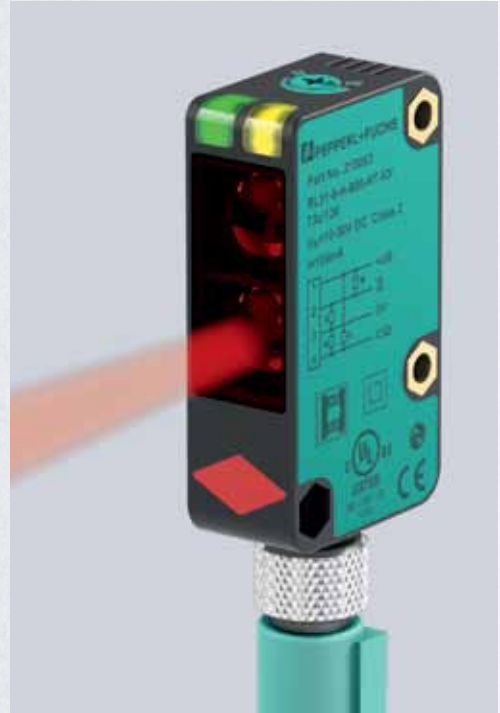


# MULTI-PIXEL ARRAY PHOTOELECTRIC SENSING



## TECHNICAL SPECIFICATIONS

<b>Sensing range</b>	50 mm to 800 mm
<b>Adjustment range</b>	100 mm to 800 mm
<b>Reference object</b>	Standard white 100 mm x 100 mm
<b>Black-white difference</b>	5% at 800 mm
<b>Type of light</b>	Red LED, PowerBeam
<b>Diameter of the light spot</b>	25 mm at 800 mm
<b>Operating voltage</b>	10 V DC to 30 V DC
<b>Operating mode</b>	Light on/dark on mode, switchable
<b>Signal output</b>	2 push-pull outputs (4-in-1)
<b>Switching frequency</b>	200 Hz
<b>Response time</b>	2.5 ms
<b>Ambient temperature</b>	-30 °C to 50 °C (-22 °F to 122 °F)
<b>Degree of protection</b>	IP67
<b>Connection</b>	4-pin, M12 connector or 2 m fixed cable



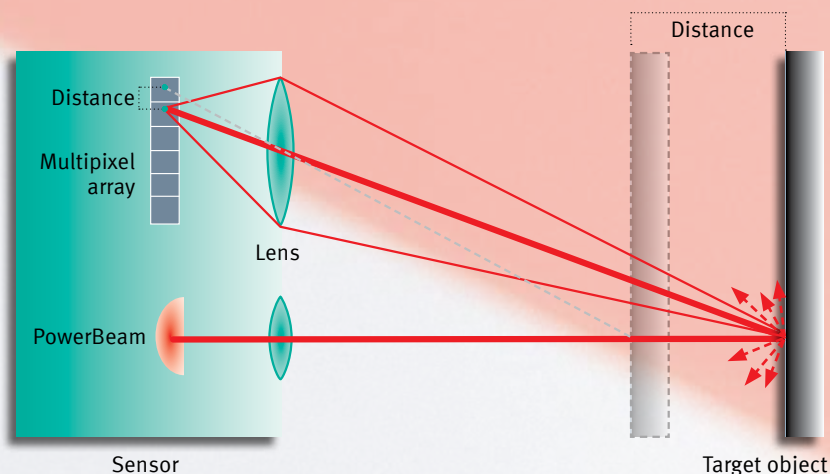
## MODEL NUMBERS

<b>RL31-8-H-800-RT-IO/59/73c/136</b>	Version with 4-pin M12 (micro) integral quick-disconnect
<b>RL31-8-H-800-RT-IO/59/115/136</b>	Version with fixed cable connection, 2 m

## OPERATING PRINCIPLE

RL31-8-H-800-RT-IO is a photoelectric sensor that uses the triangulation of reflected light common with background suppression sensors, along with a row of photodiodes called the multi-pixel array receiver, to bridge the gap between basic single switch-point sensing and higher-level distance measurement. This distance-based sensor is a proven cost-effective and potent alternative to conventional technologies.

Its PowerBeam emitter provides a high-intensity, easily aligned light spot that is reflected by the detected object back to the receiver array. The angle of this reflected light determines where the light contacts the array, and the sensor's microprocessor and IO-Link capability can be used to customize sensing thresholds and windows for the application.



# RL31-8-H-800-RT-IO DEFINES THE DISTANCE



## FLEXIBLE

- Combines elements of a sharp threshold background suppression sensor with a distance measurement sensor
- Four sensing modes optimize the fit to the application
- Two sensors in one: dual threshold setting activates two independent sensing distances and outputs
- Numerous mounting options with six potential mounting brackets

## POWERFUL

- Double to triple the sensing distance of comparable housings
- Extremely visible PowerBeam emitter armed with the brightest light spot for easy alignment over the entire sensing range
- Enhanced, high-visibility diagnostic LEDs immediately report seven different sensor statuses

## PRECISE

- Sensing ranges are accurately and reliably defined with proven sensing technology
- Virtually insensitive to changing object colors with not more than 5% difference between the sensing distances of black and white objects

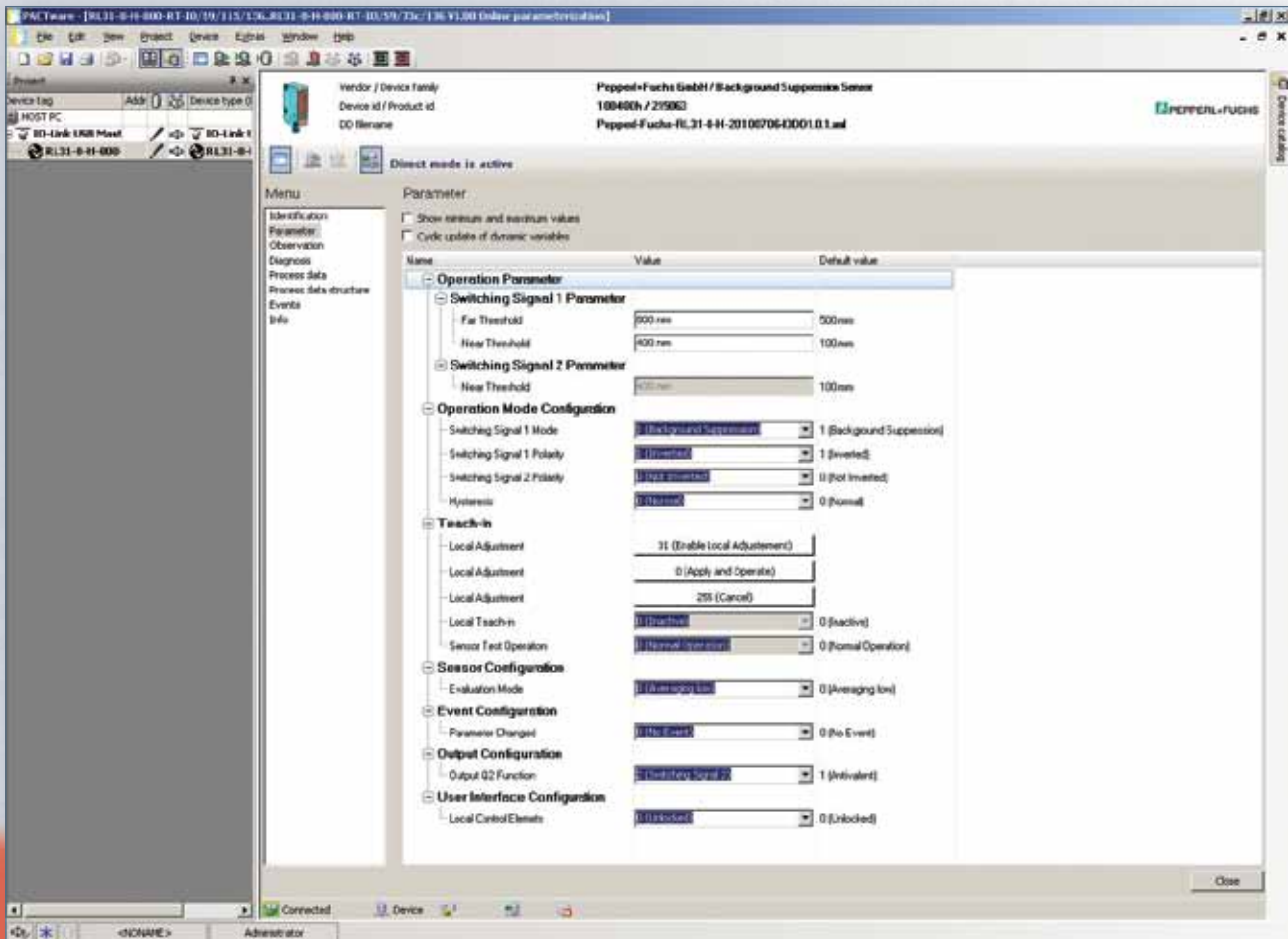
## INNOVATIVE

- IO-Link enabled for unparalleled level of control
- Latest LED technology results in a uniform light spot without a central dark spot common with conventional sensors
- Slashes inventory cost by replacing four sensor models with one, with Pepperl+Fuchs' exclusive 4-in-1™ output

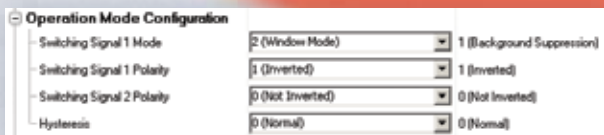
## IO-LINK

- IO-Link enabled for economical and efficient configuration of more than a dozen different sensing parameters
- Provides in-depth diagnosis as well as off-line and on-line communication
- Sensor can always be used with a standard connection as a simple discrete output sensor





## WINDOW SENSING MODE (BACKGROUND SUPPRESSION AND FOREGROUND SUPPRESSION)



Window mode allows a near threshold and far threshold to be defined, and only objects between those two points are detected. Applications best suited for window mode include web break monitoring.

Active sensing range



Blind range

Foreground suppression

Background suppression

## BACKGROUND SUPPRESSION SENSING MODE

Operation Mode Configuration		
Switching Signal 1 Mode	1 (Background Suppression)	1 (Background Suppression)
Switching Signal 1 Polarity	0 (Not Inverted)	0 (Not Inverted)
Switching Signal 2 Polarity	0 (Not Inverted)	0 (Not Inverted)
Hysteresis	0 (Normal)	0 (Normal)

- This mode allows a far threshold to be set so that objects beyond it are not detected, which is an ideal method to ignore machine panels or sidewalls beyond the object to be sensed. Applications that are ideal for this mode include presence checking, trigger sensing, and stack height detection.

A potential application when two background suppression distances are programmed to one sensor is collision avoidance of an automated guided vehicle (AGV) where the far distance slows the AGV and the near distance stops it.

Active sensing range



Blind range

Background suppression

## BACKGROUND EVALUATION SENSING MODE

Operation Mode Configuration		
Switching Signal 1 Mode	1 (Background Evaluation)	1 (Background Suppression)
Switching Signal 1 Polarity	0 (Not Inverted)	0 (Not Inverted)
Switching Signal 2 Polarity	0 (Not Inverted)	0 (Not Inverted)
Hysteresis	0 (Normal)	0 (Normal)

- In background evaluation mode, the sensor references an object constantly in the background and detects objects that are closer, which eliminates a minimum sensing distance. This mode is best for applications involving presence checking or front-edge detection of shiny objects or irregular contours on a constant background, such as a belt conveyor.

Active sensing range



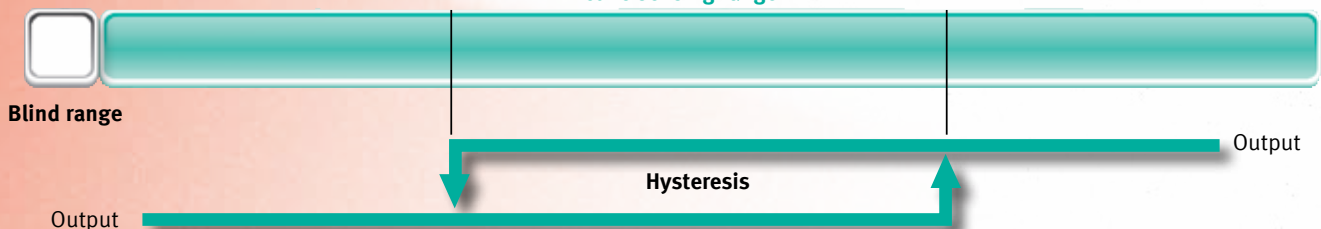
Background evaluation

## HYSTERESIS SENSING MODE

Operation Mode Configuration		
Switching Signal 1 Mode	0 (Hysteresis Mode)	1 (Background Suppression)
Switching Signal 1 Polarity	0 (Not Inverted)	0 (Not Inverted)
Switching Signal 2 Polarity	0 (Not Inverted)	0 (Not Inverted)
Hysteresis	0 (Normal)	0 (Normal)

- Like window mode, hysteresis mode allows a near threshold and far threshold to be set, but whether the output is on or off depends on the sequence that the thresholds are crossed. Applications best suited for hysteresis mode are tension checking, stroke-height monitoring, and fill-level monitoring.

Active sensing range



Blind range

Output

Output

Hysteresis

## MOUNTING BRACKETS

Model Number	Description
OMH-RL31-01	Wide, right-angle mounting bracket (galvanized sheet steel)
OMH-RL31-02	Narrow, right-angle mounting bracket (galvanized sheet steel)
OMH-RL31-03	Wrap-around right-angle mounting bracket (galvanized sheet steel)
OMH-RL31-04	Rod-mounted bracket for 12 mm or 0.5 in. $\varnothing$ rod or 1.5 mm to 3 mm
OMH-RL31-05	Mounting bracket standard wide (stainless steel)
OMH-RL31-06	Mounting bracket on M10 threaded bar with rotating head



## IO-LINK CONFIGURATION ACCESSORIES

Model Number	Description
IO-Link-Master01-USB	IO-Link-Master configuration tool including power supply and USB cable. Connects IO-Link sensor to a PC USB port.
V1-G-0.6M-PUR-V1-G	Extension cable to interconnect sensor to IO-Link-Master configuration tool
PACTware 4.X software Download at <a href="http://www.pepperl-fuchs.us">www.pepperl-fuchs.us</a>	This FDT (field device tool) software allows configuration of IO-Link sensors.
IODD file of RL31-8-H-800-RT-IO Download at <a href="http://www.pepperl-fuchs.us">www.pepperl-fuchs.us</a>	IODD (input/output device description) file contains information on a sensor's identity, process data, and other parameters.
IODD interpreter Download at <a href="http://www.pepperl-fuchs.us">www.pepperl-fuchs.us</a>	Translates the IODD file and provides the contained information to the FDT application (e.g., PACTware).



## MATING CORDSETS

Model Number	Description
V1-G-2M-PVC	Female cordset, straight connector, 4-pin M12 (micro), PVC cable, length: 2 m
V1-G-2M-PUR	Female cordset, straight connector, 4-pin M12 (micro), PUR cable, length: 2 m
V1-W-2M-PVC	Female cordset, right-angle connector, 4-pin M12 (micro), PVC cable, length: 2 m
V1-W-2M-PUR	Female cordset, right-angle connector, 4-pin M12 (micro), PUR cable, length: 2 m

Additional accessories available on request

### Contact

Pepperl+Fuchs Inc.  
1600 Enterprise Parkway  
Twinsburg, Ohio 44087 · USA  
Tel. +1 330 486-0001 · Fax +1 330 405-4710  
E-mail: [fa-info@us.pepperl-fuchs.com](mailto:fa-info@us.pepperl-fuchs.com)

### Worldwide Headquarters

Pepperl+Fuchs GmbH · Mannheim · Germany  
E-mail: [fa-info@de.pepperl-fuchs.com](mailto:fa-info@de.pepperl-fuchs.com)

### USA Headquarters

Pepperl+Fuchs Inc. · Twinsburg · USA  
E-mail: [fa-info@us.pepperl-fuchs.com](mailto:fa-info@us.pepperl-fuchs.com)

### Asia Pacific Headquarters

Pepperl+Fuchs Pte Ltd · Singapore  
Company Registration no. 199003130E  
E-mail: [fa-info@sg.pepperl-fuchs.com](mailto:fa-info@sg.pepperl-fuchs.com)

[www.pepperl-fuchs.us](http://www.pepperl-fuchs.us)

 **PEPPERL+FUCHS**  
SENSING YOUR NEEDS