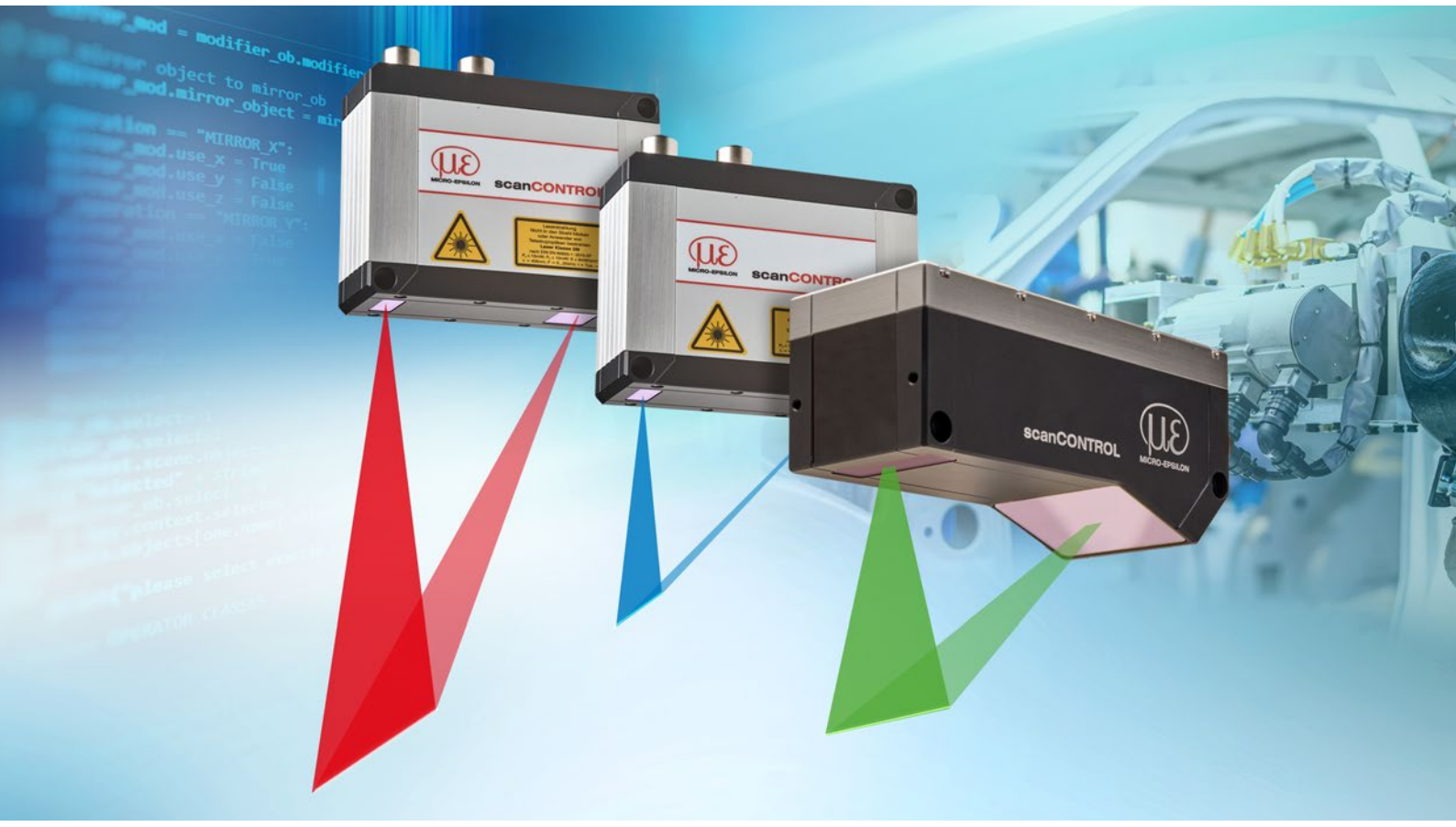
MICRO-EPSILON

More Precision.

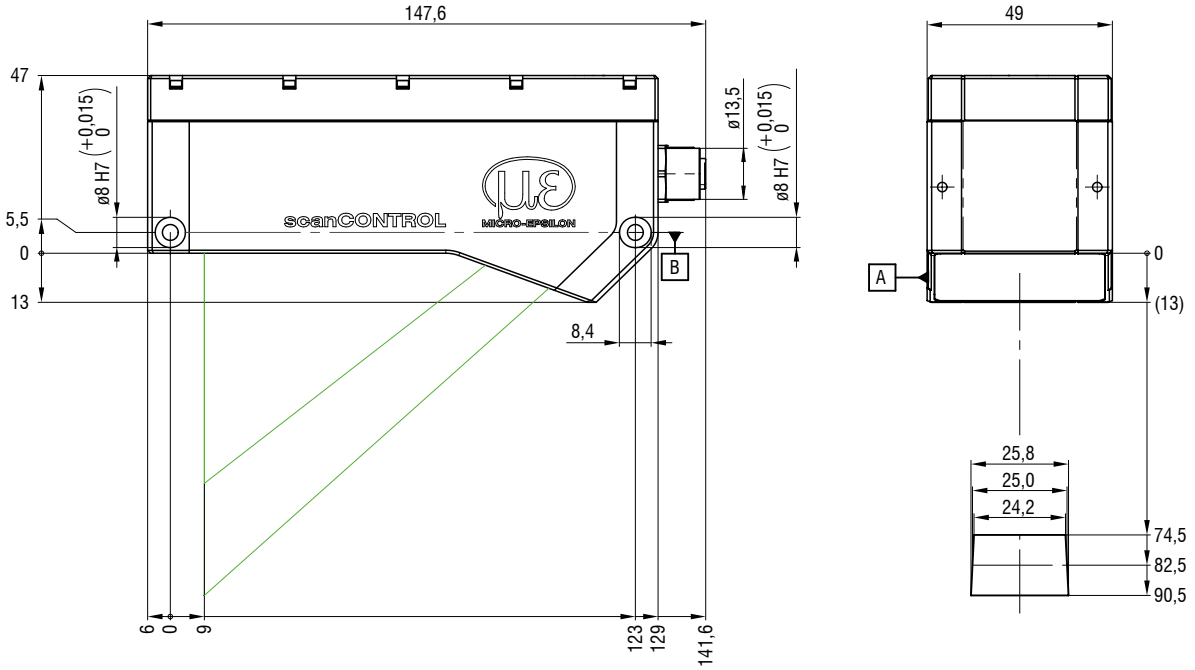
scanCONTROL // 2D/3D Laser profile scanners



Dimensions and measuring ranges
scanCONTROL 8200 / 8500

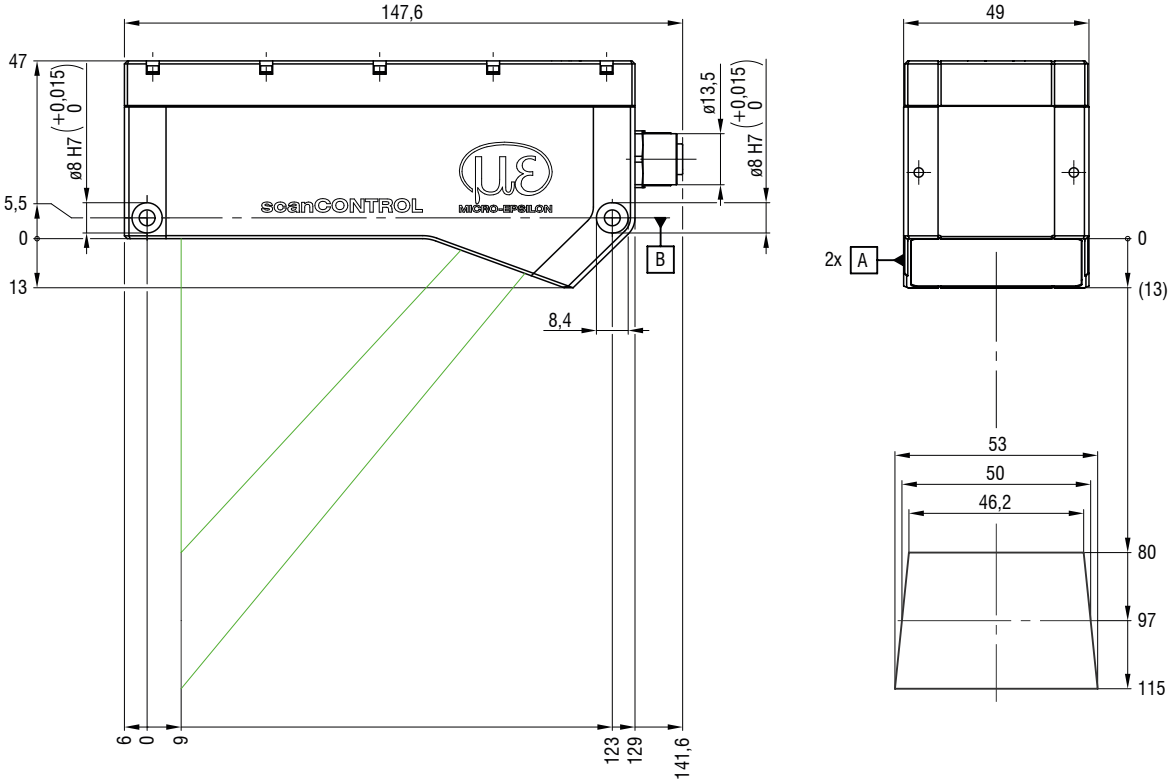
LLT8x00-25

Green-Laser



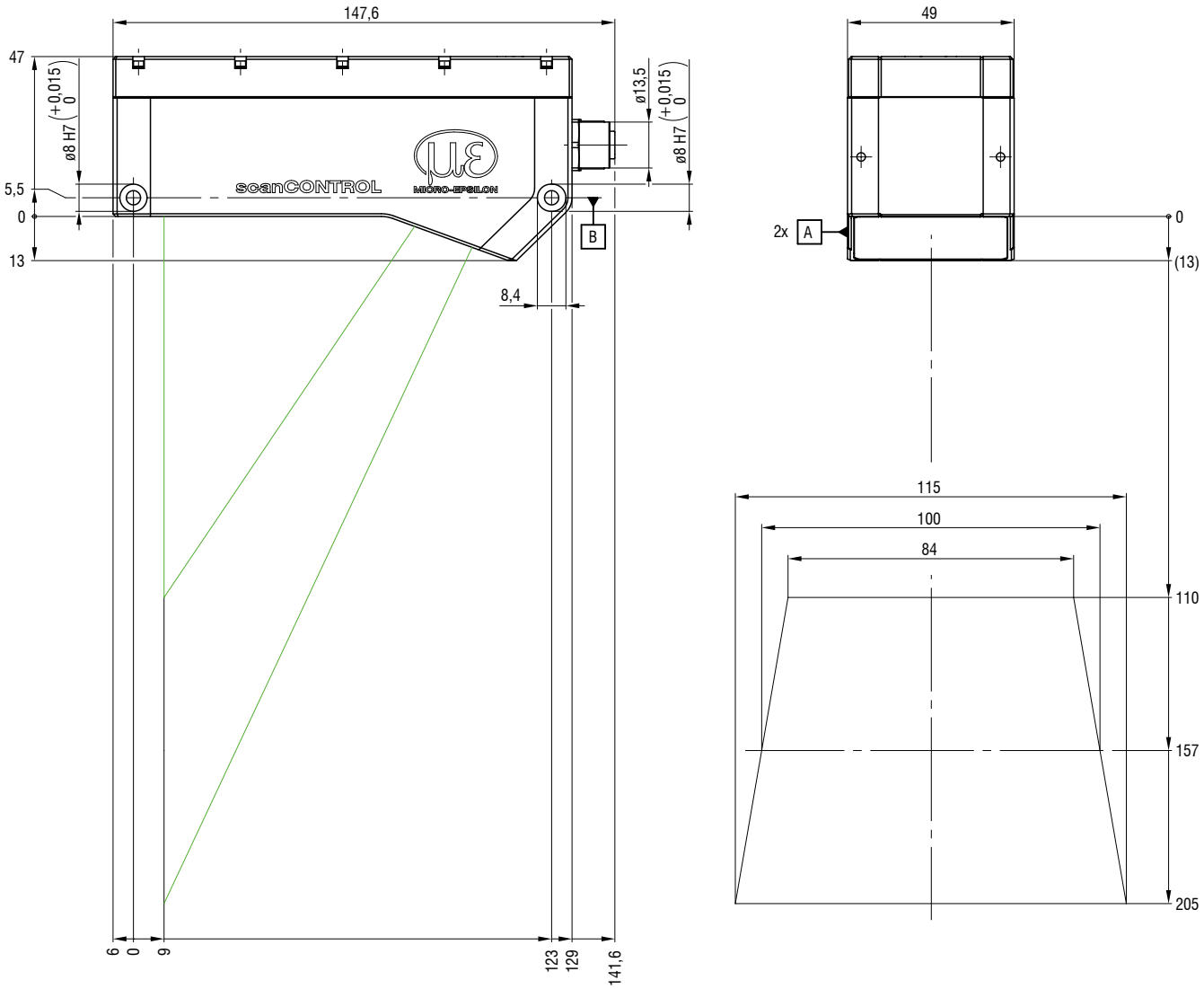
LLT8x00-50

Green-Laser



LLT8x00-100

Green-Laser



High-performance 2D/3D laser scanners with maximum precision
scanCONTROL 3000 / 3002

- High resolution in x- and z-axis for accurate profile measurement
- Profile frequency up to 10 kHz for monitoring dynamic processes
- Innovative exposure control
- For small and large measuring ranges
- Also available with patented Blue Laser Technology



Precise 2D/3D profile measurement

The scanCONTROL 30x0 and 30x2 laser profile scanners provide calibrated profile data for demanding measurement and inspection tasks. They capture profiles with high accuracy and reliably measure, for example, angles, steps, gaps, distances, and circles.
With their high profile frequency and versatile application options, the scanners are suitable for static and dynamic applications, automated inspection processes and robotic applications.

Performance levels for different requirements

The scanCONTROL 30x0 series is designed for very high data rates and delivers profile data at up to 9.6 million points per second. The scanCONTROL 30x2 series offers profile frequencies up to 10 kHz, resolutions up to 1,024 points, and data rates up to 7.9 million points per second. Depending on the application, different performance levels are available for precise and fast profile measurements.

Available as PROFILE and SMART versions

The scanCONTROL 30xx series is available in PROFILE and SMART versions. In the PROFILE version, the scanners provide calibrated profile data that can be further processed using the customer's own software.

The SMART scanners work independently and provide selected measurement values. All sensor parameters and the desired measurement programs are set in the scanCONTROL Configuration Tools software and saved directly in the internal controller. With the 3DInspect software, scanCONTROL sensors can also be used for 3D evaluations.

Article designation

LLT	30	xx	-25	/SI

Options – see below

Measuring range
25 mm
50 mm
100 mm
200 mm
430 mm
600 mm

Class
x0 class for demanding measurement tasks
x2 class for industrial measurement and integration tasks
0x = PROFILE
1x = SMART

Model series
LLT30xx

Laser options *

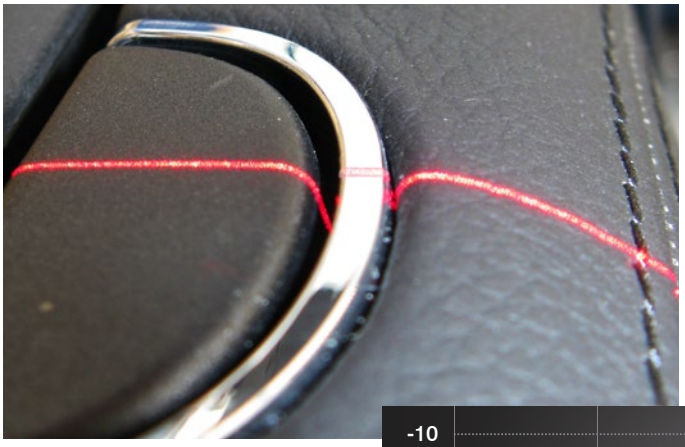
	/SI	Hardware switch-off of the laser line
	/3R	Increased laser power (Class 3R) e.g., for dark surfaces
	/BL	Blue laser line (405 nm) for (semi-)transparent, red-hot glowing and organic materials (Measuring ranges 25–100 mm)

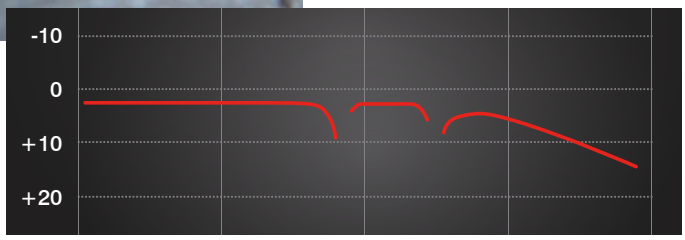
Cable outlet options *

	/RT	Cable outlet on the rear side ("Rear Tail") for space-saving installation, cable length 0.3 m, Sockets at the end of the cable (Measuring ranges 25–200 mm)
	/PT	Cable directly out of the sensor ("Pigtail"). Available lengths: 0.3 / 0.6 / 1.00 m

*Options can be combined

Accessories starting on page 50



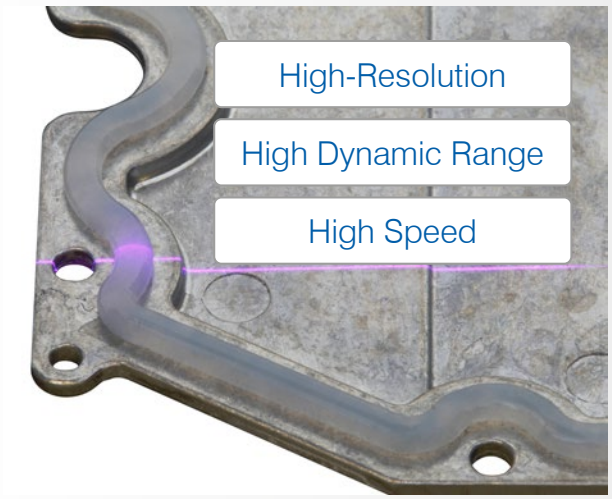


Innovative exposure control to master challenging surfaces
On inhomogeneous or dark surfaces, the HDR (High Dynamic Range) data acquisition mode and improved auto exposure optimize the measurement results.

The different exposures are acquired simultaneously in HDR mode, with no offset between the images. This enables reliable capture of moving objects. The areas for auto exposure can also be selected individually.

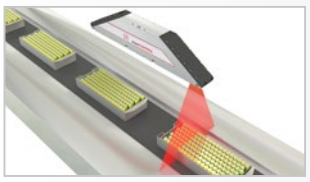
Fast measurement results with operating modes

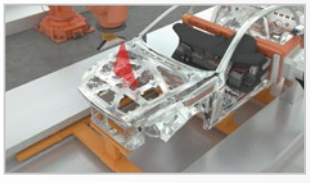
Choose from three predefined operating modes for your specific measurement task: “High-Resolution” for maximum precision, “High Dynamic Range” for optimal profile detection on difficult surfaces and “High Speed” for ultra-fast measurements.



Large measuring field up to 600×600 mm

The scanCONTROL 30xx laser scanners are also available with a large measuring field that covers up to 600 × 600 mm. This enables even large measuring objects to be captured with high accuracy.


Assembly monitoring of battery packs


Assembly monitoring in body-in-white production


Inline 3D inspection of tire geometry

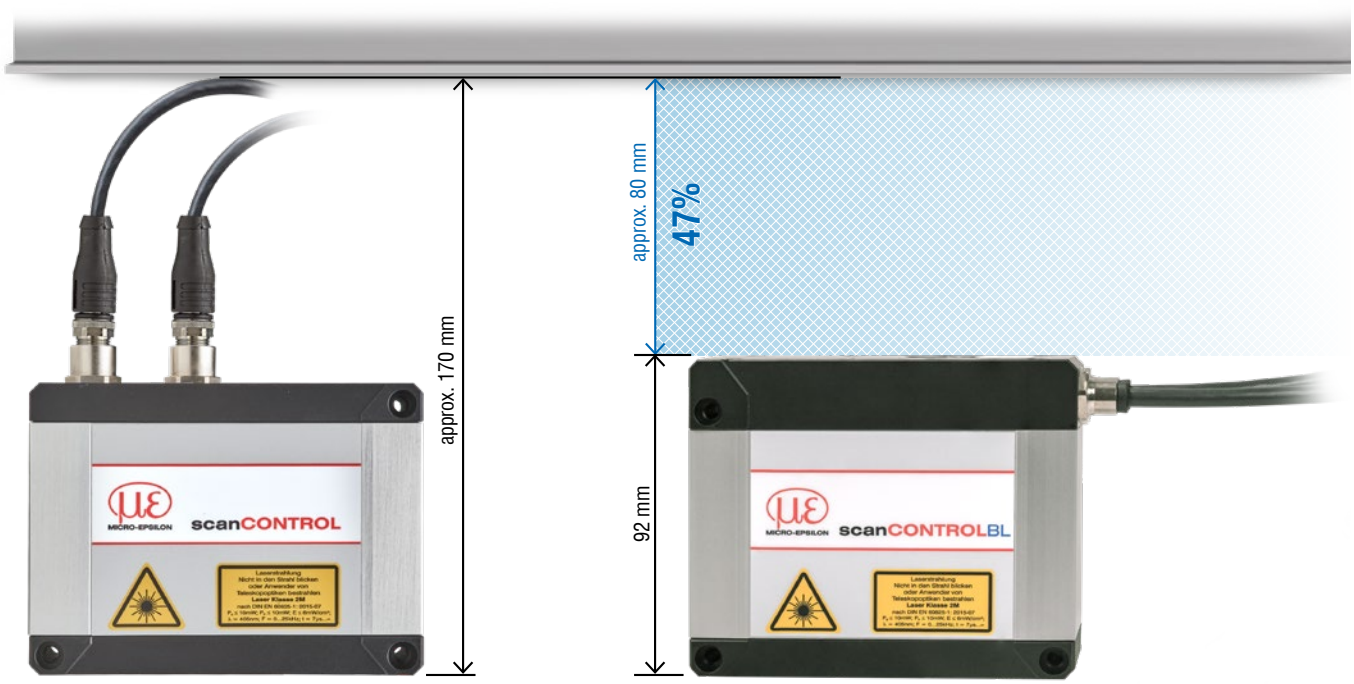


Options
scanCONTROL 30xx

Option /RT = “Rear Tail”

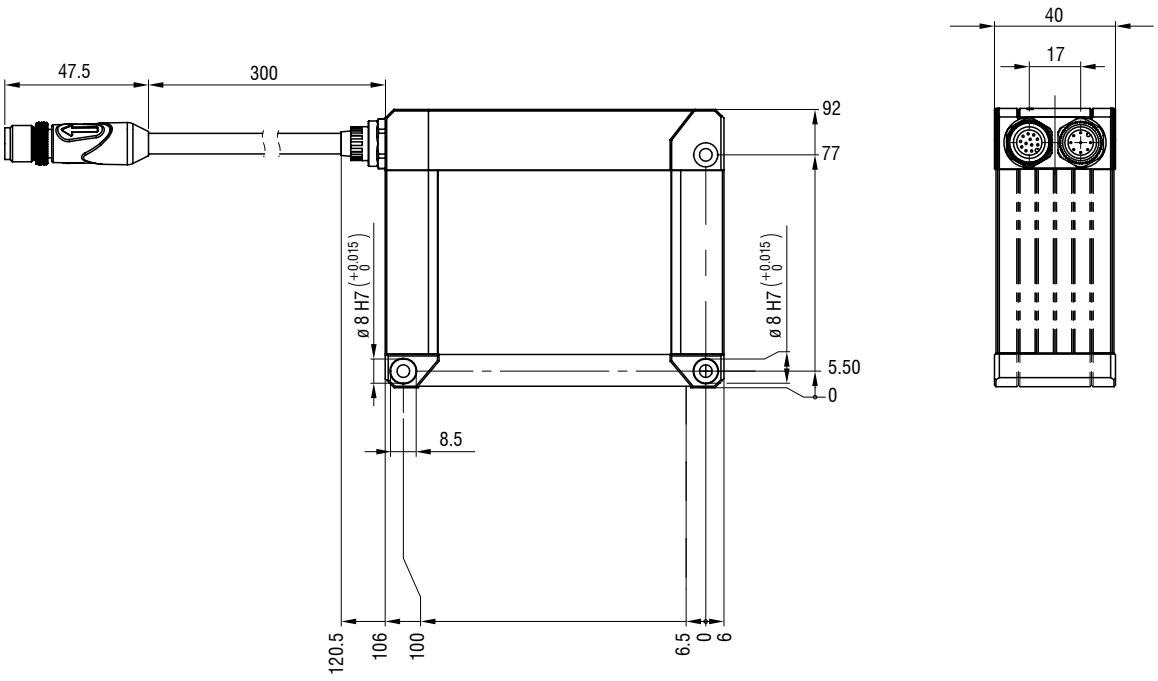
Cable outlet on the rear side (“Rear Tail”) for space-saving installation

- Available for the measuring ranges from 25 mm to 200 mm
- 30 cm pigtail
- Reduces the installation height by 47%



Standard

Option /RT

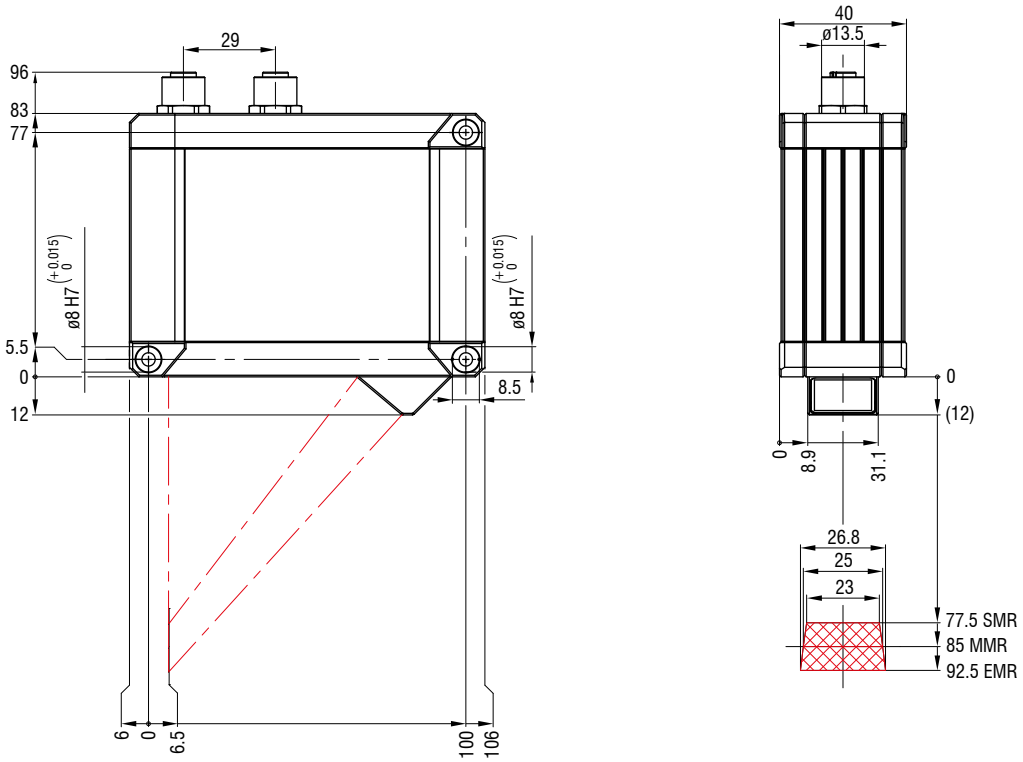


(dimensions in mm, not to scale)

Dimensions and measuring ranges
scanCONTROL 30xx

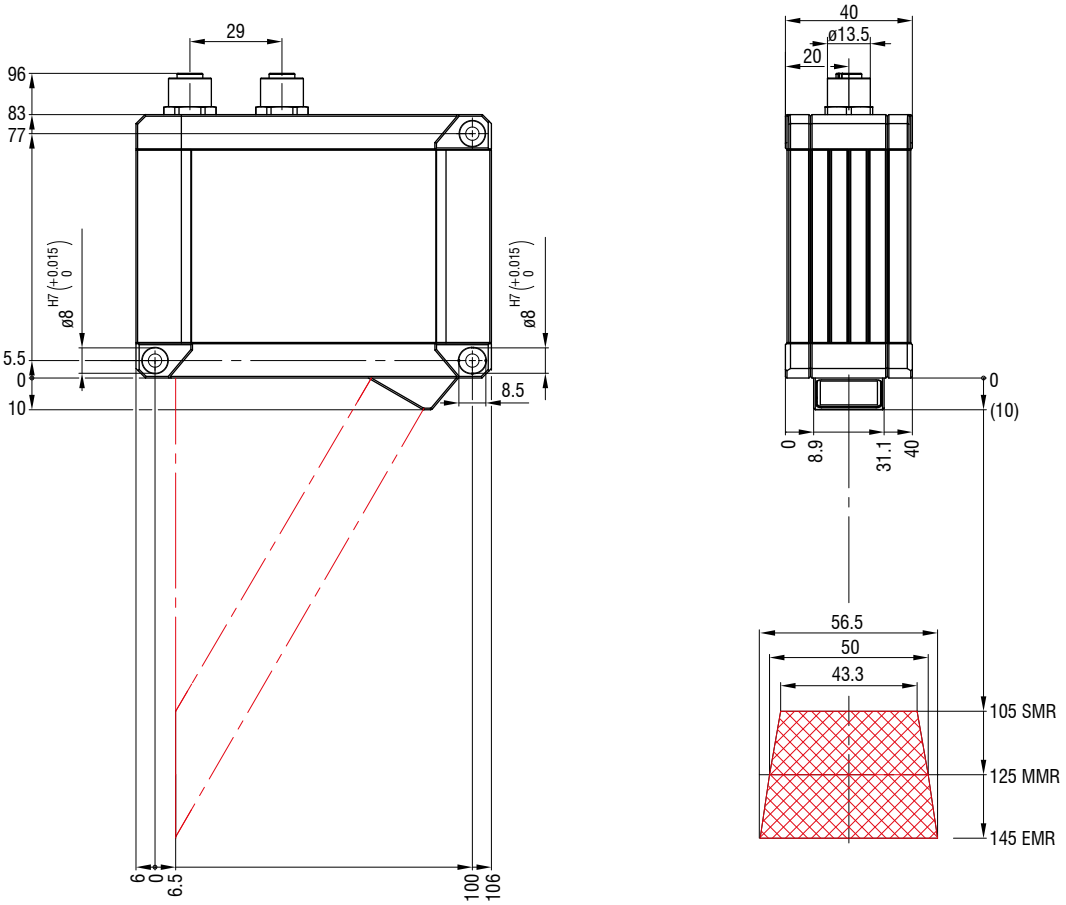
LLT30xx-25

Red Laser | Blue Laser



LLT30xx-50

Red Laser | Blue Laser

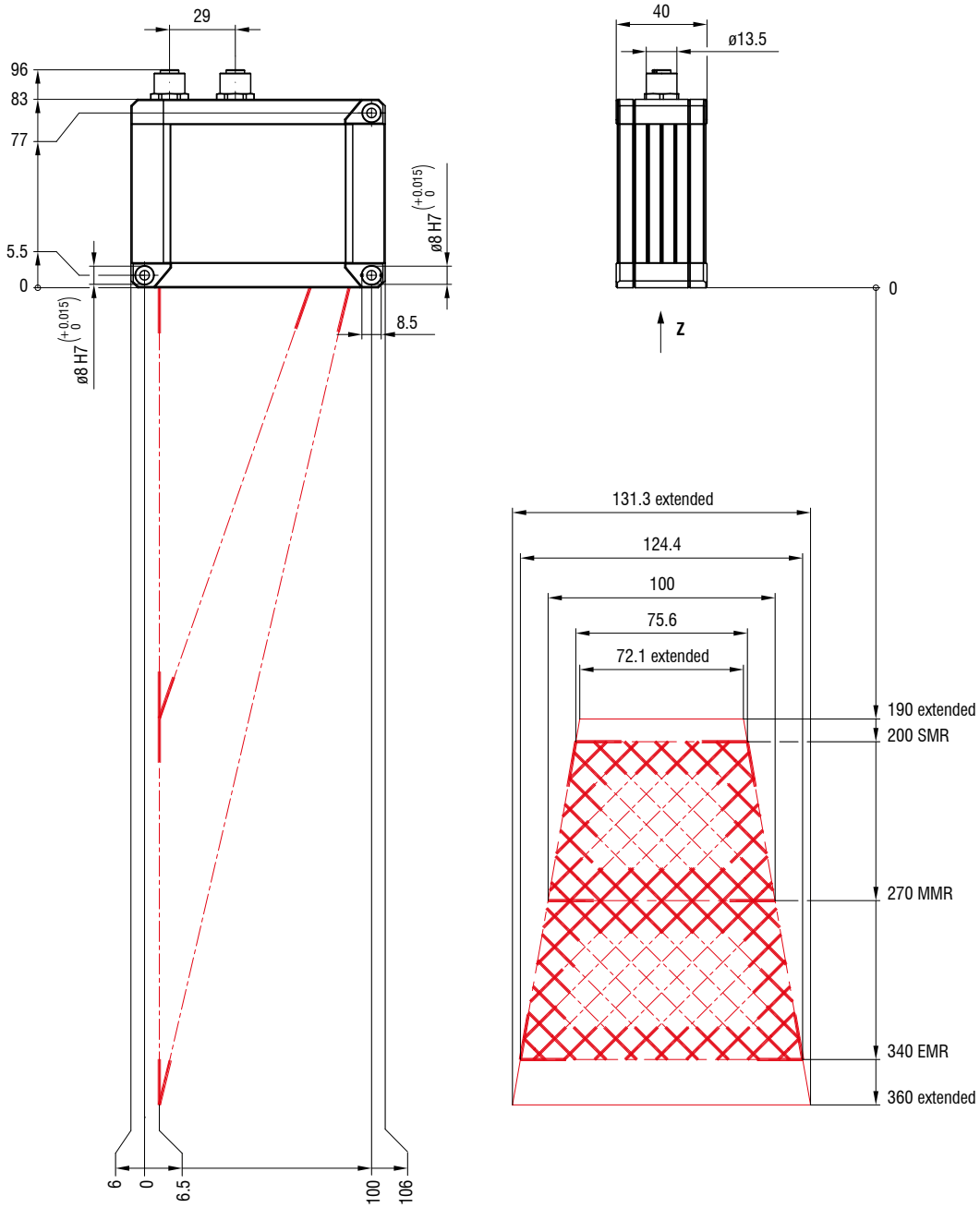


(dimensions in mm, not to scale)

Dimensions and measuring ranges
scanCONTROL 3000 / 3002

LLT30xx-100

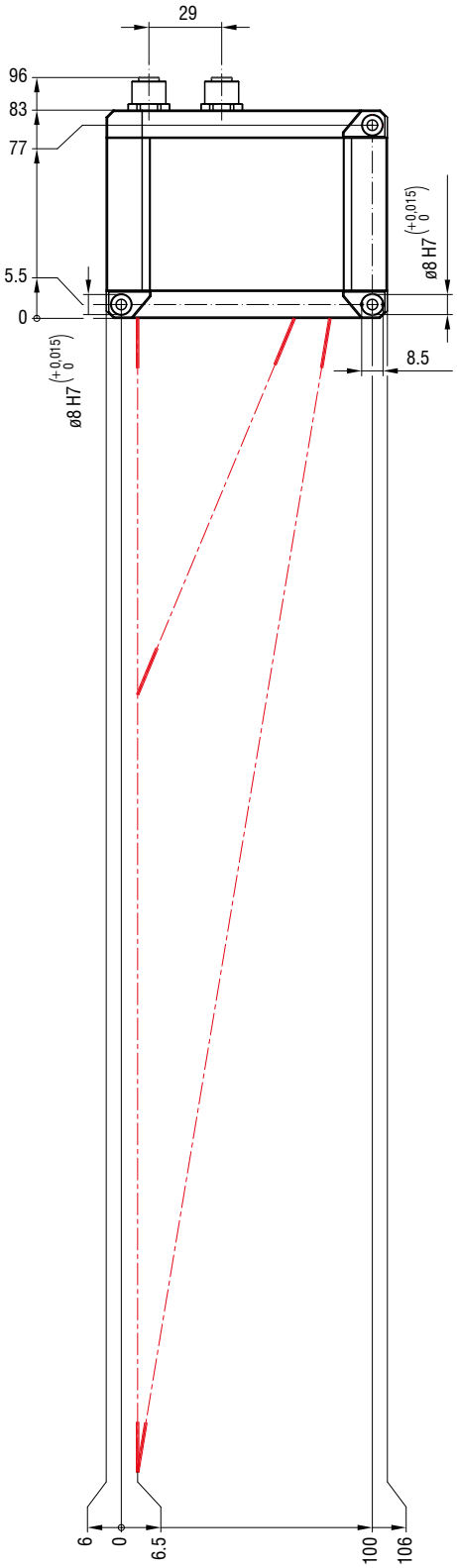
Red Laser | Blue Laser

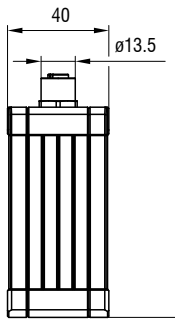


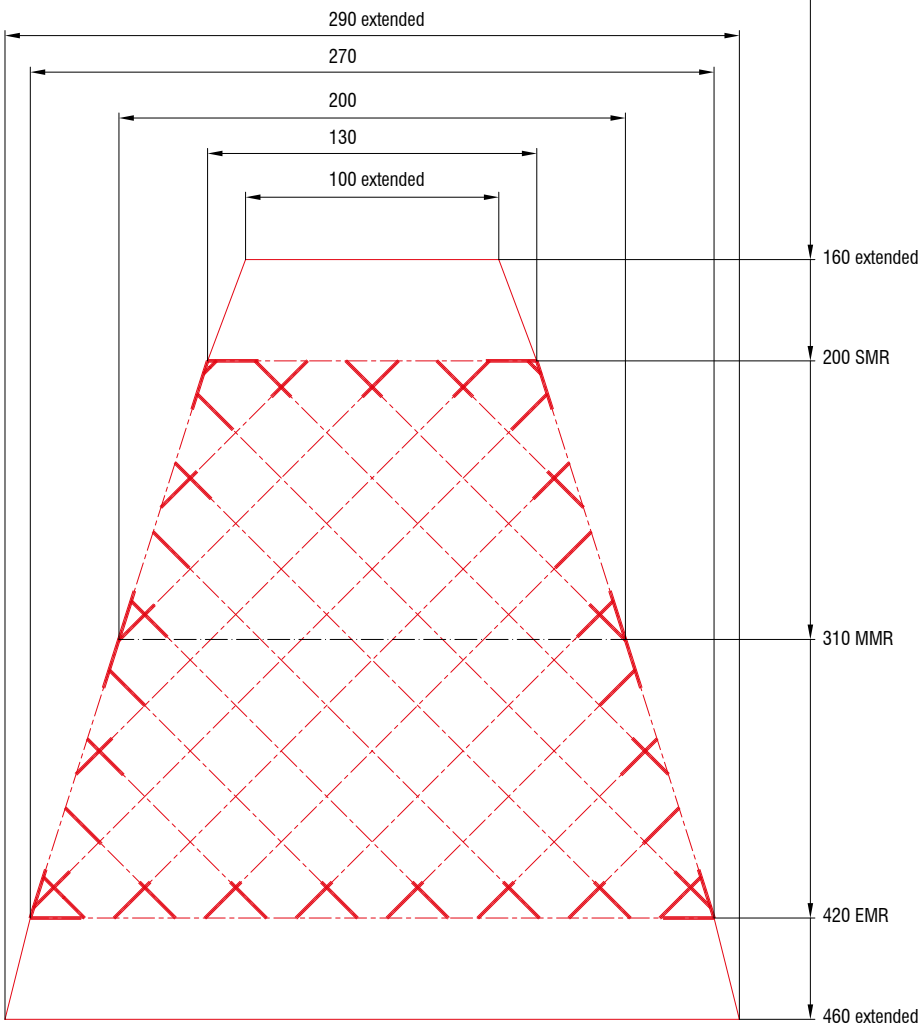
(dimensions in mm, not to scale)

LLT30xx-200

Red Laser





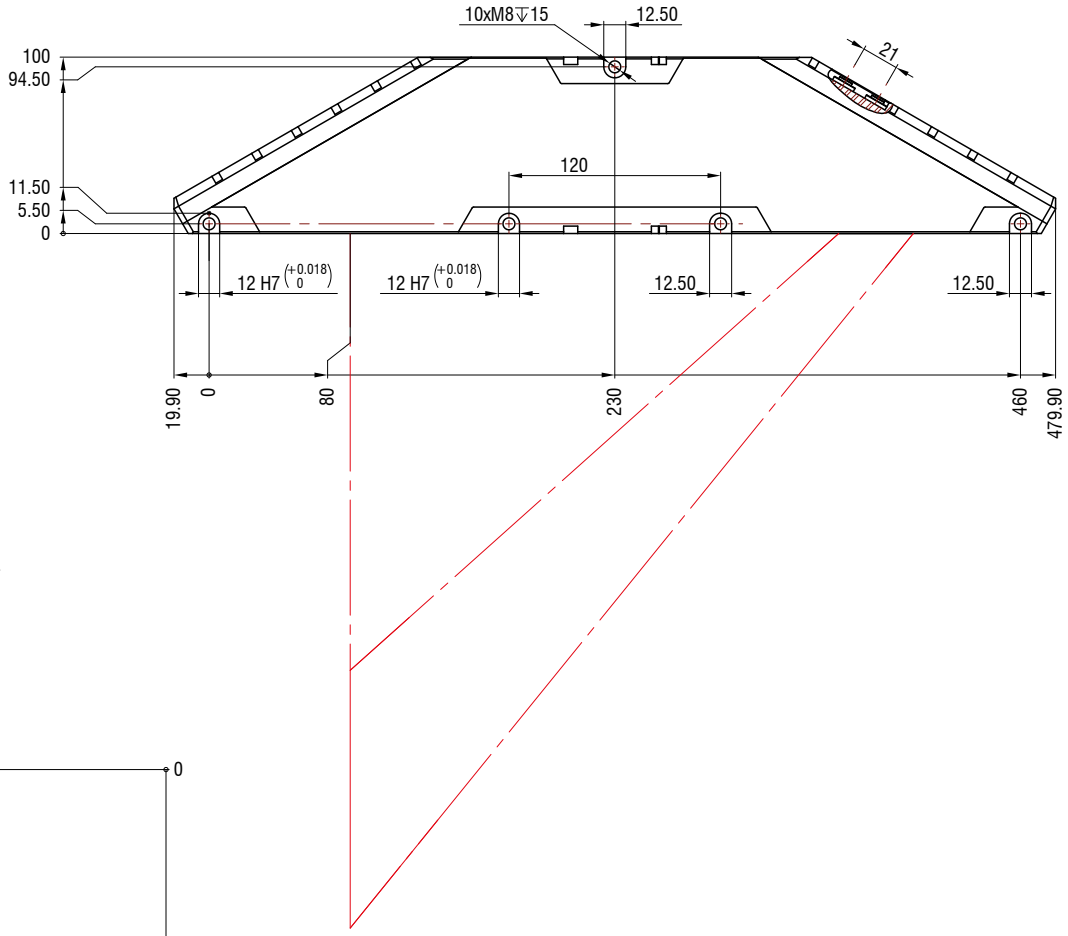


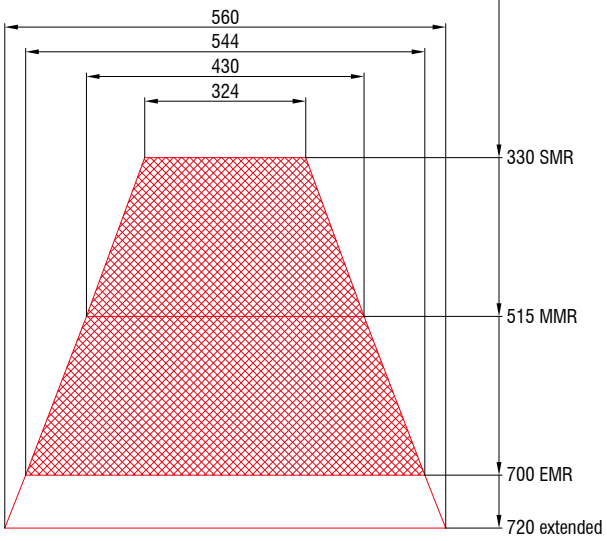
(dimensions in mm, not to scale)

Dimensions and measuring ranges
scanCONTROL 3000 / 3002

LLT30xx-430

Red Laser

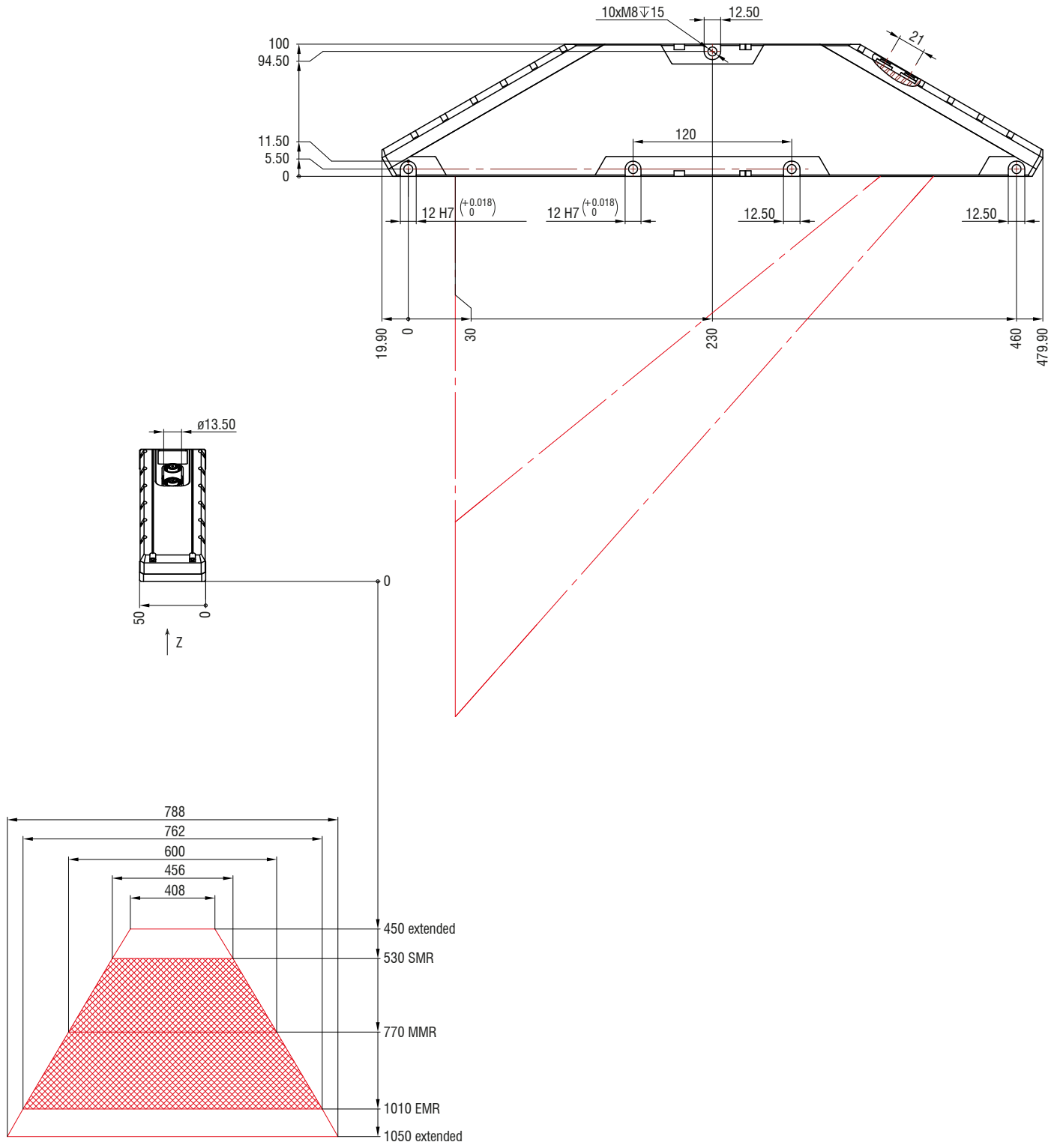




(dimensions in mm, not to scale)

LLT30xx-600

Red Laser



(dimensions in mm, not to scale)

Compact laser scanner with high precision
scanCONTROL 2900

- Resolution x-axis: 1,280 points
- High accuracy for detecting the finest details
- Profile frequency up to 2,000 Hz
- Also available with patented Blue Laser Technology



Compact design for precise measurements

The scanCONTROL 29x0 laser scanners are designed for industrial measurement tasks that require a compact design and high accuracy. Thanks to their high resolution, versatility and excellent price-performance ratio, the scanners are particularly suitable for static and dynamic applications, for example in robotic applications. 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 in PROFILE and SMART versions. As PROFILE scanners, they provide calibrated profile data that can be further processed on a PC using the customer's own software. The SMART scanners work independently and provide selected measurement values. All sensor parameters and the desired measurement programs are set in the scanCONTROL Configuration Tools software and saved directly in the internal controller.

Short measuring range with high resolution

With a laser line of just 10 mm, the scanCONTROL 29x0-10/BL models recognize the finest details and structures. The high profile resolution combined with the blue laser line allows for maximum precision in a wide range of 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

Model 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

Accessories starting on page 50

Model		LLT29xx-10/BL	LLT29xx-25	LLT29xx-50	LLT29xx-100
Measuring range (z-axis)	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 (z-axis)	Start of measuring range	-	53 mm	65 mm	125 mm
	End of measuring range	-	79 mm	125 mm	390 mm
Linearity (z-axis) [1] [2]		1 µm	2 µm	4 µm	12 µm
		±0.0125 %	±0.008 %	±0.008 %	±0.012 %
Measuring range (x-axis)	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 (x-axis)	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 (x-axis)		1,280 points/profile			
Profile frequency	standard	up to 300 Hz			
	High speed	up to 2,000 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 [4] [5]		Ethernet (UDP / Modbus TCP); RS422 (ASCII / Modbus RTU) Analog; switch signal PROFINET; EtherCAT; EtherNet/IP			
Control and indicator elements		3x color LEDs for laser, data and error			
Light source	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			
Aperture angle of laser line		10 °	20 °	25 °	25 °
Permissible extraneous light	(fluorescent light) [1]	10,000 lx			
Protection class (DIN EN 60529)		IP65 (when connected)			
Vibration (DIN EN 60068-2-27)		2g / 20 ... 500 Hz			
Shock (DIN EN 60068-2-6)		15g / 6 ms			
Temperature range	Storage	-20 °C ... +70 °C			
	Operation	0 °C … +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 across the measuring field (640 points)
[3] RS422 interface, programmable either as serial interface or as input for triggering/synchronization
[4] Analog | switching signal: Only in conjunction with 2D/3D output unit
[5] PROFINET | EtherCAT | EtherNet/IP: Only in conjunction with 2D/3D gateway

Laser scanner for industrial series applications
scanCONTROL 2500

- Ideal for industrial series applications in production line & automation
- Resolution x-axis: 640 points
- High signal stability
- Also available with patented Blue Laser Technology
- Numerous references worldwide



SMART
PROFILE

Ideal for series applications

scanCONTROL 25x0 laser scanners are designed for industrial measurement tasks. Thanks to their high signal stability, versatility and excellent price-performance ratio, the scanners are particularly suitable for measurement tasks involving large quantities. They measure and evaluate, e.g., angles, steps, gaps, distances and extreme values. The compact design and low weight also make the scanners suitable for applications with high accelerations, such as on robots.

Available as PROFILE and SMART versions

The scanCONTROL 25x0 series is available in PROFILE and SMART versions. As PROFILE scanners, they provide calibrated profile data that can be further processed on a PC using software provided by the customer. The SMART scanners work independently and provide selected measurement values. All sensor parameters and the desired measurement programs are set in the scanCONTROL Configuration Tools software and saved directly in the internal controller.

Ideal for production and machine monitoring

The scanCONTROL 25x0 series scanners are available in three different measuring ranges with a red or blue laser. The optional accessories, cable types and interface modules allow a wide range of applications in the production line and in machine building.

Article designation

LLT	25	00	-25	/PT

Options – see below

Measuring range
25 mm
50 mm
100 mm

Class
00 = PROFILE
10 = SMART

Model series
LLT25x0

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

*Options can be combined

Accessories starting on page 50

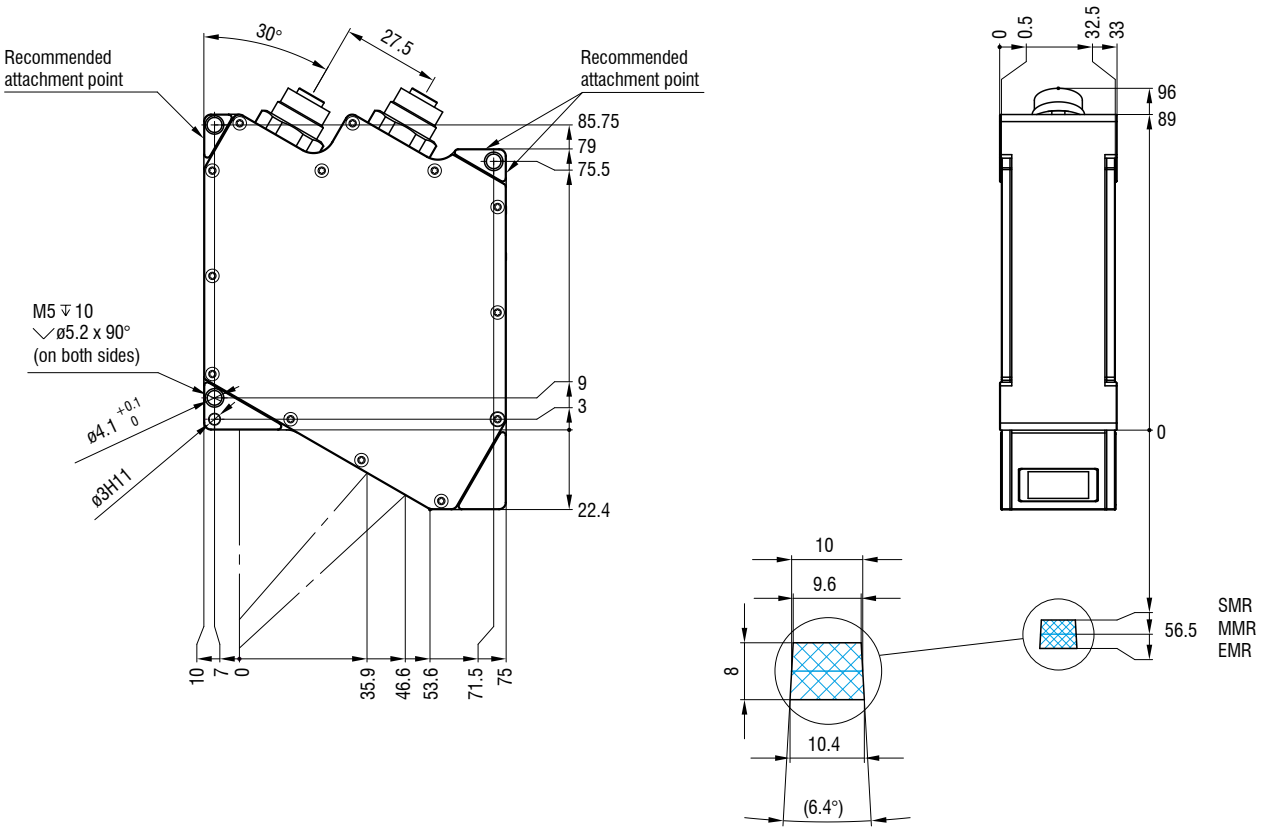
Model		LLT25xx-25	LLT25xx-50	LLT25xx-100
Measuring range (z-axis)	Start of measuring range	53.5 mm	70 mm	190 mm
	Mid of measuring range	66 mm	95 mm	240 mm
	End of measuring range	78.5 mm	120 mm	290 mm
	Height of measuring range	25 mm	50 mm	100 mm
Extended measuring range (z-axis)	Start of measuring range	53 mm	65 mm	125 mm
	End of measuring range	79 mm	125 mm	390 mm
Linearity (z-axis) [1] [2]		2 µm	4 µm	12 µm
		±0.008 %	±0.008 %	±0.012 %
Measuring range (x-axis)	Start of measuring range	23.4 mm	42 mm	83.1 mm
	Mid of measuring range	25 mm	50 mm	100 mm
	End of measuring range	29.1 mm	58 mm	120.8 mm
Extended measuring range (x-axis)	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 (x-axis)		640 points/profile		
Profile frequency		up to 2,000 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 [4] [5]		Ethernet (UDP / Modbus TCP); RS422 (ASCII / Modbus RTU) Analog; switch signal PROFINET; EtherCAT; EtherNet/IP		
Control and indicator elements		3x color LEDs for laser, data and error		
Light source	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		
Aperture angle of laser line		20 °	25 °	25 °
Permissible extraneous light	(fluorescent light) [1]	10,000 lx		
Protection class (DIN EN 60529)		IP65 (when connected)		
Vibration (DIN EN 60068-2-27)		2g / 20 ... 500 Hz		
Shock (DIN EN 60068-2-6)		15g / 6 ms		
Temperature range	Storage	-20 °C ... +70 °C		
	Operation	0 °C … +45 °C		
Weight		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 across the measuring field (640 points)
[3] RS422 interface, programmable either as serial interface or as input for triggering/synchronization
[4] Analog | switching signal: Only in conjunction with 2D/3D output unit
[5] PROFINET | EtherCAT | EtherNet/IP: Only in conjunction with 2D/3D gateway

Dimensions and measuring ranges
scanCONTROL

LLT29x0-10/BL

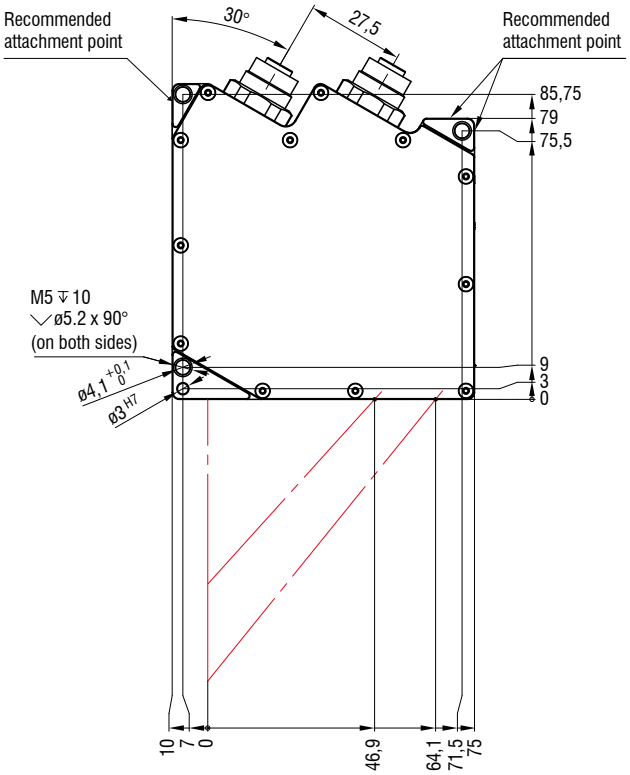
Blue Laser

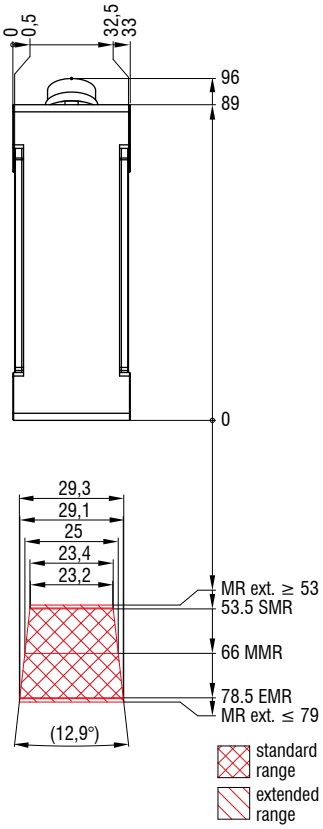


(dimensions in mm, not to scale)

LLT2xx0-25

Red Laser | Blue Laser

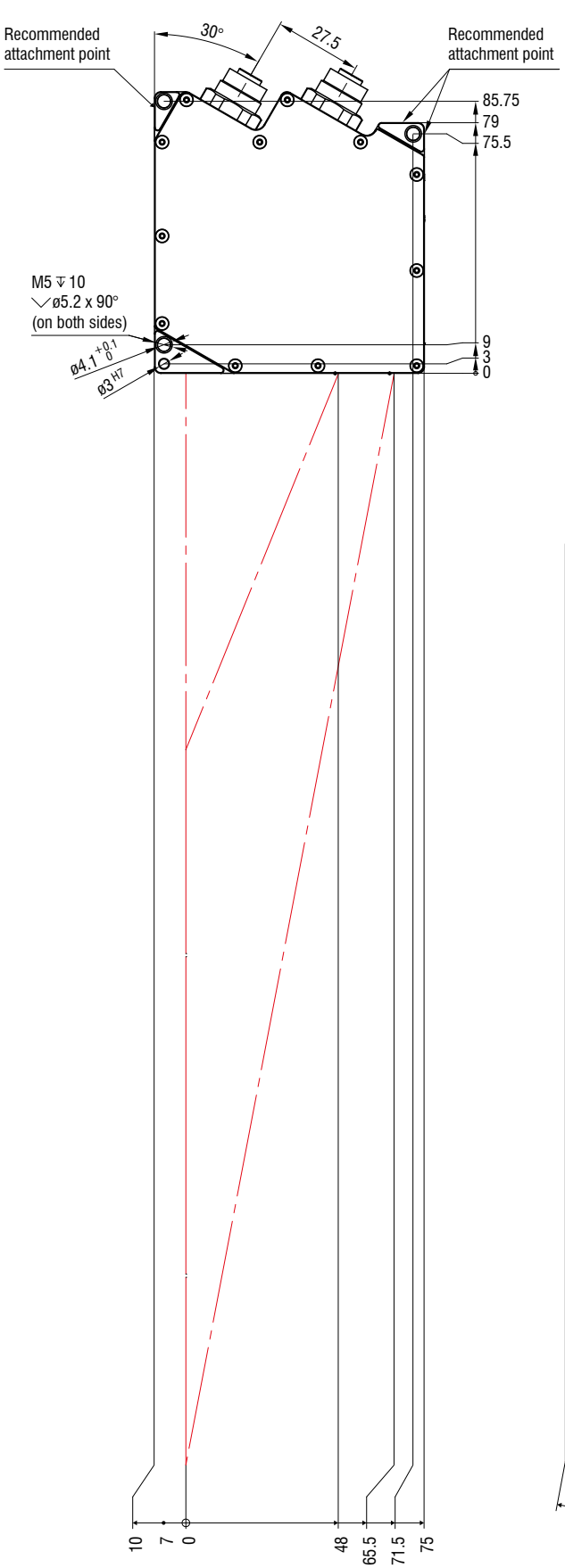


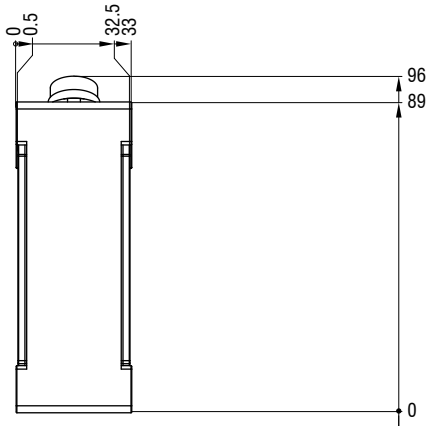


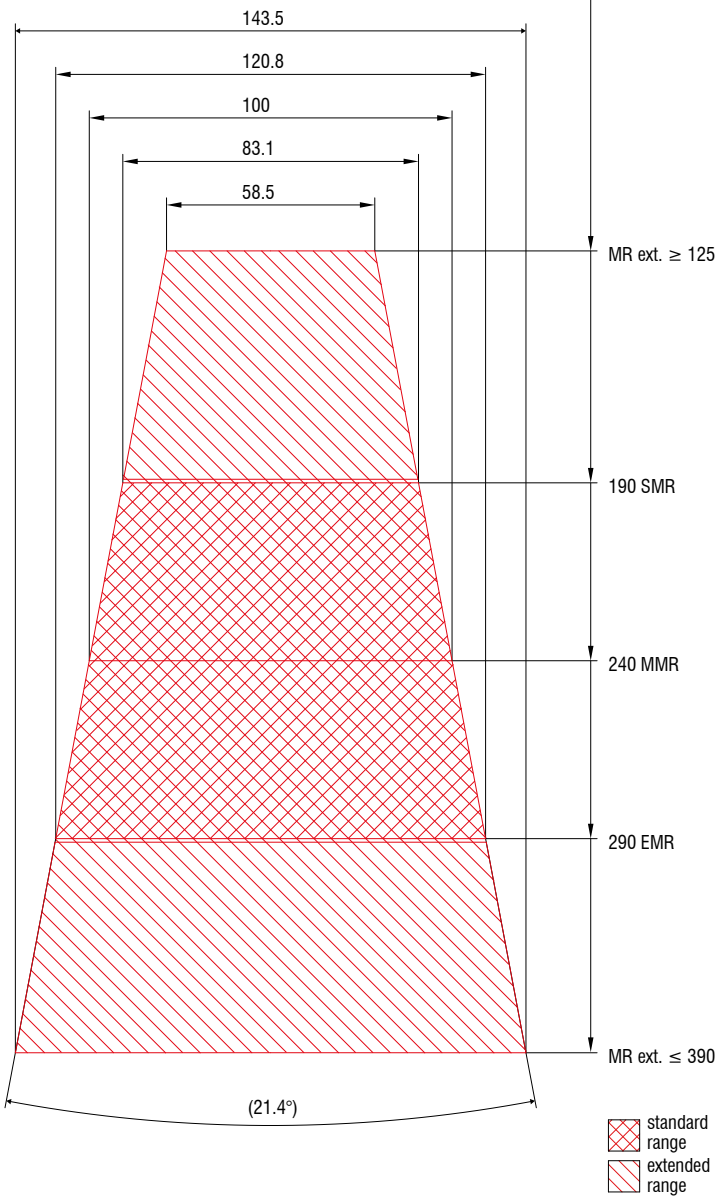
(dimensions in mm, not to scale)

LLT2xx0-100

Red Laser | Blue Laser







(dimensions in mm, not to scale)

Software for surface inspection and 3D measurement
3DInspect

More information



3DInspect: powerful software for 3D measurement and inspection tasks

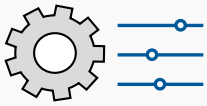
3DInspect is powerful software for industrial measurement and inspection tasks. The 3D measurement data generated by the sensor are processed, evaluated, and automatically assessed in the software based on defined criteria. Measurement results can be visualized, logged and, if required, output directly to a machine or line PLC. In addition, both the measurement results and the complete 3D data can be saved for documentation and later analysis.

Fast & intuitive path to a high-precision 3D solution

The 3D sensors are parameterized directly in 3DInspect. This enables quick configuration of the optimal sensor settings for the specific measurement task. The captured 3D data are preprocessed and optimized. For example, the part position is aligned automatically to enable repeatable evaluation of the point cloud independent of the workpiece orientation. In addition, functions are available for filtering, smoothing, cropping, creating cross-sections, and highlighting relevant features.

3DInspect offers over 80 powerful measurement programs for data evaluation. This enables reliable localization and measurement of features such as edges, spheres, or bores. In addition to evaluating the complete 3D data, cross-sections can also be evaluated. All 2D and 3D objects can be related to one another to determine, for example, distances between a sphere and a plane or the angle between two edges. All determined values and performed evaluations can be output as measurement results.

End-to-end workflow from parameterization to output



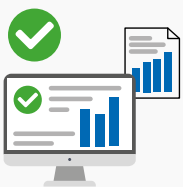
Parameterization
- Optimal sensor parameters for the application
- Save and reuse parameter sets
- Select measuring ranges



Data preprocessing
- Align and position the point cloud
- Set filters and cross-sections
- Highlight features, remove interference



Data evaluation
- Over 80 measurement programs
- Combination of multiple programs
- Evaluation of cross-sections or 3D areas



Evaluation & output
- Evaluation of results (OK/NOK)
- Output via digital outputs, fieldbus or Ethernet
- Logging and export of measurement values and 3D data

Connectivity options
scanCONTROL 8x00



More information

The right solution for integrated evaluation or 3D data

Depending on the variant, the 8x00 sensor family offers a particularly straightforward way to directly output measurement values or further process 3D data.

SMART

Fast, intuitive path to a high-precision 3D solution

3D DATA

Highest precision with maximum integration flexibility

Direct output of measurement values

For PLCs and automation

- Transfer measurement values directly to the PLC
- Sensor control via standard protocols
- OK/NOK result evaluation and output via digital outputs or fieldbus

Recommended tools

3DInspect, ME Modbus Tool

EtherCAT, EtherNet/IP, PROFINET, Modbus, UDP

Integration into image processing

For vision systems and software

- Standardized interfaces: GenICam / GigE Vision
- Direct connection to compatible vision software
- Output of 3D data

Compatible interfaces & software

COGNEX VisionPro, HALCON a product of MVTec, GENICAM, GIGE VISION

Integration into customer software

For developers and OEMs

- SDKs and LLT.DLL for C/C++ or C#/.NET
- LabVIEW drivers and example programs
- Developer Tool with sample code
- Documentation and support

Supported environments

3D sensor SDK

C/C++, C#/.NET, Linux, LabVIEW, python

For custom workflows, advanced integrations or special requirements, we will be happy to help you select the right solution.