

Retroreflective sensor with polarization filter for clear object detection

Function

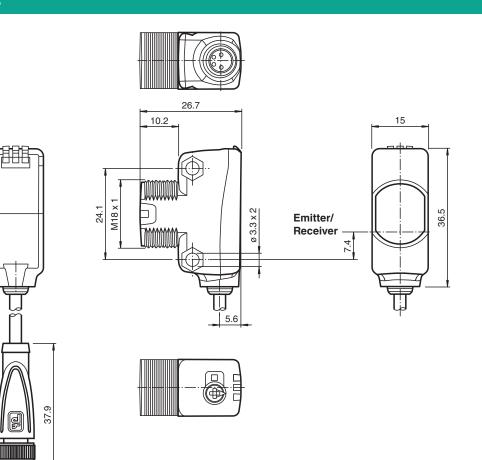
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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

M8 x 1

0 3.5 m in TEACH mode ; 0 4 m at switch position "N"
0 3.5 m in TEACH mode ; 0 4 m at switch position "N"
5 m
H85-2 reflector
LED
modulated visible red light
exempt group
approx. 170 mm at a distance of 3.5 m
approx. 5 °
EN 60947-5-2
600 a
20 a
0 %
LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve

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

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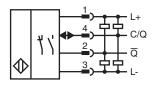
Control elementsImage: Control elementsControl elements5-step rotary switch for operating modes selectionContrast detection levels18 % - clean, water filed PET bottes 18 % - clean, water filed PET bottes 19 % - clean file	Technical Data		
Control elements 5-step rotary switch for operating modes selection Contrad detection levels 10% - clean, water filles PP toothes Adjustable via rotary switch Electrical specifications 10% - clean, water filles PP toothes Adjustable via rotary switch Operating voltage Us 10	Control elements		Teach-In key
18 % -clear glass bottles Ad % - color glass or opague materials Ad % - color glass or opage materials Ad % - color % (d 180 °F), movable cable	Control elements		
Operating voltageU_a10 30 V DCRipplemax. 10 %No-load supply currentIoProtection classIIIInterfaceIIIInterface typeO-Link (via C/Q = pin 4)IO-Link rovisionIOIO-Link voltageO-Link (via C/Q = pin 4)IO-Link rovisionIIIProcess data input 2 BitProcess data input 2 BitOutputIIISwitching typeYesCompatible master port typeAOutputSignal outputIIII max. 30 V DCSignal outputIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Contrast detection levels		18 % - clear glass bottles 40 % - colored glass or opaque materials
Ripple max. 10 % No-load supply corrent % < 25 mA at 24 V supply voltage	Electrical specifications		
No-load supply current Ip < 25 mA at 24 V supply voltage Protection class III Interface III Interface type IO-Link (via C/O = pin 4) ID-Link revision III Device ID ON10A03 (116875) Transfer rate ON10A03 (116875) Transfer rate ON10A03 (116875) Process data width Process data input 2 Bit Process data width Process data input 2 Bit Process data width Yes Compatible master port type I Signal output Yes Compatible master port type I Signal output Process data input 2 Bit Syntching votage Ime switching type of the sensor is adjustable. The default setting is: Signal output Process data output 2 Bit Syntching votage Ima switching votage / fight-on, PNP normal/ opeen / data-on, PNP	Operating voltage	U _B	10 30 V DC
Protection class III Interface Interface View Interface type IO-Link (via C/Q = pin 4) IO-Link revision 1.1 Device ID Ox110A03 (1116675) Transfer rate COM2 (28 4 kB/v)s) Min. cycle time 2.3 ms Process data width Process data input 2 Bit Process data width yes Compatible master port type A Output Still measter port type Switching type The switching type of the sensor is adjustable. The default setting is: C/Q = Pink*. NPN normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Signal output 2 pust-NPN Normally closed / agit-on, PNP normally closed / light-on, IO-Link Switching votage	Ripple		max. 10 %
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Switching type The switching type of the sensor is adjustable. The default setting is: C/G - Pin4: NPN normally open / dark-on, PNP normally open / dark-on, PNP normally obead / light-on, PNP normaly obead /	Compatible master port type		A
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Voltage drop Ud ≤ 1.5 V DC Switching frequency f 500 Hz Response time 1 ms Conformity IEC 61131-9 Communication interface IEC 61131-9 Product standard 6 Approvals and certificates IEC 61131-9 UL approval 6 Ambient conditions IES 6505, cULus Listed , class 2 power supply , type rating 1 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 IP67 / IP69 / IP69K Connection IP67 / IP69 / IP69/ IP69K Connection IP67 / IP69 / IP69K Material PMMA Material PMMA Mass approx.17 g Dimensions PMMA Mass approx.17 g Dimensions Storage temperature Storage temperature Width 15 mm	Switching current		max. 100 mA , resistive load
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Conformity IEC 61131-9 Product standard IEC 61131-9 Product standard EN 60947-5-2 Approvals and certificates IEC 61000000000000000000000000000000000000	Switching frequency	f	500 Hz
Communication interfaceIEC 61131-9Product standardEN 60947-5-2Approvals and certificatesE87056, cULus Listed, class 2 power supply, type rating 1Ambient conditionsE87056, cULus Listed, class 2 power supply, type rating 1Ambient temperature-20 60 °C (-4 140 °F), movable cable not appropriate for conveyor chains storage temperatureStorage temperature-40 70 °C (-40 158 °F)Mechanical specificationsIP67 / IP69 / IP69KConnectionfixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth62.7 mm	Response time		1 ms
Product standardEN 60947-5-2Approvals and certificatesE87056, cULus Listed, class 2 power supply, type rating 1UL approvalE87056, cULus Listed, class 2 power supply, type rating 1Ambient conditions-2060 °C (-4 140 °F), movable cable not appropriate for conveyor chains conveyor chains °F)Methanical specifications-2060 °C (-4 158 °F)Degree of protectionIP67 / IP69 / IP69 KConnectionIP67 / IP69 / IP69 KMaterial	Conformity		
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Storage temperature-40 70 °C (-40 158 °F)Mechanical specificationsDegree of protectionIP67 / IP69 / IP69KConnectionimage of fixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Optical facePMMAMassoptrox. 17 gDimensionsImage of fixed cable 300 mm with M8 x 1 male connector; 4-pinWidth15 mmOptical face16.7 mm	Ambient conditions		
Mechanical specificationsDegree of protectionIP67 / IP69 / IP69KConnectionif ixed cable 300 mm with M8 x 1 male connector; 4-pinMaterialPC (Polycarbonate)Motional facePC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth62.7 mm	Ambient temperature		-20 60 °C (-4 140 °F) , movable cable not appropriate for conveyor chains
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HousingPC (Polycarbonate)Optical facePMMAMassapprox. 17 gDimensions36.5 mmWidth15 mmDepth26.7 mm	Connection		fixed cable 300 mm with M8 x 1 male connector; 4-pin
Optical facePMMAMassapprox.17 gDimensions36.5 mmHeight36.5 mmWidth15 mmDepth26.7 mm	Material		
Mass approx.17 g Dimensions 36.5 mm Height 36.5 mm Width 15 mm Depth 26.7 mm	Housing		PC (Polycarbonate)
Dimensions 36.5 mm Height 36.5 mm Width 15 mm Depth 26.7 mm	Optical face		PMMA
Height 36.5 mm Width 15 mm Depth 26.7 mm	Mass		approx. 17 g
Width 15 mm Depth 26.7 mm	Dimensions		
Depth 26.7 mm	Height		36.5 mm
	Width		15 mm
Cable length 0.3 m	Depth		26.7 mm
	Cable length		0.3 m

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

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Connection Assignment



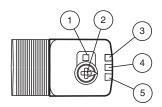
Connection Assignment

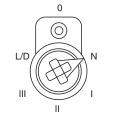


Wire colors in accordance with EN 60947-5-2

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

Ν	Normal mode
Ι	10 % contrast detection
П	18 % contrast detection
	40 % contrast detection
L/D	Switching type
0	Keylock

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

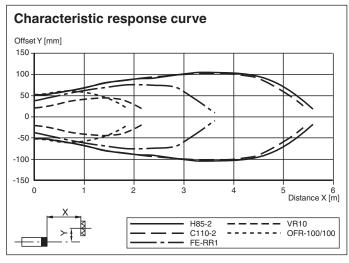
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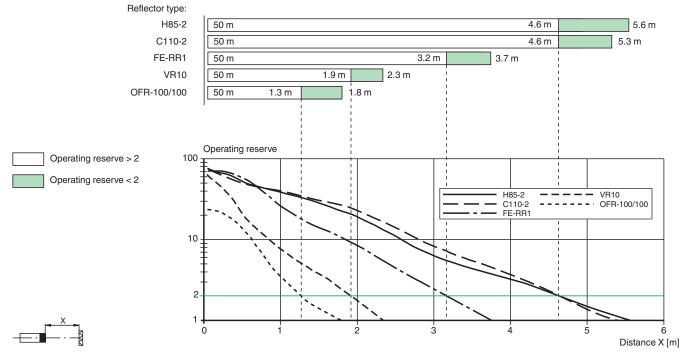
FPEPPERL+FUCHS

4

Characteristic Curve



Relative received light strength



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

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

1. Use the rotary switch to select the Normal mode (N) position.

2. Press the "TI" button for > 4 s. The yellow and green LEDs will go out.

- 3. 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

1. Use the rotary switch to select the light on/dark on (L/D) position.

- 2. Press the "TI" button for > 1 s. The respective operating indicator LED (L/D) will illuminate green and the switching type will change.
- 3. 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

1. Use the rotary switch to select the O position.

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

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Commissioning

- 2. Press the "TI" button for > 10 s. The yellow and the green LEDs will both switch off.
- 3. Release the "TI" button. The yellow LED is on. After resetting, the sensor will operate with the following default settings:
- Normal mode (N)
- Maximum sensitivity adjustment
- Dark on
- Pin 2 (white core): antivalent switching output

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

