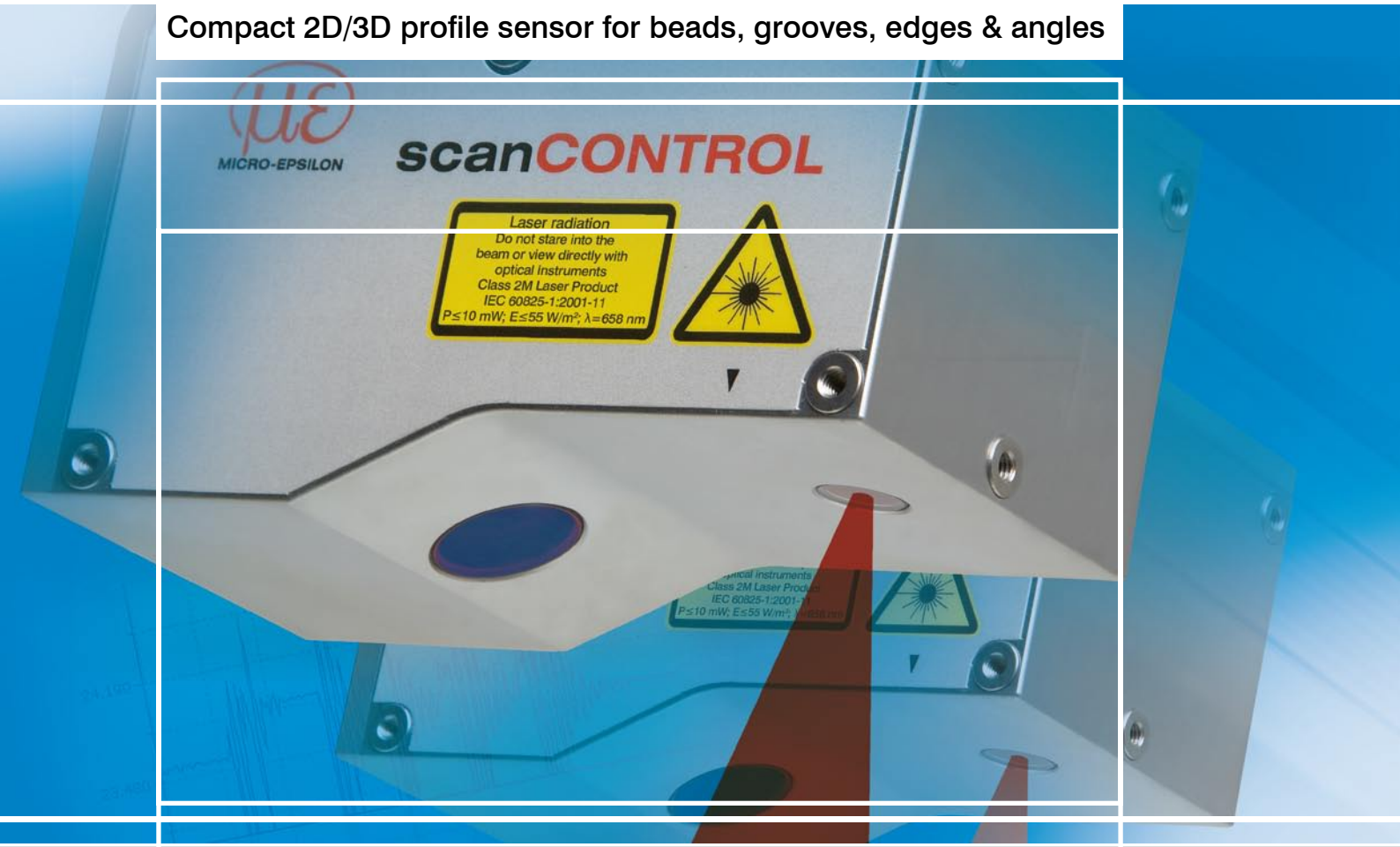
MICRO-EPSILON

More Precision.

scanCONTROL 2710

Compact 2D/3D profile sensor for beads, grooves, edges & angles



- Compact design with integrated controller
- Real time profile evaluation
- 100Hz profile frequency at full resolution
- Dynamic tracking
- More than 20 measured values for over 50 standard measurement tasks

Application

The scanCONTROL 2710 system provides a complete solution for simple measurement tasks. Angles, steps and positions can be recognized and tracked. However, more demanding tasks such as the detection of beads (e.g. adhesive beads, weld seams) or grooves (e.g. channels, gaps) are also possible with dynamic tracking.

The sensor also enables the user to evaluate the measured values in real time and provides control signals if tolerances are exceeded. The scanCONTROL 2710 can be configured easily using the configuration software included as standard.

Function and measurement principle

The scanCONTROL 2710 laser line scanner uses the triangulation principle for two-dimensional acquisition of profiles on a wide variety of target surfaces.

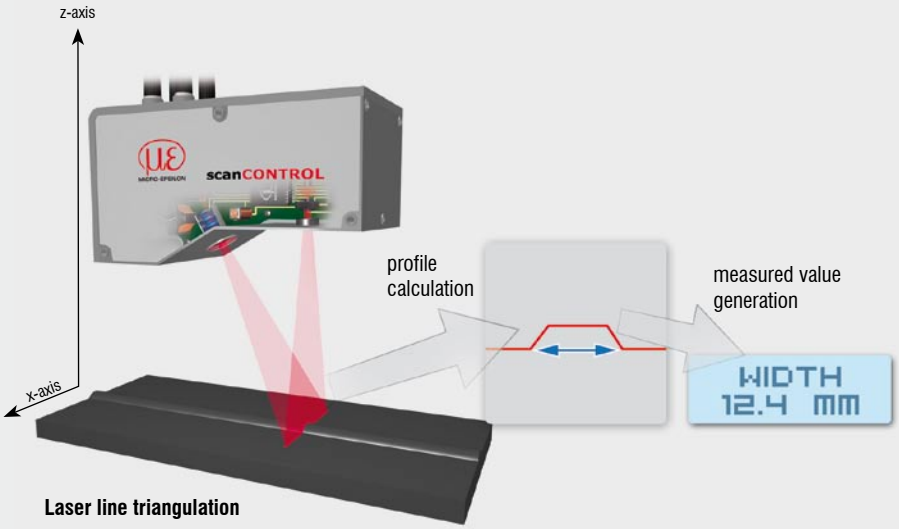
For this, a static laser line is projected onto the target surface. A high quality optical system projects the diffuse reflected light from this laser line onto a high sensitive sensor matrix.

The sensor calculates profile data from the camera image, generates the relevant measuring values and evaluates them with tolerances.

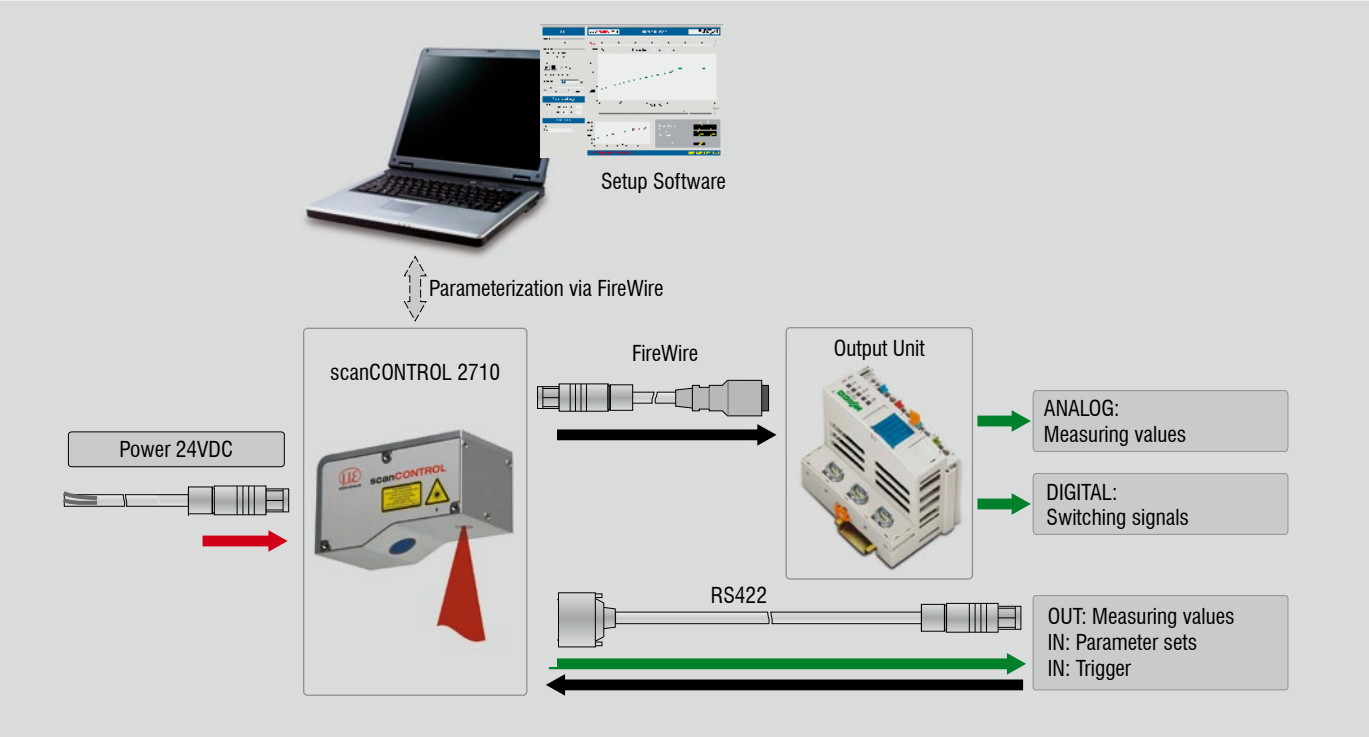
The measured values are output serial (RS422) or analog (Output Unit). The evaluated OK/NOK signals are output as digital switching signals (Output Unit).

Compact design and high speed

The scanCONTROL 2710 combines technology and performance in a single device and therefore provides a sensor design with integrated controller and compact dimensions. After the sensor has been configured using the setup software supplied, the system operates in stand alone mode and can be directly connected to a controlling unit. Using the integrated controller, the sensor acquires the data, calculates the profile and obtains measured values for the complete measurement field, at full resolution and at 100Hz profile frequency. The scanCONTROL 2710 is therefore able to control and regulate highly dynamic processes.



Laser line triangulation



Setup Software

In order to facilitate the configuration of the sensor for both static and dynamic processes, profile data can be stored at full data rate using the setup software provided. The configuration of the measurement task can be carried out not only online but also afterwards with the stored offline data.
The chosen parameters are transmitted to the scanCONTROL 2710 using a laptop or PC (FireWire interface).
The setup software enables the user to benefit quickly, easily and effectively from a variety of features provided on the scanCONTROL 2710. This includes sensor settings, cutting out ranges, automatic tracking on anchor points and dynamic referencing.

Comparison of the scanCONTROL 2700 and scanCONTROL 2710

The scanCONTROL 2700 sensor is a system that provides purely data and profiles via FireWire to an evaluation unit (e.g. PC). The complex calculations required to analyze profile data are performed by an external evaluation unit.
With the scanCONTROL 2710, the profile data are analyzed directly in the sensor. The scanCONTROL 2710 is therefore the preferred system for applications in which simple measurement tasks need to be resolved without using additional PCs or programming effort.

Extensions and enhancements for scanCONTROL 2710

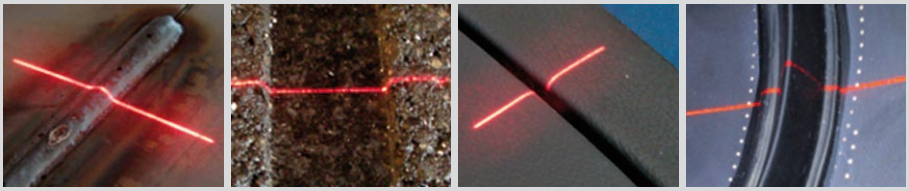
As well as measured values output via RS422, switching signals and analog measured values can also be output. This is provided by an Output Unit, which provides the analog and digital signals.

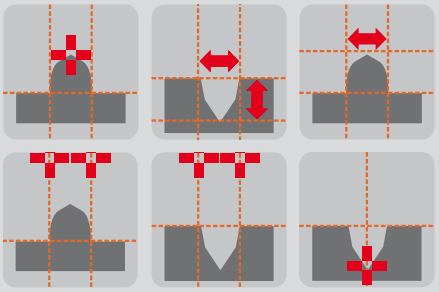
Output Unit for signal output

Applications

scanCONTROL 2710 is specially developed for measuring beads (bulges) and grooves (indentations) and operates in both stationary mode – e.g. as a fixed inline measurement unit on a conveyor system – as well as in moving processes (e.g. on a robot arm). Application examples given here are just some of numerous possible applications.

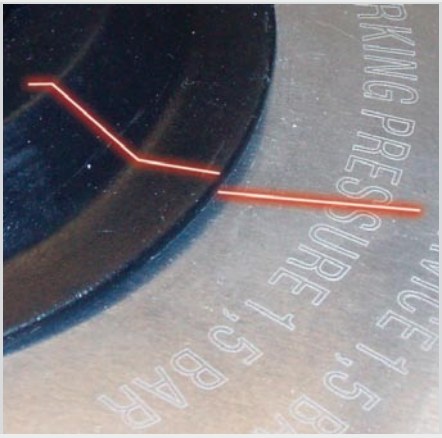
Beads, seams, grooves and gaps

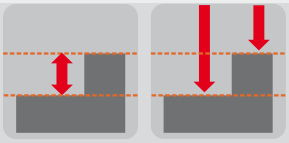




Step measurement

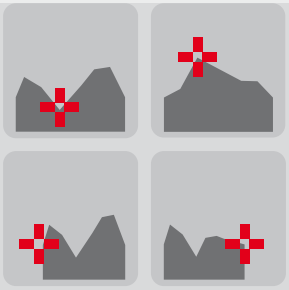
The sensor is based on the triangulation principle and can therefore be used to provide absolute distance measurement and direct step measurement.





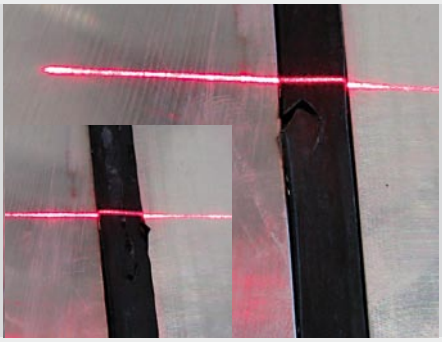
Determination of extreme values

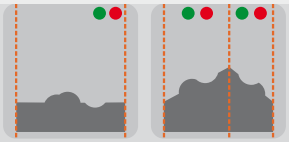
In contrast to camera systems, scanCONTROL provides calibrated height information and so is able to measure position information (e.g. the highest point) directly.



Surface defects

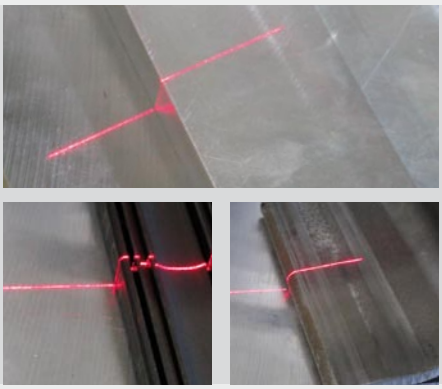
Defects on surfaces which do not show any contrast (e.g. cracks on rubber) can be detected by using the distance information, the quality of the surface can be output directly as an OK / NOK signal.

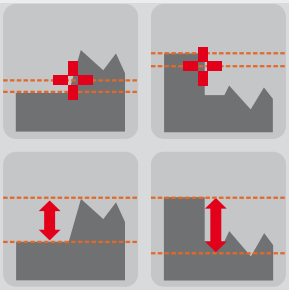




Determination of edges and position

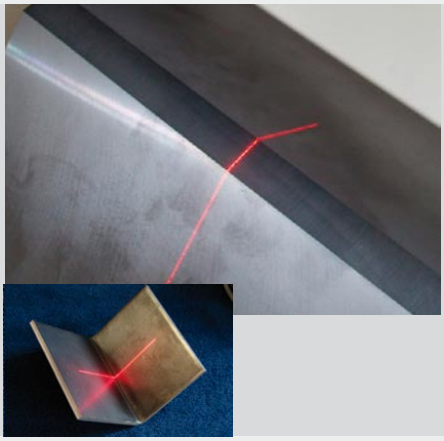
Suitable for the tracking of edges, including situations with unfavourable angle positions or belt vibrations. In addition to the position the height of the edge can be determined simultaneously.

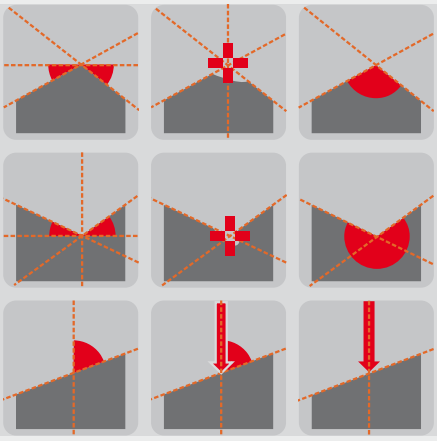


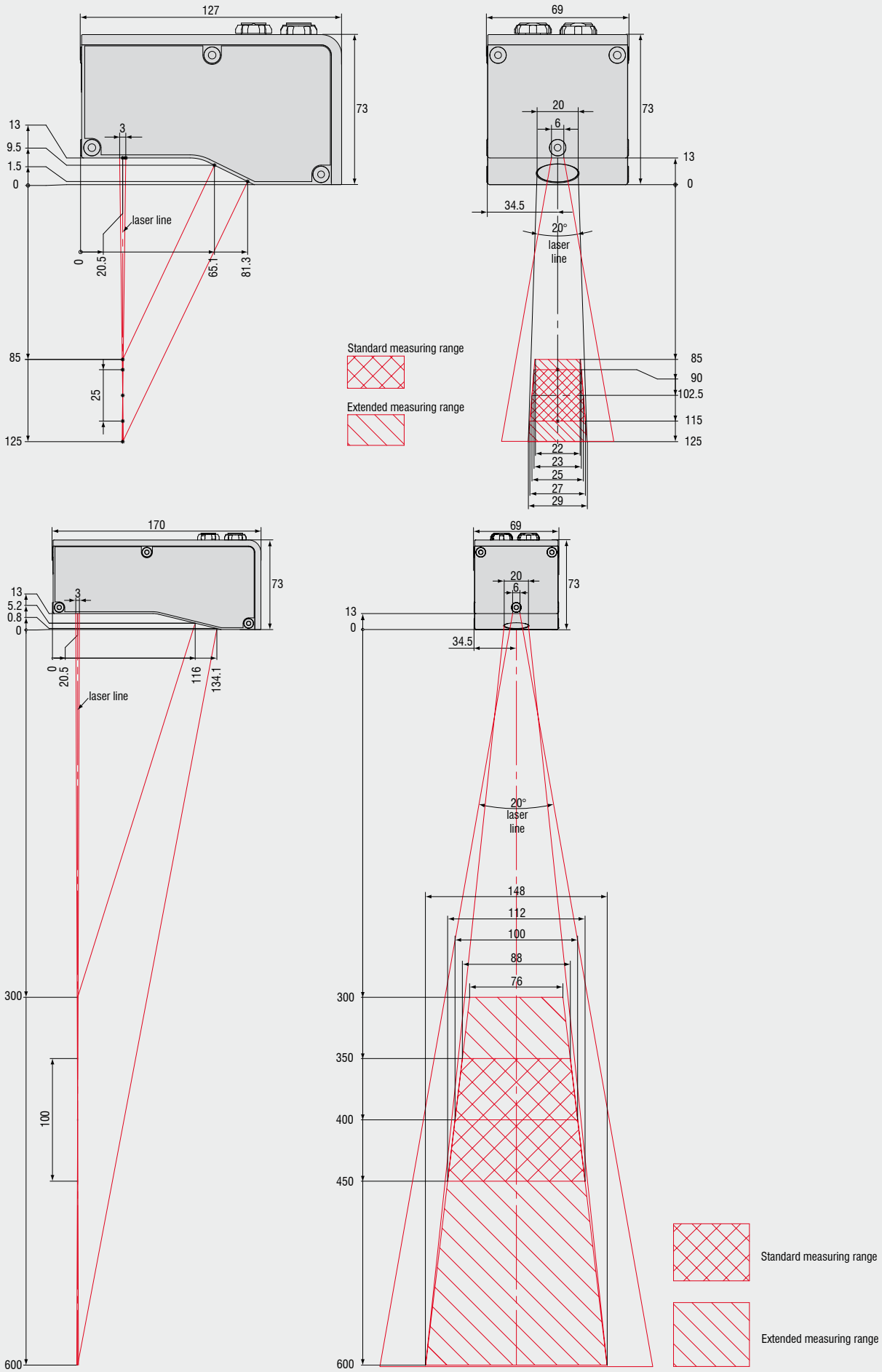


Angle measurement

The sensor enables the user to measure one or two independent angles. An intersection point can also be calculated and output. The measurement is performed by using straight lines as reference, which can also be tracked automatically if the position of the target within the measuring field changes.

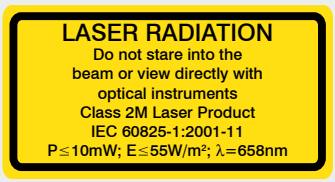





127
73
13
9.5
1.5
0
3
laser line
0
20.5
65.1
81.3
85
25
125
Standard measuring range
Extended measuring range
69
20
6
73
13
0
34.5
20°
laser
line
85
90
102.5
115
125
22
23
25
27
29
170
73
13
5.2
0.8
0
3
0
20.5
116
134.1
laser line
300
100
600
69
20
6
73
13
0
34.5
20°
laser
line
148
112
100
88
76
300
350
400
450
600
Standard measuring range
Extended measuring range

Model		scanCONTROL 2710-25	scanCONTROL 2710-100
Measuring range z-axis	standard measuring range	25mm	100mm
Start of measuring range		90mm	350mm
End of measuring range		115mm	450mm
Start of extended measuring range		85mm	300mm
End of extended measuring range		125mm	600mm
Linearity		±0.2% FSO (3σ)	
Resolution	x-axis	640 points/profile	
	reference resolution z-axis*	4µm	15µm
Profile frequency		100Hz	
Light source		semiconductor laser approx. 658nm, 20° aperture angle; standard laser class 2M: reduced 2-3 mW	
Cable length		up to 10m without hubs and full data rate, up to 50m with hubs and/or restrictions	
Protection class		IP 64	
Operating temperature		0°C to 50°C	
Storage temperature		-20°C to 70°C	
Output/Input		1x firewire, laser off (optional), 1x RS422 programmable (serial interface or synchronisation or encoder input)	
Display		1x laser, 1x power/error/status	
Supply		8-30VDC, 500mA	
Electromagnetic compatibility (EMC)	RFI emission	according to DIN EN 55011 / 11.2007 / Group 1, Class B and DIN EN 61326-1 / 10.2006 / Class B	
	Immunity to interference	according to EN 61 000-6-2 / 03.2006 and DIN EN 61326-1 / 10.2006 / Class B	
Galvanic isolation		Only at RS422, no isolation of 24V-supply, internal circuit and FireWire bus. If isolation necessary, external 24V-DC-DC-converter required	
Weight		appr. 700g	appr. 850g

FSO = Full scale output
*according to a one-time averaging across the measuring field (640 points)
Measuring object: Micro-Epsilon standard object (metallic, diffusely reflecting material)

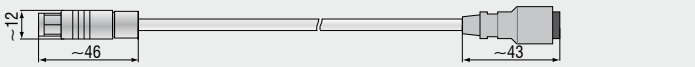


The scanCONTROL 2710 laser unit operates with a semiconductor laser featuring a wavelength of approx. 658nm (visible/red) and a 10mW optical output (laser class 2M).

Standard scope of delivery scanCONTROL 2710
- scanCONTROL 2710
- Power supply cable (4.5m)
- scanCONTROL setup software

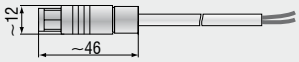
Connecting cable for power supply and interfaces

FireWire Connecting cable



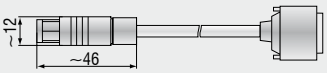
Sensor connector — IEEE1394a FireWire (6-pole)

External power supply cable



Sensor connector

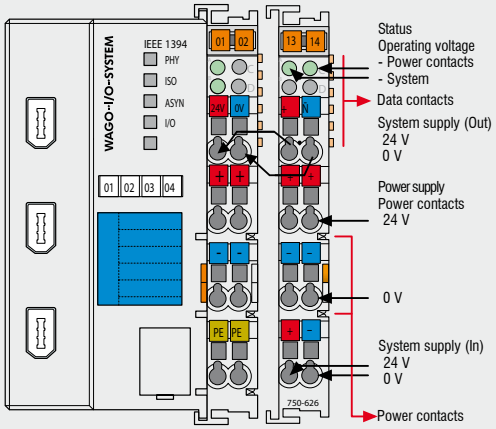
RS422 Interface cable



Sensor connector

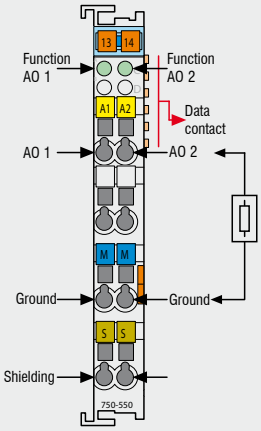
Output Unit Basic

OU fieldbus coupler



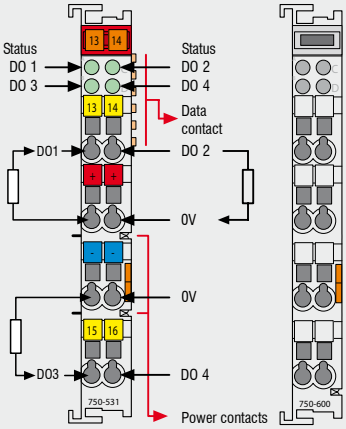
OU filter module

Analog output module



Output modules for Output Unit Basic
analog:
±10V
0-10V
0-20mA
4-20mA

Digital output module



Output modules for Output Unit Basic
digital:
24V positive switching
24V negative switching
5V positive switching

OU bus termination module

MICRO-EPSILON
Micro-Epsilon UK Ltd.
Unit 1 Pioneer Business Park · Ellesmere Port · CH65 1AD
Phone +44 (0) 151 355 6070
info@micro-epsilon.co.uk · **www.micro-epsilon.co.uk**

CE