



**Model Number**

**OBE20M-R101-S2EP-IO-V31-L**

Laser thru-beam sensor with 4-pin, M8 x 1 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

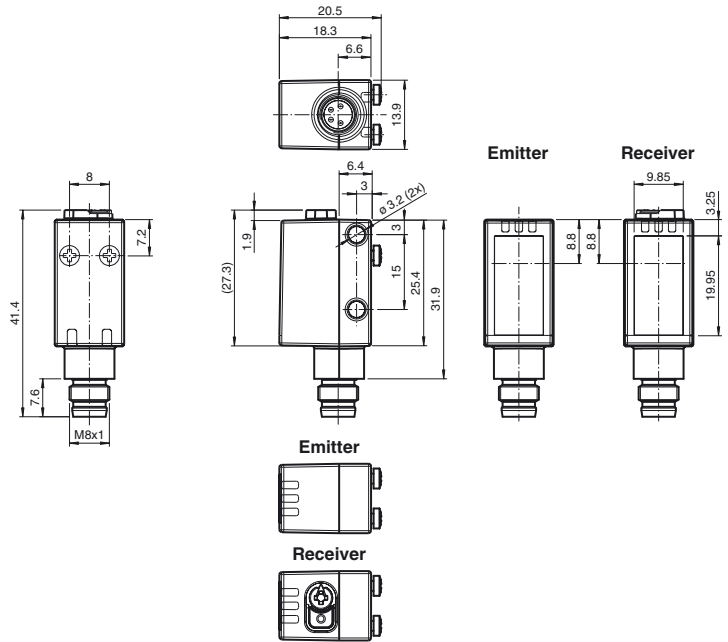
**Product information**

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.

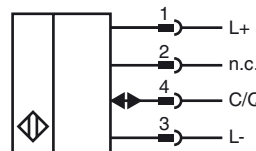
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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.

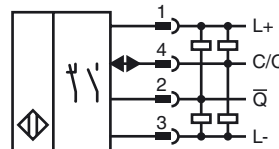
**Dimensions**



**Electrical connection emitter**



**Electrical connection receiver**



**Pinout**



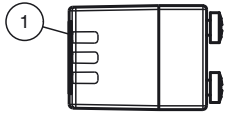
Wire colors in accordance with EN 60947-5-2

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

Release date: 2018-12-17 14:03 Date of issue: 2018-12-17 281016\_eng.xml

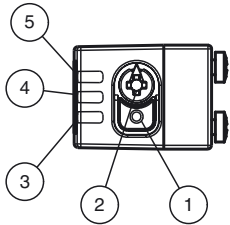
**Indicators/operating means**

**Emitter**



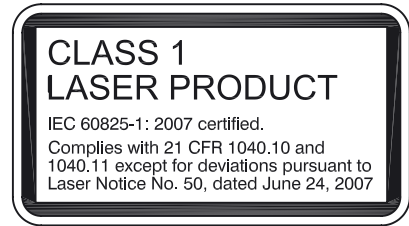
1	Operating indicator
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**Receiver**



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](http://www.pepperl-fuchs.com)

Release date: 2018-12-17 14:03 Date of issue: 2018-12-17 281016\_eng.xml

**Technical data****System components**

Emitter	OBE20M-R101-S-IO-V31-L
Receiver	OBE20M-R101-2EP-IO-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 <sub>d</sub>	440 a
Mission Time (T <sub>M</sub> )	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 <sub>B</sub>	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	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 <sub>B</sub>
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**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 <sub>d</sub> ≤ 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

Release date: 2018-12-17 14:03 Date of issue: 2018-12-17 281016\_eng.xml

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

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**Ambient conditions**

Ambient temperature -40 ... 60 °C (-40 ... 140 °F)

Storage temperature -40 ... 70 °C (-40 ... 158 °F)

**Mechanical specifications**

Housing width 18.3 mm

Housing height 13.9 mm

Housing depth 33.8 mm

Degree of protection IP67 / IP69 / IP69K

Connection M8 x 1 connector, 4-pin

**Material**

Housing PC (Polycarbonate)

Optical face PMMA

Mass Emitter: approx. 10 g receiver: approx. 10 g

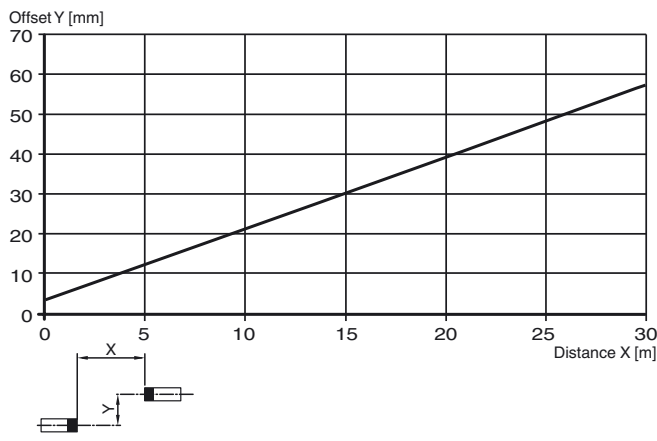
**Approvals and certificates**

UL approval E87056 , cULus Listed , class 2 power supply , type rating 1

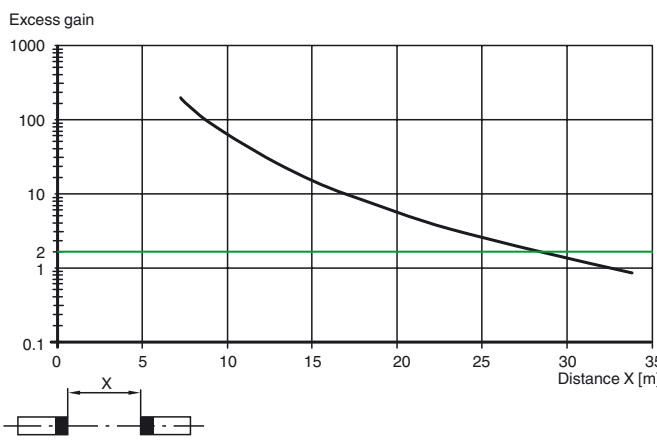
FDA approval IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**Curves/Diagrams**

**Characteristic response curve**

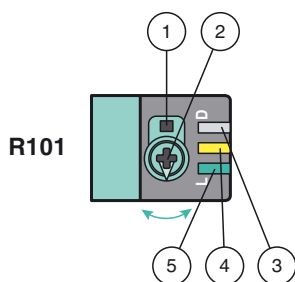


**Relative received light strength**



Release date: 2018-12-17 14:03 Date of issue: 2018-12-17 281016\_eng.xml

## 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.