More Precision

optoNCDT // Laser displacement sensors (triangulation)

	Four models with measuring ranges from 20 mm bis 750 mm
	Blue Laser Technology (Blue violet laser diode 405 nm)
RTSC	**Real Time Surface Compensation**
312Hz 375Hz 1000Hz	**Adjustable measuring rate up to 7.5 kHz**
Analog Digital	**Analog and digital output**
Trigger TeachIn	**Trigger input / teach-in / zero-setting / mastering / synchronization**
	Configuration via web interface or Plug & Play
	Application-specific presets and individual setups

Blue Laser sensors in the optoNCDT 1750BL series are designed for high speed displacement, distance and position measurements. These sensors are equipped with new high performance lenses, laser control and evaluation algorithms to ensure precise measurements on different surfaces and materials.
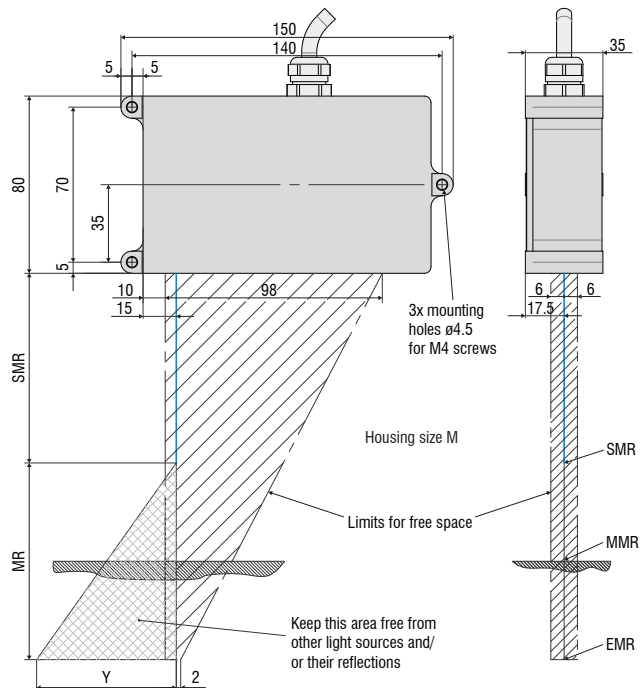
The Blue Laser technology patented by Micro-Epsilon offers decisive advantages compared to red-diode laser sensors. Since the blue laser point does not penetrate the surface, the target is sharply imaged onto the sensor element. This makes it possible to achieve high resolution and reliable signal stability.

optoNCDT 1750BL (20/200 mm)
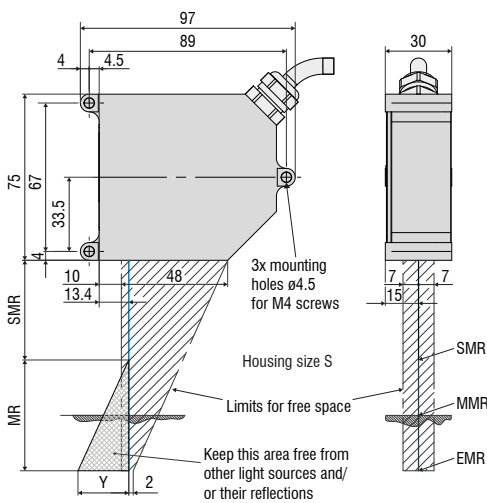
MR	SMR	Y
20	40	12
200	70	70
500	200	180
750	200	270

optoNCDT 1750BL (500/750 mm)

(Dimensions in mm, not to scale)

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	70 mm	200 mm	200 mm
Mid of measuring range	50 mm	170 mm	450 mm	575 mm
End of measuring range	60 mm	270 mm	700 mm	950 mm
Measuring rate [1]	continuously adjustable between 0.3 ... 7.5 kHz; 6 adjustable stages: 300 Hz / 625 Hz / 1.25 kHz / 2.5 kHz / 5 kHz / 7.5 kHz			
Linearity	$< \pm 12\,\mu m$	$< \pm 160\,\mu m$	$< \pm 350\,\mu m$	$< \pm 670\,\mu m$
	$< \pm 0.06\,\%$ FSO	$< \pm 0.08\,\%$ FSO	$< \pm 0.07\,\%$ FSO	$< \pm 0.09\,\%$ FSO
Repeatability [2]	$< 0.8\,\mu m$	$< 15\,\mu m$	$< 20\,\mu m$	$< 45\,\mu m$
Temperature stability [3]	$\pm 0.03\,\%$ FSO / K			
Light spot diameter (± 10 %) 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)			
Laser safety class	Class 2 in accordance with DIN EN 60825-1 : 2015-07			
Permissible ambient light	10,000 lx			
Supply voltage	11 … 30 VDC			
Power consumption	< 3 W (24 V)			
Signal input	1x HTL/TTL multi-function input 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	RS422 (18 bit)			
Analog output	4 ... 20 mA / 0 … 5 V / 0 … 10 V (16 bit, freely scalable within the measuring range)			
Switching output	1 x HTL/TTL laser on/off; 2 x switching output (error & limit value): npn, pnp, push pull			
Synchronization	possible for simultaneous or alternating measurements			
Connection	integrated pigtail 0.25 m with 14-pin ODU plug; optional extension to 3 m / 10 m			
Mounting	Screw connection via three mounting holes			
Temperature range Storage	-20 … +70 °C			
Operation	0 … +50 °C			
Shock (DIN-EN 60068-2-29)	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	Die-cast zinc housing		Aluminum housing	
Weight	approx. 550 g (incl. pigtail)		approx. 600 g (incl. pigtail)	
Control and display elements	Select & function keys for interface selections, mastering (zero), teach, presets, quality slider, frequency selection, factory settings; Web interface with application-specific presets; peak selection, video signal; freely selectable averaging possibilities; data reduction; setup management [4]			

FSO = full scale output, SMR = start of measuring range, MMR = mid of measuring range, EMR = end of measuring range
The specified data apply to a white, diffuse reflecting surface (reference: ceramics)
[1] Factory setting 5 kHz; modifying the factory settings requires the IF2001/USB converter (optionally available)
[2] Measuring rate 5 kHz, median 9
[3] Based on digital output
[4] Connection to PC via IF2001/USB (optionally available)

Accessories for all optoNCDT Series

Power supply
- PS 2020 (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)

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

Interface card
- IF2008PCI / IF2008PCIe (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 ... 5 VDC)*
- 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)
- PCF1420-6/IF2008 (6 m, interface and supply cable)
- PCF1420-10/IF2008 (10 m, interface and supply cable)
- PCF1420-3/C-Box (3 m)
* 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
- PC1605-3 (3 m)
- PC1605-6 (6 m)
- PC1607-5/BNC (5 m, BNC connector)

Accessories for optoNCDT 1750/1750LL/1750BL/1750DR/ 1710/1710BL

Supply and output cable (drag-chain suitable)
- PC1700-3 (3 m)
- PC1700-10 (10 m)
- PC1700-10/IF2008 (10 m, for use with interface card IF2008)
- PC1750-3/C-Box (3 m)
- PC1750-6/C-Box (6 m)
- PC1750-9/C-Box (9 m)

Supply and output cable (suitable for use with robots)
- PCR1700-5 (5 m)
- PCR1700-10 (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 / 2300-2DR

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)
- PC2300-3/IF2008 (interface and supply cable)
- PC2300-3/OE (3 m)
- PC2300-6/OE (6 m)
- PC2300-9/OE (9 m)
- PC2300-15/OE (15 m)
- PC2300-3/C-Box/RJ45 (3 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)

optoNCDT Demo Tool

The scope of supply includes a software for easy sensor configuration. The settings can be implemented conveniently via a Windows user interface on the PC. The sensor parameters are transmitted to the sensor via the serial port and can also be saved if required. The software is available as single and multi-channel version. The sensor is connected to the PC via the sensor cable using a USB converter.
[for any ILD sensor]

Free download

Download free of charge from www.micro-epsilon.com/download: software, driver and well-documented driver DLL for easy sensor integration in existing or customer software.

Protection housing for harsh environments

To protect the laser sensors in extreme environments, individual protective housings are available for all sensor models. There are three different models:

SGH model:

Completely enclosed housing with an integrated front window, where the sensor measures through the window. The water-resistant housing provides protection against solvents and detergents.

SGHF model:

With window and compressed-air connection ideal for high ambient temperatures. The integrated air cooling of the housing offers optimum protection for the sensor.

SGHF-HT model

This water-cooled protection housing with window and compressed-air connection is designed for measurement tasks in ambient temperatures up to 200 °C.
Suitable for all long-range sensors
optoNCDT 1710
optoNCDT 1750-500 and optoNCDT 1750-750
optoNCDT 2310
optoNCDT 2300 - 200
Maximum ambient temperature 200 °C
Maximum temperature of cooling water T(max) = 10 °C
Minimum water flow rate Q(min) = 3 liters/min

SGHx ILD size S (140x140x71 mm)
for optoNCDT 1750 / 2300 dimensions 97x75 mm

SGHx ILD size M (140x180x71 mm)
for optoNCDT 1750 / 2300 dimensions 150x80 mm

IF2008PCI / IF2008 PCIe - PCI Interface card

The IF2008 interface card is designed for installation in PCs and enables the synchronous capture of four digital sensor signals and two encoders. The IF2008E expansion board enables the acquisition of two digital sensor signals, two analog sensor signals and eight I/O signals. The absolutely synchronous data acquisition plays an important role particularly for planarity or thickness measurement tasks. The data are stored in a FIFO memory in order to enable resource-saving processing in blocks in the PC.

Special features

- 4x digital signals and 2x encoders with IF2008 basic PCB
- 2x digital signals, 2x analog signals and 8x I/O signals with IF2008E expansion board
- 6x digital signals, 2x encoders, 2x analog signals and 8x I/O signals together with IF2008E
- FIFO data memory
- Synchronous data acquisition

Interface card IF2008, IF2008E for individual signal processing
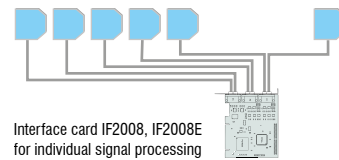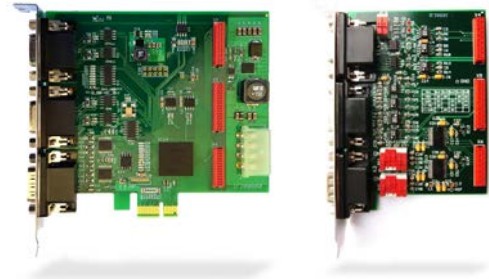
IF2001/USB converter RS422 to USB

The RS422/USB converter transforms digital signals from a laser-optical sensor into a USB data packet. The sensor and the converter are connected via the RS422 interface of the converter. Data output is done via USB interface. The converter loops through further signals and functions such as laser on/off, switch signals and function output. The connected sensors and the converter can be programmed through software.

IF2004/USB: 4-channel converter from RS422 to USB

The RS422/USB converter is used for transforming digital signals from up to four optical sensors into USB data signals. The converter has four trigger inputs and a trigger output for connecting additional converters. Data is output via an USB interface. The connected sensors and the converter can be programmed through software.

Special features

- 4x digital signals via RS422
- 4x trigger inputs, 1x trigger output
- Synchronous data acquisition
- Data output via USB

C-Box/2A Controller for conversion and evaluation of up to two sensor signals

C-Box/2A is used for fast D/A conversion of two digital input signals or for evaluating two digital sensor signals. The controller is compatible with the optoNCDT 2300 laser triangulation sensors. Output of the sensor signals is possible via two configurable analog outputs, Ethernet or USB. Handling of the C-Box/2A and of the connected sensors are performed via web interface. Averaging functions, thickness, diameter, step and inclinations can be calculated. The D/A conversion is executed at 16 bit and max. 70 kHz.
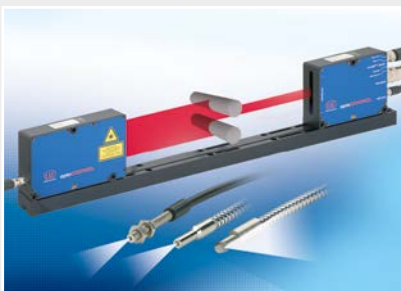
Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

Sensors and measurement devices for non-contact temperature measurement
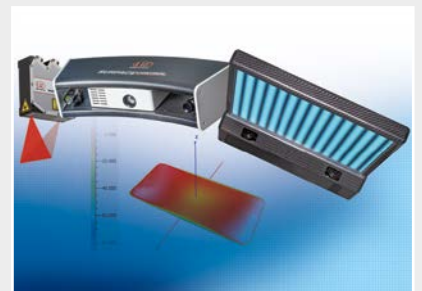
Measuring and inspection systems for metal strips, plastics and rubber

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

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