MICRO-EPSILON

# More Precision

## scanCONTROL // 2D/3D Laser profile sensors

# Powerful 2D/3D laser scanners
# scanCONTROL 30x2

- Precise profile measurements for industrial measurement tasks
- Resolution (x-axis) 1,024 points
- Profile frequency up to 10,000 Hz
- For small and large measuring ranges
- Also available with patented Blue Laser Technology
- Compatible with COGNEX® VisionPro


### Precise 2D/3D profile measurements

The new LLT30x2 laser profile scanners provide calibrated profile data with up to 7.9 million points per second. They allow profile frequencies up to 10 kHz and resolutions up to 1,024 points. Thanks to their high accuracy and versatility, the scanners are particularly suitable for static and dynamic applications as well as robotic applications. They measure and evaluate, e. g., angles, steps, gaps, distances, and circles.

### Available as PROFILE and SMART versions

The scanCONTROL 30x2 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. The 3DInspect software allows for the scanCONTROL sensors to be used also for 3D evaluations.

SMART scanners operate autonomously and provide selected measurement values. The scanCONTROL 30x2 series supports all SMART functions and programs that are set in the scanCONTROL Configuration Tools software and directly stored in the internal controller.

### Article designation

| LLT | 30 | x2 | -25 | /SI |
|---|---|---|---|---|

**Options -** see below

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

**Class**
02 = PROFILE
12 = SMART

**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 cable end (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 from page 42

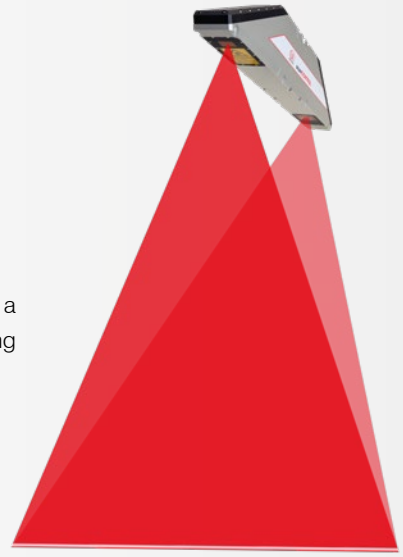

**The easy way of machine integration**

The design of the LLT30x2 series is compact and lightweight. The controller is integrated in the sensor itself, which simplifies mechanical integration. The measurement data can be output directly.

NEW

## Large measurement area up to 600 x 600 mm

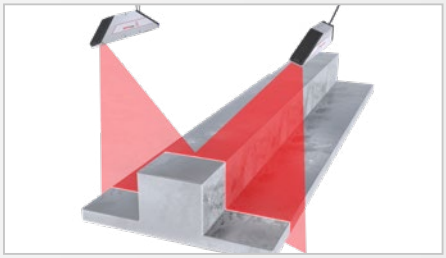
The scanCONTROL 30x2 laser scanners are now also available with a large measuring field up to 600 x 600 mm. This allows large measuring objects to be detected with high accuracy.



## Application examples

Assembly monitoring of car body shell construction

Detection of the road surface profile



Geometry inspection in metals processing

| | Model | | LLT 30x2-430 | LLT 30x2-600 |
|---|---|---|---|---|
| | **Available laser type** | | Red Laser | Red Laser |
| z-axis | Measuring range | Start of measuring range | 330 mm | 530 mm |
| | | Mid of measuring range | 515 mm | 770 mm |
| | | End of measuring range | 700 mm | 1010 mm |
| | | Height of measuring range | 370 mm | 480 mm |
| | Extended measuring range | Start of measuring range | 330 mm | 450 mm |
| | | End of measuring range | 720 mm | 1050 mm |
| | Line linearity [1) 2)] | | 15 µm | 22 µm |
| | | | ±0.0041 % | ±0.0045 % |
| x-axis | Measuring range | Start of measuring range | 324 mm | 456 mm |
| | | Mid of measuring range | 430 mm | 600 mm |
| | | End of measuring range | 544 mm | 762 mm |
| | Extended measuring range | Start of measuring range | 324 mm | 408 mm |
| | | End of measuring range | 560 mm | 788 mm |
| | Resolution | | 1,024 points/profile | |
| | Profile frequency | | up to 10,000 Hz | |
| | Interfaces | Ethernet GigE Vision | Output of measurement values<br>Sensor control<br>Profile data transmission | |
| | | Digital inputs | Mode switching<br>Encoder (counter)<br>Trigger | |
| | | RS422 (half-duplex) [3)] | Output of measurement values<br>Sensor control<br>Trigger<br>Synchronization | |
| | Output of measurement values | | Ethernet (UDP / Modbus TCP); RS422 (ASCII / Modbus RTU)<br>analog [4)]; switch signal [4)]<br>PROFINET [5)]; EtherCAT [5)]; EtherNet/IP [5)] | |
| | Control and display elements | | 3x color LEDs for laser, data and error | |
| | Light source | Red Laser | ≤ 26 mW | |
| | | | Standard: laser class 2M, semiconductor laser 660 nm | |
| | | | ≤ 100 mW | |
| | | | Option: laser class 3R, semiconductor laser 660 nm | |
| | | Laser switch-off | via software, hardware switch-off with /SI option | |
| | Aperture angle of laser line | | 60 ° | |
| | Permissible ambient light | (fluorescent light) [1)] | 5,000 lx | |
| | Protection class (DIN EN 60529) | | IP67 (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 | | 2620 g (without cable) | |
| | Supply voltage | | 11 … 30 VDC, nominal value 24 V, 500 mA,<br>IEEE 802.3af class 2, Power over Ethernet (PoE) | |
| | Connections | | Sockets, cable outlets on top (/PT) | |

[1)] Based on the measuring range; measuring object: Micro-Epsilon standard object
[2)] According to a one-time averaging over the measuring field (1,024 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

# Powerful 2D/3D laser scanners with highest precision
# scanCONTROL 30x0

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

### Fast and precise 2D/3D profile measurements

The new LLT30x0 laser profile scanners provide calibrated profile data with up to 9.6 million points per second. Thanks to their high accuracy, high profile frequency and versatility, these powerful scanners are suitable for demanding measurement tasks. They measure and evaluate, e.g., angles, steps, gaps, distances and circles with high precision. These sensors also offer predefined operating modes that enable optimal results for various applications.

### Available as PROFILE and SMART versions

The scanCONTROL 30x0 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. The 3DInspect software allows for the scanCONTROL sensors to be used also for 3D evaluations.

SMART scanners operate autonomously and provide selected measurement values. The scanCONTROL 30x0 series supports all SMART functions and programs that are set in the scanCONTROL Configuration Tools software and directly stored in the internal controller.

### Article designation

| LLT | 30 | x0 | -25 | /SI |
|---|---|---|---|---|

**Options -** see below

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

**Class**
00 = PROFILE
10 = SMART

**Series**
LLT30xx

### Laser options*

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

### Cable outlet options*

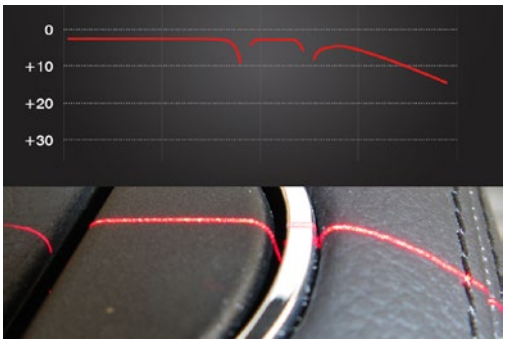
| | | |
|---|---|---|
|  | /RT | Cable outlet on the rear side ("Rear Tail") for space-saving installation, cable length 0.3 m. Sockets at cable end<br>(Measuring ranges 25 - 200 mm) |
|  | /PT | Cable directly out of the sensor ("Pigtail")<br>Available lengths: 0.3 / 0.6 / 1.00 m |

*Options can be combined

Accessories from page 42

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

In HDR mode, the rows of the sensor matrix are exposed differently but at the same time which avoids time offsets between the recordings. This is how moving objects can be detected reliably. The areas for auto exposure can be selected individually.




High resolution

High dynamic range

High speed

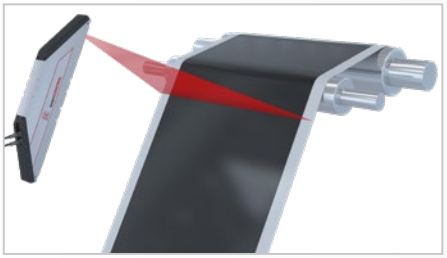
**Fast measurement results with operation modes**
Choose from three predefined operating modes for your specific measurement task: "High-Resolution" for maximum precision, "High Dynamic Range" for optimal profile detection on difficult surfaces and "High Speed" for ultra-fast measurements.

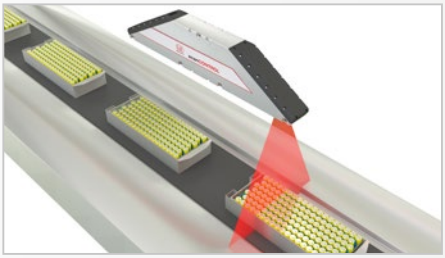
NEW

## Large measurement area up to 600 x 600 mm

The scanCONTROL 30x2 laser scanners are now also available with a large measuring field up to 600 x 600 mm. This allows large measuring objects to be detected with high accuracy.

## Application examples


Planarity of coated battery film


Assembly monitoring of battery packs


Inline 3D inspection of tire geometry

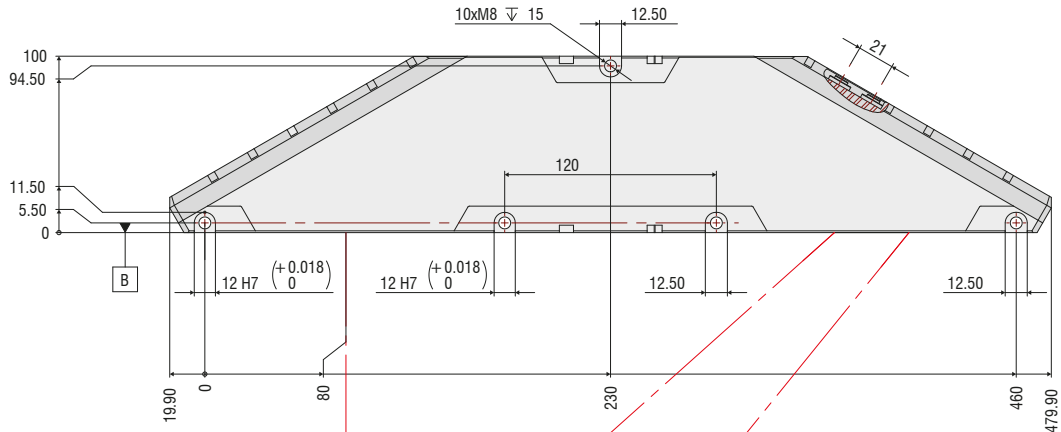
| | Model | | LLT 30x0-430 | LLT 30x0-600 |
|---|---|---|---|---|
| | **Available laser type** | | Red Laser | Red Laser |
| z-axis | Measuring range | Start of measuring range | 330 mm | 530 mm |
| | | Mid of measuring range | 515 mm | 770 mm |
| | | End of measuring range | 700 mm | 1010 mm |
| | | Height of measuring range | 370 mm | 480 mm |
| | Extended measuring range | Start of measuring range | 330 mm | 450 mm |
| | | End of measuring range | 720 mm | 1050 mm |
| | Line linearity [1) 2)] | | 12 µm | 15 µm |
| | | | ±0.0032 % | ±0.0031 % |
| x-axis | Measuring range | Start of measuring range | 324 mm | 456 mm |
| | | Mid of measuring range | 430 mm | 600 mm |
| | | End of measuring range | 544 mm | 762 mm |
| | Extended measuring range | Start of measuring range | 324 mm | 408 mm |
| | | End of measuring range | 560 mm | 788 mm |
| | Resolution | | 2,048 points/profile | |
| | Profile frequency | | up to 10,000 Hz | |
| | Interfaces | Ethernet GigE Vision | Output of measurement values<br>Sensor control<br>Profile data transmission | |
| | | Digital inputs | Mode switching<br>Encoder (counter)<br>Trigger | |
| | | RS422 (half-duplex) [3)] | Output of measurement values<br>Sensor control<br>Trigger<br>Synchronization | |
| | Output of measurement values | | Ethernet (UDP / Modbus TCP); RS422 (ASCII / Modbus RTU)<br>analog [4)]; switch signal [4)]<br>PROFINET [5)]; EtherCAT [5)]; EtherNet/IP [5)] | |
| | Control and display elements | | 3x color LEDs for laser, data and error | |
| | Light source | Red Laser | ≤ 26 mW | |
| | | | Standard: laser class 2M, semiconductor laser 660 nm | |
| | | | ≤ 100 mW | |
| | | | Option: laser class 3R, semiconductor laser 660 nm | |
| | | Laser switch-off | via software, hardware switch-off with /SI option | |
| | Aperture angle of laser line | | 60 ° | |
| | Permissible ambient light | (fluorescent light) [1)] | 5,000 lx | |
| | Protection class (DIN EN 60529) | | IP67 (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 | | 2630 g (without cable) | |
| | Supply voltage | | 11 … 30 VDC, nominal value 24 V, 500 mA,<br>IEEE 802.3af class 2, Power over Ethernet (PoE) | |
| | Connections | | Sockets, cable outlets on top (/PT) | |

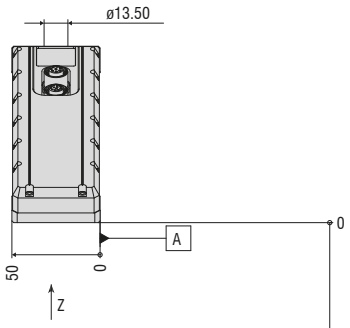
[1)] Based on the measuring range; measuring object: Micro-Epsilon standard object
[2)] According to a one-time averaging over the measuring field (2,048 points)
[3)] RS422 interface, programmable either as serial interface or as input for triggering/synchronization
[4)] Only with 2D/3D Output Unit
[5)] Only with 2D/3D Gateway

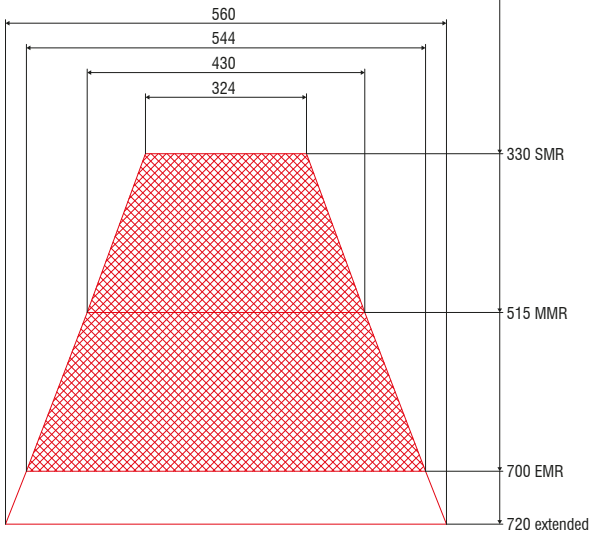
# Dimensions and measuring ranges
# scanCONTROL 30xx

## LLT30x2-430 / LLT30x0-430

Red Laser



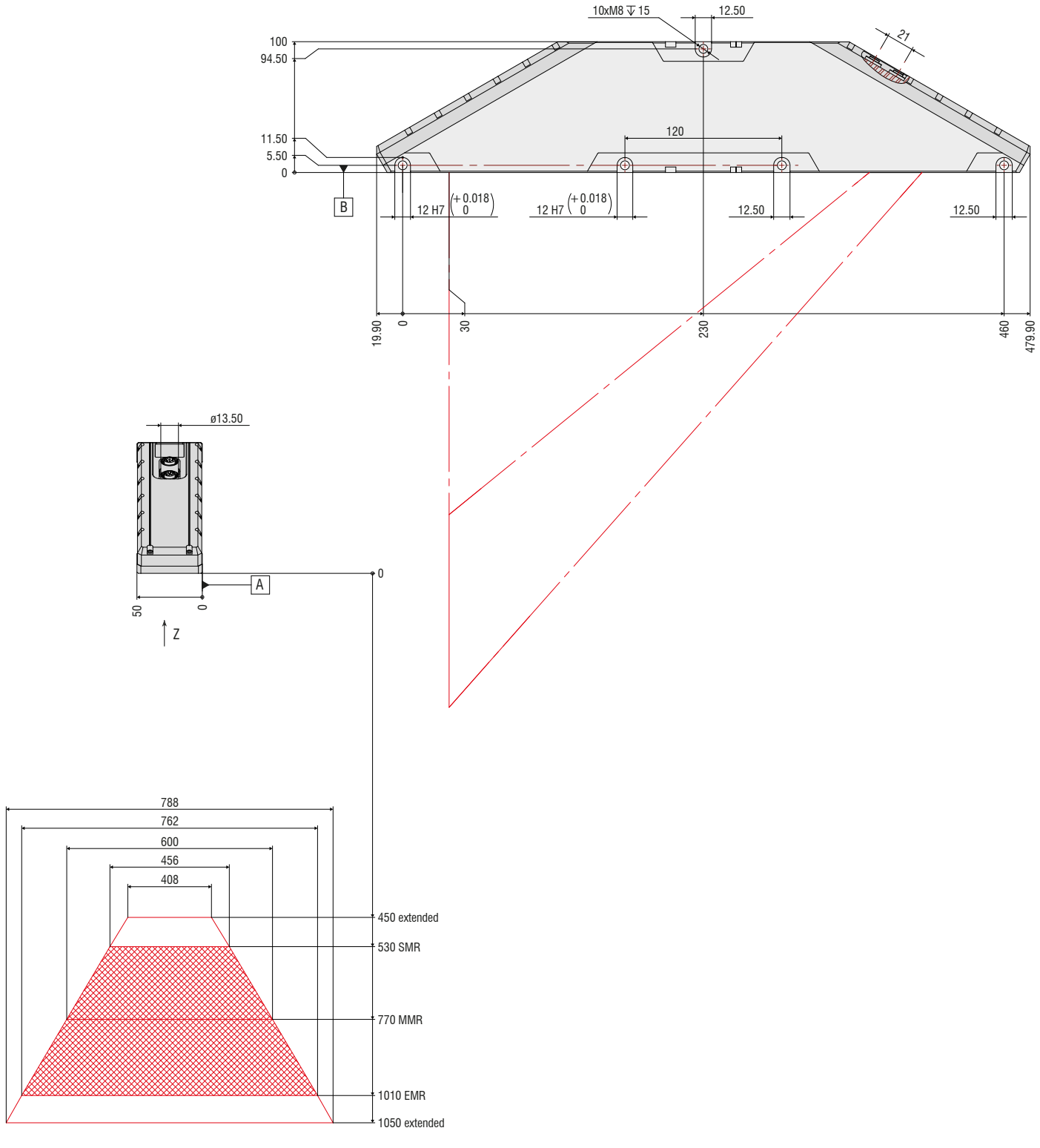




(dimensions in mm, not to scale)

## LLT30x2-600 / LLT30x0-600

Red Laser




(dimensions in mm, not to scale)

# 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.

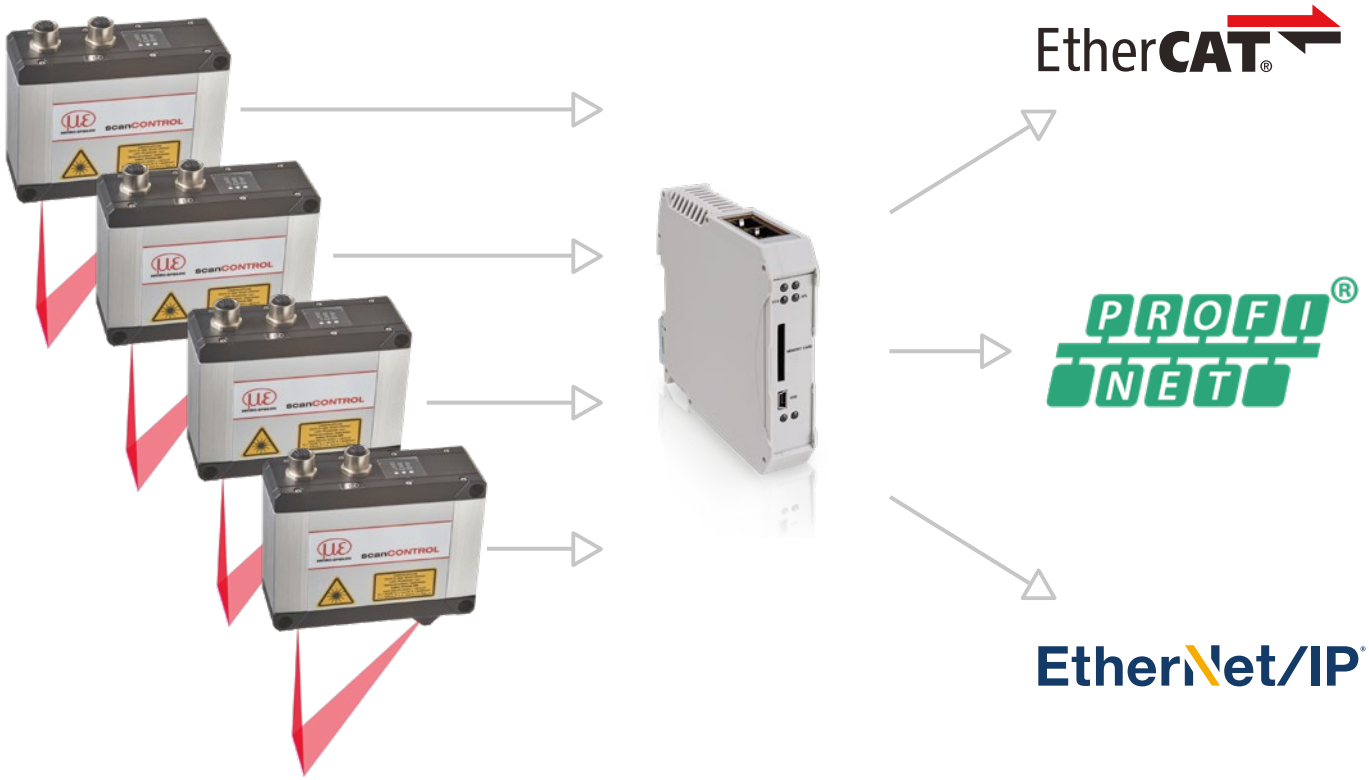
### Models

| | | |
|---|---|---|
| 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

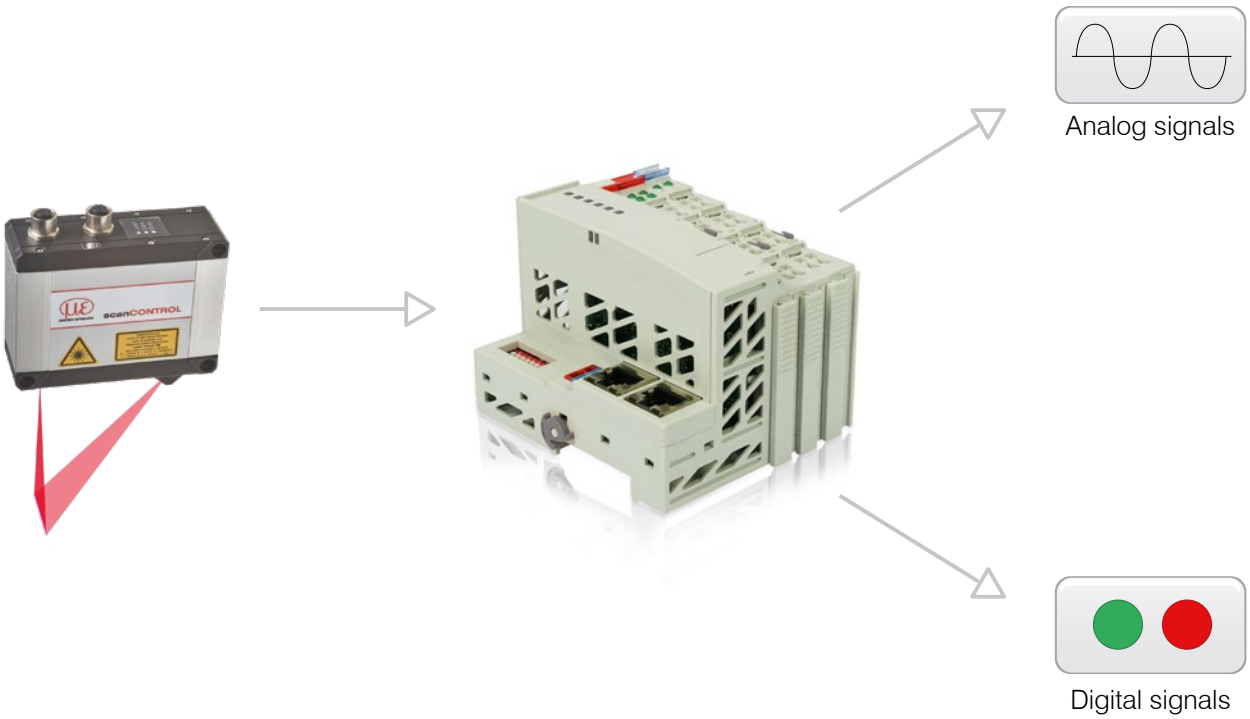
**Analog signals / digital switch signals for all SMART scanners**

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 |

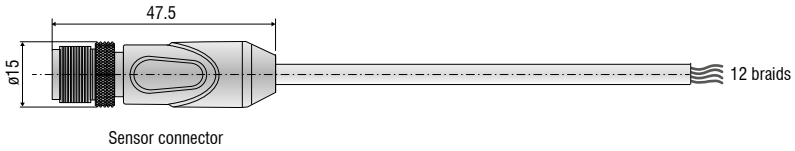
Other terminals available on request.



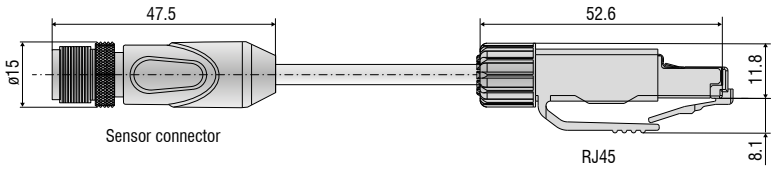
# Accessories
# scanCONTROL

## 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




**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




## Other accessories

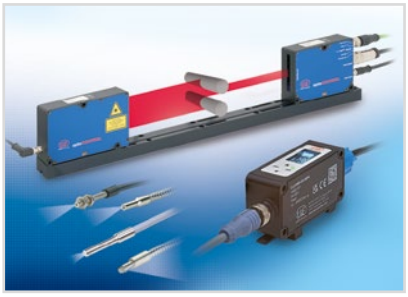
| Art. no. | Model | Description |
|---|---|---|
| 0323478 | Connector/12-pin/Multifunction for LLT25/29/30 series | Plug for multifunction port |
| 0323479 | Connector/8-pin/Ethernet for LLT25/29/30 series | Plug for Ethernet socket |
| 2420067 | PS25/29/30 | Power supply unit for scanCONTROL |
| 0254111 | 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 |

## 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



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