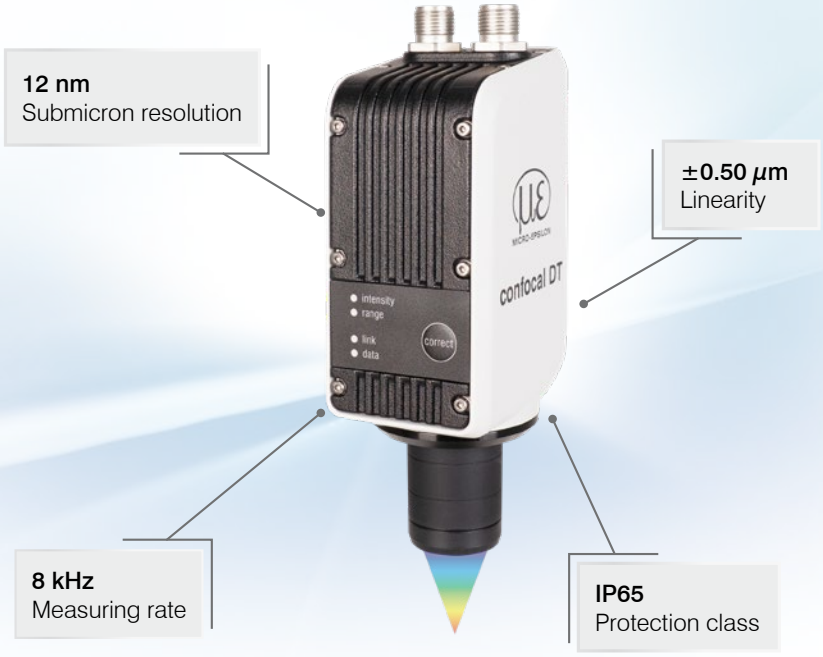
MICRO-EPSILON

More Precision

confocalDT IFD241x // Confocal chromatic sensor system

Confocal chromatic sensor system with integrated controller
confocalDT IFD2410

- All-in-One: sensor and controller in one compact housing (IP65)
- Adjustable measuring rate up to 8 kHz
- Simple integration without optical fibers
- Ethernet / RS422 / Analog
- Micron-precise measurement of distance and thickness



All-in-One: compact confocal sensor with optimal price/performance ratio

The confocalDT IFD2410 is an innovative confocal sensor with integrated controller. The space-saving IP65-housing enables fast integration into plant equipment and machines as no optical fiber is required. This makes the IFD2410 ideally suited to high precision distance and thickness measurements in industrial series applications.

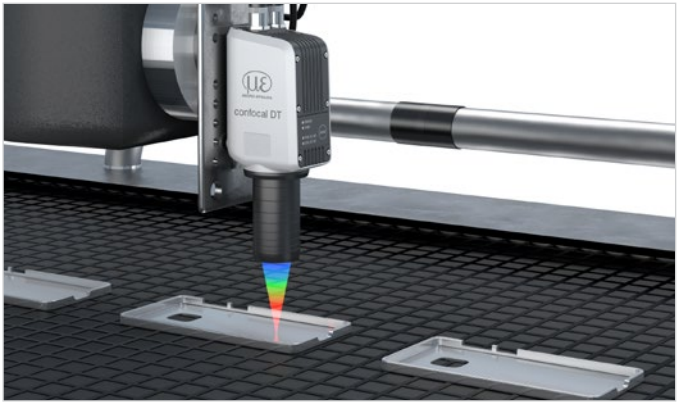
The active exposure regulation of the CCD line enables fast and accurate compensation of varying surfaces even in dynamic measurement processes up to 8 kHz. Based on its excellent price/performance ratio, the confocalDT IFD2410 sets a new benchmark in precise confocal measurement technology.

Intelligent technology meets high performance and user-friendliness

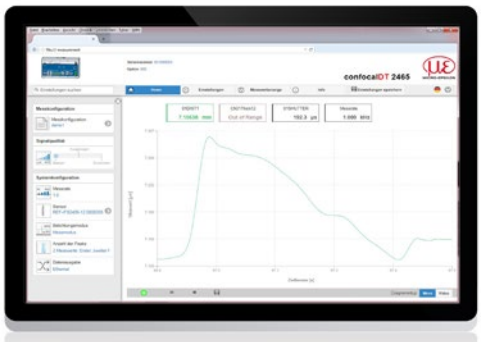
Using Ethernet, the confocalDT IFD2410 can be set via the intuitive web interface.

Fast, precise and compact

Its high performance and compact housing make this sensor ideally suitable for series applications in production lines and machines. These include inline inspection and coordinate measuring machines, inline thickness monitoring of flat glass and container glass as well as testing electronic components.



Inline measurement of smartphone housings



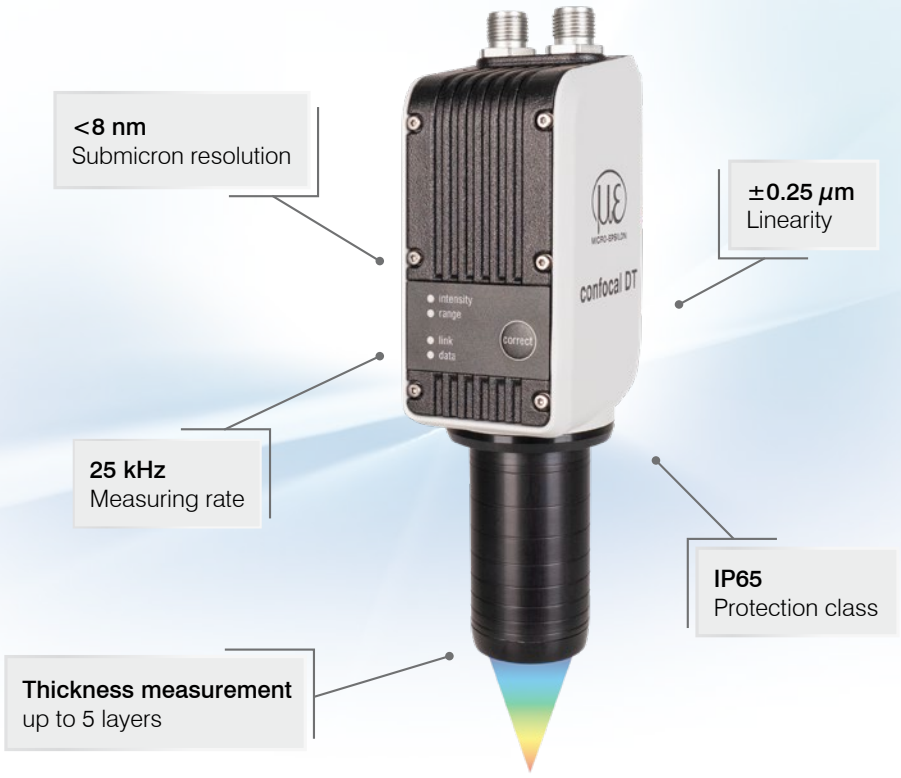
Easy setup and configuration via integrated web interface

Model		IFD2410-1 Ethernet	IFD2410-3 Ethernet	IFD2410-6 Ethernet
Measuring range		1 mm	3 mm	6 mm
Start of measuring range		approx. 15 mm	approx. 25 mm	approx. 35 mm
Resolution	Static [1]	< 12 nm	< 36 nm	< 80 nm
	Dynamic [2]	< 50 nm	< 125 nm	< 250 nm
Measuring rate		Continuously adjustable from 100 Hz to 8 kHz		
Linearity [3]	Displacement and distance	< ±0.5 µm	< ±1.5 µm	< ±3.0 µm
	Thickness	< ±1.0 µm	< ±3.0 µm	< ±6.0 µm
Multi-peak measurement		1 layer		
Light source		Internal white LED		
Permissible ambient light		30.000 lx		
Light spot diameter[4]		12 µm	18 µm	24 µm
Measuring angle [5]		±25°	±19°	±10°
Numerical aperture (NA)		0.45	0.35	0.18
Min. target thickness		0.05 mm	0.15 mm	0.3 mm
Target material		Reflective, diffuse as well as transparent surfaces (e.g. glass)		
Supply voltage		24 VDC ±10 %		
Power consumption		< 5.3 W (24V)		
Signal input		3 x encoders (A+, A-, B+, B-) 2 x HTL/TTL multifunction input: trigger in, slave in, zeroing, master, teach; 1 x RS422 synchronization input: trigger in, sync in, master/slave, master/slave alternating		
Digital interface		Ethernet / RS422		
Analog output		4 … 20 mA / 0 … 5 V / 0 ... 10 V (16 bit D/A converter)		
Switching output		Error1-Out, Error2-Out		
Digital output		Sync out		
Connection		12-pin M12 connector for supply, Ethernet, RS422 and Sync 17-pin M12 connector for I/O analog and encoder optional extension to 3 m / 6 m / 9 m / 15 m possible (see accessories for suitable connection cables)		
Mounting		Radial clamping (see accessories for mounting adapter), threaded holes		
Temperature range	Storage	-20 … +70 °C		
	Operation	+5 ... +50 °C		
Shock (DIN EN 60068-2-27)		15 g / 6 ms in XY axis, 1000 shocks each		
Vibration (DIN EN 60068-2-6)		2 g / 20 … 500 Hz in XY axis, 10 cycles each		
Protection class (DIN EN 60529)	Sensor	IP64 (front)		
	Controller	IP65		
Material		Aluminum housing, passive cooling		
Weight		approx. 490 g	approx. 490 g	approx. 490 g
Control and indicator elements		Correct button, LEDs for Intensity, Range, Link and Data		

[1] All data at constant ambient temperature (24 ±2 °C). Average from 512 values at 1 kHz, in the mid of the measuring range onto optical flat
[2] RMS noise relates to mid of measuring range (1 kHz)
[3] Maximum deviation from reference system over the entire measuring range, measured on front surface of ND filter
[4] In the mid of the measuring range
[5] Maximum sensor tilt angle that produces a usable signal on polished glass (n = 1.5) in the mid of the measuring range. The accuracy decreases when approaching the limit values.

High performance sensor system with integrated controller
confocalDT IFD2415

- All-in-One: sensor and controller in one compact housing (IP65)
- Adjustable measuring rate up to 25 kHz
- Ethernet / RS422 / Analog
- Micron-precise measurement of distance and thickness
- High precision distance and thickness measurements (5 layers)
- Short exposure time due to high light intensity



All-in-One: compact confocal sensor with highest performance

The confocalDT IFD2415 is a powerful confocal sensor with integrated controller. The space-saving IP65-housing enables fast integration into plant equipment and machines as no optical fiber is required. Furthermore, the IFD2415 is ideally suited to high precision distance and thickness measurements in industrial series applications. In addition, the sensor can be used with transparent materials for multi-layer thickness measurements of up to 5 layers.

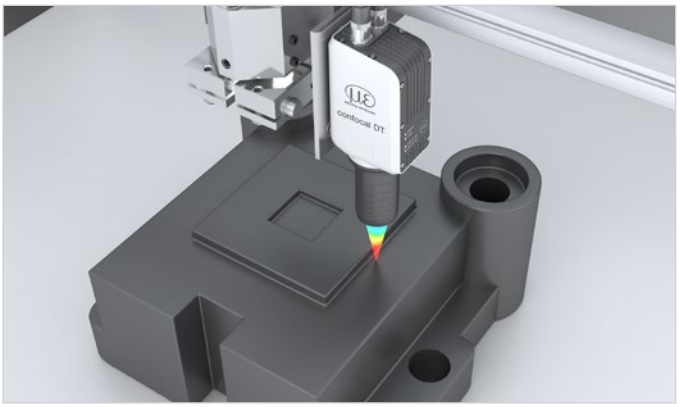
The active exposure time regulation of the CCD line enables fast and stable measurements of varying surfaces even in dynamic measurement processes up to 25 kHz. The measuring system is also characterized by high luminous intensity which enables fast and reliable measurements even on darker surfaces.

Intelligent technology meets high performance and user-friendliness

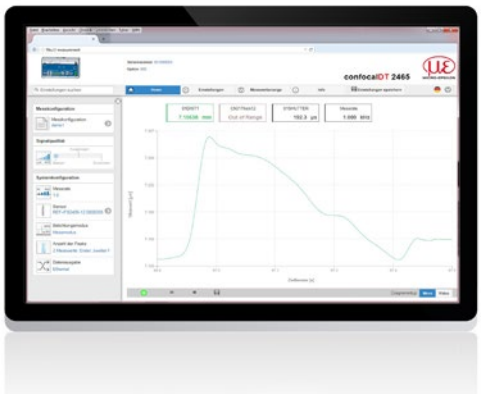
Using Ethernet, the confocalDT IFD2415 can be set via the intuitive web interface.

Fast, precise and compact

The unique combination of sensor and controller combined with excellent performance and high measuring rate make the confocalDT IFD2415 the best in its class. This compact sensor can be used in series applications such as, e.g., in inline inspection machines, robots, 3D printers and coordinate measuring machines.



Displacement and distance measurement in 3D printing

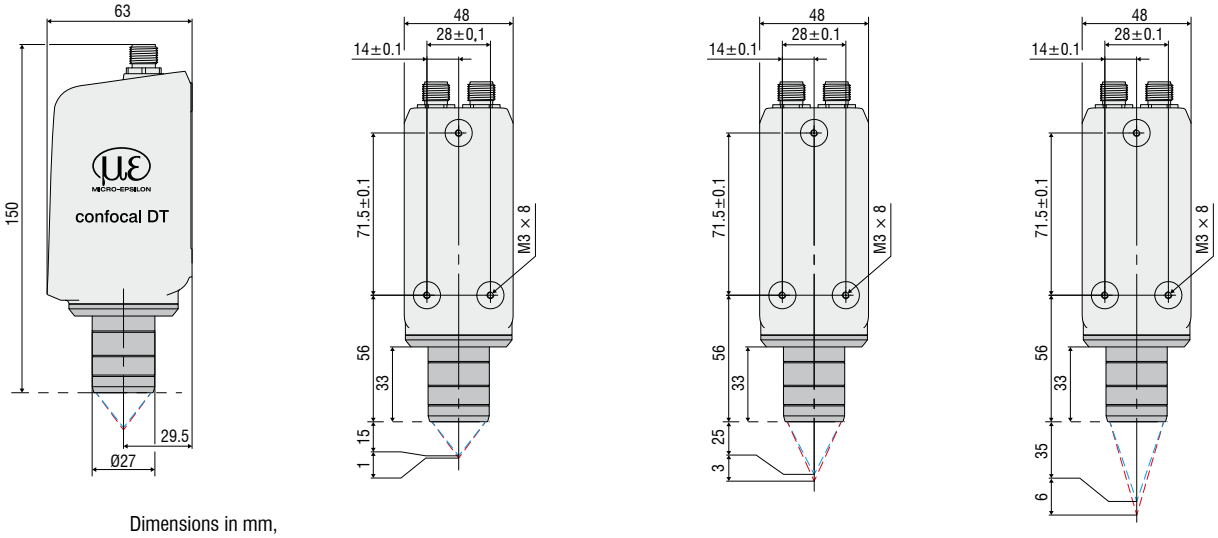


Easy setup and configuration via integrated web interface

Model		IFD2415-1 Ethernet	IFD2415-3 Ethernet	IFD2415-10 Ethernet
Measuring range		1 mm	3 mm	10 mm
Start of measuring range		approx. 10 mm	approx. 20 mm	approx. 50 mm
Resolution	Static [1]	< 8 nm	< 15 nm	< 36 nm
	Dynamic [2]	< 38 nm	< 80 nm	< 204 nm
Measuring rate		Continuously adjustable from 100 Hz to 25 kHz		
Linearity [3]	Displacement and distance	< ±0.25 µm	< ±0.75 µm	< ±2.5 µm
	Thickness	< ±0.5 µm	< ±1.5 µm	< ±5.0 µm
Multi-peak measurement		5 layers		
Light source		Internal white LED		
Permissible ambient light		30.000 lx		
Light spot diameter[4]		8 µm	9 µm	16 µm
Measuring angle [5]		±30°	±24°	±17°
Numerical aperture (NA)		0.55	0.45	0.30
Min. target thickness		0.05 mm	0.15 mm	0.5 mm
Target material		Reflective, diffuse as well as transparent surfaces (e.g. glass)		
Supply voltage		24 VDC ±10 %		
Power consumption		< 7 W (24V)		
Signal input		3 x encoders (A+, A-, B+, B-) 2 x HTL/TTL multifunction input: trigger in, slave in, zeroing, master, teach; 1 x RS422 synchronization input: trigger in, sync in, master/slave, master/slave alternating		
Digital interface		Ethernet / RS422		
Analog output		4 … 20 mA / 0 … 5 V / 0 ... 10 V (16 bit D/A converter)		
Switching output		Error1-Out, Error2-Out		
Digital output		Sync out		
Connection		12-pin M12 connector for supply, Ethernet, RS422 and Sync 17-pin M12 connector for I/O analog and encoder optional extension to 3 m / 6 m / 9 m / 15 m possible (see accessories for suitable connection cables)		
Mounting		Radial clamping (see accessories for mounting adapter), threaded holes		
Temperature range	Storage	-20 … +70 °C		
	Operation	+5 ... +50 °C		
Shock (DIN EN 60068-2-27)		15 g / 6 ms in XY axis, 1000 shocks each		
Vibration (DIN EN 60068-2-6)		2 g / 20 … 500 Hz in XY axis, 10 cycles each		
Protection class (DIN EN 60529)	Sensor	IP64 (front)		
	Controller	IP65		
Material		Aluminum housing, passive cooling		
Weight		approx. 500 g	approx. 600 g	approx. 800 g
Control and indicator elements		Correct button, LEDs for Intensity, Range, Link and Data		

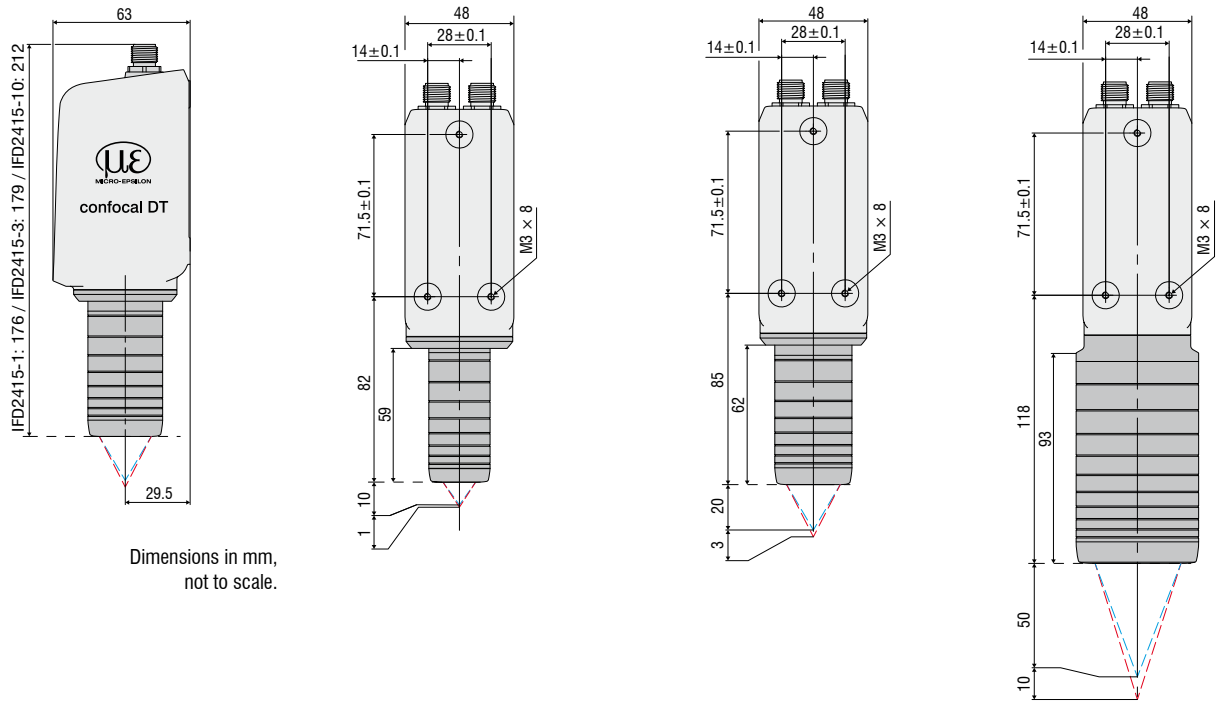
[1] All data at constant ambient temperature (24 ±2 °C). Average from 512 values at 1 kHz, in the mid of the measuring range onto optical flat
[2] RMS noise relates to mid of measuring range (1 kHz)
[3] Maximum deviation from reference system over the entire measuring range, measured on front surface of ND filter
[4] In the mid of the measuring range
[5] Maximum sensor tilt angle that produces a usable signal on polished glass (n = 1.5) in the mid of the measuring range. The accuracy decreases when approaching the limit values.

confocalDT IFD2410



Dimensions in mm,
not to scale.

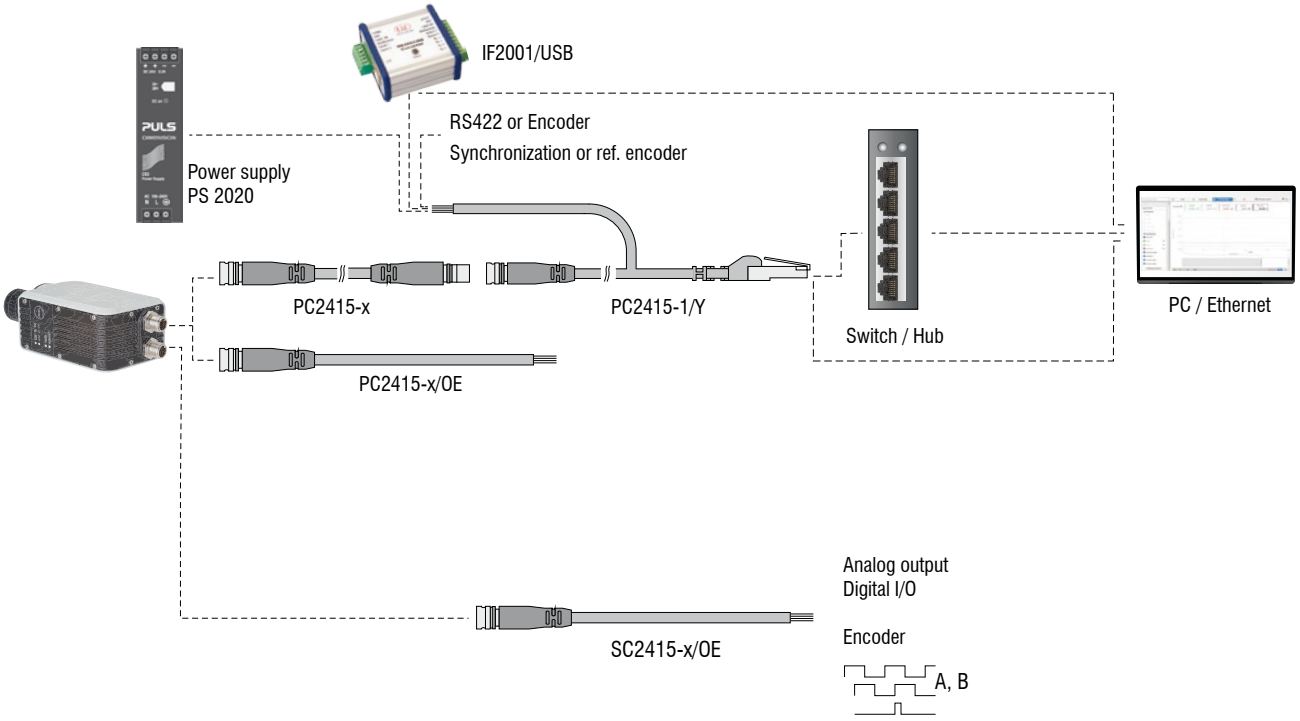
confocalDT IFD2415



Dimensions in mm,
not to scale.

Cable concepts for every application

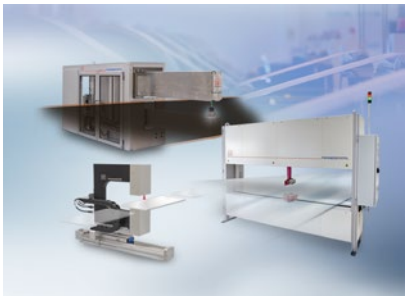
The connection options are diverse and can be adapted to your plant or machine concept.



Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

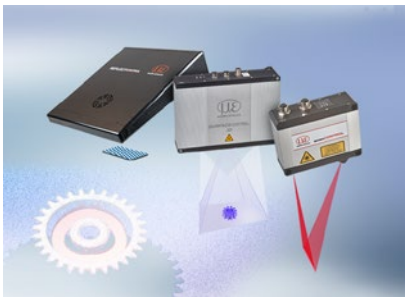
Sensors and measurement devices for non-contact temperature measurement



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**