






# More Precision

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



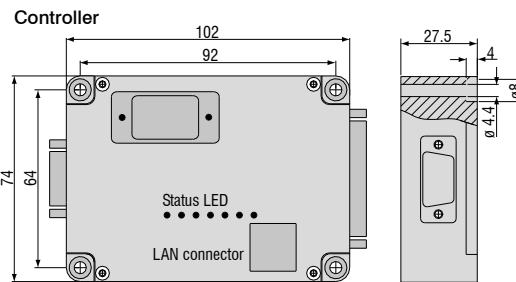


-  **Nine models with measuring ranges from 4 mm to 100 mm**
-  **Sensor head and separate controller**
-  **Up to 100 kHz (-3dB) true analog frequency response**
- INTER FACE** **Analog outputs (U/I) Ethernet**

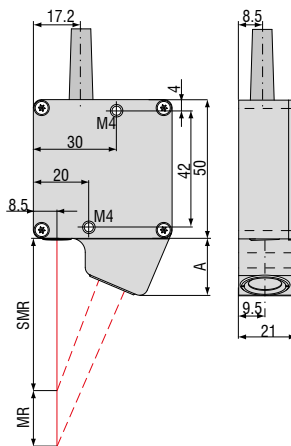
Analog laser triangulation sensors of the optoNCDT 1610 and 1630 series are designed for extremely fast measurement processes. Equipped with a PSD array, the sensors automatically adapt to the reflection factor of the measurement object enabling measurements even on changing surfaces.

The LD 1610 series achieves a frequency response of 10kHz (-3dB) while the LD 1630 series is suitable for measurements up to 100 kHz (-3dB).

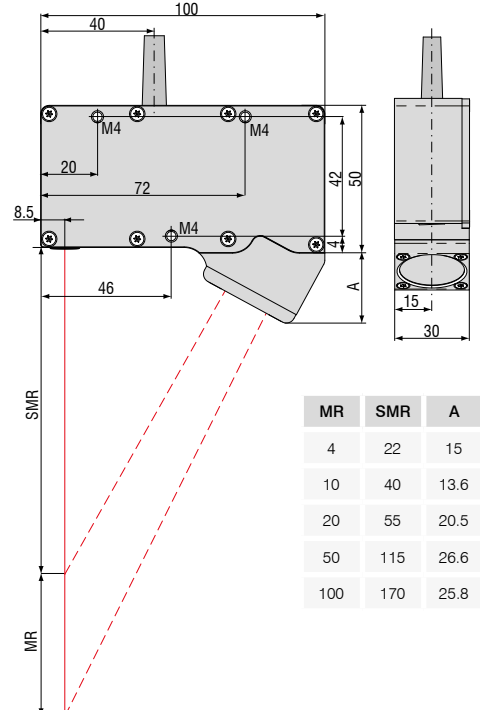
Equipped with analog interfaces (current, voltage) and an optional Ethernet interface, the controller can be easily integrated into diverse systems.



optoNCDT 1610/1630 (4/10/20 mm)



optoNCDT 1610/1630 (50/100 mm)



| Sensors                                    | LD1610-4                                   | LD1610-10                 | LD1610-20                 | LD1610-50                  | LD1610-100                 |
|--|--|---------------------------|---------------------------|----------------------------|----------------------------|
| Measuring range                            | 4 mm                                       | 10 mm                     | 20 mm                     | 50 mm                      | 100 mm                     |
| Start of measuring range                   | 22 mm                                      | 40 mm                     | 55 mm                     | 115 mm                     | 170 mm                     |
| Linearity                                  | $\leq \pm 8 \mu\text{m}$                   | $\leq \pm 20 \mu\text{m}$ | $\leq \pm 40 \mu\text{m}$ | $\leq \pm 100 \mu\text{m}$ | $\leq \pm 200 \mu\text{m}$ |
|  | $\leq \pm 0.2 \% \text{ FSO}$              |                           |                           |                            |                            |
| Resolution (noise, dynamic <sup>1)</sup> ) | 2.6 $\mu\text{m}$                          | 6.5 $\mu\text{m}$         | 13.0 $\mu\text{m}$        | 32.5 $\mu\text{m}$         | 65 $\mu\text{m}$           |
| Resolution (noise, static <sup>2)</sup> )  | 0.2 $\mu\text{m}$                          | 0.5 $\mu\text{m}$         | 1 $\mu\text{m}$           | 2.5 $\mu\text{m}$          | 6 $\mu\text{m}$            |
| Spot diameter                              | 0.3 mm                                     | 0.6 mm                    | 0.9 mm                    | 1.5 mm                     | 1.5 mm                     |
| Frequency response                         | 10 kHz (-3dB)                              |                           |                           |                            |                            |
| Light source                               | laser, wavelength 670 nm, red (visible)    |                           |                           |                            |                            |
| Laser safety class                         | class 2                                    |                           |                           |                            |                            |
| Max. vibration                             | 10 g to 1 kHz (sensor head, 20 g optional) |                           |                           |                            |                            |
| Operating temperature                      | 0° ... +50 °C                              |                           |                           |                            |                            |
| Storage temperature                        | -20° ... +70 °C                            |                           |                           |                            |                            |

Other measuring ranges on request <sup>1)</sup> Measurement on white target - Frequency response 10 kHz <sup>2)</sup> Measurement on white target - Frequency response 20 Hz

| Sensors                                    | LD1630-4                                 | LD1630-10                 | LD1630-20                 | LD1630-50                  |
|--|--|---------------------------|---------------------------|----------------------------|
| Measuring range                            | 4 mm                                     | 10 mm                     | 20 mm                     | 50 mm                      |
| Start of measuring range                   | 22 mm                                    | 40 mm                     | 55 mm                     | 115 mm                     |
| Linearity                                  | $\leq \pm 12 \mu\text{m}$                | $\leq \pm 30 \mu\text{m}$ | $\leq \pm 60 \mu\text{m}$ | $\leq \pm 150 \mu\text{m}$ |
|  | $\leq \pm 0.3 \% \text{ FSO}$            |                           |                           |                            |
| Resolution (noise, dynamic <sup>1)</sup> ) | 7 $\mu\text{m}$                          | 17.5 $\mu\text{m}$        | 35 $\mu\text{m}$          | 50 $\mu\text{m}$           |
| Resolution (noise, static <sup>2)</sup> )  | 0.4 $\mu\text{m}$                        | 1 $\mu\text{m}$           | 2 $\mu\text{m}$           | 7.5 $\mu\text{m}$          |
| Spot diameter                              | 0.3 mm                                   | 0.6 mm                    | 0.9 mm                    | 1.5 mm                     |
| Frequency response                         | 100 kHz (-3dB)                           |                           |                           |                            |
| Light source                               | laser, wavelength 670 nm, red (visible)  |                           |                           |                            |
| Laser safety class                         | class 2                                  |                           |                           |                            |
| Max. Vibration                             | 5 g to 1 kHz (sensor head, 20g optional) |                           |                           |                            |
| Operating temperature                      | 0 ... +40 °C                             |                           |                           |                            |
| Storage temperature                        | -30 ... +75 °C                           |                           |                           |                            |

Other measuring ranges on request <sup>1)</sup> Measurement on white target - Frequency response 100 kHz <sup>2)</sup> Measurement on white target - Frequency response 230 Hz

| Controller                     |                     |   |
|--------------------------------|---------------------|---|
| Analog output                  | distance            | $\pm 10 \text{ V}$ (optional 0 ... 10 V / 0 ... 5 V) ; 4 ... 20 mA      |
|                                | output impedance    | approx. 0 Ohm (10 mA max.)  |
|                                | tilt angle          | with 30° object inclination (axis A): approx. 0.5% (white target)       |
|                                | frequency response  | DC ... 10 kHz / 100 kHz   |
|                                | thermal drift       | 0.02 % °C FSO   |
|                                | light intensity     | 0 V ... 10 V  |
| Digital output                 | Ethernet (optional) | TCP/IP factory set IP 192.168.122.245 (sampling frequency 1 ... 30 kHz) |
| Switching outputs with display | MIN                 | +24 V when distance < MIN, LED yellow                                   |
|                                | OK                  | +24 V when distance > MIN and < MAX, LED green                          |
|                                | MAX                 | +24 V when distance > MAX, LED orange                                   |
|                                | Error               | +24 V, LED red  |
| Switching hysteresis           |                     | approx. 0.5 % FSO   |
| Permissible ambient light      |                     | 20,000 lux  |
| Operating time                 |                     | 50,000 h (laser diode)  |
| Insulation voltage             |                     | 200 VDC, 0 V against housing  |
| Humidity                       |                     | up to 90 % RH, non-condensing   |
| Protection class               |                     | sensor: IP64, controller: IP40  |
| Supply voltage                 |                     | 10 ... 30 VDC   |
| Max. current consumption       |                     | 200 mA (24 V)   |
| Connector                      |                     | 25-in D-sub   |
| Sensor cable length, standard  |                     | 2 m   |

**Accessories for all optoNCDT Series****Power supply**

- PS 2020 (power supply 24 V / 2.5 A, input 100 - 240 V AC, output 24 VDC / 2.5 A, mounting onto symmetrical standard rail 35 mm x 7.5 mm, DIN 50022)

**Controller unit for evaluation and signal conversion**

- C-Box/2A (controller for conversion and evaluation of up to 2 sensor signals)

**Interface card**

- IF2008 (interface card for multiple signal processing; analog and digital interfaces)

**USB converter**

- IF2001/USB RS422/USB converter (converter for digital signals in USB)

**USB converter**

- IF2004/USB 4-channel RS422/USB converter (converter for up to 4 digital signals in USB)

**Accessories for optoNCDT 1320 / 1420 / 1402CL1****Supply and output cable (drag-chain suitable)**

- PCF1420-1/I (1 m, output 4...20 mA)
- PCF1420-1/I(01) (1 m, output 4...20 mA)
- PCF1420-3/I (3 m, output 4...20 mA)
- PCF1420-6/I (6 m, output 4...20 mA)
- PCF1420-10/I (10 m, output 4...20 mA)
- PCF1420-15/I (15 m, output 4...20 mA)
- PCF1420-3/U (3 m, with integrated resistor, output 1...5 VDC)\*
- PCF1420-6/U (6 m, with integrated resistor, output 1...5V DC)\*
- PCF1420-10/U (10 m, with integrated resistor, output 1...5 VDC)\*
- PCF1420-15/U (15 m, with integrated resistor, output 1...5 VDC)\*
- PCF1420-3/IF2008 (3 m, interface and supply cable)
- PC1420-6/IF2008 (6 m, supply and output cable)
- PCF1420-10/IF2008 (10 m, interface and supply cable)

\* on request with output 2...10 VDC

**Supply and output cable, suitable for use with robots**

(available in 90° version)

- PCR 1402-3/I (3 m)
- PCR 1402-6/I (6 m)
- PCR 1402-8/I (8 m)

**Accessories for optoNCDT 1610 / 1630****Supply and output cable**

- PC 1605-3 (3 m)
- PC 1605-6 (6 m)
- PC 1607-5/BNC (5 m, BNC connector)

**Accessories for optoNCDT 1750 / 1750LL / 1700BL****Supply and output cable (drag-chain suitable)**

- PC 1700-3 (3 m)
- PC 1700-10 (10 m)
- PC 1700-10/IF2008 (10 m, for use with interface card IF2008)
- PC 1700-3/T (3 m, for use with trigger box)
- PC 1700-10/T (10 m, for use with trigger box)
- PC 1700-3/USB (3 m, with USB-RS422-converter, power supply 90 ... 230 V AC)

**Supply and output cable (suitable for use with robots)**

- PCR 1700-5 (5 m)
- PCR 1700-10 (10 m)

**Supply and output cables for temperatures up to 200 °C**

- PC1700-3/OE/HT (3 m)
- PC1700-6/OE/HT (6 m)
- PC1700-15/OE/HT (15 m)

**Protection housing**

- SGH model (sizes S and M)
- SGHF model (sizes S and M)
- SGHF-HT model

**Accessories for optoNCDT 2300 / 2300LL / 2300BL****Supply and output cable**

- PC2300-0,5Y (connection cable to PC or PLC; for operation a PC2300-3/SUB-D will be required)
- PC2300-3/SUB-D (3 m; for operation a PC2300-0,5Y will be required)
- PC 2300-3/IF2008 (interface and supply cable)
- PC 2300-3/OE (3 m)
- PC 2300-6/OE (6 m)
- PC 2300-9/OE (9 m)
- PC 2300-15/OE (15 m)

\* other cable lengths on request

**Protection housing**

- SGH model (sizes S and M)
- SGHF model (sizes S and M)
- SGHF-HT model

**Supply and output cables for temperatures up to 200 °C**

- PC2300-3/OE/HT (3 m)
- PC2300-6/OE/HT (6 m)
- PC2300-9/OE/HT (9 m)
- PC2300-15/OE/HT (15 m)

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