MICRO-EPSILON

More Precision

confocalDT // Confocal chromatic measuring system

6.5kHz	**Measuring rate up to 6.5kHz**
INTER FACE	**Ethernet / EtherCAT / RS422 / PROFINET / Ethernet/IP / Analog**
	Fast surface compensation
	Configuration via web interface
	Submicrometer resolution
	Multi-layer thickness measurement
	Synchronous two-sided thickness measurement
	Robust design with passive cooling

The confocalDT 2421/22 controllers set the industrial standard in precise, confocal measurement technology.

Available as either a single- or a dual-channel version, these measuring systems are a low cost solution especially for serial applications. The active exposure regulation feature in the CCD line is for accurate, fast surface compensation on changing surfaces.

The controller can be operated with any IFS sensor and is available as a standard version for distance measurements or as a multi-peak version for multi-layer thickness measurements. Using a special calculation function, the confocalDT 2422 dual-channel version evaluates both channels. Measurement acquisition is synchronous and can be carried out while exploiting the full measuring rate for both channels.

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.

All settings are performed in the web interface. For thickness measurements, materials are stored in an expandable materials database.

Two sensors can be directly connected to a confocal IFC2422 controller.

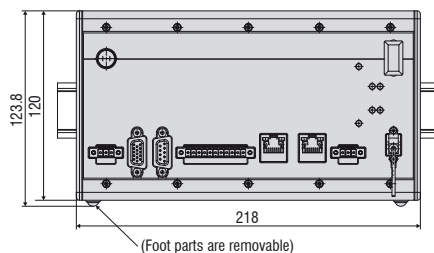| Model		IFC2421	IFC2421MP	IFC2422	IFC2422MP
Resolution	Ethernet/EtherCAT	1 nm			
	RS422	18 bit			
	analog	16 bits (teachable)			
Measuring rate		continuously adjustable from 100 Hz to 6.5 kHz			
Linearity		typ. < ±0.025 % FSO (depends on sensor)			
Multi peak measurement		1 layer	5 layers	1 layer	5 layers
Light source		internal white LED			
No. of characteristic curves		up to 20 characteristic curves for different sensors per channel, selection via table in the menu			
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; 2x encoder (A+, A-, B+, B-, Index)			
Digital interface		Ethernet; EtherCAT; RS422; PROFINET [2]; EtherNet/IP [2]			
Analog output		Current: 4 … 20 mA; voltage: 0 ... 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, 30 m with external encoder supply); RS422 connection socket (9-pin, Sub-D, max. cable length 30 m); 3-pin output terminal strip (max. cable length 30 m); 11-pin I/O terminal strip (max. cable length 30 m); RJ45 socket for Ethernet (out) / EtherCAT (in/out) (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. 1.8 kg		approx. 2.25 kg	
Compatibility		compatible with all confocalDT sensors			
No. of measurement channels [3]		1		2	
Control and display elements		multifunction button (two adjustable functions and reset to factory setting after 10 s); 5x LEDs for intensity, range, status and supply voltage			

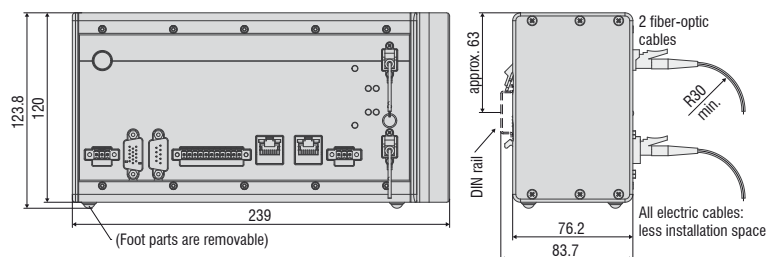FSO = Full Scale Output
[1] Illuminant: light bulb
[2] Optional connection via interface module (see accessories)
[3] No loss of intensity and linearity due to two synchronous measurement channels
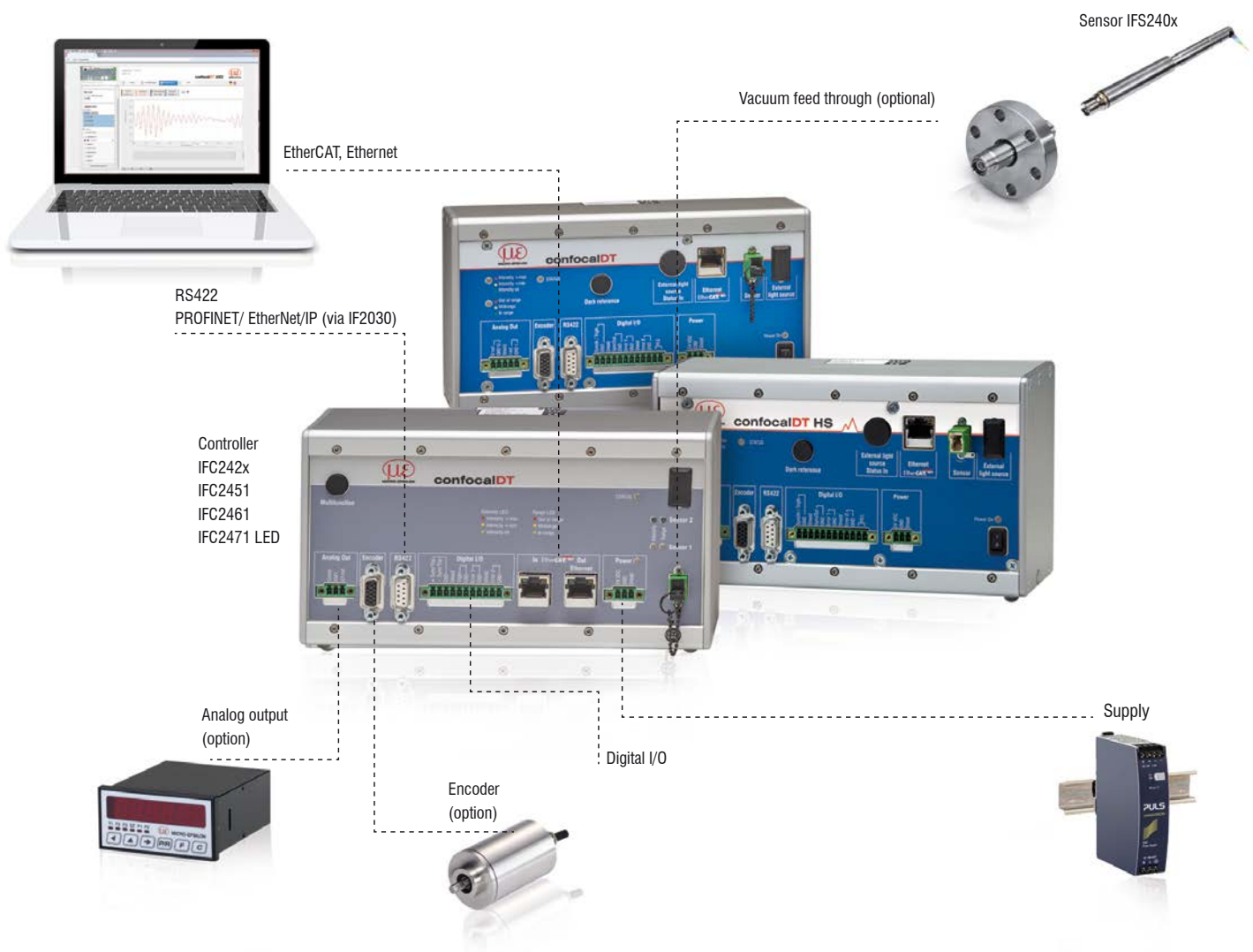
IFC2421 controller

123.8
120
218
(Foot parts are removable)
approx. 63
DIN rail
All electric cables: less installation space
76.2
83.7
R30 min.
Fiber-optic sensor cable

IFC2422 controller

123.8
120
239
(Foot parts are removable)
approx. 63
DIN rail
2 fiber-optic cables
R30 min.
76.2
83.7
All electric cables: less installation space

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
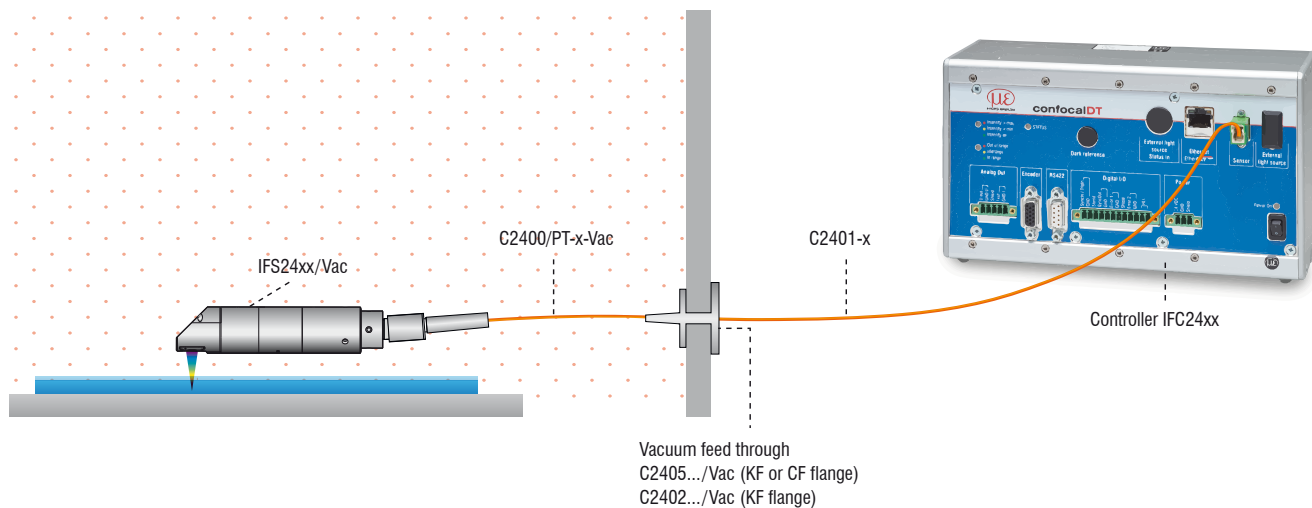(option)

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.
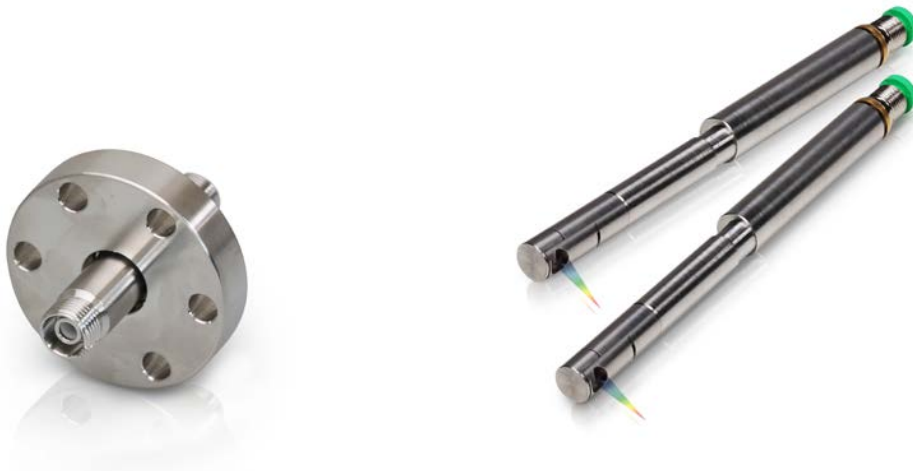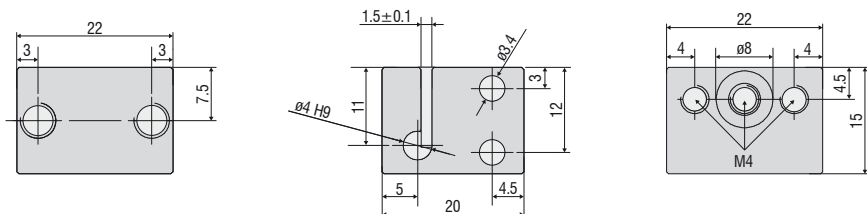
Possible modifications

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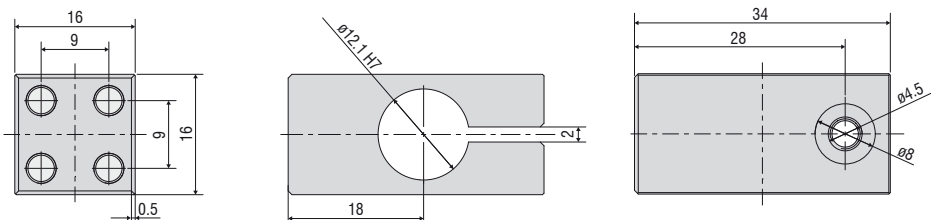- Measuring range / Offset distance

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
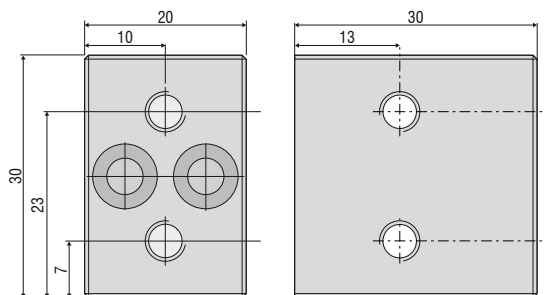MA2403 for sensors 2403
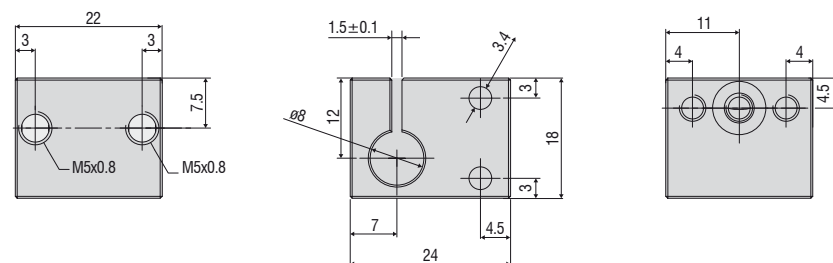
Accessories: mounting adapter
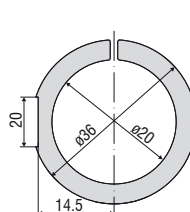MA2404-12 for sensors IFS2404-2 / IFS2404/90-2 / IFS2407-0,1

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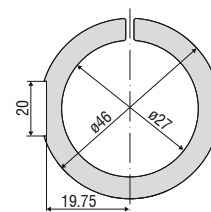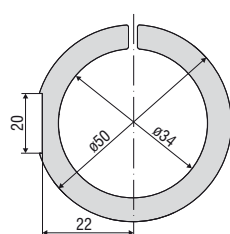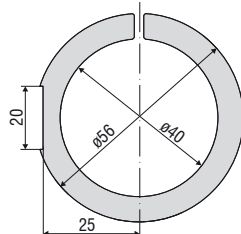
Mounting block

Mounting ring

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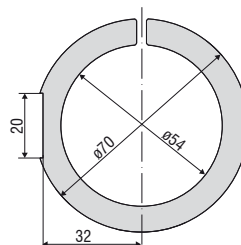for sensors
IFS2406-2,5
IFS2406/90-2,5

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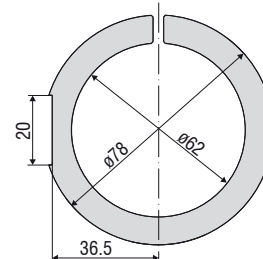IFS2405-0,3 / -1
IFS2406-3 / -10

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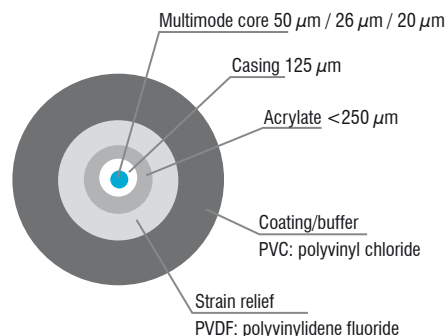C2402/Vac/KF16   Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC
                     non-vacuum side E2000/APC, clamping flange KF 16
C2405/Vac/1/KF16   Vacuum feed through on both sides FC/APC socket, 1 channel,
                     clamping flange type KF 16
C2405/Vac/1/CF16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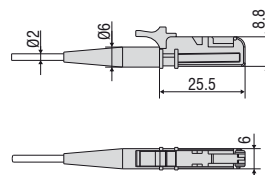
Other accessories
SC2471-x/USB/IND   Connector cable IFC2451/61/71, 3 m, 10 m, 20 m
SC2471-x/IF2008   Connector cable IFC2451/61/71-IF2008, 3 m, 10 m, 20 m
PS2020   Power supply 24V / 2.5A
EC2471-3/OE   Encoder cable, 3m
IF2030/PNET   Interface module for PROFINET connection
IF2030/ENETIP   Interface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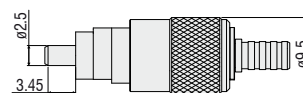
Optical fiber
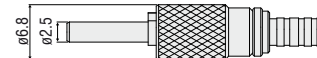Temperature range : -50 °C to 90 °C
Bending radius: 30/40 mm

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

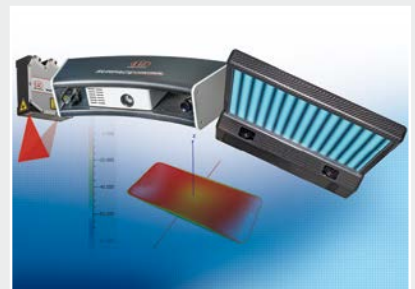Sensors and measurement devices for non-contact temperature measurement

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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