Thru-beam sensor (pair)

OBE10M-R103-S2EP-IO-0,3M-V1

- Miniature design with versatile mounting options
- 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

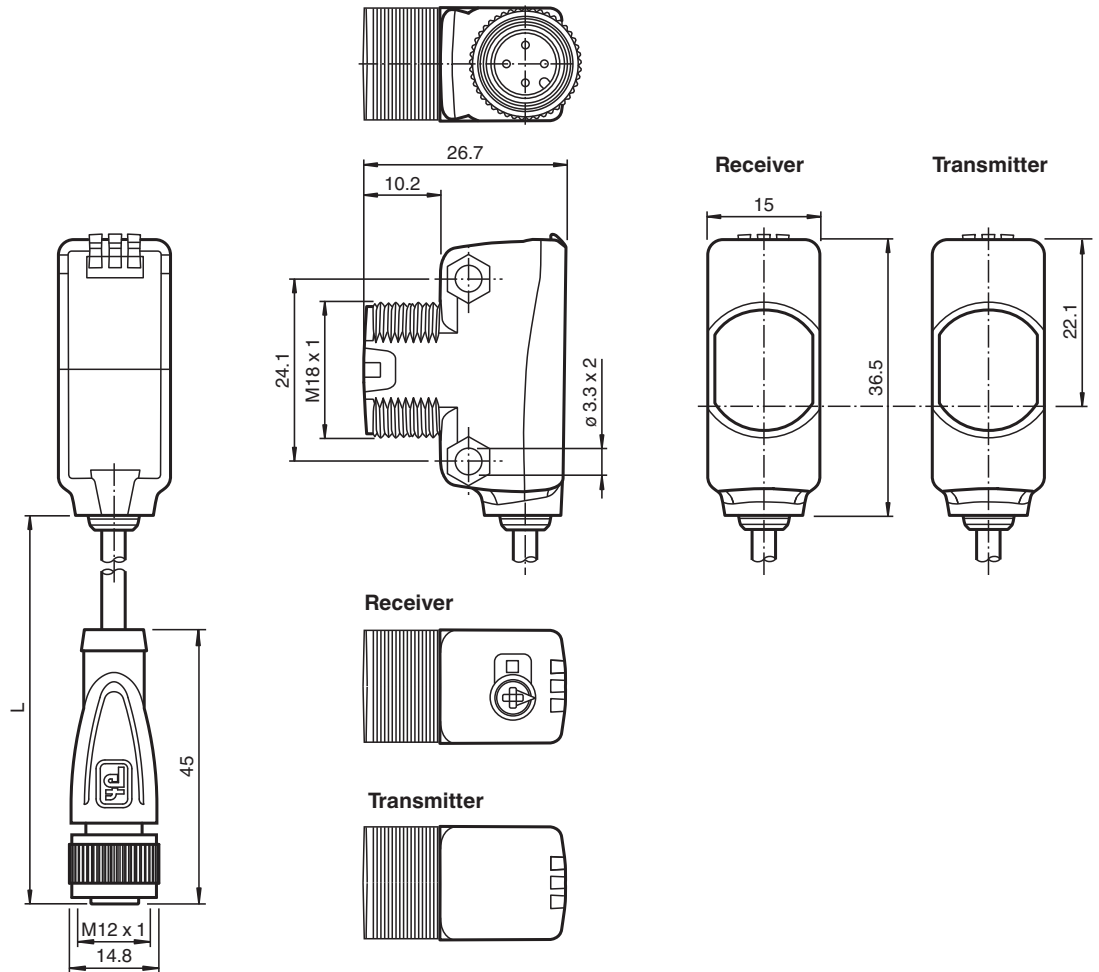CE c(UL)us LISTED UKCA IO-Link

Function

The R103 series miniature optical sensors are the first devices of their kind to offer an endto- 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.

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

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Dimensions

Receiver

Transmitter

Receiver

Transmitter

Technical Data

System components	
Emitter	OBE10M-R103-S-IO-0,3M-V1
Receiver	OBE10M-R103-2EP-IO-0,3M-V1
General specifications	
Effective detection range	0 ... 10 m
Threshold detection range	12.5 m
Light source	LED
Light type	modulated visible red light
LED risk group labelling	exempt group
Diameter of the light spot	approx. 65 mm at a distance of 1 m
Opening angle	3.7 °
Ambient light limit	EN 60947-5-2 : 30000 Lux
Functional safety related parameters	
$MTTF_d$	462 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

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## Technical Data

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: ≤ 14 mA Receiver: ≤ 13 mA at 24 V supply voltage
Protection class			III
Interface			
Interface type			IO-Link (via C/Q = pin 4)
IO-Link revision			1.1
Device ID			Emitter: 0x110403 (1115139) Receiver: 0x110303 (1114883)
Transfer rate			COM2 (38.4 kBit/s)
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
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	1000 Hz
Response time			0.5 ms
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 EN 62471:2008 EN 61131-9:2013
Approvals and certificates			
UL approval			E87056 , cULus Listed , class 2 power supply , type rating 1
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			15 mm
Housing height			36.5 mm

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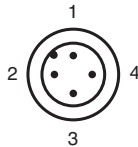
Technical Data

Housing depth	26.7 mm
Degree of protection	IP67 / IP69 / IP69K
Connection	300 mm fixed cable with M12 x 1, 4-pin connector
Material	
Housing	PC (Polycarbonate)
Optical face	PMMA
Mass	Emitter: approx. 23 g receiver: approx. 23 g
Cable length	0.3 m

Connection
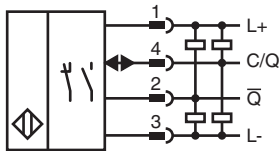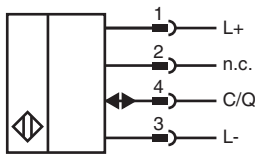
Connection Assignment

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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Assembly

Emitter
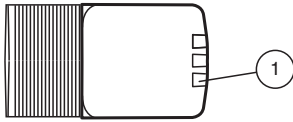
1	Operating indicator

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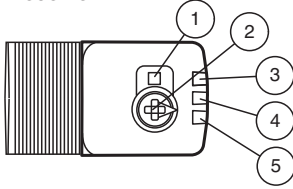
1	Light-on/Dark-on switch
2	Sensitivity adjuster
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on

Characteristic Curve

Characteristic response curve

Offset Y [mm]

Distance X [m]
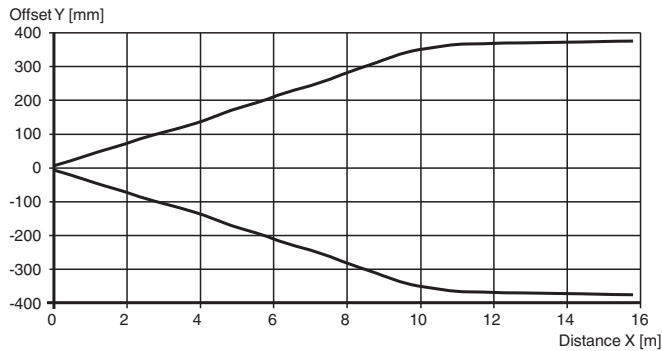
Relative received light strength

Stability control

Distance X [m]
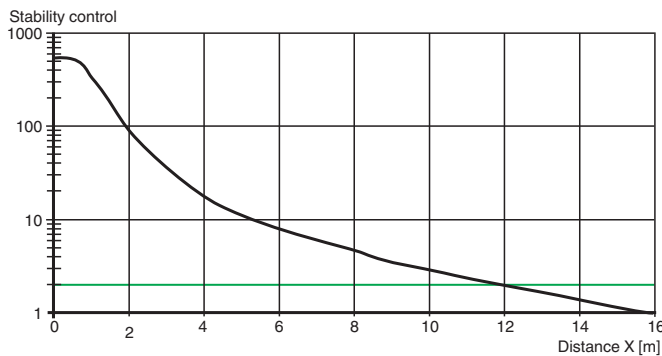
Accessories

	OMH-ML100-09	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-R103-01	Mounting bracket

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

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Accessories

	V31-GM-2M-PUR	Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey
	V31-WM-2M-PUR	Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey
	OMH-ML6	Mounting bracket
	OMH-ML6-U	Mounting bracket
	OMH-ML6-Z	Mounting bracket
	OMH-R10X-01	Mounting bracket
	OMH-R10X-04	Mounting bracket
	OMH-R10X-10	Mounting bracket
	OMH-ML100-031	Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 mm
	OMH-ML100-03	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	ICE2-8IOL-G65L-V1D	EtherNet/IP IO-Link master with 8 inputs/outputs
	ICE3-8IOL-G65L-V1D	PROFINET IO IO-Link master with 8 inputs/outputs
	ICE2-8IOL-K45S-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	ICE3-8IOL-K45P-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	ICE3-8IOL-K45S-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection
	ICE1-8IOL-G30L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE1-8IOL-G60L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE2-8IOL-K45P-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	V1-G-2M-PUR	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey

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

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Accessories

	V1-W-2M-PUR	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey

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Configuration

R103

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 / 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.

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