



OPTICAL SENSORS O-33 / O-34

COMPACT DIFFUSE REFLECTIVE SENSORS
AND LIGHT BARRIERS

 **di-soric**

Maximum flexibility and performance in a surprisingly small size

The O-33 and O-34 offer unique flexibility and function in this size – with real added value

The compact sensors of the O-33 and O-34 series are available in all functional principles and offer versatility at the highest level. They are used in nearly all industrial areas – from assembly and handling technology to part feeding to packaging and filling technology.



O-33 with potentiometer



O-33 – available with M8 connector or cable



O-33 – multifunction teach-button and status LEDs

Compact, robust, versatile and user-friendly

In addition to high ranges and large functional reserves, the O-33 and O-34 series have impressive ease of operation and fast start-up.

The sensors master the most complex object detection tasks – even under harsh ambient conditions and when in contact with cleaning agents.

These series features different light sources and ranges together with simple, fast configuration via a button or a potentiometer and IO-Link interface.



View:
200%

O-34

STAINLESS STEEL



O-34 with potentiometer



O-34 – M8 connector, 4-pin,
made of stainless steel

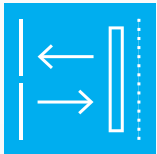


O-34 – Multifunction teach
button and status LEDs

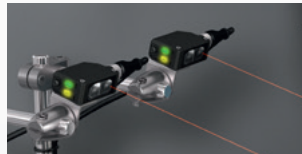
Light barriers and diffuse sensors O-33 universal / O-34 stainless steel

Four functional principles with special advantages

Just choose the sensor with functional principle and range, either in a plastic or stainless steel design, that is the best fit for your requirements – install, configure, and it's ready for operation.



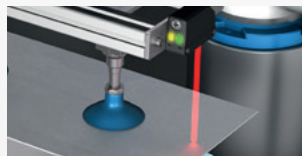
Diffuse reflective sensors with background suppression



OH33/34-LR

Range: up to 600 mm
Light type: Red Laser | Ultra small spot

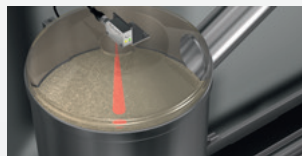
[Page 6](#)



OH33/34-R

Range: up to 350 mm
Light type: Red LED | Small spot
Red LED | Medium spot

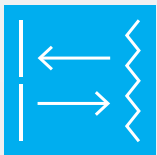
[Page 8](#)



OH33/34-LI

Range: up to 1000 mm
Light source: Infrared laser | Large spot

[Page 9](#)



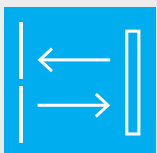
Reflective light barriers



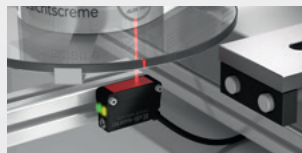
OR33/34-R

Range: up to 6000 mm
Light type: Red LED | Small spot
Red LED | Medium spot

[Page 10](#)



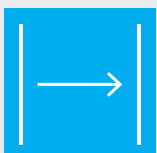
Diffuse reflective sensors energetic



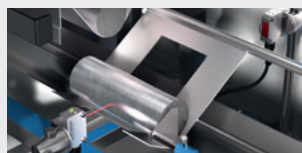
OT33/34-R

Range: up to 1000 mm
Light type: Red LED | Medium spot

[Page 11](#)



One-way light barriers



OS33/34-R OE33/34-R

Range: up to 15,000 mm
Light type: Infrared LED | Large spot

[Page 11](#)



IP67

View: 200%



IP69K

ECOLAB®

Comprehensive functionality in two complete series

- O-33 universal with IP67 in plastic design with M8 metal connector – efficient and ideal for standard and demanding applications
- O-34 stainless steel (V4A) with IP69K – ECOLAB-tested for resistance to cleaning agents. Extremely robust and long-lasting – for maximum reliability even in the toughest applications and with frequent cleaning.

Easy replacement and conversion for varying requirements

- Identical variants in all functional principles and ranges up to 15,000 mm open up a wide range of possible applications and facilitate replacement and retrofitting
- The uniform, intuitive operating concept enables fast commissioning

Maximum flexibility and application reliability with IO-Link

- Loss-free measuring function thanks to digital data transmission
- Reproducible setting of switching points
- Assessment of the functional reliability through simultaneous observation of measured values and switching point

Easy to operate, quick setup

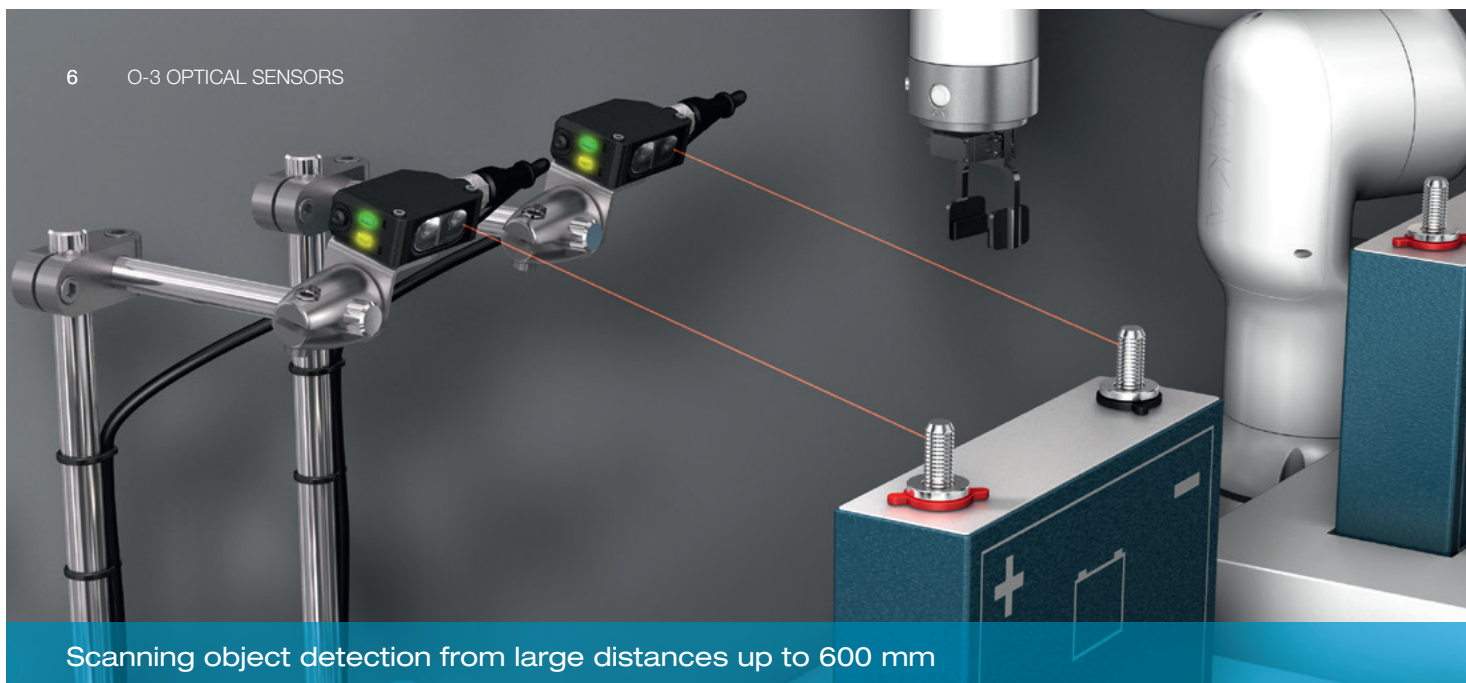
- Ready to use out of the box – with optimized factory settings for a wide variety of applications
- Dual operating concept with button / potentiometer right on the sensor and via IO-Link
- Simple 1-point teach-in – supported by flashing sequences on sensors with a multifunction teach button

Fit for Industry 4.0: Comprehensive digitalization with IO-Link

O-33 and O-34 series IO-Link products have an interface that complies with the latest V1.1.4 standard and Smart Sensor Profile 2nd Edition Version 1.2.

The sophisticated IODDs of di-soric make configuration via IO-Link significantly simpler than it is for many products on the market – clear, comprehensible sensor parameters ensure fast configuration and commissioning, as well as consistent, precise switching behavior.





Scanning object detection from large distances up to 600 mm



Retroreflective diffuse sensors with background suppression

OH33-LR / OH34-LR (laser)

Accurate, wide-ranging, fast, many functions

The smallest triangulation sensors with a range of up to 600 mm on the market, with background suppression, deviation detection mode And IO-Link – safe for eyes with laser class 1.



Original size

Advantages of OH33/34-LR:

- Variants with ranges of up to 600 mm
- Simplest teach-in of 3 functions at the push of a button or via cable:
2-4 seconds, teach-in distance
4-6 seconds, teach-in window
6-8 seconds, teach-in DD mode
- IO-Link transmits the object distance in mm
- Switching points can be set reproducibly and precisely in mm (with IO-Link fine adjustment)
- Simple assessment of the functional reliability through simultaneous observation of measured values and switching points
- Switch-on and switch-off points can be configured for the window function
- Reproducible configuration of an additional switching output on pin 2

The OH33/34-LR sensors have three sensor modes:

Precision (factory setting)	For precise object detection through optimized, more precise distance detection
Speed	For fast production processes
High functional reliability	Robust detection thanks to a large functional reserve

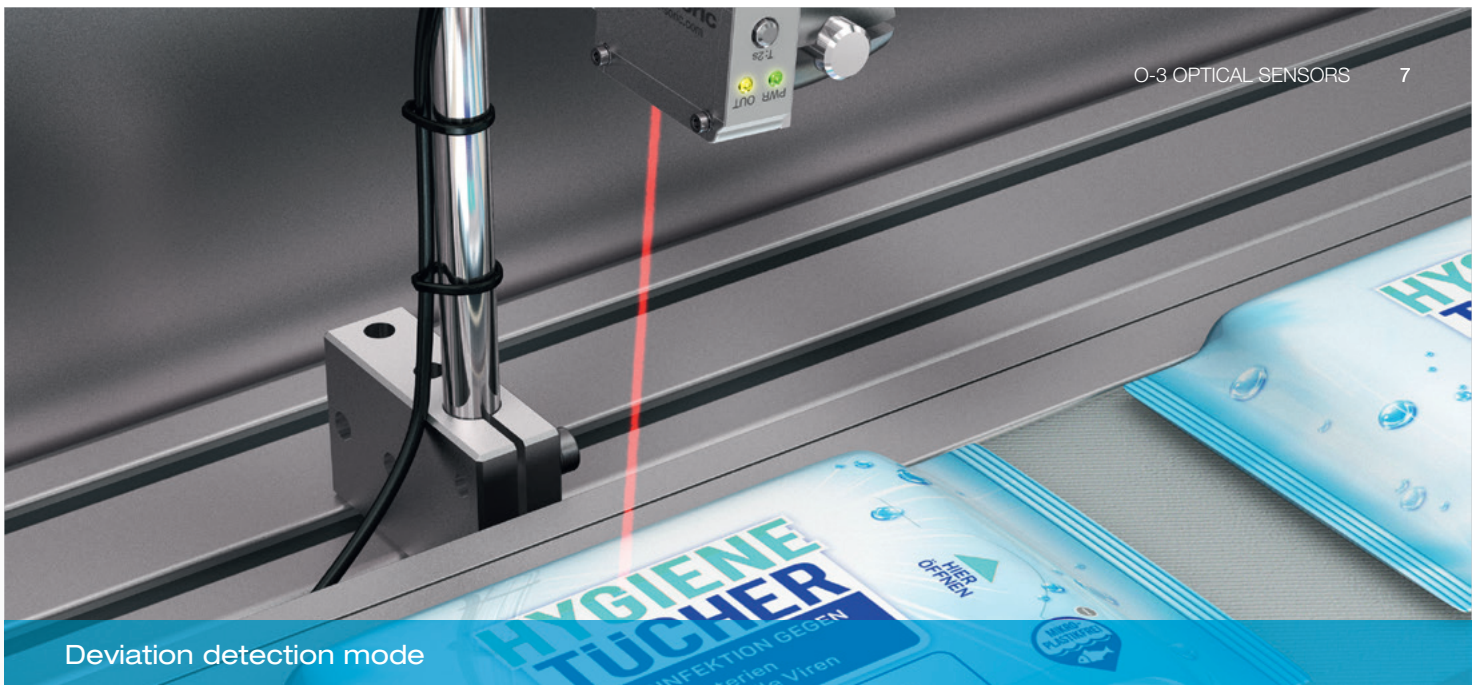
IP67

IP69K

ECOLAB

UL
LISTED

IO-Link



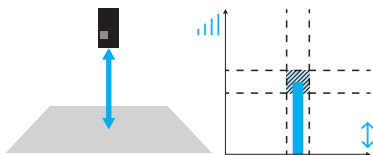
Deviation detection mode

Detection of almost any object with deviation detection mode (DD mode)

The OH33/OH34-LR sensors with red-light laser detect almost any object in DD mode after a teach-in on a reference surface. Through the simultaneous evaluation of light intensity and distance change, they reliably detect objects even with changing shapes, colors and transparency.

Configuration is incredibly simple: Trained via teach-in on a reference surface, the sensor switches reliably as soon as a percentage deviation in distance or intensity occurs.

Teach-in (E) and object detection (1-3) in DD mode:

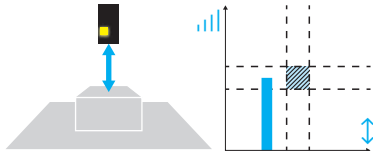
E

Teach-in: Position reference surface; activate button or input (Pin2) for 6-8 seconds; wait for 3rd flashing sequence > done

No object is detected if an object matches the reference surface in terms of intensity and distance.

Signal on reference surface:

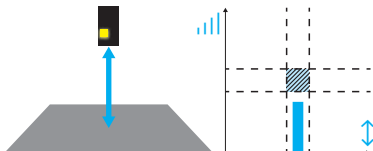
= Distance and intensity match > ■ **switching output not active**

1

An object is detected if an object differs in terms of the distance from the reference surface.

Signal on object:

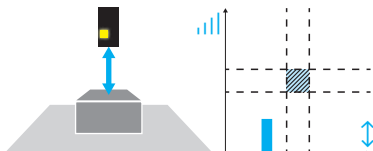
= Deviation in the distance > ■ **switching output active**

2

An object is detected if an object differs in terms of intensity from the reference surface.

Signal on object:

= Deviation in the intensity > ■ **switching output active**

3

An object is detected if an object differs in terms of intensity and in the distance from the reference surface.

Signal on object:

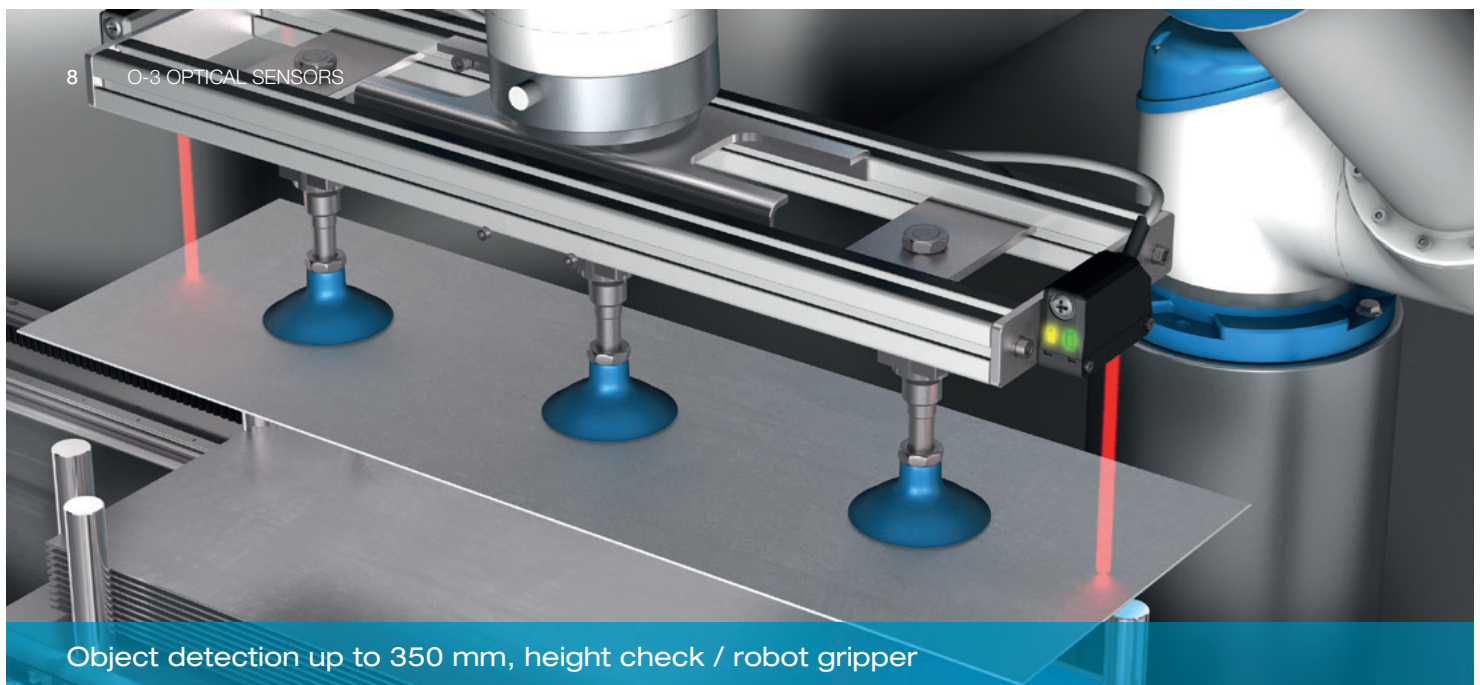
= Deviation in the distance and intensity > ■ **switching output active**

||| intensity

↑ distance

▨ Degree of correspondence threshold with reference surface

■ signal sensor



Object detection up to 350 mm, height check / robot gripper



Retroreflective diffuse sensors with background suppression

OH33-R / OH34-R (LED)

Fast functional versatility

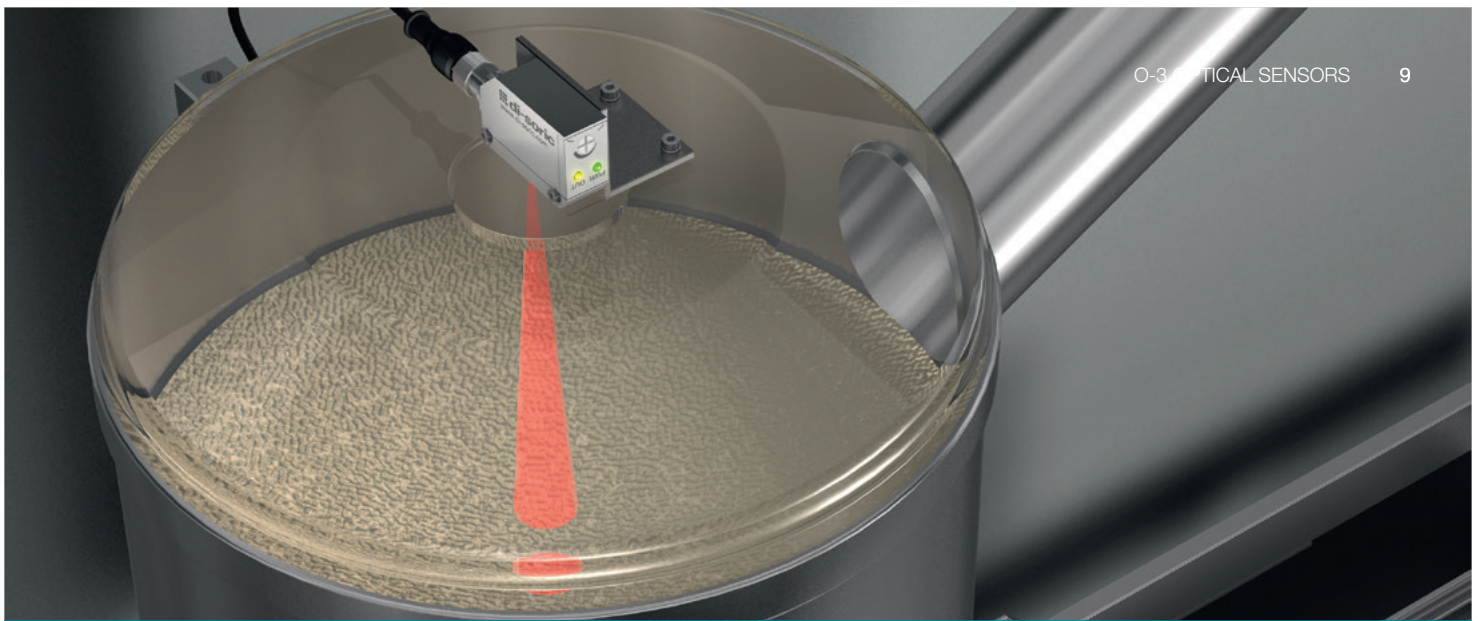
These LED red-light retroreflective diffuse sensors guarantee precise presence and feature detection and reliable height and distance checks. With ranges of up to 350 mm, they ensure smooth processes – even in dynamic applications.

The diffuse sensors are available with a standard light spot or with a small light spot, which can be used very easily to detect small parts.



Advantages of OH33/34-R:

- Variants with ranges of up to 350 mm
- Exact background suppression
- IO-Link transmits the object distance in mm
- Switching point and window function parameters can be set in mm
- Switching points can be set precisely in mm (with IO-Link fine adjustment)
- Simple monitoring of the functional reliability through simultaneous observation of the measured value
- Switch-on and switch-off points can be configured for a window function
- Reproducible configuration of an additional switching output on pin 2



Detection of larger objects, at larger distances



Retroreflective diffuse sensors with background suppression **OH33-LI / OH34-LI (infrared laser)**

The optical alternative in fill level measurement

1000 mm range and IO-Link with measuring function – these time-of-flight sensors are the ideal solution for monitoring fill levels or detecting objects over large distances.

The infrared laser light, with an eye-safe laser class 1, has a large light spot that enables detection of loose, piled-up objects.



Advantages of OH33/34-LI:

- Long range up to 1000 mm
- Background suppression at long distances
- IO-Link transmits the object distance in mm
- Switching point and window function parameters can be set in mm
- Switching points can be set precisely in mm (with IO-Link fine adjustment)
- Monitoring of the functional reliability through simultaneous observation of measured values
- Switch-on and switch-off points can be configured for a window function
- Reproducible configuration of an additional switching output on pin 2

IP67

IP69K

ECOLAB

c  US
LISTED


IO-Link



Accumulation monitoring of containers guided by rail



Retro reflective sensors

OR33-R / OR34-R**Fast retro reflective sensors with long ranges
with a standard or small light spot**

The retro reflective sensors operate with a red light LED and differ in terms of range and the size of the light spot.

OR33/34-RM units have a range of 100-6000 mm and a standard light spot.

The OR33/34-RS units with pin spot-LED and a range of 100-5000 mm have a small, round light spot.

The advantages of these sensors are the simplified commissioning and the detection of smaller objects.

**Advantages of OR33/34-R:**

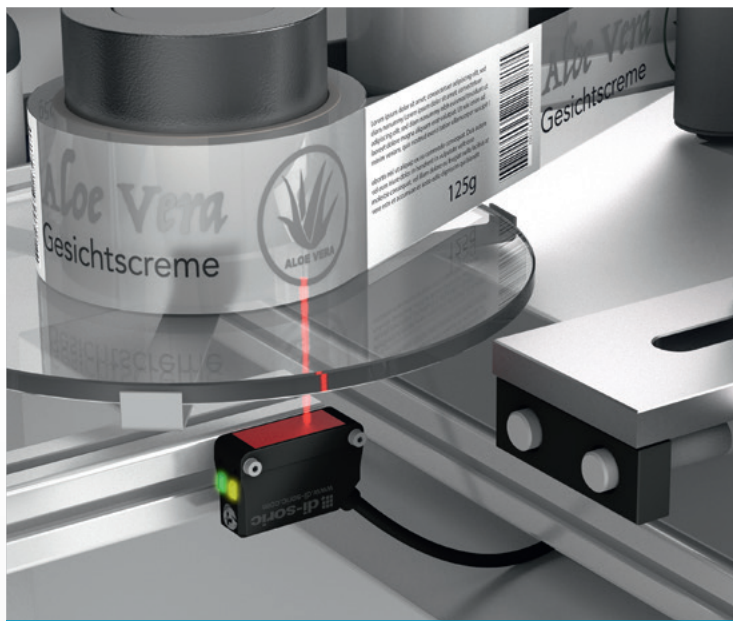
- Variants with ranges of up to 6000 mm
- LED red light with standard or small light spot
- Intuitive configuration using a potentiometer
- IO-Link transmits the intensity of the received signal
- Switching points can be set reproducibly and numerically (with IO-Link fine adjustment)
- Monitoring of the functional reliability through simultaneous observation of measured values

IP67

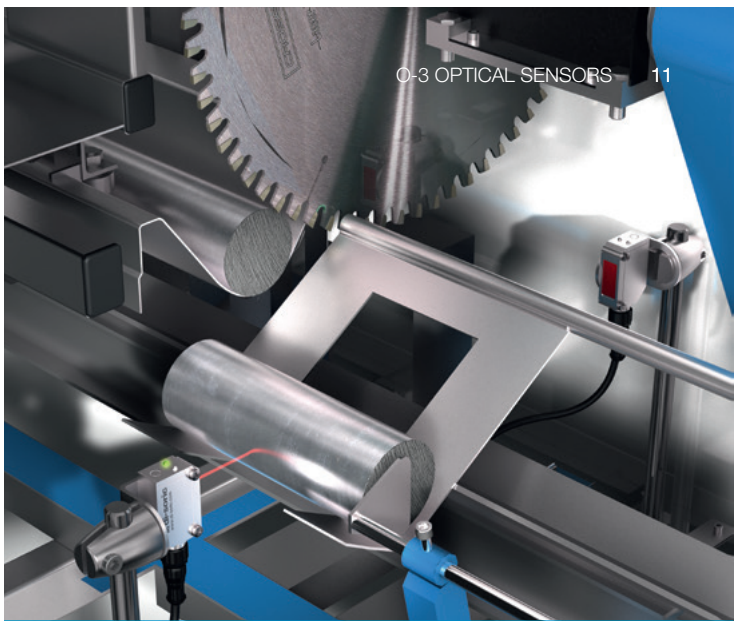
IP69K

ECOLAB®





Label monitoring for labeler



Material monitoring of machine saw



Energetic retroreflective diffuse sensor **OT33-R / OT34-R**

Efficient with a long range

The energetic retroreflective diffuse sensors with IO-Link measuring function and adjustment of switching points in intensity values efficiently ensure object detection up to a distance of 1000 mm.



Advantages of OT33/34-R:

- Range up to 1000 mm
- IO-Link transmits the intensity of the received signal
- Switching points can be set reproducibly and numerically (with IO-Link fine adjustment)
- Monitoring of the functional reliability through simultaneous observation of measured values



Through-beam sensors **OS33-R + OE33-R** **OS34-R + OE34-R**

Maximum range with large functional reserves

Through-beam sensors with a range of up to 15,000 mm: Thanks to a high function reserve, the OS transmitter with infrared LED and the OE receiver ensure reliable processes – even in harsh environments.



Advantages of OS + OE33/34-R:

- Long range up to 15,000 mm
- Intuitive configuration using a potentiometer
- Status display of low functional reserve with display LEDs

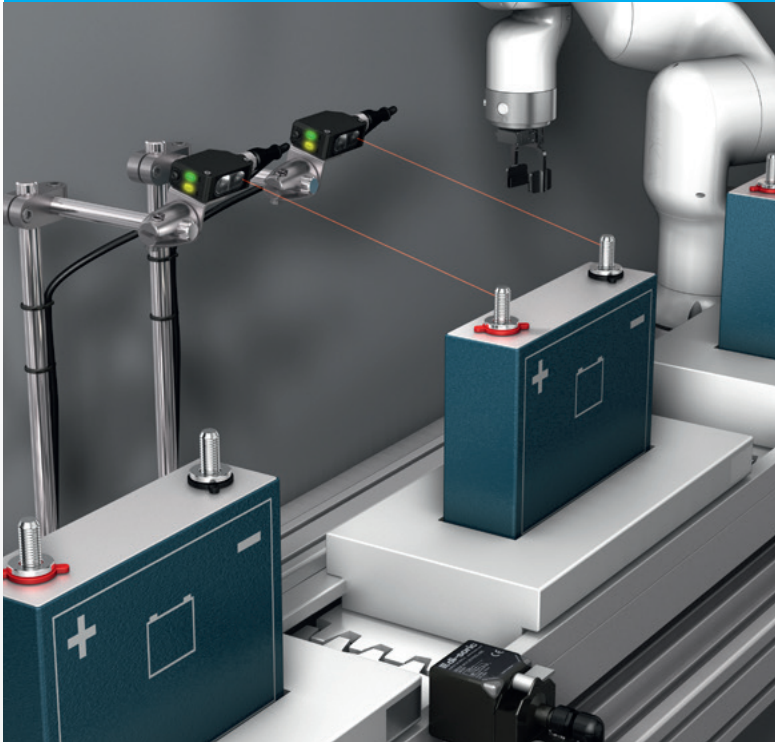
These products do not have IO-Link.

APPLICATION EXAMPLES

O-33 / O-34

Assembly

Detecting battery connection pins



In module production, the pouch battery cells are fed by a conveyor line. Before further production, all connection pins must be checked.

As the sensors have to be mounted at a long distance from pins for space reasons, a laser retroreflective diffuse sensor is used for a presence check.

The small, fine laser light spot of the sensor enables reliable detection of the connections, even at distances of up to 600 mm.

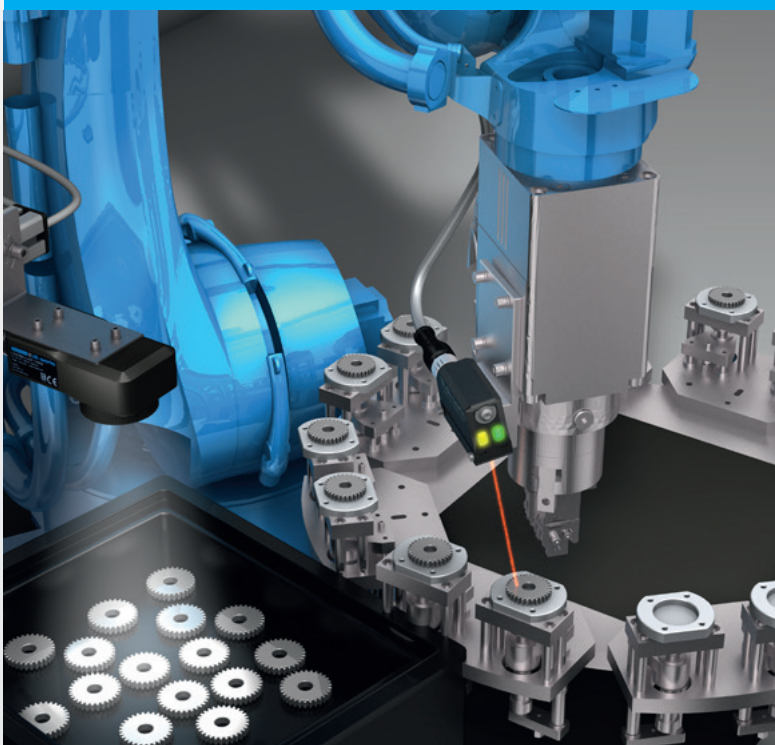
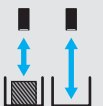
Sensor configuration is fast and easy: Press and hold the teach button for 2-4 seconds – done – switching distance taught in

Laser retroreflective diffuse sensor
OH33-LRML-TI-G3-T4



Robotics

Detecting the gear



In a circular feeder, the presence of a flat gear with a small thickness must be checked. In the process, ensure that the gear is at the correct installation height and has been correctly inserted.

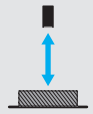
A laser retroreflective diffuse sensor with a small measuring range is used, which can reliably detect small differences in height. To check the target distance, a narrow switching window is defined around the height of the gear.

Sensor configuration is fast and easy: Press and hold the teach button for 4-6 seconds – done! This teaches in the switching window automatically.

Laser retroreflective diffuse sensor
OH33-LRMS-TI-G3-T4



Packaging Detecting tubular bags in DD mode



Hygiene products are packed into collective packaging in a packaging machine. During feeding, the presence of printed tubular bags must be reliably detected from above – despite changing designs and shiny surfaces.

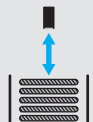
In DD mode, OH-LR sensors with a red-light detect almost all objects after they have been taught in on the homogeneous conveyor line (reference surface). Thanks to the combined evaluation of the distance and the reflection intensity, the sensor reliably switches as soon as no reference surface is detected.

Sensor configuration is simple: Align the laser beam with the conveyor belt; press and hold the teach button for 6-8 seconds – done!

Laser retroreflective diffuse sensor
OH34-LRMN-TI-G3-T4



Packaging Monitoring the fill level



In a food filling machine, OH-LI sensors monitor filling levels up to 1000 mm – even with granular bulk materials, thanks to their large light spot.

The compact O-34 series stainless steel housing (IP69K, ECOLAB) guarantees high reliability, even during frequent cleaning cycles.

Configuration is simple: Set the switching output for minimum fill height for each potentiometer– done.

Via IO-Link, up to two switching outputs can be configured in mm and with the window function, e.g. for pump and feed control.

Laser retroreflective diffuse sensor
OH34-LIMN-PT-G3-T4

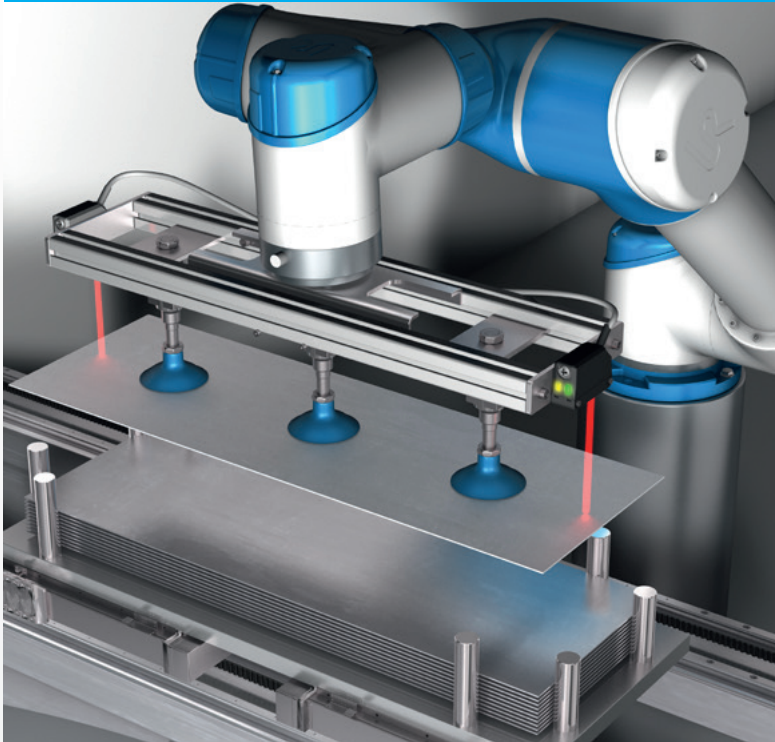
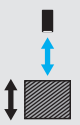


APPLICATION EXAMPLES

O-33 / O-34

Robotics

Distance monitoring in gripper



A robot transports the stacked sheets of metal to the machining station.

Two retroreflective diffuse sensors, which monitor the gripping process, are integrated into the suction gripper.

The approach speed of the robot is controlled by two LED retroreflective diffuse sensors, and this optimizes the gripping process in terms of time. Two independent switching outputs per sensor are set to the exact millimeter via IO-Link.

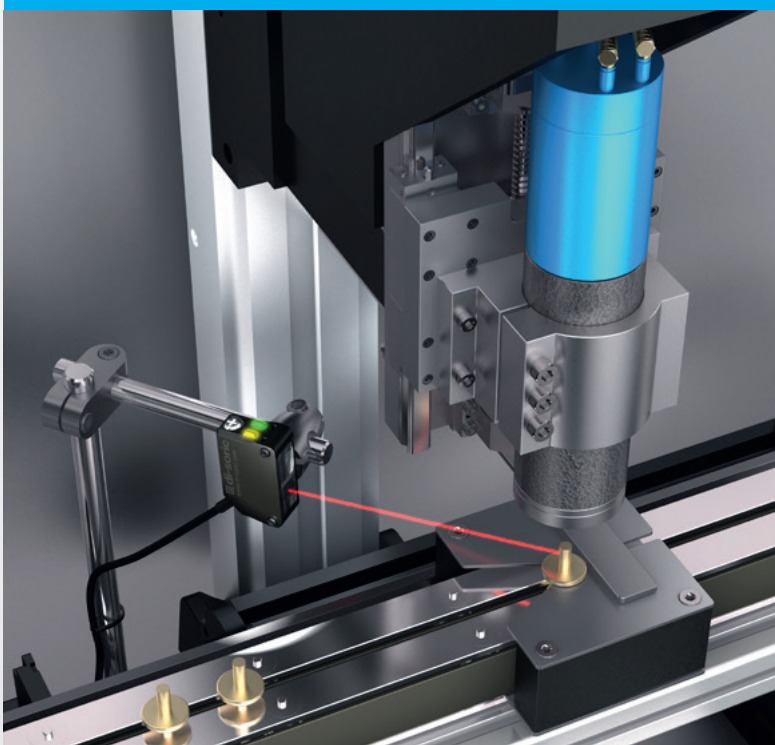
The first switching output detects approach to the stack of sheets and reduces the speed of the robot. The second switching output signals that the sheet can be gripped and safely lifted.

LED retroreflective diffuse sensor
OH33-RML-PT-G3-2C



Assembly

Checking the bolts



During feed control, the presence and correct position of an M4 threaded bolt must be checked before the assembly process.

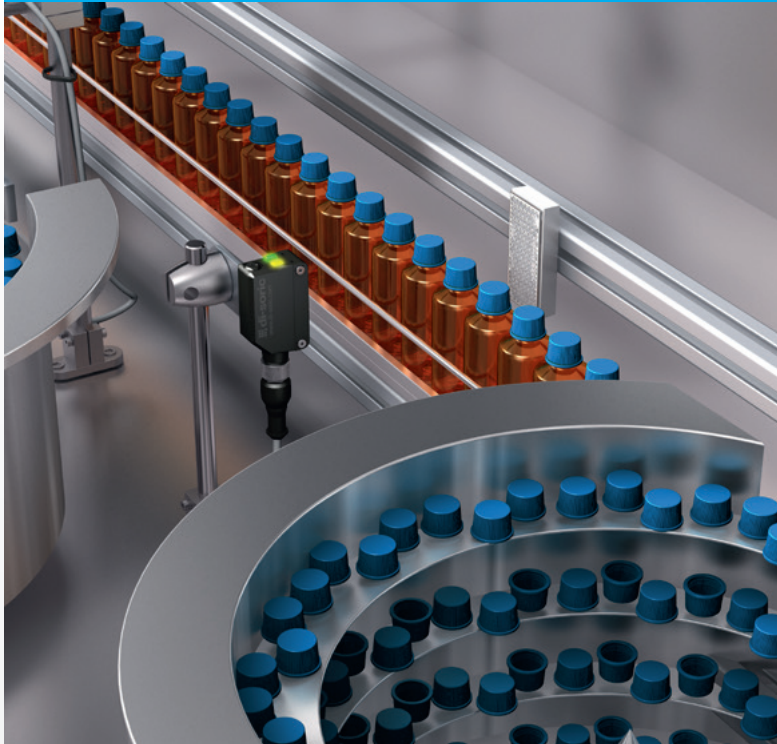
To keep the actuator's working area free, an LED retroreflective diffuse sensor detects the bolt from a greater working distance. The small, easily visible light spot enables process-reliable detection, even of small objects.

Sensor configuration is fast and easy: Set the switching distance for each potentiometer – done.

LED retroreflective diffuse sensor
OH33-RSN-PT-G3-2C



Packaging Checking for gaps



The filled and sealed containers are continuously fed into a packaging machine. Gaps must be reliably detected to ensure a reliable flow of material.

A retroreflective light barrier with small light spot enables reliable detection of small gaps. The easily visible light spot also facilitates fast and exact alignment with the reflector.

Commissioning is easy and fast: Align the sensor and reflector; set the sensitivity for each potentiometer – done.

Retroreflective light barrier
OR33-RSN-PT-G3-T4



Machine tools Material monitoring of machine saw

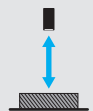


A fully automatic machine saw cuts metal rods precisely to length. O-34 series through-beam sensors reliably monitor the material flow – even in highly contaminated environments.

The sensors, with their extremely durable stainless steel full metal housings and high function reserves, offer maximum process reliability and maximum reliability in detection of parts – even under the toughest conditions.

Commissioning is very simple: Align the transmitter and receiver; set the sensitivity for each potentiometer – done.

Through-beam sensors
**OS34-IMN-T4 /
OE34-IMN-PT-P4-T4**



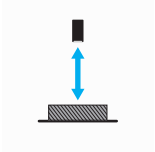
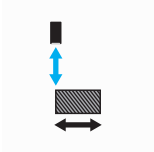
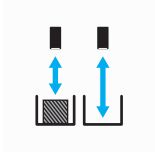
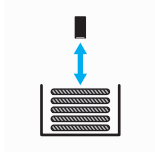
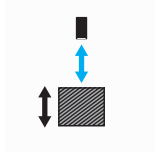
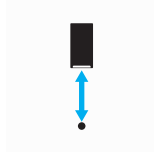
OVERVIEW

O-33 / O-34



Principle	Type	Operating principle	Light source	Ranges	Maximum switching frequency
	OH33/34-LR	Retroreflective diffuse sensors with background suppression (triangulation)	Red laser, very small light spot	20 - 100 mm 20 - 300 mm 20 - 600 mm	800 Hz ¹ 500 Hz ¹ 200 Hz ¹
	OH33/34-RS	Retroreflective diffuse sensors with background suppression (triangulation)	Red LED, small light spot	20 to 250 mm	500 Hz
	OH33/34-RM	Retroreflective diffuse sensors with background suppression (triangulation)	Red LED, standard light spot	20 - 200 mm 20 - 350 mm	500 Hz
	OH33/34-LI	Retroreflective diffuse sensors with background suppression (time-of-flight)	Infrared laser, large light spot	0 to 1000 mm	5 Hz ¹
	OR33/34-RS	Retro reflective sensors	Red LED, small light spot	100 - 5000 mm ²	1000 Hz
	OR33/34-RM	Retro reflective sensors	Red LED, standard light spot	100 - 6000 mm ²	1000 Hz
	OT33/34	Retroreflective diffuse sensor Energetic	Red LED, standard light spot	1 to 1000 mm	1000 Hz
	OS/OE33 OS/OE34	Through-beam sensors (OS transmitters / OE receivers)	Infrared LED, standard light spot	0 to 15,000 mm	500 Hz

¹ In Speed sensor mode | ² with R84 reflector

						
Sensitivity setting	Detect presence	Detect position	Detect feature	Check height	Check distance	Detect small parts
IO-Link, teach button	✓	✓	✓ +	✓	✓	✓ +
IO-Link, potentiometer	✓		✓	✓	✓	✓
IO-Link, potentiometer	✓		✓	✓	✓	
IO-Link, potentiometer	✓		✓	✓	✓	
IO-Link, potentiometer	✓	✓ +				
IO-Link, potentiometer	✓	✓				
IO-Link, potentiometer	✓		✓			
Potentiometer	✓	✓				

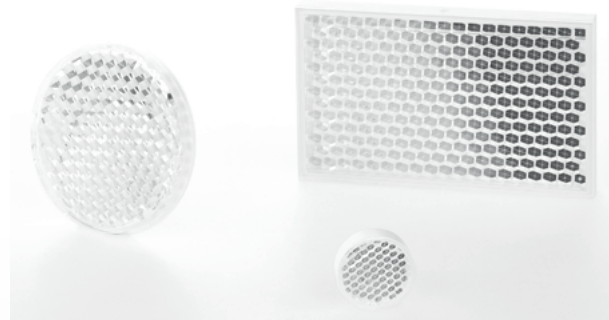
ACCESSORIES FOR O-33 / O-34

Mounting bracket



To secure the O-33 and O-34 series sensors, we recommend the adjustable, durable BW34-39 stainless steel mounting bracket, Article No. 215456.

Reflectors and reflective films



Retro reflective sensors require matching reflectors and reflective foils for operation. Reflectors from di-soric are optionally available for laser or LED light sources. Various sizes and specific designs round off the range.

Special accessories for O-34 with Ecolab certification

Connecting cables for use in the beverage and food industry



Connecting cables with angled or straight stainless steel (V4A) connection socket and open cable end and protection type IP69K are available in lengths of 2 m and 5 m.

Reflector with Ecolab certification



For O-34 series sensors with Ecolab certification, the R40x60-C reflector, which is also Ecolab-certified, Article No. 215455, is the first choice.

Connecting cables with straight connection:

Type designation	Length	Item no.
■ AL-TZKA-4PGR-200X-FB	2 m	215406
■ AL-TZKA-4PGR-500X-FB	5 m	215408

Connecting cables with angled connection:

Type designation	Length	Item no.
■ AL-TWKA-4PGR-200X-FB	2 m	215405
■ AL-TWKA-4PGR-200X-FB	5 m	215407

The appropriate accessories can be found right on the products or under Products / Accessories on www.di-soric.com

UNIVERSAL ACCESSORIES

Connection technology

In the area of connection technology, a wide variety of electrical contacts for custom industrial-suited assembly are available.



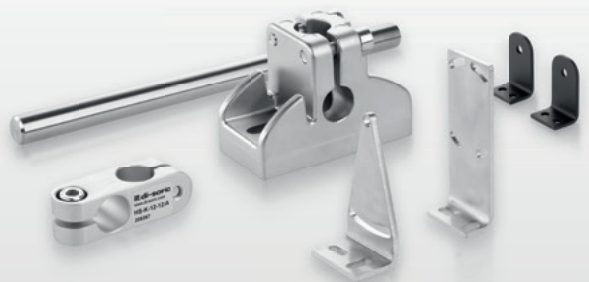
Signal preparation

Logic distributors can link two sensors with one another (e.g. AND/OR function). Function adapters change switching signals, e.g. npn, pnp, inversion, pulse stretching.



Universal mounting technology

di-soric offers tailored bracket and fastening systems for all of its sensors, image processing systems, identification systems and lighting.



Test & parameterization devices

Test & parameterization devices facilitate function tests of sensors. IOL Master and IOL Portable enable the display of measured values as well as the diagnoses and the configuration of IO-Link-capable sensors without additional control. The sensor tester is suited for pnp and npn sensors.



IOL MASTER
Operation on PC via USB



IOL PORTABLE
Handheld operation without PC



SENSOR TESTER
ST 7PNG

SOLUTIONS. CLEVER. PRACTICAL.

di-soric Headquarters

Germany: di-soric GmbH & Co. KG | Steinbeisstrasse 6 | 73660 Urbach
Phone +49 71 81 98 79-0 | Fax +49 71 81 98 79-179 | info@di-soric.com

di-soric Subsidiaries

Austria: di-soric GmbH & Co. KG | Phone +43 7228 72 366 | info.at@di-soric.com

China: di-soric Industrial Automation (Suzhou) Co. Ltd. | Phone +86 189 1374 8271 | info@di-soric.cn

France: di-soric SAS | Phone +33 476 61 65 90 | info.fr@di-soric.com

Singapore: di-soric Pte. Ltd. | Phone +65 6694 7866 | info.sg@di-soric.com

For further information visit www.di-soric.com/international

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