MICRO-EPSILON

More Precision

confocalDT // Confocal chromatic measuring system

Fastest controller worldwide:
Measuring rate up to 70kHz

Ethernet / EtherCAT / RS422 /
PROFINET / Ethernet/IP / Analog

Fast surface compensation

Configuration via
web interface

Submicrometer resolution

Multi-layer
thickness measurement
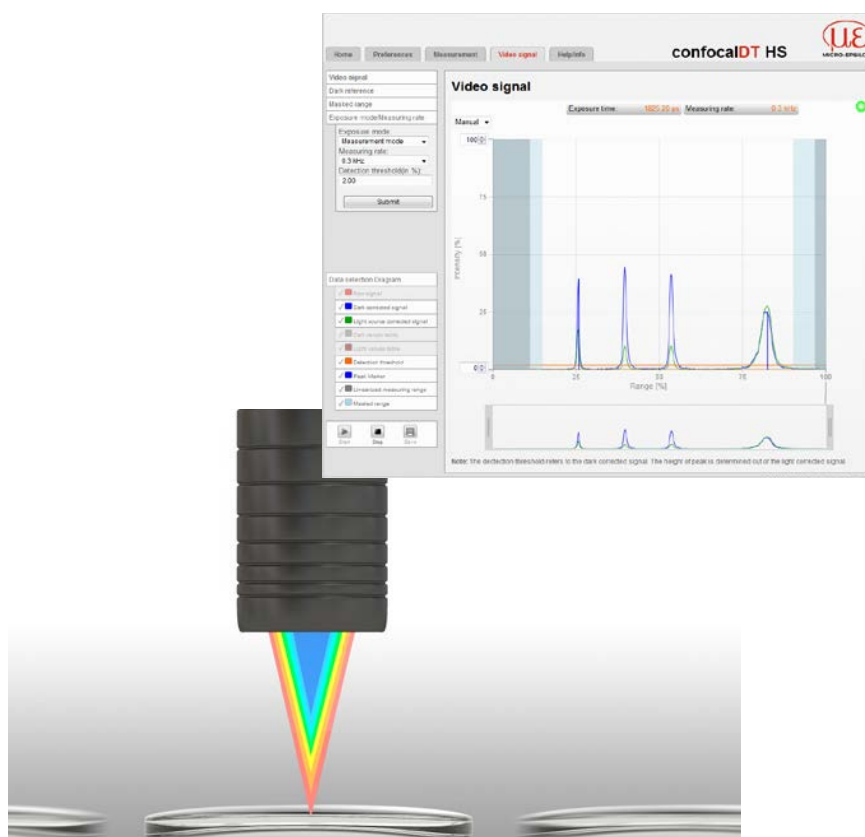
Robust design with
passive cooling

The confocalDT 2471 HS controllers are used for fast distance and thickness measurements of highly reflecting and specular surfaces. The controllers are equipped with enhanced optical components enabling measuring rates up to 70 kHz on reflecting surfaces without having to use an external light source. The confocalDT HS controllers are one of the fastest confocal measuring systems in the world. The active exposure regulation feature in the CCD line enables accurate, fast surface compensation on changing surfaces during dynamic measurement processes.

The controller can be operated with any IFS sensor and is available as a standard version for distance and thickness measurements or as a multi-peak version for multi-layer measurements.

Due to a user-friendly web interface, no additional software is necessary to configure the controller and the sensors. Data output is via Ethernet, EtherCAT, RS422 or analog output.
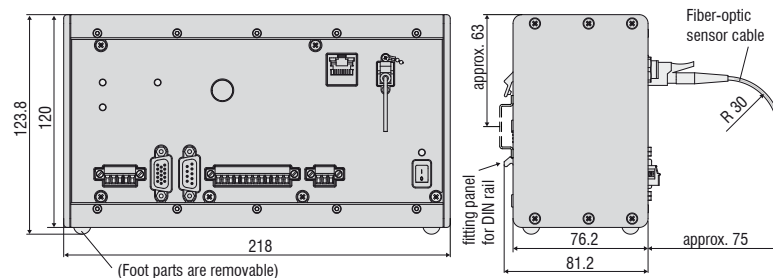
Model		IFC2471LED	IFC2471MP LED
Resolution	Ethernet/EtherCAT	1 nm	
	RS422	18 bit	
	analog	16 bits (teachable)	
Measuring rate		continuously adjustable from 100 Hz to 70 kHz	
Linearity		typ. < ±0.025 % FSO (depends on sensor)	
Multi peak measurement		1 layer	5 layers
Light source		internal white LED	
No. of characteristic curves		up to 20 calibration tables for different sensors per channel, menu selection	
Permissible ambient light [1]		30,000 lx	
Synchronization		yes	
Supply voltage		24 VDC ±15 %	
Power consumption		approx. 10 W	
Signal input		sync-in / trig-in; 3x encoder (A, B, index)	
Digital interface		Ethernet; EtherCAT; RS422; PROFINET [2]; EtherNet/IP [2]	
Analog output		Current: 4 … 20 mA; voltage: 0 ... 10 V / -10 … +10 V (16 bit D/A converter)	
Switching output		Error1-Out, Error2-Out	
Digital output		sync-out	
Connection	optical	pluggable optical fiber via E2000 socket, length 2 m ... 50 m, min. bending radius 30 mm	
	electrical	3-pin supply terminal strip; Encoder connection (15-pin, HD-sub socket, max. cable length 3 m); RS422 connection socket (9-pin, Sub-D, max. cable length 30 m); 3-pin output terminal strip (max. cable length 30 m); 12-pin I/O terminal strip (max. cable length 30 m); RJ45 socket for Ethernet /(EtherCAT (max. cable length 100 m)	
Installation		free-standing, DIN rail mounting	
Temperature range	Storage	-20 … +70 °C	
	Operation	+5 … +50 °C	
Shock (DIN EN 60068-2-27)		15 g / 6 ms in XYZ axis, 1000 shocks each	
Vibration (DIN EN 60068-2-6)		2 g / 20 … 500 Hz in XYZ axis, 10 cycles each	
Protection class (DIN EN 60529)		IP40	
Material		Aluminum	
Weight		approx. 2.2 kg	
Compatibility		compatible with all confocalDT sensors	
No. of measurement channels		1	
Control and display elements		ON/OFF multifunction button (as well as dark alignment and reset to factory setting after 10 s); 4x LEDs for intensity, range, status, supply voltage	
Features		particularly light-intensive and high measuring rate	

FSO = Full Scale Output
[1] Illuminant: light bulb
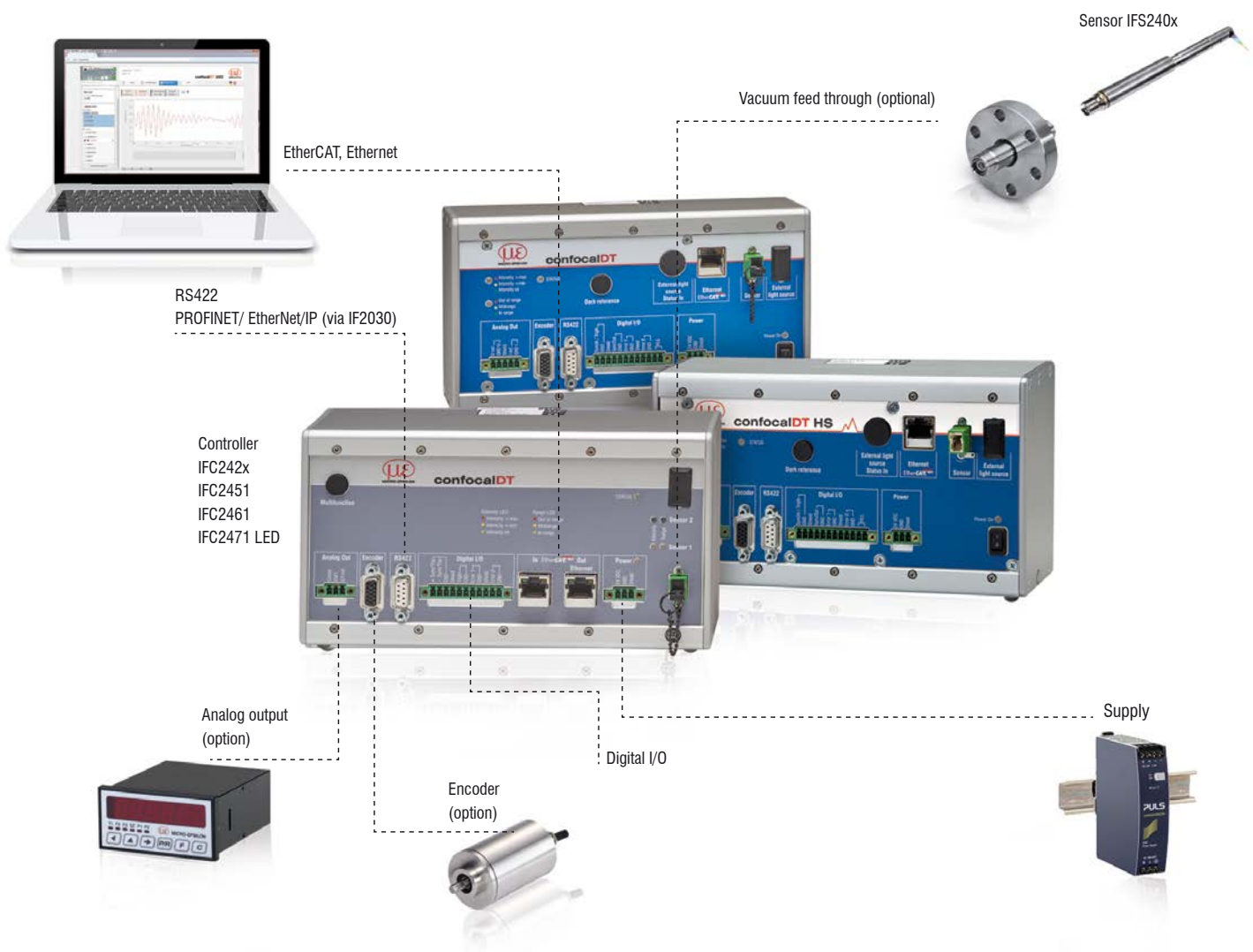[2] Optional connection via interface module (see accessories)
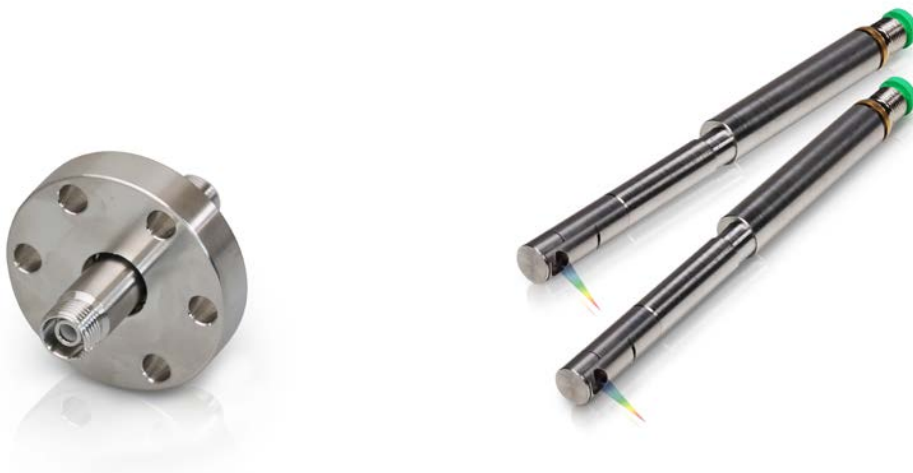
Controller IFC2471 LED

System design

The confocalDT system consists of:
- Sensor IFS240x
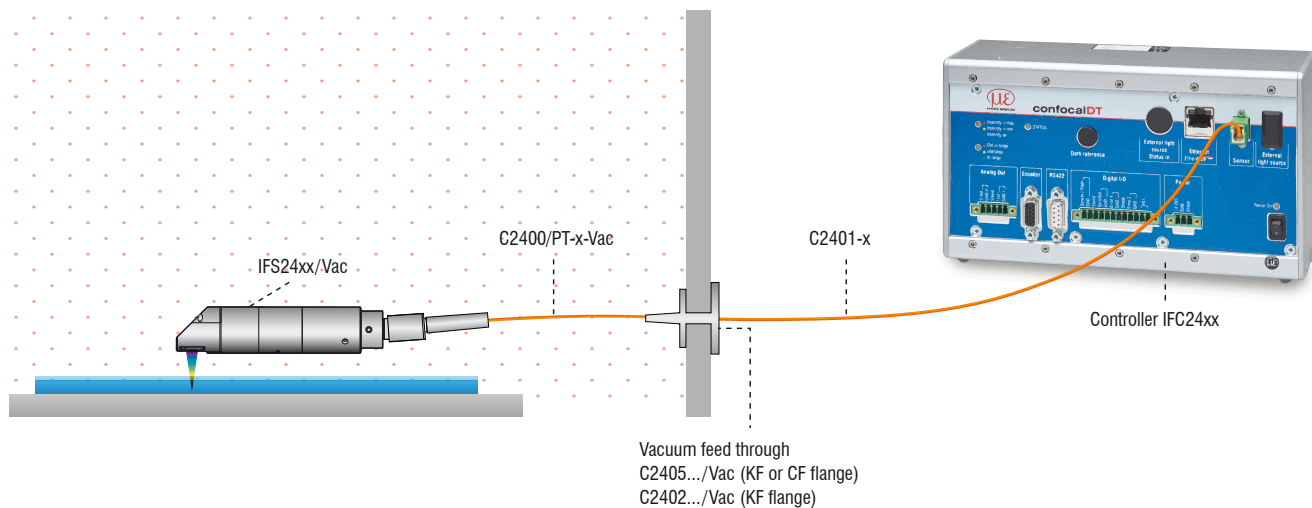- Controller IFC24xx
- Fiber optic cable C24xx

Sensor IFS240x

Vacuum feed through (optional)

EtherCAT, Ethernet

RS422
PROFINET/ EtherNet/IP (via IF2030)

Controller
IFC242x
IFC2451
IFC2461
IFC2471 LED

Analog output
(option)

Digital I/O

Encoder
(option)

Supply

Customer-specific modifications

Application examples are often found where the standard versions of the sensors and the controllers are performing at their limits. To facilitate such special tasks, it is possible to customize the sensor design and to adjust the controller accordingly. Common requests for modifications include changes in design, mounting options, customized cable lengths and modified measuring ranges.
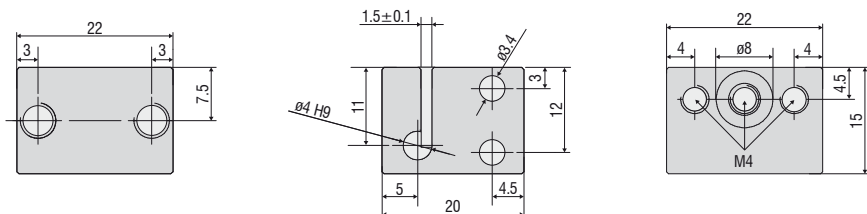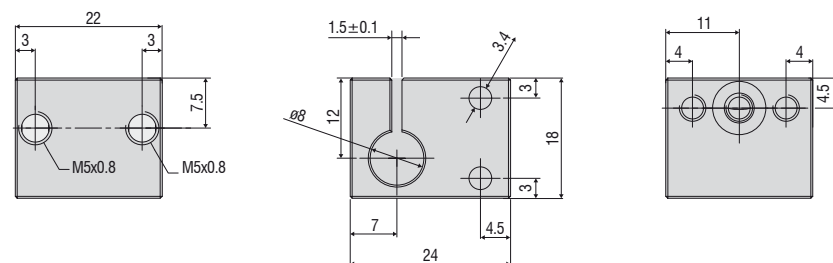
Possible modifications

- Sensors with connector
- Cable length
- Vacuum suitability up to UHV
- Specific lengths
- Customer-specific mounting options
- Optical filter for ambient light compensation
- Housing material
- Measuring range / Offset distance

IFS24xx/Vac

C2400/PT-x-Vac

C2401-x

Controller IFC24xx

Vacuum feed through
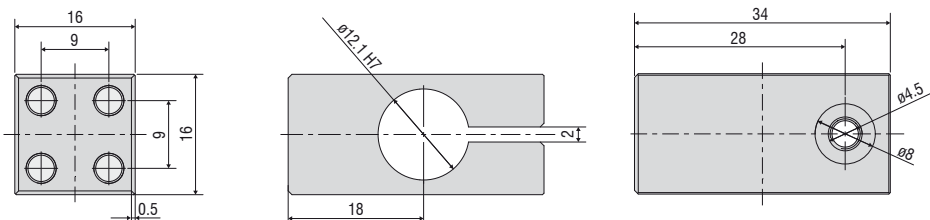C2405.../Vac (KF or CF flange)
C2402.../Vac (KF flange)

Accessories: mounting adapter
MA2402 for sensors 2402

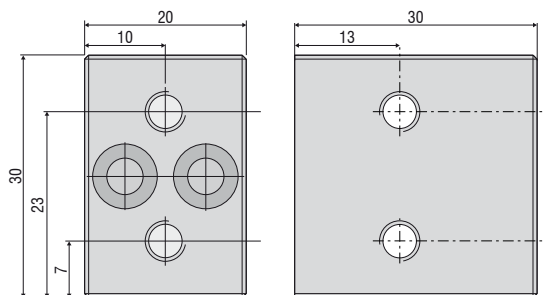**Accessories: mounting adapter**
MA2403 for sensors 2403

Accessories: mounting adapter
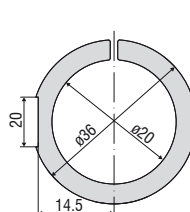MA2404-12 for sensors IFS2404-2 / IFS2404/90-2 / IFS2407-0,1

Accessories: mounting adapter
MA2400 for sensors IFS2405 / IFS2406 / IFS2407 (consisting of a mounting block and a mounting ring)
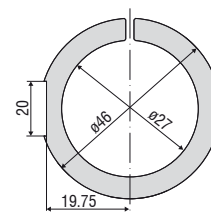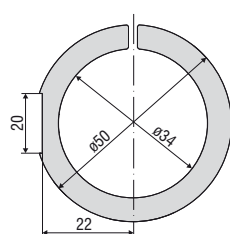
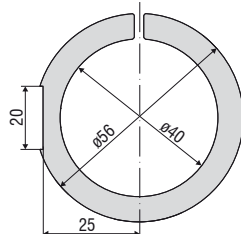Mounting block

Mounting ring

MA 2406-20
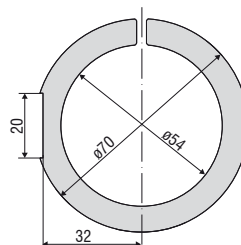for sensors
IFS2406-2,5
IFS2406/90-2,5

MA 2400-27
for sensors
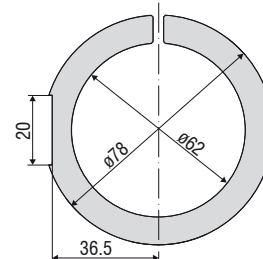IFS2405-0,3 / -1
IFS2406-3 / -10

MA 2405-34
for sensors
IFS2405-3

MA 2405-40
for sensors
IFS 2405-6

MA 2405-54
for sensors
IFS2405-10 / IFS2407-3

MA 2405-62
for sensors
IFS2405-28 / -30

Accessories

Software
IFD24xx-Tool   Software demo tool included

Accessories light source
IFL2422/LE   Lamp module for IFC2422
IFL24x1/LED   Lamp module for IFC24x1
IFL2451/LED(003)   Lamp module for IFC2451(003)

Cable extension for sensors
CE2402 cable with 2x E2000/APC connectors
CE2402-x   Extension for optical fiber (3 m, 10 m,13 m, 30 m, 50 m)
CE2402-x/PT   Extension for optical fiber with protection tube for mechanical stress
                      (3 m, 10 m, customer-specific length up to 50 m)

Cable for IFS2404 sensors
C2404-x   Optical fiber with FC/APC and E2000/APC connectors
                      Fiber core diameter 20 μm (2 m)

Cables for IFS2405/IFS2406/2407-0,1 sensors
C2401 cable with FC/APC and E2000/APC connectors
C2401-x   Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2401/PT-x   Optical fiber with protection tube for mechanical stress
                      (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2401-x (01)   Optical fiber core diameter 26 μm (3 m, 5 m, 15 m)
C2401-x(10)   Drag-chain suitable optical fiber (3 m, 5 m, 10 m)

C2400 cable with 2x FC/APC connectors
C2400-x   Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2400/PT-x   Optical fiber with protection tube for mechanical stress
                      (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2400/PT-x-Vac   Optical fiber with protection tube suitable for use in vacuum
                      (3 m, 5 m, 10 m, customer-specific length up to 50 m)

Cable for IFS2407/90-0,3 sensors
C2407-x   Optical fiber with DIN connector and E2000/APC (2 m, 5 m)

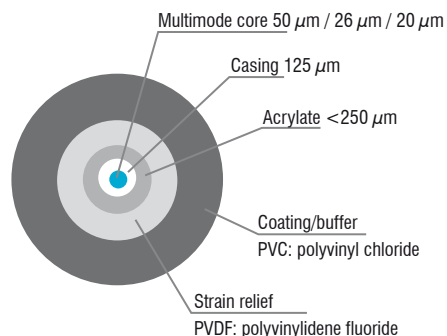### Vacuum feed through
C2402/Vac/KF16   Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC
                      non-vacuum side E2000/APC, clamping flange KF 16
C2405/Vac/1/KF16   Vacuum feed through on both sides FC/APC socket, 1 channel,
                      clamping flange type KF 16
C2405/Vac/1/CF16   Vacuum feed through on both sides FC/APC socket, 1 channel,
                      flange type CF 16
C2405/Vac/6/CF63   Vacuum feed through FC/APC socket, 6 channels,
                      flange type CF 63
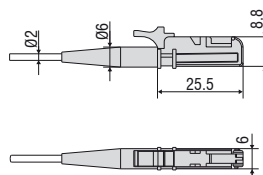
Other accessories
SC2471-x/USB/IND   Connector cable IFC2451/61/71, 3 m, 10 m, 20 m
SC2471-x/IF2008   Connector cable IFC2451/61/71-IF2008, 3 m, 10 m, 20 m
PS2020   Power supply 24V / 2.5A
EC2471-3/OE   Encoder cable, 3m
IF2030/PNET   Interface module for PROFINET connection
IF2030/ENETIP   Interface module for EtherNet/IP connection
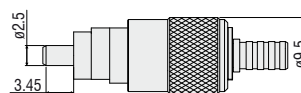
Optical fiber
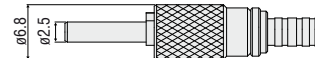Temperature range : -50 °C to 90 °C
Bending radius: 30/40 mm

Multimode core 50 μm / 26 μm / 20 μm
Casing 125 μm
Acrylate <250 μm
Coating/buffer
PVC: polyvinyl chloride
Strain relief
PVDF: polyvinylidene fluoride

E2000/APC standard connector

FC/APC standard connector

DIN connector

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

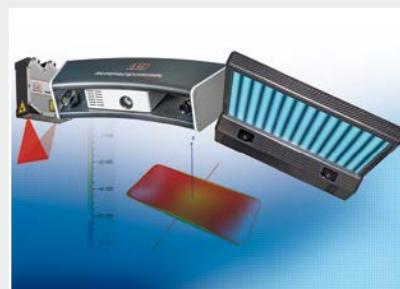Sensors and measurement devices for non-contact temperature measurement

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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