

PT120320

laser sensors,
diffuse reflection with background suppression



- ✓ background suppression
- ✓ time-of-flight measuring method
- ✓ infrared laser, laser protection class 1
- ✓ adjustment via teach-in
- ✓ push-pull switching output
- ✓ window function programmable
- ✓ short-circuit and reverse polarity protected LED-
- ✓ display
- ✓ M12-connector, 4-pin

**diffuse reflection laser sensor
with background suppression**



Description

With this new device ipf electronic presents for the first time an extremely compact optical diffuse reflection laser sensor with background suppression that is able to detect objects completely independent of their color. The background suppression works according to the so-called “time-of-flight” principle (TOF), a transit time method used for distance measurement. With this method, the distance of an object is determined by measuring the time-of-flight of a light pulse that is emitted by a sensor transmitter, reflected by the detected object and then finally captured by the sensor receiver.

The range, or rather the switching distance, of this compact diffuse reflection sensor is therefore fully independent of the reflective properties of the object surface that is to be detected. The sensors operate with infrared laser light of laser protection class 1. The electrical connection is made via a 4-pin M12-connector. To avoid EMC-interferences a shielded cable socket (e.g. VK205325) has to be used.

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operating range

20 ... 150mm M12-

connection

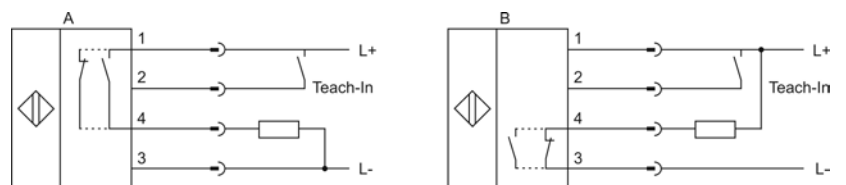
connector, 4-pin



TECHNICAL DATA

sensing range	20 ... 150mm
output signal	push-pull, light on- / dark-on mode, no / nc
operating voltage	10 ... 30V DC
output current (max. load)	100mA
transmitting element	laser diode, infrared light
laserprotectionclass	1
switching frequency	25Hz
display	LED yellow
adjustment	teach - in
short-circuit protection	+
reverse polarity protection	+
dimensions	M12x1
length (hread / total)	45mm / 72mm
material (housing)	VA 1.4305
material (front screen)	lux acryl 2H
protection class (EN 60529)	IP65
temperature (operating)	-10 ... +60°C
connection	M12-connector, 4-pin
connection accessories	e.g. VK205325 (cable socket M12 shielded) AV000114 (teach-in-adapter)
mounting accessories (universal holder)	AY000115

connection



colors: 1 = BN (brown), 2 = WH (white), 3 = BU (blue), 4 = BK (black)
functions: 1 = L+, 2 = teach-in, 3 = L-, 4 = push-pull

Warning:

Never use these devices in applications where the safety of a person depends on their functionality.

Manual

Status display:

During normal operation, the yellow LED lights up when the switching output is active.

During the teach-mode the LED flashes with different frequencies and thus displays the respective mode.

Factory settings:

After the initial startup, the sensor has the following default settings:

switching distance: approx. 65mm sensing

Description of the teach modes:

To start the teach process, connect the white wire (PIN 2) with the operating voltage.

If this connection exists between 3 and 6 seconds, the yellow LED will flash with a frequency of 5Hz.

After releasing the connection, the teach mode „sensing function“ is active.

If this connection exists between 6 and 10 seconds, the yellow LED will flash with a frequency of 2.5Hz.

After releasing the connection, the teach mode „window function“ is active.

If the connection exists more than 10 seconds, the device will be reset to the factory settings. The yellow LED flashes with a frequency of 0.5Hz.

Teach process for sensing function

1. Connect for a period of time between 3 and 6 seconds the white wire (PIN 2) with the operating voltage. The LED flashes with approx. 5Hz.
2. Release the connection. The yellow LED now flashes with a frequency of 0.3Hz.
3. Place the object to be detected at the desired distance in front of the sensor.
4. Connect the white wire (Pin 2) for at least 1 second with the operating voltage. If the LED lights up at that time, the switching output functions as normally open contact (output is active when object is detected). If the LED is off at that time, the switching output functions as normally closed contact (output is active, when object is not detected).
5. If the yellow LED flashes with a frequency of 2.5Hz, the teach process was successful. You can release the connection now. The taught value is stored and is also available after switching the sensor off and on again.
6. If the LED flashes with a frequency of 6Hz, the teach process has failed. The object could not be detected, because it was e.g. placed beyond the detection range. In this case, the teach process has to be repeated.

Teach process for window function

1. Connect for a period of time between 6 and 10 seconds the white wire (PIN2) with the operating voltage. The LED flashes with approx. 2.5Hz.
2. Release the connection. The yellow LED now flashes with a frequency of 1Hz.
3. Place the object to be detected at the switching point at long distance.
4. Connect the white wire (Pin2) for at least 1 second with the operating voltage. The yellow LED will flash with a frequency of 2.5Hz, if the value is stored.
5. Release the connection.
6. Place the object to be detected at the switching point at small distance. The distance to the previous taught switching point has to be at least 5mm!
7. Reconnect the white wire (Pin2) for at least 1 second with the operating voltage. The yellow LED will flash with a frequency of 5Hz, if the value is stored.
8. The teach process is completed. The sensor's output functions as normally open contact, i.e. it is active, when an object is detected between the two switching points. The taught value is stored and is also available after switching the sensor off and on again.
9. If the LED flashes with a frequency of 6Hz, the teach process has failed. The object could not be detected, because it was e.g. placed beyond the detection range. In this case, the teach process has to be repeated.

Note regarding the switching function:

If you want the output to function as normally closed contact during mode „window function“, i.e. beyond the taught window, place the object to be detected first (3) at the switching point at small distance – and then (6) at the switching point at long distance.

Note regarding the switching output:

The terms „normally open contact“ and „normally closed contact“ used in this manual refer to the wiring diagram A (PNP). If the device is connected according to wiring diagram B (NPN), the switching output functions inversely.

Reset to the factory settings

1. Connect for more than 10 seconds the white wire (PIN2) with the operating voltage. The LED flashes with approx. 0.5Hz.
After releasing the connection the sensor functions with the factory settings (switching distance approx. 65mm, sensing).