










More Precision

capaNCDT // Capacitive sensors for displacement, distance & gap



Capacitive, high-performance measuring system (up to 4 channels) capaNCDT 6200

-  High resolution down to 0.0001 % FSO
-  **INTER FACE** Analog outputs / Ethernet / EtherCAT / PROFINET interface
-  20kHz Ideal for fast measurements up to 20 kHz
-  Digital data rate: 4 x 3.9 kSa/s
-  Modular system scalable up to 4 channels
-  Supports triggering and synchronization
-  Simple configuration via web interface



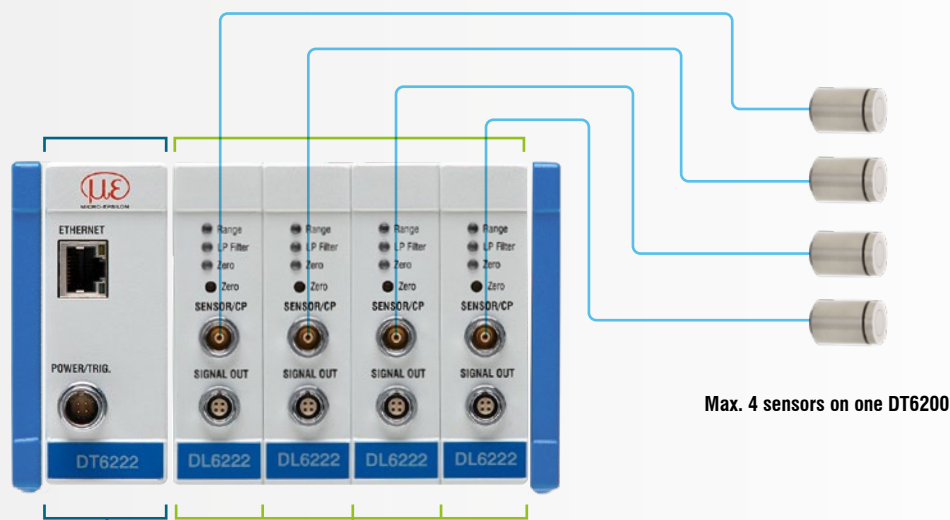
The capaNCDT 6200 is a modular measuring system designed for high-precision measurements. It consists of a controller and the corresponding demodulator for the sensor. The modular design allows up to four measurement channels to be combined and flexibly adapted to different measurement tasks.

The Ethernet interface integrated in the controller allows for easy configuration via a web browser. In addition, analog outputs and digital interfaces are available.

The compact controller can be used as a benchtop unit or mounted on a DIN rail or wall using adapters.

The DT6200 is available in various models. Depending on the base module (controller) used and the compatible demodulator, different interfaces are available or higher resolutions can be achieved.

Flexible system design for maximum performance in your application



Basic module (controller)
 DT6220: Ethernet
 DT6230: Ethernet / EtherCAT
 DT6240: PROFINET
 DT6222: High speed
 DT6228 / DT6238: for HT sensors

Demodulator with integrated preamplifier
 Depending on the application
 DL6220: Standard
 DL6230: Highest resolution
 DL6222: High speed
 DL6228: For HT sensors

Modular multi-channel system with Ethernet / EtherCAT / PROFINET

| Model | DT6220 | | DT6230 | | DT6240 | | |
|---------------------------------|--|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------|
| Demodulator | DL6220 | DL6230 | DL6220 | DL6230 | DL6220 | DL6230 | |
| Resolution ^[1] | Static | 0.0004 % FSO | 0.0001 % FSO | 0.0004 % FSO | 0.0001 % FSO | 0.0004 % FSO | 0.0001 % FSO |
| | Dynamic | 0.02 % FSO | 0.005 % FSO | 0.02 % FSO | 0.005 % FSO | 0.02 % FSO | 0.005 % FSO |
| Frequency response (-3dB) | 5 kHz, switchable to 20 Hz | | | | | | |
| Measuring rate | max. 3.906 kSa/s | | | | | | |
| Linearity ^[2] | < ±0.05 % FSO | < ±0.025 % FSO | < ±0.05 % FSO | < ±0.025 % FSO | < ±0.05 % FSO | < ±0.025 % FSO | |
| Temperature stability | < 200 ppm FSO/K | | | | | | |
| Replaceability ^[3] | < ±0.1 % FSO | | | | | | |
| Long-term stability | < ±0.02% FSO/month | | | | | | |
| Synchronization | yes (only internal) | yes | yes (only internal) | yes | yes (only internal) | yes | |
| Supply voltage | 12 ... 36 VDC | 15 ... 36 VDC | 12 ... 36 VDC | 15 ... 36 VDC | 15 ... 36 VDC | 15 ... 36 VDC | |
| Power consumption | 3 W (24 VDC) + 1.9 W / demodulator | 3 W (24 VDC) + 1.9 W / demodulator | 3.9 W (24 VDC) + 1.9 W / demodulator | 3.9 W (24 VDC) + 1.9 W / demodulator | 3.9 W (24 VDC) + 1.9 W / demodulator | 3.9 W (24 VDC) + 1.9 W / demodulator | |
| Signal input | Trigger: TTL (5 V) | | | | | | |
| Digital interface | Ethernet | | Ethernet/EtherCAT | | PROFINET | | |
| Analog output | 0 ... 10 V / 4 ... 20 mA | | | | | | |
| Connection | Sensor | Pluggable cable via triaxial socket | | | | | |
| | Supply/signal | Supply/trigger: 4-pin connector; sync: 5-pin connector; signal: analog via 4-pin connector, digital via RJ45 connector (for suitable connection cables, see accessories) | | | | | |
| Mounting | Table-top device or DIN rail | | | | | | |
| Temperature range | Storage | -10 ... 75 °C | | | | | |
| | Operation | 10 ... 60 °C | | | | | |
| Shock (DIN EN 60068-2-29) | 15 g / 6 ms in 3 axes, two directions each, 1000 shocks each | | | | | | |
| Vibration (DIN EN 60068-2-6) | 0.75 mm / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each 2 g / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each | | | | | | |
| Protection class (DIN EN 60529) | IP40 | | | | | | |
| Weight | approx. 710 g + 185 g / demodulator | approx. 710 g + 210 g / Demodulator | approx. 720 g + 185 g / demodulator | approx. 720 g + 210 g / demodulator | approx. 720 g + 185 g / demodulator | approx. 720 g + 210 g / demodulator | |
| Compatibility | compatible with all capaNCDT sensors | | | | | | |
| No. of measurement channels | max. 4 | | | | | | |

^[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

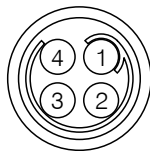
^[2] Applies to the controller only. The total linearity of the measuring channel is the sum of the controller and sensor values.

^[3] FSO = Full Scale Output | The value corresponds to the slope error that occurs when a sensor is replaced without recalibration

DT6220 / DT6230 / DT6240

Pin assignment for power supply and trigger

| Pin | Assignment | Color (cable PC6200-x/4) |
|-----|------------------------|--------------------------|
| 1 | Supply +24 V | Brown |
| 2 | GND supply | White |
| 3 | Trigger IN+, TTL level | Yellow |
| 4 | Trigger IN- | Green |

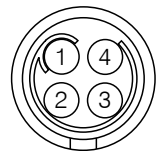


Solder side view,
4-pin socket

DT6220 / DT6230 / DT6240

Pin assignment for analog output

| Pin | Assignment | Color (color SCACx/4) |
|-----|--|-----------------------|
| 1 | U _{OUT} (load min. 10 kOhm) | Brown |
| 2 | I _{OUT} (burden max. 500 ohm) | Yellow |
| 3 | Analog ground | Gray |
| 4 | Analog ground | White |



Solder side view,
4-pin cable
connector

Capacitive, high-performance measuring system (up to 4 channels)

capaNCDT 6200

Modular multi-channel system for high-speed measurements

| | | |
|---------------------------------|---------------|---|
| Model | | DT6222 |
| Demodulator | | DL6222 |
| Resolution ^[1] | Static | 0.0005 % FSO |
| | Dynamic | 0.05 % FSO |
| Frequency response (-3dB) | | 20 kHz, switchable to 20 Hz |
| Measuring rate | | max. 3.906 kSa/s |
| Linearity ^[2] | | < ±0.1 % FSO |
| Temperature stability | | < 200 ppm FSO/K |
| Replaceability ^[3] | | < ±0.1 % FSO |
| Long-term stability | | < ±0.02% FSO/month |
| Synchronization | | yes (only internal) |
| Supply voltage | | 12 ... 36 VDC |
| Power consumption | | 2.8 W (24 VDC) + 1.2 W / demodulator |
| Signal input | | Trigger: TTL (5 V) |
| Digital interface | | Ethernet |
| Analog output | | 0 ... 10 V / 4 ... 20 mA |
| Connection | Sensor | Pluggable cable via triaxial socket |
| | Supply/signal | Supply/trigger: 4-pin connector; sync: 5-pin connector; signal: analog via 4-pin connector, digital via RJ45 connector (for suitable connection cables, see accessories) |
| Mounting | | Table-top device or DIN rail |
| Temperature range | Storage | -10 ... 75 °C |
| | Operation | 10 ... 60 °C |
| Shock (DIN EN 60068-2-29) | | 15 g / 6 ms in 3 axes, two directions each, 1000 shocks each |
| Vibration (DIN EN 60068-2-6) | | 0.75 mm / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each 2 g / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each |
| Protection class (DIN EN 60529) | | IP40 |
| Weight | | approx. 710 g + 185 g / demodulator |
| Compatibility | | compatible with all capaNCDT sensors |
| No. of measurement channels | | max. 4 |

^[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

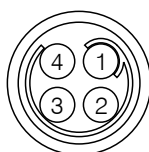
^[2] Applies to the controller only. The total linearity of the measuring channel is the sum of the controller and sensor values.

^[3] FSO = Full Scale Output | The value corresponds to the slope error that occurs when a sensor is replaced without recalibration

DT6222

Pin assignment for power supply and trigger

| Pin | Assignment | Color (cable PC6200-x/4) |
|-----|------------------------|--------------------------|
| 1 | Supply +24 V | Brown |
| 2 | GND supply | White |
| 3 | Trigger IN+, TTL level | Yellow |
| 4 | Trigger IN- | Green |

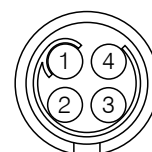


Solder side view,
4-pin socket

DT6222

Pin assignment for analog output

| Pin | Assignment | Color (color SCACx/4) |
|-----|--|-----------------------|
| 1 | U _{OUT} (load min. 10 kOhm) | Brown |
| 2 | I _{OUT} (burden max. 500 ohm) | Yellow |
| 3 | Analog ground | Gray |
| 4 | Analog ground | White |



Solder side view,
4-pin cable
connector

Modular multi-channel system for high-temperature sensors

| Model | DT6228 | DT6238 |
|---------------------------------|--|---|
| Demodulator | Demodulator DL6228 | |
| Resolution ^[1] | Static | 0.0005 % FSO |
| | Dynamic | 0.01 % FSO |
| Frequency response (-3dB) | 1 kHz, switchable to 20 Hz | |
| Measuring rate | max. 3.906 kSa/s | |
| Linearity ^[2] | < ±0.05 % FSO | |
| Temperature stability | < 200 ppm FSO/K | |
| Replaceability ^[3] | < ±0.1 % FSO | |
| Long-term stability | < ±0.02% FSO/month | |
| Synchronization | yes (only internal) | yes |
| Supply voltage | 12 ... 36 VDC | 15 ... 36 VDC |
| Power consumption | 3.1 W (24 VDC) + 1.8 W / demodulator | 3.8 W (24 VDC) + 1.8 W / demodulator |
| Signal input | Trigger: TTL (5 V) | |
| Digital interface | Ethernet | Ethernet/EtherCAT |
| Analog output | 0 ... 10 V / 4 ... 20 mA | |
| Connection | Sensor | Pluggable cable via triaxial socket |
| | Supply/signal | Supply/trigger: 4-pin connector; sync: 5-pin connector; signal: analog via 4-pin connector, digital via RJ45 connector (for suitable connection cables, see accessories) |
| Mounting | Table-top device or DIN rail | |
| Temperature range | Storage | -10 ... 75 °C |
| | Operation | 10 ... 60 °C |
| Shock (DIN EN 60068-2-29) | 15 g / 6 ms in 3 axes, two directions each, 1000 shocks each | |
| Vibration (DIN EN 60068-2-6) | 0.75 mm / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each 2 g / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each | |
| Protection class (DIN EN 60529) | IP40 | |
| Weight | approx. 710 g + 185 g / demodulator | approx. 720 g + 185 g / demodulator |
| Compatibility | Recommended for use with high-temperature sensors (CSE-x/HT models); generally compatible with all capaNCDT sensors | |
| No. of measurement channels | max. 4 | |

^[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

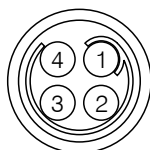
^[2] Applies to the controller only. The total linearity of the measuring channel is the sum of the controller and sensor values.

^[3] FSO = Full Scale Output | The value corresponds to the slope error that occurs when a sensor is replaced without recalibration

DT6228 / DT6238

Pin assignment for power supply and trigger

| Pin | Assignment | Color (cable PC6200-3/4) |
|-----|------------------------|--------------------------|
| 1 | Supply +24 V | Brown |
| 2 | GND supply | White |
| 3 | Trigger IN+, TTL level | Yellow |
| 4 | Trigger IN- | Green |

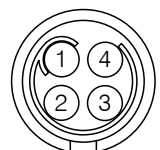


Solder side view,
4-pin socket

DT6228 / DT6238

Pin assignment for analog output

| Pin | Assignment | Color (color SCACx/4) |
|-----|--|-----------------------|
| 1 | U _{OUT} (load min. 10 kOhm) | Brown |
| 2 | I _{OUT} (burden max. 500 ohm) | Yellow |
| 3 | Analog ground | Gray |
| 4 | Analog ground | White |



Solder side view,
4-pin cable
connector

Connections and combinations

capaNCDT

Controller



DT6100



DT6200



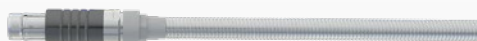
DT6500

Sensor cable



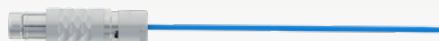
Type: CCg

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

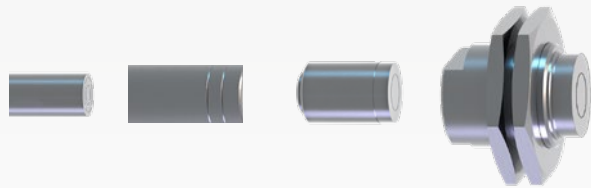


Type E connector

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

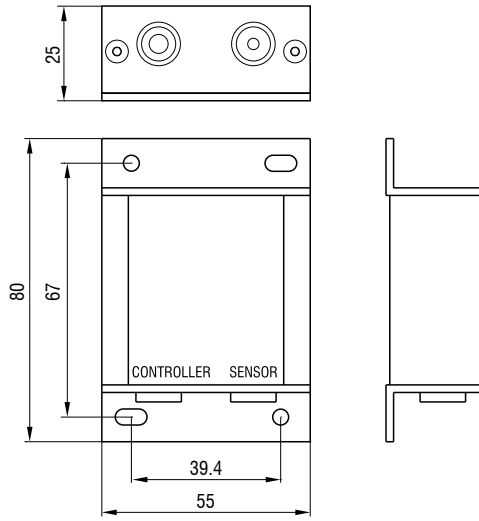


Connection accessories and signal cables

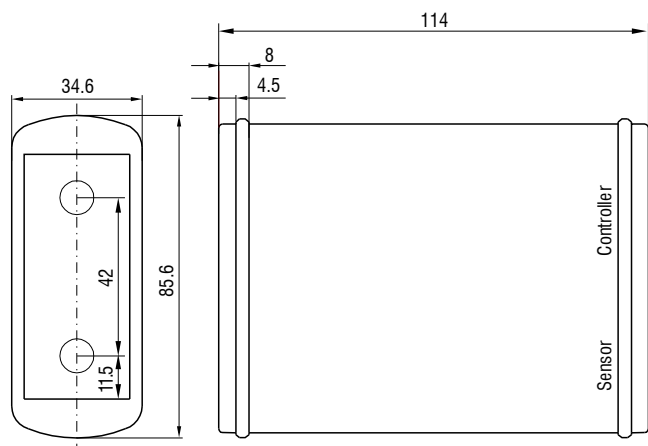
capa**NCDT**

| 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: 5 m / 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 |  | Pre-amplifier 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 pre-amplifier for standard measurements | X | | | | | |
| CP6001 |  | External pre-amplifier 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 | |

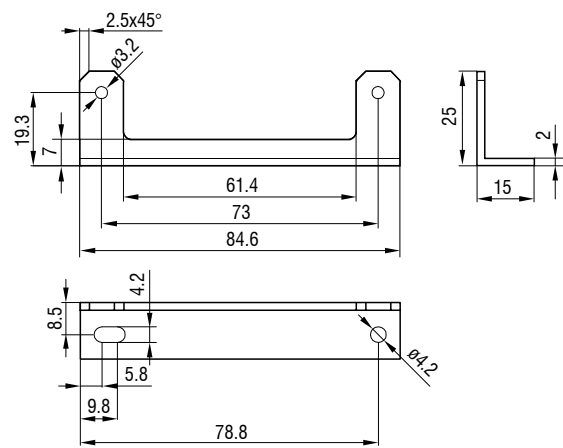
CPM6011
External preamplifier



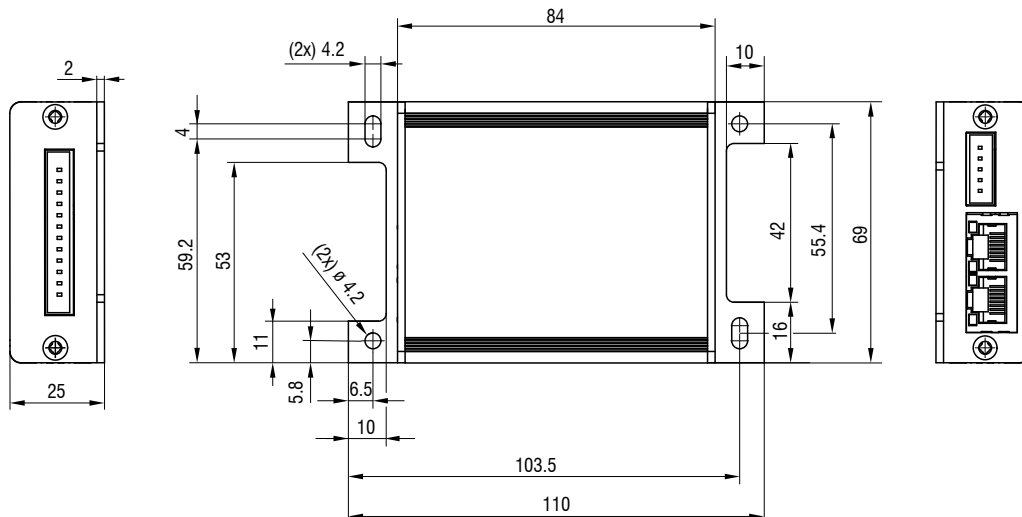
CP6001
External preamplifier



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



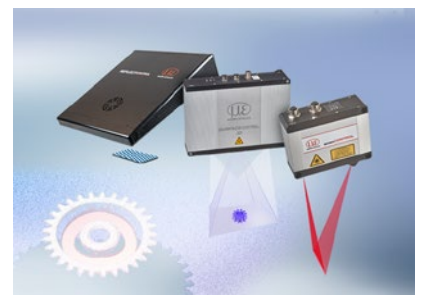
Measuring and inspection systems for metal strips, plastics and rubber



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