









Model Number

OBE40M-R201-SEP-IO-V3-L

Laser thru-beam sensor with 3-pin, M8 x 1 connector

Features

- Medium 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

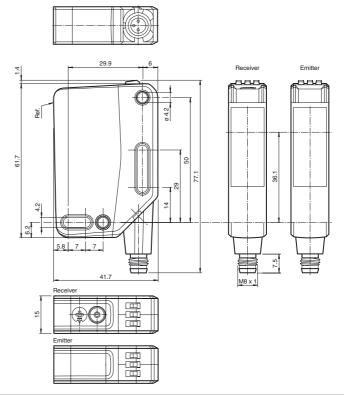
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design—from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The entire series enables sensors to communicate via IO-Link.

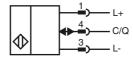
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

Multi Pixel Technology (MPT) ensures that the standard sensors are flexible and can be adapted to the application environment.

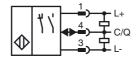
Dimensions



Electrical connection emitter



Electrical connection receiver



Pinout

Wire colors in accordance with EN 60947-5-2

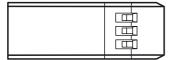
(blue) (black)



1 | BN 3 | BU 4 | BK

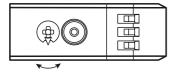
Indicators/operating means

Emitter



Operating indicator

Receiver



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

Laserlabel



CLASS 1 LASER PRODUCT

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

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Accessories

IO-Link-Master02-USB

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

V3-GM-2M-PUR

Female cordset single-ended, M8, 3-pin, PUR cable

V3-WM-2M-PUR

Female cordset single-ended, M8, 3-pin, PUR cable

OMH-RL31-02

Mounting bracket narrow

OMH-RL31-03

Mounting bracket narrow

OMH-RL31-04

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

OMH-RL31-07

Mounting bracket including adjustment

OMH-R20x-Quick-Mount

Quick mounting accessory

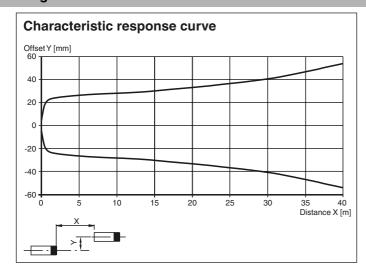


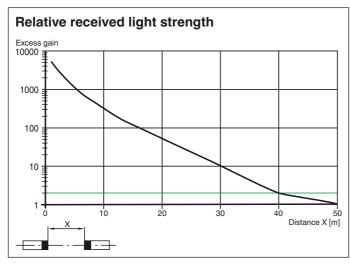
System components	Technical data		
Emitter OBE40M-R201-EP-IO-V3-L			
Receiver OBE40M-R201-EP-IO-V3-L	•		ODE 40M DOO4 O IO VO I
General specifications 0 40 m Threshold detection range 50 m Light source laser diode Light source laser diode Light source laser diode Laser chass 1 Wave length 680 nm Beam divergence > 5 mrad; d63 < 2 mm in the range of 250 mm 750 mm			
Effective detection range			OBE40WI-R201-EP-IO-V3-L
Threshold detection range Light supre Light supre Laser nominal ratings Note Laser class 1 Wave length Beam divergence Publis length Repetition rate max. publis energy Alignment aid Illiams of the light spot Angle of divergence Angle of divergen	•		0 40 m
Light type			
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Note			
Laser class			modulated violate for light
Wave length 680 nm Beam divergence > 5 mrad; d63 < 2 mm in the range of 250 mm 750 mm	•		LASER LIGHT , DO NOT STARE INTO BEAM
Peam divergence	Laser class		1
Pulse length Repetition rate max. pulse energy 9.6 nJ Alignment aid LED red (in receiver lens) illuminated constantly: beam is interrupted, flashes: reaching switching point, off: sufficient stability control Diameter of the light spot approx. 80 mm at a distance of 40 m Angle of divergence Ambient light limit EN 60947-5-2: 40000 Lux Functional safety related parameters WITF _g Mission Time (T _N) 20 a Diagnostic Coverage (DC) 00 % Indicators/operating means Operation indicator UED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Function indicator Permanently it: light path clear Permanently off- object detected Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode Flashing (4Hz) - short circuit flashing with short break (1Hz) - IO-Link mode flashing with short break (1Hz) - IO-Link (1Hz)	Wave length		680 nm
Repetition rate max, 17.6 kHz max, pulse energy 9.6 n Alignment aid LED red (in receiver lens) illuminated constantly: beam is interrupted, flashes: reaching switching point, off: sufficient stability control Diameter of the light spot approx. 80 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m All of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Angle of divergence approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx. 90 mm at a distance of 40 m Function indicator approx.	Beam divergence		> 5 mrad ; d63 $<$ 2 mm in the range of 250 mm 750 mm
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Alignment aid LED red in receiver lens) Illuminated constantly: beam is interrupted, flashes: reciping switching point, off: sufficient stability control Diameter of the light spot approx. 80 mm at a distance of 40 m approx. 80 mm at a distance of 40 m approx. 912 m ap	Repetition rate		
illuminated constantly: beam is interrupted, flashes: reaching switching point, off: sufficient stability control Diameter of the light spot approx. 80 mm at a distance of 40 m Angle of divergence approx. 80 mm at a distance of 40 m Angle of divergence approx. 80 mm at a distance of 40 m Angle of divergence approx. 80 mm at a distance of 40 m Angle of divergence approx. 80 mm at a distance of 40 m Ambision Time (T _M) 20 a Mission Time (T _M) 20 a Mission Time (T _M) 20 a Diagnostic Coverage (DC) 60 % Indicators/operating means Operation indicator LED green: constantly on-power on constantly on-power on lashing (4H₂) - short circuit flashing with short break († H₂) - IO-Link mode Function indicator Yellow LED: Permanently it light path clear Permanently off - object detected Flashing (4H₂) - insufficient operating reserve Beceiver: Ilght/dark switch Receiver: 13 mA Receiver: 13 mA Receiver: 13 mA Receiver: 13 mA Receiver: 15 mA at 24 V Operating voltage Ill Interface I			
Angle of divergence Ambient light limit EN 60947-5-2 : 40000 Lux Functional safety related parameters MTTF _d Mission Time (T _M) Diagnostic Coverage (DC) Both Safety Performance Operation indicator Corporation indicator Control elements C	Alignment aid		illuminated constantly: beam is interrupted, flashes: reaching switching point,
Functional safety related parameters MITF _q Mission Time (T _M) Diagnostic Coverage (DC) Defaultion indicator Coperation indicator Function indicator Fermanently (alt-z) - short circuit flashing with short break (1 Hz) - IO-Link mode Function indicator Fermanently off - object detected Flashing (4 Hz) - insufficient operating reserve Fermanently (alt-z) - insufficient operating reserve Receiver: sensitivity adjustment Electrical specifications Operating voltage UB Receiver: 13 mA Receiver: ≤ 15 mA at 24 V Operating voltage Ill Ill Interface Interface Interface Interface type Interface (DC-Link (via C/Q = pin 4)) Device profile Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: COM 2 (38.4 kBaud) Interface type (DC-Link Revision 1.1 Min. cycle time Process data witth Finiter: Process data input: 0 bit Process data output: 1 bit Receiver: Process data input: 2 bit Process data output: 2 bit Process data output	Diameter of the light spot		approx. 80 mm at a distance of 40 m
Functional safety related parameters MTTF _d Mission Time (T _M) Diagnostic Coverage (DC) Defeation indicator Certain indicator Defeation indicator Function	Angle of divergence		approx. 0.12 °
MTFd Mission Time (TM) Diagnostic Coverage (DC) Indicators/operating means Operation indicator Certain indicator Function indicator Function indicator Centrol elements Centrol elements Centrol elements Certain yeologie Coperating voltage Receiver: Ight/dark switch Control elements Certain yeologie Coperating voltage Receiver: Sensitivity adjustment Electrical specifications Operating voltage Receiver: Sensitivity adjustment Electrical specifications Operating voltage Receiver: Sensitivity adjustment Electrical specifications Operating voltage Receiver: Sensitivity adjustment Electrical specifications Receiver: Sensitivity adjustment Electrical specifications Operating voltage Receiver: Sensitivity adjustment Electrical specifications Receiver: Sensitivity adjustment Electrical specification Receiver: Sensitivity adjustment Electrical specification Receiver: Sensitivity adjustment Electrical specification Re	Ambient light limit		EN 60947-5-2 : 40000 Lux
Mission Time (T _M) Diagnostic Coverage (DC) Default indicator Operation indicator Euclidean Sequence (DC) Function indicator Function indicator Function indicator Function indicator Function indicator Control elements Permanently (alt - light path clear Pe	Functional safety related paran	neters	
Diagnostic Coverage (DC) Indicators/operating means	u		440 a
Indicators/operating means Operation indicator LED green:			
Department LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode	5 , ,		60 %
constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode Function indicator Function indicator Vellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve Control elements Receiver: light/dark switch Control elements Operating voltage UB 10 30 V DC Ripple No-load supply current UB Receiver: ≤ 15 mA at 24 V Operating voltage Protection class Ill Interface Interface type Device profile Interface type IO-Link (via C/Q = pin 4) Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: Finance type 2.3 ms Frocess data witdh Frocess data witdh Frocess data input: 0 bit Process data witdh Frocess data input: 0 bit Process data input: 2 bit Receiver: Process data input: 2 bit Receiver: 0x111312 (1118994) Compatible master port type A Input Test input emitter deactivation at +UB 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 close inplicts of the polarity protected, reverse polarity protected, overvoltage protected Switching current max. 100 mA, resistive load Usage category Ud 1 15 V DC Switching frequency f 1 155 V DC Switching frequency f 1 155 V DC Switching frequency f 1 155 V DC Switching frequency f 1 255 Hz	· -		
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Electrical specifications Operating voltage U _B 10 30 V DC Ripple max. 10 % No-load supply current I _O Emitter: ≤ 13 mA Receiver: ≤ 15 mA at 24 V Operating voltage Protection class III III Interface Interface type IO-Link (via C/Q = pin 4) Device profile Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: - Transfer rate COM 2 (38.4 kBaud) IO-Link Revision 1.1 Min. cycle time 2.3 ms Process data witdh Emitter: Process data input: 0 bit Process data input: 0 bit Receiver: Process data input: 2 bit Process data input: 2 bit Process data input: 2 bit Process data output: 1 bit Receiver: Process data input: 2 bit Process data output: 2 bit Process data output: 2 bit Process data input: 2 bit Process data output: 2 bit Process data input: 3 bit Process data input: 4 bit Process data input: 4 bit Process data input: 5 bit Process data input: 6 bit Process	Function indicator		Permanently lit - light path clear Permanently off - object detected
Electrical specifications Operating voltage UB 10 30 V DC Ripple max. 10 % No-load supply current Ignitter: ≤ 13 mA Receiver: ≤ 15 mA at 24 V Operating voltage Protection class III Interface III Interface type IO-Link (via C/Q = pin 4) Device profile Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: - Transfer rate COM 2 (38.4 kBaud) IO-Link Revision 1.1 Min. cycle time 2.3 ms Process data witdh Emitter: Process data input: 0 bit Process data output: 1 bit Receiver: Process data input: 2 bit Process data output: 9 bit Process data input: 9 bit Process data output: 9 bit Process data input: 9 bit Process data	Control elements		Receiver: light/dark switch
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Ripple max. 10 % No-load supply current I ₀ Emitter: ≤ 13 mA Receiver: ≤ 15 mA at 24 V Operating voltage Protection class III Interface Interface type IO-Link (via C/Q = pin 4) Device profile Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: Transfer rate COM 2 (38.4 kBaud) IO-Link Revision 1.1 Min. cycle time 2.3 ms Process data witdh Emitter: Process data output: 1 bit Receiver: Process data output: 2 bit Process	Electrical specifications		
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Protection class III Interface Interface type			
Protection class III Interface Interface type IO-Link (via C/Q = pin 4) Device profile Identification and diagnosis Smart Sensor: Receiver: type 2.4 Emitter: - Transfer rate COM 2 (38.4 kBaud) IO-Link Revision 1.1 Min. cycle time 2.3 ms Process data witdh Emitter: Process data input: 0 bit Process data output: 1 bit Receiver: Process data output: 2 bit Process da	No-load supply current	I ₀	
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IO-Link Revision Min. cycle time 2.3 ms Process data witdh Emitter: Process data input: 0 bit Process data output: 1 bit Receiver: Process data input: 2 bit Process data output: 2 bit SIO mode support yes Device ID Emitter: 0x111412 (1119250) Receiver: 0x111312 (1118994) Compatible master port type A Input Test input Switching type The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally close light-on, IO-Link Signal output Signal output 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected Switching voltage max. 30 V DC Switching current max. 100 mA , resistive load Usage category Voltage drop Ud ≤ 1.5 V DC Switching frequency f 1250 Hz	Device promo		Smart Sensor: Receiver: type 2.4
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Switching type The switching type of the sensor is adjustable. The default setting is: $C/Q - Pin4$: NPN normally open / dark-on, PNP normally close light-on, IO-Link Signal output 1 push-pull (4 in 1) output, 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	Test input		emitter deactivation at +U _B
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally close light-on, IO-Link
Switching current max. 100 mA , resistive load Usage category DC-12 and DC-13 Voltage drop $U_d \le 1.5 \text{ V DC}$ Switching frequency f 1250 Hz			polarity protected, overvoltage protected
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Voltage drop $U_d \le 1.5 \text{ V DC}$ Switching frequency f 1250 Hz	-		
Switching frequency f 1250 Hz	Osage category		DO-12 dilu DO-13
	Voltage drop	11.	< 1.5 V DC
	<u> </u>	-	

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

Conformity				
Communication interface	IEC 61131-9			
Product standard	EN 60947-5-2			
Laser safety	EN 60825-1:2014			
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	61.7 mm			
Housing depth	41.7 mm			
Degree of protection	IP67 / IP69 / IP69K			
Connection	Connector plug, M8 x 1, 3 pin, rotatable by 90°			
Material				
Housing	PC (Polycarbonate)			
Optical face	PMMA			
Mass	Emitter: approx. 44 g receiver: approx. 44 g			
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			
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





Functions and Operation

To unlock the adjustment functions turn the sensing range /sensitivity 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.