Assembly Instructions

optoCONTROL 2520
Laser micrometer
Assembly Instructions

**optoCONTROL 2520**

**Functions**
- Edge measurement with the shadow principle (Edge low-high; edge high-low)
- Measurement of diameter-, width-, gap incl. center axis
- Counting of edges or segments, any segment situations or widths; calculation of the center axes between edges
- Trigger, synchronization and further functions
- RS422, Ethernet or EtherCAT interface, transfer of several measuring values to the PC
- Measuring rate 2.5 kHz

**Warnings**
Connect the power supply according to the safety regulations for electrical operating equipment.
Supply voltage must not exceed specified limits.
> Danger of injury, damage to or destruction of the sensor
Protect cables against damage.
> Failure of the measuring device
Avoid shock and vibration to the light source and the receiver.
> Danger of injury, damage to or destruction of the sensor

**Notes on CE Identification**
The following applies to the optoCONTROL 2520: EMC regulation 2004/108/EC
The sensor satisfies the requirements according to the standards
EN 61000-6-3 / EN 61326-1 (class B) emitted interference
EN 61000-6-2 / EN 61326-1 interference immunity

**Proper Environment**
Protection class: IP 64 applies only with connected cable (with protective cap on Ethernet connector)
Operating temperature: +5 ... +50 °C
Storage temperature: -20 ... +70 °C
Mounting the Components
- Light source
- Receiver
- On the delivered mounting rail (or free mounting on own stable appliance)
- Power supply
- Laptop / PC

Position the light source and the receiver without covering the connectors and the display elements.

Connect the components.

Dimensional Drawings
Light source and receiver

Light Source Female Connector (3-pin)
There are cables of various lengths (1 m, 2 m or 5 m, each one optionally with straight plug or angled connector) for the connection between the light source and the receiver.
### Power Signals Female Connector (14-pin)
A cable with open ends (PC/SC2520-3) is included.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
<th>Comments</th>
<th>Cable color</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC</td>
<td>Operating voltage</td>
<td>11 ... 30 VDC, I max &lt; 1 A</td>
<td>Red</td>
</tr>
<tr>
<td>GND</td>
<td>Operating voltage ground</td>
<td></td>
<td>Black</td>
</tr>
<tr>
<td>Out 1</td>
<td>Switching output 1</td>
<td>Error or limits, not electrically isolated, 24 V logic (HTL), High level depends on operating voltage</td>
<td>Blue</td>
</tr>
<tr>
<td>Out 2</td>
<td>Switching output 2</td>
<td></td>
<td>Pink</td>
</tr>
<tr>
<td>In</td>
<td>Input</td>
<td>Not electrically isolated, 24 V logic (HTL), Low level ≤ 3 V, High level ≥ 10 V</td>
<td>Gray/pink</td>
</tr>
<tr>
<td>Sync - In/out</td>
<td>Input synchronization or triggering, synchronous output</td>
<td>symmetrical, RS422 level, load resistance 120 Ohm and direction via software switchable, not electrically isolated</td>
<td>White/green</td>
</tr>
<tr>
<td>/Sync - In/out</td>
<td></td>
<td></td>
<td>Red/blue</td>
</tr>
<tr>
<td>RX - 422</td>
<td>RS422</td>
<td>Serial input, symmetrical, internally terminated with 100 Ohm</td>
<td>Brown</td>
</tr>
<tr>
<td>/RX - 422</td>
<td></td>
<td></td>
<td>Green</td>
</tr>
<tr>
<td>/TX - 422</td>
<td></td>
<td>Serial output RS422, symmetrical</td>
<td>Yellow</td>
</tr>
<tr>
<td>TX - 422</td>
<td></td>
<td></td>
<td>Grey</td>
</tr>
<tr>
<td>GND - RS 422</td>
<td>Ground</td>
<td>Ground reference for RS422-Pegel</td>
<td>Violet</td>
</tr>
<tr>
<td>Ana - Out</td>
<td>Voltage output</td>
<td>0 ... 10 V, not electrically isolated, only one measuring value, 14 bit D/A</td>
<td>Shielded inner cable: White inner conductor</td>
</tr>
<tr>
<td>Ana - GND</td>
<td>Ground analog output</td>
<td>Reference ground for analog signal</td>
<td>Shielded inner cable: Shielding braid</td>
</tr>
<tr>
<td>PE</td>
<td>Total outer shield</td>
<td>Connect with PE of the system</td>
<td>Black shrinking hose with wire end</td>
</tr>
</tbody>
</table>

- Connect at least the power supply and switch it on.
- Adjust the position of the light source in direction to the receiver when mounting without rail.
- The laser light has to hit exactly the center of the entry window of the receiver.
  Please consider: The larger the distance between light source and receiver, the more exactly has to be adjusted.

### Ethernet/EtherCAT Female Connection (4-pin)
Electrically isolated M12x1-female connection in combination with an Ethernet-network (PC) or with the bus system EtherCAT. There is an Ethernet cable with straight plug on RJ45-plug, 3 m long (accessory). The receiver is connected with a PC or generally with a network via the Ethernet interface. The internal web pages can be retrieved with a web browser and thereby the measuring system can be configured.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Pin female connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX+</td>
<td>2</td>
</tr>
<tr>
<td>RX-</td>
<td>4</td>
</tr>
<tr>
<td>TX+</td>
<td>1</td>
</tr>
<tr>
<td>TX-</td>
<td>3</td>
</tr>
</tbody>
</table>

Solder pin side on the cable
Meaning of the Light Emitting Diodes on the Receiver

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power on</td>
<td>green</td>
<td>---</td>
</tr>
<tr>
<td>Status</td>
<td>yellow</td>
<td>Ethernet transmission error; when EtherCAT-interface is active, the meaning depends on the EtherCAT guidelines</td>
</tr>
<tr>
<td>Speed</td>
<td>yellow</td>
<td>Baud rate 100 Mb</td>
</tr>
<tr>
<td></td>
<td>off</td>
<td>Baud rate 10 Mb</td>
</tr>
<tr>
<td>Link/activity</td>
<td>green</td>
<td>Active link</td>
</tr>
<tr>
<td></td>
<td>off</td>
<td>Inactive link</td>
</tr>
<tr>
<td></td>
<td>Flasing</td>
<td>Network activity</td>
</tr>
</tbody>
</table>

Quick Start Guide

The sensor is delivered ex works with the IP address 169.254.168.150. The IP address of the sensors which are connected to a PC/network can be interrogated with the program SensorFinder.exe.

1. Start the SensorFinder and press the Find sensors button.
2. Select the correct sensor from the list.
3. Press the Start browser button in order to connect the sensor with your standard browser.

The start screen of the sensor software should be displayed now in the web browser:

Selecting the Measuring Distance

1. Open the menu Settings > Measuring distance.
2. Select a calibrated measuring distance from the list and confirm with Submit.
3. If the measuring distance changes during the measurement or if the target edge has a large thickness parallel to the laser beam, a considerable linearity error can occur.

Selecting the Measuring Program

1. Open the menu Settings > Measurement program.
2. Select the desired measurement e.g. Edge Low-high.
Executing the Light Source Reference
This adjustment is at least necessary once after mounting and a warm-up time of 30 min but can also
be repeated very often in case of elevated accuracy requirements.
- There must not be any object between the light source and the receiver when executing the light
correction.

Press the light source reference via the menu Video signal > Light source reference >
button Start light source reference.
Press respectively once the Stop and Start buttons if the diagram does not start again
automatically.

Aligning the Target
Align the target in the measuring distance chosen to the receiver, as centrally as possible in the
measuring range.
If the edge to be measured has a large thickness, the latter has to be aligned exactly parallel to the
laser beam.

Controlling the Video Signal
Open the menu Video signal and check it.
The edges to be measured have to cross the detection threshold. Should a transparent measuring
target should be measured, you can increase the detection threshold which can consequently
influence the linearity.

Controlling the Measurement
Open the menu Measurement and check the timing diagram of measurement.
You can select further data for the display in the measurement programs Diameter, Gap and
Segment e.g. single edges or center axes.
You can also quickly modify averaging settings and observe their effects on this site.

Save Settings
Save the current settings in the receiver with a setup.
Otherwise the settings will be lost by switching-off.

Read the detailed instruction manual before using the sensor. The manual is available online on
www.micro-epsilon.de/download/manuals/man--optoCONTROL-2520--en.pdf or
on the supplied CD.