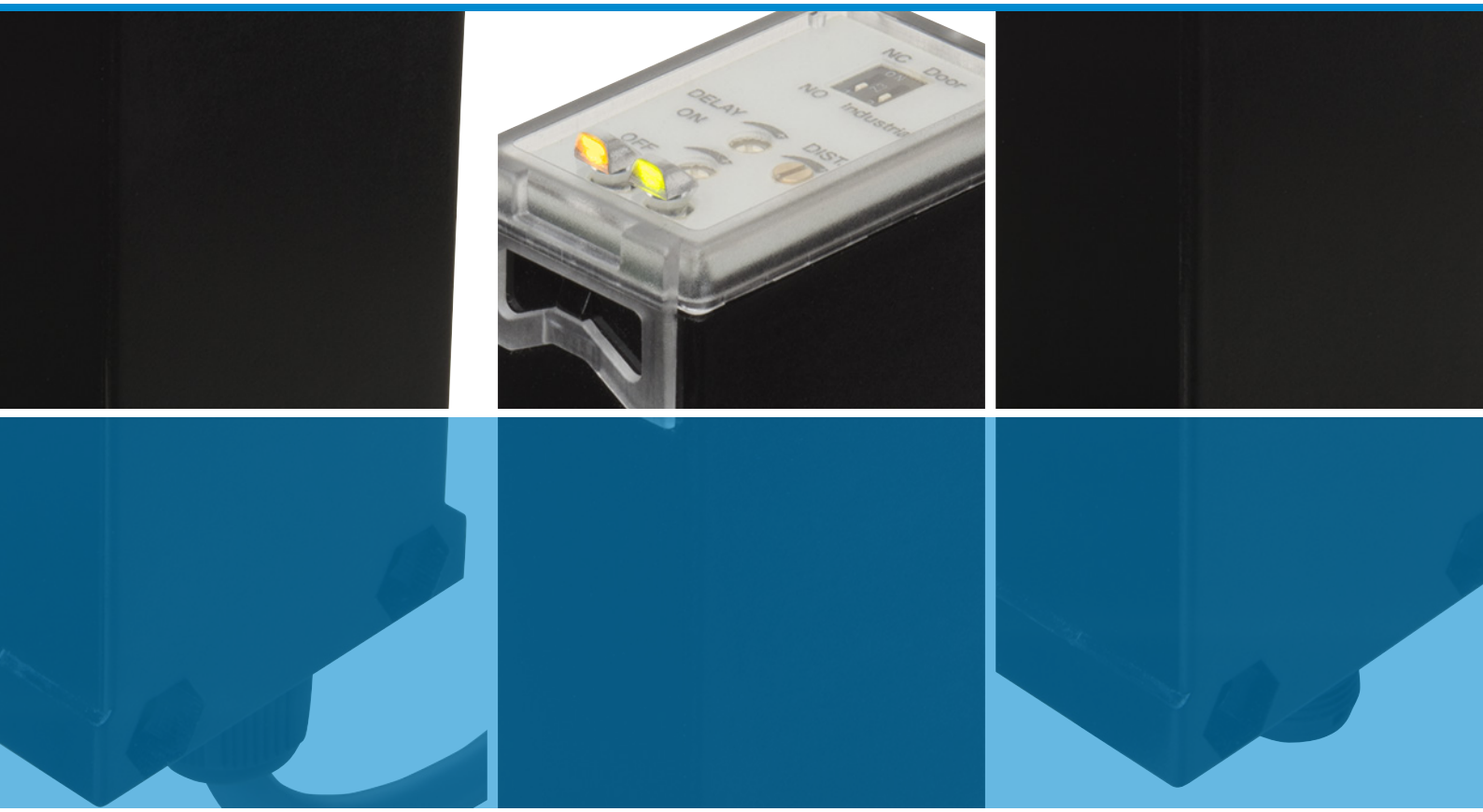
CARLO GAVAZZI
Automation Components

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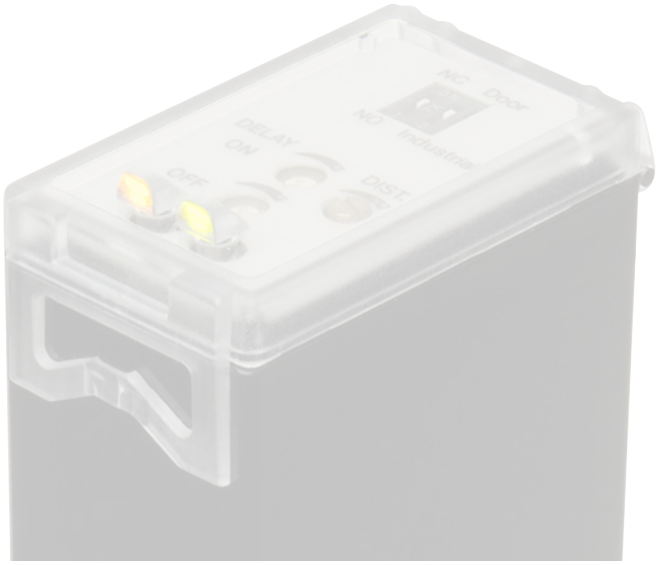


PD112 - Photoelectric sensors

Sensors

PD112
Sensor for doors and Industry

The PD112 sensor is designed for general industrial applications as well as automatic door applications, providing both industry and door mode. The sensor shows outstanding performance by distinguishing the objects to be detected from the background.
The mechanical adjustment of the background vs. objects ensures a long detection range even on black objects.
When long range and high accuracy are required, this sensor is the right choice.





The versatile long range sensor

Robust housing
The one-piece housing reduces the number of joints and ensures a high degree of protection (IP67).
The robust case, a sophisticated mechanical design and high power LEDs provide excellent performance in harsh environments.

Long sensing range
PD112 offers a record sensing range of up to 2.5 m on white and grey objects and 2.0 m on black objects.

High EMC performance
Mechanical distance adjustment together with an optimized differential detection circuit allows for exceptional EMC performance.

Environmentally friendly
This lead-free sensor is designed according to the RoHS directive. PD112 comes in recycled cardboard boxes.

Precise setup
The sensor uses a 28 turn mechanical adjustment of the distance resulting in a very high level of accuracy.

Triangulation detection
Distance detection in the PD112 is based on triangulation. This ensures a precise detection even if the sensor front is not completely free from dirt.

Industrial or door mode
PD112 is designed for industrial applications as well as for use with doors and gates. These two different modes are selectable by a single DIP-switch.

Approvals
EMC directive 2004/180/EL
The Low-Voltage Directive 2006/95/EC,
cULus (UL508)

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Easy setup

NC or NO
A single change of the dip-switch determines whether the output is normally closed or normally open.

ON/OFF Delay
Output can be delayed for 1-16 seconds in both door and industry mode.

LED Indications
Yellow: Target detected
Green: Power
(Flashing in time delay mode)

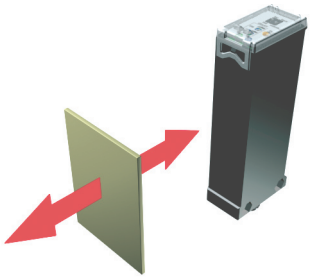


Door or Industry Mode
A single change of the dip-switch determines the application mode.

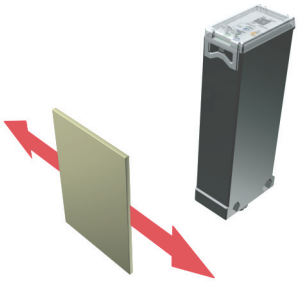
Distance Adjustment
By means of the 28 turn distance adjustment screw, PD112 can be set to ignore the background. The receiver lense is physically moved in order to focus light correctly on the photoelectric receiver.



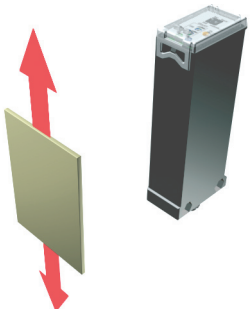
Object Direction vs. Reliable Detection



Correct



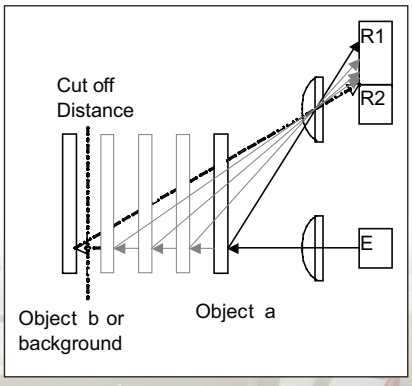
Correct



Incorrect
Object moving in this direction may cause an unstable detection

Detection Principle

Adjustable Background Suppression by Triangulation
The PD112 sensor operates on the principle of true background suppression by triangulation. A standard diffuse reflective sensor only reacts to the amount of light received from detected objects. PD112 has a built-in 2-segment photodiode which reacts not only to the intensity of the light received, but also to the angle of the ligh received. Primarily using the angle of light received, the sensor will activate according to the object's distance from the sensor. This detection principle ensures a very reliable object detection while ignoring objects or backgrounds placed farther away.



Applications

Automatic Doors

In door mode PD112 offers various optimized parameters for control and monitoring of doors and gates from a position directly above the door or mounted on the ceiling. This sensor detects persons in the doorway irrespective of their appearance (height, colour of clothing etc.). In order to guarantee a high level of safety, a built-in test input for evaluation of the sensor function by muting is available.



Luggage Transportation

On large conveyer belts such as airport luggage conveyor systems, the PD112 can be used to avoid suitcases being stacked on top of each other. PD112 can detect even a slim black suitcase or bag placed flat on a dark conveyor belt.
Using this sensor, the need for a reflector placed on the outside of the conveyor is eliminated.



Pallet Wrapping

PD112 can detect goods on the pallet irrespective of their colour or size, while ignoring a reflective or disturbing background.
It has a built-in time delay so that small objects can be ignored (delay on operate) - or the detection signal can be prolonged (delay on release) allowing the pallet wrapper to rotate one extra time if necessary.
PD112 has an outstanding detection distance on black objects.



Wood Industry

With PD112, any wood colour at a distance of 2 m can be detected and any reflective or disturbing background ignored. Thus, when changing wood type, no adjustment of the sensor is required.

Since the background suppression works on triangulation, some dirt accumulation can be accepted without influencing the sensor's accuracy.



Specifications

	PD112	
Cable	**PD112CNB25BP**	
Plug	**PD112CNB25BPM1**	
	Industry mode	**Door mode**
Rated operating distance (S_n)	50 - 2500 mm	
Blind zone	50 mm	
Background suppression distance	500 - 2500 mm (28 turns calibration screw)	
Rated operational voltage	10 to 30 VDC (ripple included)	
Ripple (Urpp)	< 10%	
Output current, continuous (Ie)	≤ 200 mADC, (Maximum load capacity 100 nF)	
Minimum operational current (Im)	0.5 mA	
OFF-state current (Ir)	≤ 100 µA	
No Load supply current (Io)	≤ 40 mADC @ 24 VDC	
Voltage drop (Ud)	≤ 2.5 VDC @ 200 mA	
Sensor protection	Short-circuit, reverse polarity and transients	
Light source	GaAlAs, LED, 850 nm, Infrared, modulated	
Sensing angle	± 1.9°	± 2.6°
Ambient light	10,000 lux	
Light spot	60 mm @ 1.5 m	
Operating frequency	250 Hz	16.7 Hz
Response time OFF-ON (t_{ON}) ON-OFF (t_{OFF})	 ≤ 2 mS ≤ 2 mS	 ≤ 30 mS ≤ 30 mS
Power on dalay (tv)	≤ 50 ms	
Output function	NPN and PNP transistor output	
N.O. / N.C. Switching function	Selectable by DIP switch	
Industry / Door mode	Selectable by DIP switch	
Mute function Emitter off (voltage level) Input current	 Not available Not available	 < 1 VDC, NPN, (no pull-up resistor) or > 9 VDC, PNP, (no pull-down resistor) < 3 mA DC
Led indications Output ON Time delay in progress Signal stability ON and Power ON	 Yellow LED Yellow LED flashing Green LED	
Ambient temperature	Operating: -25 to +55 °C (-13 to +131 °F), Storage: -25 to +80 °C (-13 to +176 °F)	
Vibration	10 to 150 Hz (0.5 mm/7.5 g; (IEC 60068-2-6)	
Shock	2 x 1 m, 100 x 500 mm (IEC60068-2-32)	
Degree of protection	IP67 (IEC 60529; 60947-1)	
Installation category	III (IEC60664/60664A; 60947-1)	
Pollution degree	3(IEC60664/60664A; 60947-1)	
Material	Body: PC black; Cover: PC clear	
Cable	PVC, black, 2 m, 5 x 0.34 mm², Ø5.2 mm	
Plug	M12, 5 pin (CONM15-series)	
Weight	With cable: 160 g, With plug: 80 g	
CE-marking	Yes	
Approvals	cULus (UL508)	

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