



Assembly Instructions

scanCONTROL 2500 / 2510

1. Warnings

Connect the power supply and the display/output device according to the safety regulations for electrical equipment. The supply voltage must not exceed the specified limits.

- > Risk of injury, damage to or destruction of the sensor
- > Avoid shocks and impacts to the sensor. Avoid constant exposure of the sensor to dust and splashes of water. Avoid exposure of sensor to aggressive media (detergents, cooling emulsions).
- > Damage to or destruction of the sensor

You can find more information about the sensor in the operating instructions. They are online at:

www.micro-epsilon.de/download/manuals/man--scanCONTROL-25xx--en.pdf

2. Notes on Product Marking

The product meets the requirements of CE and UKCA. All specifications and safety instructions described in the operating instructions must be observed.

3. Proper Environment

- Protection class: IP65
- Temperature range:
 - Operation: 0 ... +45 °C (+32 ... +113 °F), when air is circulating freely
 - Storage: -20 ... +70 °C (-4 ... +158 °F)
- Humidity: 5 ... 95 % RH (non-condensing)

4. Laser Safety

The scanCONTROL 25xx operates with a semiconductor laser with a wavelength of 658 nm (visible/red).

i If both warning labels are covered over when the unit is installed, the user must ensure that supplementary labels are attached.

Operation of the laser is indicated visually by the LED on the sensor, see operating instructions, Chap. 3.3. The housing of the optical sensors may only be opened by the manufacturer, see operating instructions, Chap. 9. For repair and service purposes, the sensors must always be sent to the manufacturer. Please observe national regulations, e. g., Laser Notice No. 50 for the USA.

When operating the scanCONTROL 25xx sensors, the relevant regulations according to IEC 60825, Part 1 of 05/2014 and the applicable accident prevention regulations must be followed.

The laser warning labels for Germany have already been attached. For other non German speaking countries, an IEC standard label is included in delivery and the versions valid for the user's country must be attached before the device is put into operation for the first time.

i Observe the national laser protection requirements.

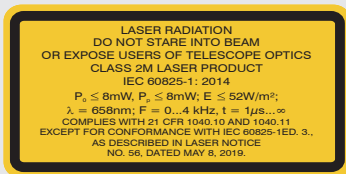
Laser Class 2M

The sensors fall within laser class 2M. The laser is operated on a pulsed mode, the maximum optical power is ≤ 8 mW. The pulse frequency depends on the adjusted measuring rate (0 ... 4 kHz). The pulse duration of the peaks is regulated depending on the measuring rate and reflectivity of the target and can be $1 \dots \infty \mu\text{s}$.



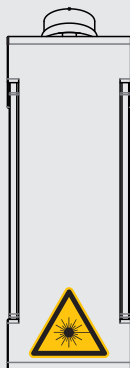
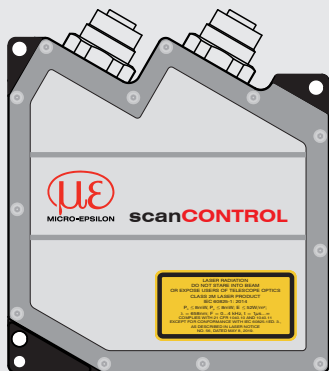
Laser radiation. Irritation or injury of the eyes possible.
Close your eyes or immediately turn away if the laser beam hits the eye.

Attach the following warning labels to the cover (front and rear side) of the sensor housing.



Laser warning sign and laser label LLT25xx-25, LLT25xx-50, LLT25xx-100

Mark the laser area recognizable and everlasting.



Sensors with laser labels

Laser Class 3B

The sensors with the /3B option fall within laser class 3B. The laser is operated on a pulsed mode, the maximum optical power is ≤ 50 mW. The pulse frequency depends on the adjusted measuring rate (0 ... 4 kHz). The pulse duration of the peaks is regulated depending on the measuring rate and reflectivity of the target and can be 1 ... ∞ μ s.



Laser radiation. Injury of the eyes and the skin are possible. Wear suitable protective glasses and clothing.

Attach the following warning labels to the cover (front and rear side) of the sensor housing:



In addition, the following information label must be attached to the laser output on the sensor housing:



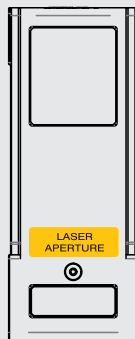
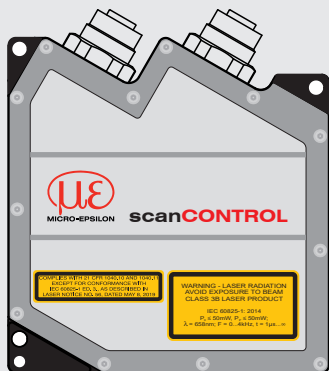
Laser warning sign and laser label, LLT25xx-25, LLT25xx-50, LLT25xx-100



Only for USA

Class 3B laser sensors are notifiable and a laser protection officer is required. Mark the laser area recognizable and everlasting. During operation the laser area has to be restricted and marked.

i With laser class 3B sensors, the customer is required to provide an external key switch for laser switch-off, see operating instructions, Chap. 5.2.6.



Sensors with laser labels

Beam attenuator

Laser products certified as Class 3B products (EN 60825-1) require a beam attenuator, other than the key-operated control. The beam attenuator prevents access to all laser and collateral radiation.



Sensor with close beam attenuator



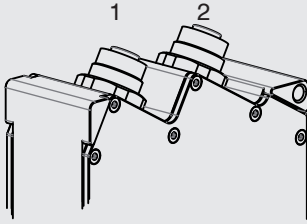
Sensor with open beam attenuator for measurements

To open or close the aperture please follow the steps below:

- ➡ Loosen the knurled screw
- ➡ Change the attenuator position and tighten the knurled screw.

The laser aperture must be open during measurement. Please observe the notes on external laser switching, see operating instructions Chap. 5.2.6.

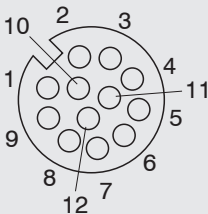
5. Connections, LED Indication



- 1 Ethernet port
- 2 Multifunction port (power supply, I/O)

Multifunction Port

Designation	Sensor connector pin	Cable color PCR3000-x	Notes
V ₊	9	Red	+ 11 V - 30 V DC (rated value 24 V); max. 500 mA
GND	2	Blue	0 V
+Laser on/off	3	White	available with SI option
-Laser on/off	1	Brown	
RS422	12	Red-Blue	RS422 input or output
/RS422	11	Gray-Pink	
In1	6	Yellow	Switching input In1
GND-In1	4	Green	Ground connection In1
In2	5	Pink	Switching input In2
GND-In2	8	Gray	Ground connection In2
In3	10	Purple	Switching input In3
GND-In3	7	Black	Ground connection In3
Screen	Housing	Black	Not electrically connected to GND



GND: galvanically isolated from In1, In2, In3, RS422, Laser on/off

Laser on/off: Input galvanically isolated from GND, In1, In2, In3, RS422

In1, In2, In3, RS422: Inputs galvanically isolated from GND and Laser on/off

12-pin screw connector, view on solder pin side (cable)

RS422, Synchronisation

The RS422 connection (pins 11 and 12 of the multifunction port) can be used in either of the following configurations:

- RS422 (half-duplex): Load programs, control sensor and transmit measurement results (Modbus RTU or ASCII format).
- Synchronization/triggering: Synchronization or triggering using switching signals.

Trigger, Encoder, Mode Switching

The switching inputs of the multifunction port can either be used for encoder input, trigger input or for load previously stored user modes.


The signal levels are switchable for all switching inputs between LLL (low-voltage, TTL logic) and HLL (high-voltage, HTL logic):

- LLL level: Low 0 V ... 0.8 V, high 2.4 V ... 5 V, internal pull-up 10 k Ω to 5 V
- HLL level: Low 0 V ... 3 V, high 11 V ... 24 V (permitted to 30 V), internal pull-up 10 k Ω to 24 V
- Pulse duration: $\geq 5 \mu\text{s}$

External Laser Switch-off, Optional

The external laser switch-off is implemented as a hardware solution and is a top priority. The laser can also be switched off by software.

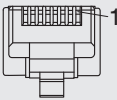
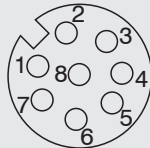
This function is offered by sensors with the /SI option.

 Use a serial key switch in the control circuit to switch off the laser

With standard sensors, connecting the supply voltage activates the laser light source in the sensor.

Wiring details are available in the operating instructions, Chap. 5.2.6.

Ethernet Connection, Standard Connection to PC

RJ45 connector		8-pin screw connector (sensor side)		
Pin no.	Color of stranded hook-up wire SCR3000A-x	Pin no.	10BaseT, 100BaseTX	1000BaseT
1	White (orange)	5	Tx+	D1+
2	Orange	6	Tx-	D1-
3	White (green)	8	Rx+	D2+
4	Blue	1		D3+
5	White (blue)	2		D3-
6	Green	7	Rx-	D2-
7	White (brown)	3		D4+
8	Brown	4		D4-
 <p>View on pin side of male cable connector</p>		 <p>View on solder side (cable) of screw connector (A-coded)</p>		

- The sensor supports an automatic, sensor-specific IP address in the link-local net (169.254.x.x). No collision detection is implemented. This is also the default setting.
- The sensor supports DHCP. This setting is activated by default and has priority over search the link-local net.
- The scanCONTROL 25xx sensor supports Power over Ethernet.

NOTICE

If the sensor is connected to a POE-capable network adapter/ switch and you also use the power supply of the multifunction port, these two power supplies must be galvanically isolated.
 > Damage to the sensor and/or Ethernet card!

- A fixed IP address can be assigned.

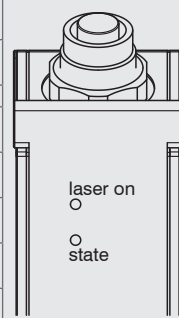
➡ Use the `sensorTOOL` program to specify the sensor settings described above.

The program is available online at www.micro-epsilon.com/download/software/sensor-TOOL.exe.

LED Indication

LED laser on	Meaning
Green	Laser is on

LED state	Meaning
Green	Measurement is active
Green, flashes long	Data transmission is active
Green, flashes short	Controller is accessing laser
Red, flashes	Error code



The diagram shows a laser sensor assembly. It consists of a cylindrical lens assembly mounted on a rectangular base. Below the base, there are two vertical lines representing mounting holes. To the right of the base, there is a label 'laser on' above a small circle, and 'state' below another small circle.

6. System Requirements

scanCONTROL Configuration Tools

The following minimum system requirements are necessary:

- Windows 8 or 8.1, Windows 10, Windows 11 (64 bit each)
- 1-GHz processor (64 bit)
- 1 GB RAM
- Screen resolution: 1024 x 768

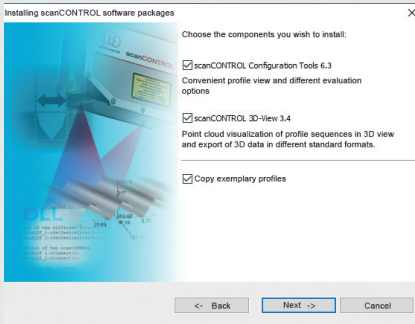
scanCONTROL 3D-View

The following minimum system requirements are necessary:

- Windows 8 or 8.1, Windows 10, Windows 11 (64 bit each)
- 1-GHz or faster (64 bit) processor or higher
- 1 GB RAM
- Screen resolution: 1024 x 768
- Graphics card / GPU with OpenGL 3.1 or higher

7. Quickstart: Initial Operation, Software

- ➔ Mount the sensor according to the installation instructions.
- ➔ Install the software.



You will find the software online on the product website of the sensor or in the download area:

www.micro-epsilon.com/2D_3D/laser-scanner/Software/downloads/



Follow the dialog through the installation process:

- Reading the installation help
- Installing the software
- Additional information in the online documentation

- ➔ Connect the sensor to the PC using the optionally available SCR3000A-x Ethernet cable.
- ➔ Connect the shield of the power supply cable to the PE grounding conductor of the main power supply. Close unused connection plugs with the included protective caps. Turn on the power supply (24 VDC).
- ➔ Please wait until the scanCONTROL measuring system is recognized by the PC. This may take a few seconds.
- ➔ Now you can operate the scanCONTROL measuring system with the scanCONTROL software packages.

i Operating the sensors via Ethernet may require the IP settings of the PC/sensor or the firewall settings to be adjusted, see Chap. 5.2.5 of the operating instructions.

The connectors for Ethernet and the multifunction port include a screw connector.

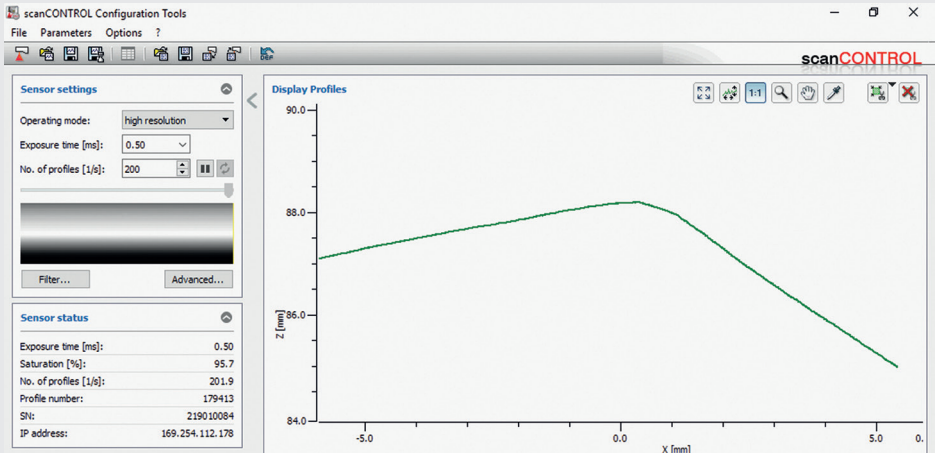
- ➔ Loosen the screws connection before you remove the connector from the socket.

i Only connect the sensor to the peripheral equipment, if it is disconnected from the power supply, i.e. only when the supply voltage is turned off. The sensor needs a warm-up time of typically 20 minutes for high precision measurements.

8. First Profile

- ▶ Now start the scanCONTROL Configuration Tools software.
Click **Display Profiles** in the main window.

If the software shows the error message **No scanCONTROL found** in the status line, please check the Ethernet connection between scanCONTROL and the PC.



On the left side you can adjust the settings for your measurement task, the right side shows the profile data and further information about the measurement.

9. How to Access Profile Data

Profile data of scanCONTROL can be accessed via:

- GigEVision and GenICam for digital cameras via Ethernet interface
- SDK for fast integration into applications (C, C++, C# and others)

Please refer to the respective SDK documentation for further information on accessing the profile data.

10. Transmitting Measurement Results

scanCONTROL 25xx offers the following options for transmitting measurement results:

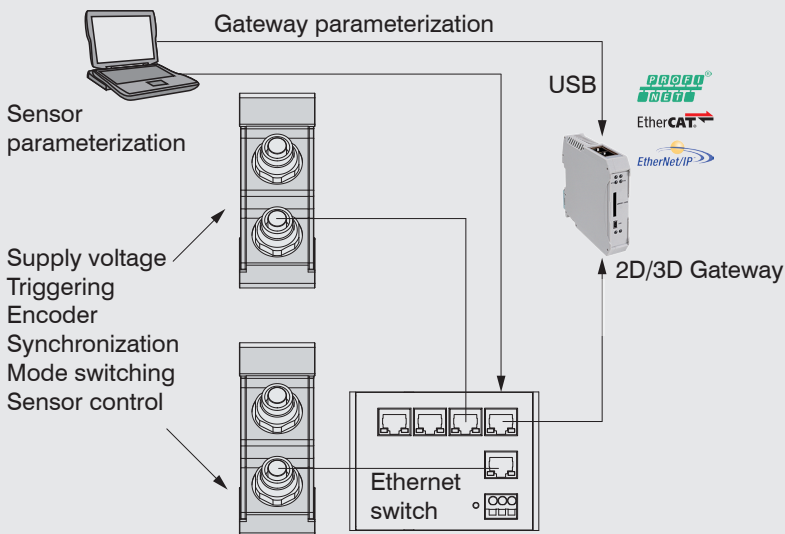
- Ethernet interface
 - Modbus TCP protocol
 - UDP protocol
 - Analog output of measurement values (via optional 2D/3D Output Unit)
 - Digital output of switching signals (via optional 2D/3D Output Unit)
 - Fieldbus connection PROFINET, Ethernet/IP, EtherCAT (via optional 2D/3D Gateway)
- RS422 interface
 - Modbus RTU protocol
 - Transmission of measurement values in ASCII format

11. 2D/3D Gateway

2D/3D Gateway allows for scanCONTROL SMART sensors to be integrated into various fieldbus systems:

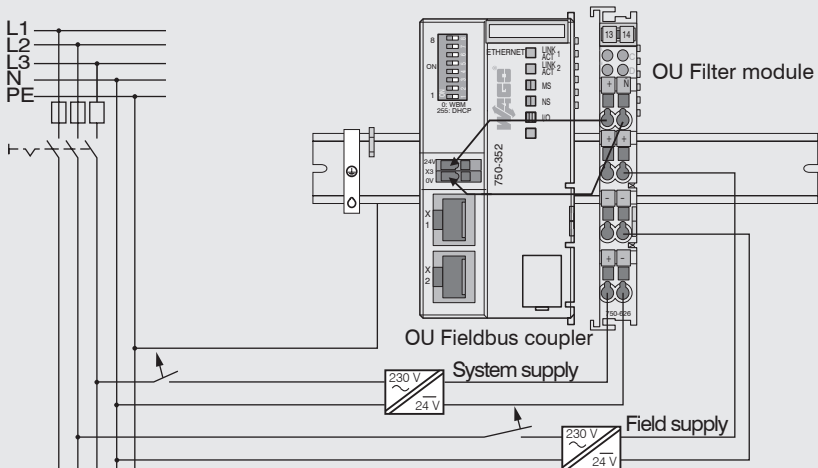
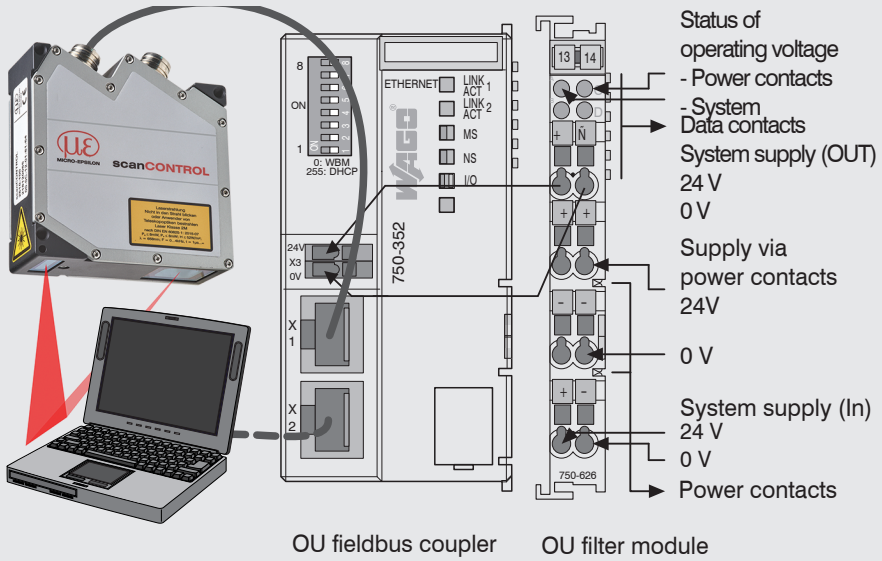
- PROFINET
- EtherNet/IP
- EtherCAT

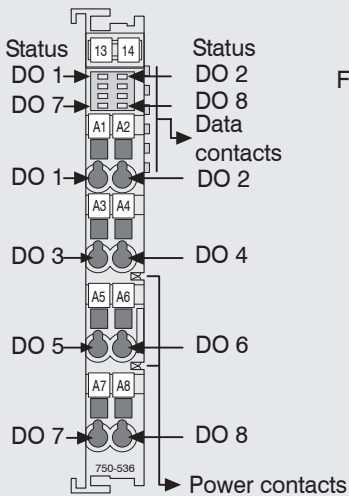
All measurement results obtained from the profile evaluation performed by a scanCONTROL SMART sensor can be transmitted to a PLC via one of these fieldbus systems. Furthermore, all scanCONTROL sensor settings can be set via the 2D/3D Gateway (e. g. Laser on/off or User Mode).



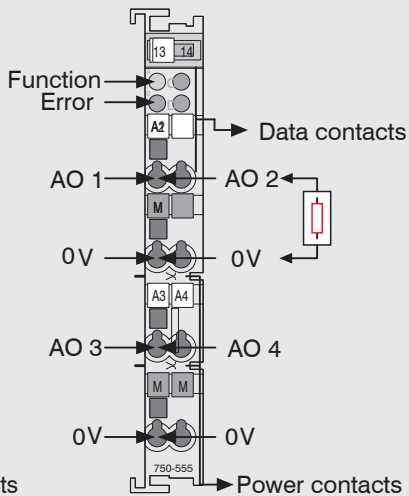
The 2D/3D Gateway can connect up to four scanCONTROL SMART sensors to the fieldbus. Measurement values are transmitted at up to 500 Hz. Please refer to the TechNote T026 (scanCONTROL fieldbus integration) for more details.

12. scanCONTROL 25xx with 2D/3D Output Unit for PLC Connection

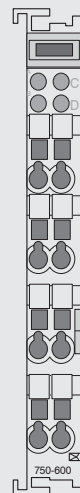




Digital output terminal



Analog output terminal



Bus termination

Connecting the Supply Voltage

Digital output terminals need a field supply of 5 VDC or 24 VDC depending on the module type.

After mounting the modules, install the required wiring.

- Connect the “System supply (out)” contacts of the OU-Filter module to the “System supply (in)” contacts of the OU-Fieldbus coupler (0 V and 24 V).
- Connect the system supply (in) of the OU-Filter module to the power supply (0 V and 24 V).
- Connect the field supply (in) of the OU-Filter module to the power supply (0 V and 24 V or 0 V and 5 V).

i The system supply and field supply should be separated to ensure the bus operation and electrical isolation if an actor short-circuits. Disclaimer

13. Disclaimer

All components of the device have been checked and tested for functionality in the factory. However, should any defects occur despite careful quality control, these shall be reported immediately to MICRO-EPSILON or to your distributor / retailer.

MICRO-EPSILON undertakes no liability whatsoever for damage, loss or costs caused by or related in any way to the product, in particular consequential damage, e.g., due to

- non-observance of these instructions/this manual,
- improper use or improper handling (in particular due to improper installation, commissioning, operation and maintenance) of the product,
- repairs or modifications by third parties,
- the use of force or other handling by unqualified persons.

This limitation of liability also applies to defects resulting from normal wear and tear (e.g., to wearing parts) and in the event of non-compliance with the specified maintenance intervals (if applicable).

MICRO-EPSILON is exclusively responsible for repairs. It is not permitted to make unauthorized structural and / or technical modifications or alterations to the product. In the interest of further development, MICRO-EPSILON reserves the right to modify the design.

In addition, the General Terms of Business of MICRO-EPSILON shall apply, which can be accessed under Legal details | Micro-Epsilon <https://www.micro-epsilon.com/impressum/>.

14. Decommissioning, Disposal

In order to avoid the release of environmentally harmful substances and to ensure the reuse of valuable raw materials, we draw your attention to the following regulations and obligations:

- Remove all cables from the sensor and/or controller.
- Dispose of the sensor and/or the controller, its components and accessories, as well as the packaging materials in compliance with the applicable country-specific waste treatment and disposal regulations of the region of use.
- You are obliged to comply with all relevant national laws and regulations.

For Germany / the EU, the following (disposal) instructions apply in particular:

- Waste equipment marked with a crossed garbage can must not be disposed of with normal industrial waste (e.g. residual waste can or the yellow recycling bin) and must be disposed of separately. This avoids hazards to the environment due to incorrect disposal and ensures proper recycling of the old appliances.



- A list of national laws and contacts in the EU member states can be found at https://ec.europa.eu/environment/topics/waste-and-recycling/waste-electrical-and-electronic-equipment-weee_en.

Here you can inform yourself about the respective national collection and return points.

- Old devices can also be returned for disposal to MICRO-EPSILON at the address given in the imprint at <https://www.micro-epsilon.com/impresum/>.

- We would like to point out that you are responsible for deleting the measurement-specific and personal data on the old devices to be disposed of.

- Under the registration number WEEE-Reg.-Nr. DE28605721, we are registered at the foundation Elektro-Altgeräte Register, Nordostpark 72, 90411 Nuremberg, as a manufacturer of electrical and/or electronic equipment.

15. Unpacking, Included in Delivery

- 1 scanCONTROL 25xx sensor with integrated controller
- 1 PCR3000-5 multifunction cable, length 5 m; for power supply, trigger and RS422; M12x1 screw connector and free cable ends
- Calibration protocol / assembly instructions
- 2 Protective caps

16. Additional Information

Please refer to

- the enclosed online documentation
- the "Status and Error Messages" and "Notes" sections in the scanCONTROL Configuration Tools operating instructions.

You will find details about the individual programs in the respective operating instructions or in the operating instructions of this sensor, Chap. 6.2.

www.micro-epsilon.com

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