More Precision

confocalDT // Confocal chromatic measuring system
The universal confocalDT IFC2451 controllers are used for various industrial measurement tasks. Due to their excellent signal-to-noise ratio, these controllers achieve measuring rates of 10 kHz with white light LEDs.

The active exposure regulation feature in the CCD line enables accurate, fast surface compensation on changing surfaces during dynamic measurement processes.

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.

The confocalDT controllers are used for complex distance and thickness measurements and can be used with any IFS sensor. Furthermore, up to 6 peaks are provided which allows the thickness of transparent, multi-layer objects to be measured. Optical signals are transferred between sensor and controller via optical fibers.
### Controller IFC2451 IFC2451MP

<table>
<thead>
<tr>
<th>Feature</th>
<th>IFC2451</th>
<th>IFC2451MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi peak measurement</td>
<td>1 layer</td>
<td>up to 5 layers</td>
</tr>
<tr>
<td>Light source</td>
<td>internal white LED</td>
<td></td>
</tr>
<tr>
<td>Measuring rate</td>
<td>continuously adjustable from 100 Hz to 10 kHz</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>Ethernet 1 nm</td>
<td>RS422 18 bits</td>
</tr>
<tr>
<td></td>
<td>RS422 18 bits</td>
<td>analog 16 bits (teachable)</td>
</tr>
<tr>
<td>Storage</td>
<td>up to 20 calibration tables for different sensors per channel, menu selection</td>
<td></td>
</tr>
<tr>
<td>Controller inputs/outputs</td>
<td>Sync-In/Trig-In, Sync-Out</td>
<td>Error1-Out, Error2-Out-Encoder (3x A, B, Index)</td>
</tr>
<tr>
<td></td>
<td>EtherCAT/Ethernet</td>
<td>EtherCAT, Ethernet</td>
</tr>
<tr>
<td></td>
<td>analog: current, voltage (16-bit D/A converter)</td>
<td></td>
</tr>
<tr>
<td>EtherCAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating elements, controller display</td>
<td>on/off switch; button for dark alignment (and for reset to factory settings after 10 sec)</td>
<td>4x LEDs for intensity, range, status, supply voltage</td>
</tr>
<tr>
<td>Supply voltage, power consumption</td>
<td>Controller 24 VDC ± 15 %, approx. 10 W</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum case for DIN rail mounting</td>
<td></td>
</tr>
<tr>
<td>Protection class</td>
<td>IP40</td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>Operation +5 °C ... +50 °C</td>
<td>Storage -20 °C ... +70 °C</td>
</tr>
<tr>
<td>Permissible ambient light</td>
<td>30,000 lx</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>15 g, 6 ms</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>2g / 10 Hz ... 500 Hz</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Cable (optical fiber) 2 ... 50 m</td>
<td>CAT5E; cable length &lt;100 m</td>
</tr>
<tr>
<td></td>
<td>Connector E2000</td>
<td></td>
</tr>
<tr>
<td>Max. cable lengths (all cables are shielded)</td>
<td>Supply, RS422, Sync./Error &lt;30 m</td>
<td>analog &lt;30 m</td>
</tr>
<tr>
<td></td>
<td>Encoder &lt;3 m</td>
<td></td>
</tr>
</tbody>
</table>

- IFC2451 controller

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*Diagram of IFC2451 controller and sensor cable (optical fiber)*
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 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

[Illustration of vacuum setup with labels: IFS24xx/Vac, C2400-x/Vac, C2401-x, Vacuum feed through C2405.../Vac (KF or CF flange), C2402.../Vac (KF flange), Controller IFC24xx]
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 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
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, 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 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

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
E2000/APC standard 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