MICRO-EPSILON

More Precision

confocalDT // Confocal chromatic sensor system

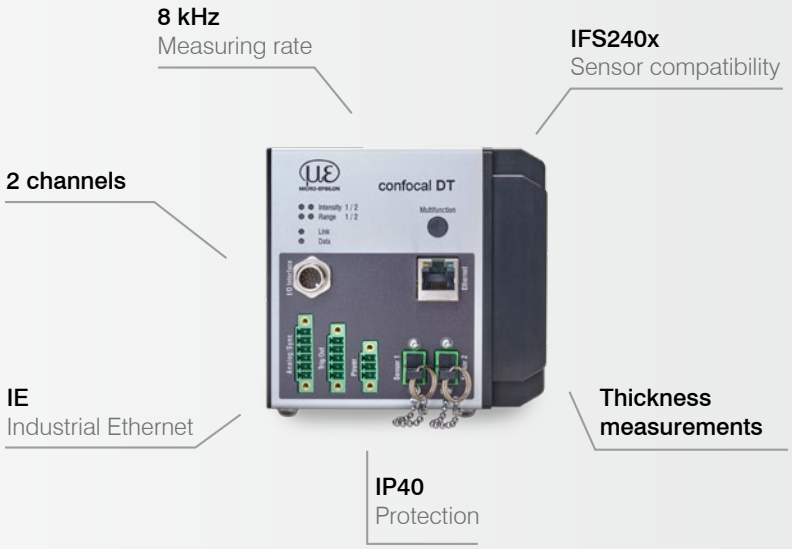
New products
confocalDT

NEW Compact confocal chromatic controllers for industrial series applications

The new IFC2412 and IFC2417 confocal controllers are now available as 2-channel versions of the ultra-compact IFC2411 and IFC2416 controllers. The IFC2412 has two channels with an adjustable measuring rate of 8 kHz and a submicrometer resolution of up to 1 nm. The IFC2417 with its two channels has a measuring rate of 25 kHz and is also able to perform multi-peak measurements with up to 5 layers. An active exposure regulation of the CCD line enables fast and reliable measurements on varying surfaces. Both controllers feature integrated interfaces such as Ethernet, EtherCAT and two analog outputs.

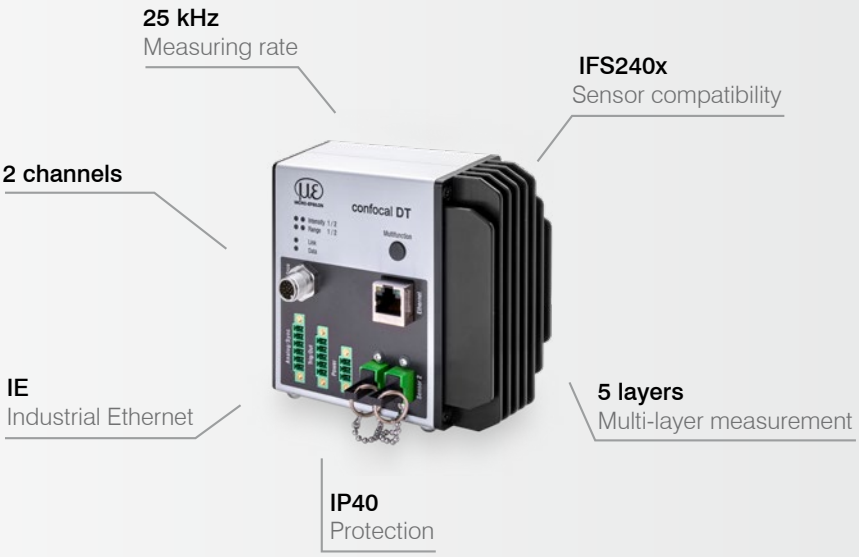
confocalDT IFC2411 / IFC2412

- Most compact confocal controller on the market
- Nanometer resolution for precise distance and thickness measurements
- INTERFACE Flexible integration via Ethernet, RS422 or analog output (U/I)
- Direct PLC connection due to Industrial Ethernet
- IP40 Robust aluminum housing (IP40)
- Best price Excellent price-performance ratio



confocalDT IFC2416 / IFC2417

- Nanometer resolution for highest precision
- Hz Ideal for extremely fast distance and thickness measurements up to 25 kHz
- Multi-peak: up to 5 layers with one measurement
- Best signal quality and stability due to high light intensity
- INTERFACE Flexible integration via Ethernet, RS422 or analog output
- IP40 Compact design and robust IP40 aluminum housing



More details from p. 36.

Compact confocal controllers for precise and fast inline processes
confocalDT IFC2416 / IFC2417

- Nanometer resolution for highest precision
- Ideal for extremely fast distance and thickness measurements up to 25 kHz
- Multi-peak: up to 5 layers with one measurement
- Best signal quality and stability due to high light intensity
- Flexible integration via Ethernet, RS422 or analog output
- Compact design and robust IP40 aluminum housing

Compact housing – maximum speed & precision

The confocal chromatic controllers IFC2416 and IFC2417 feature a high measuring rate of 25 kHz and enormous light intensity. This enables stable and precise measurements at high speed on various materials and surfaces.

These compact controllers are used for high-resolution distance and thickness measurements in all areas of industry. Thanks to the multi-peak option, multi-layer measurements of transparent objects with up to 5 layers are possible.

One controller – two channels with full performance

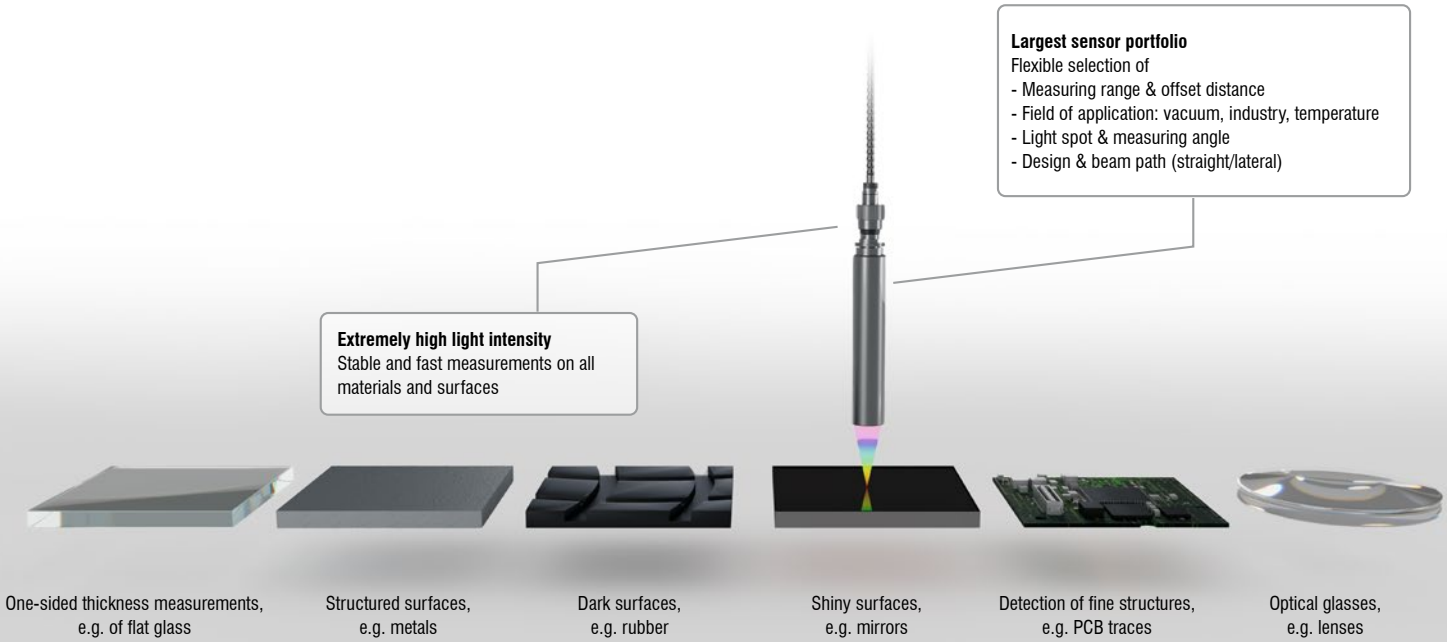
With the dual-channel version confocalDT IFC2417, integrated calculation functions enable the data combination of both channels, for example for thickness measurements of battery film. The measured values are recorded synchronously and at full measuring rate for both channels.

Flexible choice of sensor for a wide range of applications

The flexible connection of various sensors enables measurements on almost all surfaces as well as one-sided thickness measurements on transparent objects. Micro-Epsilon's extensive sensor portfolio covers measuring ranges from 0.1 mm to 30 mm. In addition, sensors are available for use in high-temperature environments and in a vacuum.

Robustness and ease of integration

The powerful controllers are optimally protected in a compact IP40 aluminum housing for easy integration into machines and production lines. Several interfaces are available for integration purposes. In addition to Ethernet and RS422, analog signals can be output as current or voltage values. In addition, encoder inputs as well as a synchronization and switching output support optimal process control.



Model		IFC2416
Resolution	Ethernet	1 nm
	RS422	18 bit
	Analog	16 bits (teachable)
Measuring rate		Continuously adjustable from 100 Hz to 25 kHz
Linearity [1]		typ. < ±0.02 % FSO (depends on sensor)
Multi-peak measurement		5 layers
Light source		Internal white LED
No. of characteristic curves		up to 10 characteristic curves for different sensors per channel, selection via table in the menu
Permissible ambient light [2]		30.000 lx
Synchronization		yes
Supply voltage		24 VDC ±10 %
Power consumption		< 9 W (24V)
Signal input		Sync-In / trig-In; 2 encoders (A+, A-, B+, B-, Index) | 3 encoders (A+, A-, B+, B-)
Digital interface		Ethernet / RS422
Analog output		Current: 4 … 20 mA; voltage: 0 ... 5V & 0 … 10 V (16 bit D/A converter)
Digital output		Sync-out; error-out
Connection	Optical	pluggable optical fiber via E2000 socket, length 2 m ... 50 m, min. bending radius 30 mm
	Electrical	3-pin supply terminal block; 6-pin I/O terminal block (max. cable length 30 m); 17-pin M12 connector for RS422, analog and encoder; RJ45 connector for Ethernet) (max. cable length 100 m)
Mounting		free-standing, DIN rail mounting
Temperature range	Storage	-20 … +70 °C
	Operation	+5 … +50 °C
Shock (DIN EN 60068-2-27)		15 g/6 ms on XYZ axis, 1000 shocks each
Vibration (DIN EN 60068-2-6)		2 g / 20 ... 500 Hz in XYZ axis, 10 cycles each
Protection class (DIN EN 60529)		IP40
Material		Aluminum
Weight		approx. 460 g
Compatibility		compatible with all confocalDT sensors
No. of measurement channels		1
Control and indicator elements		Web interface for setup and settings; Multifunction button: interface selection, adjustable functions and reset to factory settings after 10 s; 4x color LEDs for intensity, range, link and data

[1] FSO = Full Scale Output
[2] Illuminant: light bulb

Compact confocal controllers for precise and fast inline processes
confocalDT IFC2416 / IFC2417

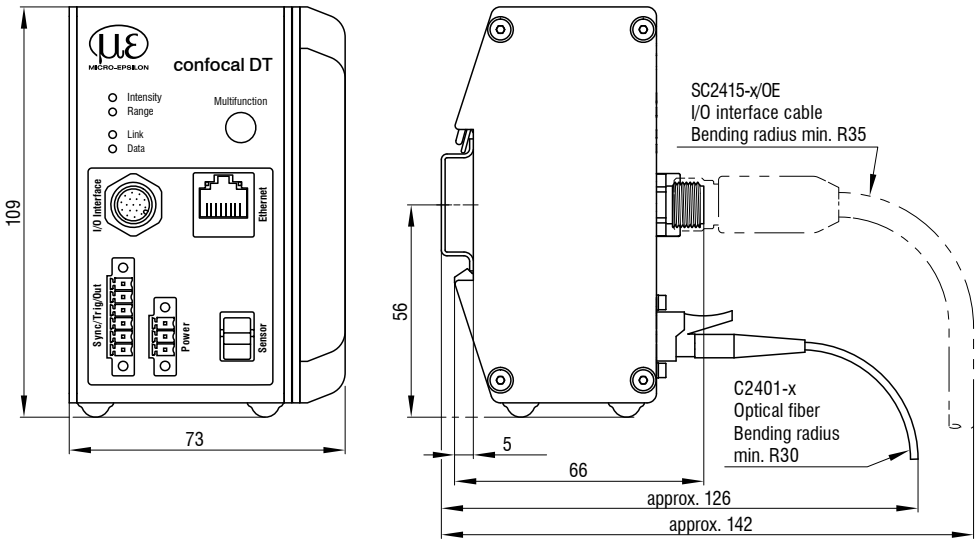
Model		IFC2417	IFC2417/IE
Resolution	Ethernet	1 nm	-
	Industrial Ethernet	-	1 nm
	RS422	18 bit	18 bit
	Analog	16 bits (teachable)	16 bits (teachable)
Measuring rate		Continuously adjustable from 100 Hz to 25 kHz	
Linearity [1]		typ. < ±0.02 % FSO (depends on sensor)	
Multi-peak measurement		5 layers	
Light source		Internal white LED	
No. of characteristic curves		Storage of up to 10 characteristic curves for different sensors per channel, selection via table in the menu	
Permissible ambient light [2]		30.000 lx	
Synchronization		yes	
Supply voltage		24 VDC ±10 %	
Power consumption		< 12 W (24V)	
Signal input		Sync-In / trig-In; 2 encoders (A+, A-, B+, B-, Index) | 3 encoders (A+, A-, B+, B-)	
Digital interface		Ethernet / RS422	EtherCAT / RS422
Analog output		2x freely selectable (16 bit D/A converter) Current: 4 … 20 mA; voltage: 0 … 5 V & 0 … 10 V	
Digital output		Sync-out; error-out	
Connection	Optical	pluggable optical fiber via E2000 socket, length 2 m ... 50 m, min. bending radius 30 mm	
	Electrical	3-pin supply terminal block; 5-pin terminal for Out/Trig; 6-pin I/O terminal block (max. cable length 30 m); 17-pin M12 connector for RS422, analog and encoder; RJ45 connector for Ethernet) (max. cable length 100 m)	
Mounting		free-standing, DIN rail mounting	
Temperature range	Storage	-20 … +70 °C	
	Operation	+5 … +50 °C	
Shock (DIN EN 60068-2-27)		15 g/6 ms on XYZ axis, 1000 shocks each	
Vibration (DIN EN 60068-2-6)		2 g / 20 ... 500 Hz in XYZ axis, 10 cycles each	
Protection class (DIN EN 60529)		IP40	
Material		Aluminum	
Weight		670 g	670 g
Compatibility		compatible with all confocalDT sensors	
No. of measurement channels		2	2
Control and indicator elements		Web interface for setup and settings; Multifunction button: interface selection, adjustable functions and reset to factory settings after 10 s; 4x color LEDs for intensity, range, link and data	

[1] FSO = Full Scale Output
[2] Illuminant: light bulb

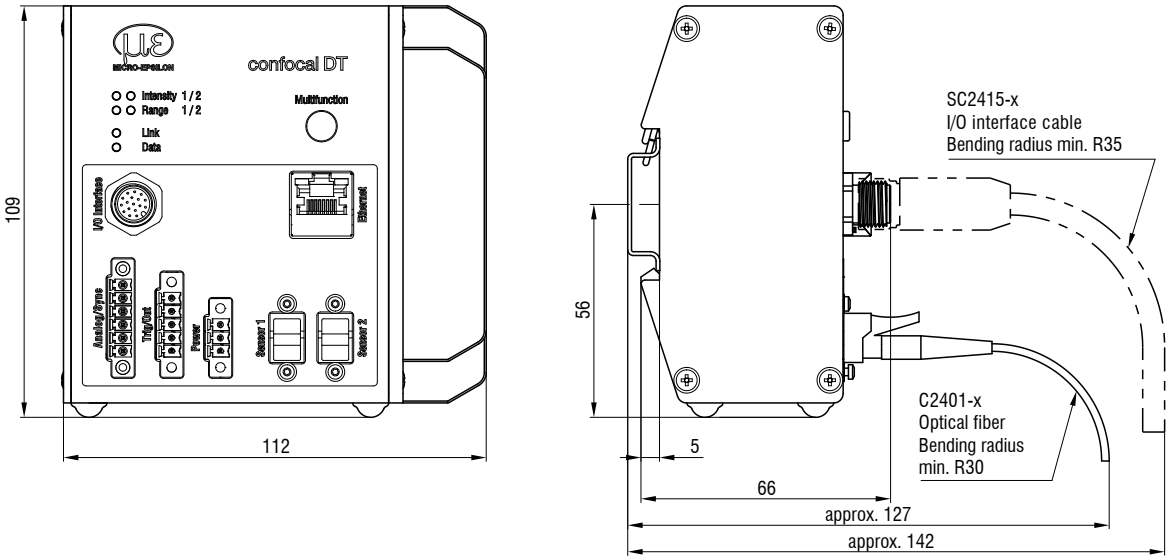
Dimensions

(in mm, not to scale)

confocalDT IFC2416



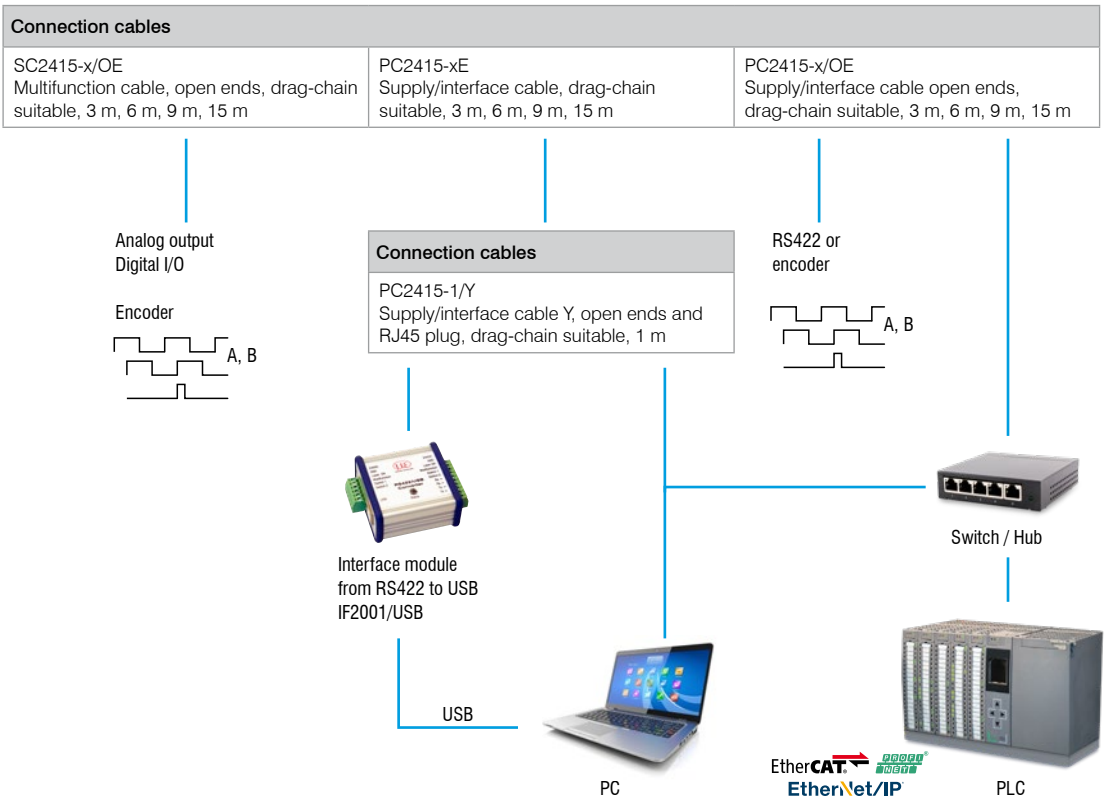
confocalDT IFC2417



Connection possibilities
confocalDT

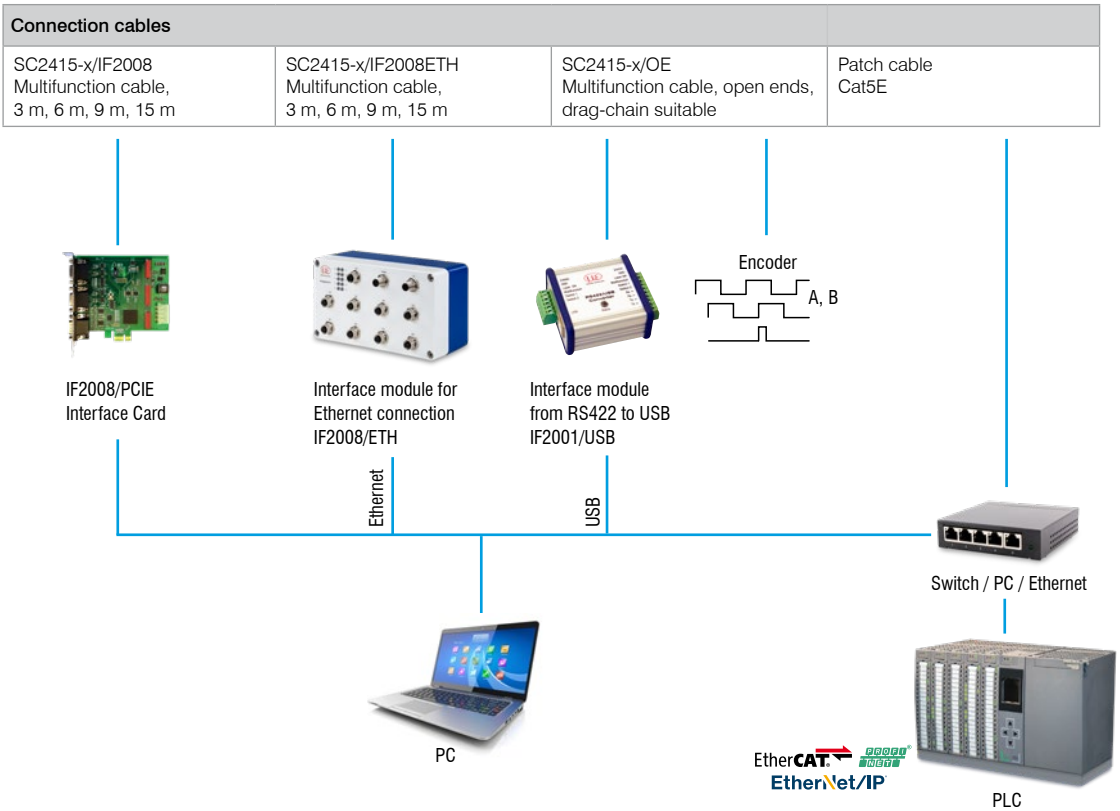
IFD2410 / IFD2415

* Can be connected via the PS2020 power supply unit (24 V / 2.5 A)



IFC2411 / IFC2416
IFC2412 / IFC2417

* Can be connected via the PS2020 power supply unit (24 V / 2.5 A)



Accessories
Interface modules

Module	IFD2410/IFD2415	IFC2411/12	IFC2416/17	IFC242x	IFC246x
IF2001/USB Single-channel RS422/USB converter cable	✔	✔	✔	✔	✔
IF2004/USB RS422/USB converter to convert up to 4 digital signals to USB	⊘	✔	✔	✔	✔
IF2008/ETH Interface module for Ethernet connection for up to 8 sensors	⊘	✔	✔	✔	✔
IF2008PCIE Interface card for multiple sensor signals; analog and digital interfaces	⊘	✔	✔	✔	✔
IF2035/PNET Interface module for Industrial Ethernet connection (PROFINET)	⊘	⊘	⊘	✔	✔
IF2035/ENETIP Interface module for Industrial Ethernet connection (EtherNet/IP)	⊘	⊘	⊘	✔	✔

IF2001/USB converter RS422 to USB

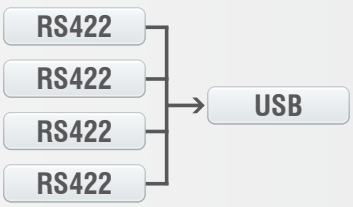
The RS422/USB converter converts the digital signals of a confocal controller into a USB data packet. The sensor and the converter are connected via the RS422 interface of the converter. Data output is via the USB interface. The converter also passes through additional signals and functions such as laser on/off, switch signals and function output. The connected controllers and the converter can be programmed through software.

Characteristics

- Robust aluminum housing
- Easy sensor connection via screw terminals (plug and play)
- Conversion from RS422 to USB
- Supports baud rates from 9.6 kBaud to 12 MBaud

IF2004/USB: 4-channel converter from RS422 to USB

The RS422/USB converter is used for transforming digital signals of up to four confocal controllers into USB data signals. The converter has four trigger inputs and a trigger output for connecting additional converters. Data is output via a USB interface. The connected controllers and the converter can be programmed through software. The COM interfaces can be used individually and can be switched.



Characteristics

- 4x digital signals via RS422
- 4x trigger inputs, 1x trigger output
- Synchronous data acquisition
- Data output via USB

IF2008/ETH

Interface module for Ethernet connection with up to 8 sensors

The IF2008/ETH integrates up to eight sensors and/or encoders with an RS422 interface into an Ethernet network. Four programmable switching in-/outputs (TTL and HTL logic) are available.

Ten indicator LEDs directly on the module show both the channel and the device status. In addition, acquisition and output of data via Ethernet is performed at high speeds up to 200 kHz. Parameter setting of the interface module can be easily done via the web interface.

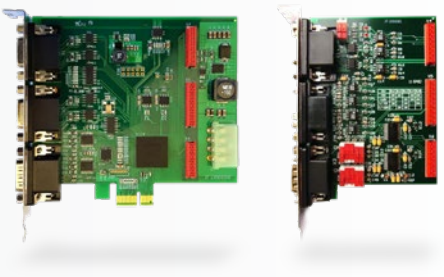
IF2008PCIe / IF2008E

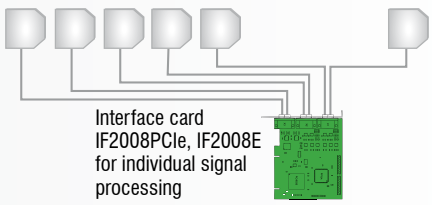
Interface card for synchronous data acquisition

Absolute synchronous data acquisition is a decisive factor for the deflection or straightness measurement using several controllers. The IF2008PCIe interface card is designed for installation in PCs and enables the synchronous acquisition of four idigital sensor signals and two encoders. The data is stored in a FIFO memory in order to enable resource-saving processing in blocks in the PC. The IF2008E expansion board also enables the acquisition of two digital controller signals, two analog controller signals and eight I/O signals.

Characteristics

- IF2008PCIe - Basic printed circuit board: 4 digital signals and 2 encoders
- IF2008E - Expansion board: 2x digital signals, 2x analog signals and 8x I/O signals



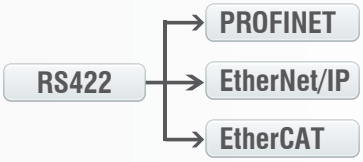


IF2035

Interface module for Industrial Ethernet connection

The IF2035 interface modules are designed for easy connection of Micro-Epsilon sensors to Ethernet-based fieldbuses. The IF2035 is compatible with sensors that output data via an RS422 or RS485 interface and supports the common Industrial Ethernet protocols EtherCAT, PROFINET and EtherNet/IP.

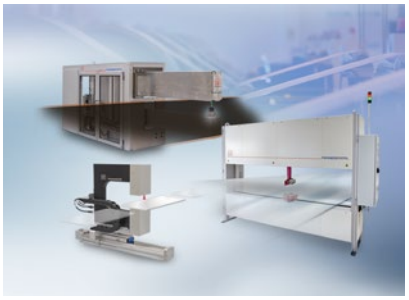
On the sensor side, these modules operate with up to 4 MBd and feature two network connections for different network topologies. In addition, the IF2035-EtherCAT offers a 4-fold oversampling function that enables faster measurements than the bus cycle would otherwise allow, if required. Installation in control cabinets is via a DIN rail.



Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

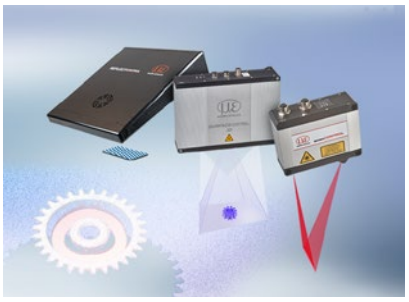
Sensors and measurement devices for non-contact temperature measurement



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

MICRO-EPSILON

MICRO-EPSILON Headquarters
Koenigbacher Str. 15 · 94496 Ortenburg / Germany
Tel. +49 (0) 8542 / 168-0 · Fax +49 (0) 8542 / 168-90
info@micro-epsilon.com · **www.micro-epsilon.com**