MICRO-EPSILON

Assembly Instructions
confocalDT 2461
confocalDT 2471LED

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 25 kHz respectively 70 kHz

Warnings

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

Avoid shock and vibration to the controller or the sensor.
> Damage to or destruction of the system

Notes on CE Identification

The following applies to the confocalDT 2461/2471LED system:
- EU directive 2014/30/EC
- EU directive 2011/65/EC, "RoHS" category 9

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)
                          IP 40 or 65 (depending on 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-2451-2461-2471--en.pdf or on the delivered CD.

Assembly

Place the controller IFC2461/2471LED 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.
ℹ When attaching the controller, ensure that no connections, operating or display elements are covered.

Dimensional Drawing IFC2461/2471LED
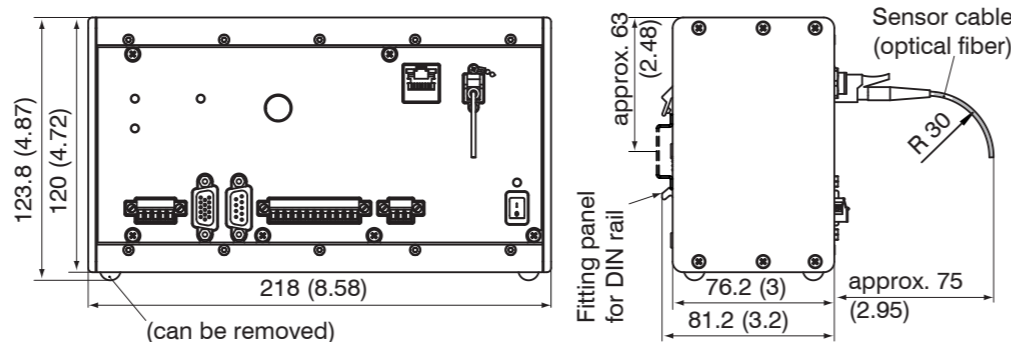
Sensor Cable, Optic Fiber

Do not shorten or lengthen the optical fibers. A damaged sensor cable cannot be repaired, but replaced only.
ℹ 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.
ℹ Please ensure careful handling during installation and operation!

➡ Use an installation bracket to mount IFS 2402/2403/2405 sensors.

	IFS2402-x	IFS2403-x	IFS2405-x
MA2400			•
MA2402	•		
MA2403		•	
MA2405			•

X9771238.03-A021056MSC

X9771238.03-A021056MSC

Ethernet, EtherCAT

Potential isolated RJ 45 standard connector for connecting the controller IFC2461 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 1 MHz.
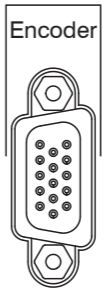
Values for A, B, N: TTL level

$2.4\ V \le High \le 5\ V$

$0\ V \le Low \le 0.5\ V$

Reference value: GND

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

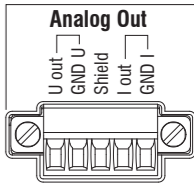| Encoder	Pin	Signal	Encoder	Pin	Signal	Encoder	Pin	Signal
1	5	A1	2	4	A2	3	3	A3
	15	B1		14	B2		13	B3
	10	N1		9	N2		8	N3
	1	GND1		6	GND2		11	GND3
	2	5V-1		7	5V-2		12	5V-3
	Cover	Screen		Cover	Screen		Cover	Screen

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.
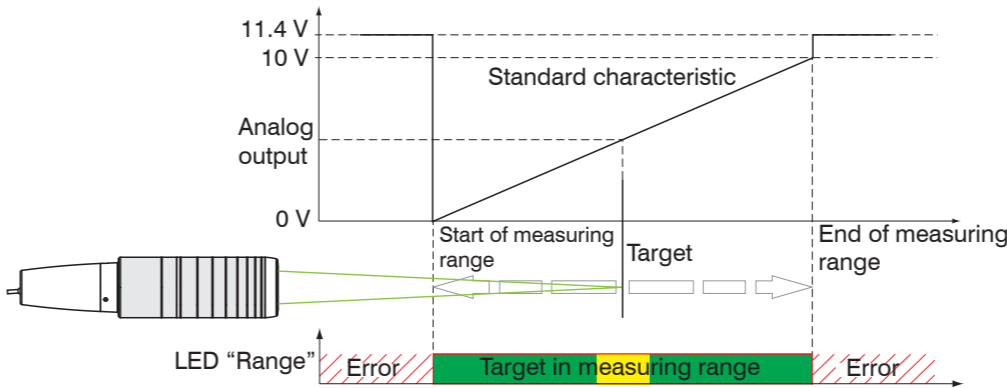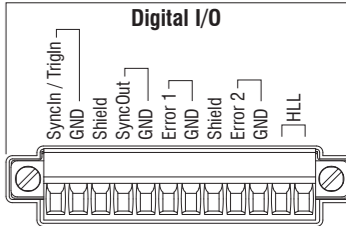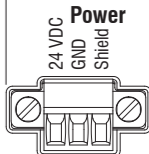

Screw Terminals

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; $R_L \le 500$ Ohm	
GND U/I	Ground analog output	Galvanically isolated from supply	
SyncIn/ TrigIn	Input synchronization or trigger-ring	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	$\pm$ 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	If the EtherCAT interface is active, then the meaning of the Status-LED is conform with the EtherCAT guidelines.
	Red flashing	Processing error	
	Red	Error during synchronization	

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

Quick Guide

Structure of the Components

- Controller
- Power supply
- Laptop / PC + USB -> Ethernet adapter + Ethernet cable
- Sensor and clamp

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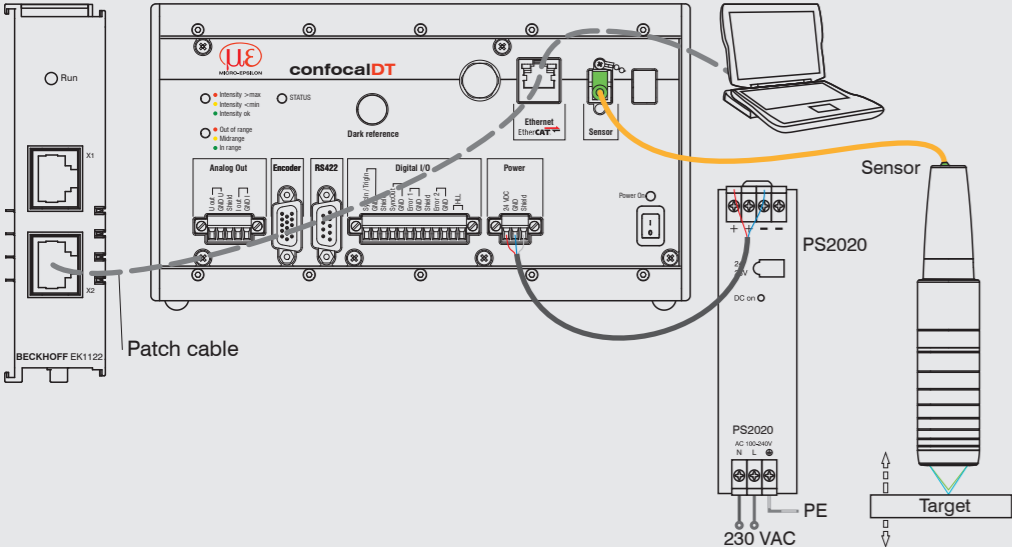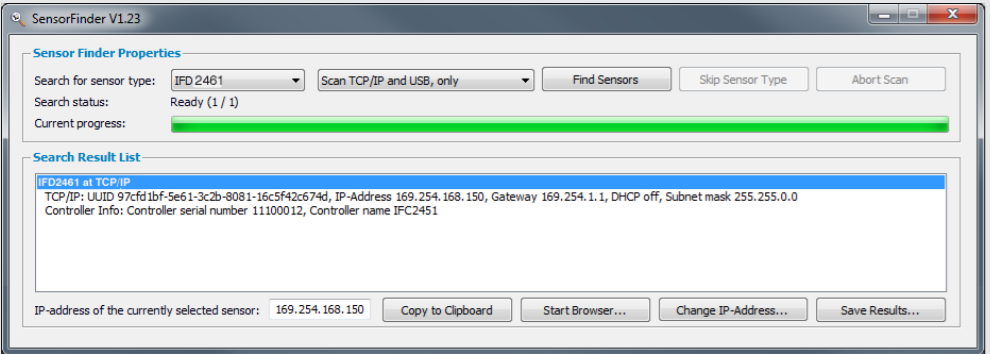

Commissioning

The controller is delivered ex factory with the IP address 169.254.168.150.
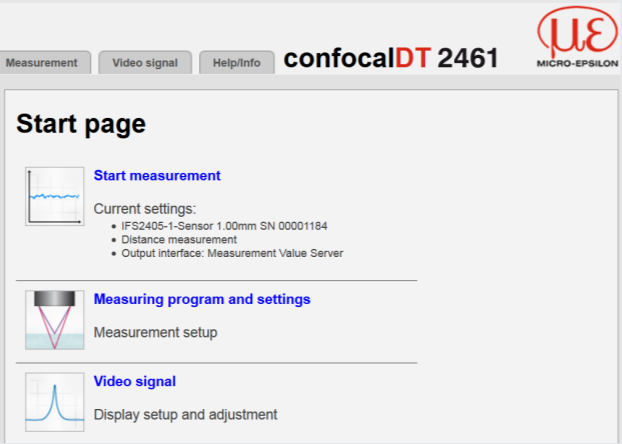
You can check the IP address of the controller, that are connected to a PC / network, with the SensorFinder.exe program. You will find this program on the provided CD.

▶️ 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.

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

Start page

Start measurement

Current settings:
- IFS2405-1-Sensor 1.00m SN 00001184
- Distance measurement
- Output interface: Measurement Value Server

Measuring program and settings

Measurement setup

Video signal

Display setup and adjustment

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.
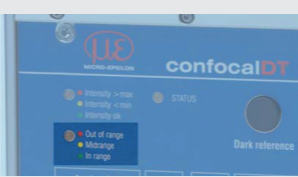
Place Target

▶️ Place the target in the midrange.

SMR = Start of measuring range
MMR = Midrange
EMR = End of measuring range
MR = Measuring range
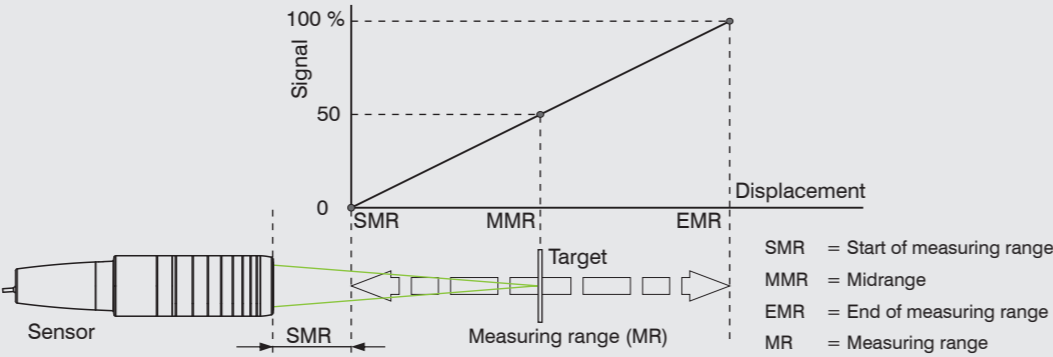
The LED range on the front side of the controller shows the position of the target to the sensor.

|	
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 should be as low as possible and preferably not be changed.
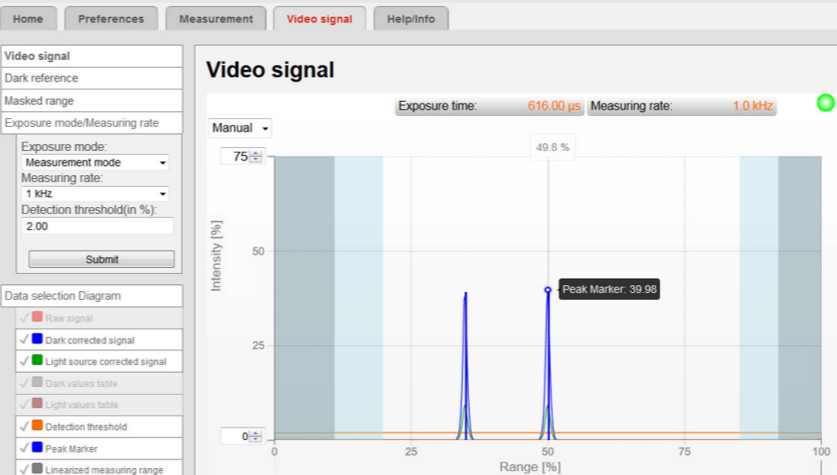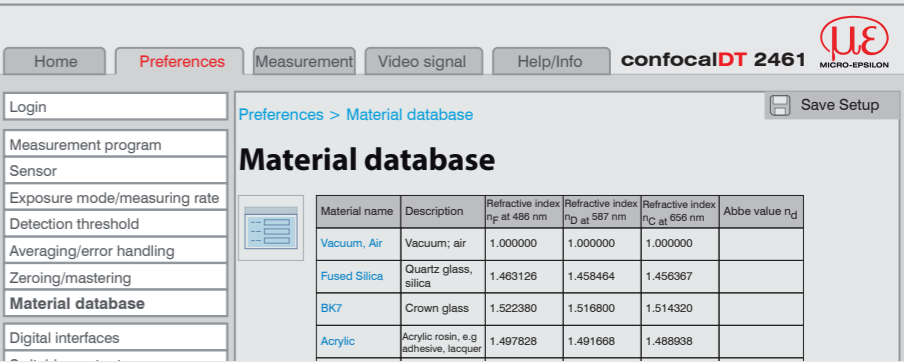

Menu Measurement
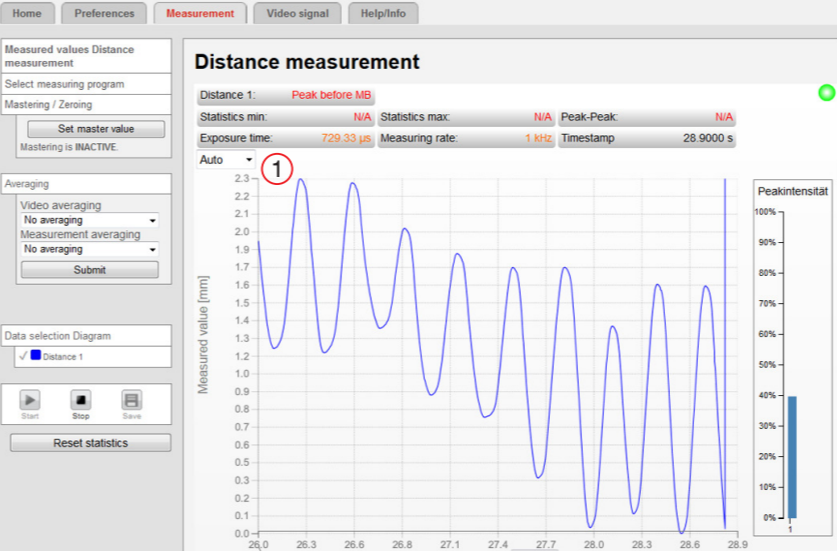
① It is recommended, to set the scaling manually at first and not to select too fine.

Thickness Measurement

▶️ Go to the menu `Preferences > Measurement program`. Select the `thickness measurement` program.
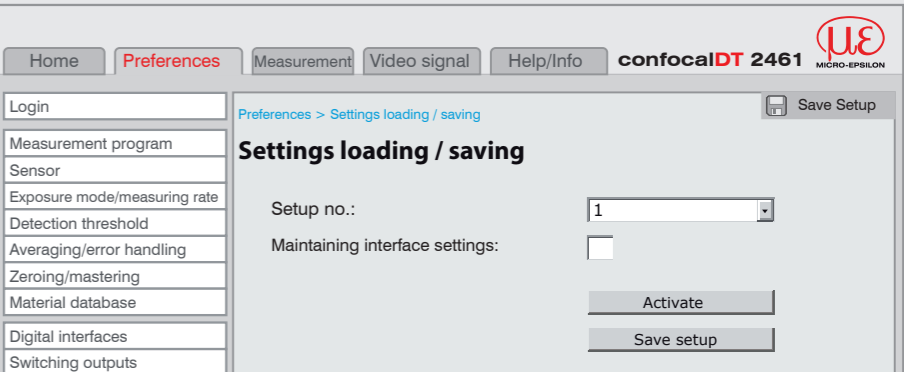
Differing from the previous steps the target material is to considered when measuring the thickness.

▶️ 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.