






# More Precision

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



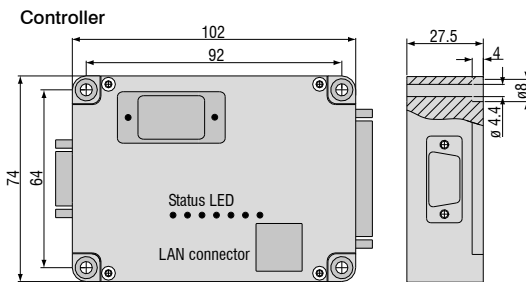


-  **Nine models with measuring ranges from 4 mm to 100 mm**
-  **Sensor head and separate controller**
-  **Up to 100 kHz (-3dB) true analog frequency response**
- INTER FACE** **Analog outputs (U/I) Ethernet**

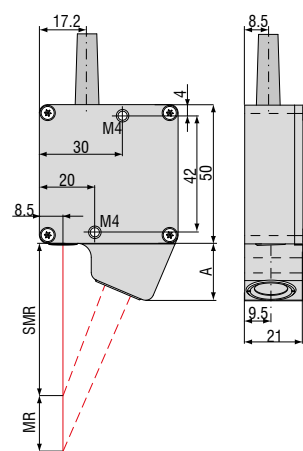
Analog laser triangulation sensors of the optoNCDT 1610 and 1630 series are designed for extremely fast measurement processes. Equipped with a PSD array, the sensors automatically adapt to the reflection factor of the measurement object enabling measurements even on changing surfaces.

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).

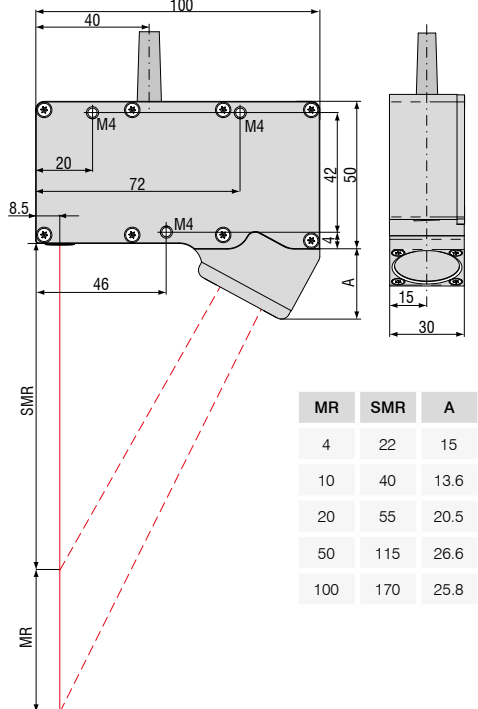
Equipped with analog interfaces (current, voltage) and an optional Ethernet interface, the controller can be easily integrated into diverse systems.



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)

## High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fiber optic sensors and fiber optics



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Measurement and inspection systems