More Precision
capaNCDT // Capacitive displacement sensors and systems
System design
The capaNCDT 6500 can be used for multi-channel operation and is modular in its design. Up to eight sensors can be connected to the signal conditioning electronics (Euro-size cards) via a preamplifier module.

For the DL6530 version, the pre-amplifier is integrated in the housing and is used for cable lengths up to 4 m (with CC cable) or 8 m (with CCg cable). For longer cable lengths, the external preamplifiers CP6001 or CPM6011 are used.

A measuring system with n measurement channels consists of:
1. controller DT6530 with power supply, display, Ethernet, oscillator and analog output
2. n x demodulator modules DL6510 (DL6530 with integral pre-amplifier)
3. n x pre-amplifier connecting cables
4. n x pre-amplifier modules CP6001
5. n x sensor cables
6. n x sensors

DL6510: One item of position 2 to 6 is needed for each channel.
DL6530: One item of position 2, 5 and 6 is needed for each channel.
Web interface
The web interface for controller configuration opens via Ethernet.
Up to 8 channels can be visualized and linked arithmetically.

System configuration

System capaNCDT 6500 (with integral pre-amplifier):
- DT6530 / DT6530C Rack
- Demodulator DL6530
- Sensor cable
- Sensor

System capaNCDT 6510 (with external pre-amplifier):
- DT6530 / DT6530C Rack
- Demodulator DL6510
- Sensor cable
- Sensor
- Pre-amplifier CPM6011 / CP6001
- Pre-amplifier cable

CPM6011
External pre-amplifier for standard measurements

CP6001
External pre-amplifier for high precision measurements

DT6530C 2 channel rack

DT6530 8 channel rack
### Specifications

<table>
<thead>
<tr>
<th>Controller type</th>
<th>DT6530</th>
<th>DT6530 with pre-amplifier CPM6011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution static</td>
<td>0.000075 % FSO</td>
<td>0.0006 % FSO</td>
</tr>
<tr>
<td>Resolution dynamic</td>
<td>0.002 % FSO (8.5 kHz)</td>
<td>0.015 % FSO (8.5 kHz)</td>
</tr>
<tr>
<td>Data rate analog output</td>
<td>8.5 kHz (-3 dB)</td>
<td>8.5 kHz (-3 dB)</td>
</tr>
<tr>
<td>Bandwidth (switchable)</td>
<td>20 Hz; 1 kHz; 8.5 kHz</td>
<td>20 Hz; 1 kHz; 8.5 kHz</td>
</tr>
<tr>
<td>Data rate digital output</td>
<td>4 x 7.8 kSa/s; 8 x 3.9 kSa/s</td>
<td>4 x 7.8 kSa/s; 8 x 3.9 kSa/s</td>
</tr>
<tr>
<td>Linearity (typ.)</td>
<td>≤ ± 0.025 % FSO</td>
<td>≤ ± 0.05 % FSO</td>
</tr>
<tr>
<td>Max. sensitivity deviation</td>
<td>≤ ± 0.05 % FSO</td>
<td>≤ ± 0.1 % FSO</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.0003 % FSO</td>
<td>0.001 % FSO</td>
</tr>
<tr>
<td>Long-term stability</td>
<td>± 0.002 % FSO / month</td>
<td>± 0.02 % FSO / month</td>
</tr>
<tr>
<td>Synchronous operation</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Insulator measurement</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Temperature stability</td>
<td>± digital: 5 ppm/°C analog: 10 ppm/°C</td>
<td>80 ppm</td>
</tr>
<tr>
<td>Temperature range (during operation)</td>
<td>Sensor: -50 ... + 200 °C; Controller: +10 ... +60 °C</td>
<td>Sensor: -50 ... + 200 °C; Controller: +10 ... +60 °C</td>
</tr>
<tr>
<td>Temperature range (storage)</td>
<td>-10 ... +75 °C</td>
<td>-10 ... +75 °C</td>
</tr>
<tr>
<td>Supply</td>
<td>230 VAC</td>
<td>230 VAC</td>
</tr>
<tr>
<td>Output</td>
<td>0 ... 10 V (max. 10 mA short circuit proof); 4 ... 20 mA (load max. 500 Ω) optional: 0 ... 20 mA (load max. 500 Ω)</td>
<td>Ethernet 24 Bit; EtherCAT</td>
</tr>
<tr>
<td>Sensors</td>
<td>suitable for all sensors</td>
<td>suitable for all sensors</td>
</tr>
<tr>
<td>Sensor cable standard</td>
<td>CC cable ≤ 1 m; CCm cable = 1.4 m; CCg cable = 2 m</td>
<td>CC cable ≤ 1 m; CCm cable = 1.4 m; CCg cable = 2 m</td>
</tr>
<tr>
<td>Sensor cable (special tuning)</td>
<td>double / triple / quadruple standard cable length</td>
<td>double / triple / quadruple standard cable length</td>
</tr>
<tr>
<td>Trigger</td>
<td>TTL, 5 V</td>
<td>TTL, 5 V</td>
</tr>
<tr>
<td>No. of channels</td>
<td>max. 8</td>
<td>max. 8</td>
</tr>
</tbody>
</table>

FSO = Full Scale Output

### Options

<table>
<thead>
<tr>
<th>Article number</th>
<th>Description</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>2982011</td>
<td>EMR2 CP6001</td>
<td>extended measuring range (factor: 2) in combination with DL6510</td>
</tr>
<tr>
<td>2982013</td>
<td>RMR 1/2 CP6001</td>
<td>reduced measuring range (factor: 1/2) in combination with DL6510</td>
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<tr>
<td>2982015</td>
<td>ECL2 CP6001</td>
<td>special tuning for double standard cable length in combination with DL6510</td>
</tr>
<tr>
<td>2982017</td>
<td>ECL3 CP6001</td>
<td>special tuning for triple standard cable length in combination with DL6510</td>
</tr>
<tr>
<td>2982026</td>
<td>ECL4 CP6001</td>
<td>special tuning for quadruple standard cable length in combination with DL6510</td>
</tr>
<tr>
<td>2982028</td>
<td>ECL2 CPM6011</td>
<td>special tuning for 2 m sensor cable in combination with DL6510</td>
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<tr>
<td>2982019</td>
<td>EMR2 DL65x0</td>
<td>extended measuring range (factor: 2)</td>
</tr>
<tr>
<td>2982020</td>
<td>RMR 1/2 DL65x0</td>
<td>reduced measuring range (factor: 1/2)</td>
</tr>
<tr>
<td>2982021</td>
<td>ECL2 DL65x0</td>
<td>special tuning for double standard cable length</td>
</tr>
<tr>
<td>2982023</td>
<td>ECL3 DL65x0</td>
<td>special tuning for triple standard cable length</td>
</tr>
<tr>
<td>2982025</td>
<td>ECL4 DL65x0</td>
<td>special tuning for 4 m sensor cable</td>
</tr>
<tr>
<td>2982033</td>
<td>EMR2 CPM6011</td>
<td>extended measuring range (factor: 2)</td>
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</tbody>
</table>
## Accessories
capoNCDT

### Sensor cable
- **Cable CCx,x / CCx,x/90**
  - **Description**: Low-outgassing cable up to 4 m length, for applications in clean rooms
  - **Temperature stability**: -100 °C to +200 °C
  - **Outer diameter**: 3.1 mm ±0.1 mm
  - **Standard length**: 1 m
- **Cable CCmx,x / CCmx,x/90**
  - **Description**: Low-outgassing cable up to 4.2 m length, for applications in clean rooms, UHV and EUV
  - **Temperature stability**: -100 °C to +200 °C
  - **Outer diameter**: 2.1 mm ±0.1 mm
  - **Standard length**: 1 m
- **Cable CCgx,x / CCgx,x/90**
  - **Description**: Robust cable up to 8 m length, for industrial applications
  - **Temperature stability**: -20 °C to +80 °C (permanent)
  - **Outer diameter**: 3.1 mm ±0.1 mm
  - **Standard length**: 1 m

### Connector type C/90

### Connector type B/90

### Accessories
- **MC2.5** Micrometer for sensor calibration, range 0 - 2.5 mm, Resolution 0.1 µm. Suitable for sensors CS005 to CS2
- **MC25D** Digital micrometer for sensor calibration, range 0 - 25 mm, adjustable offset (zero). Suitable for all sensors.
- **HV/B** Vacuum feed through triaxial
- **UHV/B** Vacuum feed through triaxial for ultra-high vacuum
- **PC6200-3/4** Power-trigger cable, 4 pin, 3 m
- **SCAC3/4** Signal output cable, (necessary for multi-channel applications), 4 pin, 3 m
- **SCAC3/5** Signal output cable, analog, 5 pin, 3 m
- **SC6000-1.0** Synchronization cable, 5 pin, 1 m
- **CA5** Preamplifier cable 5 pin, 5 m
- **PS2020** Power supply for DIN rail mounting; Input 230 VAC (115 VAC); Output 24 VDC / 2.5 A; L/W/H 120x120x40 mm
Max. leak rate $1 \times 10^{-7}$ mbar · l s$^{-1}$, compatible with connector type B.

**HV/B Vacuum feed through** (Art.-no. 0323050)

Max. leak rate $1 \times 10^{-9}$ mbar · l s$^{-1}$, compatible with connector type B.

**UHV/B Vacuum feed triax weldable** (Art.-no. 0323346)

Max. leak rate $1 \times 10^{-9}$ mbar · l s$^{-1}$, compatible with connector type B.

**UHV/B Vacuum feed triax with flange CF16** (Art.-no. 0323349)

Max. leak rate $1 \times 10^{-9}$ mbar · l s$^{-1}$, compatible with connector type B.

**UHV/B Vacuum feed triax screwable** (Art.-no. 0323370)

**PC6200-3/4 Power-/trigger cable** (Art.-no. 2901881)

**SCAC3/4 Signal output cable** (Art.-no. 2902104)

**SC6000-1,0 Synchronization cable** (Art.-no. 2903473)

**CAS Preamplifier cable** (Art.-no. 2903180)
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