MICRO-EPSILON

Assembly Instructions
scanCONTROL 2900/2950BL

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 materials (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:

https://www.micro-epsilon.com/download/manuals/man--scanCONTROL-29xx--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), for free circulation of air
    - Storage: -20 ... +70 °C (-4 ... +158 °F)
- Humidity: 5 ... 95 % RH (non-condensing)

4. Laser Safety

The scanCONTROL 2900/2950-xx/BL operates with a semiconductor laser with a wavelength of 405 nm (visible/blue).

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 29xx 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 $\leq$ 8 mW (scanCONTROL 29xx-10BL $\leq$ 7 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 ... ∞ μs.
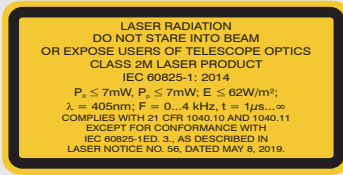
> ⚠ **CAUTION**   Laser radiation. Irritation or injury of the eyes possible.
> Close your eyes or immediately turn away if the laser beam hits the eye.

Attach the following warning labels to the cover (front and rear side) of the sensor housing:
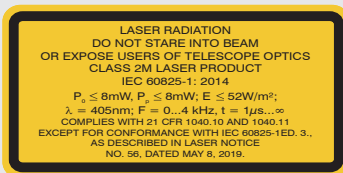
Laser warning sign and laser label, LLT 29xx-25/BL, 29xx-50/BL, 29xx-100/BL

Laser warning sign and laser label, LLT 29xx-10/BL

Mark the laser area recognizable and everlasting.

Sensor with laser labels

5.   Unpacking, Included in Delivery

- 1 scanCONTROL 2900/2950-xx/BL sensor with integrated controller
- 1 PCR3000-5 multifunction cable, length 5 m; for power supply, trigger and RS422; screw connector and free cable ends
- Calibration protocol / assembly instructions
- 2 Protective caps

6. Connections, LED Indication
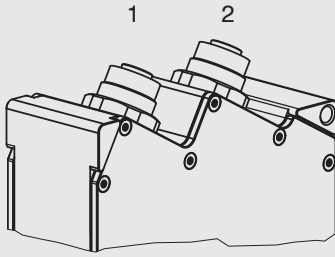
1 Ethernet port
2 Multifunction port (Power supply, I/O)

Multifunction Port

Designation	Sensor con-nector pin	Cable color PCR3000-x	Notes
V_+	9	Red	+ 11 V - 30 V DC (rated value 24 V); max. 5 W
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
Shield	Housing	Black	Not electrically connected to GND
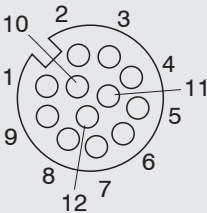
GND: galvanically isolated from In1, In2, In3, RS422, laser on/off

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 side (cable)

RS422, Synchronization

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

- RS422 (half-duplex): Load user modes and sensor control, sensor control and transmission of 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 kOhm to 5 V
- HLL level: Low 0 V … 3 V, high 11 V … 24 V (permitted to 30 V), internal pull-up 10 kOhm to 24 V
- Pulse duration: $\geq 5\,\mu$s

External Laser Switch-off, Optional

The external laser switch-off is implemented as a hardware solution and has a top priority. The laser can be switched off, in addition, also by software.
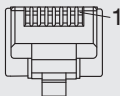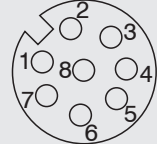
This function is offered by sensors with the /BL-SI option.

➡️ 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-

View on pin side of male cable connector

View on solder side (cable) of screw connector (A-coded)

- The sensor supports an automatic, sensor-adapted IP address in the link-local-net (169.254.x.x). No collision check is performed. This is also the standard setting.
- The sensor supports DHCP. This setting is activated by default and has priority over the retrieval in the link-local net.
- The sensor scanCONTROL 2900/2950-xx/BL 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 make specify the sensor settings described above.

The program is available online at https://www.micro-epsilon.de/service/download/software.

LED Indication

LED `Laser on`		LED `state`	
Green:	Laser on	Green:	Measurement active
		Green, flashes long	Data transmission is active
		Green, flashes short	Controller accesses
		Red, flashes	Error code
The `state` LED indicates different error states by flashing. If no flashing occurs for several seconds, no error has occurred. For a detailed description of the error codes, please refer to the operating instructions, Chap. 12.			

7. 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

8. How to Access Profile Data

Profile data of scanCONTROL can be accessed via:
- GigEVision and GenICam for digital cameras via Ethernet
- SDK for fast application integration (C, C++, C# and others)

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

9. 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.

10. Quickstart: Initial Operation, Software

➡️ Mount the sensor according to the installation instructions.

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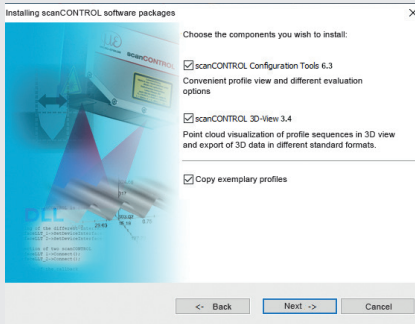
You will find the software online on the product website of the sensor or in the download area:

https://www.micro-epsilon.de/2D_3D/laser-scanner/Software/downloads/.

Follow the dialog instructions through the installation process:

A. Read the installation help

B. Install the software

C. 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 connection plugs you do not require 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.

ℹ️ 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.

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

11.   First Profile

➡️ Now start the scanCONTROL Configuration Tools software. Click on `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 PC.
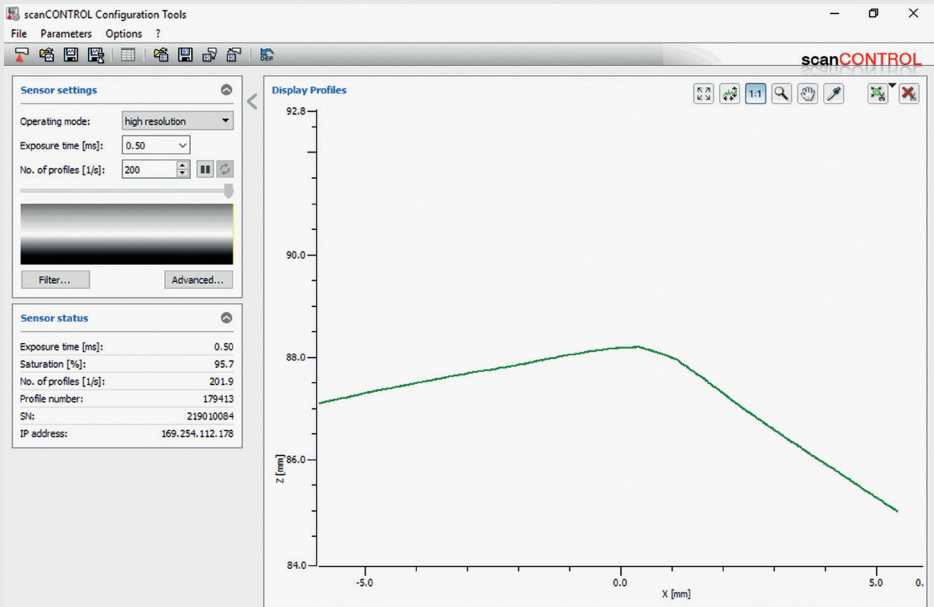
On the left side you can adjust the settings for your measurement task. The right side shows the profile data and further information about the measurement.

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