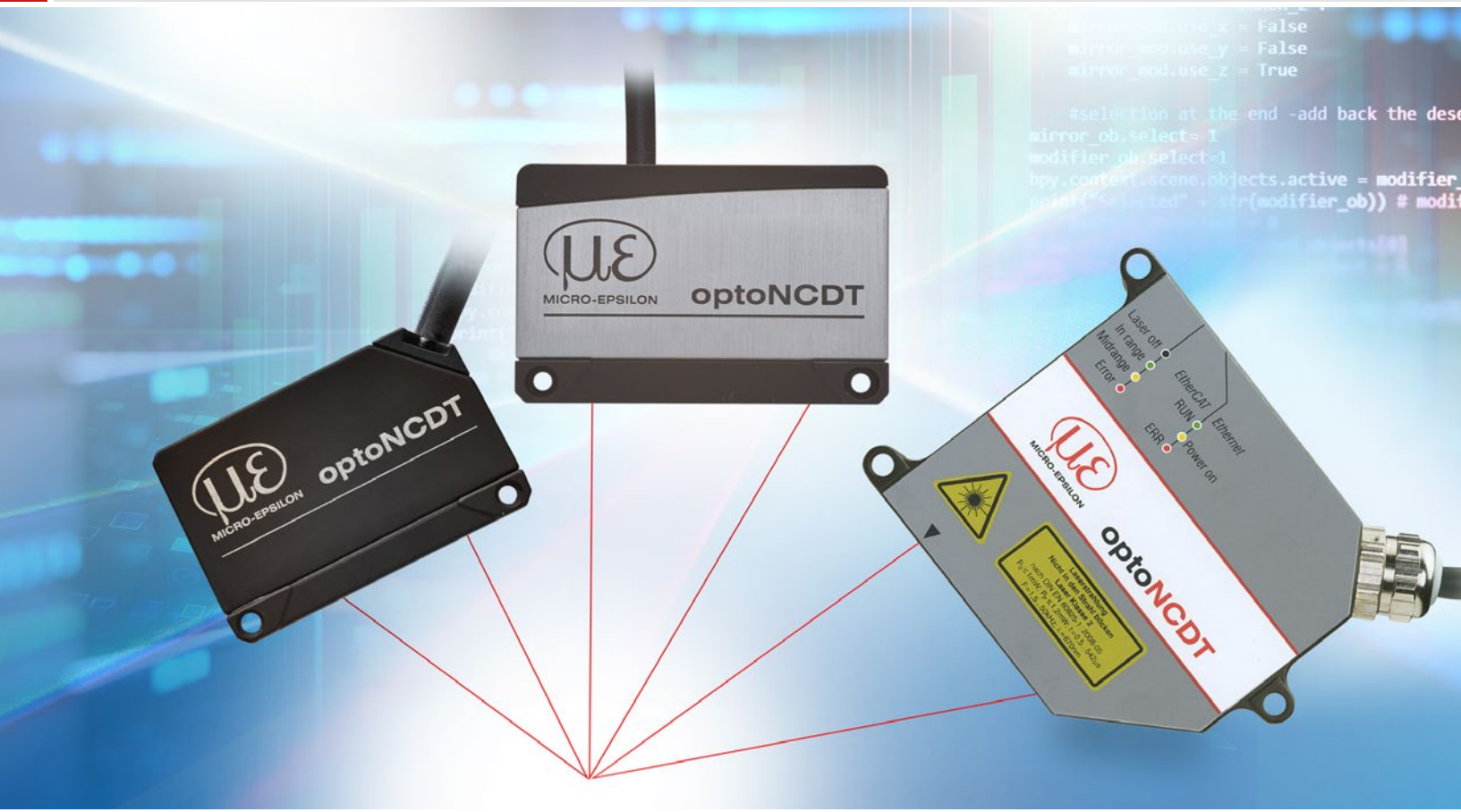









More Precision

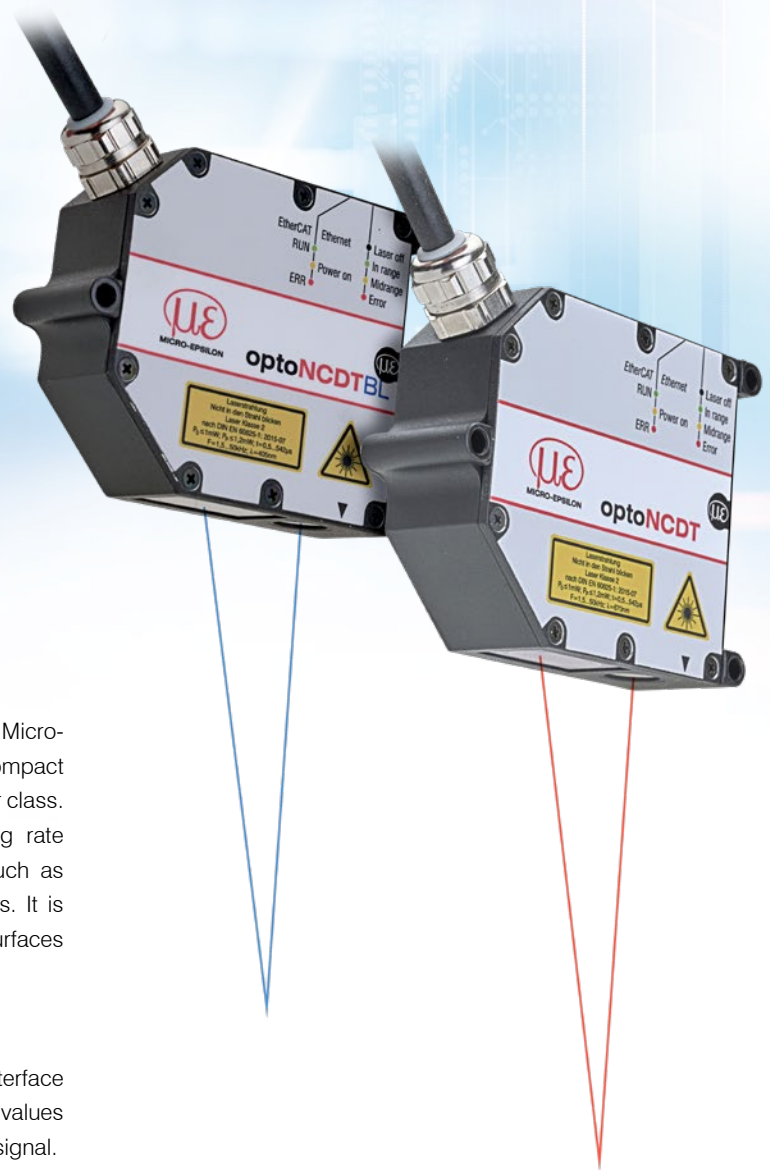
optoNCDT // Laser displacement sensors (triangulation)



Highly dynamic laser sensors with high precision

optoNCDT 2300

-  For common surfaces
-  Adjustable measuring rate up to 49.14 kHz
- INTERFACE** Analog (U/I) / RS422 / Ethernet / EtherCAT / PROFINET / EtherNet/IP
-  **A-RTSC** Advanced Real Time Surface Compensation
-  Resolution 0.03 μm
-  For diffuse and reflective surfaces








The optoNCDT 2300 sensors form the high-end segment of Micro-Epsilon laser sensors. The entire electronics is integrated in a compact sensor housing which is a worldwide unique feature of this sensor class. The high-precision laser sensor has an adjustable measuring rate of 49.14 kHz and is used for particularly fast applications, such as monitoring vibrations or measurements on challenging surfaces. It is used on diffuse reflective surfaces and for directly reflecting surfaces when equipped with the special alignment feature.

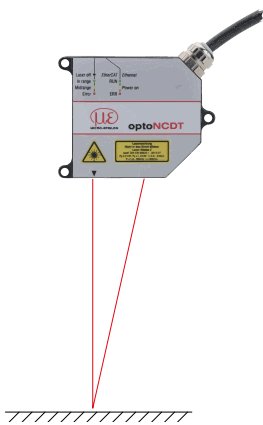
User-friendly web interface for easy operation

The optoNCDT 2300 laser sensors can be operated via a web interface which offers multiple possibilities in order to process measured values and signals, e.g., peak selection, filter and masking of the video signal.

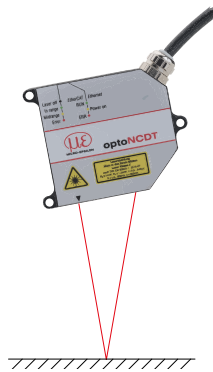
Fast exposure control for demanding surfaces

The new A-RTSC (Advanced Real Time Surface Compensation) feature is a development based on the proven RTSC technology and, with its improved dynamic range, enables more precise real time surface compensation during the measurement process. This means the sensor is not influenced by rapidly changing surface reflections and provides stable measurement results.

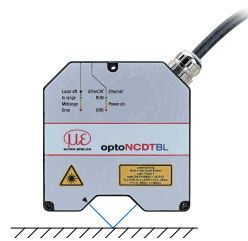
| Model | Technology | Measuring range | Repeatability | Linearity |
|-------------------|---|-----------------|--------------------|-------------|
| optoNCDT 2300 |  | 2 - 300 mm | 0.03 μm | from 0.02 % |
| optoNCDT 2300BL |  | 2 - 50 mm | 0.03 μm | from 0.02 % |
| optoNCDT 2300LL |  | 2 - 50 mm | 0.1 μm | from 0.02 % |
| optoNCDT 2300-2DR |  | 2 mm | 0.03 μm | from 0.03 % |
| optoNCDT 2310 |  | 10 - 50 mm | 0.5 μm | from 0.03 % |



Distance measurement on diffuse reflecting surfaces



Distance measurement on directly reflecting surfaces

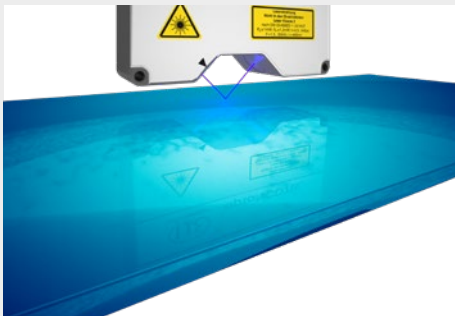


High precision distance measurement on directly reflecting surfaces

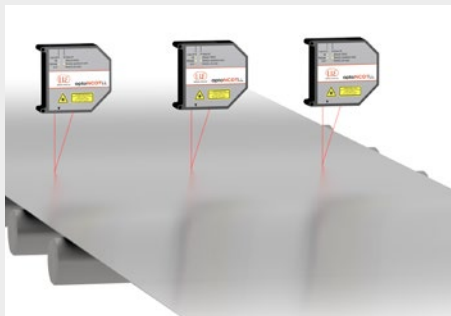
Versatile use

The optoNCDT 2300 sensors can be operated in several measurement modes: in standard mode for distance measurement on diffusely reflecting materials. In addition, the sensors can be used for distance measurement on reflective and shiny surfaces (direct reflection).

Application examples



Distance measurement of coated glass



Planarity testing of metal strips



Testing the radial run out of rollers

Technical data

optoNCDT 2300



Laser-Line - optoNCDT 2300LL

| Model | | ILD2300-2LL | ILD2300-10LL | ILD2300-20LL | ILD2300-50LL |
|---|-----|-----------------------|---------------|---------------|---------------|
| Measuring range ^[1] | | 2 (2) mm | 10 (5) mm | 20 (10) mm | 50 (25) mm |
| Start of measuring range ^[1] | | 24 (24) mm | 30 (35) mm | 40 (50) mm | 45 (70) mm |
| Mid of measuring range ^[1] | | 25 (25) mm | 35 (37.5) mm | 50 (55) mm | 70 (82.5) mm |
| End of measuring range ^[1] | | 26 (26) mm | 40 (40) mm | 60 (60) mm | 95 (95) mm |
| Linearity ^[2] | | < ±0.6 μm | < ±2 μm | < ±4 μm | < ±10 μm |
| | | < ±0.03 % FSO | < ±0.02 % FSO | < ±0.02 % FSO | < ±0.02 % FSO |
| Resolution ^[3] | | 0.03 μm | 0.15 μm | 0.3 μm | 0.8 μm |
| Light spot diameter ^[4] | SMR | 85 x 240 μm | 120 x 405 μm | 185 x 485 μm | 350 x 320 μm |
| | MMR | 24 x 280 μm | 35 x 585 μm | 55 x 700 μm | 70 x 960 μm |
| | EMR | 64 x 400 μm | 125 x 835 μm | 195 x 1200 μm | 300 x 1940 μm |
| Material | | Die-cast zinc housing | | | |

^[1] Value in brackets applies for a measuring rate of 49.14 kHz

^[2] FSO = Full Scale Output

The specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[3] Measuring rate 20 kHz

^[4] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range



Direct reflection - optoNCDT 2300-2DR

| Model | | ILD2300-2DR/BL |
|---|-----|--|
| Measuring range ^[1] | | 2 (1) mm |
| Start of measuring range ^[1] | | 9 (9) mm |
| Mid of measuring range ^[1] | | 10 (9.5) mm |
| End of measuring range ^[1] | | 11 (10) mm |
| Linearity ^[2] | | < ±0.6 μm |
| | | < ±0.03 % FSO |
| Resolution ^[3] | | 0.03 μm |
| Temperature stability ^[4] | | ±0.01 % FSO / K |
| Light spot diameter ^[5] | SMR | 21.6 x 25 μm |
| | MMR | 8.5 x 11 μm |
| | EMR | 22.4 x 23.7 μm |
| Light source | | Semiconductor laser <1 mW, 405 nm (blue violet) |
| Power consumption | | < 2 W (24 V) |
| Connection | | integrated pigtail 0.25 m with 14-pin cable connector, min. bending radius 30 mm when firmly installed; optional extension to 3 m / 10 m possible (see accessories for suitable connection cables) |
| Material | | Aluminum housing |
| Weight | | approx. 400 g (incl. pigtail) |

^[1] Value in brackets applies for a measuring rate of 49.14 kHz

^[2] The specified data apply to directly reflecting surfaces; FSO = Full Scale Output

^[3] Measuring rate 20 kHz

^[4] Relates to digital output in mid of measuring range

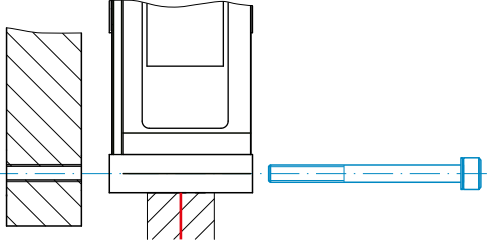
^[5] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range

Light spot diameter determined with point-shaped laser with Gaussian fit (full 1/e² width)

Installation options

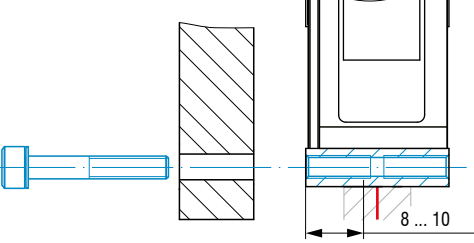
Housings M and L

Bolt connection



| | |
|--|----|
| ILD2300-2 ... ILD2300-100 ILD2300BL / ILD2300LL | M4 |
| ILD2300-200 / -300 ILD2310-10 / -20 /-40 | M4 |
| ILD2310-50 ILD2310-50BL | M5 |
| ILD2300-2DR | M3 |

Direct fastening



| | |
|--|----|
| ILD2300-2 ... ILD2300-100 ILD2300BL / ILD2300LL | - |
| ILD2300-200 / -300 ILD2310-10 / -20 /-40 | M5 |
| ILD2310-50 ILD2310-50BL | M6 |
| ILD2300-2DR | M4 |

Accessories for optoNCDT 2300/2310

Power supply unit

PS2020 (power supply 24 V / 2.5 A, input 100 - 240 VAC, output 24 VDC / 2.5 A, mounting onto symmetrical standard rail 35 mm x 7.5 mm, DIN 50022)

Mounting plate

for easy alignment of the DR models

Protective housings

see page 60

Article designation

| | | | |
|--|---|----|---|
| ILD2300- | 6 | LL | 3R |
| | | | Laser class No indication: class 2 (standard) 3R: class 3R (on request) |
| | | | Laser type No indication: Red laser point (standard) LL: Laser Line BL: Blue Laser DR: Direct Reflection |
| Measuring range in mm | | | |
| Series ILD2300: Highly dynamic laser sensor in the 50 kHz class ILD2310: Laser sensors with small measuring range and large offset distance | | | |

Scope of supply









- 1 sensor ILD23x0 with 0.25 m connection cable and cable socket
- 2 laser warning signs according to IEC standard
- RJ45 short-circuit plug

Connection possibilities

optoNCDT 2300




Drag-chain suitable extension and adapter cables

Cable diameter: max. 7.5 mm
 Drag chain: ja
 Robot: no
 Temperature range: -40 ... 70 °C (moving / not moving)
 Bending radius: > 90 mm (fixed installation / dynamic / drag chain)

| Sensor | Cables | Type | Connection possibilities and accessories | |
|---|--|-----------|---|--|
| ILD2300-xx ILD2300-xxLL ILD2300-xxBL ILD2300-2DR | Extension cable pigtail Length 3 m / 6 m / 9 m / 15 m <i>Art. no.</i> <i>Designation</i> 2901717 PC2300-3/OE 2901760 PC2300-6/OE 2901761 PC2300-9/OE 2901762 PC2300-15/OE | Open ends | Supply voltage connection Power supply unit PS2020  | |
| | Adapter cable for PC interface card Length 3 m / 6 m <i>Art. no.</i> <i>Designation</i> 2901728 PC2300-3/IF2008 2901729 PC2300-6/IF2008 | Sub-D | Interface module of RS422 to USB IF2001/USB  | |
| ILD2310-xx | Adapter cable for sensor calculation Length 3 m / 6 m / 9 m <i>Art. no.</i> <i>Designation</i> 29011031 PC2300-3/C-Box/RJ45 29011044 PC2300-6/C-Box/RJ45 29011045 PC2300-9/C-Box/RJ45 | Sub-D | Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT  | |
| | Adapter cable for sensor calculation Length 2 m <i>Art. no.</i> <i>Designation</i> 29011279 PCE2300-3/M12 | M12 | Interface card for synchronous data acquisition IF2008PCle / IF2008E  | |
| | Adapter cable Sub-D for EtherCAT Length 3 m / 6 m <i>Art. no.</i> <i>Designation</i> 2901661 PC2300-3/SUB-D 2901976 PC2300-6/SUB-D | Sub-D | 4-fold interface module from RS422 to USB IF2004/USB  | |
| | | | Controller for D/A conversion and evaluation of up to 2 sensor signals Dual Processing Unit  | |
| | | | Interface module for Ethernet connection of up to 8 sensors IF2008/ETH  | |
| | | | Signal output Ethernet, EtherCAT, RS422 to PC or PLC PC2300-0.5Y Connection cable ILD2300  | |





Connection cable for high temperature

| | |
|--------------------|--|
| 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 | Connection possibilities and accessories | | | | | | | | | | | |
|--|---|-----------------|--|----------|----------------|----------|----------------|----------|----------------|----------|-----------------|-----------|--|---|
| ILD2300-xx ILD2300-xxLL ILD2300-xxBL ILD2300-2DR ILD2310-xx | Connection cable high temperatures Length 3 m / 6 m / 9 m / 15 m <table> <tr> <td><i>Art. no.</i></td> <td><i>Designation</i></td> </tr> <tr> <td>29011118</td> <td>PC2300-3/OE/HT</td> </tr> <tr> <td>29011119</td> <td>PC2300-6/OE/HT</td> </tr> <tr> <td>29011095</td> <td>PC2300-9/OE/HT</td> </tr> <tr> <td>29011120</td> <td>PC2300-15/OE/HT</td> </tr> </table> | <i>Art. no.</i> | <i>Designation</i> | 29011118 | PC2300-3/OE/HT | 29011119 | PC2300-6/OE/HT | 29011095 | PC2300-9/OE/HT | 29011120 | PC2300-15/OE/HT | Open ends | Connection supply voltage PS2020  | Interface module of RS422 to USB IF2001/USB  |
| | | <i>Art. no.</i> | <i>Designation</i> | | | | | | | | | | | |
| 29011118 | PC2300-3/OE/HT | | | | | | | | | | | | | |
| 29011119 | PC2300-6/OE/HT | | | | | | | | | | | | | |
| 29011095 | PC2300-9/OE/HT | | | | | | | | | | | | | |
| 29011120 | PC2300-15/OE/HT | | | | | | | | | | | | | |
| Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT  | | | | | | | | | | | | | | |






Connection cable for EtherCAT operation

| | |
|--------------------|---|
| Cable diameter: | max. 7.5 mm |
| Drag chain: | yes |
| Robot: | no |
| Temperature range: | -40 ... 70 °C (moving / not moving) |
| Bending radius: | > 90 mm (fixed installation / dynamic / drag chain) |

| Input | Cables | Type | Connection possibilities and accessories | | | | | |
|---|---|-----------------|--|---------|--|------------------|--|--|
| Sub-D (PC2300-x/ Sub-D) | Adapter cable for EtherCAT Length 0.5 m <table> <tr> <td><i>Art. no.</i></td> <td><i>Designation</i></td> </tr> <tr> <td>2901693</td> <td>PC2300-0,5Y Connection cable ILD2300</td> </tr> </table>  | <i>Art. no.</i> | <i>Designation</i> | 2901693 | PC2300-0,5Y Connection cable ILD2300 | Open ends & RJ45 | Signal output EtherCAT & Ethernet  | Supply voltage connection Power supply unit PS2020  |
| | | <i>Art. no.</i> | <i>Designation</i> | | | | | |
| | | 2901693 | PC2300-0,5Y Connection cable ILD2300 | | | | | |
| Interface module of RS422 to USB IF2001/USB  | | | | | | | | |

Protective housings for demanding environments

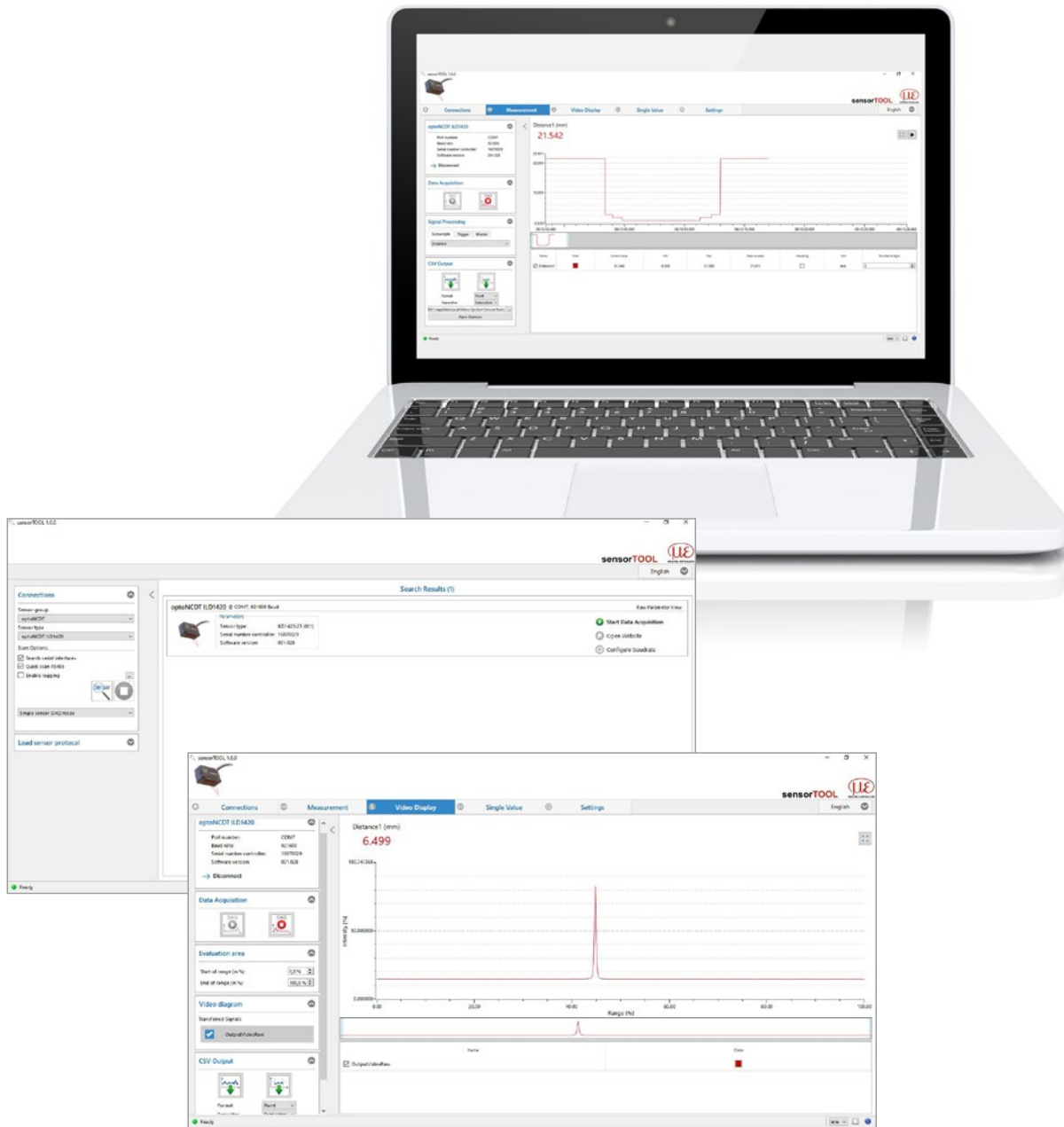
optoNCDT

| SGH & SGHF models | | | | SGHF-HT model |
|--|---|---|---|---|
| Protective housing Size S | | Protective housing Size M | | |
| SGH | SGHF | SGH | SGHF | |
|  |  |  |  |  |
| (140 x 140 x 71 mm) | | (180 x 140 x 71 mm) | | (260 x 180 x 154 mm) |
| Water-resistant housing protects the sensor from solvents and detergents. | Ideal with high ambient temperatures. The integrated air cooling of the housing offers optimum protection for the sensor. | Water-resistant housing protects the sensor from solvents and detergents. | Ideal with high ambient temperatures. The integrated air cooling of the housing offers optimum protection for the sensor. | Water-cooled protective housing with window and compressed-air connection for measurement tasks in ambient temperatures up to 200 °C. Maximum temperature of cooling water T(max) = 10 °C Minimum water flow rate Q(min) = 3 liters/min |
| Size S suitable for ILD1750-20BL ILD1750-200BL ILD2300-2 / -2LL / -2BL ILD2300-5 / -5BL ILD2300-10 / -10LL / -10BL ILD2300-20 / -20LL ILD2300-50 / -50LL ILD2300-100 | | Size M suitable for ILD1750-500BL ILD1750-750BL ILD2300-200 ILD2300-300 ILD2310-10 ILD2310-20 ILD2310-40 | | Suitable for ILD1750-500BL ILD1750-750BL ILD2300-200 ILD2300-300 ILD2310-10 ILD2310-20 ILD2310-40 ILD2310-50BL |

| Protective housing SGHF ILD1900 |
|---|
|  |
| Compact protective housing which is simply attached to the sensor. The protective housing has an air purge for cleaning the protective windows. It also cools the sensor. |
| Suitable for ILD1900-6 / -6LL ILD1900-10 / -10LL ILD1900-25 / -25LL ILD1900-50 / -50LL ILD1900-100 ILD1900-200 ILD1900-500 |

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

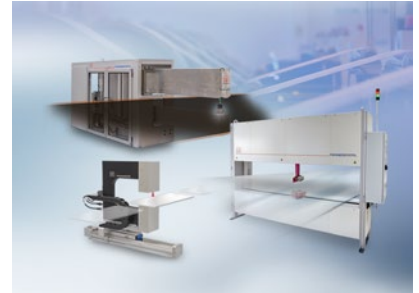
Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



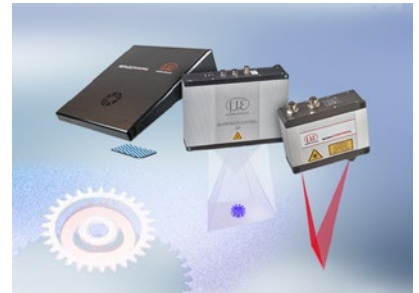
Measuring and inspection systems for metal strips, plastics and rubber



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