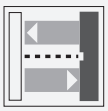
Diffuse sensor with measurement core technology

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



- 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

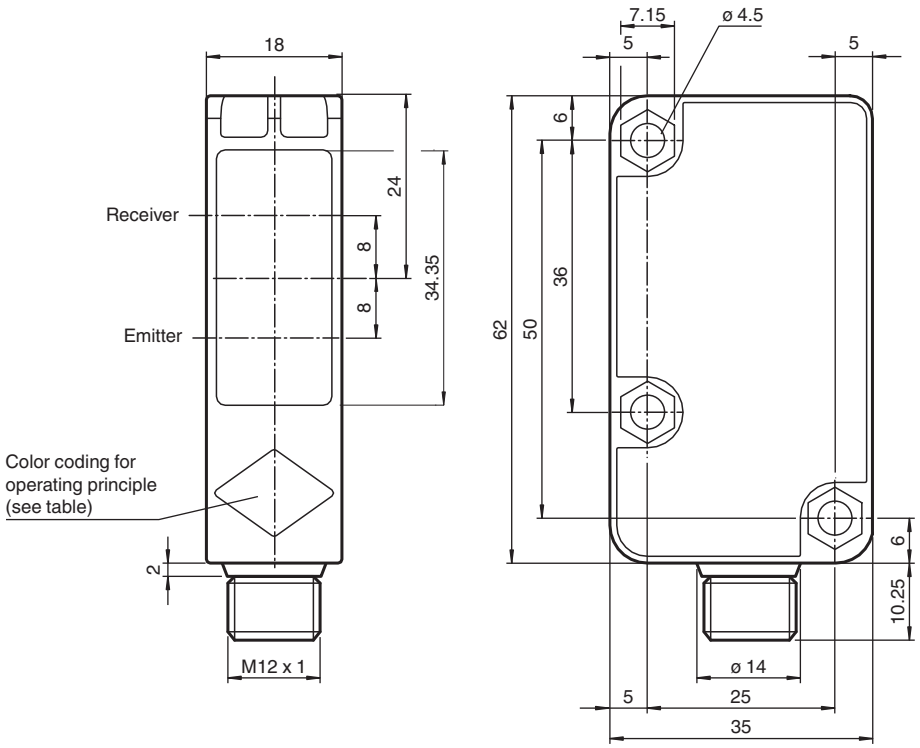
Diffuse sensor with measurement core technology, large housing design, background suppression and 3 more adjustable operating modes, IO-Link interface, 800 mm adjustable detection range, red light, 2 push-pull outputs, M12 plug

Function

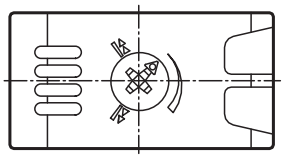
The measuring photoelectric sensor combines the benefits of the triangulation principle with the measuring functionality of a distance sensor. The integrated measuring principle enables a variety of switching functions in one device, a large sensing range up to 800 mm and a small BW/WB difference up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

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

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



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
Opening angle	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

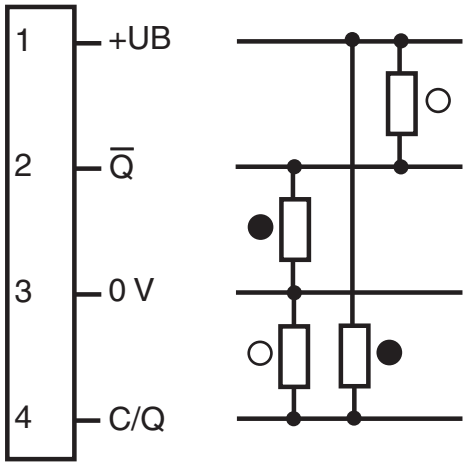
Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

Technical Data

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		COM2 (38.4 kBit/s)
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
Approvals and certificates		
EAC conformity		TR CU 020/2011
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
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

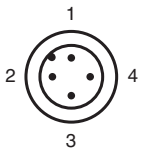
Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

Connection Assignment



○ = Light on
● = Dark on

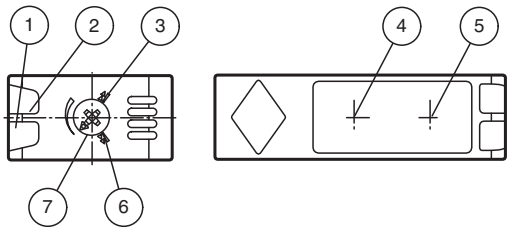
Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

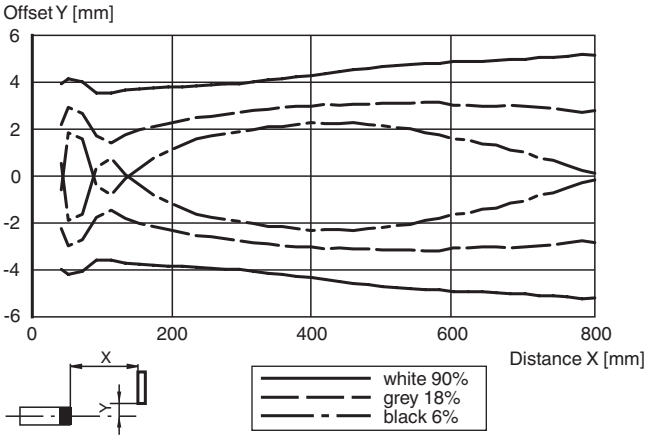
Assembly



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

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

Characteristic response curve



Accessories

	PACTware 4.1	FDT Framework
	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
	V1-G-2M-PUR	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey
	V1-W-2M-PUR	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey
	ICE2-8IOL-G65L-V1D	EtherNet/IP IO-Link master with 8 inputs/outputs
	ICE3-8IOL-G65L-V1D	PROFINET IO IO-Link master with 8 inputs/outputs
	ICE1-8IOL-G30L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE1-8IOL-G60L-V1D	Ethernet IO-Link module with 8 inputs/outputs
	ICE2-8IOL-K45P-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	ICE2-8IOL-K45S-RJ45	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

Accessories

	ICE3-8IOL-K45P-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	ICE3-8IOL-K45S-RJ45	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	IO-Link-Master02-USB	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf

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.

Configuration

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 ≥ 0 mm). The background serves as reference

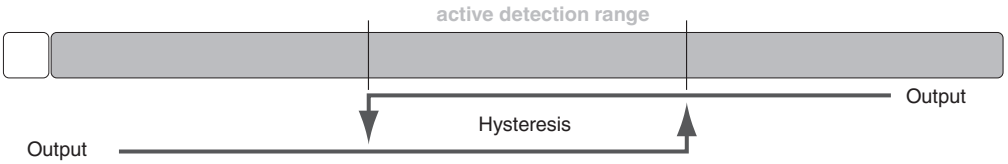
Window operation operating mode:

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

Hysteresis operating mode:

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

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf



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**.

Release date: 2022-08-08 Date of issue: 2022-08-08 Filename: 215063_eng.pdf