confocalDT // Confocal chromatic measuring system

More Precision
confocalDT IFC2461 systems are used for complex distance and thickness measurements. The IFC2461 controller is equipped with enhanced, optimized optical components for measuring rates up to 25 kHz without having to use an external light source. The high light intensity enables reliable measurements on difficult surfaces, e.g., on matt black objects or for multi-layer thickness measurement of glass. The active exposure regulation feature in the CCD line is for 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.
<table>
<thead>
<tr>
<th>Model</th>
<th>IFC2461</th>
<th>IFC2461MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet/EtherCAT</td>
<td>1 nm</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>RS422</td>
<td>18 bit</td>
</tr>
<tr>
<td>analog</td>
<td></td>
<td>16 bits (teachable)</td>
</tr>
<tr>
<td>Measuring rate</td>
<td>continuously adjustable from 100 Hz to 25 kHz</td>
<td></td>
</tr>
<tr>
<td>Linearity</td>
<td>typ. &lt; ± 0.025 % FSO (depends on sensor)</td>
<td></td>
</tr>
<tr>
<td>Multi peak measurement</td>
<td>1 layer</td>
<td>5 layers</td>
</tr>
<tr>
<td>Light source</td>
<td>internal white LED</td>
<td></td>
</tr>
<tr>
<td>No. of characteristic curves</td>
<td>up to 20 characteristic curves for different sensors per channel, selection via table in the menu</td>
<td></td>
</tr>
<tr>
<td>Permissible ambient light</td>
<td>30,000 lx</td>
<td></td>
</tr>
<tr>
<td>Synchronization</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 VDC ± 15 %</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>approx. 10 W</td>
<td></td>
</tr>
<tr>
<td>Signal input</td>
<td>sync-in / trig-in; 3x encoder (A, B, index)</td>
<td></td>
</tr>
<tr>
<td>Digital interface</td>
<td>Ethernet; EtherCAT; RS422</td>
<td></td>
</tr>
<tr>
<td>Analog output</td>
<td>Current: 4 … 20 mA; voltage: 0 … 10 V / -10 … +10 V (16 bit D/A converter)</td>
<td></td>
</tr>
<tr>
<td>Switching output</td>
<td>Error1-Out, Error2-Out</td>
<td></td>
</tr>
<tr>
<td>Digital output</td>
<td>sync-out</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>optical</td>
<td>pluggable optical fiber via E2000 socket, length 2 m ... 50 m, min. bending radius 30 mm</td>
</tr>
<tr>
<td></td>
<td>electrical</td>
<td>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)</td>
</tr>
<tr>
<td>Installation</td>
<td>free-standing, DIN rail mounting</td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>Storage: -20 … +70 °C</td>
<td>Operation: +5 … +50 °C</td>
</tr>
<tr>
<td>Shock (DIN-EN 60068-2-29)</td>
<td>15g / 6 ms in XYZ axis, 1000 shocks each</td>
<td></td>
</tr>
<tr>
<td>Vibration (DIN-EN 60068-2-6)</td>
<td>2 g / 20 … 500 Hz in XYZ axis, 10 cycles each</td>
<td></td>
</tr>
<tr>
<td>Protection class (DIN-EN60529)</td>
<td>IP40</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 2.2 kg</td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
<td>compatible with all confocalDT sensors</td>
<td></td>
</tr>
<tr>
<td>No. of measurement channels</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Control and display elements</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Features</td>
<td>particularly light-intensive</td>
<td></td>
</tr>
</tbody>
</table>

* FSO = Full Scale Output
* 1) Illuminant: light bulb

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**IFC2461 controller**

![IFC2461 controller diagram](image-url)
System design

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

- EtherCAT, Ethernet
- RS422
- Vacuum feed through (optional)
- Analog output (option)
- Encoder (option)
- Digital I/O
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
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 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
C2405/Vac/1/KF16  Vacuum feed through on both sides FC/APC socket, 1 channel, non-vacuum side E2000/APC, clamping flange KF 16
C2405/Vac/1/CF16  Vacuum feed through on both sides FC/APC socket, 1 channel, clamping flange type KF 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
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