

## ODSL 8

## Optical laser distance sensors

2024/05/17 50106534-05



20 ... 200mm



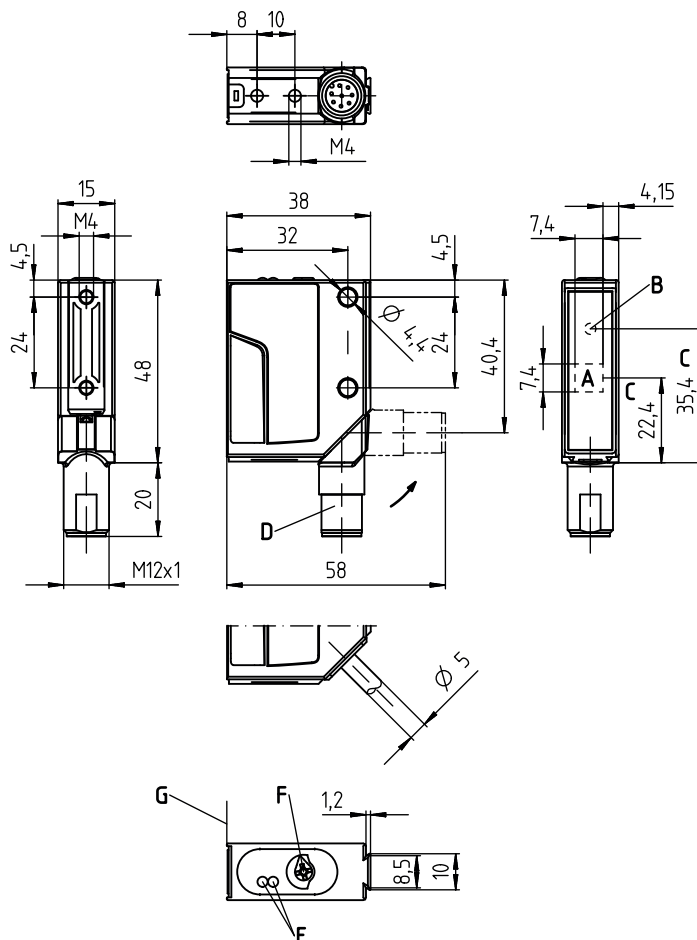
- Reflection-independent distance information
- Analog voltage output or current output (can be inverted, teachable)
- 2 teachable switching outputs (push-pull)
- M12 turning connector
- Easy alignment through visible red light

### Accessories:

(available separately)

- Mounting systems
- Cables with M12 connector (KD ...)
- Control guard

### Dimensioned drawing



- A Receiver
- B Transmitter
- C Optical axis
- D Turning connector, turnable 90°
- E Yellow, green LED
- F Operational control (rotary switch)
- G Reference edge for the measurement (cover glass)

### Electrical connection

ODSL 8/V66-200-S12

|             |   |       |
|-------------|---|-------|
| 18-30V DC + | 1 | br/BN |
| Q2          | 2 | ws/WH |
| GND         | 3 | bl/BU |
| Q1          | 4 | sw/BK |
| 1-10V       | 5 | gr/GY |

ODSL 8/C66-200-S12

|             |   |       |
|-------------|---|-------|
| 18-30V DC + | 1 | br/BN |
| Q2          | 2 | ws/WH |
| GND         | 3 | bl/BU |
| Q1          | 4 | sw/BK |
| 4-20mA      | 5 | gr/GY |

### Technical data

#### Optical data

|                                 |  |
|---------------------------------|--|
| Measurement range <sup>1)</sup> | 20 ... 200mm   |
| Resolution <sup>2)</sup>        | 0.1 ... 0.2mm  |
| Light source                    | Laser  |
| Laser class                     | 2 in acc. with IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 |
| Wavelength                      | 650nm (visible red light)                                  |
| Max. output power               | < 1.2mW  |
| Impulse duration                | 4ms  |
| Light spot                      | Ø 1mm at 200mm   |

#### Error limits (relative to measurement distance)

|   |                  |
|---|------------------|
| Absolute measurement accuracy <sup>1)</sup> | ± 2% up to 200mm |
| Repeatability <sup>3)</sup>                 | ± 1% up to 200mm |
| B/W detection thresh. (6 ... 90% rem.)      | ≤ 1.5%           |
| Temperature drift                           | ≤ 0.2%/°C        |

#### Time behavior

|                  |           |
|------------------|-----------|
| Measurement time | 2 ... 7ms |
| Response time    | ≤ 20ms    |
| Readiness delay  | ≤ 300ms   |

#### Electrical data

|   |  |
|---|--|
| Operating voltage $U_B$                 | 18 ... 30VDC (incl. residual ripple)   |
| Residual ripple                         | ≤ 15% of $U_B$   |
| Open-circuit current                    | ≤ 50mA   |
| Switching output/function <sup>4)</sup> | 2 push-pull switching outputs<br>Pin 2: Q2, PNP light switching, NPN dark switching<br>Pin 4: Q1, PNP light switching, NPN dark switching<br>$\geq (U_B - 2V) / \leq 2V$<br>Voltage 1 ... 10V, $R_L \geq 2k\Omega$ / Current 4 ... 20mA, $R_L < 500\Omega$ |
| Signal voltage high/low                 |  |
| Analog output                           |  |

#### Indicators

|                             |   |
|-----------------------------|---|
| Green LED Continuous light  | Ready   |
| Flashing (no teach)         | Fault, teach values were not applied                                    |
| Off                         | No voltage  |
| Yellow LED Continuous light | Object within teach-in measurement distance (output Q1 <sup>5)</sup> )  |
| Flashing (no teach)         | Teach values were not applied   |
| Off                         | Object outside teach-in measurement distance (output Q1 <sup>6)</sup> ) |

#### Mechanical data

|                 |                                |
|-----------------|--------------------------------|
| Housing         | Metal                          |
| Optics cover    | Glass                          |
| Weight          | 70g                            |
| Connection type | M12 connector, 5-pin, turnable |

#### Environmental data

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Ambient temp. (operation/storage)  | -40°C ... +50°C / -40°C ... +70°C |
| Protective circuit <sup>6)</sup>   | 2, 3                              |
| VDE protection class <sup>7)</sup> | II, all-insulated                 |
| Degree of protection <sup>8)</sup> | IP 67, IP 69K <sup>9)</sup>       |
| Environmentally tested acc. to     | ECOLAB                            |
| Standards applied                  | IEC 60947-5-2                     |
| Certifications                     | UL 508, CSA C22.2 No.14           |

- 1) Diffuse reflection 6% ... 90%, at 20°C, measurement object  $\geq 20 \times 20 \text{mm}^2$
- 2) Minimum and maximum value depend on measurement distance and configuration of the analog output
- 3) Same object, identical environmental conditions, measurement object  $\geq 20 \times 20 \text{mm}^2$
- 4) The push-pull switching outputs must not be connected in parallel
- 5) No display for output Q2
- 6) 2=polarity reversal protection, 3=short circuit protection for all outputs
- 7) Rating voltage 250VAC
- 8) In end position of the turning connector (turning connector engaged)
- 9) IP 69K test acc. to DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives, acids and bases are not part of the test

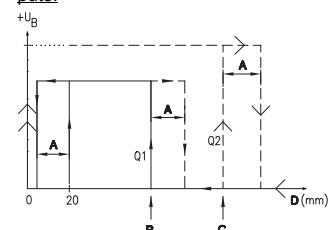
### Order guide

|                    | Designation        | Part no. |
|--------------------|--------------------|----------|
| With M12 connector |                    |          |
| and voltage output | ODSL 8/V66-200-S12 | 50105761 |
| and current output | ODSL 8/C66-200-S12 | 50108362 |

### Tables

### Diagrams

Characteristic curve of switching outputs:



- A Hysteresis
- B Switching point Q1 (teach point)
- C Switching point Q2 (teach point)
- D Measurement distance

### NOTES



#### Observe intended use!

- ⚠ This product is not a safety sensor and is not intended as personnel protection.
- ⚠ The product may only be put into operation by competent persons.
- ⚠ Only use the product in accordance with its intended use.

- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.

### Safety notices – CLASS 2 LASER PRODUCT

#### ⚠ ATTENTION, LASER RADIATION – CLASS 2 LASER PRODUCT



#### Do not stare into beam!

The device satisfies the requirements of IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 safety regulations for a product of **laser class 2** 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.

- ⚠ Never look directly into the laser beam or in the direction of reflected laser beams!  
If you look into the beam path over a longer time period, there is a risk of injury to the retina.
- ⚠ Do not point the laser beam of the device at persons!
- ⚠ Interrupt the laser beam using a non-transparent, non-reflective object if the laser beam is accidentally directed towards a person.
- ⚠ When mounting and aligning the device, avoid reflections of the laser beam off reflective surfaces!
- ⚠ **CAUTION!** Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous light exposure.
- ⚠ 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.

The device emits a collimated and pulsed laser beam. For laser power, pulse duration, wavelength and light spot diameter see Technical data.

#### NOTE



#### Affix laser information and warning signs!

Laser warning and laser information signs are affixed to the device (see ①). In addition, self-adhesive laser warning and information signs (stick-on labels) are supplied in several languages (see ②).

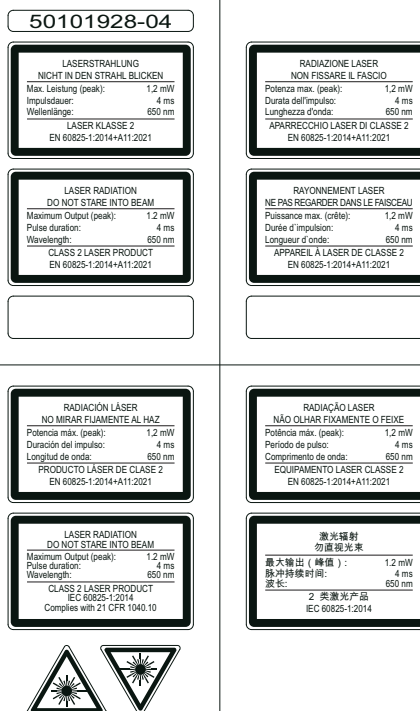
- ⚠ Affix the laser information sheet to the device in the language appropriate for the place of use.  
When using the device in the US, use the stick-on label with the "Complies with 21 CFR 1040.10" notice.
- ⚠ Affix the laser information and warning signs near the device if no signs are attached to the device (e.g., because the device is too small) or if the attached laser information and warning signs are concealed due to the installation position.  
Affix the laser information and warning signs so that they are legible without exposing the reader to the laser radiation of the device or other optical radiation.

①

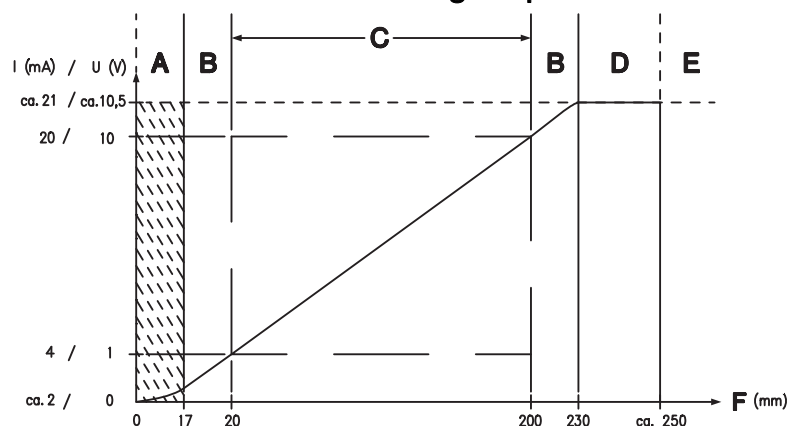


- A Laser aperture
- B Laser warning sign

②



### Characteristic curve of analog output

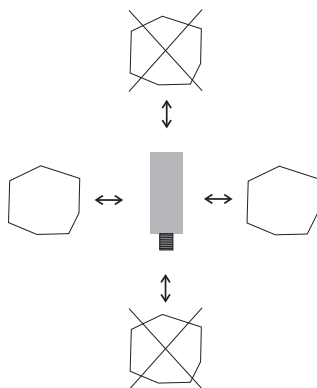


- A** Area not defined
- B** Linearity not defined
- C** Measurement range
- D** Object present
- E** No object detected
- F** Measurement distance

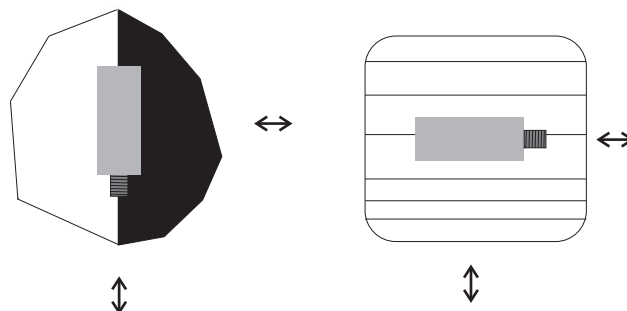
### Mounting instructions

There are mounting systems available, which have to be ordered separately from Leuze electronic. Apart from this, the drilled-through holes and threaded holes are suitable for the individual mounting of the ODSL 8, depending on the area in which it is to be used. When mounting, do not subject the housing to excessive force.

#### Preferred entry direction of objects

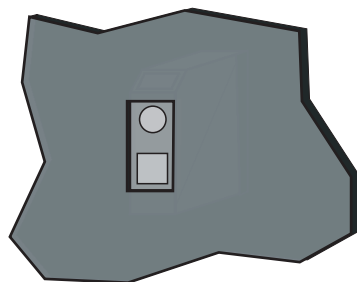


#### Preferred mounting in connection to objects with structured surface



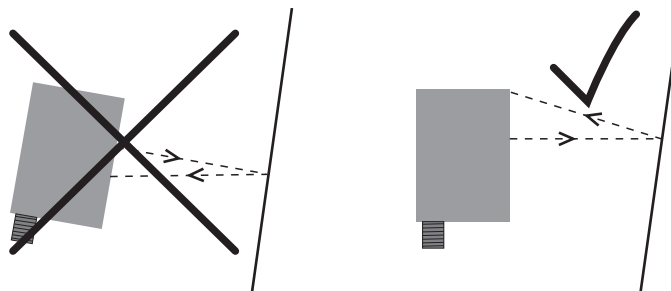
#### View through a recess

If the ODSL 8 has to be installed behind a cover, the recess has to have at least the size of the optical glass cover. Otherwise, a correct measurement is not possible or can not be guaranteed.



#### Alignment on measurement objects with reflective surfaces

If the measurement object to be detected has a reflective surface, a measurement may not be possible depending on the angle in which the light is reflected by the measurement object's surface. Adjust the angle between the sensor and the measurement object such that the sensor can reliably detect the measurement object.



### T<sub>I</sub> teach-in with rotary switch

1. Position measurement object at the desired measurement distance (①).

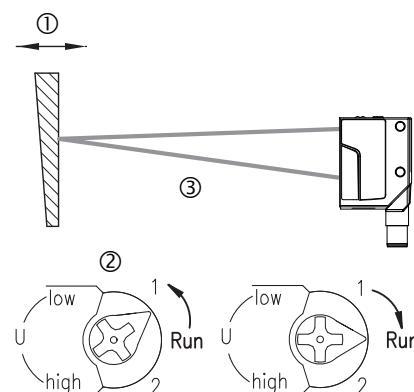
2. Turn rotary switch into the desired position (Low, High, 1, 2) (②).

Wait for optical confirmation by flashing of the LEDs.

| Teach function         | Rotary switch position | Green LED           | Yellow LED |
|------------------------|------------------------|---------------------|------------|
| 1V/4mA analog output   | Low                    | On                  | Flashing   |
| 10V/20mA analog output | High                   | Flashing            | On         |
| Switching output Q1    | 1                      | Flash synchronously |            |
| Switching output Q2    | 2                      | Flash alternately   |            |

3. For teaching, position rotary switch onto "Run" (③).

Wait for optical confirmation by end of flashing signal (green LED on).



### Reset the analog output to factory settings

#### Reset 1V/4mA analog output at 20mm:

1. Position measurement object just below start of measurement range (20mm).
2. Position rotary switch on "Low". Wait for optical confirmation by flashing of the LEDs.
3. For teaching, position rotary switch onto "Run".  
Wait for optical confirmation by end of flashing signal (green LED on).

#### Reset 10V/20mA analog output at 200mm:

1. Position measurement object just beyond end of measurement range (200mm).
2. Position rotary switch on "High". Wait for optical confirmation by flashing of the LEDs.
3. For teaching, position rotary switch onto "Run".  
Wait for optical confirmation by end of flashing signal (green LED on).

### Error messages

Continuously flashing LEDs in switch position "Run" signal an unsuccessful teach event (sensor not ready):

| Green LED           | Yellow LED | Error                                     |
|---------------------|------------|---|
| On                  | Flashing   | Teach 1V/4mA analog output unsuccessful   |
| Flashing            | On         | Teach 10V/20mA analog output unsuccessful |
| Flash synchronously |            | Teach switching output Q1 unsuccessful    |
| Flash alternately   |            | Teach switching output Q2 unsuccessful    |

Remedy:

- Repeat teach event or
- Disconnect sensor from voltage to restore the old values.