Large measurement range
- Reflection-independent distance information
- Highly insensitive to extraneous light
- IO-Link/LC display and key pad for configuration
- Measurement value is indicated in mm on LC display
- Configurable measure mode and measurement range
- M12 turning connector

Accessories:
- Mounting systems
- Cable with M12 connector (K-D...)
- IO-Link master set MD12-US2-IOL1 (50112085) and K-DS M12A-M12A-4P-2m-PVC cable (50110126)

Electrical connection

| 18–30V DC+ | 1 | br/BN |
| Do not connect | 2 | wb/WH |
| GND | 3 | bi/BU |
| 1/O-Link Data | 4 | sw/BK |
| Do not connect | 5 | gr/GY |

ODSL 9/L-450-S12

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.ctiautomation.net - Email: info@ctiautomation.net
Specifications

Optical data
- Measurement range: 50 ... 650mm
- Resolution: 0.1 ... 0.5mm
- Light source: laser
- Wavelength: 655nm
- Light spot: divergent, 1x1mm² at 450mm
- Max. output power: 1.2mW
- Pulse duration: 22ms

Error limits (relative to measurement distance)
- Absolute measurement accuracy: ± 1%
- Repeatability: ± 0.5%
- B/W detection thresh. (6 ... 90% rem.): ≤ 0.5%
- Temperature compensation: yes

Timing
- Measurement time: 2ms
- Response time: ≤ 6ms
- Delay before start-up: ≤ 300ms

Electrical data
- Operating voltage: U_B: 18 ... 30V (incl. residual ripple)
- Residual ripple: ≤ 15 % of U_B
- Open-circuit current: ≤ 180mA

Sensor operating mode
- IO-Link: COM2 (38.4kBaud), Frame 2.2, Vers. 1.0, min. cycle time 2.2ms
- SIO: not supported

Indicators
- Green LED: continuous light
  - ready on: with voltage
  - off: no voltage
- Yellow LED: continuous light
  - object within measurement range on: ready
  - no object within measurement range off

Mechanical data
- Housing: plastic
- Optics cover: glass
- Weight: approx. 50g
- Connection type: M12 connector, 5-pin

Environmental data
- Ambient temp. (operation/storage): -20°C ... +50°C / -30°C ... +70°C
- Protective circuit: 1, 2, 3 (1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs)
- VDE safety class: II, all-insulated
- Protection class: IP 67
- Laser class: 2 (according to EN 60825-1 and 21 CFR 1040.10 with Laser Notice No. 50)
- Standards applied: IEC 60947-5-2

- 1) Luminosity coefficient 6% ... 90%, complete measurement range. "Standard" operating mode, at 20°C, medium range of U_B, measurement object ≥ 50x50mm²
- 2) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
- 3) Typ. ± 0.02%/K
- 4) Internal measurement time distance sensor
- 5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
- 6) Rating voltage 50VAC

Order guide

<table>
<thead>
<tr>
<th>Designation</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO-Link interface</td>
<td>ODSL 9/L-650-S12</td>
</tr>
</tbody>
</table>

Remarks

- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.
- Approved purpose: This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.
## ODSL 9
### Optical laser distance sensors

**IO-Link process data**

Output data device

<table>
<thead>
<tr>
<th>Data bit</th>
<th>16 bit measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSB</td>
<td>A15 A14 A13 A12 A11 A10</td>
</tr>
<tr>
<td></td>
<td>A9  A8  A7  A6  A5  A4</td>
</tr>
<tr>
<td></td>
<td>A3  A2  A1  A0  LSB</td>
</tr>
</tbody>
</table>

16 bit measurement value: distance

1 bit output resolution: 0.1 mm

Signal too weak: 65535

Laser error: 65533
**IO-Link service data**

Sensors with IO-Link interface can be configured and diagnosed via the service data.

**Parameters**

**Measure mode**

A measurement mode for adapting to the application task can be activated with this parameter. There is a selection of four measurement modes (standard, precision, speed and light suppression). By selecting the mode, the following results are achieved:

- **Standard**: standard setting
- **Precision**: high accuracy, approx. 95% slower
- **Speed**: fast measurement, approx. 30% faster
- **Light suppression**: higher immunity against external light interference

The following table provides an overview of the effects of the individual parameters on the measurement function.

<table>
<thead>
<tr>
<th>Measure mode</th>
<th>Accuracy</th>
<th>Measurement time / update</th>
<th>Ambient light</th>
<th>Varying diffuse reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Precision</td>
<td>++</td>
<td>--</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Speed</td>
<td>--</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Light suppression</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>0</td>
</tr>
</tbody>
</table>

**Measurement filter**

A measurement filter for adapting to the application task can be activated with this parameter. There is a selection of three options (off, averaging, center value). By selecting the filter, the following results are achieved:

- **Off**: no filtering of the measurement values
- **Averaging**: a moving average from the last 2 ... 99 measurement values (setting of the number with measurement count) is calculated and output. If the measurement value changes abruptly, the output value moves linearly over n measurements from the old to the new measurement value. The time until the measurement value is updated is therefore not affected by the number of measurements; the response time for distance changes slows down.
- **Center value**: filtering out of extreme values - the average is calculated from 10 ... 50 individual measurements. The number of individual measurements used for this purpose is selected via measurement count (10, 20, 30, 40 or 50). The setting under filter depth specifies whether only the most extreme (coarse), the middle (medium) or the lowest deviations (fine) should be filtered out.

The following table provides an overview of the effects of the individual parameters on the measurement function.

<table>
<thead>
<tr>
<th>Filter depth (center value)</th>
<th>Updating measurement time</th>
<th>Response time for small change in distance</th>
<th>Response time for large change in distance</th>
<th>Filtering of individual faulty measurements</th>
<th>Filtering of cumulative faulty measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>+</td>
<td>-</td>
<td>++</td>
<td>--</td>
<td>++</td>
</tr>
<tr>
<td>Averaging</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Center value</td>
<td>--</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

**Number of measurement values (averaging)**

This parameter defines the number of individual measurements which are used for filtering.

**Number of measurement values (center value)**

This parameter defines the number of individual measurements which are used for filtering.

**Filter depth (center value)**

This parameter defines the filter gauge (medium, coarse, fine).

**Display**

This parameter determines the display setting on the sensor (on, off, auto).

**Button lock**

This parameter determines whether the key pad on the sensor is locked or activated.
System commands:

**Laser transmitter activation**
This system command switches on the laser transmitter.

**Laser transmitter deactivation**
This system command switches off the laser transmitter.
If the sensor is deactivated, the last measurement value detected is frozen. The state of the laser can be seen from the sensor status.

**Setting to factory setting**
This system command restores the factory settings of the sensor.

Diagnostics (observation)

**Signal too weak [process value 65535] or laser failure [process value 65533]**
Reception signal is not sufficient: either no object is in the measurement range or the signal from the object is too weak for detection. A displayed laser failure signalizes interference of the laser light source.

**Signal warning**
Low reception signal: the object is not detected reliably, e.g. because the signal from the object is very weak.

**Laser activation**
Status information on whether the laser transmitter is activated or deactivated.

**Measurement range sensor**
Status information on whether an object is located in the measurement range of the sensor.

---

**Notice!**
If parameters are changed on the device via the display and keyboard, the master is not signaled.
In the event the master sends an explicit request, however, the changed value is available.

**Notice!**
Detailed information about the IO-Link service data and the IODD can be found at Leuze website.
Working safely

Attention Laser Radiation!

The ODSL 9 optical distance sensors operate with a red light laser of class 2 acc. to EN 60825-1. If you look into the beam path over a longer time period, the retina of your eye may be damaged!

Never look directly into the beam path! Do not point the laser beam of the ODSL 9 at persons!

When mounting and aligning the ODSL 9 take care to avoid reflections of the laser beam off reflective surfaces!

The use of operating and adjusting devices other than those specified in the technical description, carrying out of differing procedures, or improper use of the optical laser distance sensor may lead to dangerous exposure to radiation!

The use of optical instruments or devices in combination with the device increases the danger of eye damage!

Adhere to the applicable legal and local regulations regarding protection from laser beams acc. to EN 60825-1 in its latest version.

The ODSL 9 uses a laser diode with low power in the visible red light range with an emitted wavelength of about 655nm.

The glass lens cover is the only opening through which the laser radiation can escape from the device. The housing of the ODSL 9 is sealed and has no parts that need to be adjusted or maintained by the user. The device must not be tampered with and must not be changed in any way! Unauthorized opening of the device voids the warranty!

Notice!

It is important to attach the stick-on labels delivered with the device (notice signs)! If the signs could be covered due to the installation location of the ODSL 9, attach them close to the ODSL 9 so that it is not possible to look into the laser beam when reading the notices!
Large measurement range
- Reflection-independent distance information
- Highly insensitive to extraneous light
- IO-Link/OLED display and key pad for configuration
- Measurement value is indicated in mm on LC display
- Configurable measure mode and measurement range
- M12 turning connector

Adjustable measurement range:
50 ... 450 mm

18 - 30 V DC

Accessories:
(available separately)
- Mounting systems
- Cable with M12 connector (K-D ...
- IO-Link master set MD12-US2-IOL1 (50112085) and K-DS M12A-M12A-4P-2m-PVC cable (50110126)

Electrical connection

<table>
<thead>
<tr>
<th>DSDL 9/L-450-S12</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–30V DC +</td>
</tr>
<tr>
<td>Do not connect</td>
</tr>
<tr>
<td>GND</td>
</tr>
<tr>
<td>1/O–Link Data</td>
</tr>
<tr>
<td>Do not connect</td>
</tr>
</tbody>
</table>
Specifications

Optical data
Measurement range 1) 50 ... 450mm
Resolution 0.1mm
Light source laser
Wavelength 655nm
Light spot off divergent, 1x1mm² at 450mm
Max. output power 1.2mW
Pulse duration 22ms

Error limits (relative to measurement distance)
Absolute measurement accuracy 1) ± 1%
Repeatability 2) ± 0.5%
B/W detection thresh. (6 ... 90% rem.) ≤ 0.5%
Temperature compensation yes 3)

Timing
Measurement time 4) 2ms 1)
Response time ≤ 6ms
Delay before start-up ≤ 300ms

Electrical data
Operating voltage UB 18 ... 30V (incl. residual ripple)
Residual ripple ≤ 15% of UB
Open-circuit current ≤ 180mA

Sensor operating mode
IO-Link COM2 (38.4kBaud), Frame 2.2, Vers. 1.0, min. cycle time 2.2ms
SIO not supported

Indicators
Green LED continuous light ready no voltage
Yellow LED continuous light object within measurement range no object within measurement range

Mechanical data
Housing plastic
Optics cover glass
Weight approx. 50g
Connection type M12 connector, 5-pin

Environmental data
Ambient temp. (operation/storage) -20°C ... +50°C / -30°C ... +70°C
Protective circuit 5) 1, 2, 3
VDE safety class 6) II, all-insulated
Protection class IP 67
Laser class 2 (according to EN 60825-1 and 21 CFR 1040.10 with Laser Notice No. 50)
Standards applied IEC 60947-5-2

Order guide

<table>
<thead>
<tr>
<th>Designation</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO-Link interface</td>
<td>ODSL 9/L-450-S12</td>
</tr>
</tbody>
</table>

1) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of UB, measurement object ≥ 50x50mm²
2) Same object, identical environmental conditions, measurement object ≥ 50x50mm²
3) Typ. ± 0.02 %/K
4) Internal measurement time distance sensor
5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
6) Rating voltage 50VAC

Remarks
- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.
- Approved purpose:
This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.ctiautomation.net - Email: info@ctiautomation.net
## IO-Link process data

### Output data device

<table>
<thead>
<tr>
<th>Data bit</th>
<th>16 bit measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A15</td>
<td>A14</td>
</tr>
</tbody>
</table>

- 16 bit measurement value: distance
- 1 bit output resolution: 0.1 mm
- Signal too weak: 65535
- Laser error: 65533
IO-Link service data

Sensors with IO-Link interface can be configured and diagnosed via the service data.

Parameters

Measure mode

A measurement mode for adapting to the application task can be activated with this parameter.

There is a selection of four measurement modes (standard, precision, speed and light suppression). By selecting the mode, the following results are achieved:

- **Standard**: standard setting
- **Precision**: high accuracy, approx. 95% slower
- **Speed**: fast measurement, approx. 30% faster
- **Light suppression**: higher immunity against external light interference

The following table provides an overview of the effects of the individual parameters on the measurement function.

<table>
<thead>
<tr>
<th>Measure mode</th>
<th>Accuracy</th>
<th>Measurement time / update</th>
<th>Ambient light</th>
<th>Varying diffuse reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Precision</td>
<td>++</td>
<td>--</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Speed</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Light suppression</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>0</td>
</tr>
</tbody>
</table>

Measurement filter

A measurement filter for adapting to the application task can be activated with this parameter.

There is a selection of three options (off, averaging, center value). By selecting the filter, the following results are achieved:

- **Off**: no filtering of the measurement values.
- **Averaging**: a moving average from the last 2 ... 99 measurement values (setting of the number with **measurem. count**) is calculated and output. If the measurement value changes abruptly, the output value moves linearly over *n* measurements from the old to the new measurement value. The time until the measurement value is updated is therefore not affected by the number of measurements; the response time for distance changes slows down.
- **Center value**: filtering out of extreme values - the average is calculated from 10 ... 50 individual measurements. The number of individual measurements used for this purpose is selected via **measurem. count** (10, 20, 30, 40 or 50). The setting under **filter depth** specifies whether only the most extreme (coarse), the middle (medium) or the lowest deviations (fine) should be filtered out.

The following table provides an overview of the effects of the individual parameters on the measurement function.

<table>
<thead>
<tr>
<th></th>
<th>Updating measurement time</th>
<th>Response time for small change in distance</th>
<th>Response time for large change in distance</th>
<th>Filtering of individual faulty measurements</th>
<th>Filtering of cumulative faulty measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Averaging</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Center value</td>
<td>--</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>

Number of measurement values (averaging)

This parameter defines the number of individual measurements which are used for filtering.

Number of measurement values (center value)

This parameter defines the number of individual measurements which are used for filtering.

Filter depth (center value)

This parameter defines the filter gauge (medium, coarse, fine).

Display

This parameter determines the display setting on the sensor (on, off, auto).

Button lock

This parameter determines whether the key pad on the sensor is locked or activated.
System commands:

_Laser transmitter activation_
This system command switches on the laser transmitter.

_Laser transmitter deactivation_
This system command switches off the laser transmitter.
If the sensor is deactivated, the last measurement value detected is frozen. The state of the laser can be seen from the sensor status.

_Setting to factory setting_
This system command restores the factory settings of the sensor.

Diagnostics (observation)

_Signal too weak [process value 65535] or laser failure [process value 65533]_
Reception signal is not sufficient: either no object is in the measurement range or the signal from the object is too weak for detection. A displayed laser failure signalizes interference of the laser light source.

_Signal warning_
Low reception signal: the object is not detected reliably, e.g. because the signal from the object is very weak.

_Laser activation_
Status information on whether the laser transmitter is activated or deactivated.

_Measurement range sensor_
Status information on whether an object is located in the measurement range of the sensor.

---

Notice!
If parameters are changed on the device via the display and keyboard, the master is not signaled. In the event the master sends an explicit request, however, the changed value is available.

Notice!
Detailed information about the IO-Link service data and the IODD can be found at Leuze website.
Working safely

Attention Laser Radiation!

The ODSL 9 optical distance sensors operate with a red light laser of class 2 acc. to EN 60825-1. If you look into the beam path over a longer time period, the retina of your eye may be damaged!

Never look directly into the beam path! Do not point the laser beam of the ODSL 9 at persons!

When mounting and aligning the ODSL 9 take care to avoid reflections of the laser beam off reflective surfaces!

The use of operating and adjusting devices other than those specified in the technical description, carrying out of differing procedures, or improper use of the optical laser distance sensor may lead to dangerous exposure to radiation!

The use of optical instruments or devices in combination with the device increases the danger of eye damage!

Adhere to the applicable legal and local regulations regarding protection from laser beams acc. to EN 60825-1 in its latest version.

The ODSL 9 uses a laser diode with low power in the visible red light range with an emitted wavelength of about 655nm.

The glass lens cover is the only opening through which the laser radiation can escape from the device. The housing of the ODSL 9 is sealed and has no parts that need to be adjusted or maintained by the user. The device must not be tampered with and must not be changed in any way! Unauthorized opening of the device voids the warranty!

Notice!

It is important to attach the stick-on labels delivered with the device (notice signs)! If the signs could be covered due to the installation location of the ODSL 9, attach them close to the ODSL 9 so that it is not possible to look into the laser beam when reading the notices!
ODSL 9

Optical laser distance sensors

- Red light laser diode with laser class 1
- Large measurement range
- Reflection-independent distance information
- Measurement value is indicated in mm on LC display
- Configurable measurement mode
- Configurable measurement data preprocessing and filter
- Input (pin 2) for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- M12 turning connector

50 … 450 mm

18 - 30 V DC

Accessories:
- Mounting systems
- Configuration software
- Cable with M12 connector (K-D …)

Dimensioned drawing

- Reference edge for the measurement
- Optical axis
- Device plug M12
- Receiver
- Transmitter
- LCD display
- Indicator diode yellow
- Indicator diode green
- Control buttons

Electrical connection

<table>
<thead>
<tr>
<th>0DSL 9/C6.C1…</th>
<th>0DSL 9/V6.C1…</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 30V DC + In</td>
<td>18 - 30V DC + In</td>
</tr>
<tr>
<td>br/BN</td>
<td>br/BN</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>ws/WH</td>
<td>ws/WH</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>bl/BU</td>
<td>bl/BU</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>sw/BK</td>
<td>sw/BK</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4 - 20mA</td>
<td>1 - 10V</td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.ctiautomation.net - Email: info@ctiautomation.net
**Specifications**

**Optical data**
- Measurement range 1) 50 ... 450mm
- Resolution: 0.1mm
- Light source: laser
- Wavelength: 655nm
- Light spot: divergent, 1x1mm² at 450mm
- Laser warning notice: see remarks

**Measurement range 1)** Luminosity coefficient: 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of UB, measurement object \( \geq 50 \times 50 \text{mm}^2 \),

**Error limits (relative to measurement distance)**
- Absolute measurement accuracy 1) ± 1%
- Repeatability 2) ± 0.5%
- B/W detection thresh. (6 ... 90% rem.) ≤ 0.5%
- Temperature compensation: yes 3)

**Timing**
- Measurement time: 4ms 1)
- Response time: ≤ 12ms
- Delay before start-up: ≤ 300ms

**Electrical data**
- Operating voltage UB ...C6/V6: 18 ... 30VDC (incl. residual ripple)
- Residual ripple: ≤ 15% of UB
- Open-circuit current: ≤ 180mA
- Switching output: push-pull switching output 4), PNP light switching, NPN dark switching
- Signal voltage high/low: \( \geq (U_B - 2 \text{V})/2 \text{V} \)
- Analog output: voltage 1 ... 10V / 0 ... 10V / 1 ... 5V / 0 ... 5V, \( R_L \geq 2k\Omega \)
- B/W detection thresh. (6 ... 90% rem.): \( \leq 0.5\% \)

**Indicators**
- Green LED: continuous light ready, teaching procedure
- Yellow LED: continuous light teaching procedure

**Mechanical data**
- Housing: plastic
- Optics cover: glass
- Weight: approx. 50g
- Connection type: M12 connector, 5-pin

**Environmental data**
- Ambient temp. (operation/storage): -20°C ... +50°C / -30°C ... +70°C
- Protective circuit: 1, 2, 3
- VDE safety class: II, all-insulated
- Protection class: IP 67
- Laser class: 1 (acc. to EN 60825-1)
- Standards applied: IEC 60947-5-2

1) Luminosity coefficient 6% ... 90%, complete measurement range, "Standard" operating mode, at 20°C, medium range of UB, measurement object \( \geq 50 \times 50 \text{mm}^2 \)
2) Same object, identical environmental conditions, measurement object \( \geq 50 \times 50 \text{mm}^2 \)
3) Typ. ± 0.02 %/K
4) The push-pull switching outputs must not be connected in parallel
5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
6) Rating voltage 50VAC

**Order guide**

<table>
<thead>
<tr>
<th>Analog voltage output</th>
<th>Designation</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 teachable push/pull output</td>
<td>ODSL 9/6.C1-450-S12</td>
<td>50115029</td>
</tr>
</tbody>
</table>

**Tables**

<table>
<thead>
<tr>
<th>Teach-in on GND</th>
<th>Teach-in on +U_B</th>
</tr>
</thead>
<tbody>
<tr>
<td>continuous light</td>
<td>continuous light</td>
</tr>
<tr>
<td>flashing</td>
<td>flashing</td>
</tr>
<tr>
<td>off</td>
<td>off</td>
</tr>
</tbody>
</table>

**Remarks**

- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.
- Approved purpose: This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.
Analog output: characteristic curve for factory setting

A  Area not defined
B  Linearity not defined
C  Measurement range
D  Object present
E  No object detected
F  Measurement distance
Large measurement range
- Reflection-independent distance information
- Highly insensitive to extraneous light
- Measurement value is indicated in mm on LC display
- Configurable measurement mode
- Configurable measurement data preprocessing and filter
- Input (pin 2) for deactivating the laser, triggering, offset correction, reference measurement or teach-in
- M12 turning connector

Accessories:
- Mounting systems
- Configuration software
- Cable with M12 connector (K-D …)

Electrical connection

Dimensioned drawing
Specifications

Optical data
- Measurement range: 50 ... 650 mm
- Resolution: ≤ 0.1% of UB
- Wavelength: 655 nm
- Pulse duration: 22 ms
- Light spot: divergent, 1x1 mm² at 450 mm

Error limits (relative to measurement distance)
- Absolute measurement accuracy: ± 1%
- Repeatability: ± 0.5%
- B/W detection threshold: (6 ... 90% rem.) ≤ 0.5%
- Temperature compensation: yes

Timing
- Measurement time: 2 ms
- Response time: ≤ 6 ms
- Delay before start-up: ≤ 300 ms

Electrical data
- Operating voltage UB ...U 6/V 6: 18 ... 30 V DC (incl. residual ripple)
- Residual ripple: ≤ 15% of UB
- Open-circuit current: ≤ 180 mA
- Signal voltage high/low: voltage 1 ... 10 V / 0 ... 10 V / 1 ... 5 V / 0 ... 5 V, R L ≥ 2 kΩ
- Analog output: current 4 ... 20 mA, R L ≤ 500 Ω

Indicators
- Green LED: continuous light ready, teach-in on GND
- Yellow LED: continuous light flashing ready, off, teach-in on + UB

Mechanical data
- Housing: plastic
- Optics: cover glass
- Weight: approx. 50 g

Environmental data
- Ambient temp. (operation/storage): -20°C ... +50°C / -30°C ... +70°C
- Protective circuit: I, all-insulated
- VDE safety class: II
- Laser class: 2 (according to EN 60825-1 and 21 CFR 1040.10 with Laser Notice No. 50)

Standards applied
- IEC/EN 60947-5-2
- A: Area not defined
- B: Linearity not defined
- C: Measurement range
- D: Object present
- E: No object detected
- F: Measurement distance

Analog output: characteristic curve for factory setting

Order guide

<table>
<thead>
<tr>
<th>Analog current output, 1 teachable push/pull output</th>
<th>Designation</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODSL 9/C6-650-S12</td>
<td>ODSL 9/C6-650-S12</td>
<td>50113583</td>
</tr>
<tr>
<td>Analog voltage output, 1 teachable push/pull output</td>
<td>ODSL 9/V6-650-S12</td>
<td>50114627</td>
</tr>
</tbody>
</table>

Remarks

- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.
- Approved purpose: This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.
Large measurement range
Reflection-independent distance information
Configuration via PC/LC display and control buttons
Measurement value is indicated in mm on LC display
Configurable measure mode and measurement range
M12 turning connector input (pin 2) for deactivating the laser, triggering, offset correction, reference measurement or teach-in
M12 turning connector
Fieldbus connection (e.g. PROFINET, PROFIBUS, ...) with a MA2xx modular interfacing unit for ODSL 9/D26...

Accessories:
Mounting systems
Configuration software
Cable with M12 connector (K-D ...)
Connection cable for MA2xx (K-DS M12A-MA-5P-3m-S-PUR, Part no. 50115049)

Electrical connection

Dimensioned drawing

We reserve the right to make changes - DS_ODSL9450_en_50112185.fm

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Specifications

Optical data
Measurement range 1) 50 ... 450mm
Resolution 0.1 mm
Light source laser
Wavelength 655 nm
Light spot divergent, 1x1 mm² at 450 mm
Laser warning notice see remarks

Error limits (relative to measurement distance)
Absolute measurement accuracy 1) ± 1%
Repeatability 2) ± 0.5%
B/W detection thresh. (6 ... 90 % rem.) ± 0.5%
Temperature compensation yes 3)

Timing
Measurement time 2ms 1)
Response time ≤ 6 ms
Delay before start-up ≤ 300ms

Electrical data
Operating voltage UB ...C6/C66/V6/V66 18 ... 30VDC (incl. residual ripple)
Residual ripple ≤ 15 % of UB
Open-circuit current ≤ 180mA
Switching output push-pull switching output 4), PNP light switching, NPN dark switching
Signal voltage high/low voltage 1 ... 10V / 0 ... 10V / 1 ... 5V / 0 ... 5V, Rₑ ≥ 2kΩ
Analog output ...V6/V66 current 4 ... 20mA, Rₑ ≤ 500Ω
Serial interface ...D26/D36 RS 232/RS 485, 9600 ... 57600Bd,
Transmission protocol 14 bit, 16 bit, ASCII, Remote Control

Indicators
Green LED continuous light ready
Yellow LED continuous light fault
flashing teaching procedure
Teach-in on GND object inside teach-in measurement distance
Teach-in on +UB object outside teach-in measurement distance

Mechanical data
Housing plastic
Optics cover glass
Weight approx. 50g
Connection type M12 connector, 5-pin

Environmental data
Ambient temp. (operation/storage) -20°C ... +70°C / -30°C ... +70°C
VDE safety class 5) all-insulated
Protection class IP 67
Laser class 2 (according to EN 60825-1 and 21 CFR 1040.10 with Laser Notice No. 50)
 Standards applied IEC 60947-5-2

Order guide

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<tr>
<td>1 teachable push/pull output</td>
<td>ODSL 9/C6-450-S12</td>
<td>50111157</td>
</tr>
<tr>
<td>2 push/pull outputs</td>
<td>ODSL 9/C66-450-S12</td>
<td>50111161</td>
</tr>
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<td>50111158</td>
</tr>
<tr>
<td>2 push/pull outputs</td>
<td>ODSL 9/V66-450-S12</td>
<td>50111162</td>
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<tr>
<th>Serial digital output</th>
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<th>Part No.</th>
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</thead>
<tbody>
<tr>
<td>RS 232, 1 push/pull output</td>
<td>ODSL 9/D26-450-S12</td>
<td>50111159</td>
</tr>
<tr>
<td>RS 485, 1 push/pull output</td>
<td>ODSL 9/D36-450-S12</td>
<td>50111160</td>
</tr>
</tbody>
</table>

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<tr>
<th>Only switching outputs</th>
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<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 teachable push/pull outputs</td>
<td>ODSL 9/66-450-S12</td>
<td>50111163</td>
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Remarks

- Measurement time depends on the reflectivity of the measurement object and on the measurement mode.
- Approved purpose: This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

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Analog output: characteristic curve for factory setting

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

Starting at approx. 650mm, measurement value “0” is displayed and 0V is output at the analog output.

Serial output: transmission protocol for factory setting

9600Bd, 1 start bit, 8 data bits, 1 stop bit, transmission protocol ASCII measurement values

Transmission format: MMMMM<CR>

MMMM = 5-digit measurement value in mm (resolution 0.1 mm)
<CR> = ASCII character “Carriage Return” (x0D)

Operation of ODSL 9/D26… with MA2xxi modular interfacing unit

Set S4 rotary switch for device selection in MA 2xxi to switch position “B” (AMS) (see MA 2xxi Technical description).

Set the serial interface of the ODSL 9/D26… to:
- ASCII (factory setting)
- Baud rate: 38400Bd (see ODSL 9 Technical description…)

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