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

> Risk of injury, damage to or destruction of the sensor
Avoid shocks and impacts to the sensor. Avoid continuous exposure to dust and spray on the sensor. Avoid exposure of sensor to aggressive materials (detergents, cooling emulsions).

> Damage to or destruction of the sensor
Read the detailed instruction manual before operating the sensor. You will find this manual on the provided CD or online at www.micro-epsilon.com.

2. **Notes on CE Identification**
The following applies to the scanCONTROL 30xx:
- EU Directive 2014/30/EU
The sensor is designed for use in industry and satisfies the requirements.

    The sensor fulfills the specifications of the EMC requirements, if the instructions in the manual are followed.

3. **Proper Environment**
- Protection class: IP 67
- Operating temperature: 0 to +45 °C (+32 to +113 °F), by free circulation of air
- Storage temperature: -20 to +70 °C (-4 to +158 °F)
- Humidity: 5 - 95 % (non condensing)

4. **Scope of Delivery of scanCONTROL 30xx**
- 1 Sensor scanCONTROL 30xx with integrated controller
- 1 Multifunction cable PCR3000-5, length 5 m; for power supply, trigger and RS422; screw connector and free cable ends
- Calibration final inspection / assembly instructions
- 2 protective caps
- scanCONTROL Sofware-CD with drivers, programs and documentation
5. Laser Safety

The scanCONTROL 30xx sensors operate with a semiconductor laser having a wavelength of 658 nm (visible/red). The laser operation is indicated visually by the LED on the sensor.

Attach the following warning labels to the cover (front side) of the sensor housing. The laser warning labels for Germany have already been applied. Those for other non-German-speaking countries an IEC standard label is included in delivery and the versions applicable to the user’s country must be applied before the equipment is used for the first time.

- If the information labels are hidden in the installed state, the user must ensure that additional labels are fitted at the point of installation.

Laser Class 2M

scanCONTROL 30xx sensors with a maximum laser power up to 10 mW are classified in Laser Class 2M (IIM). Attach the following warning labels to the cover (front side) of the sensor housing.

- **CAUTION** Hazard to the eye via laser radiation! Consciously close your eyes or turn away if the laser radiation impinges on the eye.

Laser Class 3R

scanCONTROL 30xx sensors with a maximum laser power up to 30 mW are classified in Laser Class 3R (IIIR). Attach the following warning labels to the cover (front side) of the sensor housing.

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

- **CAUTION** Hazard to the eye via laser radiation! Consciously close your eyes or turn away if the laser radiation impinges on the eye.

Class 3R lasers require a laser protection officer.
6. Connections, LED Displays

1 Multifunction port (Power supply, IO)
2 Ethernet port

Multifunction Port

<table>
<thead>
<tr>
<th>Designation</th>
<th>Sensor connector Pin</th>
<th>Cable color PCR3000-x</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>+Ub</td>
<td>9</td>
<td>red</td>
<td>+ 11 V - 30 V DC (rated value 24 V); max. 5 W</td>
</tr>
<tr>
<td>GND</td>
<td>2</td>
<td>blue</td>
<td>0 V</td>
</tr>
<tr>
<td>+Laser on/off</td>
<td>3</td>
<td>white</td>
<td>available with SI option</td>
</tr>
<tr>
<td>-Laser on/off</td>
<td>1</td>
<td>brown</td>
<td></td>
</tr>
<tr>
<td>RS422</td>
<td>12</td>
<td>red-blue</td>
<td></td>
</tr>
<tr>
<td>/RS422</td>
<td>11</td>
<td>gray-pink</td>
<td>RS422 input respectively output</td>
</tr>
<tr>
<td>GND RS422</td>
<td>10</td>
<td>purple</td>
<td>Ground connection RS422</td>
</tr>
<tr>
<td>In1</td>
<td>4</td>
<td>green</td>
<td>Switching input In1</td>
</tr>
<tr>
<td>In2</td>
<td>6</td>
<td>yellow</td>
<td>Switching input In2</td>
</tr>
<tr>
<td>In3</td>
<td>8</td>
<td>gray</td>
<td>Switching input In3</td>
</tr>
<tr>
<td>In4</td>
<td>5</td>
<td>pink</td>
<td>Switching input In4</td>
</tr>
<tr>
<td>GND-In</td>
<td>7</td>
<td>black</td>
<td>Ground connection In</td>
</tr>
</tbody>
</table>

Screen | Housing | black | Not electrically connected to GND

GND: galvanically isolated from IN1, 2, 3, 4, RS422, Laser on/off
Laser on/off: Input galvanically isolated from GND, IN1…4, RS422
IN1, IN2, IN3, IN4, RS422: Inputs galvanically isolated from GND and Laser on/off

12-pin screw connector, view on solder pin side (cable)
RS422, Synchronization
The RS422 connection (Pin 11 and 12 of the multifunction port) can be used with either of the following configurations:
- RS422 (half-duplex): Load user modes, sensor control and transmit measurement results (Modbus RTU or ASCII-Format).
- Synchronization/trIGGERING: Synchronization respectively triggering using switching signals.

Trigger, Encoder, Mode Switching
The switching inputs of the multifunction port can either be used for encoder-, trigger input or for loading previously stored user modes.

The signal levels are switchable for all switching inputs between LLL (TTL logic) and HLL (HTL logic):
- LLL level: Low 0 V … 0.8 V, high 2.4 V … 5 V, internal pull-up/down switchable resistor 10 kΩ
- HLL level: Low 0 V … 3 V, high 11 V … 24 V (permitted to 30 V), internal pull-up/down switchable resistor 10 kΩ
- Pulse duration: ≥ 5 µs

External Laser Switching
The sensors of the scanCONTROL 30xx/SI series offer this function.

Use a serial key switch inside the control circuit to switch off the laser.

You will find details for the wiring in the instruction manual, Chap. 5.2.6.

With standard sensors, connecting the supply voltage activates the laser light source in the sensor.
Ethernet Connection, Standard Connection to PC

<table>
<thead>
<tr>
<th>RJ45 connector</th>
<th>8-pin. screw connector (sensor side)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin no.</td>
<td>Color stranded hook-up wire SCR3000A-x</td>
</tr>
<tr>
<td>1</td>
<td>white (orange)</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>3</td>
<td>white (green)</td>
</tr>
<tr>
<td>4</td>
<td>blue</td>
</tr>
<tr>
<td>5</td>
<td>white (blue)</td>
</tr>
<tr>
<td>6</td>
<td>green</td>
</tr>
<tr>
<td>7</td>
<td>white (brown)</td>
</tr>
<tr>
<td>8</td>
<td>brown</td>
</tr>
</tbody>
</table>

View on pin side male cable connector

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

- The sensor supports an automatically, sensor-adapted 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 the retrieval in the link-local-net.
- The sensor scanCONTROL 30xx supports Power over Ethernet.

**NOTICE**

If the sensor is connected to a network adapter/switch that is capable of POE and if you also use the power supply of the multifunction port, these two power supplies have to be galvanically isolated.

> Damage of the sensor and/or the Ethernet card!

- A fixed IP address can be assigned.

Use the program “SensorFinder” delivered on the CD, to make the above-described sensor settings.

**LED Displays**

<table>
<thead>
<tr>
<th>LED Laser</th>
<th>LED Data</th>
<th>LED Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow: Laser on</td>
<td>Green: Measurement is active</td>
<td>Red, flashes: Error code, see operating instructions Chap. 11</td>
</tr>
<tr>
<td>Green, flashes: Data transmission is active</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The **Data** LED flashes green, long during active transmission and short for controller accesses.
7. Transmitting Measurement Results

scanCONTROL 30xx offers the following options for transmitting measurement results:

- Ethernet interface
  - Modbus TCP protocol
  - UDP protocol
  - Analog output of measurement values (via optional Output Unit)
  - Digital output of switching signals (via optional Output Unit)
  - Fieldbus connection Profinet, Ethernet/IP, EtherCat (via optional Gateway)
- RS422 interface
  - Modbus RTU protocol
  - Measurement value transmission in ASCII format

8. System Requirements

scanCONTROL Configuration Tools
The following minimum system specification is necessary:

- Windows 7 (32 bit and 64 bit), Windows 8 or 8.1 (32 bit and 64 bit), Windows 10 (32 bit and 64 bit)
- 1-GHz or faster (32 bit and 64 bit) processor / 1 GB RAM
- Screen resolution: 1024 x 768

scanCONTROL 3D-View
The following minimum system specification is necessary:

- Windows 7 (64 bit), Windows 8 or 8.1 (64 bit), Windows 10 (64 bit)
- 1-GHz or faster (64 bit) processor
- 1 GB RAM
- Screen resolution: 1024 x 768
- Graphic card / GPU with OpenGL 3.1 or higher
9. Quick Start: Commissioning, Software

Install the software.

Please insert the scanCONTROL Software CD in the CD-ROM device. Follow the dialog through the installation process.

A. Reading of installation help
B. Installation of software
C. Further information in the online documentation

Mount the sensor according to the installation instructions.
Connect the sensor to the PC via the Ethernet cable.
Connect the sensor to display or monitoring units.
Connect the sensor to the power supply.
The connectors for Ethernet and the multifunction port are fitted with a screw connector.
Loosen the screws before you remove the connector from the socket.
Connect the shield of the power supply cable to the PE protective earth conductor of the main power supply. Close unused connection plugs with the provided protective caps. Switch on the power supply (24 VDC).

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

Please wait until the scanCONTROL device is recognized by the PC.
This may take a few seconds.

Now you can operate the scanCONTROL measurement system with the scanCONTROL software packages.

Operating a scanCONTROL sensor via Ethernet may require a modification of the IP settings of the PC/sensor or a modification of the firewall settings, see Chap. 5.2.5 of instruction manual.
10. 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 information about the measurement.

11. 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 application integration (C, C++, C# and others)

For details how to access profile data refer to the enclosed online manual.
scanCONTROL 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 carried out of 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 scanCONTROL Gateway (e.g. Laser on/off or switch User Mode).

The scanCONTROL Gateway can connect up to four scanCONTROL SMART sensors to the fieldbus. The transmission rate of measurement values is up to 500 Hz. Please refer to the TechNote T026 (scanCONTROL fieldbus integration) for more details.
13. scanCONTROL 30xx with scanCONTROL Output

Status voltage supply
- Power jumper contacts
- System
Data contacts
System supply (OUT)
24 V
0 V
Supply via power jumper contacts
24 V
0 V
System supply (In)
24 V
0 V
Power jumper contacts

OU fieldbus coupler
OU filter module
Connect the supply voltage

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

After mounting of the modules install the required wiring.

- Connect the “System supply (out)” terminals of the OU-Filter module to the “System supply (in)” terminals 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 resp. 0 V and 5 V).

The system supply and field supply should be separated to ensure the bus operation and electrical isolation in case of a short-circuit of an actor.
14. Further Information

Please refer to

- the enclosed online manual
- the section “Status and Error Messages“ and “Notes“ in the scanCONTROL Configuration Tools manual.

You will find details to the separate programs in the respective instruction manuals or in the instruction manual of this sensor, Chap. 6.2. You will find the instruction manuals online or on the provided CD.