confocalDT // Confocal chromatic measuring system
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.
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, Error1-Out, Error2-Out, Encoder (2x A, B, index), EtherCAT/Ethernet, RS-422, analog: current, voltage (16-bit D/A converter)
EtherCAT | Operating elements, controller display | multifunction button (dark alignment and reset to factory setting after 10 sec)
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) | Connector: E2000
EtherCAT, Ethernet | CAT5E; cable length <100 m
Max. cable lengths (all cables are shielded) | 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

![System design diagram](image-url)
Customer-specific modifications

Application examples are often found where the standard versions of the sensors and the controller 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

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

Controller IFC24xx

IFS24xx/Vac

C2400-x/Vac

C2401-x
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

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 IFS2405-0,3 / -1

Accessories: mounting adapter
MA2400-27 for sensors IFS2405-0,3 / -1

Accessories: mounting adapter
MA2405-34 for sensors IFS2405-3

Accessories: mounting adapter
MA2405-40 for sensors IFS 2405-6

Accessories: mounting adapter
MA2405-54 for sensors IFS2405-10

Accessories: mounting adapter
MA2405-62 for sensors IFS2405-28 / IFS2405-30
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-(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-x/PT-x Optical fiber with protection tube for mechanical stress (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2401-(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

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

FC/APC standard connector

DiN connector
Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

Optical micrometers and fiber optics, measuring and test amplifiers

Sensors and measurement devices for non-contact temperature measurement

Color recognition sensors, LED analyzers and inline color spectrometers

Measuring and inspection systems for metal strips, plastics and rubber

3D measurement technology for dimensional testing and surface inspection