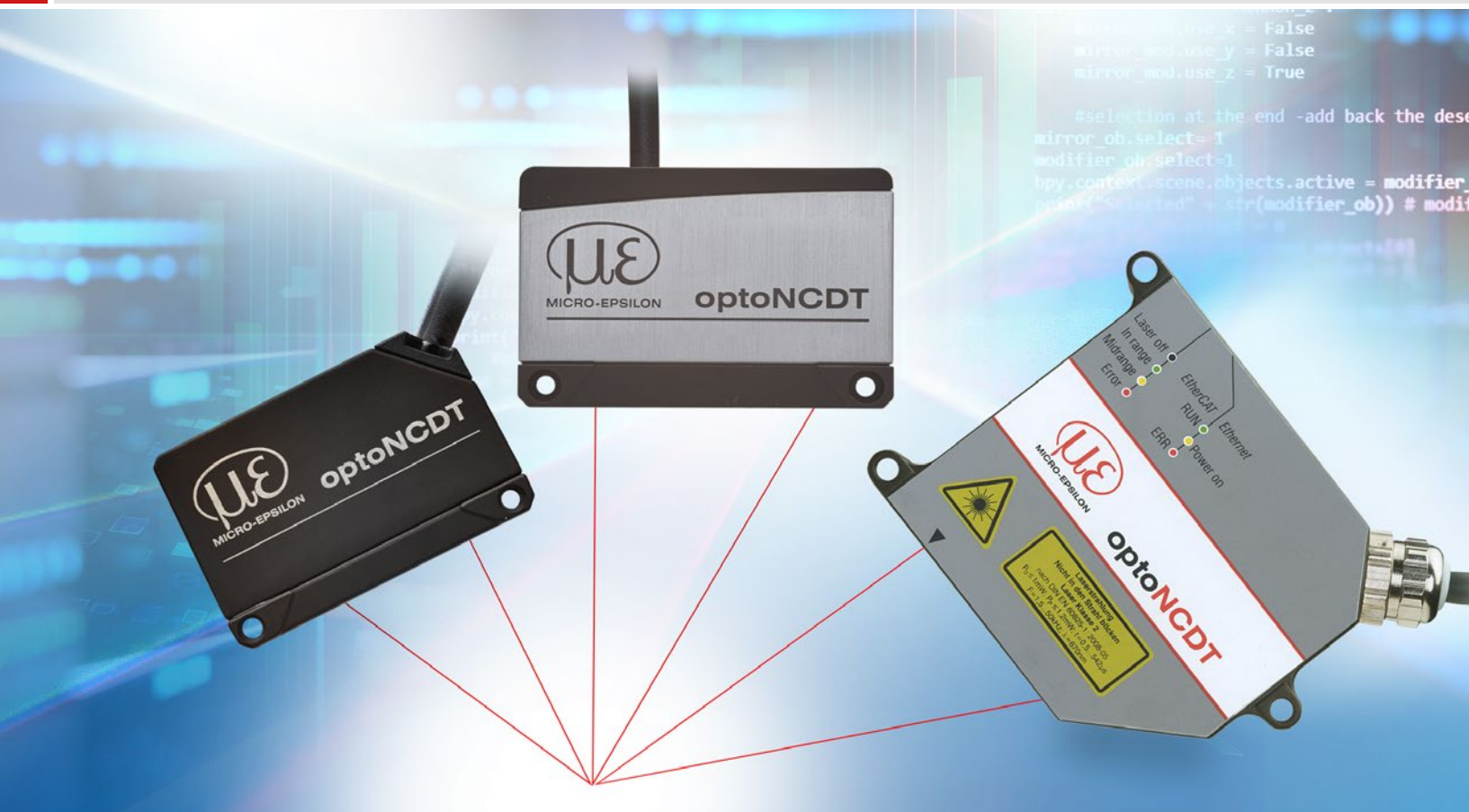




More Precision

optoNCDT // Laser displacement sensors (triangulation)



Connection possibilities

optoNCDT 1220 / 1320 / 1420

Sensors with integrated cable

Cable diameter:	5.40 ±0.2 mm
Drag chain:	no
Robot:	no
Temperature range:	-25 ... 105 °C (moving) -40 ... 105 °C (not moving)
Bending radius:	> 27 mm (fixed installation) > 54 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories
ILD1220-xx	Integrated cable Length 2 m	Open ends	Supply voltage connection Power supply unit PS2020 
ILD1320-xx ILD1420-xx ILD1420-xxLL	Integrated cable Length 3 m		Interface module of RS422 to USB IF2001/USB IC2001/USB 
			Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT 

Drag-chain suitable extension and adapter cables

Cable diameter:	6.0 ±0.2 mm
Drag chain:	yes
Robot:	no (optional on request)
Temperature range:	-40 ... 90 °C
Bending radius:	> 30 mm (fixed installation) > 60 mm (dynamic)

Sensor	Cables	Type	Connection possibilities and accessories																			
ILD1420-xx ILD1420-xxLL	Extension cable pigtail Length 3 m / 6 m / 10 m / 15 m <table><tr><th>Art. no.</th><th>Designation</th></tr><tr><td>29011067</td><td>PCF1420-3/I</td></tr><tr><td>29011068</td><td>PCF1420-6/I</td></tr><tr><td>29011069</td><td>PCF1420-10/I</td></tr><tr><td>29011070</td><td>PCF1420-15/I</td></tr><tr><td>29011071</td><td>PCF1420-3/U</td></tr><tr><td>29011072</td><td>PCF1420-6/U</td></tr><tr><td>29011073</td><td>PCF1420-10/U</td></tr><tr><td>29011074</td><td>PCF1420-15/U</td></tr></table>	Art. no.	Designation	29011067	PCF1420-3/I	29011068	PCF1420-6/I	29011069	PCF1420-10/I	29011070	PCF1420-15/I	29011071	PCF1420-3/U	29011072	PCF1420-6/U	29011073	PCF1420-10/U	29011074	PCF1420-15/U	Open ends	Supply voltage connection Power supply unit PS2020	
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	29011067	PCF1420-3/I																				
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	29011072	PCF1420-6/U																				
	29011073	PCF1420-10/U																				
	29011074	PCF1420-15/U																				
	Interface module of RS422 to USB IF2001/USB IC2001/USB																					
	Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT																					
	Interface card for synchronous data acquisition IF2008PCle / IF2008E																					
	4-fold interface module from RS422 to USB IF2004/USB																					
Adapter cable for PC interface card Length 3 m / 6 m / 10 m <table><tr><th>Art. no.</th><th>Designation</th></tr><tr><td>29011079</td><td>PCF1420-3/IF2008</td></tr><tr><td>29011088</td><td>PCF1420-6/IF2008</td></tr><tr><td>29011089</td><td>PCF1420-10/IF2008</td></tr></table>	Art. no.	Designation	29011079	PCF1420-3/IF2008	29011088	PCF1420-6/IF2008	29011089	PCF1420-10/IF2008	Sub-D	Controller for D/A conversion and evaluation of up to 2 sensor signals Dual Processing Unit												
Art. no.	Designation																					
29011079	PCF1420-3/IF2008																					
29011088	PCF1420-6/IF2008																					
29011089	PCF1420-10/IF2008																					
Adapter cable for sensor calculation Length 3 m / 6 m / 9 m <table><tr><th>Art. no.</th><th>Designation</th></tr><tr><td>29011171</td><td>PCF1420-3/C-Box</td></tr><tr><td>29011172</td><td>PCF1420-6/C-Box</td></tr><tr><td>29011170</td><td>PCF1420-9/C-Box</td></tr></table>	Art. no.	Designation	29011171	PCF1420-3/C-Box	29011172	PCF1420-6/C-Box	29011170	PCF1420-9/C-Box	Sub-D	Interface module for Ethernet connection of up to 8 sensors IF2008/ETH												
Art. no.	Designation																					
29011171	PCF1420-3/C-Box																					
29011172	PCF1420-6/C-Box																					
29011170	PCF1420-9/C-Box																					
Adapter cable for sensor calculation Length 2 m <table><tr><th>Art. no.</th><th>Designation</th></tr><tr><td>29011149</td><td>PCE1420-2/M12</td></tr></table>	Art. no.	Designation	29011149	PCE1420-2/M12	M12																	
Art. no.	Designation																					
29011149	PCE1420-2/M12																					

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	Connection possibilities and accessories	
2 x Sub-D (PCF1420-x/ IF2008)	Adapter cable for the connection of two sensors per Sub-D connector Length 0.1 m Art. no. Designation 2901528 IF2008-Y-adapter cable 	Sub-D	Interface card for synchronous data acquisition IF2008PCIe / IF2008E 	
			4-fold interface module from RS422 to USB IF2004/USB 	

Powerful laser sensors for special applications

optoNCDT 17x0 / optoNCDT 1910

-  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

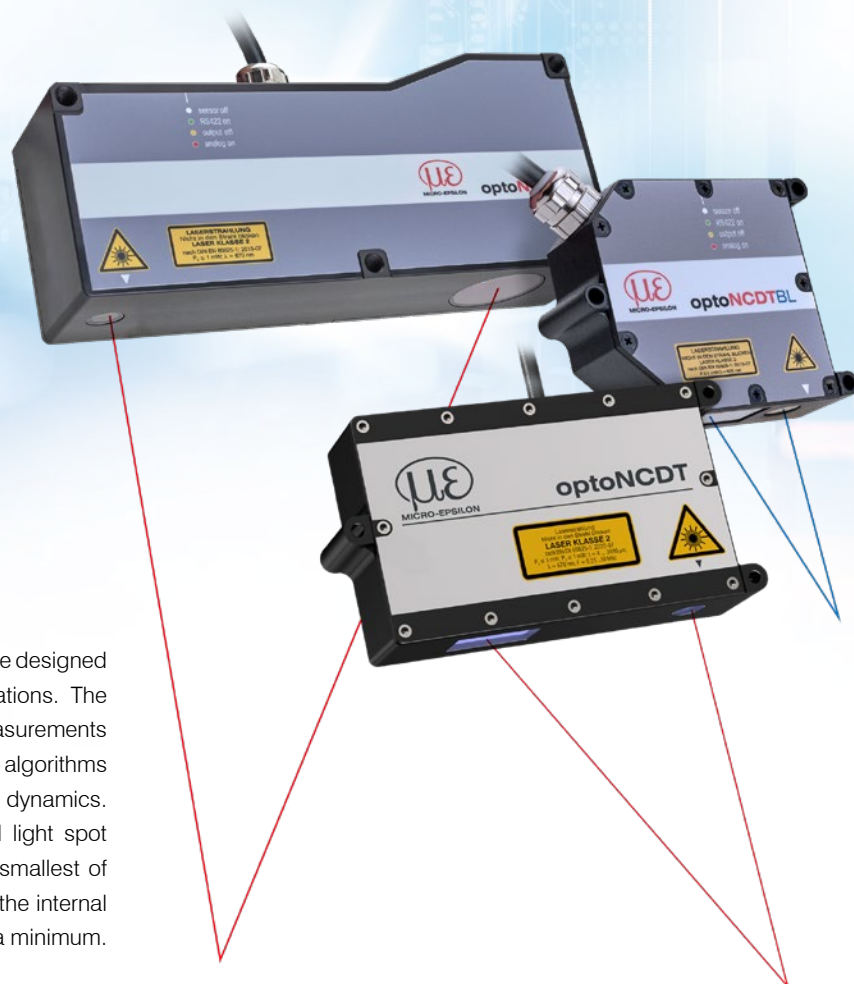
The optoNCDT 1910, 1710 and 1750 series laser sensors are designed for fast and precise measurements in industrial applications. The models are used for demanding surfaces and impress in measurements where large distances are required. Innovative evaluation algorithms and improved components enable high 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.

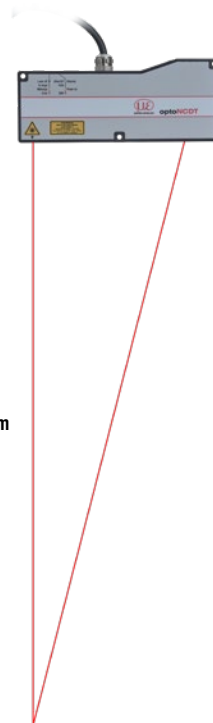


Model	Technology	Measuring range	Repeatability	Linearity
optoNCDT 1750BL		2 - 750 mm	0.8 μm	from 0.06 %
optoNCDT 1750-DR		2 - 20 mm	0.1 μm	0.08 %
optoNCDT 1710		50 mm	from 7.5 μm	0.10 %
optoNCDT 1710BL		50 / 1000 mm	7.5 μm	from 0.10 %
optoNCDT 1760		1000 mm	from 7.5 μm	0.10 %
optoNCDT 1910		500 / 750 mm	from 20 μm	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.

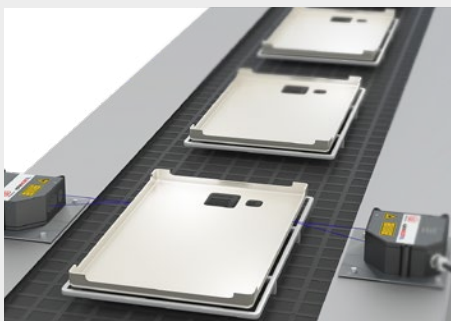
Measurement distances up to 2 m



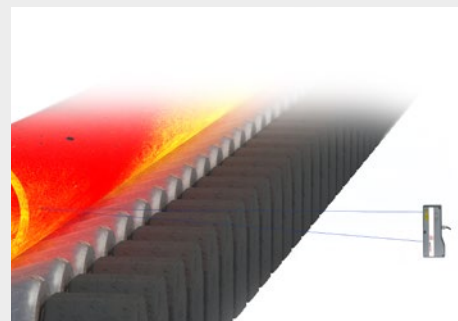
Application examples



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 demanding objects

optoNCDT 1750 (General technical data)

Model		ILD1750-xx
Measuring rate ^[1]		6 adjustable stages: 7.5 kHz / 5 kHz / 2.5 kHz / 1.25 kHz / 625 Hz / 300 Hz
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
Power consumption		< 3 W (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 ^[2]		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)
	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		Zinc die-cast housing
Weight		approx. 550 g (incl. pigtail)
Control and indicator elements ^[3]		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: measuring rate 4 kHz, modifying the factory setting requires the IF2001/USB converter (see accessories)

^[2] EtherCAT, PROFINET and EtherNet/IP require connection via interface module (see accessories)

^[3] Access to web interface requires connection to PC via IF2001/USB (see accessories)



Blue laser - optoNCDT 1750BL

Model		ILD1750-20BL	ILD1750-200BL	ILD1750-500BL	ILD1750-750BL
Measuring range		20 mm	200 mm	500 mm	750 mm
Start of measuring range		40 mm	100 mm	200 mm	200 mm
Mid of measuring range		50 mm	200 mm	450 mm	575 mm
End of measuring range		60 mm	300 mm	700 mm	950 mm
Linearity ^[1]		< ±12 μm	< ±160 μm	< ±350 μm	< ±670 μm
		< ±0.06 % FSO	< ±0.08 % FSO	< ±0.07 % FSO	< ±0.09 % FSO
Repeatability ^[2]		0.8 μm	15 μm	20 μm	45 μm
Light spot diameter ^[3]	SMR	320 μm	1300 μm	1500 μm	1500 μm
	MMR	45 μm			
	EMR	320 μm			
Light source		Semiconductor laser <1 mW, 405 nm (blue violet)			
Material		Die-cast zinc housing		Aluminum housing	

^[1] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[2] Measuring rate 5 kHz, median 9

^[3] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range



Direct reflection - optoNCDT 1750DR

Model		ILD1750-2DR	ILD1750-10DR	ILD1750-20DR
Measuring range		2 mm	10 mm	20 mm
Start of measuring range		24 mm	30.5 mm	53.5 mm
Mid of measuring range		25 mm	35.5 mm	63.5 mm
End of measuring range		26 mm	40.5 mm	73.5 mm
Linearity ^[1]		< ±1.6 µm	< ±6 µm	< ±12 µm
		< ±0.08 % FSO		
Repeatability ^[2]		0.1 µm	0.4 µm	0.8 µm
Measuring angle		20°	17.6°	11.5°
Light spot diameter ^[3]	SMR	80 µm	110 µm	320 µm
	MMR	35 µm	50 µm	45 µm
	EMR	80 µm	110 µm	320 µm

^[1] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[2] Measuring rate 5 kHz, median 9

^[3] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range

Technical data

optoNCDT 17x0 Laser sensors for large measuring ranges



Long range - optoNCDT 1710

Model		ILD1710-50
Measuring range		50 mm
Start of measuring range		550 mm
Mid of measuring range		575 mm
End of measuring range		600 mm
Measuring rate		4 adjustable stages: 2.5 kHz / 1.25 kHz / 625 Hz / 312.5 Hz
Linearity ^[1]		< ±50 µm
		< ±0.1 % FSO
Resolution ^[2]		7.5 µm
Light spot diameter ^[3]	SMR	400 x 500 µm
	MMR	
	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		Zero, laser on/off
Digital interface		RS422 (14 bit)
Analog output		4 ... 20 mA / 0 ... 10 V
Switching output		1 x error / 2 x limit values (configurable)
Connection		integrated pigtail 0.25 m with 14-pin ODU plug, min. bending radius 30 mm when firmly installed (see accessories for suitable connection cable)
Installation		Screw connection via three mounting holes
Temperature range	Storage	-20 ... +70 °C (non-condensing)
	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 display elements		Select & function keys: output type, measuring rate, type of averaging, averaging number, error analog, synchronization, operation mode, trigger mode, baud rate, data format; display of measured values via PC with sensorTOOL; 5x color LEDs for status display

^[1] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[2] Measuring rate 2.5 kHz, without averaging

^[3] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range



Long range / Blue laser - optoNCDT 1710BL

Model		ILD1710-50BL	ILD1710-1000BL
Measuring range		50 mm	1 000 mm
Start of measuring range		550 mm	1 000 mm
Mid of measuring range		575 mm	1 500 mm
End of measuring range		600 mm	2 000 mm
Measuring rate		4 adjustable stages: 2.5 kHz / 1.25 kHz / 625 Hz / 312.5 Hz	
Linearity ^[1]		< ±50 µm	< ±1000 µm
		< ±0.1 % FSO	
Resolution ^[2]		7.5 µm	100 µm
Light spot diameter ^[3]	SMR	400 x 500 µm	2500 ... 5000 µm
	MMR		
	EMR		
Light source		Semiconductor laser <1 mW, 405 nm (blue violet)	
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		Zero, laser on/off	
Digital interface		RS422 (14 bit)	
Analog output		4 ... 20 mA / 0 ... 10 V	
Switching output		1 x error / 2 x limit values (configurable)	
Connection		integrated pigtail 0.25 m with 14-pin ODU plug, min. bending radius 30 mm when firmly installed (see accessories for suitable connection cable)	
Installation		Screw connection via three mounting holes	
Temperature range	Storage	-20 ... +70 °C (non-condensing)	
	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 display elements		Select & function keys: output type, measuring rate, type of averaging, averaging number, error analog, synchronization, operation mode, trigger mode, baud rate, data format; display of measured values via PC with sensorTOOL; 5x color LEDs for status display	

^[1] FSO = Full Scale Output; the specified data apply to white, diffuse reflecting surfaces (Micro-Epsilon reference ceramic for ILD sensors)

^[2] Measuring rate 2.5 kHz, without averaging

^[3] ±10 %; SMR = Start of measuring range; MMR = Mid of measuring range; EMR = End of measuring range



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	2500 ... 5000 µm
	MMR	
	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)
	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)