



Assembly Instructions confocalDT 2471

Functions

- Distance measurement against reflecting (mirroring and diffuse) surfaces
- Thickness measurement of transparent objects
- Triggering, synchronization and further functions
- Ethernet- or EtherCAT interface
- Measuring rate up to 70 kHz

Warnings

Do not open the external light source (IFX2471), connect the power supply in accordance to the safety regulations for electrical equipment. The power supply may not exceed the specified limits.
> Danger of injury, damage to or destruction of the system

Protect the optical fiber ends from dirt and contamination, protect the cables from damage.
> Failure of the measurement device

Do not cover the ventilation slots on the top and bottom of the external light source.
> Damage to external light source, or light source switches off automatically.

Avoid shock and vibration to the controller, sensor or the external light source.
> Damage to or destruction of the system

Notes on CE Identification

The following applies to the confocalDT 2471 system: EMC regulation 2004/108/EC
The system satisfies the requirements of the standards
- EN 61000-6-3 / EN 61326-1 (Class B) Interference emission
- EN 61000-6-2 / EN 61326-1 Immunity to interference

Proper Environment

- Protection class IP 40 (Controller, xenon light source)
IP 64 (Sensor)
- Operating temperature
Sensor, Controller: 5 ... +50 °C (+41 ... +122 °F)
- Storage temperature: -20 ... 70 °C (-4 ... +158 °F)

For further informations about the system read the instruction manual. You will find this online at: www.micro-epsilon.com/download/manuals/man--confocalDT-2451-2471--en.pdf or on the delivered CD.

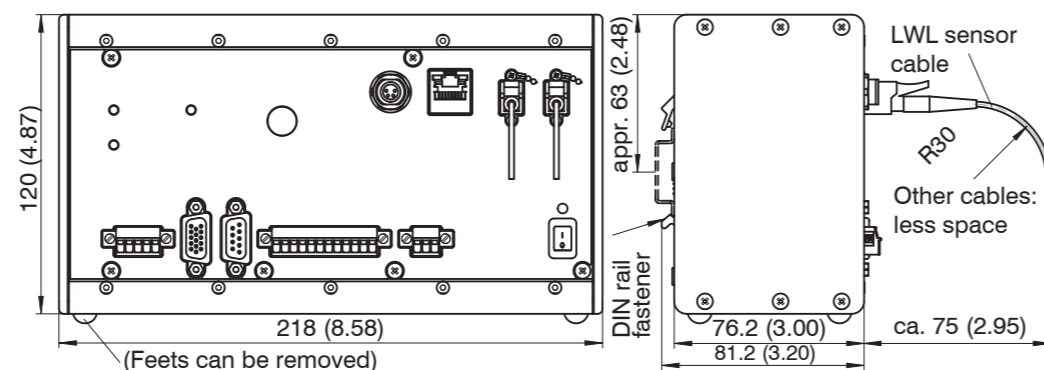
Assembly

Place the controller IFC2471 on a level surface, or install it at a location of your choice (e.g. in a switch cabinet) using a DIN EN 60715 mounting rail (DIN rail TS35).

➔ To remove, push the controller upwards, and pull it forwards.

ⓘ When attaching the controller, ensure that no connections, operating or display elements are covered.

Dimensional Drawing IFC2471



Sensor Cable, Optic Fiber

Do not shorten or lengthen the optical fibers. A damaged sensor cable cannot be repaired, but replaced only.

ⓘ Avoid any contamination of the connector, mechanical stress, bending the cable.
Minimum bending radius: 30 mm fixed, 40 mm permanent flexible

Mounting Sensor, Installation Bracket

The sensors of series IFS240x are optical sensors for measurements in micrometer accuracy.

ⓘ Please ensure careful handling during installation and operation!

➔ Use an installation bracket to mount IFS 2400/2401/2402 sensors.

	IFS2400-x	IFS2401-x	IFS2402-x	IFS2403-x
MA2400	•	•		
MA2402			•	
MA2403				•

Ethernet, EtherCAT

Potential isolated RJ 45 standard connector for connecting the controller IFC2471 to an Ethernet network (PC) or the EtherCAT bus system.

The controller is connected with a PC or generally with a network via the Ethernet interface. The internal websites can be accessed in the controller with a web browser and so the controller can be operated.

Encoder Inputs

Three encoders can be connected simultaneously and powered with 5 V using the 15-pin HD-sub connector.

Each encoder provides A, B and N signals (zero pulse, reference, index).

The maximum pulse frequency is 1MHz.

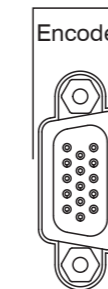
Values for A, B, N: TTL level

$2.4 V \leq \text{High} \leq 5 V$

$0 V \leq \text{Low} \leq 0.5 V$

Reference value: GND

Encoder supply 5 V: 5 V each, max. 150 mA

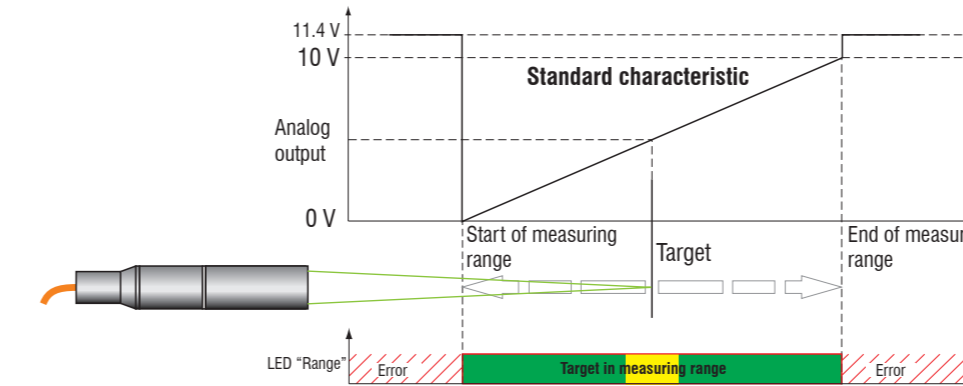


Encoder	Pin	Signal	Encoder	Pin	Signal	Encoder	Pin	Signal
1	5	A1	2	4	A2	3	3	A3
	15	B1		14	B2		13	B3
	10	N1		9	N2		8	N3
	1	GND1		6	GND2		11	GND3
	2	5V-1		7	5V-2		12	5V-3
	Cover	Screen		Cover	Screen		Cover	Screen

Analog Output

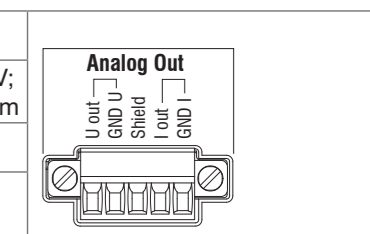
Analog outputs can either be used for distance or thickness measurements. Only one type of measurement can be transmitted at any given time.

The analog output has a resolution of 16 bit. Either the voltage or the current output on the controller can be used at any given time.

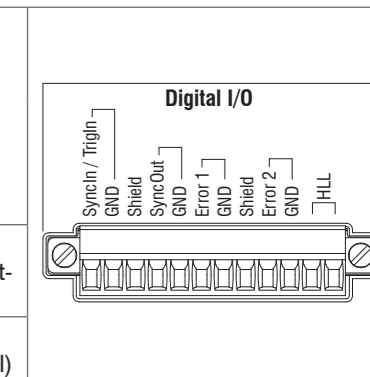


Screw Terminals

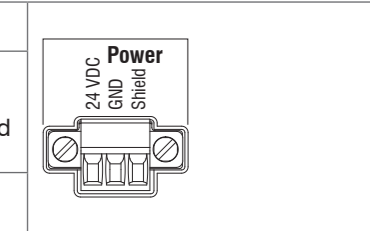
Pin	Description	Comments
U out	Voltage output	0 ... 5 V; 0 ... 10 V; -5 ... +5 V; -10 ... +10 V; R _i appr. 30 Ohm
I out	Current output	4 ... 20 mA; R _L ≤ 500 Ohm
GND U/I	Ground analog output	Galvanically isolated from supply



SyncIn/ TrigIn	Input synchronization or triggering	Low logic level (LLL) or high logic level (HLL), switchable via bridge „HLL“.
SyncOut	Synchronous output	
Error 1 / 2	Error outputs	
GND	Ground potentials	All GND are connected to each other and to the operating voltage ground.
HLL	Switching logic level of digital I/O	open: LLL (Low logic level); bridge: HLL (High logic level)



24 VDC	Operating voltage	± 15 %, I _{max} < 1 A
GND	Operating voltage ground	GND is galvanically connected to GND of switching outputs, synchronization and encoder input.
Shield	Shields to respective output/input, connector housing	



The plug-in screw terminals are designed for a conductor cross-section of 0.14 mm² up to 1.5 mm². The screw terminals are mounted with two screws on the controller and can be removed for the wiring or a quick controller change.

LEDs

Status	Off	No error
	Red flashing	Processing error
	Red	Error during synchronization

If the EtherCAT interface is active, then the meaning of the Status-LED is conform with the EtherCAT guidelines.

Intensity	Red flashing	Dark signal acquisition in progress
	Red	Signal in saturation
	Yellow	Signal too low
Range	Green	Signal ok
	Red flashing	Dark signal acquisition in progress
	Red	No target or out of range
	Yellow	Midrange
	Green	Target in the measuring range

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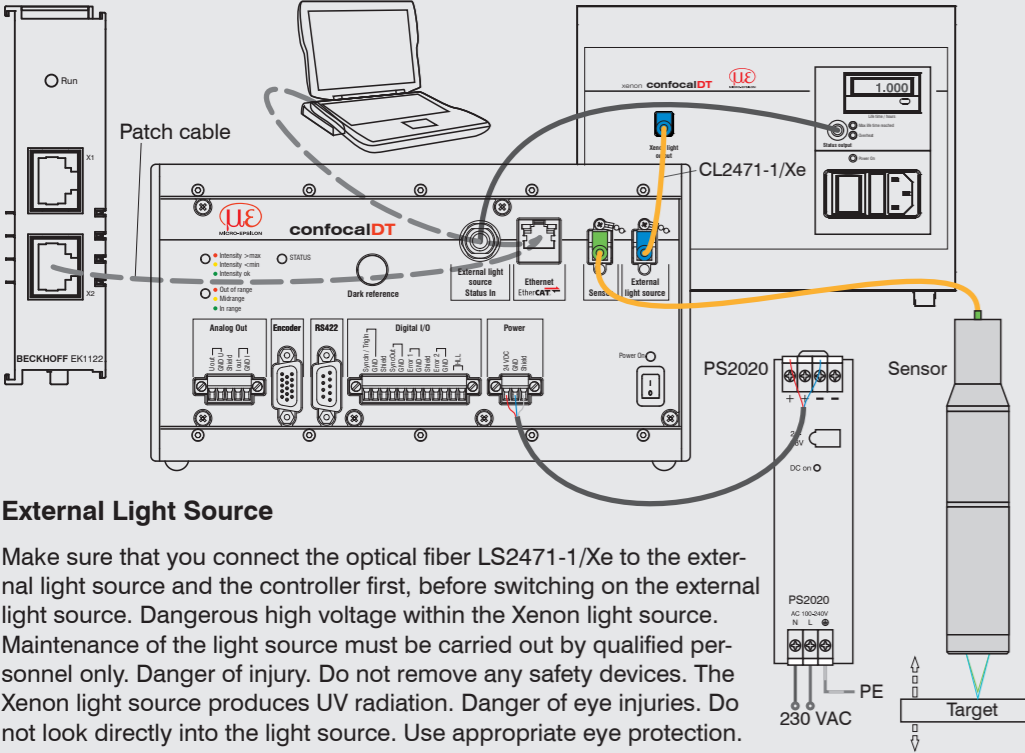


Quick Guide

Structure of the Components

- Controller, Sensor and clamp
- Power supply, Laptop / PC + USB -> Ethernet adapter + Ethernet cable
- Xenon light source IFX2471

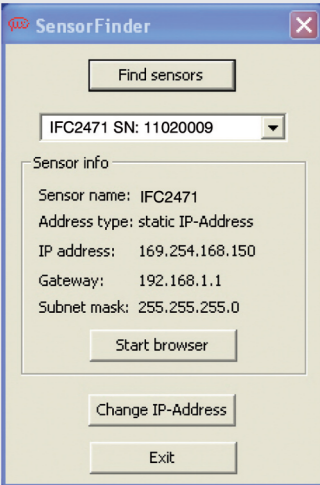
➔ Connect the components together and mount the sensor into the clamp.



External Light Source

Make sure that you connect the optical fiber LS2471-1/Xe to the external light source and the controller first, before switching on the external light source. Dangerous high voltage within the Xenon light source. Maintenance of the light source must be carried out by qualified personnel only. Danger of injury. Do not remove any safety devices. The Xenon light source produces UV radiation. Danger of eye injuries. Do not look directly into the light source. Use appropriate eye protection.

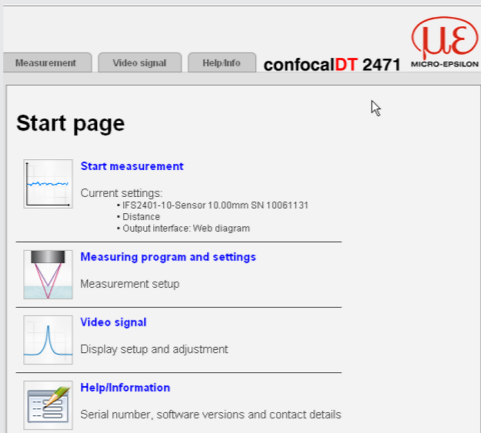
Commissioning



The controller is delivered ex factory with the IP address 169.254.168.150.

You can check the IP address of the controller, that are connected to a PC / network, with the SensorFinder.exe program. You will find this program on the provided CD.

- ➔ Now start the SensorFinder.exe and click on the button Find sensors.
- ➔ Select the designated controller from the list.
- ➔ Click the button Start browser to connect the controller with your default browser.



Select Measurement Program

- ➔ Go to the menu Preferences > Measurement program.
- ➔ Select displace Measurement as measurement program to be performed.

Select Sensor

- ➔ Go to the menu Preferences > Sensor.
- ➔ Select a sensor from the list. Confirm with Submit.

Perform Dark Reference

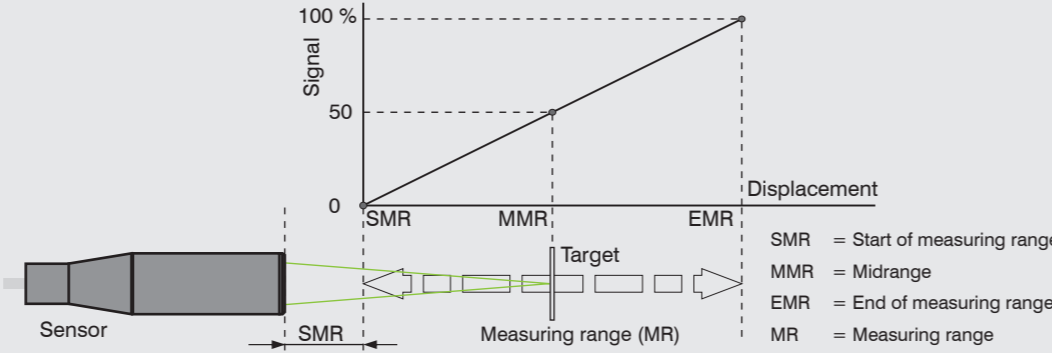
This adjustment is necessary after each sensor change; warm-up time controller about 30 min.

- ➔ Cover the sensor with a piece of dark paper and press the Dark Reference button on controller or the Start dark reference button on the Dark reference web page.

For dark referencing, no object must be within the measuring range, and no ambient or external light must reach the sensor. Duration about 20 s. Alternatively, you can also perform the dark reference in the Video signal menu.

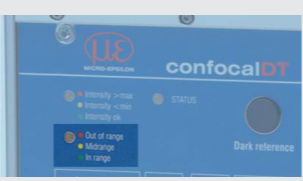
Place Target

- ➔ Place the target in the midrange.



The LED range on the front side of the controller shows the position of the target to the sensor.

The start screen of the controller software should be displayed in the web browser now.

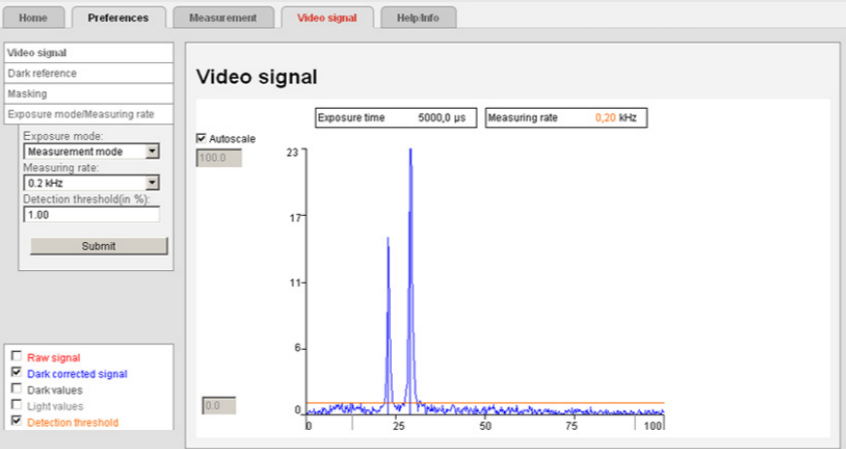


Red flashing	Dark signal acquisition in progress
Red	No target, or target outside the measuring range
Yellow	Target near the midrange
Green	Target within the measuring range

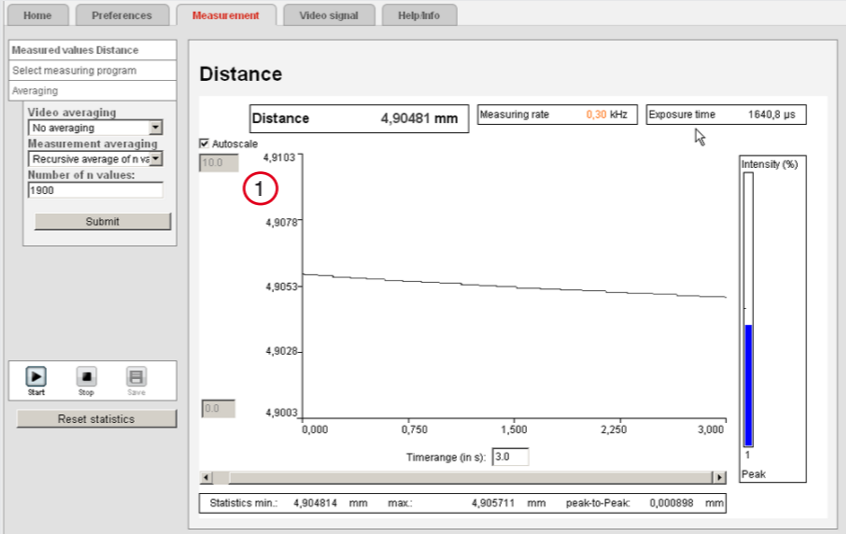
Check Video Signal

- ➔ Go to the Video signal menu and adjust any settings on the exposure mode, the measuring rate and the detection threshold if applicable.

The recognition threshold needs to be high enough that no undesired video signal peak is included in the measurement.



Menu Measurement



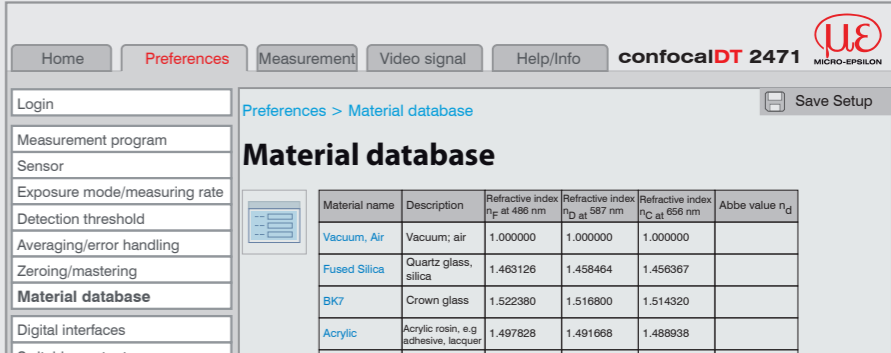
- ① It is recommended, to set the scaling manually at first and not to select too fine.

Thickness Measurement

- ➔ Go to the menu Preferences > Measurement program. Select the thickness measurement program.

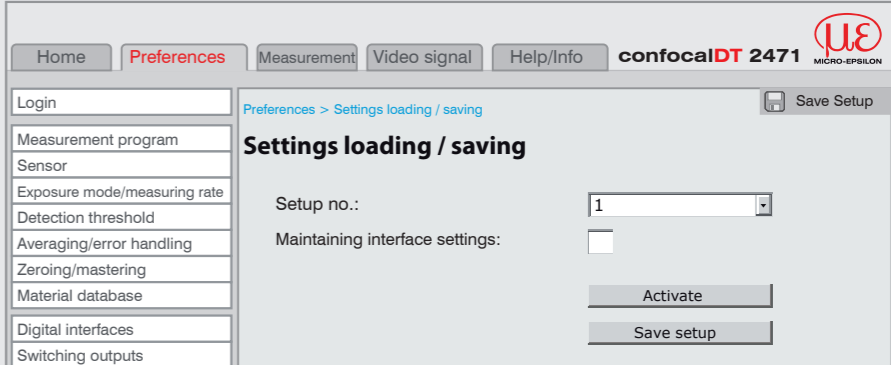
Differing from the previous steps the target material is to be considered when measuring the thickness.

- ➔ Select a material from the database.



Save Settings

The current settings can be saved in the controller in one setup. Otherwise the settings are lost when switching off.



Application flow saving:

- ➔ Select a setup and click on the Save setup button.

When switching on, the parameter set (setup) is loaded, which is saved in the controller at last.