



Triangulation sensor (BGE) OBT80-R103-2EP-IO-1T-L-Y0351



- Miniature design with versatile mounting options
- Secure and gapless detection, even near the surface through background evaluation
- DuraBeam Laser Sensors durable and employable like an LED
- Extended temperature range -40 °C ... 60 °Ċ
- High degree of protection IP69K
- IO-Link interface for service and process data

Laser diffuse mode sensor with background evaluation











Function

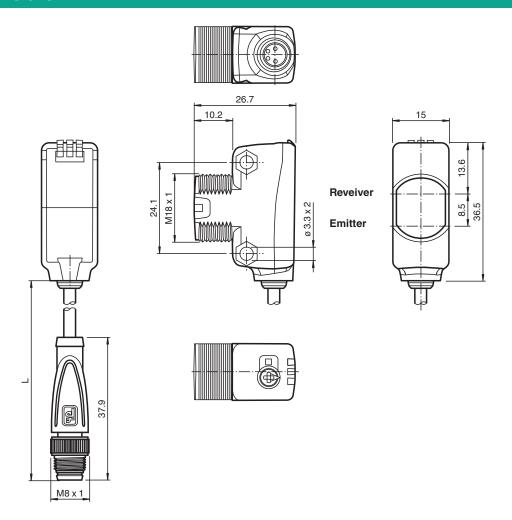
The R103 series miniature optical sensors are the first devices of their kind to offer an endto- end solution in a small single standard design from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation 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.

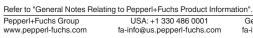
Dimensions



Technical Data

General specifications	
Detection range	7 80 mm
Detection range min.	7 25 mm
Detection range max.	7 80 mm
Adjustment range	25 80 mm
Reference target	standard white, 100 mm x 100 mm
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 < 1 mm in the range of 150 mm 250 mm
Pulse length	3 μs
Repetition rate	approx. 13 kHz
max. pulse energy	10.4 nJ
Black-white difference (6 %/90 %)	< 5 % at 120 mm
Diameter of the light spot	< 1 mm at a distance of 60 mm
Opening angle	approx. 0.3 °
Ambient light limit	EN 60947-5-2 40000 Lux
Functional safety related parameters	
$MTTF_d$	560 a

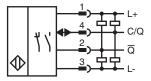
Mission Time (Tiu) 20 a Diagnostic Coverage (DC) 0% Indicator's operation indicator Operation indicator Control elements Cortrol elements Co	Diagnostic Coverage (DC) ndicators/operating means Operation indicator Function indicator		LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode LED yellow: constantly on - object detected constantly off - object not detected
Diagnostic Coverage (DC) Indicator/Operating means Operation indicator Operation indicator Operation indicator Constantly on power on constantly on power on indicator constantly on power on indicator LED yellow: constantly on object detected constantly off - object not not not not not not not not not no	Diagnostic Coverage (DC) ndicators/operating means Operation indicator Function indicator		LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode LED yellow: constantly on - object detected constantly off - object not detected
Indicators/operating means Operation indicator Operation indicator Canadamily on - power on consisting on - power on flashing (id-1) - short circuit flashing with short break (id-1) - lo-Link mode flashing (id-1) - short circuit flashing with short break (id-1) - lo-Link mode flashing (id-1) - short circuit flashing with short break (id-1) - lo-Link mode constantly on - object detected constantly of - object detected constantly object of - object detected constantly object of - object object on - object detected constantly object of - object object on - object object object on - object object on - object object on - object object object on - object object object on - object	Operation indicator Function indicator		LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode LED yellow: constantly on - object detected constantly off - object not detected
Deparation indicator LED green: constantly on - power on flashing (AHZ) - short circuit (12) - IO-Link mode tashing (AHZ) - short circuit (12) - IO-Link mode tashing (AHZ) - short circuit (12) - IO-Link mode tashing (AHZ) - short circuit (12) - IO-Link mode tashing (AHZ) - short circuit (12) - IO-Link mode tashing with short break (12) - IO-Link (13) - IO-Link (Operation indicator Function indicator		constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode LED yellow: constantly on - object detected constantly off - object not detected
considently on power on flashing (AHz) - short crout Flashing AHz) - short crout Flashing AH	Function indicator		constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode LED yellow: constantly on - object detected constantly off - object not detected
Control elements			constantly on - object detected constantly off - object not detected
Control elements Sensing range adjuster Electrical specifications Operating voltage U _B 10 30 V DC Ripple max. 10 % No-load supply current I _B 2 × 20 mA at 24 V supply voltage Protection class III Interface Interface III OL-Link (via C/O = pin 4) OL-Link (0		
Description	Control elements		Light-on/dark-on changeover switch
Operating voltage			Sensing range adjuster
Ripple max. 10 % No-load supply current I₀ < 20 mA at 24 V supply voltage Protection class III Interface III Interface type IO-Link (via C/Q = pin 4) IO-Link revision 1.1 Device profile Smart Sensor Device ID 0x110706 (1115910) Transfer rate COM2 (98.4 kBr/s) Min. cycle time 2.3 ms Process data width Process data input 1 Bit Process data output 2 Bit SIO mode support yes SiO mode support yes Switching type The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally poen / light-on, PNP normally closaed / dark-on, IO-Link / Q Pin2: NPN normally poen / light-on, PNP normally closaed / dark-on, IO-Link / Q Pin2: NPN normally closaed / dark-on, PNP normally closaed / dark-on,	lectrical specifications		
No-load supply current Protection class III Interface Interface ype IO-Link (via C/Q = pin 4) IO-Link revision I.1 Device profile Smart Sensor Device ID Ox110706 (1115910) Transfer rate COM2 (38.4 kBit/s) Min. cycle time Compatible master port type A Output Switching type C'Q - Pin4 NPN normally open / light-on, PNP normally closed / dark-on, IO-Link Q'D - Pin4 NPN normally open / light-on, PNP normally closed / dark-on, IO-Link Q'D - Pin4 NPN normally closed / dark-on, PNP normally copen / light-on Switching voltage Switching voltage Max. 30 V DC Switching voltage Max 10 0 mA, resistive load Usage category Uclas or DC-12 and DC-13 Voltage drop Ug 1 15 V DC Switching frequency I 660 H2 Response time J 30 0 µs Conformity Communication interface I EC 61131-9 Product standard Product standard PRO 6000000000000000000000000000000000000	Operating voltage	U _B	10 30 V DC
Protection class III Interface Interface type IO-Link (via C/Q = pin 4) IO-Link (vision 1.1 Device profile Smart Sensor Device ID (0.115910) Transfer rate COM2 (38.4 kBirls) Min. cycle time 2.3 ms Process data width Process data input 1 Bit Process data input 2 Bit Process data width Process data input 2 Bit Process data width Process data output 2 Bit SIO mode support yes Compatible master port type A Switching type The switching type of the sensor is adjustable. The default satting is: C'O - Pind: NPN normally open / light-on, PNP normally closed / dark-on, IO-Link /O - Pind: NPN normally closed / dark-on, PNP normally closed / dark-on, IO-Link /O - Pind: NPN normally closed / dark-on, PNP normally open / light-on Signal output 2 push-puil (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvollage protected value overvollage value	Ripple		max. 10 %
Interface type	No-load supply current	I ₀	< 20 mA at 24 V supply voltage
Interface type	Protection class		
IO-Link revision 1.1	nterface		
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Process data width Process data input 1 Bit Process data output 2 Bit Process data output 3 Queen 2 Bit Process data output 4 Queen 2 Bit Process data output 4 Queen 2 Bit Process data output 5 Queen 2 Bit Process data output 5 Queen 2 Bit Process data output 5 Queen 2 Bit Process data output 2 Bit Proc	Transfer rate		COM2 (38.4 kBit/s)
Process data output 2 Bit	Min. cycle time		2.3 ms
Compatible master port type A Output The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / light-on, PNP normally closed / dark-on, IO-Link /Q - Pin2: NPN normally closed / dark-on, PNP normally open / light-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 1650 Hz Response time 300 μs Conformity Communication interface IEC 61131-9 Product standard EN 60947-5-2 Laser safety IEC 60825-1:2007 Approvals and certificates ER7056, cULus Listed, class 2 power supply, type rating 1 FDA approval ER60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 Ambient conditions Ambient temperature -40 60 °C (-40 140 °F), fixed cable not appropriate for conveyor chains Storage temperature -40 70 °C (-40 158 °F) Mechanical specifications <td>Process data width</td> <td></td> <td></td>	Process data width		
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Switching type The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / light-on, PNP normally closed / dark-on, IO-Link / Q - Pin2: NPN normally open / light-on Signal output 2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected max. 30 V DC Switching voltage max. 30 V DC Switching current Usage category DC-12 and DC-13 Voltage drop U _d ≤ 1.5 V DC Switching frequency f 1650 Hz Response time 300 μs Conformity Communication interface Froduct standard EN 60947-5-2 Laser safety EC 60825-1:2007 Approvals and certificates UL approval ES 87056, cULus Listed, class 2 power supply, type rating 1 FDA approval EC 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 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	Compatible master port type		A
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Voltage drop Switching frequency Response time 300 μs Conformity Communication interface Product standard EN 60947-5-2 Laser safety Approvals and certificates UL approval FDA approval FDA approval EC 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 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	Switching current		max. 100 mA, resistive load
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Mechanical specifications	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)
Housing width 15 mm	lechanical specifications		
	Housing width		15 mm
Housing height 36.5 mm	Housing height		36.5 mm
Housing depth 26.7 mm	Housing depth		26.7 mm
Degree of protection IP67 / IP69 / IP69K	Degree of protection		IP67 / IP69 / IP69K



Technical Data

Connection	fixed cable 300 mm with M8 x 1 male connector; 4-pin
Material	
Housing	PC (Polycarbonate)
Optical face	PMMA
Mass	approx. 17 g
Cable length	0.3 m

Connection



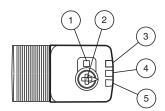
Connection Assignment



Wire colors in accordance with EN 60947-5-2

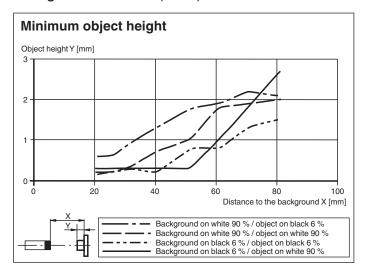
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Assembly



- 1 Light-on/dark-on changeover switch
- 2 Sensing range adjuster
- 3 Operating indicator / dark on
- 4 Function indicator
- 5 Operating indicator / light on

Triangulation sensor (BGE)



Safety Information



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

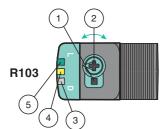
CLASS 1 LASER PRODUCT

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

Accessories

	OMH-ML100-09	Mounting aid for round steel ø 12 mm or sheet 1.5 mm 3 mm
6/	V3-WM-2M-PUR	Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey
5	OMH-R103-01	Mounting bracket
*	OMH-ML6	Mounting bracket
	OMH-ML6-U	Mounting bracket

Acces	sories	
ME	OMH-ML6-Z	Mounting bracket
4	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
11-	ICE3-8IOL-G65L-V1D	PROFINET IO IO-Link master with 8 inputs/outputs
	ICE1-8IOL-G30L-V1D	Ethernet IO-Link module with 8 inputs/outputs
0: a 0: a 0: a 0: a 0: a 0: a	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
9	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
64.	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection



- 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.