



## 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

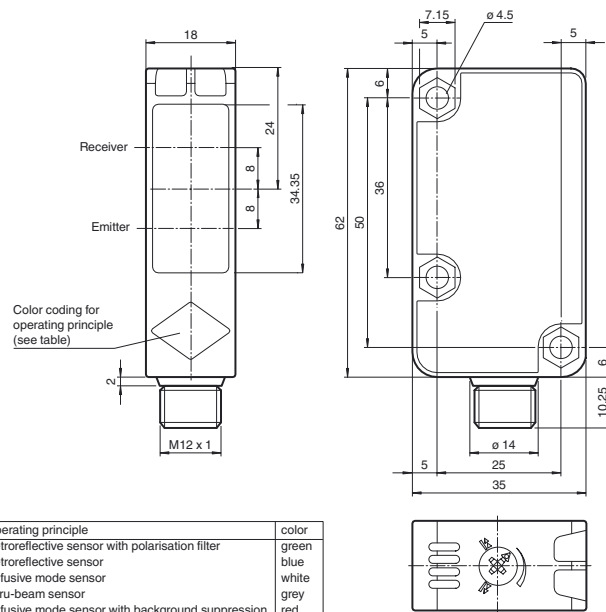
- Cost-optimized series for standard tasks
- Sensing-by-ranging functionality
- IO-link interface for service and process data
- PowerBeam transmitter LED
- Large adjustment range can be pre-defined
- Low sensitivity to target color
- Clear and functional display concept for the operating modes

## Product information

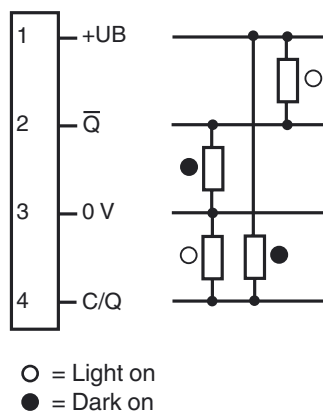
The measuring photoelectric sensor combines the benefits of the triangulation principle with the measuring functionality of a distance sensor. The integrated measuring principle enables a variety of switching functions in one device, a large sensing range up to 800 mm and a small BW/WB difference up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

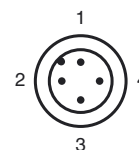
## Dimensions



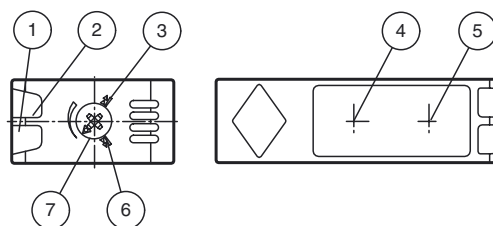
## Electrical connection



## Pinout



## 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	

**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 <sub>d</sub>	580 a
Mission Time (T <sub>M</sub> )	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	Detection range adjuster
Parameterization indicator	IO link communication: green LED goes out briefly (1 Hz)

**Electrical specifications**

Operating voltage	U <sub>B</sub>	10 ... 30 V DC , class 2
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	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 <sub>d</sub>	≤ 2 V DC
Switching frequency	f	200 Hz
Response time	2.5 ms	

**Ambient conditions**

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

**Mechanical specifications**

Degree of protection	IP67
Connection	4-pin, M12 x 1 connector
Material	
Housing	Polycarbonate
Optical face	PMMA
Mass	25 g

**Compliance with standards and directives**

Directive conformity	EMC Directive 2004/108/EC
Standard conformity	
Product standard	EN 60947-5-2:2007 IEC 60947-5-2:2007

**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.X**

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 with M10 threaded rod

**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**

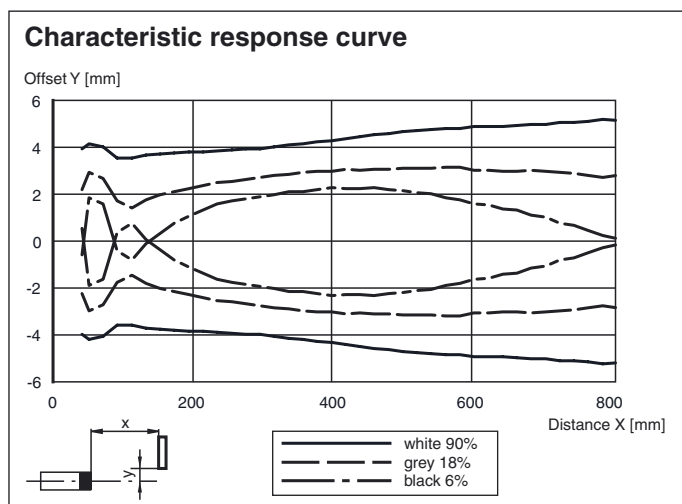
Female cordset, M12, 4-pin, PUR cable

**V1-W-2M-PUR**

Female cordset, M12, 4-pin, PUR cable

Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

## Curves/Diagrams



## 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

**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  $\geq 0$  mm). The background serves as reference



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



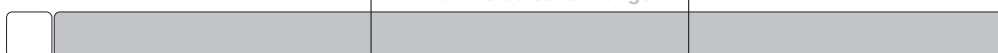
Foreground suppression

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

Output

Hysteresis

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](http://www.pepperl-fuchs.com).