Model Number

RL31-8-H-800-RT-IO/59/73c/136

Diffuse sensor with measurement core technology

with 4-pin, M12 x 1 connector

Features

- Cost-optimized series for standard tasks
- Sensing-by-ranging functionality
- IO-link interface for service and process data
- PowerBeam transmitter LED
- Large adjustment range can be precisely defined
- Low sensitivity to target color
- Clear and functional display concept for the operating modes

Product information

The measuring photoelectric sensor combines the benefits of the triangulation principle with the measuring functionality of a distance sensor. The integrated measuring principle enables a variety of switching functions in one device, a large sensing range up to 800 mm and a small BW/WB difference up to the final detection range.

The sensor is equipped with an IO-Link interface, through which the measuring principle is optimized to the requirements of the relevant application.

Dimensions
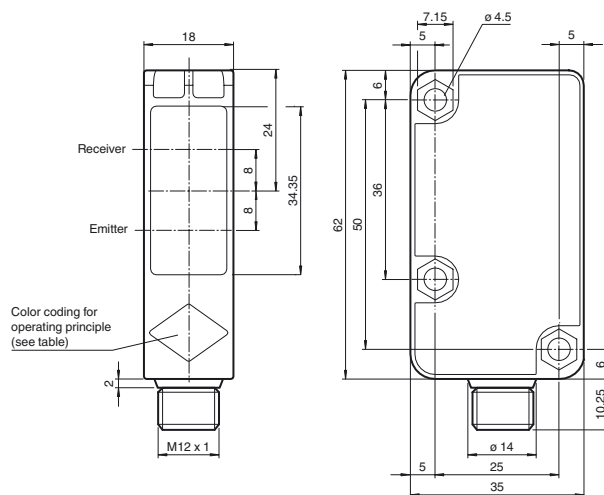
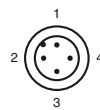| Operating principle	color
Retroreflective sensor with polarisation filter	green
Retroreflective sensor	blue
Diffusive mode sensor	white
Thru-beam sensor	grey
Diffusive mode sensor with background suppression	red

Electrical connection

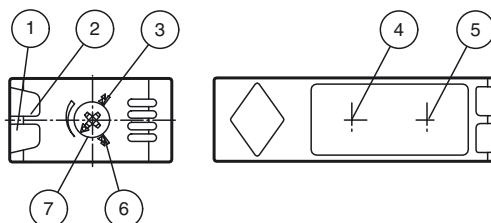1 +UB
2 $\overline{Q}$
3 0 V
4 C/Q
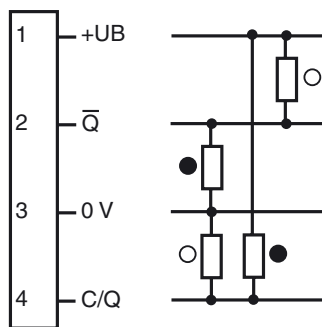
○ = Light on
● = Dark on

Pinout

Wire colors in accordance with EN 60947-5-2

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

Indicators/operating means

1	Operating display	green
2	Signal display	yellow
3	Page up	
4	Emitter	
5	Receiver	
6	Page down	
7	Sensing range adjuster	

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

Pepperl+Fuchs Group
www.pepperl-fuchs.com
USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com
Germany: +49 621 776 1111
fa-info@de.pepperl-fuchs.com
Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com
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Technical data

General specifications

Detection range	50 ... 800 mm
Detection range min.	50 ... 100 mm
Detection range max.	50 ... 800 mm
Adjustment range	100 ... 800 mm
Diagnosis range	100 ... 800 mm
Reference target	standard white, 100 mm x 100 mm
Light source	LED
Light type	modulated visible red light
Black/White difference (6 %/90 %)	< 5 %
Diameter of the light spot	approx. 25 mm at a distance of 800 mm
Angle of divergence	approx. 2 °
Ambient light limit	20000 Lux

Functional safety related parameters

$MTTF_d$	580 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Operation indicator	LED green, statically lit Power on , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)
Function indicator	LED yellow ; ON: object inside the sensing range ; OFF: object outside the sensing range
Control elements	Sensing range adjuster
Parameterization indicator	IO link communication: green LED goes out briefly (1 Hz)

Electrical specifications

Operating voltage	U_B	10 ... 30 V DC , class 2
Ripple		max. 10 %
No-load supply current	I_0	max. 25 mA at 24 V supply voltage

Interface

Interface type	IO-Link
Protocol	IO-Link V1.0
Mode	COM 2 (38.4 kBaud)

Output

Switching type		dark on
Signal output		2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	200 Hz
Response time		2.5 ms

Conformity

Product standard	EN 60947-5-2

Ambient conditions

Ambient temperature	-30 ... 55 °C (-22 ... 131 °F)
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)

Mechanical specifications

Housing width	18 mm
Housing height	62 mm
Housing depth	35 mm
Degree of protection	IP67
Connection	4-pin, M12 x 1 connector
Material	
Housing	Polycarbonate
Optical face	PMMA
Mass	25 g

Approvals and certificates

Protection class	II , rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 Output circuit basis insulation of input circuit according to EN 50178, rated insulation voltage 240 V AC
UL approval	cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval	CCC approval / marking not required for products rated ≤36 V

Accessories

PACTware 4.1
FDT Framework

IODD Interpreter DTM
Software for the integration of IODDs in a frame application (e. g. PACTware)

IO-Link-Master02-USB
IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

IO-Link-Master-USB DTM
Communication DTM for use of IO-Link-Master

OMH-RL31-01
Mounting bracket

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-RL31-05
Mounting bracket for mounting on flat surfaces with 2 M4 screws

OMH-RL31-06
Stainless steel mounting bracket with adjustable half clamp on the side

RL31-8-H IODD
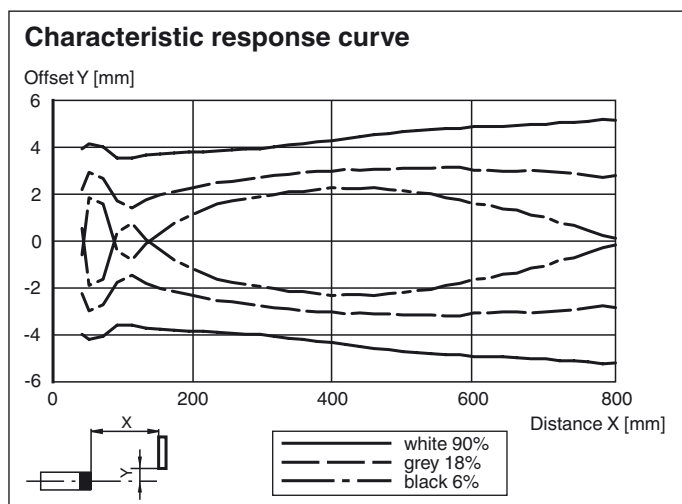IODD for communication with RL31-8-H-IO-Link sensors

V1-G-2M-PUR
Female cordset, M12, 4-pin, PUR cable

V1-W-2M-PUR
Female cordset, M12, 4-pin, PUR cable

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

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fa-info@us.pepperl-fuchs.com | Germany: +49 621 776 1111
fa-info@de.pepperl-fuchs.com | Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

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Curves/Diagrams

Characteristic response curve

Offset Y [mm]

white 90%
grey 18%
black 6%

Distance X [mm]

Setting information

Detection range adjustment:

The detection range can be adjusted between 100 mm and 800 mm via the rotary switch or IO-Link. For finer adjustment, the adjustable detection range is divided into several subranges which can be selected using Page Up/Down.

The value set with IO-Link is always assigned the current rotary switch configuration.

Setting using the rotary switch:

Increasing the detection range:
Turn the potentiometer to the right. If the desired detection range is not reached, turn the potentiometer to the right until it stops (Page Up). The green LED will flash briefly. Now set the desired detection range again.

Reducing the detection range:
Turn the potentiometer to the left. If the desired detection range is not reached, turn the potentiometer to the left until it stops (Page Down). The green LED will flash briefly. Now set the desired detection range again.

Example application: manually reduce detection range from 750 mm to 120 mm:

The potentiometer has a position as shown here, but works with a 750 mm detection range.

Now turn the potentiometer completely to the left until it stops (Page Down). The green LED will flash briefly.

Now set the detection range to 120 mm. If the desired detection range cannot be set, turn the potentiometer again to the left until it stops (Page Down) and repeat the procedure.

Setting via IO-Link interface

Setting different operating modes via IO-Link interface

The devices have an IO-Link interface as standard for diagnostic and parameterization tasks enabling optimum adaptation of the sensors to the application. In addition, four different operating modes can be set:

Background suppression operating mode (1 or 2 switching points):

- Detection of objects irrespective of type and color in a defined sensing range. Objects in the background are reliably suppressed
- Background suppression with 2 switching points

active detection range

Background
suppression

Background evaluation operating mode:

- Detection of objects irrespective of type and color against a defined background. Reliable detection of objects at close range (detection range >= 0 mm). The background serves as reference

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www.pepperl-fuchs.com | USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com | Germany: +49 621 776 1111
fa-info@de.pepperl-fuchs.com | Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com | **PEPPERL+FUCHS** **3**

active detection range

Background evaluation

Window operation operating mode:

• Detection of objects irrespective of type and color in a defined sensing range. Reliable detection when leaving the defined sensing range.
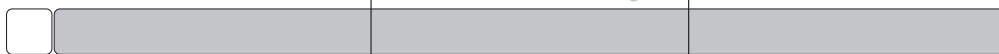
active detection range

Foreground suppression   **Background suppression**

Hysteresis operating mode:

• Detection of objects irrespective of type and color between a defined switch-on and switch-off point

active detection range

Output

Hysteresis

Output

To use the diagnostic and parameterization options, you will find the compatible IODD, and if required, the FDT base application PACTware in the download area at **www.pepperl-fuchs.com**.

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        www.pepperl-fuchs.com   fa-info@us.pepperl-fuchs.com fa-info@de.pepperl-fuchs.com fa-info@sg.pepperl-fuchs.com

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