MICRO-EPSILON

Quick Manual

capaNCDT 6200

DT6220
DT6222
DT6230

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You can find more information about the measurement system in the operating instructions. They are available online at:

www.micro-epsilon.com/download/manuals/man--capaNCDT-6200--en.pdf

www.micro-epsilon.com/download/manuals/man--capaNCDT-6222--en.pdf

or on the CD supplied.

General

Symbols Used

The following symbols are used in this document:

⚠ CAUTION	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a situation that may result in property damage if not avoided.
➡	Indicates a user action.
i	Indicates a tip for users.
`Measure`	Indicates hardware or a software button/menu.
↑↑↑	Sensor measurement direction

Warnings

⚠ CAUTION

Disconnect the power supply before touching the sensor surface.
> Risk of injury, static discharge

Connect the power supply and the display/output device according to the safety regulations for electrical equipment.
> Risk of injury, damage to or destruction of the sensor and/or the controller

NOTICE

Avoid shocks and impacts to the sensor and the controller.
> Damage to or destruction of the sensor and/or the controller

The supply voltage must not exceed the specified limits.
> Damage to or destruction of the sensor and/or the controller

Protect the sensor cable against damage.
> Destruction of the sensor, failure of the measurement system.

Intended Use

- The measuring system is designed for use in an industrial environment. It is used for
  - measuring displacement, distance, movement and thickness,
  - measuring the position of parts or machine components.
- The measuring system must only be operated within the limits specified in the technical data.

➡ The measuring system must be used in such a way that no persons are endangered or machines and other material goods are damaged in the event of malfunction or total failure of the controller..

➡ Take additional precautions for safety and damage prevention in case of safety-related applications.

Proper Environment

Temperature range controller	Operation	Storage
	+10 ... +60 °C (+50 ... +140 °F)	-10 ... +75 °C (+14 ... +167 °F)

Temperature range sensor	Operation	Storage
CS005, CS02, CS05, CS08, CS1, CS2, CS3, CS5, CS10	-50 ... +200 °C (-58 ... +392 °F)	-50 ... +200 °C (-58 ... +392 °F)
CSH02, CSH05, CSH1, CSH1.2, CSH2		
CSH02FL, CSH05FL, CSH1FL, CSH1.2FL, CSH2FL, CSH3FL		
CSE05, CSE1, CSE2		
CS1HP		
CSG0.50, CSG1.00	-50 ... +100 °C (-58 ... +212 °F)	-50 ... +100 °C (-58 ... +212 °F)

Temperature range sensor cable	Operation		Storage
	Up to 10,000 operating hours	Permanent	
CCgxC, CCgxC/90	-20 ... +100 °C (-4 ... +212 °F)	-20 ... +80 °C (-4 ... +176 °F)	-50 ... +80 °C (-58 ... +176 °F)
CCgxB , CCgxB/90			
CCmxC, CCmxC/90		-100 ... +200 °C (-148 ... +392 °F)	-50 ... +200 °C (-58 ... +392 °F)
CCmxB, CCmxB/90			

Protection class	IP 40
Humidity	5 - 95 % (non-condensing)
Ambient pressure	Atmospheric pressure

The space between sensor surface and target must have an unchanging dielectric constant.

Setup, Connection Options

Power supply and signal output are provided via plug connectors on the front of the controller.

Ground Connection, Grounding

Ensure sufficient grounding of the target, for example, by connecting it to the sensor or the power supply ground. If necessary, use the grounding connection on the housing cover. The grounding connection is included in the conversion kit supplied in the scope of delivery.

Non-contact target grounding

Grounding the target is very difficult or even impossible in many applications. Unlike common systems, the target does not need to be grounded if two DL62xx demodulators are synchronized.

The schematic diagram below shows two synchronized capaNCDT sensors that measure against a roll. Since the sensors are connected by MICRO-EPSILON's unique synchronization technology, grounding of the target is not required in most cases.

Position and imbalance measurement with two measurement systems

Grounding connection on the housing cover (1)

Target grounding is not required with synchronized capaNCDT sensors by Micro-Epsilon.

Synchronization

All sensors are synchronized with each other within one DT6220/6222/6230 controller. Several capaNCDT 6230 series controllers can be operated simultaneously as a multi-channel system. Synchronizing the controllers prevents interference of the sensors with each other.

External synchronization DT6230

PIN	Assignment	Insulation	Color
1	n.c.	-	-
2	Twisted pair 1	1	white 1
3	Twisted pair 1	blue	blue
4	Twisted pair 2	2	white 2
5	Twisted pair 2	orange	orange

SC6000-x is an assembled synchronization cable which is 0.3 or 1 m long

View: solder side, 5-pin ODU male cable connector

IN/OUT sync on the controller, 5-pin female connector

- Plug the `SC6000-x` synchronization cable into the `SYNC OUT` port (output) on Controller 1.
- Plug the connector of the `SC6000-x` into the `SYNC IN` port (input) on Controller 2.

i Automatic synchronization, each controller can be the master.

Controller 1 Controller 2

Synchronization of a second DT6230 controller

Assembly

No sharp or heavy objects should be allowed to affect the cable sheath.

i A damaged cable cannot be repaired. Tension on the cable is not permitted!

Sensor

Flush installation

Protruding installation

Recessed installation, not for sensors in the CSE series

During installation, take care that the sensor front face is not scratched.

Clamping Around Circumference, Cylindrical Sensors

Clamping around circumference, assembly with clamping collet

- High reliability
- Flat clamping across cylindrical housing
- Recommended assembly for e.g., machines, production facilities, etc.

Radial Spot Clamping with Grub Screw, Cylindrical Sensors

Radial spot clamping with grub screw (1)

- Simple mounting option
- Recommended assembly only for installation locations
  that are free of impact or vibration
- The grub screw must be made of plastic

Do not use metal grub screws!
> Risk of damage to the sensor

Flat Sensors

Screwed connection from top

Screwed connection from bottom

Controller

Dimensional drawing of base module and demodulator module

Dimensional drawing of housing cover

Inserting Demodulator Module

- Loosen the sleeve nuts (4b) on the right side of the controller, remove the right housing cover (3).
- Pull out a sleeve nut (4a), including the threaded rod (1).
- Replace the threaded rod (1) with the next-longest threaded rod in the conversion kit supplied. Push the new threaded rod, including sleeve nut (4a), through the modules.
- Replace the remaining 3 threaded rods in the same manner.
- Attach the additional demodulator module.

Number of demodulator modules	Length of threaded rod M4
1	59 mm
2	84 mm
3	109 mm
4	134 mm
Controller mechanical parts	

i Only touch the demodulator modules on the housing, not on the electronics. This avoids electrostatic discharges onto the electronics.

- Connect both flat strip connections (5) of the previous demodulator module to the new demodulator module (6).

Wiring of demodulator modules

5 Wiring of previous demodulator module
6 Wiring of next demodulator module

- Attach the right housing cover (3).
- Screw the sleeve nuts (4b) onto the threaded rods on the right side of the controller and tighten the sleeve nuts.

Wiring to the previous demodulator module (5) can be released by using the supplied unplugging tool – see Accessories – as follows:

- 1. Push the unplugging tool with the cutout sideways onto the plug (5).
- 2. Remove the plug with a lever movement.
- 3. Release the other side of the plug in the same manner.

Use of the unplugging tool for wiring of the demodulator elements

Commissioning

LEDs

1) LP filter can only be switched via Ethernet.

LED	Color		Function
Range	☀	green	Target within the measuring range
		red	Measuring range exceeded
LP filter [1]	○	off	Default strip width active
	☀	red	20 Hz low-pass filter at analog outputs enabled.
Zero	○	off	Zero potentiometer in base position (right-hand stop)
	☀	red	Zero potentiometer misaligned

Pin Assignment Supply, Trigger

PIN	Wire color PC6200-3/4	Signal	Description
1	brown	+24VIN	+24 VDC supply
2	white	Zero VIN	GND supply
3	yellow	TRI_IN+	Trigger IN+, TTL level
4	green	TRI_IN-	Trigger IN-
Shield			

PC6200-3/4 is an assembled supply and trigger cable that is 3 m long.

View: solder side, 4-pin ODU female connector

Supply input on controller, 4-pin plug

Pin Assignment of Analog Output

Pin	Wire color SCACx/4	Signal	Description
1	brown	U-out	U_{OUT}, (Load min. 10 kOhm)
2	yellow	I-out	I_{OUT}, (Load max. 500 Ohm)
3	gray	AGND	Analog ground
4	white	AGND	Analog ground
Shield			

Analog grounds are connected internally. SCACx/4 is a 4-wire output cable that is 3 m long. It is supplied as an optional accessory.

View: soldering pin side, 4-pin male cable connector

Signal output on controller, 4-pin port

Ethernet/EtherCAT Switching DT6230

Switch for changing between Ethernet and EtherCAT

You can change between Ethernet and EtherCAT by using the hardware switch on the DT6230 base module or in the software.

If the switch is in the `EN` (Ethernet) position, the Ethernet interface is always active irrespective of the software setting. If the switch is in the `EN/EC` (Ethernet/EtherCAT) position, the interface set by the software is active. Any change to the interface only takes effect after restarting the controller.

Commissioning, IP Address

The controller is shipped with the factory-set IP address `169.254.168.150`.

You can query the IP addresses of the controllers that are connected to a PC or network by using the SensorFinder.exe program. You will find this program on the supplied CD.

- Start the `SensorFinder` and click the button.
- Select the correct controller from the list.
- Click the `Open WebPage` button to connect the sensor to your default browser.

OR: If DHCP is active and the DHCP server is linked to the DNS server, access is also possible by using e.g., `DT6200_SN01234567` (where “01234567” is the serial number of your controller).

- Start a web browser on your PC. Enter `DT6200_Serial_number` in the address bar of your browser.

The controller supports UPnP. If you have an operating system where the UPnP service is enabled, e.g. by default in Windows 7, the controller is automatically listed in Explorer under network devices and can be accessed from there, e.g. if you have forgotten its IP address.

First interactive web page after calling the IP address

Additional help functions (e.g. `Settings`) are available in the top navigation bar. All settings on the web page are implemented in the controller immediately.

Parallel operation with web browser and Telnet commands is possible; the last setting applies.

The appearance of the web pages can change depending on the functions and the peripherals. Each page contains parameter descriptions and thus tips for configuring the controller.

Channel Information, Measuring Range

The measuring ranges of the connected sensors must be specified manually. After replacing a sensor, don't forget to specify its new measuring range.

➡ Go to the `Settings` > `Channel n` > `Channel information` menu.

➡ Specify the measuring range of the sensor.

Data channel	1/2/3/4	*Value*

Value range between 0 and 1000000 µm Value range between 0 and 1000000 µm

Math Function

This function permits scaling of a measuring channel and mathematical linking of individual measuring channels.

Formula: Data channel = Offset + Factor Measuring channel 1 + Factor Measuring channel 2 + Factor Measuring channel 3 + Factor Measuring channel 4.

Data channel = digital values

Measuring channel = analog value of a demodulator module

➡ Go to the `Settings` > `Channel n` > `Math function` menu.

➡ Specify the values for Offset and Factor.

Data channel	1/2/3/4	Offset	*Value*
		Factor measuring channel	*Value*

Value range for Offset: max. ±8 times MR

Value range for Factor: measuring channel between -9.9 and +9.9

Positioning the Target

➡ Position the target within the sensor measuring range.

SMR	Start of measuring range
MMR	Mid of measuring range
EMR	End of measuring range

Distance Measurements

➡ Switch to the `Measurement` menu.

➡ Click the `Start measuring` button.

Operation and Maintenance

Please note for operation and maintenance:

- Ensure that the sensor surface is always clean.
- Before cleaning, turn off the supply voltage.
- Clean with a damp cloth and then rub the sensor surface dry.

If the target has been changed or operating periods are very long, minor losses in operating quality are possible. You can correct these long-term errors by recalibrating.

- Disconnect the power supply before touching the sensor surface.

> Static discharge, danger of injury

If the cause of a fault cannot be clearly determined, always send the complete measurement system. In case of a defect in the controller, the sensor or the sensor cable, send the affected parts for repair or exchange.

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Liability for Material Defects

All components of the device have been checked and tested for functionality at the factory. However, if defects occur despite our careful quality control, MICRO-EPSILON or your dealer must be notified immediately.

The liability for material defects is 12 months from delivery. Within this period, defective parts, except for wearing parts, will be repaired or replaced free of charge, if the device is returned to MICRO-EPSILON with shipping costs prepaid. Any damage that is caused by improper handling, the use of force or by repairs or modifications by third parties is not covered by the liability for material defects.

Repairs are carried out exclusively by MICRO-EPSILON.

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For translations into other languages, the German version shall prevail.

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