DISTANCE SENSORS
Precise and unmatched in speed even at long distances

www.leuze.com
THE ONE STANDARD HERE IS TOP QUALITY

How one measures distances today – fast and with absolute precision.

YOUR YARDSTICK

Independent of their operating principle – triangulation, time of flight (TOF) or phase measurement – optical distance sensors from Leuze electronic stand for high accuracy with a resolution of up to 0.01 mm. And specific light spots enable the reliable measurement of small parts, measurement over large operating ranges or even the measurement of objects with openings.

Selectable measurement modes – fast, standard, precise – facilitate fast adaptation to special applications. With degrees of protection IP 67 or IP 69K, the devices are very robust and work reliably at temperatures from 40°C to +50°C.

All sensors are characterized by simple operation with measurement value visualization on the display or a teach-in process. And, because even the best device is only as good as its connection options, the distance sensors from Leuze electronic offer modern interfaces for integration in all established control and field-bus environments.
The most important advantages at a glance

Our distance sensors stand for maximum accuracy – over small as well as large distances. They are used everywhere geometric parameters such as height or width need to be determined. They are characterized by high resolving capacity at high measurement rates.

**think modular.**
- Selectable measurement mode – Fast, standard or precision for application adaptation
- Range of interfaces – Analog, IO-Link, gateways for fieldbuses
- Three selectable measurement principles
- Various light-spot geometries

**easy handling.**
- Plain-text display – Easy-to-comprehend display of the measurement values
- Flexible installation – M12 turning connector with selectable cable outlet direction
- Short-stroke keys – Sensor configuration with graphical menu

**power reserve.**
- Precise laser measurement – Resolution up to 0.01 mm with exact factory calibration
- Large measurement range: 20 – 65,000 mm with compact design
THREE PRINCIPLES, ONE ADVANTAGE – THE HIGHEST PRECISION

**TRIANGULATION**
Distance measuring procedure, which determines the distance of an object by the incidence angle of the light reflected from the object.

**Products:**
- ODSL 8, ODSL 9, ODS 96B, ODSL 96B

**Benefits:**
- High precision at short range
- Resolution capability of up to 0.01 mm for short distances
- Ideal for measuring small parts and small structures and quickly moving objects

**Industries:**
- Conveyor and storage systems
- Packaging systems
- Mounting / handling technology
- Wood working industry

**TIME OF FLIGHT (TOF)**
Distance measurement procedure, which determines the distance to an object by the propagation time of a light pulse emitted by the transmitter and reflected from the object.

**Products:**
- ODSL 96B, ODSL 96B, ODKL 96B

**Benefits:**
- Large operating ranges
- Robust measurement procedure
- Maximum insensitivity to ambient light
- Accurate measurement results on all surfaces (also glossy, textured...)

**Industries:**
- Conveyor and storage systems
- Packaging systems
- Wood working industry

**PHASE MEASUREMENT**
Distance measurement procedure, which determines the distance of an object by the shift of the phase angle of the light reflected from the object.

**Products:**
- ODSL 30

**Benefits:**
- Large operating ranges
- Operating range up to 30 m on black surfaces
- Maximum accuracy through integrated sensor referencing

**Industries:**
- Conveyor and storage systems
- Automotive industry
- Wood working industry

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<table>
<thead>
<tr>
<th>Triangulation</th>
<th>Distance range</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODSL 8</td>
<td>20–500 mm</td>
<td>0.03/0.1 mm</td>
</tr>
<tr>
<td>ODSL 9</td>
<td>50–650 mm</td>
<td>0.01/0.1 mm</td>
</tr>
<tr>
<td>ODS 96B</td>
<td>60–2,000 mm</td>
<td>0.1/1 mm</td>
</tr>
<tr>
<td>ODSL 96B</td>
<td>300–25,000 mm</td>
<td>3 mm</td>
</tr>
<tr>
<td>ODSK 96B</td>
<td>200–65,000 mm</td>
<td>1 mm</td>
</tr>
</tbody>
</table>
ANALOG INTERFACES: CURRENT / VOLTAGE

The industrial, standard design for distance sensors. Leuze electronic distance sensors are characterized by highly accurate digital-analog converters. The analog interface is comfortably configured via a display or by teach-in.

DIGITAL INTERFACES

Experts agree – the future belongs to digital interfaces. Digital interfaces prevent conversion losses in the sensor, control and during measurement data transfer. Distance sensors from Leuze electronic demonstrate their true potential for precision with digital interfaces.

Serial interfaces have long been established for operation on controls and PCs. The RS485 interface facilitates address assignment and, thus, operation of up to 15 distance sensors on one interface.

IO-Link is the most economical solution for digital measurement data transfer and the PLC configuration of optical distance sensors. Through the use of conventional, 3-pin, M12-cables, wiring work is kept to a minimum. Commissioning for the user is about as easy as with an analog interface. In addition, IO-Link makes it easy to access the fieldbus via a master.

ODSL 9, ODSL 96B, ODKL 96B or ODSL 30 with RS232 are connected to MA 2xx gateways with M12 connection technology. Gateways from the MA 2xx family are modular connection units which allow for simple and comfortable access to Ethernet, EtherNet IP and DeviceNet as well as PROFINET networks.

FIELDBUS AND ETHERNET WITH MODULAR INTERFACING UNITS

RS 232 / fieldbus gateway

Fieldbus / IO-Link master
TRIANGULATION PRINCIPLE

**Focused**

**ODSL 8 with small light spot**

- Measurement range: 25 – 45 mm / 20 – 200 mm
- Light spot dimensions: 1 × 1 mm
- Resolution: 0.03 – 0.1 mm
- Measurement time: 2 – 7 ms
- Operation: Rotary switch for teach-in
- Output: Analog current / voltage

- For position and height measurement of small components or objects
- Robust design in metal housing
- Fast commissioning by means of teach-in

**Robust**

**ODSL 8 with large light spot**

- Measurement range: 20 – 500 mm
- Light spot dimensions: 1 × 6 mm
- Resolution: 0.1 mm
- Measurement time: 2 – 7 ms
- Operation: Rotary switch for teach-in
- Output: Analog current / voltage

- For measuring larger objects
- Large temperature range: -40 °C bis +50 °C
- Robust: IP 67, IP 69K

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Variant monitoring

Width measurement of dough
### Precise

**ODSL 9 High Resolution**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range</td>
<td>50 – 100 mm</td>
</tr>
<tr>
<td>Light spot dimensions</td>
<td>1 x 1 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>Measurement time</td>
<td>2 ms</td>
</tr>
<tr>
<td>Operation</td>
<td>Display, PC, IO-Link</td>
</tr>
<tr>
<td>Output</td>
<td>Analog current / voltage,</td>
</tr>
<tr>
<td></td>
<td>IO-Link, RS232 / 485</td>
</tr>
</tbody>
</table>

- For quality control on assembly lines
- Contour measurement of moving objects

### Fast

**ODSL 9**

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<tr>
<td>Measurement range</td>
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<tr>
<td>Light spot dimensions</td>
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<tr>
<td>Resolution</td>
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- For the positioning of actuators and robots
- Height and width measurement as well as determination of diameter

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- Assembly inspection
- Width measurement of timber
TRIANGULATION PRINCIPLE

IDEAL FOR GLOSSY AND STRUCTURED SURFACES
ODSL 96B “S”

<table>
<thead>
<tr>
<th>Specification</th>
<th>Measurement range:</th>
<th>Light spot dimensions:</th>
<th>Resolution:</th>
<th>Measurement time:</th>
<th>Operation:</th>
<th>Output:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range:</td>
<td>150 – 800 mm</td>
<td>1 × 1 mm</td>
<td>0.1 mm</td>
<td>1 – 5 ms</td>
<td>Display, PC</td>
<td>Analog current / voltage, RS232/485</td>
</tr>
</tbody>
</table>

- Small laser light spot for the precise measurement onto small objects, metallic surfaces or objects with color structures

IDEAL FOR OBJECTS WITH OPENINGS
ODSL 96B “XL”

<table>
<thead>
<tr>
<th>Specification</th>
<th>Measurement range:</th>
<th>Light spot dimensions:</th>
<th>Resolution:</th>
<th>Measurement time:</th>
<th>Operation:</th>
<th>Output:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range:</td>
<td>150 – 1,200 mm</td>
<td>15 × 4 mm (for 800 mm)</td>
<td>0.1 mm</td>
<td>1 – 5 ms</td>
<td>Display, PC, IO-Link</td>
<td>Analog current / voltage,</td>
</tr>
</tbody>
</table>

- Elongated light spot for precise measurements on porous objects and objects with openings (e.g. corrugated cardboard) as well as on objects that are not aligned precisely

Robot arm positioning

Lateral stack positioning
**ROBUST**

**ODSL 96B with LED**

- Measurement range: 100 – 1,400 mm
- Light spot dimensions: 15 × 15 mm
- Resolution: 0.1 mm
- Measurement time: 1 – 5 ms
- Operation: Display, PC
- Output: Analog current / voltage

- For measurements on objects with large surface area, e.g. bulk material, band materials, plate materials
- **brightVision®,** very bright light spot with red-light LED, indicator diodes visible from all sides

**UNIVERSAL**

**ODSL 96B**

- Measurement range: 60 – 2,000 mm
- Light spot dimensions: 2 × 6 mm
- Resolution: 1 mm
- Measurement time: 1 – 5 ms
- Operation: Display, PC, IO-Link
- Output: Analog current / voltage, IO-Link, RS232 / 485

- For measurements in ms cycle at large operating ranges
- Stable and precise measurement values, even at varying temperatures and object variations
PULSE PROPAGATION TIME MEASUREMENT

FOR MEASUREMENTS ON OBJECTS UP TO 10 M
ODSL 96B

- Measurement range: 300 – 10,000 mm
- Light spot dimensions: 7 × 7 mm
- Resolution: 3 mm
- Adjustable measurement time: 1.4 – 50 ms
- Operation: Display, PC, IO-Link
- Output: Analog current / voltage, IO-Link, RS232 / 485

- Large operating range even with dark objects
- Operating modes for fast or precise measurement

WITHOUT VISIBLE LASER BEAM
ODSL 96B

- Measurement range: 300 – 10,000 mm
- Light spot dimensions: 7 × 7 mm
- Resolution: 3 mm
- Adjustable measurement time: 2.8 – 100 ms
- Operation: Display, PC
- Output: Analog current / voltage,

- Infrared laser with improved measurement behavior on dark objects
- Invisible measurement beam, no influence by people
- Integrated red-light laser alignment aid

Sag control of band materials
Stack height measurement
MEASUREMENTS ON REFLECTIVE TAPE, UP TO 25 M

**ODKL 96B**

- Measurement range: 300 – 25,000 mm
- Light spot dimensions: 7 × 7 mm
- Resolution: 3 mm
- Adjustable measurement time: 1.4 – 50 ms
- Operation: Display, PC, IO-Link
- Output: Analog current / voltage, IO-Link, RS232 / 485

- Fast and easy alignment due to well visible laser light spot
- Large operating range in compact construction

**FAR AND HIGHLY ACCURATE**

**ODSL 30**

- Measurement range: 200 – 65,000 mm
- Light spot dimensions: 6 × 6 mm
- Resolution: 1 mm
- Adjustable measurement time: 30 – 100 ms
- Operation: Display
- Output: Analog current / voltage, IO-Link, RS232 / 485

- Operating range of up to 30 m on black surfaces, up to 65 m for light objects
- Integrated sensor referencing enables highly accurate measurement (±2 mm) over long distances

Positioning of side-tracking skates

Crane positioning
Switching Sensors
Optical Sensors
Ultrasonic Sensors
Fiber Optic Sensors
Inductive Switches
Forked Sensors
Light Curtains
Special Sensors

Measuring Sensors
Distance Sensors
Sensors for Positioning
3D Sensors
Light Curtains
Forked Sensors

Products for Safety at Work
Optoelectronic Safety Sensors
Safe Locking Devices, Switches and Proximity Sensors
Safe Control Components
Machine Safety Services

Identification
Bar Code Identification
2D-Code Identification
RF Identification

Data Transmission/
Control Components
MA modular connection units
Data Transmission
Safe Control Components
Signaling Devices
Connection Technology and Passive Distribution Boxes

Industrial Image Processing
Light Section Sensors
Smart Camera

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