



More Precision

confocalDT // Confocal chromatic measurement system





	Measuring rate up to 70kHz
INTER FACE	Interfaces: Ethernet / EtherCAT / RS422 / Analog
	Fast surface compensation
	Configuration via web interface
	Submicrometer resolution
	Multi-layer thickness measurement
	Robust design with passive cooling

The confocalDT 2451/2471 high precision controllers are the next generation of confocal chromatic measurement technology. Due to their excellent signal-to-noise ratio, these controllers achieve measuring rates of 10kHz with white light LEDs (IFC2451) and 70kHz (IFC2471) using an external Xenon light source.

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

Due to a user-friendly web interface, the entire configuration process of controller and sensors is carried out without using any additional software. Data output is via Ethernet, EtherCAT, RS422 or analog output.

confocalDT 2451/2471 systems 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.

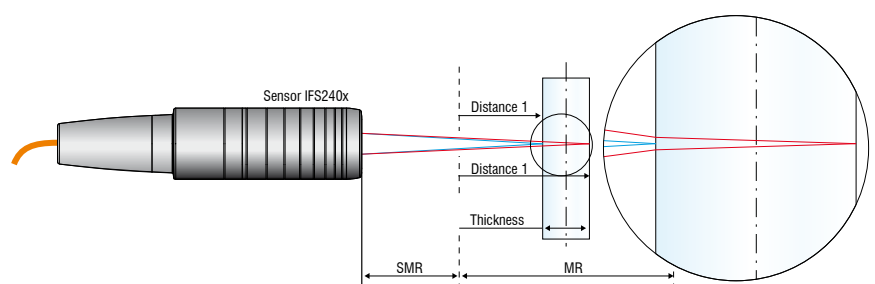


The web interface can be accessed via Ethernet and provides set up and configuration options for controller and sensors. Materials are stored in an expandable materials database.

confocalDT 2451						
Material database						
Material name	Description	Refractive index n _y at 488nm	Refractive index n _y at 587nm	Refractive index n _y at 655nm	Abbe value n _D	Delete
Vacuum, air	Vacuum, Luft (measuring position, approximately)	1.000000	1.000000	1.000000		☐
Water	Water	1.337121	1.333044	1.331152		☐
Ethanol	Alkohol (ethyl alcohol)	1.361400	1.361400	1.361400		☐
Acrylic	Acrylat, Harter, Lacke (Acryl, Acryl, Acryl, Acryl)	1.497528	1.491868	1.488528		☐
PMMA	Polymethylmethacrylat, Plexiglas, Acryglas (acrylic glass)	1.497761	1.491756	1.489200		☐
PSM	Polymethylmethacrylat, ein Kunststoff (a plastic)	1.534300	1.534300	1.534300		☐
PS	Polystyrol, Polystyrol, ein Kunststoff (a plastic)	1.604379	1.590481	1.584549		☐
PC	Polycarbonat, Makrolon, Lexan, ein Kunststoff (a plastic)	1.589439	1.585479	1.578664		☐
Fused silica	Quarzglas, Siliziumdioxid	1.463126	1.458464	1.456267		☐

EtherCAT®
Conformance tested

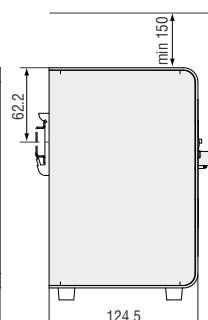
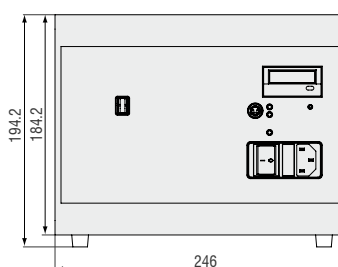
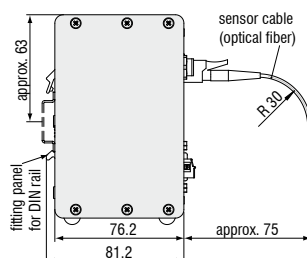
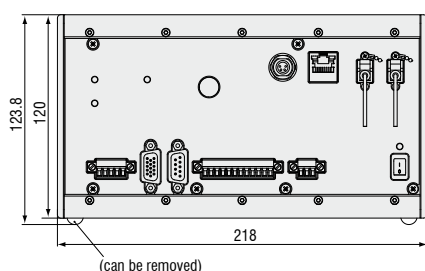
EtherCAT Conformance tested: IFC2451



Controller		IFC2451	IFC2451MP	IFC2471	IFC2471MP
Multi peak measurement		2 peaks	up to 6 peaks	2 peaks	up to 6 peaks
Light source		internal white LED		external Xenon light source IFX2471	
Measuring rate		continuously adjustable from 100Hz to 10kHz		continuously adjustable from 300Hz to 70kHz	
Resolution	Ethernet / EtherCAT	1nm			
	RS422	18bit			
	analog	16bit			
Storage		up to 20 calibration tables for different sensors, menu selection			
Controller inputs / outputs		sync-in / trigger-in, sync-out error1-out, error2-out encoder (3x A, B, Index) EtherCAT/Ethernet RS422 analog: current, voltage (16bit D/A converter)		sync-in / trigger-in, sync-out error1-out, error2-out encoder (3x A, B, Index) EtherCAT/Ethernet RS422 analog: current, voltage (16bit D/A converter) external light source: temperature, light-bulb exchange	
EtherCAT					
Operating elements, controller display		On/Off switch; button for dark alignment (as well as for reset to factory setting after 10 sec) 4x LED for intensity, range, status, supply voltage			
Supply voltage, power consumption	Controller	24VDC ± 15%, ~10W		24VDC ± 15%, ~10W	
	External light source	-		90 ... 265VAC, ~100W	
Housing		Aluminum case for DIN rail mounting			
Protection class		IP40			
Operating temperature	Controller	5 °C ... 50 °C		5 °C ... 50 °C	
	External light source	-		5 °C ... 40 °C	
Storage temperature		-20 °C ... 70 °C			
Permissible ambient light		30,000lx			
Safety; EMC interference emission Interference resistance		CE EN 61 000-6-3 / DIN EN 61326-1 (class B) EN 61 000-6-2 / DIN EN 61326-1			
Shock		15g, 6ms			
Vibration		2g / 10Hz ... 500Hz			
Optical fiber cable length	Sensor	2 ... 50m			
	Xenon light source	-		1m	
	Connector	E2000			
Cable length (all cables are shielded)	EtherCAT, Ethernet	CAT5E; length <100m			
	Supply, RS422, sync./ error	<30m			
	analog	<30m			
	Encoder	<3m			

Controller IFC2451/2471

Xenon light source IFX2471



System design

The confocalDT 247x system consists of:

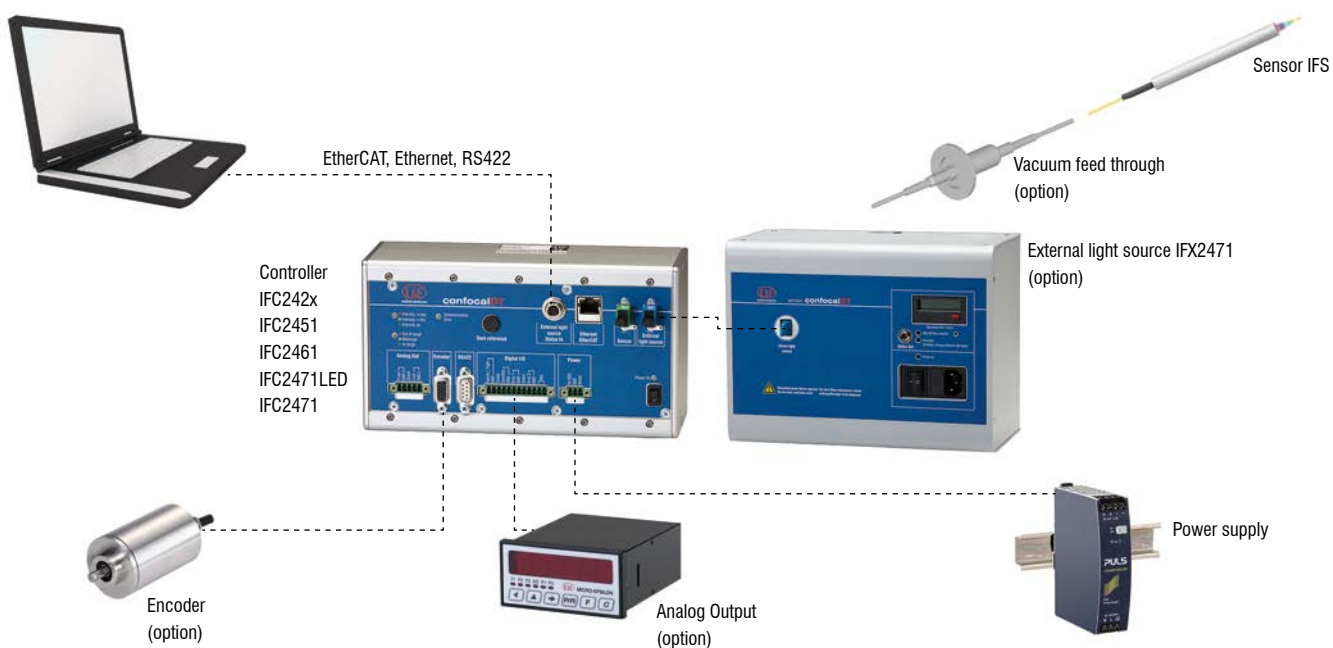
- Sensor IFS240x
- Controller IFC242x

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
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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)
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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

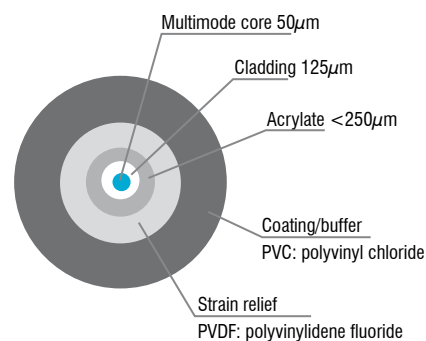
Other accessories

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

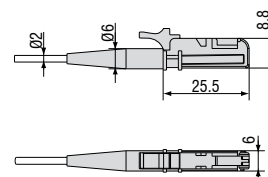
Optical fiber

Temperature range : -50°C to 90°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