MICRO-EPSILON

# More Precision

## confocalDT // Confocal chromatic measuring system


- Measuring rate up to 6.5kHz
- Interfaces: Ethernet / EtherCAT / RS422 / 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 enable a low cost solution especially for serial applications. The active exposure regulation feature in the CCD line enables 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.

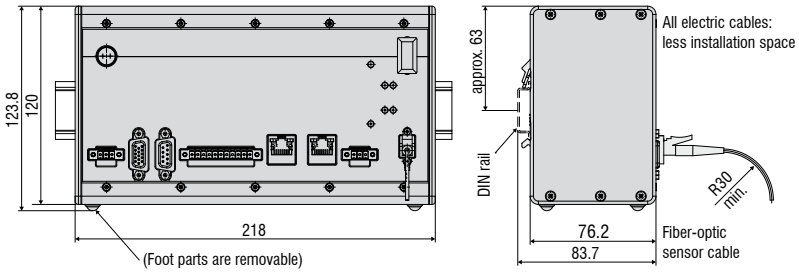
Due to a user-friendly web interface, no additional software is necessary to configure the controller and the sensors. Data output is via Ethernet, EtherCAT, RS422 or analog output.

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

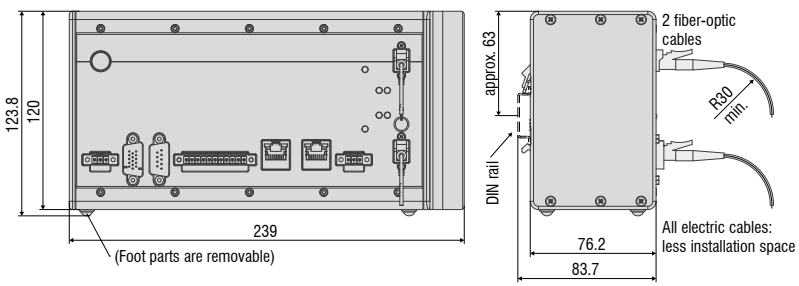
Two sensors can be directly connected to a confocal IFC2422 controller.

| Controller | | IFC2421 | IFC2421MP | IFC2422 | IFC2422MP |
|---|---|---|---|---|---|
| Multi peak measurement | | 1 layer | up to 5 layers | 1 layer | up to 5 layers |
| Measurement channels | | 1 | 1 | 2 | 2 |
| Light source | | internal white LED | | | |
| Measuring rate | | continuously adjustable from 100 Hz to 6.5 kHz | | | |
| Resolution | Ethernet | 1 nm | | | |
| | RS422 | 18 bits | | | |
| | analog | 16 bits (teachable) | | | |
| Storage | | up to 20 calibration tables for different sensors per channel, menu selection | | | |
| Controller inputs/outputs | | Sync-In/Trig-In, Sync-Out<br>Error1-Out, Error2-Out<br>Encoder (2x A, $\bar{A}$, B, $\bar{B}$, index)<br>EtherCAT/Ethernet<br>RS422<br>analog: current, voltage (16-bit D/A converter) | | | |
| EtherCAT | | EtherCAT® | | | |
| Operating elements, controller display | | multifunction button (dark alignment and reset to factory setting after 10 sec)<br>5x LEDs for intensity, range, status, supply voltage | | | |
| Supply voltage, power consumption | | 24 VDC ± 15 %, approx. 10 W | | | |
| Material | | Aluminum case for DIN rail mounting | | | |
| Protection class | | IP40 | | | |
| Temperature range | Operation | +5 ... +50 °C | | | |
| | Storage | -20 ... +70 °C | | | |
| Permissible ambient light | | 30,000 lx | | | |
| Shock | | 15 g, 6 ms | | | |
| Vibration | | 2g / 10 Hz ... 500 Hz | | | |
| Connection | Cable (optical fiber) | 2 ... 50 m | | | |
| | Connector | E2000 | | | |
| Max. cable lengths<br>(all cables are shielded) | EtherCAT, Ethernet | CAT5E; cable length <100 m | | | |
| | Supply, RS422, Sync./Error | <30 m | | | |
| | analog | <30 m | | | |
| | Encoder | <3 m | | | |

**IFC2421 controller**



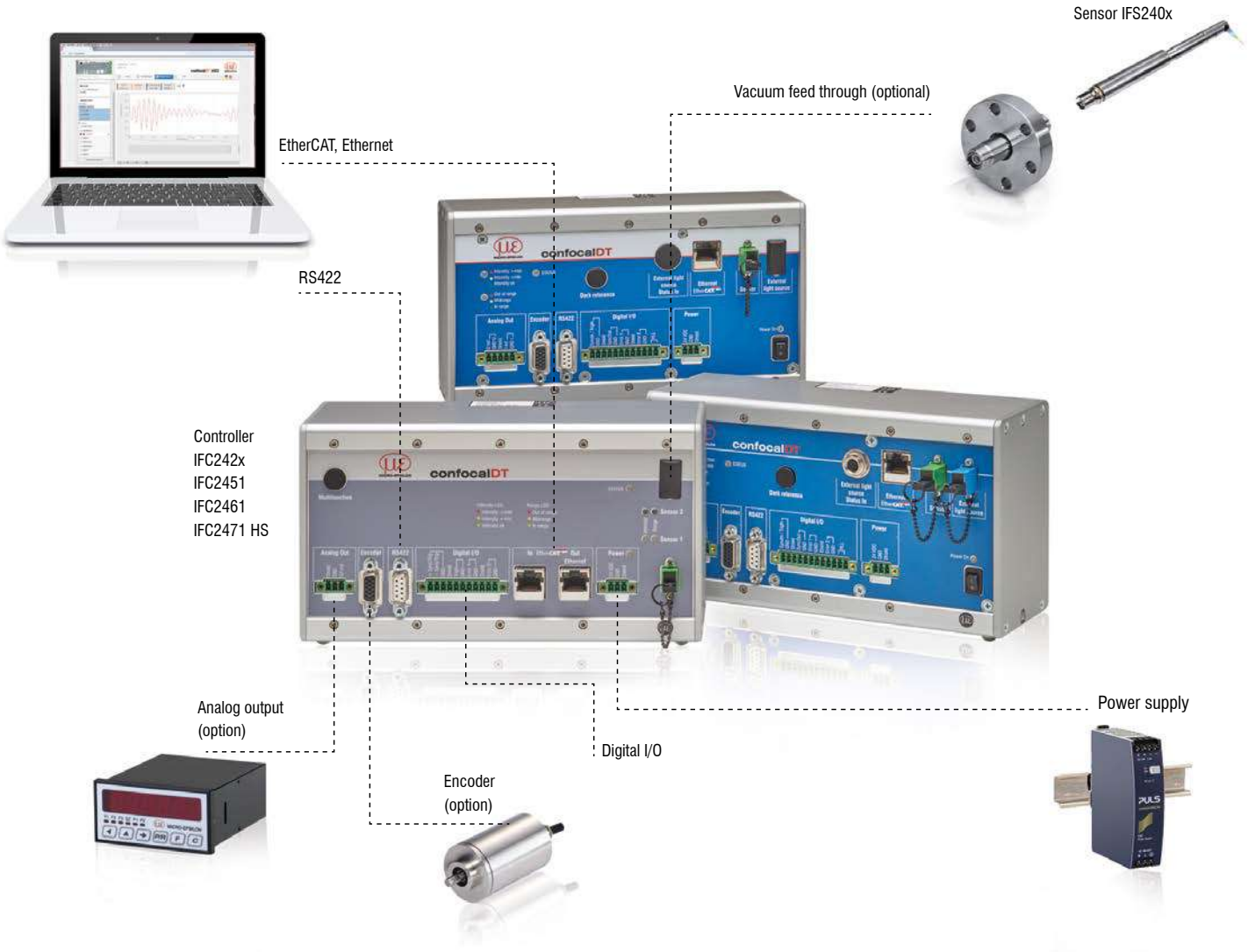

**IFC2422 controller**



## System design

**The confocalDT system consists of:**

- Sensor IFS240x
- Controller IFC24xx
- Fiber optic cable C24xx



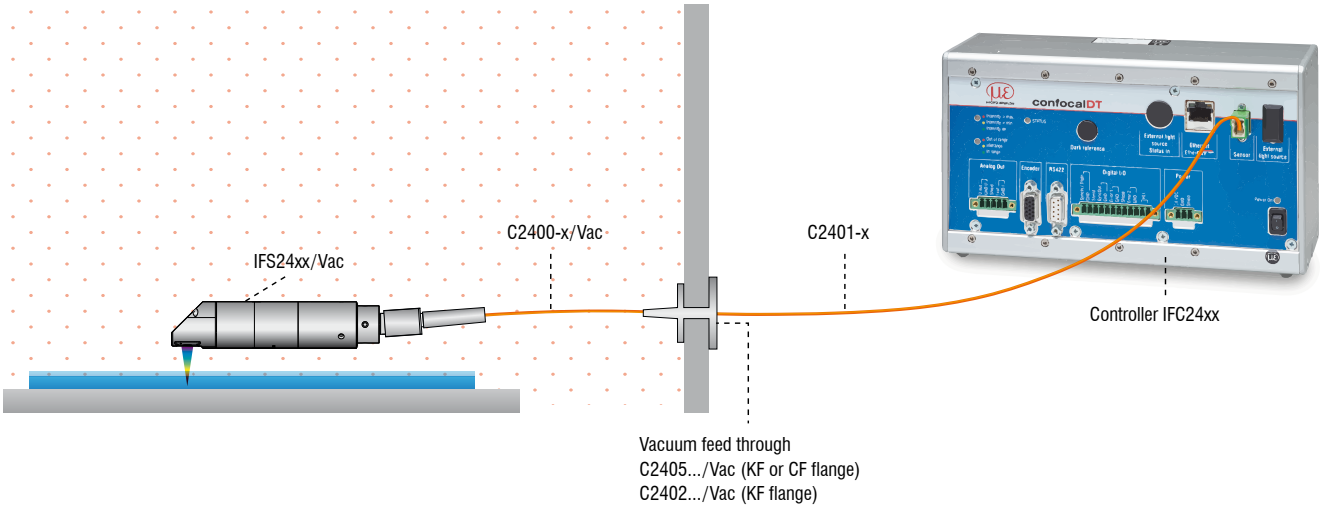
**Customer-specific modifications**

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.

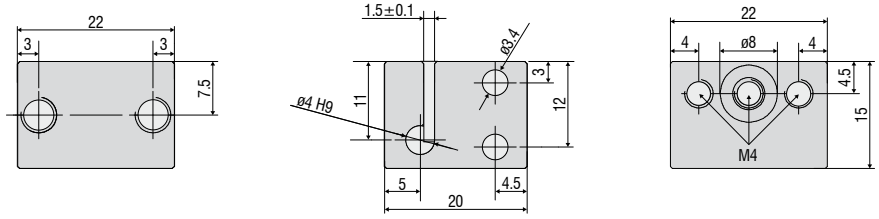
**Possible modifications**

- 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

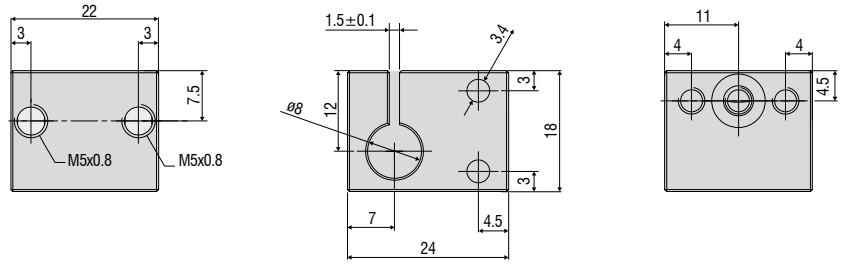
## Vacuum setup



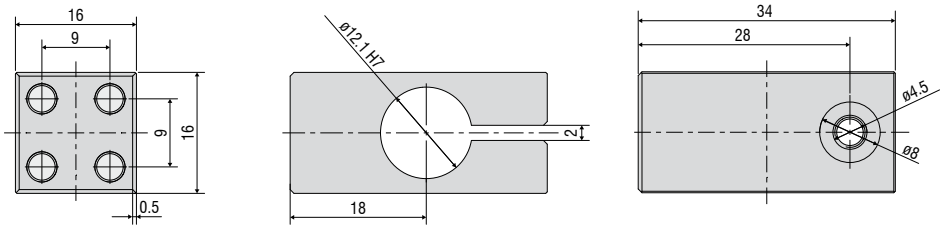
**Accessories: mounting adapter**
MA2402 for sensors 2402




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

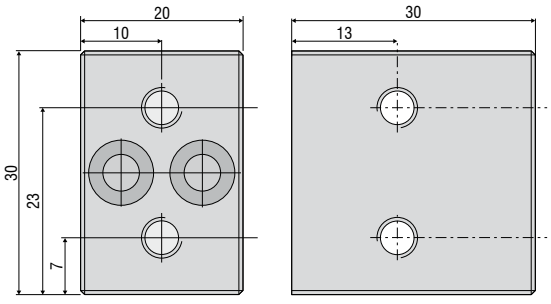



**Accessories: mounting adapter**
MA2404-12 for sensors IFS2404-2

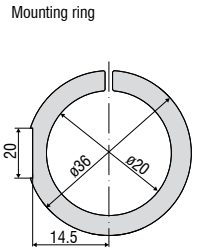



**Accessories: mounting adapter**
MA2400 for sensors IFS2405/IFS2406 (consisting of a mounting block and a mounting ring)

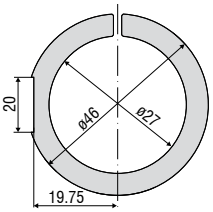
Mounting block



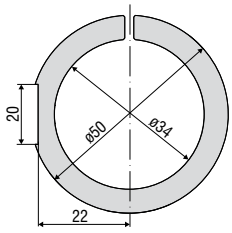

Mounting ring



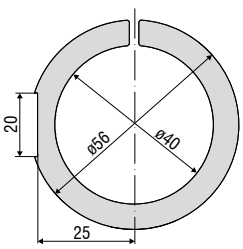

MA 2406-20
for sensors
IFS2406



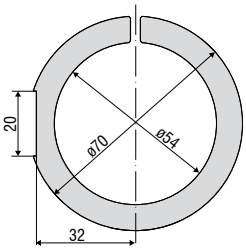

MA 2400-27
for sensors
IFS2405-0,3 / -1



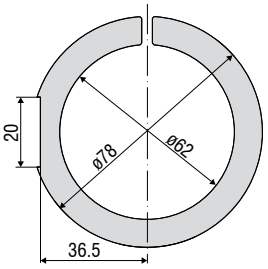

MA 2405-34
for sensors
IFS2405-3




MA 2405-40
for sensors
IFS 2405-6




MA 2405-54
for sensors
IFS2405-10




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

## Accessories

### Software

| | |
|---|---|
| IFD24n1-Tool | Free demo software 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 (01) | Optical 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

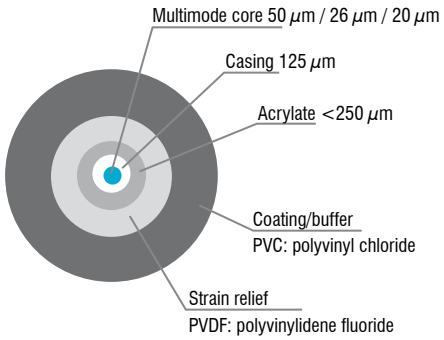
| | |
|---|---|
| C2402/Vac/KF16 | Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC non-vacuum side E2000/APC, clamping flange KF 16 |
| C2405/Vac/1/KF16 | Vacuum feed through on both sides FC/APC socket, 1 channel, clamping flange type KF 16 |
| C2405/Vac/1/CF16 | Vacuum feed through 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

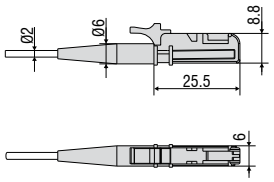
| | |
|---|---|
| SC2471-x/USB/IND | Connector cable IFC2451/61/71, 3 m, 10 m, 20 m |
| SC2471-x/IF2008 | Connector cable IFC2451/61/71-IF2008, 3 m, 10 m, 20 m |
| PS2020 | Power supply 24V / 2.5A |
| EC2471-3/OE | Encoder cable, 3m |

### Optical fiber

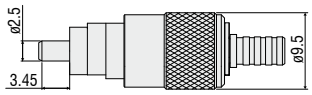
Temperature range : -50°C to 90°C
Bending radius: 30/40 mm



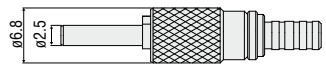

### E2000/APC standard connector




### FC/APC standard connector




### DIN connector



## Sensors and Systems from Micro-Epsilon

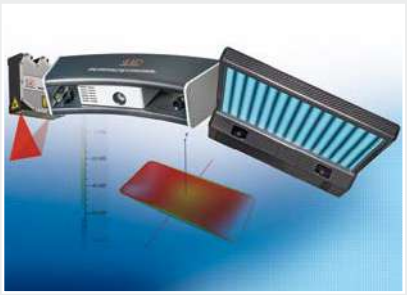
Sensors and systems for displacement, distance and position

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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