Triangulation sensor (BGE)
OBT650-R201-2EP-IO-V31-1T

- Medium design with versatile mounting options
- Secure and gapless detection, even near the surface through background evaluation
- Precision object detection, almost irrespective of the color
- Extended temperature range -40 °C ... 60 °C
- High degree of protection IP69K
- IO-Link interface for service and process data

Triangulation sensor with background evaluation
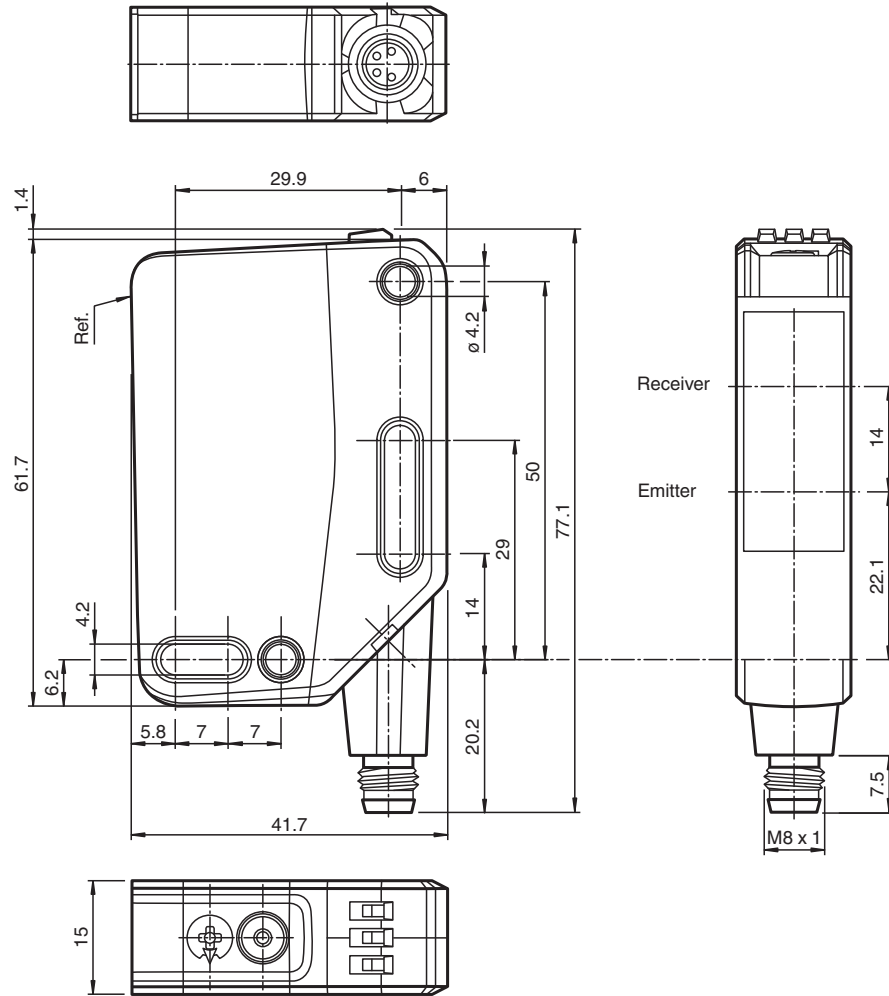
CE c(UL)us LISTED UKCA IO-Link

Function

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.

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

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Dimensions

Technical Data

General specifications

Detection range	10 ... 650 mm
Detection range min.	10 ... 100 mm
Detection range max.	10 ... 650 mm
Adjustment range	100 ... 650 mm
Reference target	standard white, 100 mm x 100 mm
Light source	LED
Light type	modulated visible red light
LED risk group labelling	exempt group
Black-white difference (6 %/90 %)	< 6 % at 650 mm
Diameter of the light spot	approx. 20 mm x 20 mm at a distance of 650 mm
Opening angle	approx. 2 °
Ambient light limit	EN 60947-5-2 : 70000 Lux

Functional safety related parameters

MTTF$_d$	600 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			LED yellow: constantly on - background detected (object not detected) constantly off - object detected
Control elements			Light-on/dark-on changeover switch
Control elements			Sensing range adjuster
Electrical specifications			
Operating voltage		U_B	10 ... 30 V DC
Ripple			max. 10 %
No-load supply current		I_0	< 25 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 profile			Identification and diagnosis Smart Sensor type 2.4
Device ID			0x111711 (1120017)
Transfer rate			COM2 (38.4 kBit/s)
Min. cycle time			2.3 ms
Process data width			Process data input 1 Bit Process data output 2 Bit
SIO mode support			yes
Compatible master port type			A
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	500 Hz
Response time			1 ms
Conformity			
Communication interface			IEC 61131-9
Product standard			EN 60947-5-2
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
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			4-pin, M8 x 1 connector, 90° rotatable
Material			
Housing			PC (Polycarbonate)
Optical face			PMMA
Mass			approx. 44 g

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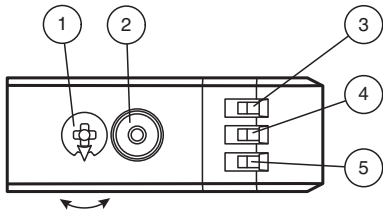PEPPERL+FUCHS

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

Minimum object height
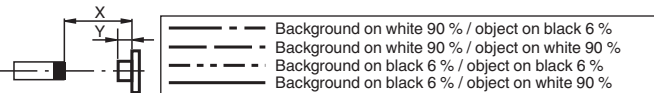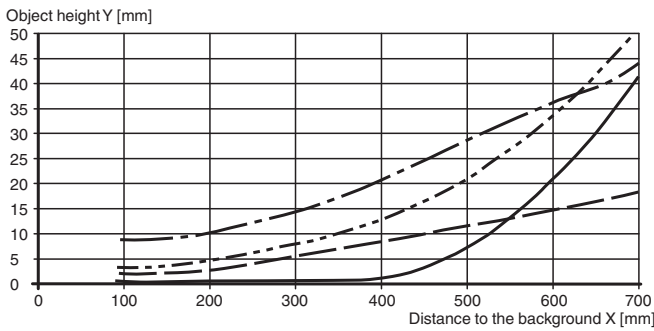
Object height Y [mm]

Distance to the background X [mm]

— · — · Background on white 90 % / object on black 6 %
— — Background on white 90 % / object on white 90 %
— ·· — Background on black 6 % / object on black 6 %
——— Background on black 6 % / object on white 90 %

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Accessories

	V31-WM-2M-PUR	Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey
	V31-GM-2M-PUR	Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey
	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-RL31-08	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-R20x-Quick-Mount	Quick mounting accessory
	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

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Configuration

To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster by more than 180°.

Sensing Range/Sensitivity

To increase the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster clockwise.

To reduce the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster counter-clockwise.

As soon as the end of the adjustment range is reached, the signal indicator flashes at 8 Hz.

Configuring Light On/Dark On

Press the light-on/dark-on changeover switch for more than 1 second (but less than 4 seconds). "Light on/dark on" mode changes and the relevant operating indicator lights up.

If you press the light-on/dark-on changeover switch for longer than 4 seconds, the "light on/dark on" mode will switch back to the original setting. The current status is activated when the light-on/dark-on changeover switch is released.

Restoring Factory Settings

Press the light-on/dark-on changeover switch for more than 10 seconds (but less than 30 seconds) until all LEDs go out. When the light-on/dark-on changeover switch is released, the signal indicator lights up. After 5 seconds, the sensor resumes operation with the factory settings.

The adjustment functions are locked after 5 minutes of inactivity. To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster again by more than 180°.

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