MICRO-EPSILON

More Precision

capaNCDT // Capacitive sensors for displacement, distance & gap

High-performance measuring system (up to 8 channels)
capaNCDT 6500

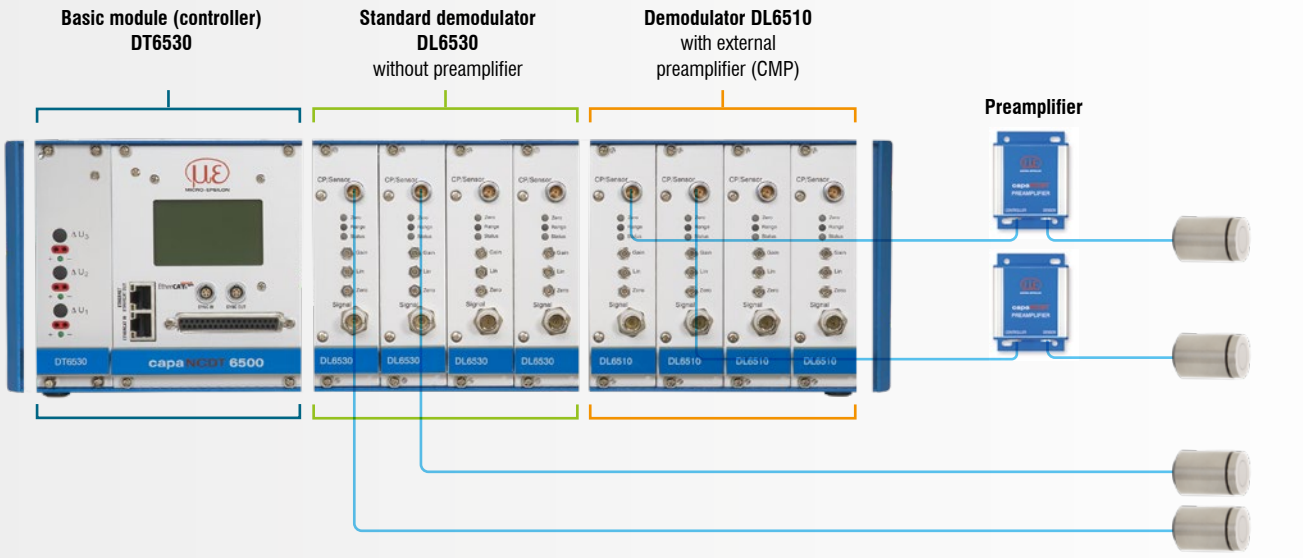
- Multi-channel system with subnanometer resolution
- Analog output and digital interface (Ethernet / EtherCAT)
- Data rate digital: up to 7.8 kSa/s
- Integrated calculation function, e.g., for thickness measurements
- Modular system scalable up to 8 channels
- With internal or external preamplifier available
- Intuitive operation via web interface

The capaNCDT 6500 offers maximum resolution and precision for up to 8 sensors. Inside the rugged aluminum housing, interchangeable and freely combinable demodulator modules ensure optimal signal processing for a wide range of measurement requirements.

The demodulator version DL6530 has an integrated preamplifier. To improve accuracy or when using longer cables, one of the external preamplifiers (CP6001 or CPM6011) is used in conjunction with the DL6510 demodulator.

The system is easily configured via an integrated web interface, which can be accessed via the Ethernet port. Features such as filtering and averaging, trigger functions, data logging, digital linearization, and arithmetic calculations allow for flexible adaptation to a wide variety of measurement tasks.

Variable sensor connections for maximum performance in your application



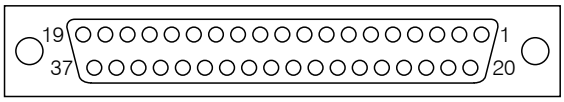
Max. 8 sensors on one DT6500

Model		DT6530		
Demodulator		**DL6530**	**DL6510 with CP6001**	**DL6510 with CPM6011**
Resolution [1]	Static	0.00003 % FSO		0.0006 % FSO
	Dynamic	0.002 % FSO		0.015 % FSO
Frequency response (-3dB)		8.5 kHz, switchable to 1 kHz, 20 Hz		
Measuring rate		4 x 7.8 kSa/s; 8 x 3.9 kSa/s		
Linearity [2]		< ±0.025 % FSO		< ±0.05 % FSO
Temperature stability		< 5 ppm FSO / K (digital); < 10 ppm FSO / K (analog)		< 80 ppm FSO/K
Replaceability [3]		< ±0.05 % FSO		< ±0.1 % FSO
Long-term stability		< ±0.004% FSO/month		< ±0.04% FSO/month
Synchronization		yes (internal + external)		
Supply voltage		230 VAC		
Power consumption		12 W + 3.2 W / demodulator		
Signal input		TTL (5 V)		
Digital interface		Ethernet (24 bits) / EtherCAT		
Analog output		0 … 10 V (max. 10 mA, short circuit proof) / (0) 4 ... 20 mA (max. burden 500 Ω)		
Connection		Sensor: triax connector (DL6530) or 5-pin connector (DL6510); power supply: IEC connector; trigger/sync: 37-pin Sub-D connector; signal: analog via 37-pin Sub-D connector or BNC, digital via RJ45 connector (suitable connection cables, see accessories)		
Mounting		Table-top device or 19-inch rack		
Temperature range	Storage	-10 ... 75 °C		
	Operation	10 ... 60 °C		
Shock (DIN EN 60068-2-29)		20 g / 5 ms in 3 axes, two directions each, 1000 shocks each		
Vibration (DIN EN 60068-2-6)		1 mm / 10 Hz ... 49.8 Hz in 3 axes, 10 cycles each 10 g / 49.8 … 2000 Hz in 3 axes, 10 cycles each		
Protection class (DIN EN 60529)		IP20		
Weight	Controller	Base system for max. 2 measuring channels: 3.5 kg; base system for max. 8 measuring channels: 6.0 kg		
	Demodulator	0.4 kg per equipped measuring channel (demodulator)	0.5 kg per equipped measuring channel (demodulator) and external preamplifier	
Compatibility		compatible with all capaNCDT sensors		
No. of measurement channels		max. 2 or max 8 (depending on the base system)		

[1] FSO = Full Scale Output | RMS noise referred to the end of the measuring range; static = 2 Hz, dynamic = maximum frequency response of the controller
[2] Applies to the controller only. The total linearity of the measuring channel is the sum of the controller and sensor values.
[3] FSO = Full Scale Output | The value corresponds to the slope error that occurs when a sensor is replaced without recalibration

DT6530
Pin assignment analog output, trigger and synchronization

Pin	Assignment	Pin	Assignment	Pin	Assignment
1	U-Out channel 1	13	Trigger_In	25	AGND channel 6
2	U-Out channel 2	14	Sync_In-8M	26	AGND channel 7
3	U-Out channel 3	15	Sync_Out-8M	27	AGND channel 8
4	U-Out channel 4	16	Sync_In-31K	28	I-Out channel 2
5	U-Out channel 5	17	Sync_Out-31K	29	I-Out channel 4
6	U-Out channel 6	18	Not assigned	30	I-Out channel 6
7	U-Out channel 7	19	Not assigned	31	I-Out channel 8
8	U-Out channel 8	20	AGND channel 1	32	GND_Trigger_I
9	I-Out channel 1	21	AGND channel 2	33	Sync_In+ 8M
10	I-Out channel 3	22	AGND channel 3	34	Sync_Out+ 8M
11	I-Out channel 5	23	AGND channel 4	35	Sync_In+ 31K
12	I-Out channel 7	24	AGND channel 5	36	Sync_Out+ 31K
				37	Not assigned

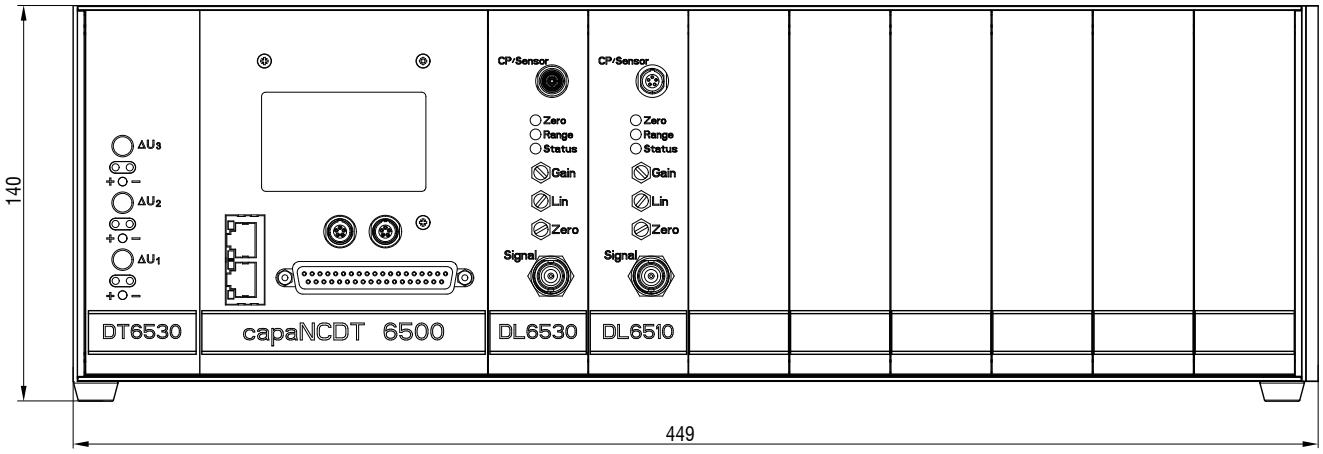


Solder side view, 37-pin Sub-D cable connector

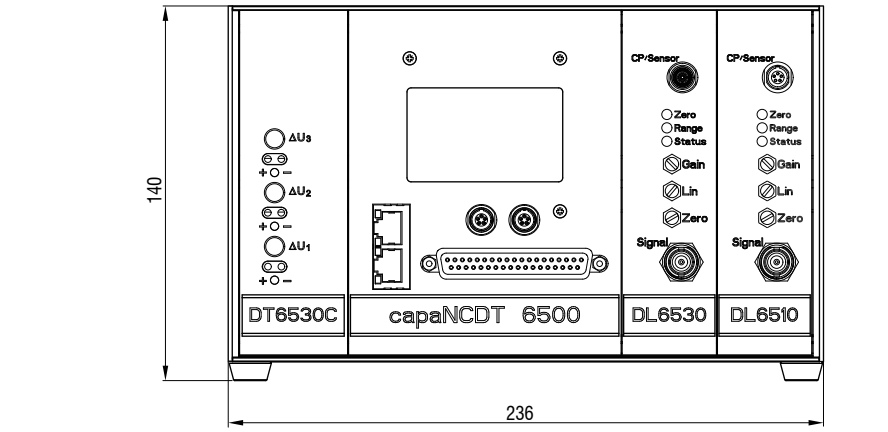
DT6530

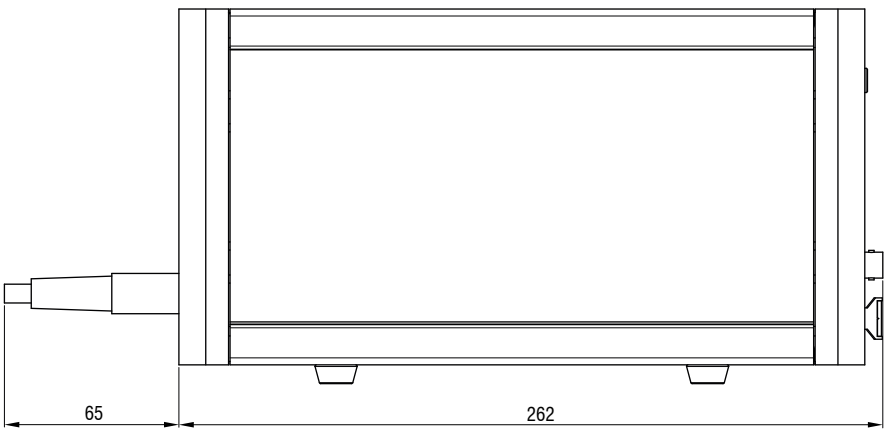
If there are three or more measuring channels, the housing length remains the same.
A shorter housing version is available as an option for systems with one or two measuring channels.

Dimensions for 3 to 8 measuring channels



Dimensions for 1 to 2 measuring channels





Connections and combinations
capaNCDT

Controller

DT6100

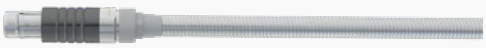
DT6200

DT6500

Sensor cable

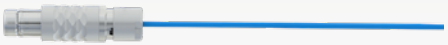
Type: CCg

Robust triaxial cable for industrial applications
Cable diameter: 3.1 mm (±0.1 mm)
Minimum bending radius: static approx. 10 mm / dynamic approx. 30 mm
Temperature resistance: -20 ... +85 °C (permanent) / -20 ... +100 °C (limited to 10,000 h)
Standard length: 2 m (optional lengths see p. 41)



Type CCg/PT

Crush-resistant triaxial cable with protective metal tubing
Cable diameter: 6 mm (± 0.15 mm)
Minimum bending radius: static approx. 20 mm / dynamic approx. 30 mm
Temperature resistance: -20 °C ... +85 °C (permanent) / -20 ... +100 °C (limited to 10,000 h)
Standard length: 2 m (optional lengths see p. 41)



Type CCm

Low-outgassing triaxial cable for UHV and cleanroom
Cable diameter: 2.1 mm (±0.1 mm)
Minimum bending radius: static approx. 7 mm / dynamic approx. 25 mm
Temperature resistance: up to -100 ... 200 °C
Standard length: 1.4 m (optional lengths see p. 41)

Type CCo

Low-outgassing triaxial cable for high temperatures
Cable diameter: 3.1 mm (±0.1 mm)
Minimum bending radius: static approx. 10 mm / dynamic approx. 30 mm
Temperature resistance: -20 ... +200 °C
Standard length: 2 m (optional lengths see p. 41)

Sensors with integrated cable use the cable types CCM and CCg

Type CCm

Low-outgassing triaxial cable for UHV and cleanroom
Cable diameter: 2.1 mm (±0.1 mm)
Minimum bending radius: static approx. 15 mm / dynamic approx. 30 mm
Temperature resistance: up to 200 °C
Standard length: 1.4 m (optional lengths see p. 41)

Type: CCg

Robust triaxial cable for industrial applications
Cable diameter: 3.1 mm (±0.1 mm)
Minimum bending radius: static approx. 10 mm / dynamic approx. 30 mm
Temperature resistance: -20 °C ... +85 °C (permanent) / -20 ... +100 °C (limited to 10,000 h)
Standard length: 2 m (optional lengths see p. 41)

Plug connector

Type B connector

Type B / 90 connector

Type B / IP connector

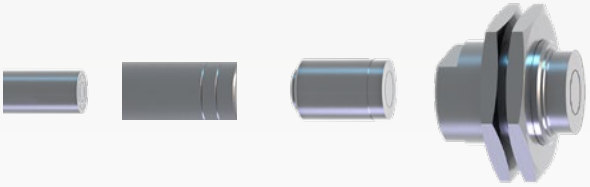
Type C connector

Type C / 90 connector

Type E connector

Sensors with socket

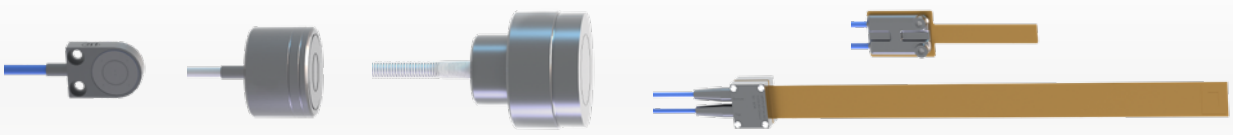
CS-x, CSE and CSE/Mx models
with a measuring range from 1 mm



CS, CS-x, CSE and CSE/Mx models
with measuring range up to 1 mm

CSF flat sensors with socket

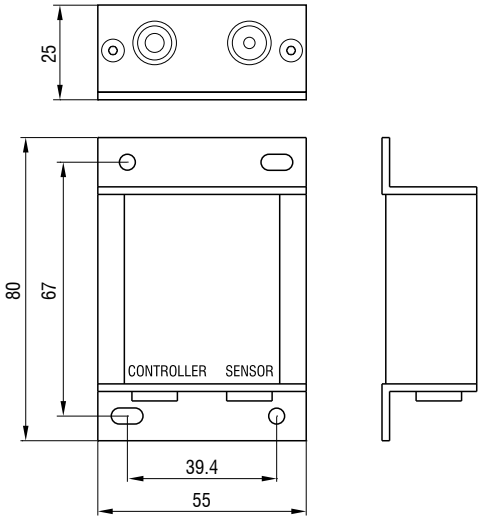
Sensors with integrated cable



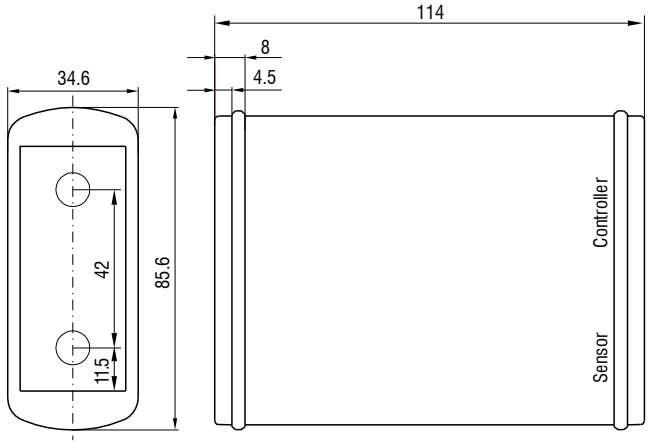
Connection accessories and signal cables
capaNCDT

Controller accessories							
Article		**Description**	**DT65xx**	**DT62xx**	**DT611x**	**DT6120**	**DT61x0/IP**
SCACx/4		**Analog signal cable** 4-pin with XYZ connector / open ends Standard length: 3 m Optional lengths available: 6 m / 10 m / 12 m / 15 m		x			
PC6200-x/4		**Power supply and trigger cable** 4-pin with XYZ connector / open ends Standard length: 3 m Optional lengths available: 5m / 15 m		x			
SC6000-x		**Power supply and trigger cable** 5-pin with XYZ connector / open ends Standard length: 0.3 m Optional lengths available: 3 m / 5 m / 15 m	x	x			
SCACx/5		**Power supply and signal cable** 5-pin with XYZ connector / open ends Standard length: 3 m Optional lengths available: 4 m / 5 m / 6 m / 8 m / 15 m			x		
SCACx/6		**Power supply and signal cable** 6-pin with XYZ connector / open ends Standard length: 3 m				x	
SCACx/6/IP		**Power supply and signal cable IP68** 6-pin with XYZ connector / open ends Standard length: 3 m					x
CAx		**Preamplifier connection cable** 5-pin with XYZ connector both ends Standard length: 3 m Optional lengths available: 5 m / 10 m / 15 m / 20 m	x				
CMP6011		**External preamplifier for standard measurements**	x				
CP6001		**External preamplifier for high precision measurements**	x				
PS2020		**Power supply unit** Input 100-240 VAC Output 24 VDC / 2.5 A Mounting on a symmetrical DIN rail 35 mm x 7.5 mm DIN 50022		x	x	x	x
IF1032		**Interface module for Ethernet/EtherCAT**			x	x	x

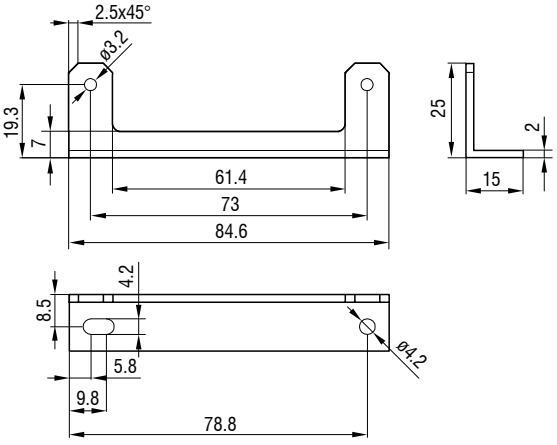
CPM6011
External preamplifier



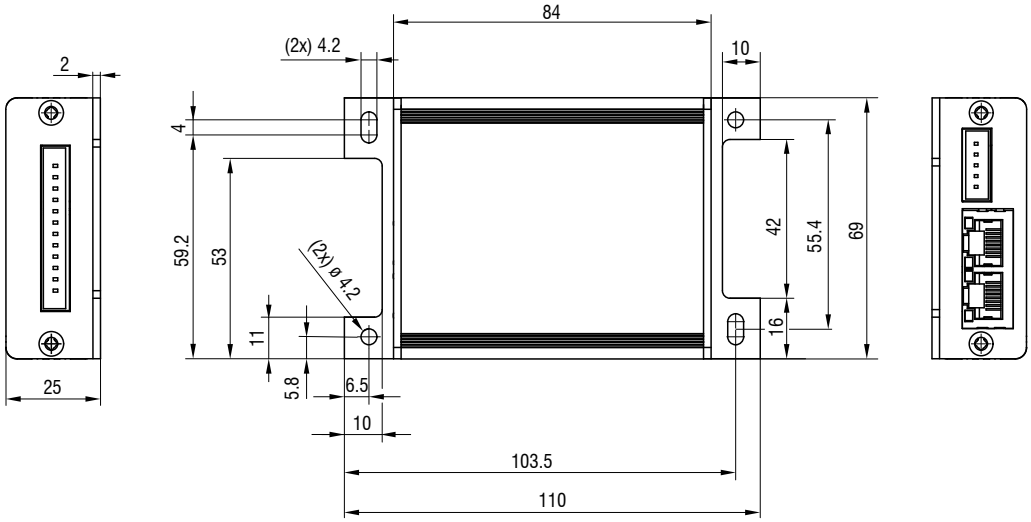
CP6001
External preamplifier



Mounting bracket for CP6001



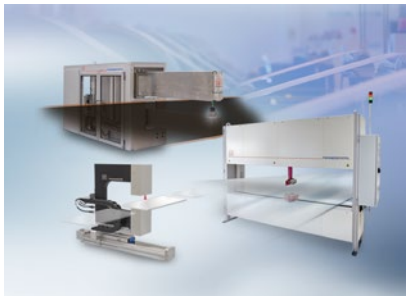
IF1032
Interface module



Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

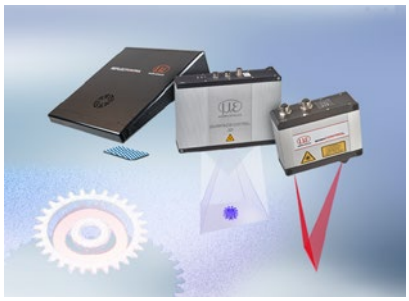
Sensors and measurement devices for non-contact temperature measurement



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

Modifications reserved / Y9766319-I012066GKE

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