



# More Precision

**confocalDT** // Confocal chromatic measurement system

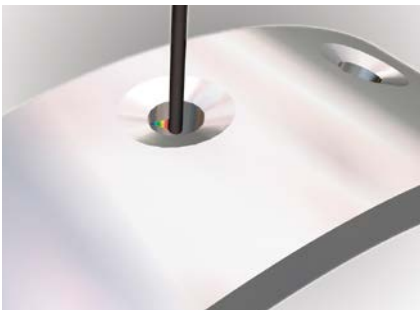




	<b>Hybrid sensors <math>\varnothing 8\text{mm}</math> with axial or radial (<math>90^\circ</math>) measuring direction</b>
	<b>Submicrometer resolution</b>
	<b>One-sided thickness measurement</b>
	<b>Distance measurement</b>
	<b>Extremely small spot size</b>
	<b>Passive design without electronic components</b>

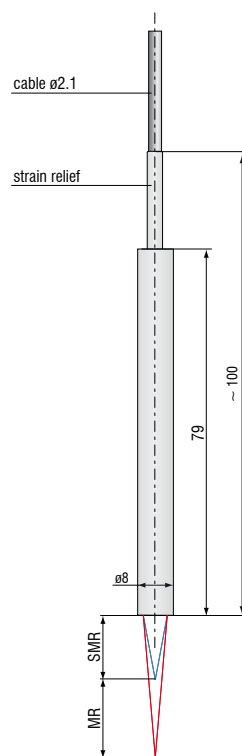
The IFS2403 sensors are equipped with a gradient index lens and a relay optics. With an external diameter of 8mm, these sensors can still be used for precise measurements in relatively restricted installation space. Due to the larger numerical aperture in comparison with the IFS2402, significantly larger offsets and larger tilt angles can be realized than for the miniature IFS2402 sensors.

In addition to sensors with axial measuring direction, sensors with radial beam path ( $90^\circ$ ) are available for cavity measurement.

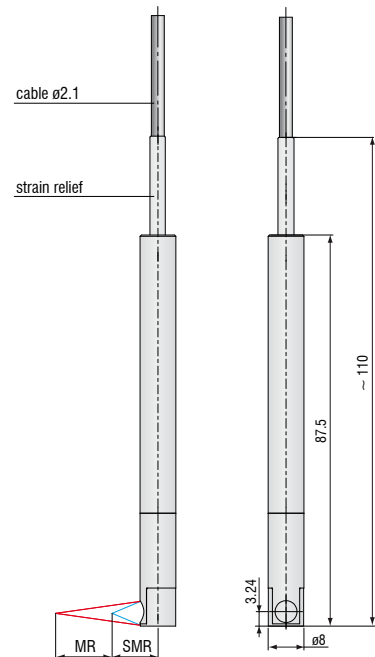


Measurement in bores and cavities with IFS2403/90 sensors

IFS2403-0.4/1.5/4/10



IFS2403/90-1.5/4/10



Tolerance  $\pm 0.1$  mm  
MR = Measuring Range SMR = Start of Measuring Range Dimensions in mm.

Sensor model (GRIN lens with relay optics)	IFS 2403-0,4	IFS 2403-1,5	IFS 2403/90-1,5	IFS 2403-4	IFS 2403/90-4	IFS 2403-10	IFS 2403/90-10
Measuring range	400µm	1.5mm	1.5mm	4mm	4mm	10mm	10mm
Start of measuring range approx.	2.5mm	8.0mm	4.9mm <sup>1)</sup>	14.7mm	12mm <sup>1)</sup>	11mm	8.6mm <sup>1)</sup>
Spot diameter	9µm	15µm	15µm	28µm	28µm	56µm	56µm
Linearity (displacement and distance measurement)	0.3µm	1.2µm	1.2µm	3µm	3µm	20µm	20µm
	≤ ±0.08 % FSO					≤ ±0.2 % FSO	
Linearity (thickness measurement)	0.6µm	2.4µm	2.4µm	6µm	6µm	40µm	40µm
	≤ ±0.16 % FSO					≤ ±0.4 % FSO	
Resolution <sup>2)</sup>	16nm	60nm	60nm	0.2µm	0.1µm	0.25µm	0.25µm
Weight	25g						
Max. tilt (direct reflection)	± 13°	± 16°	± 16°	± 6°	± 6°	± 6°	± 6°
Protection class	IP40						
Operating temperature	+5 ... +70 °C						
Storage temperature	-30 ... +70 °C						
Sensor cable (optical fiber)	length: integral cable 2m; option up to 50m; bending radius: static 30mm; dynamic 40mm						
Shock	15g, 6ms						
Vibration	2g / 10Hz ... 500Hz						

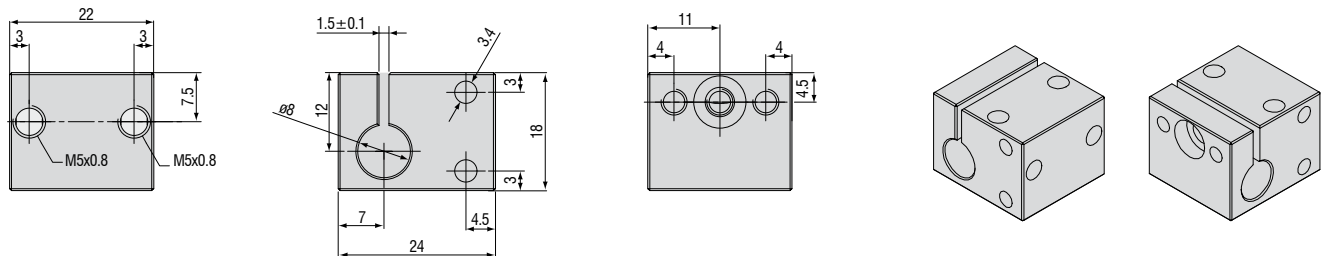
FSO = full scale output

All data at constant ambient temperature (25±2°C) against optical flat; specifications can change when measuring different materials.

<sup>1)</sup> Start of measuring range measured from sensor axis

<sup>2)</sup> Average from 512 values

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



## System design

### The confocalDT 247x system consists of:

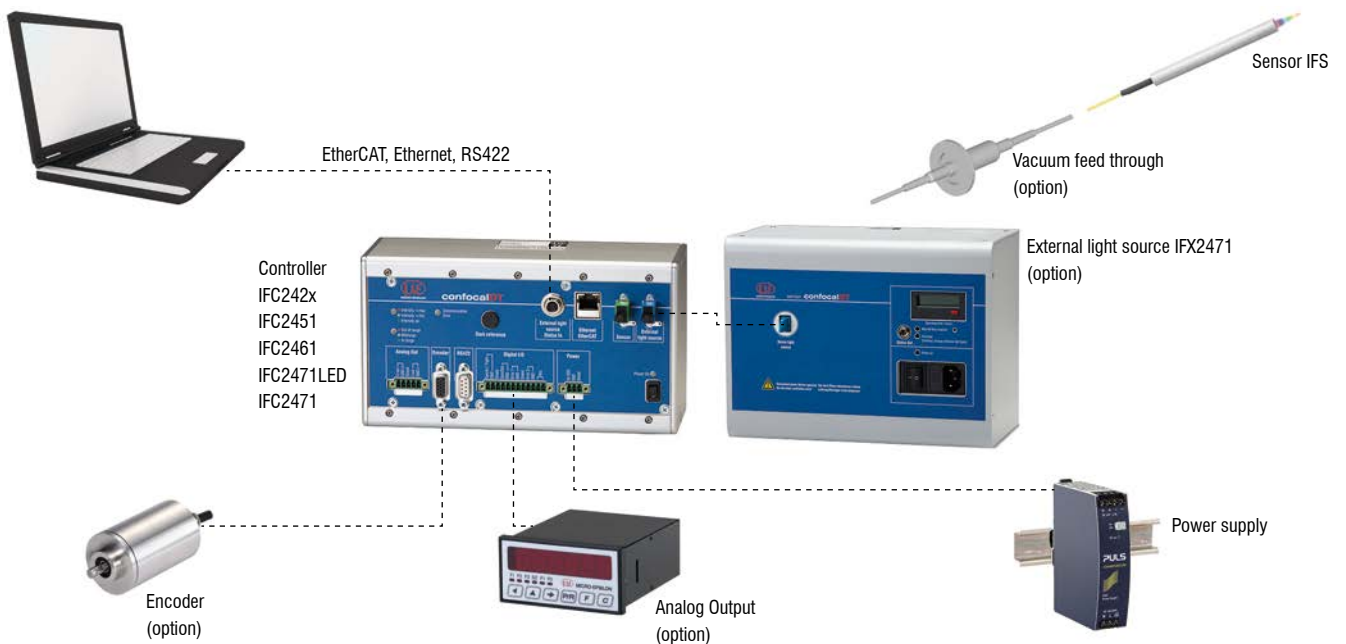
- Sensor IFS240x
- Controller IFC242x

### The confocalDT 2451 / 2461 / 2471 HS system consists of:

- Sensor IFS240x
- Controller IFC2451 / IFC2461 / IFC2471LED

### The confocalDT 2471 system consists of:

- Sensor IFS240x
- Controller IFC2471 (for external light source)
- Xenon light source IFX2471



### Customer-specific modifications

On occasions, application requirements exceed the performance limits of standard sensors and controllers. 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
- 90° cable outlet
- Vacuum suitability, no outgassing, also UHV
- Reduced sensor length
- Customer-specific mounting options
- Extended sensor lance
- Optical filter for ambient light compensation
- Housing material



## Accessories

### Software

IFD24n1-Tool Free demo software tool included

### Light source accessories

IFX2471/Xe/75 External Xenon light source for IFC2471 controller (70 kHz)  
 IFX2471/Xe/75 Lamp module for IFX2471  
 IFL2451/LE Lamp module for IFC2451  
 IFL2451/LED(003) Lamp module for IFC2451(003) with cooling element  
 CL2471-1/Xe Light source cable, 1m

### Accessories IFS2406

C2401-X (01) Optical fiber  $\varnothing 26\mu\text{m}$  (3m, 10m)

### Accessories IFS2405

C2401-X Optical fiber (3m, 10m, customer-specific length up to 50m)  
 C2401/PT-X Protection tube for mechanical stress  
 (3m, 10m, customer-specific length up to 50m)  
 C2401-3(10) Sensor cable for drag chain use, 3m  
 C2401-5(10) Sensor cable for drag chain use, 5m

### Accessories IFS2402/2403

CE2402-X Sensor cable extension (3/10/13/30/50m)  
 CE2402-X/PT Sensor with protection tube (for mechanical stress)  
 (3m/10m, customer-specific length up to 50m)  
 C2402/Vac/KF16 Vacuum feed through for optical fiber, 1 channel  
 C2405/Vac/6/CF63 Vacuum feed through for optical fiber, 6 channels  
 C2405/Vac/9/CF63 Vacuum feed through for optical fiber, 9 channels

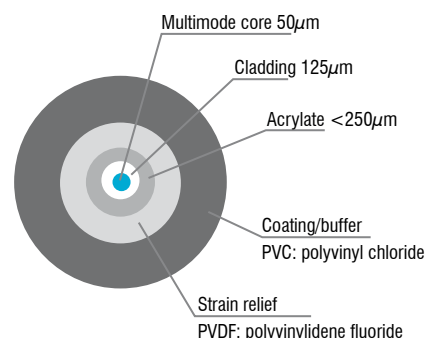
### Other accessories

SC2471-3/USB/IND Connector cable IFC2451/61/71, 3m  
 SC2471-3/IF2008 Connector cable IFC2451/61/71-IF2008, 3m  
 SC2471-3/CSP Connector cable IFC2451/61/71-CSP2008, 3m  
 SC2471-10/IF2008 Connector cable IFC2451/61/71-IF2008, 10m  
 SC2471-10/CSP Connector cable IFC2451/61/71-CSP2008, 10m  
 SC2471-10/USB/IND Connector cable IFC2451/61/71, 10m  
 SC2471-20/USB/IND Connector cable IFC2451/61/71, 20m  
 PS2020 Power supply 24V / 2.5A  
 EC2471-3/OE Encoder cable, 3m

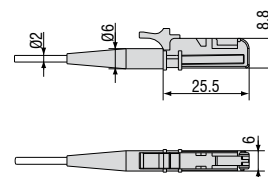
### Optical fiber

Temperature range :  $-50^{\circ}\text{C}$  to  $90^{\circ}\text{C}$

Bending radius: 30/40mm



### E2000/APC standard connector



## High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fiber optic sensors and fiber optics



Color recognition sensors, LED analyzers and color inline spectrometer



Measurement and inspection systems