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# **Model Number**

#### OBR7500-R100-EP-IO-V3

Retroreflective sensor with 3-pin, M8 x 1 connector

# **Features**

- Miniature design with versatile mounting options
- Extended temperature range -40°C ... 60°C
- High degree of protection IP69K
- IO-link interface for service and process data

# **Product information**

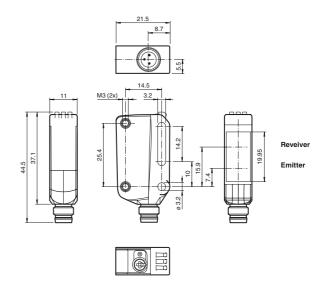
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The entire series enables sensors 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**



# **Electrical connection**



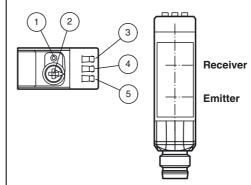
#### **Pinout**

Wire colors in accordance with EN 60947-5-2



BN BU

# Indicators/operating means



- Light-on/Dark-on changeover switch
- 2 Sensitivity adjuster
- 3 Operating indicator / dark on
- Signal indicator
- Operating indicator / light on



MTF <sub>0</sub> Mission Time (T <sub>1/0</sub> ) Diagnostic Coverage (DC) Deration indicator  Function indicator  Function indicator  Function indicator  Function indicator  Function indicator  Control elements Control elements Control elements Light-on/dark-on changeover switch Sensitivity adjustment Derameterization indicator  Electrical specifications  Operating voltage Ug 1030 V DC Ripple max. 10 % No-load supply current log < 25 ma 42 4 V supply voltage Interface Interface VP Interfac	Technical data		
Reflector distance	General specifications		
Threshold detection range	Effective detection range		0 7.5 m
MES-2 reflector   Light source	Reflector distance		0.03 7.5 m
Light source	Threshold detection range		10 m
Light type	Reference target		H85-2 reflector
EDF risk group labelling	Light source		LED
Polarization filter	Light type		modulated visible red light
Diameter of the light spot	LED risk group labelling		exempt group
Angle of divergence Ambient light limit Enuctional safety related parameters MTTF <sub>d</sub> Mission Time (T <sub>M</sub> ) Diagnostic Coverage (DC) Operation indicator Operation indicator  Understand the second of th	Polarization filter		yes
Ambient light limit Functional safety related parameters  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Mission Time (T <sub>Ne</sub> ) Diagnostic Coverage (DC)  ### Diagnostic Coverage (DC)  #	Diameter of the light spot		approx. 65 mm at a distance of 1 m
Functional safety related parameters  MTF <sub>d</sub> Mission Time (T <sub>M</sub> )  Diagnostic Coverage (DC)  Indicators/operating means  Operation indicator  Constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode  Function indicator  Control elements  Contro	Angle of divergence		3.7 °
MTF <sub>d</sub> Mission Time (T <sub>th</sub> )  Diagnostic Coverage (DC)  No%  Indicators/operating means  Operation indicator  Department of the control of t	Ambient light limit		EN 60947-5-2
Mission Time (T <sub>M</sub> )   20 a   0   0   0   0   0   0   0   0   0	Functional safety related parai	meters	
Diagnostic Coverage (DC) Indicators/operating means Operation indicator  Operation indicator  Eunction indicator  Function indicator  Control elements  Control elements  Control elements  Control elements  Parameterization indicator  Electrical specifications  Operating voltage  Operating voltage  Operating voltage  Operating voltage  III  Interface  Interface  Interface  Interface Vpe  IO-Link (via C/Q = pin 4)  Transfer rate  COM 2 (38.4 kBaud)  IO-Link Revision  I.1  Min. cycle time  2.3 ms  Process data witdh  Process data input 2 Bit  Process data output 2 Bit  Process data outpu	MTTF <sub>d</sub>		724 a
Indicators/operating means  Operation indicator  Defraction indicator  Euclidean indicator  Control elements  Control elements  Control elements  Control elements  Control elements  Euclidean indicator  I O link communication: green LED goes out briefly (1 Hz)  Electrical specifications  Operating voltage  I D	Mission Time (T <sub>M</sub> )		20 a
Departation indicator  LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode  Function indicator  Function indicator  Function indicator  Function indicator  Yellow LED: Permanently fit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve Light-on/dark-on changeover switch Sensitivity adjustment Parameterization indicator  Control elements  Control elements  Control elements  Control elements  Parameterization indicator  Parameterization indicator  Control elements  Operating voltage  U <sub>B</sub> 10 30 V DC  Ripple  max. 10 % No-load supply current  Interface  Interface  Interface  Interface  Interface  Interface y	Diagnostic Coverage (DC)		0 %
Departation indicator  LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode  Function indicator  Function indicator  Function indicator  Function indicator  Yellow LED: Permanently fit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve Light-on/dark-on changeover switch Sensitivity adjustment Parameterization indicator  Control elements  Control elements  Control elements  Control elements  Parameterization indicator  Parameterization indicator  Control elements  Operating voltage  U <sub>B</sub> 10 30 V DC  Ripple  max. 10 % No-load supply current  Interface  Interface  Interface  Interface  Interface  Interface y	Indicators/operating means		
Function indicator  Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve  Light-on-dan-con changeover switch  Control elements Control elements Parameterization indicator Electrical specifications  Operating voltage Operati	• •		constantly on - power on
Permanently off - Object detected   Flashing (4 Hz) - insufficient operating reserve	Function indicator		, ,
Control elements Light-on/dark-on changeover switch sensitivity adjustment   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication: green LED goes out briefly (1 Hz)   Electrical specifications   Dolink communication interface   Dolink communication   Do			Permanently off - object detected
Control elements sensitivity adjustment in Darameterization indicator in Colink communication: green LED goes out briefly (1 Hz) in Communication in Colink communication in Colink (1 Hz) in Col	Control elements		
Parameterization indicator  Electrical specifications  Operating voltage  Ripple  No-load supply current Protection class  Ill  Ill  Interface  Interface  Interface y  Interface  Interface y  Interfac			
Description			• •
Operating voltage         UB 10 30 V DC           Ripple         max. 10 %           No-load supply current         I₀         < 25 mA at 24 V supply voltage			g
Ripple	•	Un	10 30 V DC
No-load supply current   Io	· · · · · · · · · · · · · · · · · · ·	ОВ	
Protection class	• •	l <sub>a</sub>	
Interface  Interface type  In		'0	
Interface type			
Transfer rate         COM 2 (38.4 kBaud)           IO-Link Revision         1.1           Min. cycle time         2.3 ms           Process data witdh         Process data input 2 Bit Process data output 2 Bit           Process data output 2 Bit         Process data output 2 Bit           SIO mode support         yes           Device ID         0x110201 (1114625)           Compatible master port type         A           District NPN normally open / dark-on, PNP normally clost light-on, IO-Link           Switching type         The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally clost light-on, IO-Link           Signal output         1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected           Switching voltage         max. 30 V DC           Switching voltage         max. 30 V DC           Switching frequency         max. 100 mA, resistive load           Usage category         DC-12 and DC-13           Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Switching frequency         f 1000 Hz           Response time         0.5 ms           Conformity         Communication interface         IEC 61131-9           Product standard         EN 60947-5-2			10.1  ink (via C/O - pin 4)
IO-Link Revision	**		, , ,
Min. cycle time			
Process data witdh  Process data input 2 Bit Process data output 3 Deficit 3 Deficit 3 Deficit 4 Deficit 4 Deficit 4 Deficit 4 Deficit 4 Deficit 5 Deficit 5 Deficit 5 Deficit 6 Deficit 6 Deficit 6 Deficit 6 Deficit 6 Deficit 7 Deficit 6 Deficit 7 Deficit 6 Deficit 7 Deficit 6 Deficit 7 Defi			
Process data output 2 Bit  SIO mode support  Device ID  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 clos light-on, IO-Link  Signal output  1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected  Switching voltage  Switching current  Max. 100 mA , resistive load  Usage category  DC-12 and DC-13  Voltage drop  Ud ≤1.5 V DC  Switching frequency f 1000 Hz  Response time 0.5 ms  Conformity  Communication interface Product standard EN 60947-5-2  Ambient conditions  Ambient temperature  -40 60 °C (-40 140 °F)  Storage temperature  -40 70 °C (-40 158 °F)  Mechanical specifications  Housing width 11 mm  Housing height 44.5 mm  Housing depth 21.5 mm  Degree of protection  IP67 / IP69 / IP69K  Connection  Max 1 connector, 3-pin  Material  Housing PC (Polycarbonate)  PMMA			
SIO mode support  Device ID  Ox110201 (1114625)  Compatible master port type  A  Output  Switching type  The switching type of the sensor is adjustable. The default setting is:  C/O - Pin4: NPN normally open / dark-on, PNP normally clos light-on, IO-Link  Signal output  1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected  Switching voltage  Switching voltage  Switching current  Usage category  DC-12 and DC-13  Voltage drop  Ud  ≤ 1.5 V DC  Switching frequency  f 1000 Hz  Response time  Conformity  Communication interface  Product standard  EN 60947-5-2  Ambient conditions  Ambient temperature  -40 60 °C (-40 140 °F)  Storage temperature  -40 70 °C (-40 158 °F)  Mechanical specifications  Housing width  11 mm  Housing height  44.5 mm  Housing depth  21.5 mm  Degree of protection  IP67 / IP69 / IP69 K  Connection  Material  Housing  PC (Polycarbonate)  PMMA	FIOCESS UAIA WILUIT		
Device ID Compatible master port type  Output  Switching type  Switching type  The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally closlight-on, IO-Link  Signal output  Signal output  1 push-pull (4 in 1) output, 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  Ud ≤ 1.5 V DC  Switching frequency  Response time  0.5 ms  Conformity  Communication interface  Product standard  EN 60947-5-2  Ambient conditions  Ambient temperature  -40 60 °C (-40 140 °F)  Storage temperature  -40 70 °C (-40 158 °F)  Mechanical specifications  Housing width  11 mm  Housing height  44.5 mm  Degree of protection  Connection  M8 x 1 connector, 3-pin  Material  Housing  PC (Polycarbonate)  PMMA	SIO mode support		·
Compatible master port type       A         Output       The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / dark-on, PNP normally clos light-on, IO-Link         Signal output       1 push-pull (4 in 1) output, 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 <sub>d</sub> ≤ 1.5 V DC         Switching frequency       f 1000 Hz         Response time       0.5 ms         Conformity       EC 61131-9         Product standard       EN 60947-5-2         Ambient conditions       Ambient temperature       -40 60 °C (-40 140 °F)         Storage temperature       -40 70 °C (-40 158 °F)         Mechanical specifications       Housing width       11 mm         Housing depth       21.5 mm         Degree of protection       IP67 / IP69 / IP69 K         Connection       M8 x 1 connector, 3-pin         Material       Housing       PC (Polycarbonate)         Optical face       PMMA	• • • • • • • • • • • • • • • • • • • •		•
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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         Conformity         Communication interface       IEC 61131-9         Product standard       EN 60947-5-2         Ambient conditions         Ambient temperature       -40 60 °C (-40 140 °F)         Storage temperature         40 70 °C (-40 158 °F)         Mechanical specifications         Housing width       11 mm         Housing height       44.5 mm         Housing depth       21.5 mm         Degree of protection       IP67 / IP69 / IP69K         Connection       M8 x 1 connector, 3-pin         Material       PC (Polycarbonate)         Optical face       PMMA	= = =		max. 100 mA , resistive load
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Material Housing PC (Polycarbonate) Optical face PMMA	= :		
Housing PC (Polycarbonate) Optical face PMMA			· ·
Optical face PMMA			PC (Polycarbonate)
·	-		· ·
Mass approx 10 d	Mass		approx. 10 g

#### Accessories

# IO-Link-Master02-USB

IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

# V3-WM-2M-PUR

Cable socket, M8, 3-pin, PUR cable

#### OMH-R10X-01

Mounting bracket

#### OMH-R10X-02

Mounting bracket

# OMH-R10X-04

Mounting bracket

#### OMH-R10X-10

Mounting bracket

#### OMH-ML100-03

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

#### OMH-ML100-031

Mounting aid for round steel ø 10 ... 14 mm or sheet 1 mm ... 5 mm

#### REF-H85-2

Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes

#### REF-H50

Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap

#### OFR-100/100

Reflective tape 100 mm x 100 mm

# REF-H33

Reflector with screw fixing

### REF-VR10

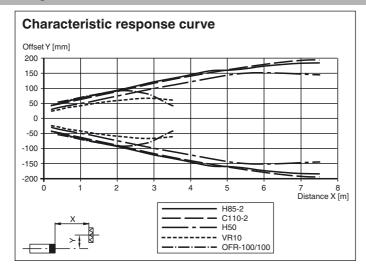
Reflector, rectangular 60 mm x 19 mm, mounting holes

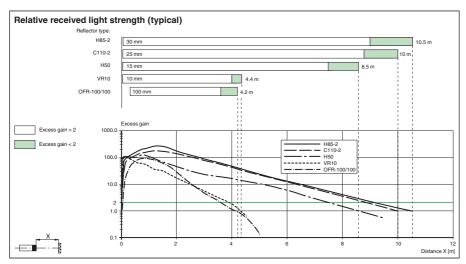
Other suitable accessories can be found at www.pepperl-fuchs.com

UL approval

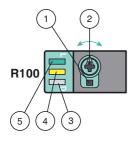
E87056, cULus Listed, class 2 power supply, type rating 1

# **Curves/Diagrams**





## **Functions and Operation**



- 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 /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.