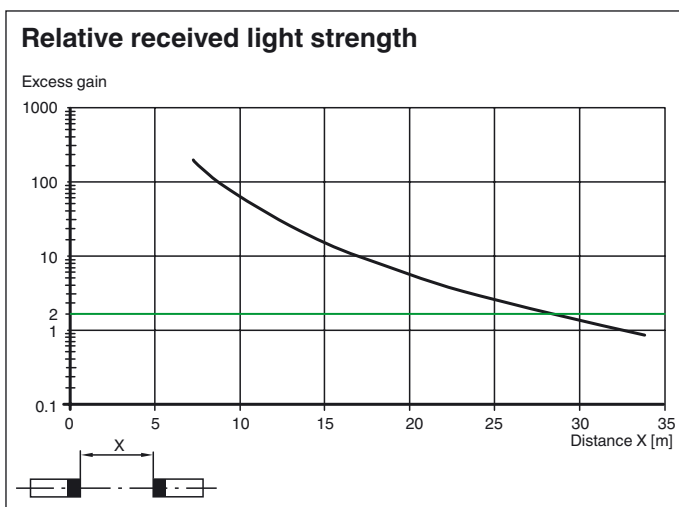
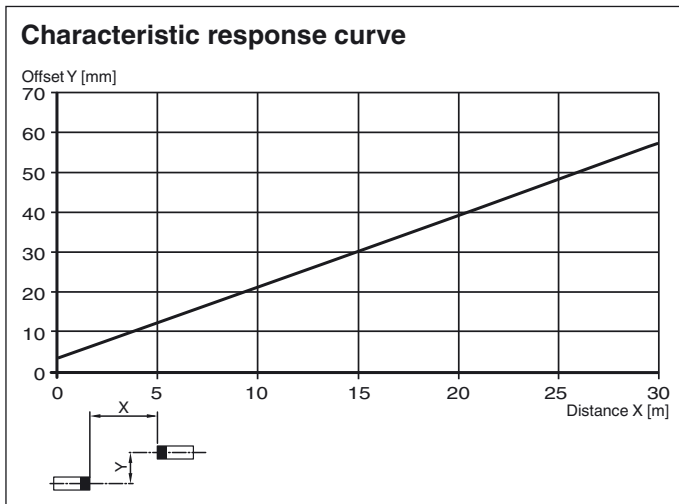
Compliance with standards and directives

| | |
|---------------------------|--|
| Directive conformity | |
| EMC Directive 2004/108/EC | EN 60947-5-2:2007+A1:2012 |
| Standard conformity | |
| Product standard | EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012 |
| Standards | UL 60947-5-2: 2014 IEC 61131-9:2013 IEC 60825-1:2007 EN 60825-1:2007 EN 61131-9:2013 |

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 |

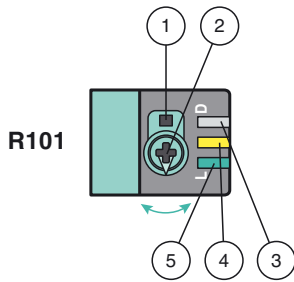
Curves/Diagrams



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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 / 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.