MICRO-EPSILON

More Precision

scanCONTROL // 2D/3D Laser profile sensors

Compact laser scanner with high precision
scanCONTROL 29x0

Ideal for precise 2D/3D measurements

Resolution (x-axis) 1,280 points

High accuracy for the detection
of finest details

Profile frequency up to 2,000 Hz

Also available with patented
Blue Laser Technology

Compatible with **COGNEX**® VisionPro

Compact design for precise measurements

scanCONTROL 29x0 laser scanners are designed for industrial measurement tasks where compact design and high accuracy are required. Thanks to their high resolution, versatility and excellent price-performance ratio, the scanners are particularly suitable for static and dynamic applications, e.g., on robots. They measure and evaluate, e.g., angles, steps, gaps, distances and extreme values.

Available as PROFILE and SMART versions

The scanCONTROL 29x0 series is available as PROFILE and SMART versions. The PROFILE scanners provide calibrated profile data that can be further processed on a PC with software evaluation provided by the customer. SMART scanners operate autonomously and provide selected measurement values. The sensor parameters and the desired measuring programs are set in the scanCONTROL Configuration Tools software and directly stored in the internal controller.

Small measuring range with high resolution

With a laser line of just 10 mm, the scanCONTROL 29x0-10/BL models recognize the finest of details and structures. The high profile resolution combined with the blue laser line allow for maximum precision in versatile applications, e.g., monitoring in electronics production.

Article designation

LLT	29	00	-25	/SI

Options - see below

Measuring range
10 mm (only Blue Laser)
25 mm
50 mm
100 mm

Class
00=PROFILE
10=SMART
50=HIGHSPEED
60=HIGHSPEED SMART

Series
LLT29x0

Laser options*

	/SI	Hardware switch-off of the laser line
	/3B	Increased laser power (class 3B, ≤ 20 mW), e.g., for dark surfaces
	/BL	Blue laser line (405 nm) for (semi-) transparent, red-hot glowing and organic materials

Cable outlet options*

	/PT	Cable directly out of the sensor ("Pigtail") Length 0.3 m
	/VT	Cable directly out of the sensor ("Variable Tail") Length 0.1 ... 1.0 m (freely selectable)

*Options can be combined

Model	LLT29x0-10/BL	LLT 29xx-25	LLT 29xx-50	LLT 29xx-100
Available laser type	Blue Laser	Red Laser Blue Laser	Red Laser Blue Laser	Red Laser Blue Laser

z-axis

		LLT29x0-10/BL	LLT 29xx-25	LLT 29xx-50	LLT 29xx-100
Measuring range	Start of measuring range	52.5 mm	53.5 mm	70 mm	190 mm
	Mid of measuring range	56.5 mm	66 mm	95 mm	240 mm
	End of measuring range	60.5 mm	78.5 mm	120 mm	290 mm
	Height of measuring range	8 mm	25 mm	50 mm	100 mm
Extended measuring range	Start of measuring range	-	53 mm	65 mm	125 mm
	End of measuring range	-	79 mm	125 mm	390 mm
Line linearity [1] [2]		1 μm	2 μm	4 μm	12 μm
		±0.0125 %	±0.008 %	±0.008 %	±0.012 %

x-axis

		LLT29x0-10/BL	LLT 29xx-25	LLT 29xx-50	LLT 29xx-100
Measuring range	Start of measuring range	9.4 mm	23.4 mm	42 mm	83.1 mm
	Mid of measuring range	10 mm	25 mm	50 mm	100 mm
	End of measuring range	10.7 mm	29.1 mm	58 mm	120.8 mm
Extended measuring range	Start of measuring range	-	23.2 mm	40 mm	58.5 mm
	End of measuring range	-	29.3 mm	60 mm	143.5 mm
Resolution		1,280 points/profile			

Profile frequency	Standard	up to 300 Hz
	High speed	up to 2000 Hz
Interfaces	Ethernet GigE Vision	Output of measurement values Sensor control Profile data transmission
	Digital inputs	Mode switching Encoder (counter) Trigger
	RS422 (half-duplex) [3]	Output of measurement values Sensor control Trigger Synchronization
Output of measurement values		Ethernet (UDP / Modbus TCP); RS422 (ASCII / Modbus RTU) analog [4]; switch signal [4] PROFINET [5]; EtherCAT [5]; EtherNet/IP [5]
Control and display elements		3x color LEDs for laser, data and error

Light source

	LLT29x0-10/BL	LLT 29xx-25 / -50 / -100
Red Laser	-	≤ 8 mW
	-	Standard: laser class 2M, semiconductor laser 658 nm
	-	≤ 20 mW
	-	Option: laser class 3B, semiconductor laser 658 nm
Blue Laser	≤ 8 mW	
	Standard: laser class 2M, semiconductor laser 405 nm	
Laser switch-off	via software, hardware switch-off with /SI option	

		LLT29x0-10/BL	LLT 29xx-25	LLT 29xx-50	LLT 29xx-100
Aperture angle of laser line		10°	20°	25°	25°
Permissible ambient light	(fluorescent light) [1]	10,000 lx			
Protection class (DIN EN 60529)		IP65 (when connected)			
Vibration (DIN EN 60068-2-27)		2 g / 20 … 500 Hz			
Shock (DIN EN 60068-2-6)		15 g / 6 ms			
Temperature range	Storage	-20 … +70 °C			
	Operation	0 … +45 °C			
Weight		440 g (without cable)	380 g (without cable)		
Supply voltage		11 … 30 VDC, nominal value 24 V, 500 mA, IEEE 802.3af class 2, Power over Ethernet (PoE)			

[1] Based on the measuring range; measuring object: Micro-Epsilon standard object
[2] According to a one-time averaging over the measuring field (640 points)
[3] RS422 interface, programmable either as serial interface or as input for triggering/synchronization
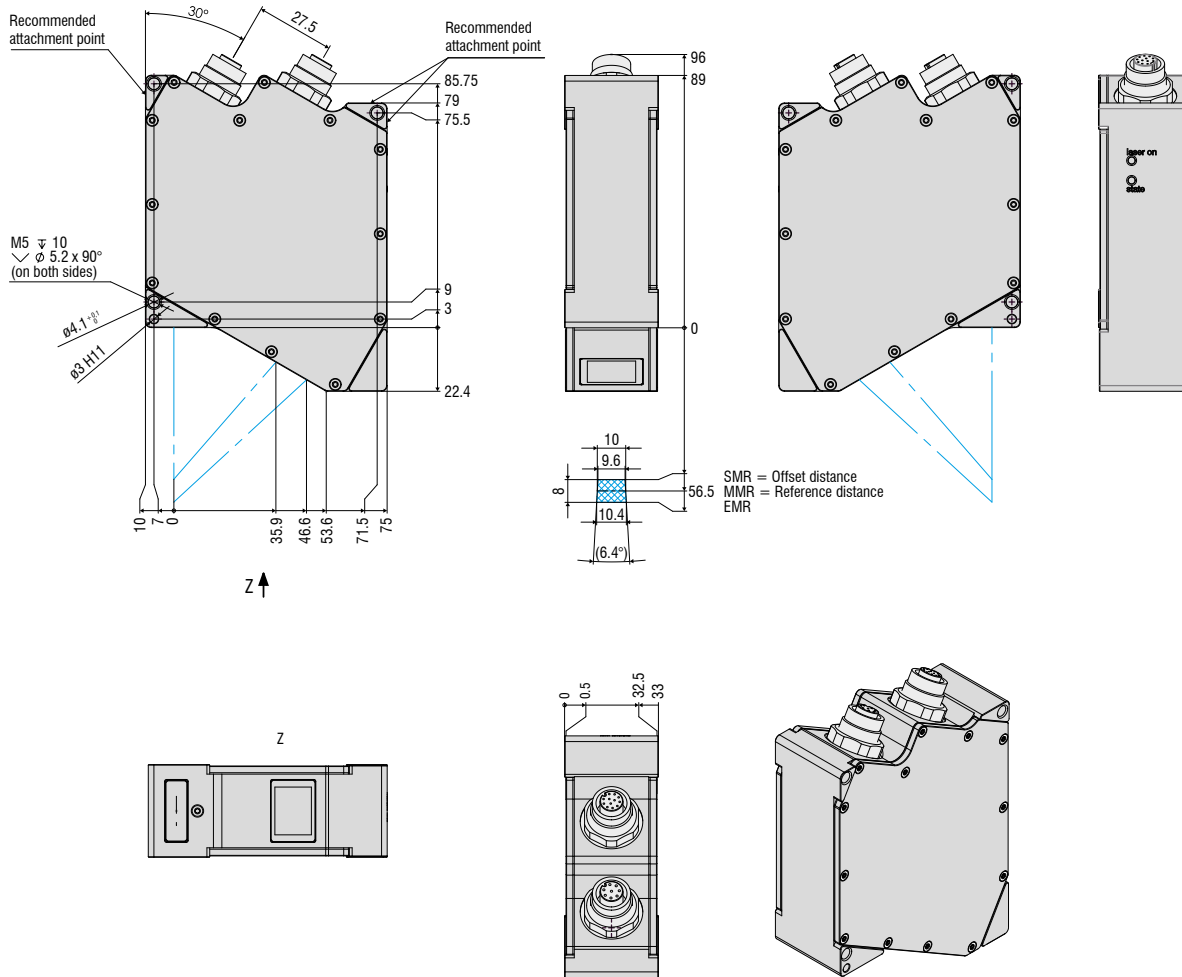[4] Only with 2D/3D Output Unit
[5] Only with 2D/3D Gateway
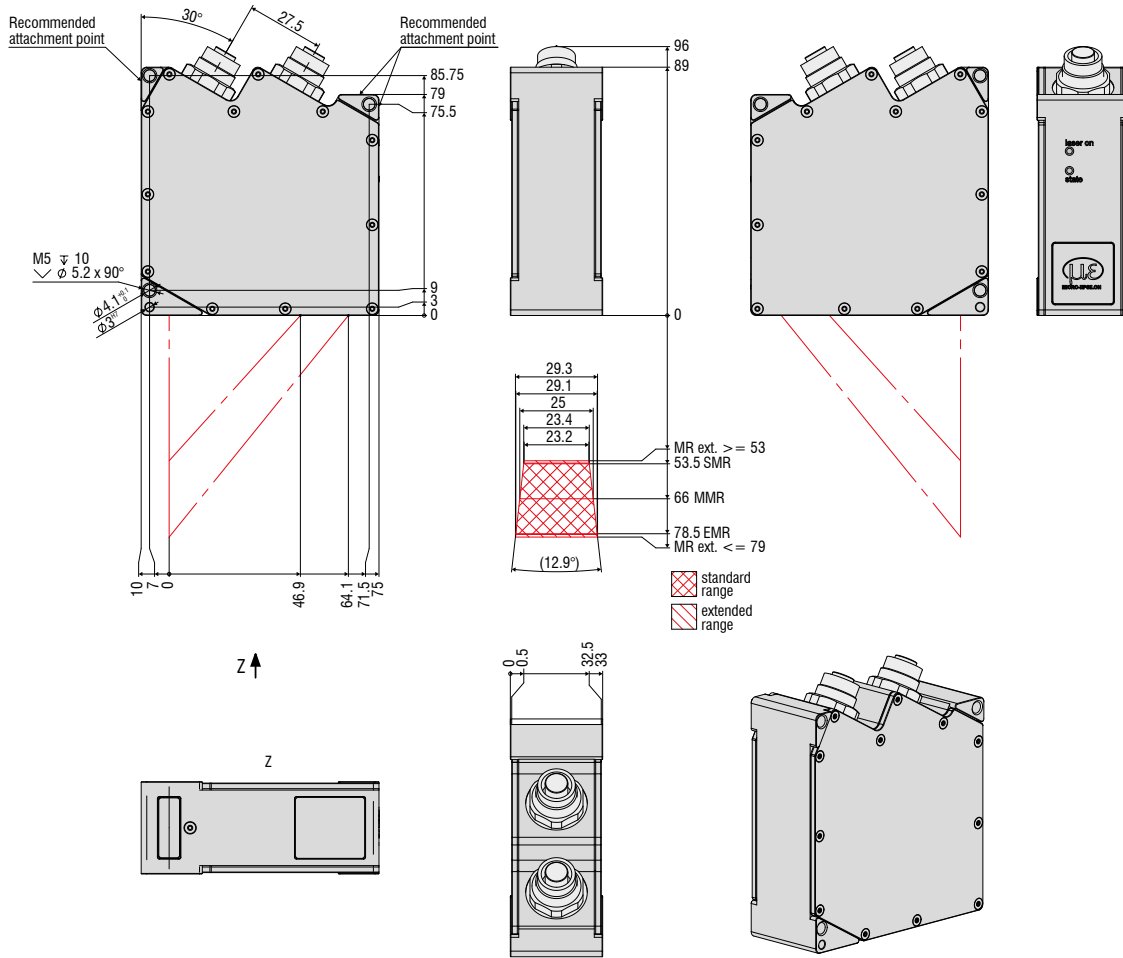
Dimensions and measuring ranges
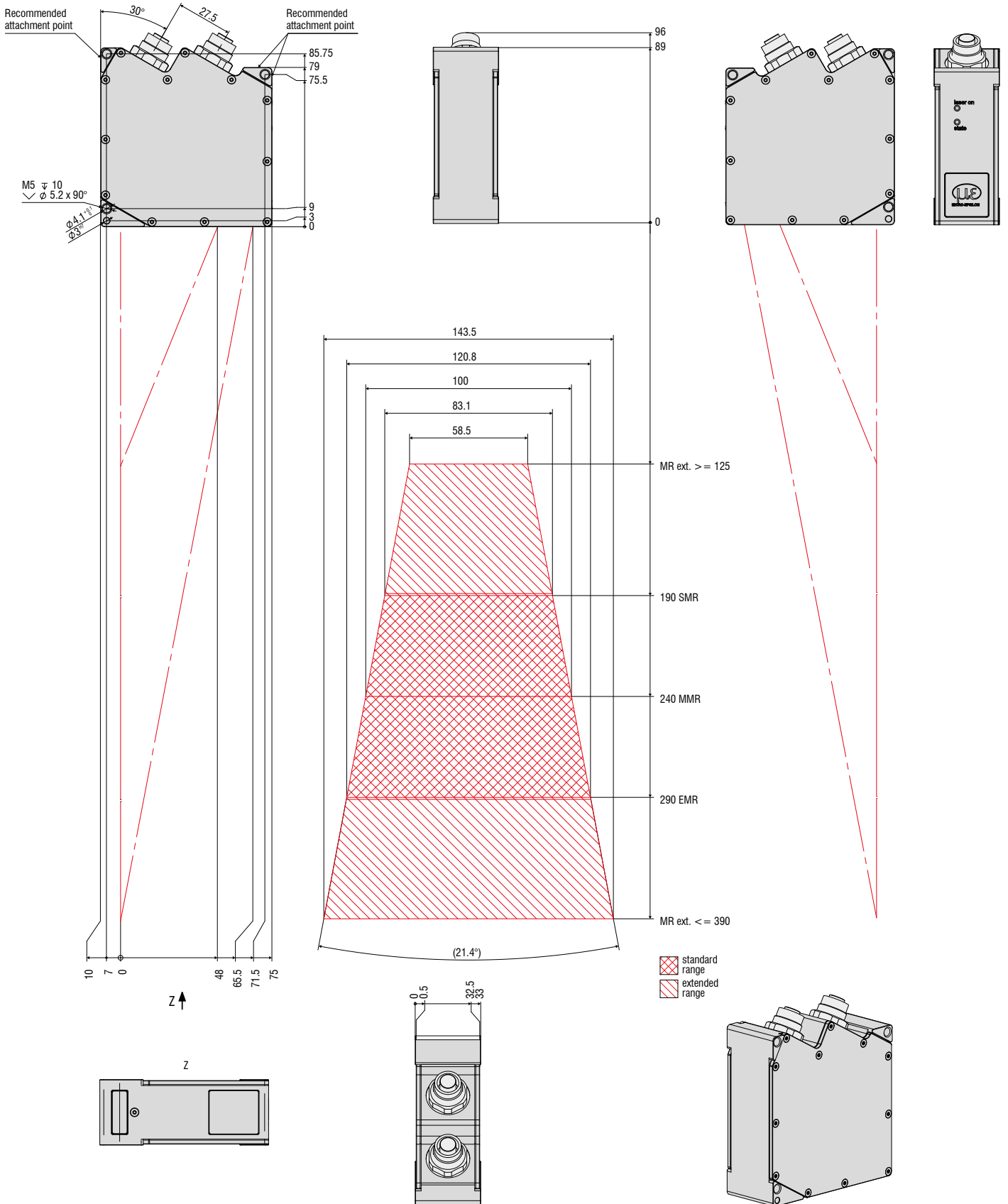## scanCONTROL

LLT29x0-10/BL

Blue Laser

Recommended attachment point

Recommended attachment point

30°   27.5

85.75
79
75.5

M5 ⍈ 10
⌵ ⌀ 5.2 x 90°
(on both sides)

⌀4.1 +0.1/0

⌀3 H11

9
3

22.4

10
7
0

35.9
46.6
53.6
71.5
75

Z ↑

96
89

0

10
9.6

8

56.5

10.4

(6.4°)

SMR = Offset distance
MMR = Reference distance
EMR

laser on

state

Z

0
0.5
32.5
33

LLT25x0-25 / LLT29x0-25

Red Laser   Blue Laser

Recommended attachment point

30°   27.5

Recommended attachment point

85.75
79
75.5

M5 ⤸ 10
⌄ ⌀ 5.2 x 90°

⌀ 4.1
⌀ 3.8

9
3
0

10 7 0

46.9

64.1
71.5
75

96
89

0

29.3
29.1
25
23.4
23.2

MR ext. > = 53
53.5 SMR

66 MMR

78.5 EMR
MR ext. < = 79

(12.9°)

standard range
extended range

Z ↑

Z

Z

0
0.5

32.5
33

laser on
state

17

Dimensions and measuring ranges
scanCONTROL

LLT25x0-50 / LLT29x0-50

Red Laser Blue Laser

Recommended attachment point	Recommended attachment point

30° 27.5

96
89

85.75
79
75.5

M5 ▽ 10
∇ Ø 5.2 x 90°

Ø4.1 +0.1
Ø3

9
3
0

0

60
58
50
42
40

MR ext. >= 65
70 SMR

95 MMR

120 EMR
MR ext. <= 125

(~19°)

10
7
0

47.2

64.8
71.5
75

standard range

extended range

Z ↑

laser on
state

Z

0
0.5

32.5
33

LLT25x0 / LLT29x0-100

Red Laser **Blue Laser**

Recommended attachment point

Recommended attachment point

30° 27.5

85.75
79
75.5

M5 ▽ 10
▽ ⌀ 5.2 x 90°

⌀ 4.1 +⁰·⁸
⌀ 3 +⁰·⁸

9
3
0

96
89

0

10 7 0   48 65.5 71.5 75

Z ↑

Z

143.5
120.8
100
83.1
58.5

MR ext. >= 125

190 SMR

240 MMR

290 EMR

MR ext. <= 390

(21.4°)

standard range
extended range

0
0.5   32.5 33

laser on
state

Accessories
scanCONTROL

2D/3D Gateway

PROFINET / EtherCAT / EtherNet/IP for all SMART scanners

One 2D/3D Gateway is connectable with up to 4 sensors. Operation of more than one sensor requires a switch. The 2D/3D Gateway communicates with the scanCONTROL SMART sensor via Ethernet Modbus. The resultant values are then converted to PROFINET, EtherCAT or EtherNet/IP. The customer carries out the parameter setup with a detailed instruction manual. The gateway can also be parameterized in advance at the factory.

Models

6414142	2D/3D Gateway	Fieldbus coupler, configurable for PROFINET, EtherNet/IP and EtherCAT
6414142.001	2D/3D Gateway, pre-parameterized	Pre-parameterized to customer log and IP addresses

Number of sensors on the gateway	Maximum measurement frequency
1	500 Hz
2	500 Hz
3	330 Hz
4	250 Hz

NEW

Higher measurement frequencies are also possible with the 30xx sensors due to the Modbus bundling option.
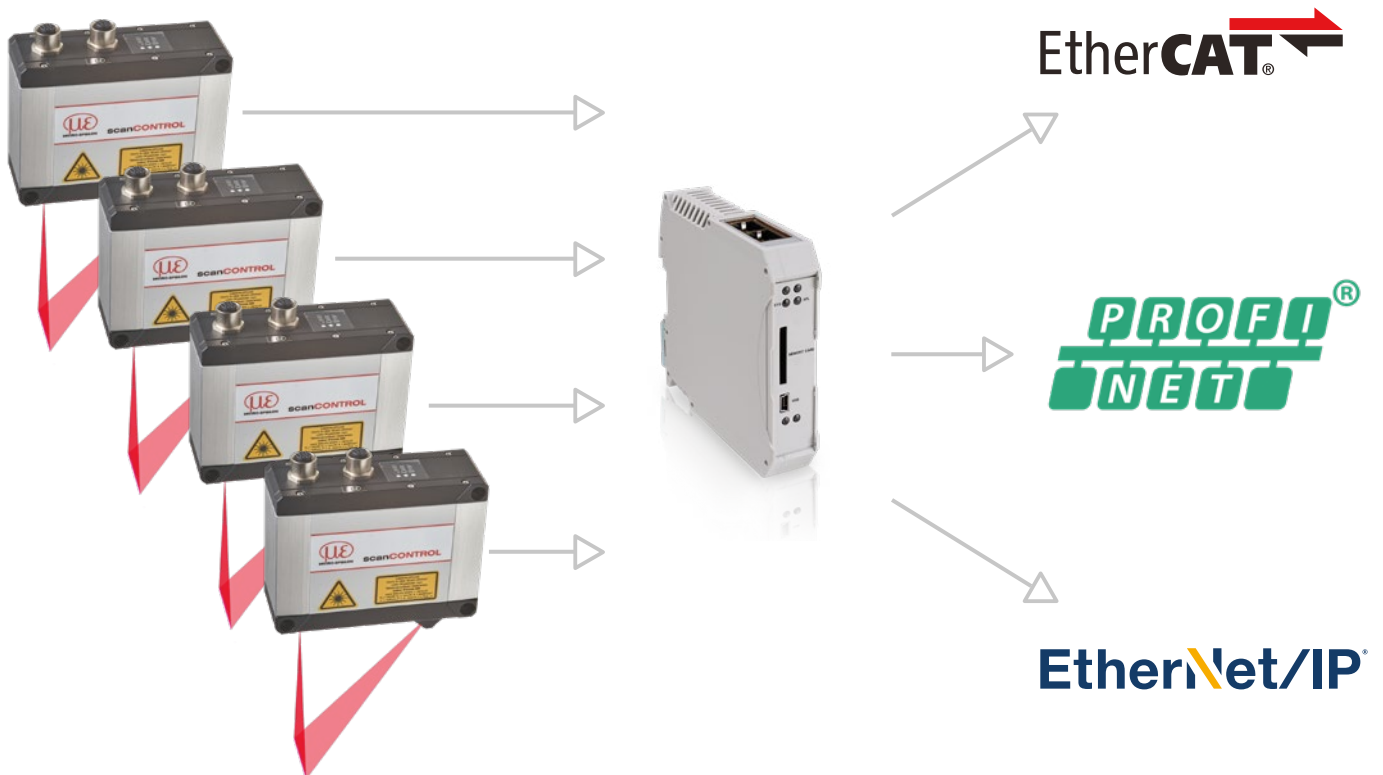
2D/3D Output Unit

Analog signals / digital switch signals for all SMART scanners

The 2D/3D Output Unit is addressed via Ethernet and outputs analog and digital
signals. Different output terminals can be connected to the fieldbus coupler.

Models

6414073	2D/3D Output Unit Basic/ET	Fieldbus coupler with filter module and bus end terminal
0325131	OU-DigitalOut/8-channel/DC24V/0.5A/negative	8-channel digital output terminal; DC 24 V; 0.5 A; negative switching
0325115	OU-DigitalOut/8-channel/DC24V/0.5A/positive	8-channel digital output terminal; DC 24 V; 0.5 A; positive switching
0325116	OU-AnalogOut/4-channel/±10 V	4-channel analog output terminal; ±10 V
0325135	OU-AnalogOut/4-channel/0-10 V	4-channel analog output terminal; 0-10 V
0325132	OU-AnalogOut/4-channel/0-20 mA	4-channel analog output terminal; 0-20 mA
0325133	OU-AnalogOut/4-channel/4-20 mA	4-channel analog output terminal; 4-20 mA

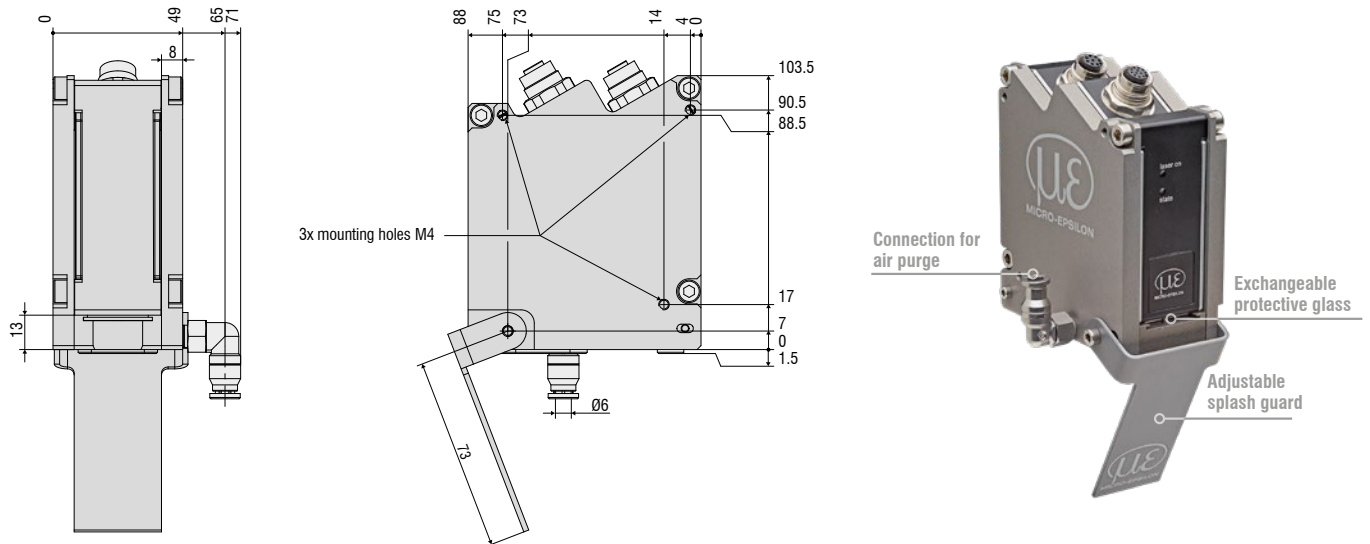Other terminals available on request.

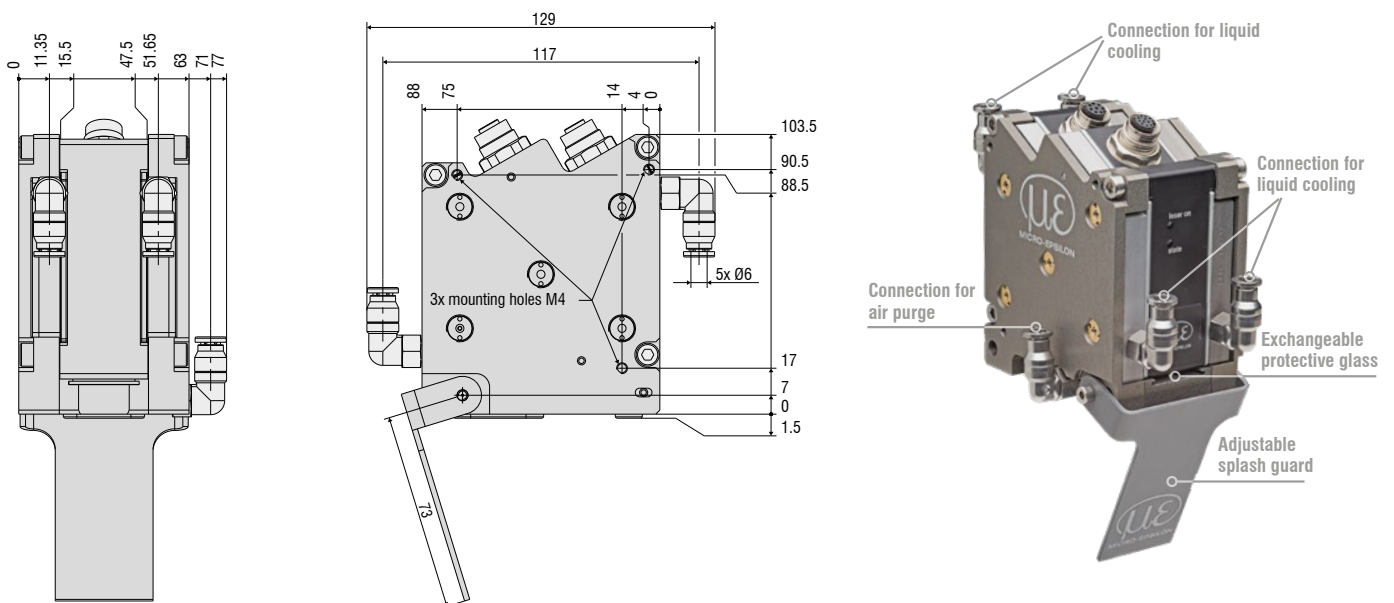Analog signals

Digital signals
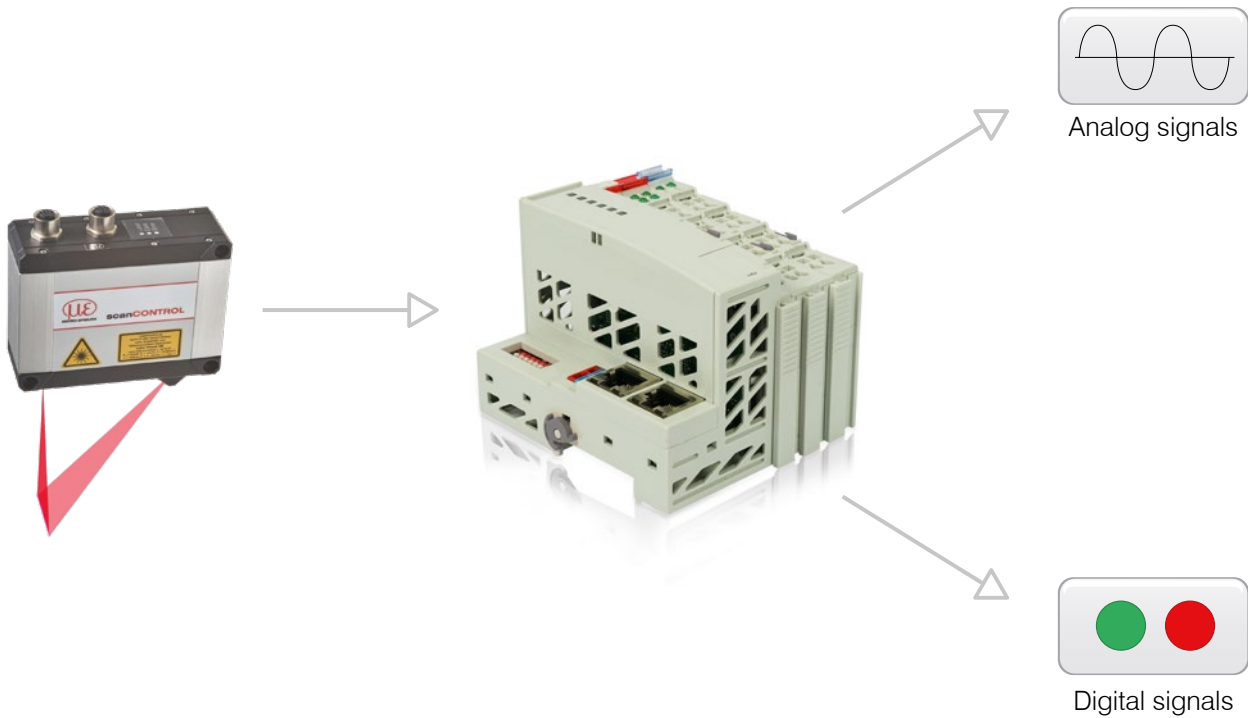
Accessories
scanCONTROL

Protection and cooling housing for LLT25x0 and 29xx

(Not available for scanCONTROL 29xx-10/BL)

Protective housing with blow-out system

- 3x mounting holes M4
- Ø6

- Connection for air purge
- Exchangeable protective glass
- Adjustable splash guard

Protective housing with blow-out system and water cooling

- 3x mounting holes M4
- 5x Ø6

- Connection for liquid cooling
- Connection for liquid cooling
- Connection for air purge
- Exchangeable protective glass
- Adjustable splash guard

| Art. no.	Model	Description
2105058	Protective housing for LLT25/29 series	Adaptive protective housing for LLT25x0/29xx
2105059	Protective cooling housing for LLT25/29 series	Adaptive protection and cooling housing for LLT25x0/29xx
0755075	Exchangeable glass for protective housing LLT25/29	Exchangeable glass for protection/cooling concept LLT25/29, packaging unit with 50 pcs.

Accessories
scanCONTROL

Connection cables

PCR3000-x Multi-function cable
Cable for power supply, digital inputs (TTL or HTL),
RS422 (half-duplex);
suitable for drag chains and robots
Cable length (m): 2 / 5 / 10 / 15 / 20 / 25 / 35

47.5

ø15

12 braids

Sensor connector
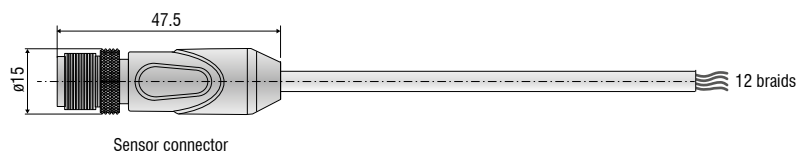
SCR3000A-x Ethernet connection cable
Cable for parameter setting, value and profile transmission;
suitable for drag chains and robots
Cable length (m): 0.5 / 2 / 5 / 10 / 15 / 20 / 25 / 35

47.5

ø15

52.6

11.8

Sensor connector

RJ45

8.1
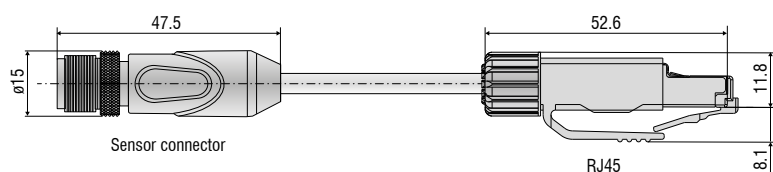
Other accessories

Art. no.	Model	Description
0323478	Connector/12-pin/Multifunction for LLT25/29/30 series	Plug for multifunction port
0323479	Connector/8-pin/Ethernet for LLT25/29/30 series	Plug for Ethernet socket
2420067	PS25/29/30	Power supply unit for scanCONTROL
0254111	Case for LLT25/29/30 (up to MR 200)	Transport case for scanCONTROL sensors incl. measuring stand
0254153	Case for LLT30 series, MR 430/600	Transport case for scanCONTROL sensors incl. measuring stand
2960097	Measuring stand for LLT25/26/29/30 series	Measuring stand with sensor adapter board, flexible rod and clamp base
2960115	Measuring stand for LLT30 series, MR 430/600	Measuring stand with sensor adapter board, flexible rod and clamp base

3D snapshot sensors for the inspection of shapes and surfaces

surfaceCONTROL 3D 3500

**Innovative 3D snapshot sensor for inline inspection
of geometry, shapes and surfaces**
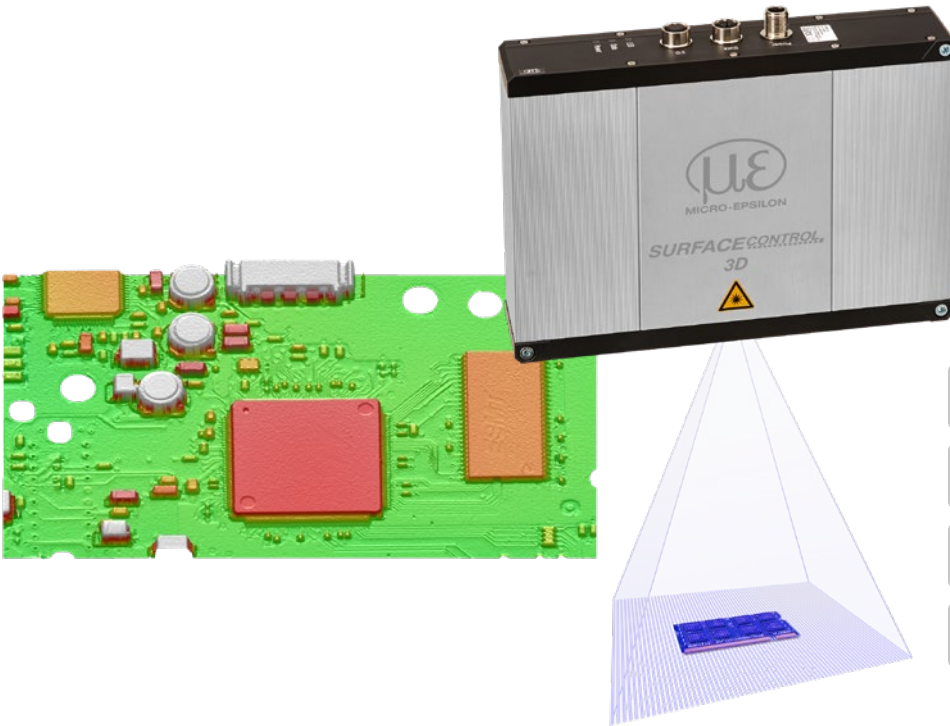
Highest repeatability up to 0.25 μm

Best Z-axis resolution from 0.7 μm

Up to 2.2 million 3D points / second

Easy integration in all common
3D image processing packets

reflectCONTROL

**3D inline inspection of shiny surfaces:
flat glass, mirrors and wafers**

Complete inspection of reflecting and
shiny surfaces

Highest z-accuracy < 1 μm

Fastest 3D inspection < 1 s

High compatibility via different interfaces
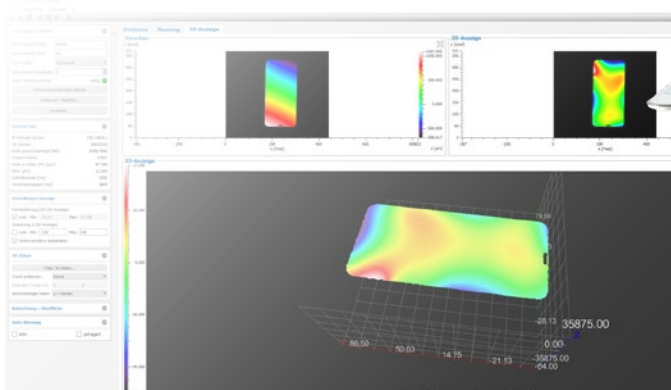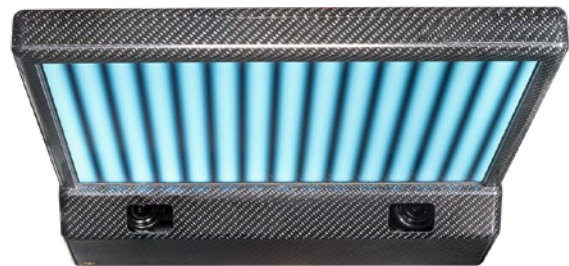
Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, position and dimension

Sensors and measurement devices for non-contact temperature measurement

Measuring and inspection systems for quality assurance

Optical micrometers, fiber optics, measuring and test amplifiers

Color recognition sensors, LED Analyzers and inline color spectrometers

3D measurement technology for dimensional testing and surface inspection

Download catalog:

MICRO-EPSILON USA
8120 Brownleigh Dr. · Raleigh, NC 27617 / USA
Phone +1/919/787-9707 · Fax +1/919/787-9706
me-usa@micro-epsilon.com · **www.micro-epsilon.com**

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