**MICRO-EPSILON**

More Precision

**optoNCDT** // Laser displacement sensors (triangulation)

# Powerful laser sensors for special applications
## optoNCDT 17x0 / optoNCDT 1910

| | |
|---|---|
| (Hz) | Adjustable measuring rate up to 10 kHz |
| INTER FACE | Analog (U/I) / RS422 / PROFINET / EtherNet/IP |
| RTSC | Fast surface compensation |
| | High repeatability |
| | Ideal for large measurement distances |

The optoNCDT 1910 and 1750 series laser sensors are designed for fast and precise measurements in industrial applications. The models are used for demanding surfaces and impress in measurements where large distances are required. Innovative evaluation algorithms and improved components enable high accuracy and dynamics. The high-performance optical system generates a small light spot onto the target which enables the detection of even the smallest of components reliably. The pigtail cable in conjunction with the internal controller reduces the installation effort for the sensors to a minimum.

### The intelligent exposure control for demanding surfaces
The optoNCDT 1750 sensors feature real-time surface compensation. The real-time surface compensation feature (RTSC) determines the amount of reflection from the target surface during continuous exposure and in real-time. The exposure time or the amount of light produced by the laser is optimally matched to the reflection characteristics of the target surface. This enables extremely reliable measurements even on reflecting surfaces. The optoNCDT 1910 sensors use Advanced Surface Compensation and are also highly resistant to ambient light.

### Ideal for industrial applications
Different output signals enable the integration of the sensor into plant and machine control systems. As well as analog voltage and current outputs, a digital interface provides distance information from the sensor. Due to the universal setting and evaluation possibilities, the sensors meet all the requirements for use in industrial applications.
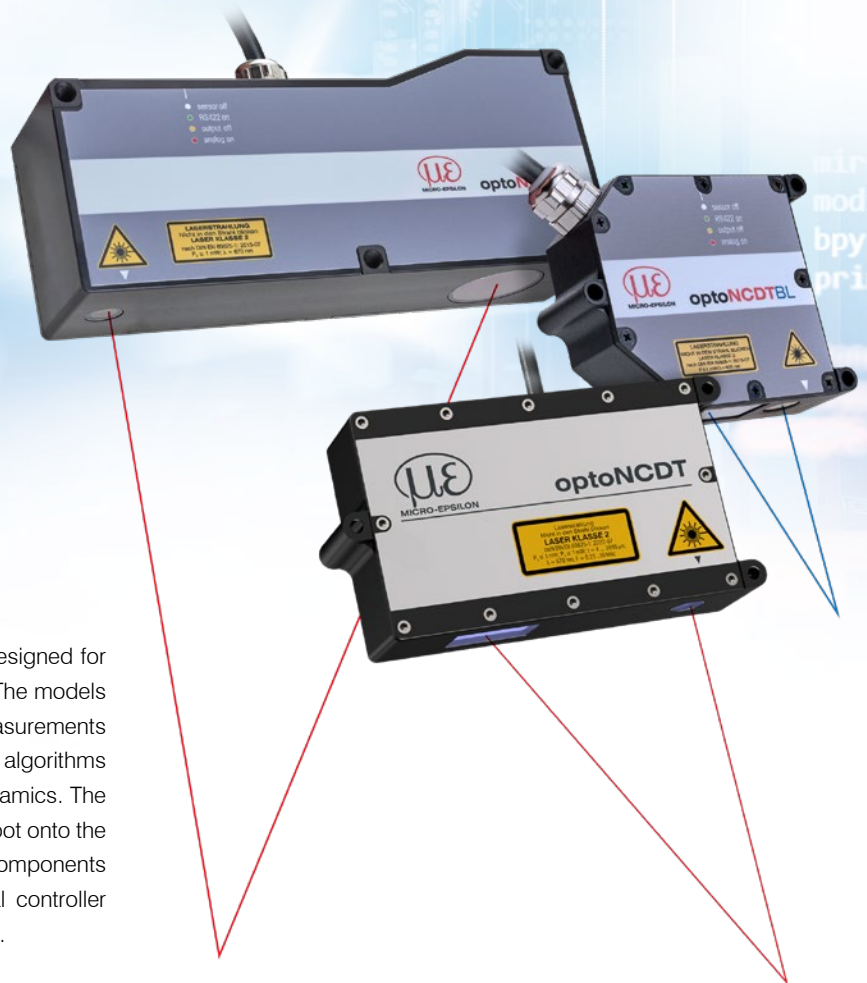
| Model | Technology | Measuring range | Repeatability | Linearity |
|---|---|---|---|---|
| optoNCDT 1750BL | | 2 - 750 mm | 0.8 $\mu m$ | from 0.06 % |
| optoNCDT 1750-DR | | 2 - 20 mm | 0.1 $\mu m$ | 0.08 % |
| optoNCDT 1760 | | 1000 mm | from 7.5 $\mu m$ | 0.10 % |
| optoNCDT 1910 | | 500 / 750 mm | from 20 $\mu m$ | 0.07 % |

**Large distance and large measuring range**

The optoNCDT long-range models are used to cover a large measuring range or to measure from a large distance to the target. The long-range laser sensors combine high accuracy and large measuring distances.
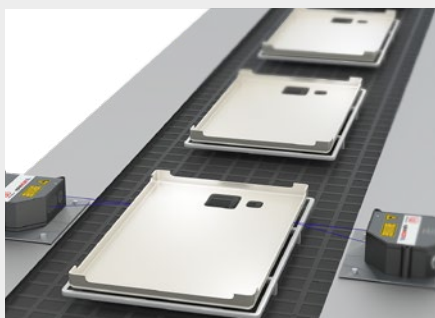
**Measurement distances up to 2 m**
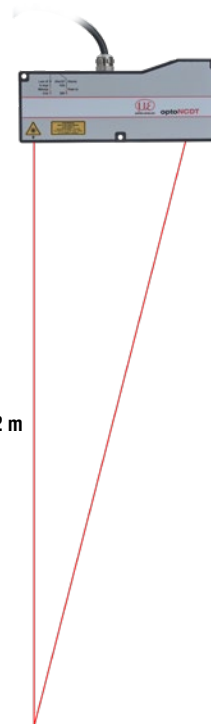
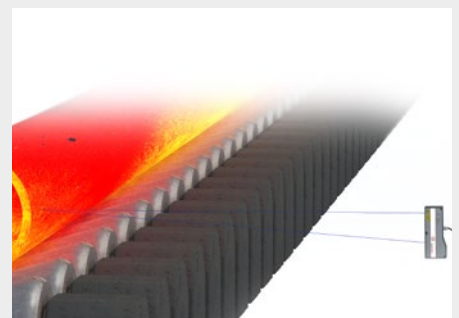## Application examples



Geometry testing of reflective glass parts



Position check of plastic components



Position measurement of red-hot glowing pipes

# Technical data
## optoNCDT 17x0 Laser sensors for large measuring ranges

### Long-Range - optoNCDT 1760

| Model | ILD1760-1000 |
|---|---|
| Measuring range | 1 000 mm |
| Start of measuring range | 1 000 mm |
| Mid of measuring range | 1 500 mm |
| End of measuring range | 2 000 mm |
| Measuring rate [1] | 6 adjustable stages: 7.5 kHz / 5 kHz / 2.5 kHz / 1.25 kHz / 625 Hz / 300 Hz |
| Linearity [2] | < ±1000 μm |
| | < ±0.1 % FSO |
| Repeatability [3] | 100 μm |
| Light spot diameter [4] — SMR | |
| Light spot diameter [4] — MMR | 2500 … 5000 μm |
| Light spot diameter [4] — EMR | |
| Light source | Semiconductor laser < 1 mW, 670 nm (red) |
| Laser class | Class 2 in accordance with DIN EN 60825-1: 2022-07 |
| Permissible ambient light | 10,000 lx |
| Supply voltage | 11 … 30 VDC |
| Max. current consumption | 150 mA (24 V) |
| Signal input | 1 x HTL/TTL laser on/off; 1 x HTL/TTL multi-function input: trigger in, slave in, zero setting, mastering, teach-in; 1 x RS422 synchronization input: trigger in, sync in, master/slave, master/slave alternating |
| Digital interface [5] | RS422 (16 bit) / EtherCAT / PROFINET / EtherNet/IP |
| Analog output | 4 ... 20 mA / 0 … 5 V / 0 … 10 V (16 bit, freely scalable within the measuring range) |
| Switching output | 2x switching outputs (error & limit value): npn, pnp, push pull |
| Connection | integrated pigtail 0.25 m with 14-pin ODU connector, min. bending radius 30 mm when firmly installed; optional extension to 3 m / 10 m possible (see accessories for suitable connection cables) |
| Installation | Screw connection via three mounting holes |
| Temperature range — Storage | -20 … +70 °C (non-condensing) |
| Temperature range — Operation | 0 … +50 °C (non-condensing) |
| Shock (DIN EN 60068-2-27) | 15 g / 6 ms in 3 axes |
| Vibration (DIN EN 60068-2-6) | 2 g / 20 … 500 Hz |
| Protection class (DIN EN 60529) | IP65 |
| Material | Aluminum housing |
| Weight | approx. 800 g (incl. pigtail) |
| Control and indicator elements [6] | Select & function keys: interface selections, mastering (zero), teach, presets, quality slider, frequency selection, factory settings; web interface for setup: application-specific presets, peak selection, video signal, freely selectable averaging possibilities, data reduction, setup management 2 x color LEDs for power / status |

[1] Factory setting 5 kHz, modifying the factory setting requires the IF2001/USB converter (see accessories)
[2] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)
[3] Measuring rate 5 kHz, median 9
[4] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range
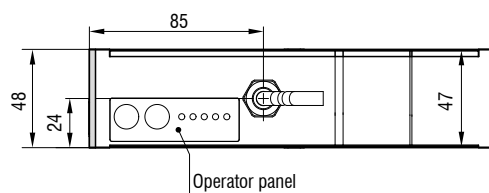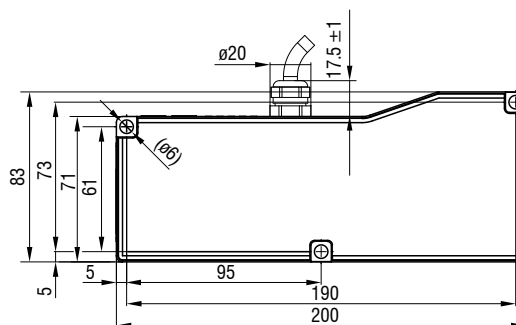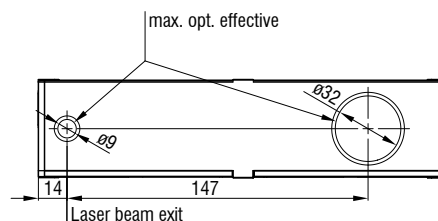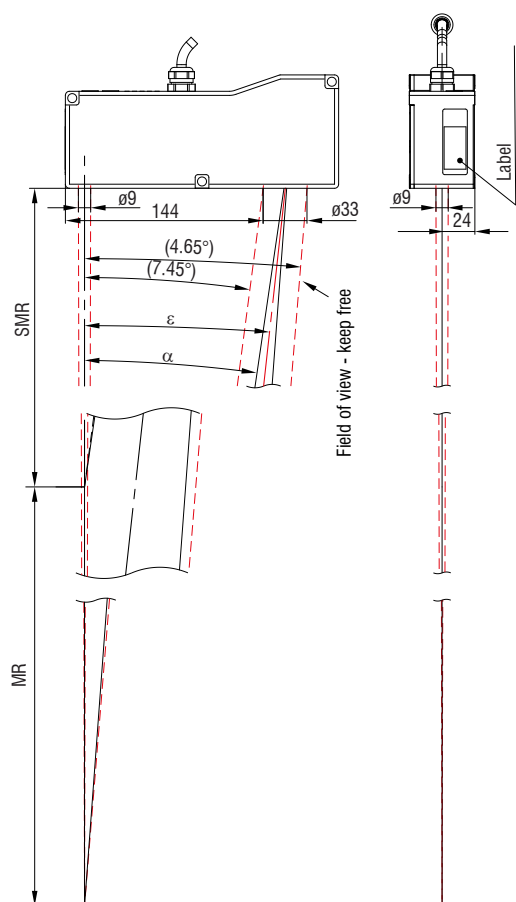[5] EtherCAT, PROFINET and EtherNet/IP require connection via interface module (see accessories)
[6] Access to web interface requires connection to PC via IF2001/USB  (see accessories)
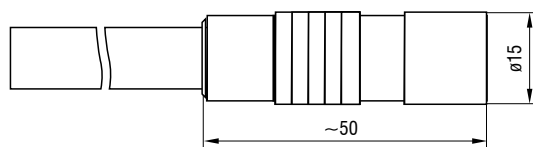
# Dimensions
## optoNCDT 17x0

### optoNCDT 1760-1000



| MR | SMR | α | ε |
|------|------|--------|--------|
| 1000 | 1000 | 7.45 ° | 4.65 ° |

**Connector (sensor side)**



(Dimensions in mm, not to scale)
MR = measuring range; SMR = start of measuring range,
MMR = Mid of measuring range, EMR = end of measuring range

## optoNCDT 1750 / 1760

### Drag-chain suitable extension and adapter cables

Cable diameter:      6.8 ±0.2 mm
Drag chain:          yes
Robot:               no
Temperature range:   -40 … 90 °C (moving /not moving)
Bending radius:      > 55 mm (fixed installation / dynamic / drag chain)

| Sensor | Cables | Type | | Connection possibilities and accessories | |
|---|---|---|---|---|---|
| ILD1750-xxBL ILD1750-xxDR ILD1760-1000 | **Extension cable pigtail** Length 3 m / 6 m / 9 m / 15 m | Open ends | | **Supply voltage connection** Power supply unit PS2020 | |
| | *Art. no.*      *Designation* 2901189       PC1700-3 2901357       PC1700-6 2901191       PC1700-10 2901266       PC1700-15 | | | **Interface module of RS422 to USB** IF2001/USB IC2001/USB | |
| | | | | **Interface module for Industrial Ethernet connection** IF2035-PROFINET IF2035-EIP IF2035-EtherCAT | |
| | **Adapter cable for PC interface card** Length 3 m / 6 m | Sub-D | | **Interface card for synchronous data acquisition** IF2008PCIe / IF2008E | |
| | *Art. no.*      *Designation* 2901555       PC1700-3/IF2008 2901556       PC1700-6/IF2008 2901557       PC1700-8/IF2008 | | | **4-fold USB converter** IF2004/USB | |
| | **Adapter cable for sensor calculation** Length 3 m / 6 m / 9 m | Sub-D | | **Controller for D/A conversion and evaluation of up to 2 sensor signals** Dual Processing Unit | |
| | *Art. no.*      *Designation* 29011173      PC1750-3/C-Box 29011180      PC1750-6/C-Box 29011181      PC1750-9/C-Box | | | | |

### Robot-suitable extension cables

Cable diameter:      max. 9 mm
Drag chain:          no
Robot:               yes
Temperature range:   -40 … 70 °C (moving / not moving)
Bending radius:      110 mm (dynamic)

| Sensor | Cables | Type | | Connection possibilities and accessories | |
|---|---|---|---|---|---|
| ILD1750-xxBL ILD1750-xxDR ILD1760-1000 | **Extension cable pigtail:** Length 3 m / 6 m / 9 m / 15 m | Open ends | | **Connection supply voltage** PS2020 | |
| | *Art. no.*      *Designation* 2901494       PCR1700-5 2901299       PCR1700-10 | | | **Interface module from RS422 to USB** IF2001/USB IC2001/USB | |
| | | | | **Interface module for Industrial Ethernet connection** IF2035-PROFINET IF2035-EIP IF2035-EtherCAT | |

## Extension cables for high temperatures

| | |
|---|---|
| Cable diameter: | max. 7.5 mm |
| Drag chain: | no |
| Robot: | no |
| Temperature range: | -55 … 250 °C (moving) |
| | -90 … 250 °C (not moving) |
| Bending radius: | > 40 mm (fixed installation) |
| | > 75 mm (dynamic) |

| Sensor | Cables | Type |
|---|---|---|
| ILD1750-xxBL<br>ILD1750-xxDR<br><br>ILD1760-1000 | **Extension cables high temperatures**<br>Length 3 m / 6 m / 9 m / 15 m<br><br>*Art. no.*    *Designation*<br>29011091    PC1700-3/OE/HT<br>29011092    PC1700-6/OE/HT<br>29011094    PC1700-15/OE/HT | Open ends |

| Connection possibilities and accessories | |
|---|---|
| **Supply voltage connection**<br>Power supply unit PS2020 | |
| **Interface module of RS422 to USB**<br>IF2001/USB | |
| **Interface module for Industrial Ethernet connection**<br>IF2035-PROFINET<br>IF2035-EIP<br>IF2035-EtherCAT | |

## Other cables

| | |
|---|---|
| Cable diameter: | 6.7 mm |
| Drag chain: | yes |
| Robot: | no |
| Temperature range: | -40 … 80 °C |
| Bending radius: | > 27 mm (fixed installation) |
| | > 51 mm (dynamic) |

| Input | Cables | Type |
|---|---|---|
| 2 x Sub-D<br><br>(PC1700-x/<br>IF2008) | **Adapter cables for 4-fold sensor connection**<br>Length 0.1 m<br><br>*Art. no.*    *Designation*<br>2901528    IF2008-Y-adapter cable | Sub-D |

| Connection possibilities and accessories | |
|---|---|
| **Interface card for synchronous data acquisition**<br>IF2008PCIe / IF2008E | |
| **4-fold USB converter & parameter setting**<br>IF2004/USB | |

# optoNCDT 1910

see Connection possibilities optoNCDT 1900 on pg. 32.

## sensorTOOL

The Micro-Epsilon sensorTOOL is a powerful software that is used to operate one or more optoNCDT sensors. The sensorTOOL can be used to access the sensor connected to the PC, display its complete data stream and save it in a file (in Excel-compatible CSV format). The sensor is configured via its web interface.
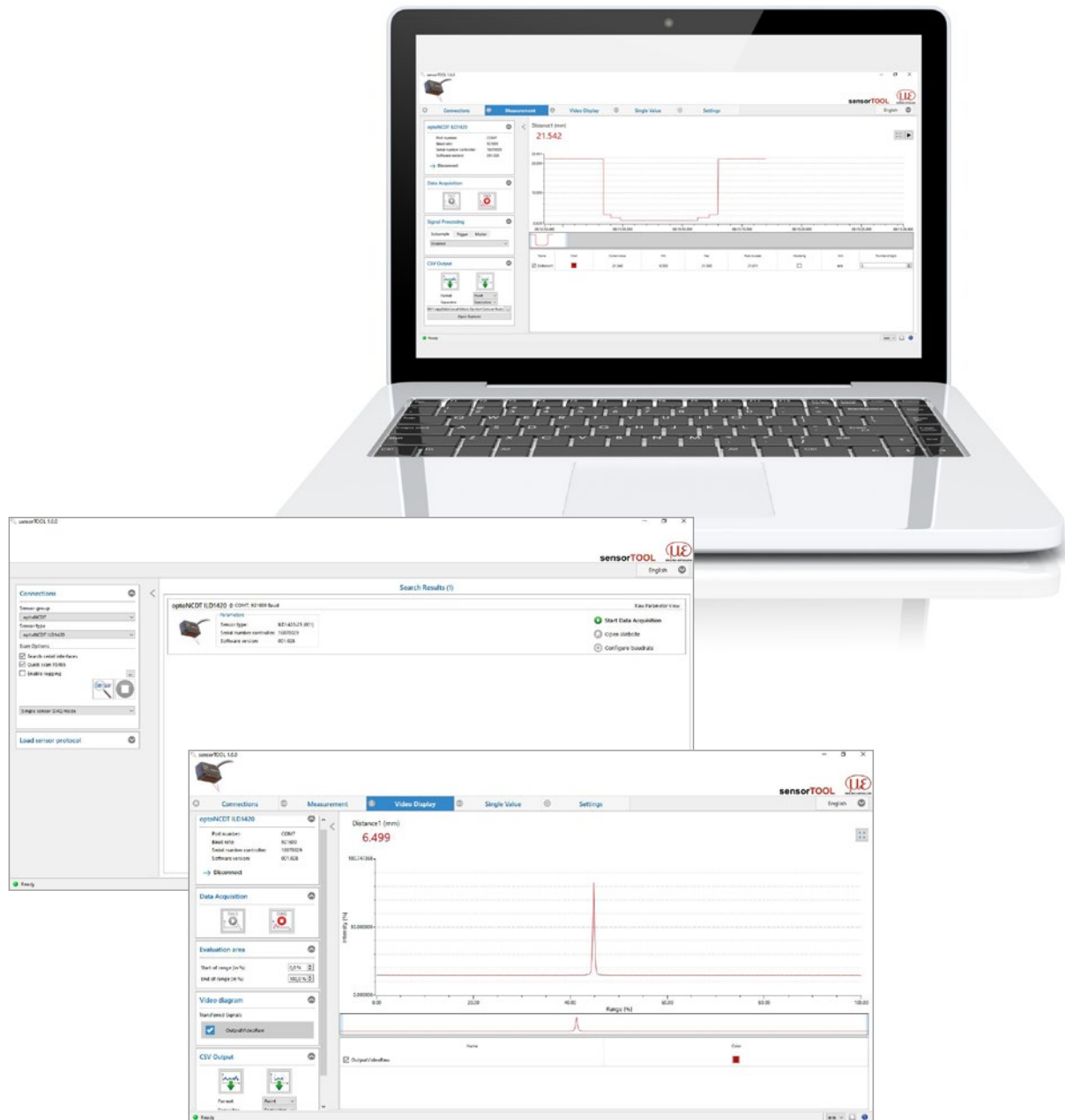


### Free download

All software tools, drivers and documented driver DLL for easy integration of the sensors into existing or internally-generated software are available free of charge under www.micro-epsilon.de/download

# Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



Measuring and inspection systems for metal strips, plastics and rubber



Optical micrometers and fiber optics, measuring and test amplifiers



Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection