MICRO-EPSILON

# More Precision

## confocalDT IFC241x

Compact confocal controllers for precise distance and thickness measurements

# Compact confocal chromatic controllers for industrial series applications
# confocalDT IFC2411 / IFC2412

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


EtherCAT PROFINET EtherNet/IP

**Precision meets compactness –**
**powerful confocal chromatic controllers**

The IFC2411 and IFC2412 controllers set new standards in non-contact distance and thickness measurements. The most compact confocal chromatic controllers currently available deliver impressive results with high-precision measurements at high speeds. Their unique design makes these controllers ideal for easy integration into existing plants and systems. They can be quickly mounted on a DIN rail and fit into even the smallest control cabinets.

**One controller – two channels with full performance**

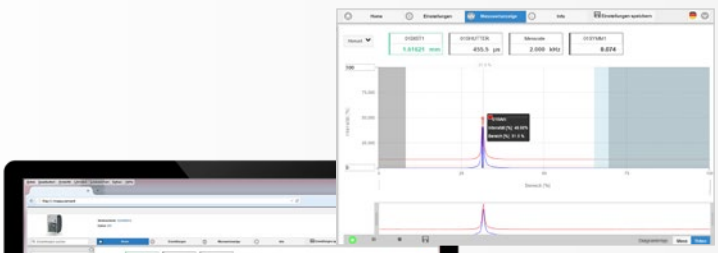
With the dual-channel version confocalDT IFC2412, integrated calculation functions enable the data combination of both channels, for example for thickness measurements of battery film. The measured values are recorded synchronously and at full measuring rate for both channels.

**Largest sensor portfolio & numerous application possibilities**

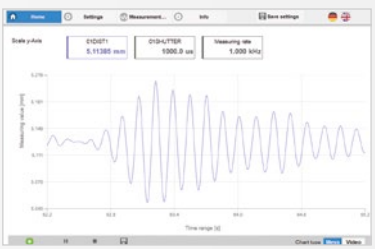
The flexible connection of various sensors enables measurements on almost all surfaces as well as one-sided thickness measurements on transparent objects. Micro-Epsilon's extensive sensor portfolio covers measuring ranges from 0.1 mm to 30 mm. In addition, the sensors are available for use in high-temperature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

**Developed for industry, OEM & automation**

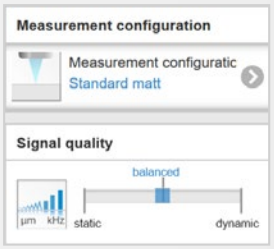
Diverse interfaces enable flexible integration into machines and systems. The robust IP40 aluminum housing provides reliable protection in industrial environments for maximum precision and signal stability. These systems impress in series and OEM applications with their outstanding performance and excellent price-performance ratio.



Video signal display



Measurement chart




Presets for fast setting

**Simple operation via web interface**

Setup and configuration of the controller and sensors are handled in a user-friendly web interface via Ethernet connection. No additional software is required. For thickness measurements, materials are stored in an editable materials database.

| Model | | IFC2411 | IFC2411/IE |
|---|---|---|---|
| Resolution | Ethernet | 1 nm | - |
| | Industrial Ethernet | - | 1 nm |
| | RS422 | 18 bit | |
| | Analog | 16 bits (teachable) | |
| Measuring rate | | Continuously adjustable from 100 Hz to 8 kHz | |
| Linearity [1] | | typ. < ±0.02 % FSO (depends on sensor) | |
| Multi-peak measurement | | 1 layer | |
| 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 | | < 7 W (24V) | |
| Signal input | | Sync-In / trig-In; 2 encoders (A+, A-, B+, B-, Index) \| 3 encoders (A+, A-, B+, B-) | sync-in / trig-in; 1x encoder (A+, A-, B+, B-, index) |
| Digital interface [3] | | Ethernet / RS422 | EtherCAT / PROFINET / Ethernet/IP / RS422 |
| Analog output | | Current: 4 … 20 mA; voltage: 0 ... 5V & 0 … 10 V (16 bit D/A converter) | |
| Digital output | | Sync-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;<br>6-pin I/O terminal block (max. cable length 30 m);<br>17-pin M12 connector for RS422, analog and encoder;<br>RJ45 connector for Ethernet) (max. cable length 100 m) | 3-pin supply terminal block;<br>5-pin I/O terminal block (max. cable length 30 m);<br>17-pin M12 connector for RS422, analog and encoder;<br>RJ45 connector for Industrial 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. 335 g | |
| Compatibility | | compatible with all confocalDT sensors | |
| No. of measurement channels | | 1 | |
| Control and indicator elements | | Web interface for setup and settings;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for intensity, range, link and data | Web interface for setup and settings;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for Intensity, Range, RUN and ERR |

[1] FSO = Full Scale Output
[2] Illuminant: light bulb
[3] The controller can also be parameterized via Ethernet

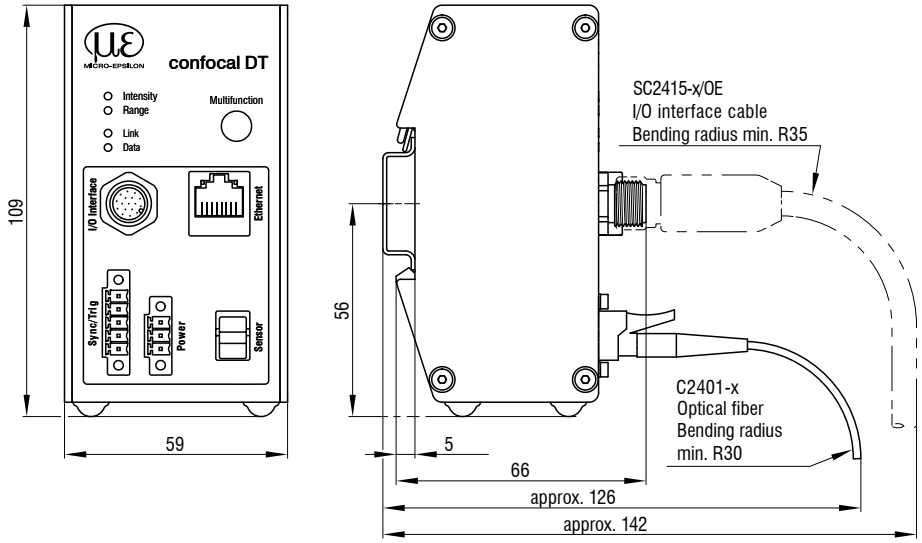
# Compact confocal chromatic controllers for industrial series applications
# confocalDT IFC2411 / IFC2412

| Model | | IFC2412 | IFC2412/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 8 kHz | |
| Linearity [1] | | typ. < ±0.02 % FSO (depends on sensor) | |
| Multi-peak measurement | | 1 layer | |
| 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 | EtherCAT / RS422 |
| Analog output | | Current: 4 … 20 mA; voltage: 0 ... 5V & 0 … 10 V (16 bit D/A converter) | |
| Digital output | | Sync-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;<br>5-pin terminal for Out/Trig;<br>6-pin I/O terminal block (max. cable length 30 m);<br>17-pin M12 connector for RS422, analog and encoder;<br>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;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for intensity, range, link and data | Web interface for setup and settings;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for Intensity, Range, RUN and ERR |

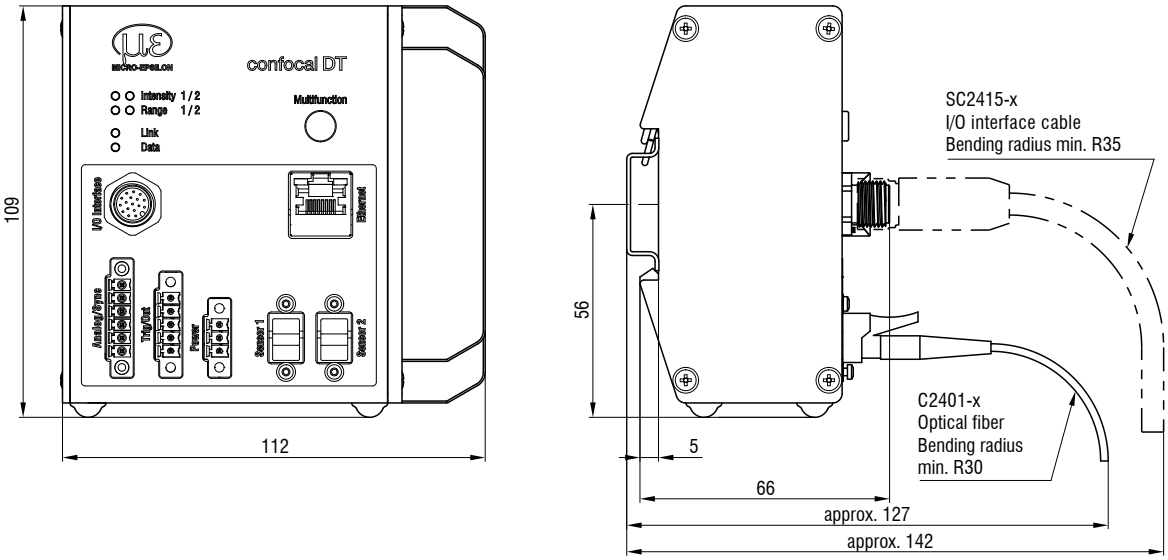
[1] FSO = Full Scale Output
[2] Illuminant: light bulb

# Dimensions

## confocalDT IFC2411




## confocalDT IFC2412



# Powerful 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**

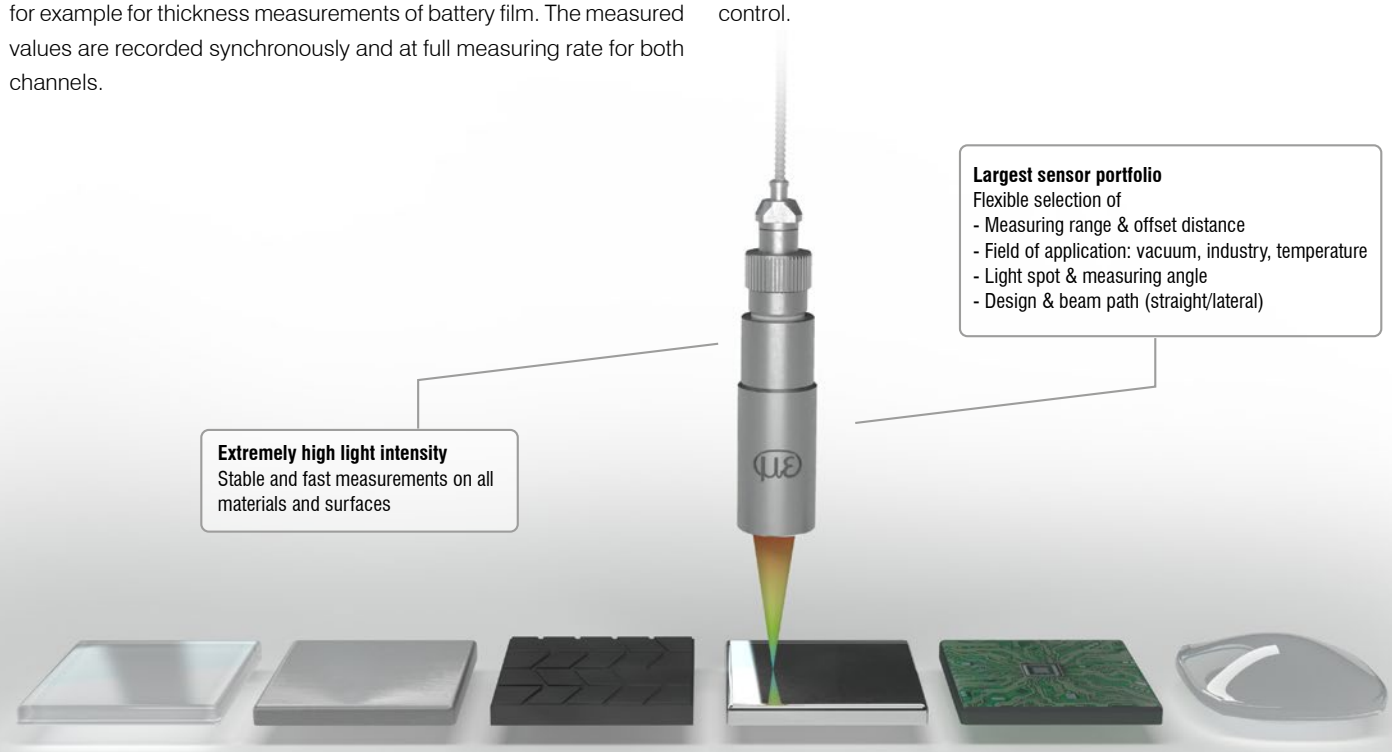
With the dual-channel version confocalDT IFC2417, integrated calculation functions enable the data combination of both channels, for example for thickness measurements of battery film. The measured values are recorded synchronously and at full measuring rate for both channels.

**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. Last but not least, 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;<br>6-pin I/O terminal block (max. cable length 30 m);<br>17-pin M12 connector for RS422, analog and encoder;<br>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;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for intensity, range, link and data |

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

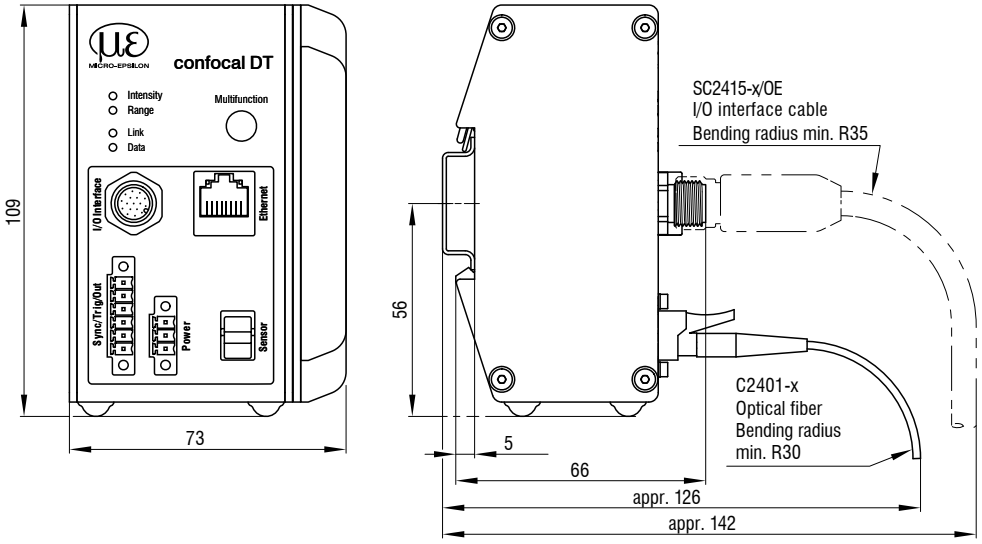
# Powerful confocal controllers for precise and fast inline processes
# confocalDT IFC2416 / IFC2417

| 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 | | 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 | | 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;<br>5-pin terminal for Out/Trig;<br>6-pin I/O terminal block (max. cable length 30 m);<br>17-pin M12 connector for RS422, analog and encoder;<br>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;<br>Multifunction button: interface selection, two adjustable functions and reset to factory settings after 10 s;<br>4x color LEDs for intensity, range, link and data | |

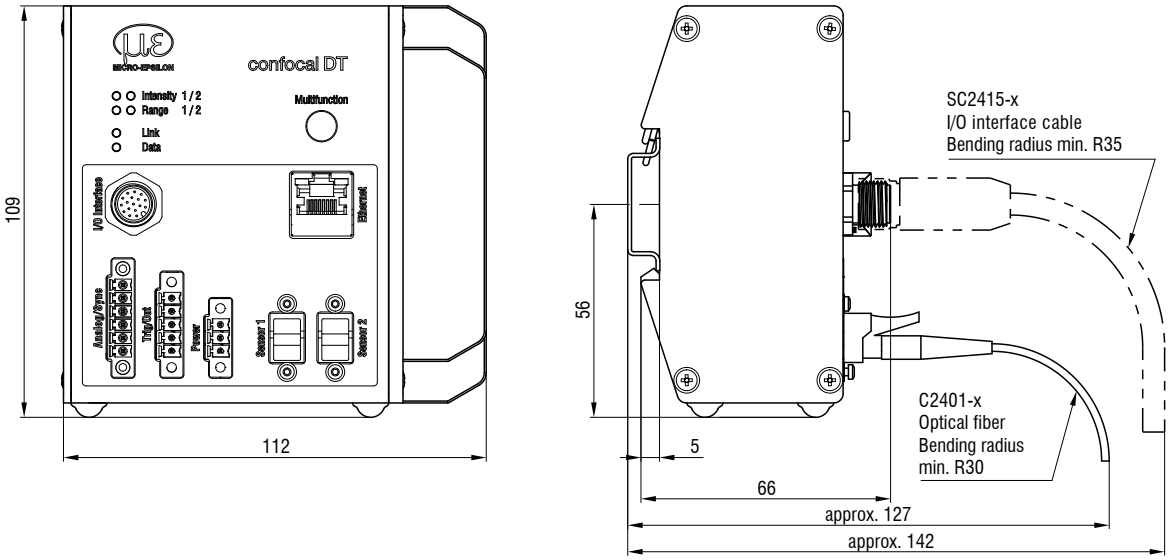
[1] FSO = Full Scale Output
[2] Illuminant: light bulb

# Dimensions

## confocalDT IFC2416

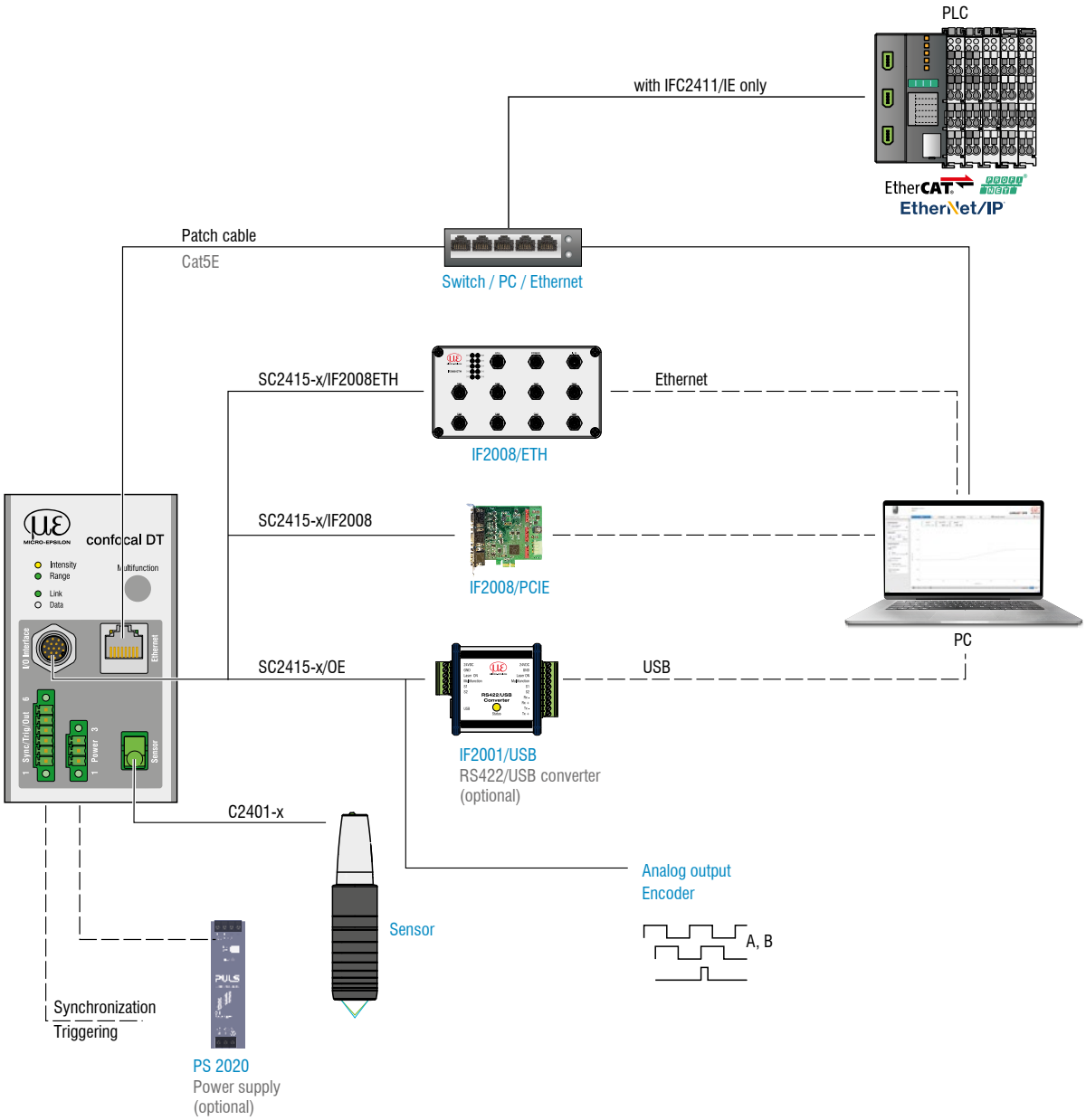



## confocalDT IFC2417

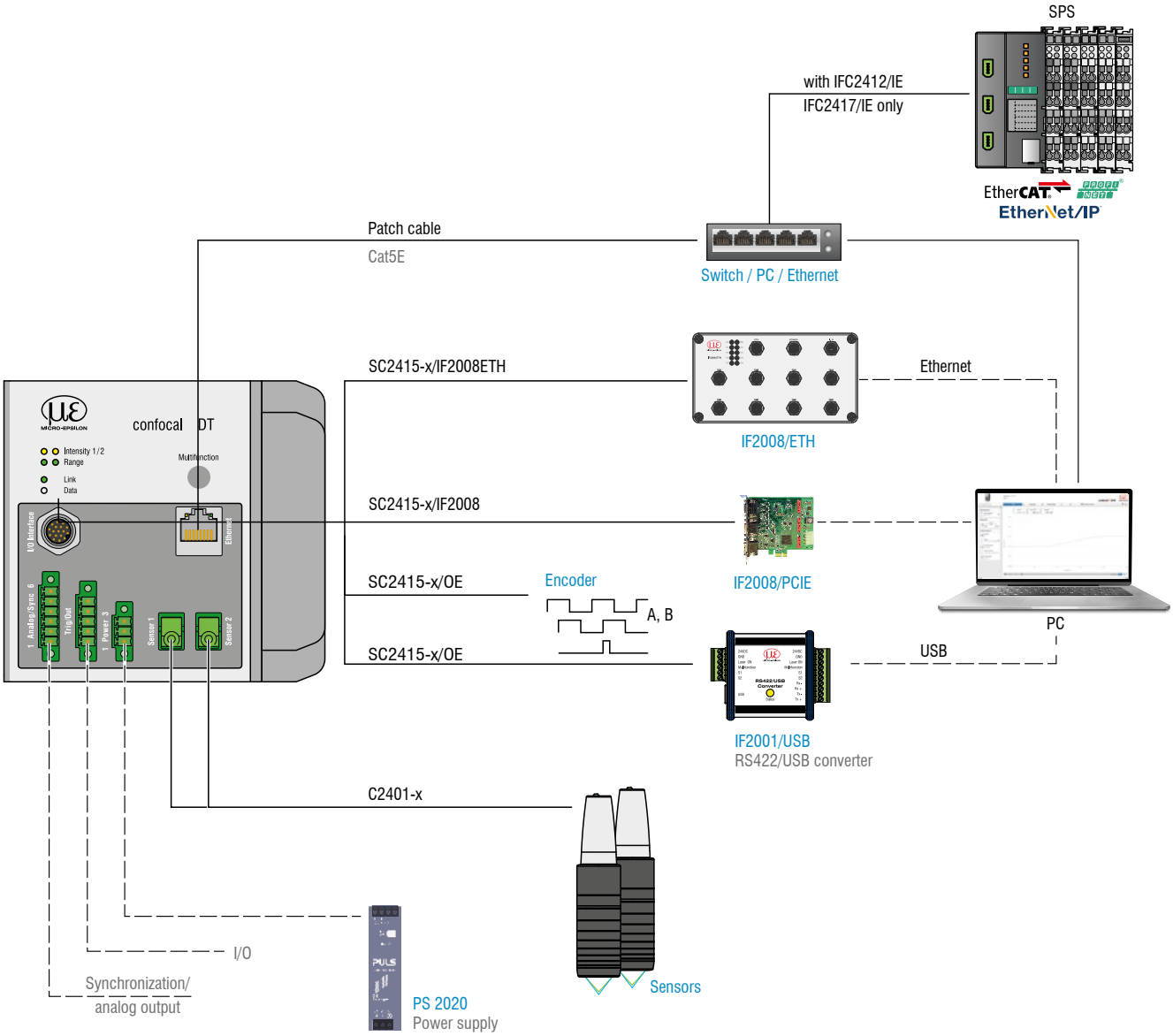


# Connection possibilities
# confocalDT

## IFC2411 / IFC2416



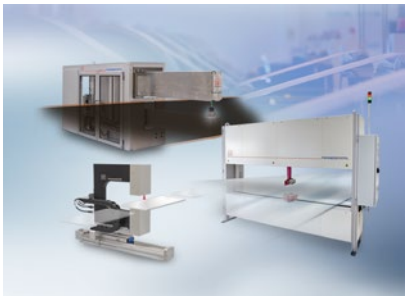
## IFC2412 / IFC2417



## Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

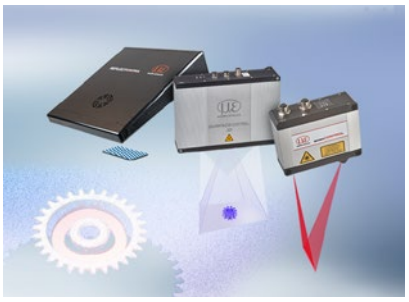
Sensors and measurement devices for non-contact temperature measurement



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



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