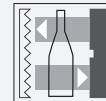




Retroreflective sensor (glass) OBG4000-R103-2EP-IO-0,3M-V1



- Miniature design with versatile mounting options
- Detects transparent objects, i.e., clear glass, PET and transparent films
- Two machines in one: clear object detection or reflection operating mode with long range
- High degree of protection IP69K
- IO-Link interface for service and process data

Retroreflective sensor with polarization filter for clear object detection



IO-Link

Function

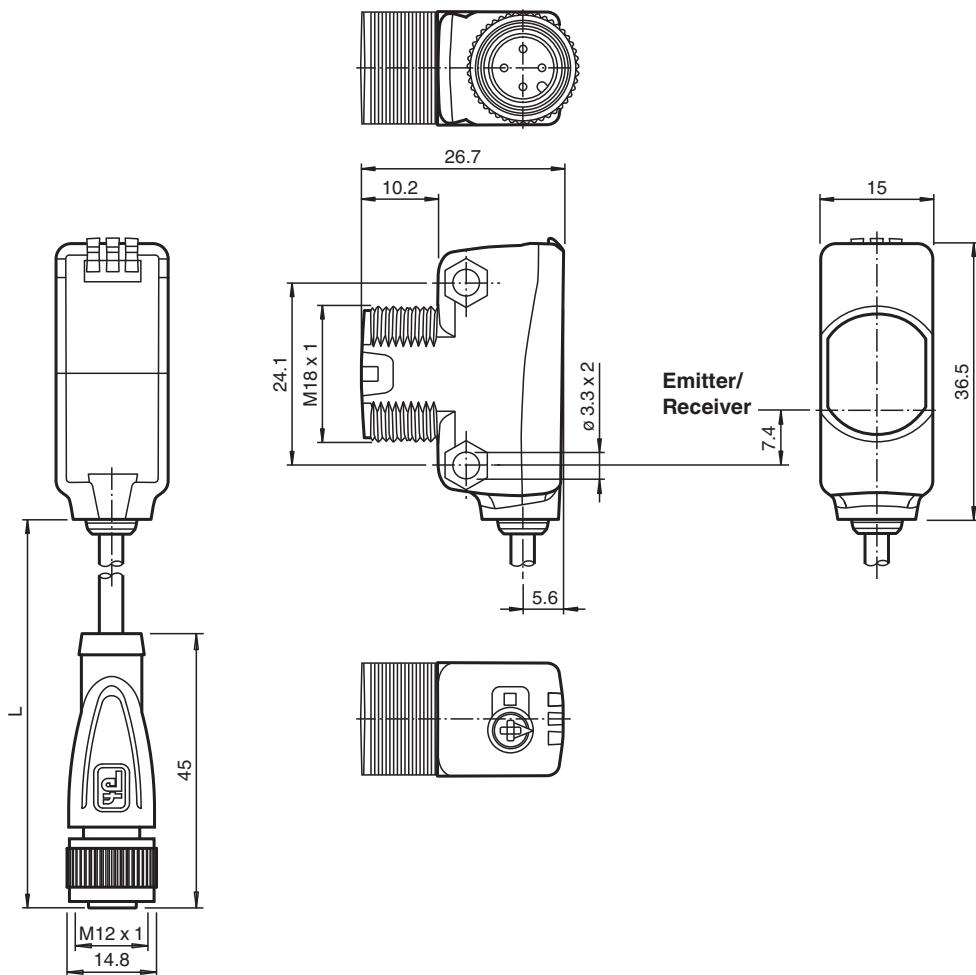
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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

Effective detection range	0 ... 3.5 m in TEACH mode ; 0 ... 4 m at switch position "N"
Reflector distance	0 ... 3.5 m in TEACH mode ; 0 ... 4 m at switch position "N"
Threshold detection range	5 m
Reference target	H85-2 reflector
Light source	LED
Light type	modulated visible red light
LED risk group labelling	exempt group
Diameter of the light spot	approx. 170 mm at a distance of 3.5 m
Opening angle	approx. 5 °
Ambient light limit	EN 60947-5-2

Functional safety related parameters

MTTF _d	600 a
Mission Time (T _M)	20 a
Diagnostic Coverage (DC)	0 %

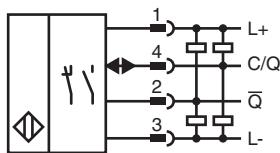
Indicators/operating means

Operation indicator	LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Function indicator	Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve

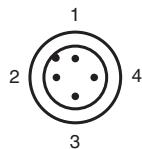
Technical Data

Control elements	Teach-In key	
Control elements	5-step rotary switch for operating modes selection	
Contrast detection levels	10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials Adjustable via rotary switch	
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 ID	0x110A03 (1116675)	
Transfer rate	COM2 (38.4 kB/s)	
Min. cycle time	2.3 ms	
Process data width	Process data input 2 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: PNP 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	
Ambient conditions		
Ambient temperature	-20 ... 60 °C (-4 ... 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	
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	approx. 23 g	
Cable length	0.3 m	

Connection



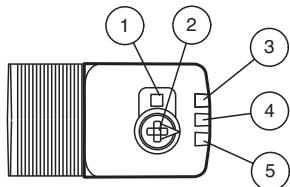
Connection Assignment



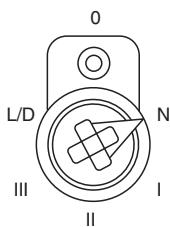
Wire colors in accordance with EN 60947-5-2

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

Assembly

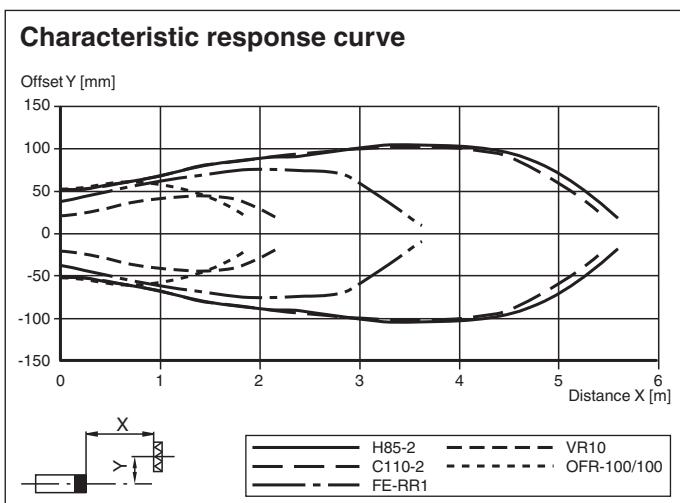


1	Teach-in button
2	Mode rotary switch
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on



N	Normal mode
I	10 % contrast detection
II	18 % contrast detection
III	40 % contrast detection
L/D	Switching type
0	Keylock

Characteristic Curve



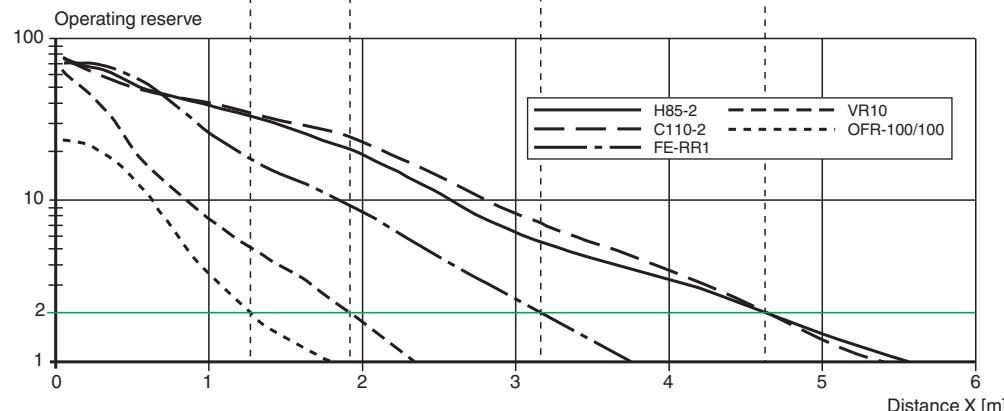
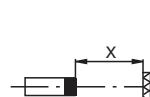
Relative received light strength

Reflector type:

H85-2	50 m	4.6 m	5.6 m
C110-2	50 m	4.6 m	5.3 m
FE-RR1	50 m	3.2 m	3.7 m
VR10	50 m	1.9 m	2.3 m
OFR-100/100	50 m	1.3 m	1.8 m

Operating reserve > 2

Operating reserve < 2



Commissioning

Teach-in

Use the rotary switch to select the required operating mode: Normal mode (N) or contrast level I – III.

To teach in a threshold or activate an operating mode, press the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s). Release the "TI" button. Teach-in starts.

Successful teach-in is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs. The sensor will now operate in the selected operating mode with the taught-in threshold.

An unsuccessful teach-in is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs. After an unsuccessful teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Every taught-in switching threshold can be re-taught (overwritten) by pressing the "TI" button again.

Note: To ensure that the device functions reliably in Contrast mode, the device must be powered on at least 30 s before teach-in.

Setting the Device to Maximum Sensitivity

- Use the rotary switch to select the Normal mode (N) position.
- Press the "TI" button for > 4 s. The yellow and green LEDs will go out.
- Release the "TI" button.

The settings will be reset to maximum sensitivity. After successfully resetting, the yellow and green LEDs will flash alternately (2.5 Hz).

Switching between light on/dark on

- Use the rotary switch to select the light on/dark on (L/D) position.
- Press the "TI" button for > 1 s. The respective operating indicator LED (L/D) will illuminate green and the switching type will change.
- To reset the switching type, press the "TI" button for > 4 s. The respective operating indicator LED (L/D) will illuminate green and the operating indicator will be reset to the most recently active switching type.

Reset to Default Settings

- Use the rotary switch to select the O position.

Commissioning

- Press the "TI" button for > 10 s. The yellow and the green LEDs will both switch off.
- Release the "TI" button. The yellow LED is on. After resetting, the sensor will operate with the following default settings: