Leuze

Translation of original operating instructions

ODT25CL1-3M.3

Diffuse reflection sensor with teach

The Sensor People

We reserve the right to make technical changes
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1 About this document

Tab. 1.1: Warning symbols and signal words

	Symbol indicating dangers to persons
	Symbol indicating possible property damage
NOTE	Signal word for property damage Indicates dangers that may result in property damage if the measures for danger avoidance are not followed.
CAUTION	Signal word for minor injuries Indicates dangers that may result in minor injury if the measures for danger avoidance are not followed.

Tab. 1.2: Other symbols

	Symbol for tips Text passages with this symbol provide you with further information.
	Symbol for action steps Text passages with this symbol instruct you to perform actions.
	Symbol for action results Text passages with this symbol describe the result of the preceding action.

Tab. 1.3: Terms and abbreviations

SP	Switching point
SSC	Switching output

2 Safety

ATTENTION

LASER RADIATION – CLASS 1 LASER PRODUCT

The device satisfies the requirements of IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

- Observe the applicable statutory and local laser protection regulations.
- The device must not be tampered with and must not be changed in any way.
  There are no user-serviceable parts inside the device.
  CAUTION! Opening the device may result in hazardous radiation exposure!
  Repairs must only be performed by Leuze electronic GmbH + Co. KG.

CAUTION

UL applications!

For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).

CAUTION

Observe intended use!

The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use.

- Only operate the device in accordance with its intended use.
- Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use.
- Read these operating instructions before commissioning the device. Knowledge of the operating instructions is an element of proper use.

NOTICE

Comply with conditions and regulations!

- Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

2.1 Disclaimer

Leuze electronic GmbH + Co. KG is not liable in the following cases:

- The device is not being used properly.
- Reasonably foreseeable misuse is not taken into account.
- Mounting and electrical connection are not properly performed.
- Changes (e.g., constructional) are made to the device.

3 Device overview

Fig. 3.1: Overview

A	Laser aperture

4 Sensor adjustment (teach) via teach button (SSC.1 and SSC.2)

Object test

Upon activation of the function, the light spot begins to flash brightly to brightly display the light spot on the object that is to be detected. During this process, the function reserve is tested on the object that is to be detected.

↳ Briefly press the teach button (250 ms … 2 s).

⇨ The yellow and green LEDs flash alternately and quickly.

⇨ The light spot begins to flash brightly.

↳ Alignment with the object that is to be detected.

⇨ Green LED lights up: sufficient function reserve available.
Yellow LED lights up: Function reserve in critical range

↳ Press the teach button between 250 ms and 2 s to switch off the object test and return to the standard light spot and operation.
Object test ends automatically after 15 seconds.

This device setting is only available for sensors with two switching outputs SSC.1 and SSC.2.

For devices with only one switching output, the SP2 of SSC.1 is set with the second button level (7...12s).

- Switching points SP1 and SP2 of the sensor are set to 1000 mm (SP1) and 500 mm (SP2) on delivery.

(1) 1-point teach of SSC.1 with reserve

↳ Position the object that is to be taught.

↳ Hold down the teach button (2 to 7 s) until the yellow and green LEDs flash simultaneously.

⇨ Release teach button – ready.

With this teach mode, the switching distance is configured in such a way that the object which is in the beam path during the teach procedure is detected with reserve.

The reserve R refers to the additional distance by which the operating range is increased/decreased with respect to the distance to the teach object. Thus, all objects located up to just beyond the distance of the taught object are detected.

Hysteresis:

To ensure continuous object detection in the switching point, the sensor has a switch hysteresis.

The object is no longer detected if:
distance to sensor > teach point + reserve + hysteresis.

(2) 1-point teach of SSC.2 with reserve

↳ Position the object that is to be taught.

↳ Hold down the teach button (7 to 12 s) until the yellow and green LEDs flash alternately.

⇨ Release teach button – ready.

With this teach mode, the switching distance is configured in such a way that the object which is in the beam path during the teach procedure is detected with reserve.

The reserve R refers to the additional distance by which the operating range is increased/decreased with respect to the distance to the teach object. Thus, all objects located up to just beyond the distance of the taught object are detected.

Hysteresis:

To ensure continuous object detection in the switching point, the sensor has a switch hysteresis.

The object is no longer detected if:
distance to sensor > teach point + reserve + hysteresis.

(3) Set switching behavior (light/dark switching)

When the function is activated, the switching outputs are inverted relative to the previously set state.

↳ Hold down the teach button longer than 12 s until only the green LED flashes.

↳ Release teach button.

⇨ The green LED flashes for another two seconds.

⇨ Behavior of the yellow LED while the green LED is flashing:
Yellow LED ON: Switching output now light-switching (output active with object within the set detection range)
Yellow LED OFF: Switching output now dark-switching (output active with no object within the set detection range)

⇨ Device settings are stored fail-safe.

	NOTICE
	The yellow LED only indicates the switching behavior of SSC.1 and is dependent on the setting of the switching behavior. In normal operation, it always indicates the light path.

Operating range

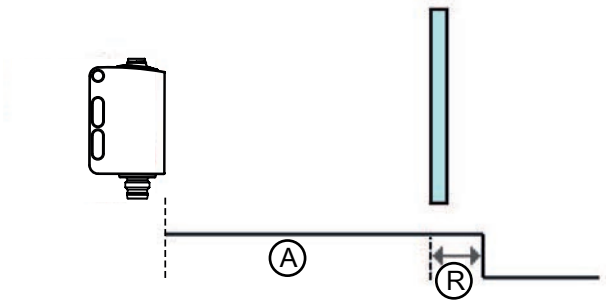

Fig. 4.1: ODT55C_G6

A	Set operating range
R	Reserve

5 Line teach

Functions are only available for sensors with the variant ODT25CL1-3M.../...T.....

Level 1: Teach switching point SP1 of SSC.1

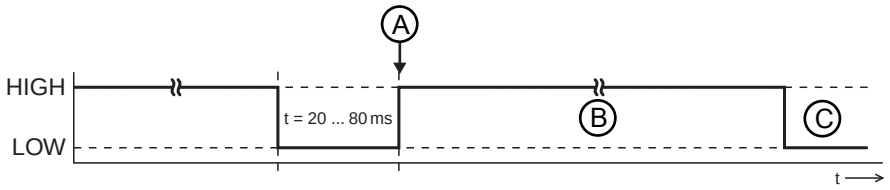

Fig. 5.1: Line teach – operating level 1

A	Teach switching point SP1 of SSC.1 is being implemented.
B	Teach button is locked.
C	Teach button is enabled again.

Level 2: Teach switching point SP2 of SSC.1

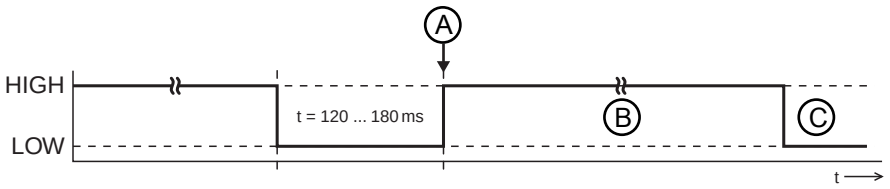

Fig. 5.2: Line teach – operating level 2

A	Teach switching point SP2 of SSC.1 is being implemented.
B	Teach button is locked.
C	Teach button is enabled again.

Level 3: Dark switching logic

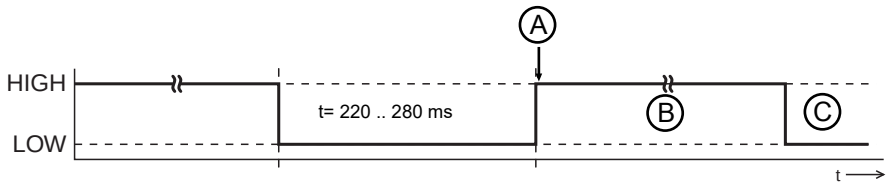

Fig. 5.3: Line teach – operating level 3

A	Dark switching logic is implemented in the sensor.
B	Teach button is locked.
C	Teach button is enabled again.

Switching output dark switching, i.e. output active if there is no object in the sensor's set detection range.

Level 4: Light-switching logic

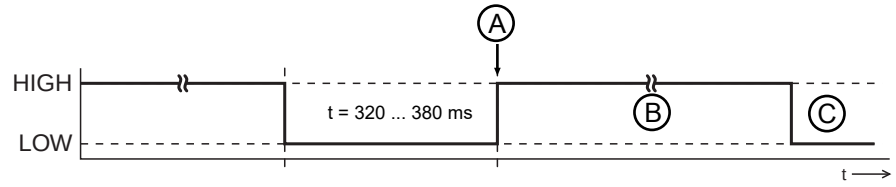

Fig. 5.4: Line teach – operating level 4

Switching output light switching, i.e. output active when an object is in the sensor's detection range.

A	Light switching logic is implemented in the sensor.
B	Teach button is locked.
C	Teach button is enabled again.

Level 5: Single-point teach

The teach process is switched to single-point teach logic. The sensor switches after the teach event if an object is detected closer than the SP1 of SSC.1 (light switching) or no object is detected between the sensor and SP1 of SSC.1 (dark switching).

Pause from t= 420 ... 480 ms

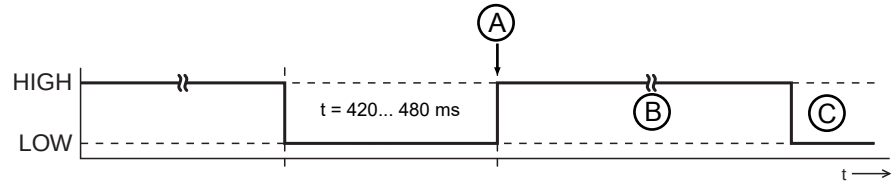

Fig. 5.5: Line teach – operating level 5

A	Single-point teach logic is implemented in the sensor.
B	Teach button is locked.
C	Teach button is enabled again.

Level 6: Window teach

The teach event is switched to window teach logic. The sensor switches after the teach event when an object between SP1 and SP2 is detected by SSC.1.

Pause from t= 520 ... 580 ms

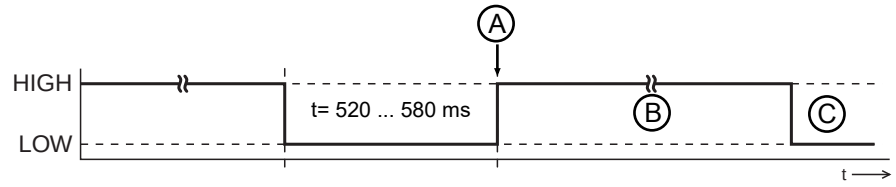

Fig. 5.6: Line teach – operating level 6

A	Window teach logic is implemented in the sensor.
B	Teach button is locked.
C	Teach button is enabled again.

Locking the teach button via the teach input

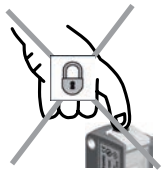

Fig. 5.7: Operation via teach button

A static high signal (≥ 20 ms) at the teach input locks the teach button on the sensor if required, such that no manual operation is possible (e.g., protection from erroneous operation or manipulation).

If the teach input is not connected or if there is a static low signal, the button is unlocked and can be operated freely.

6 Application notes

- Optimum detection behavior is achieved when the light spot is fully on the object.
- The maximum possible angle relative to the object surface depends on the reflection properties.
- An only partially covered light spot can affect the detection behavior.

7 Service and support

Service hotline

You can find the contact information for the hotline in your country on our website **www.leuze.com** under **Contact & Support**.

Repair service and returns

Defective devices are repaired in our service centers competently and quickly. We offer you an extensive service packet to keep any system downtimes to a minimum. Our service center requires the following information:

- Your customer number
- Product description or part description
- Serial number or batch number
- Reason for requesting support together with a description

Please register the merchandise concerned. Simply register return of the merchandise on our website **www.leuze.com** under **Contact & Support > Repair Service & Returns**.

To ensure quick and easy processing of your request, we will send you a returns order with the returns address in digital form.

8 Declaration of Conformity

The sensors of the ODT25CL1 series have been developed and manufactured in accordance with the applicable European standards and directives.

	NOTICE
	You can download the EC Declaration of Conformity from the Leuze website. ↳ Call up the Leuze website: *www.leuze.com*. ↳ Enter the type designation or part number of the device as the search term. The article number can be found on the name plate of the device under the entry “Part. No.”. ↳ The documents can be found on the product page for the device under the *Downloads* tab.