

SI-COLO-GD Series

▶ SI-COLO-GD-40

- Relative gloss detection (direct/diffuse)
- 3-color filter detector
- Measuring range typ. 35 mm ... 45 mm
- Up to 31 color/gloss values can be stored
- RS232 interface (USB adapter available optionally)
- 8x white-light LED, 30 kHz modulated, insensitive to outside light
- Detection of color, shades of grey and gloss
- Brightness correction can be activated
- Several TEACH possibilities (via PC, PLC, or teach button)
- Various evaluation algorithms can be activated
- Switching state indication by means of 5 yellow LEDs
- Averaging can be activated (from 1 up to more than 32000 Werte,
- RS232/Ethernet converter available as an accessory

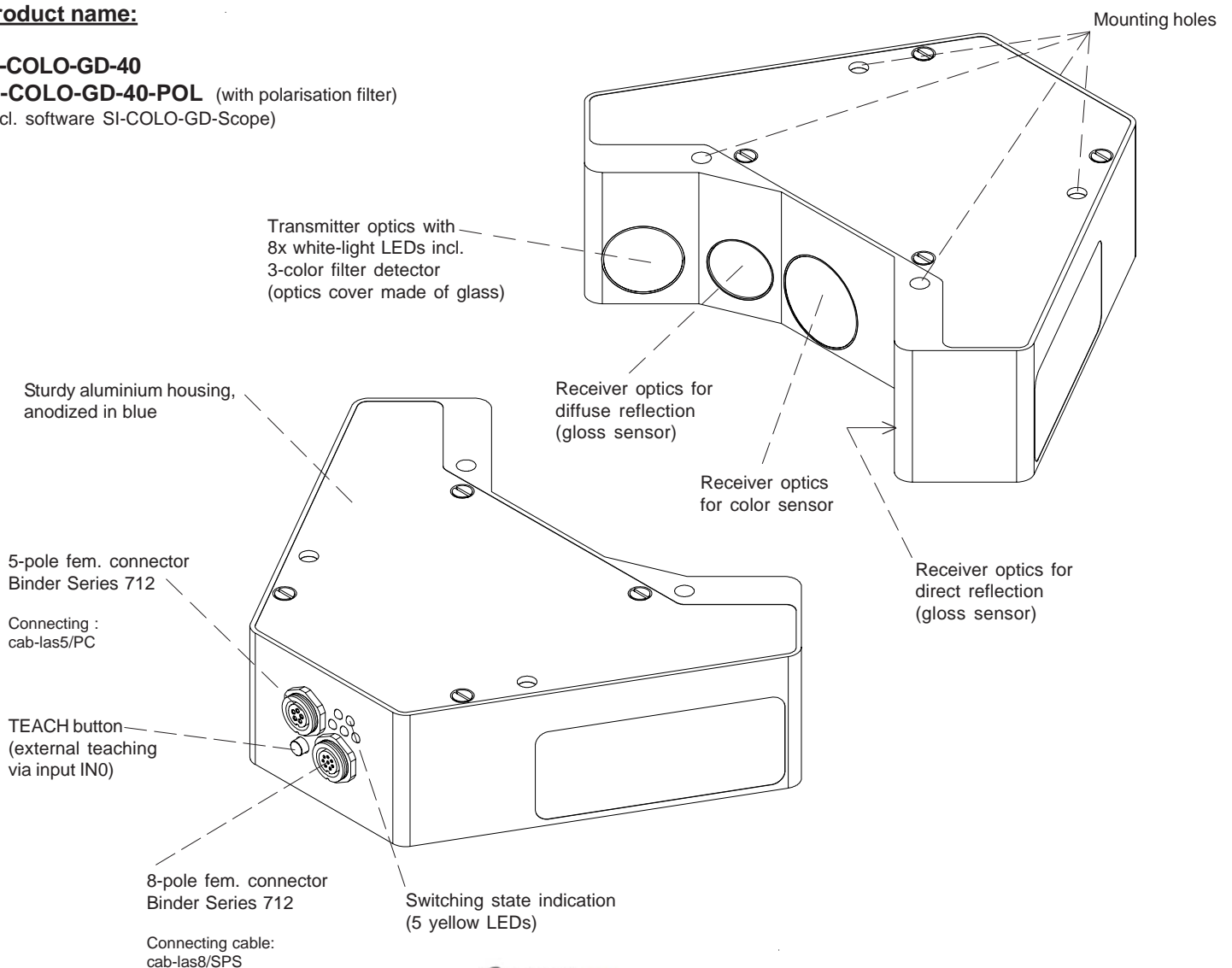


Design

Product name:

SI-COLO-GD-40

SI-COLO-GD-40-POL (with polarisation filter)
(incl. software SI-COLO-GD-Scope)

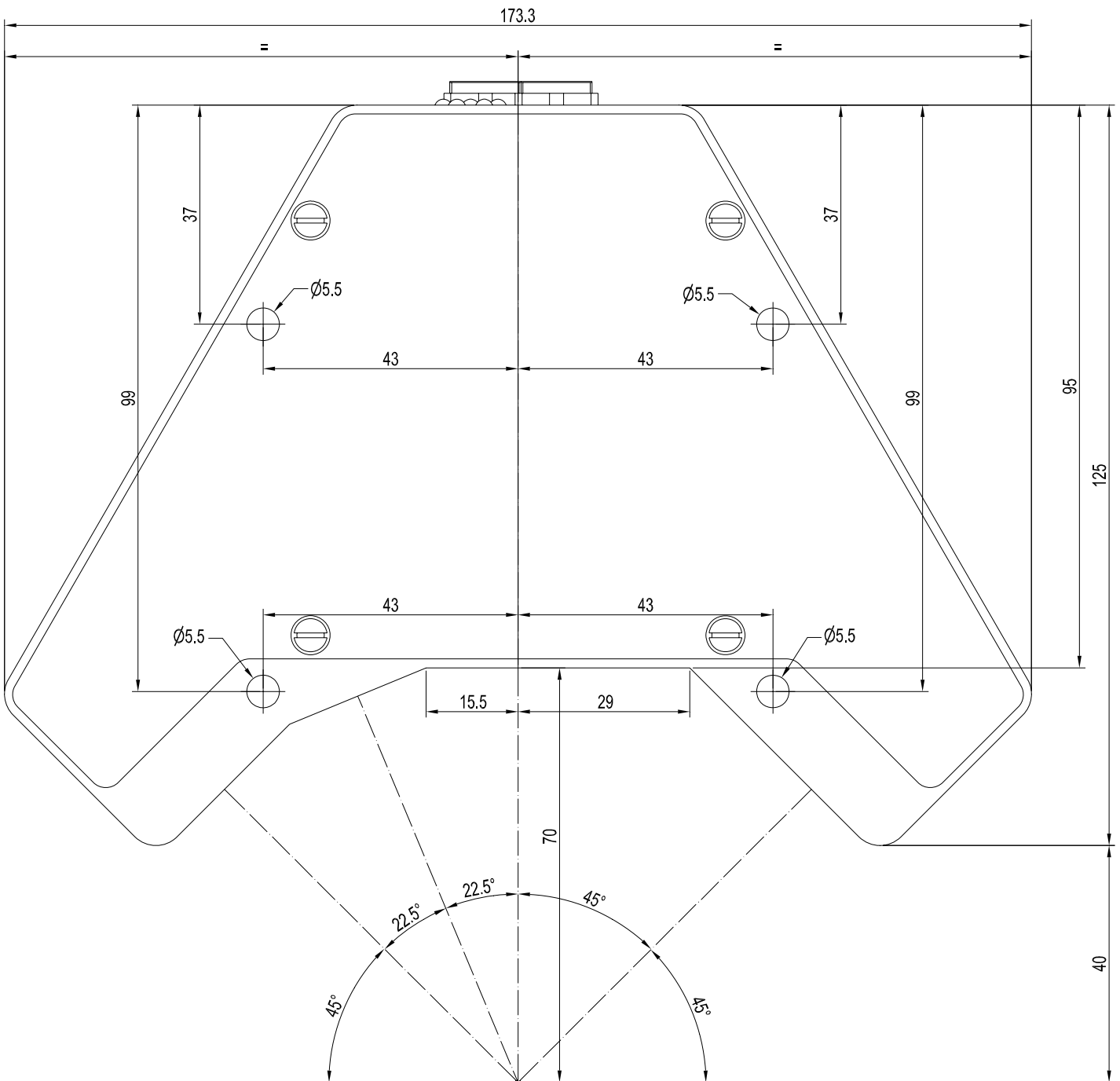
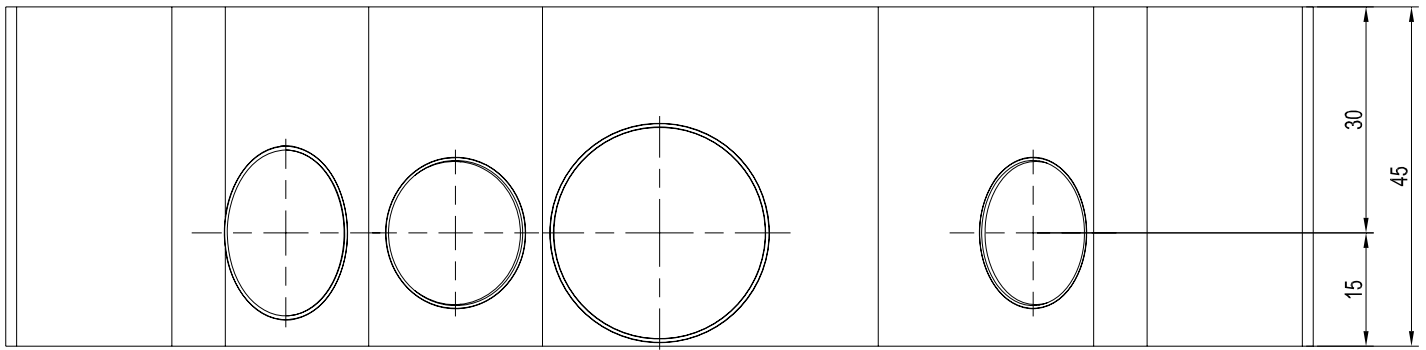




Technical Data

Model	SI-COLO-GD-40
Light source	8x white-light LED, modulated 30 kHz
Object distance	typ. 35 mm ... 45 mm
Detection range (half intensity width)	typ. 20 x 30 mm at a distance of 40 mm
Reproducibility	in the x,y color range each 1 digit at 12-Bit-A/D conversion
Receiver	3-color filter detector, 2 photo detectors (gloss)
Alternating light operation	30 kHz
Ambient light	up to 5000 Lux
Enclosure rating	Electronics IP64, optics IP 67
Current consumption	typ. 320 mA
Interface	RS232, parameterisable under Windows®
Type of connector	Connection to PLC: 8-pole circular fem. connector Binder series 712 Connection to PC: 5-pole fem. connector Binder series 712
EMC test acc. too	DIN EN 60947-5-2
Housing material	Aluminium, anodized in blue
Operating temperature range	-20°C ... +55°C
Storage temperature range	-20°C ... +85°C
Pulse lengthening	adjustable under Windows® 0 ms ... 100 ms
Max. switching current	100 mA, short-circuit proof
Switching frequency	max. 1 kHz (depends on number of colors to be taught and setting of AVERAGE)
Outputs	5 digital outputs: OUT 0 ... OUT 4 (0V/+Ub), short-circuit proof, 100 mA max. switching current npn-/pnp-able (bright-/dark-switching, can be switched over via software)
Averaging	over max. 32768 values
Voltage supply	+24VDC (± 10%), reverse-polarity proof, overload-protected
Switching state indication	Visualization by means of 5 yellow LEDs
Color memory capacity	non-volatile EEPROM with parameter sets for max. 31 colors
TEACH button	for external teaching of color/gloss references via input IN0
Temperature drift	temperature compensated

Dimensions



All dimensions in mm

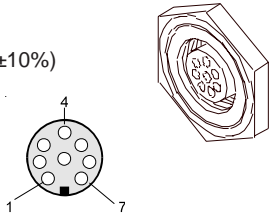
Connector Assignment

Connection to PLC:

8-pole fem. connector Binder series 712

Pin: Color: Assignment:

1	white	GND (0V)
2	brown	+24VDC (±10%)
3	green	INO
4	yellow	OUT0
5	grey	OUT1
6	pink	OUT2
7	blue	OUT3
8	red	OUT4

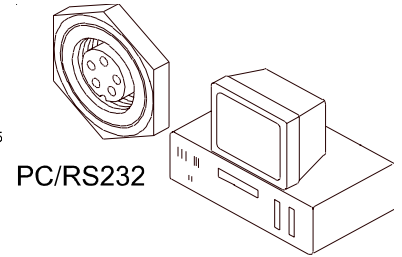
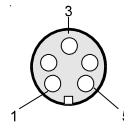


Connection to PC:

5-pole fem. connector Binder series 712

Pin: Assignment:

1	GND (0V)
2	TX0
3	RX0
4	+24VDC (+Ub, OUT)
5	not connected

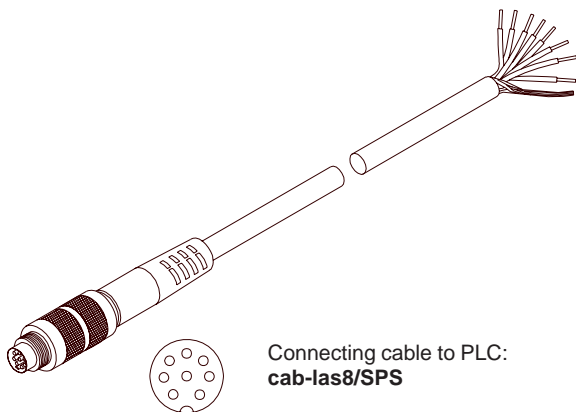


PC/RS232

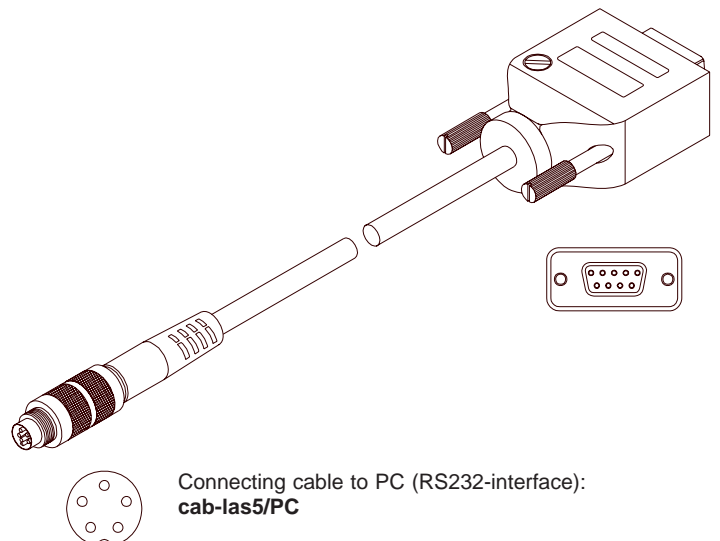
Connecting cables

Connecting cables:

cab-las8/SPS Length: 2m Outer jacket: PUR
cab-las5/PC Length: 2m Outer jacket: PUR



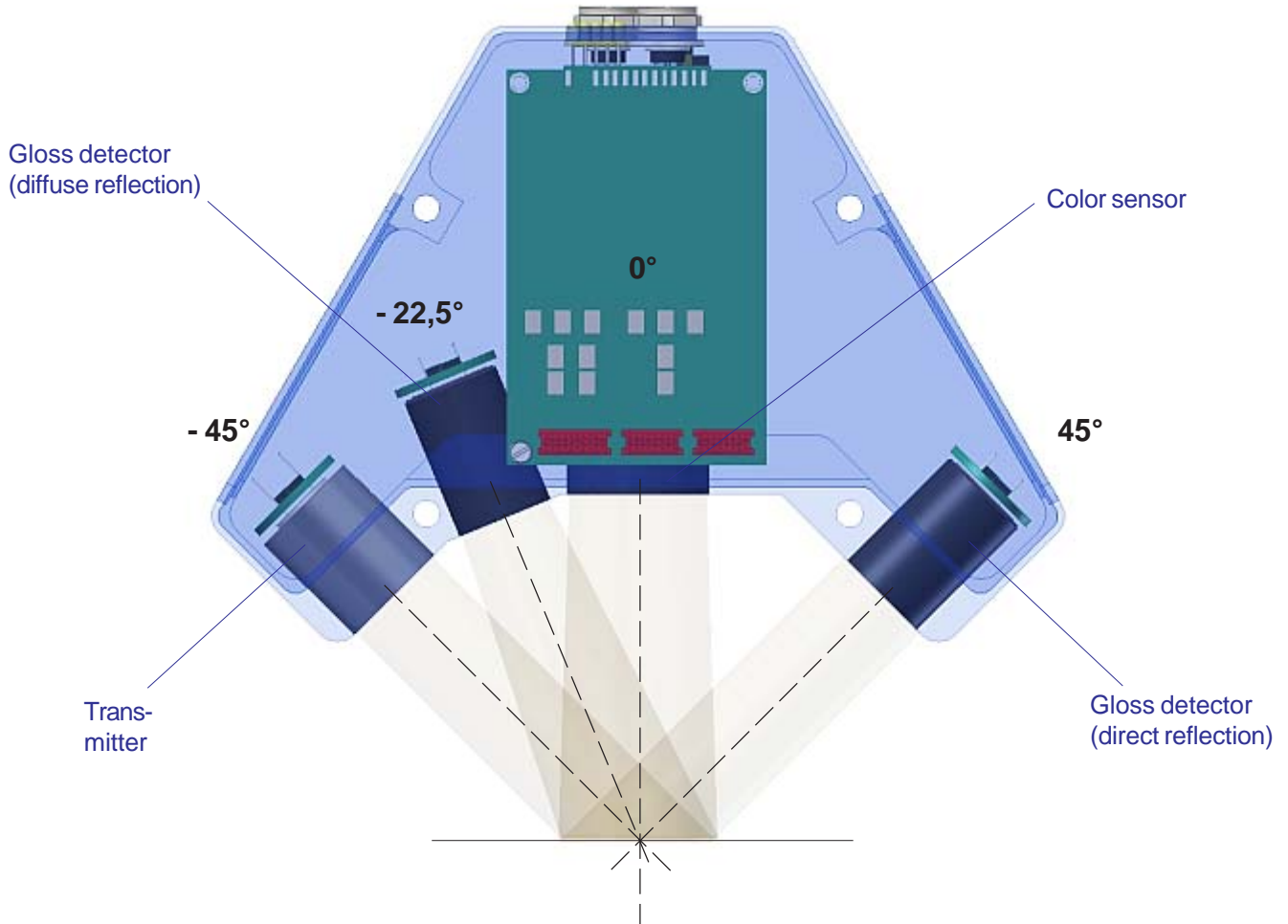
Connecting cable to PLC:
cab-las8/SPS



Connecting cable to PC (RS232-interface):
cab-las5/PC

**Measuring Principle****Measuring principle:**

Modulated white-light (collimated) is directed under an angle of -45° onto a surface to be checked. Through an optical receiver unit part and a photo diode the direct reflection is then measured under an angle of $+45^\circ$. The diffuse reflection is measured under an angle of $-22,5^\circ$ while color measurement is done under 0° .



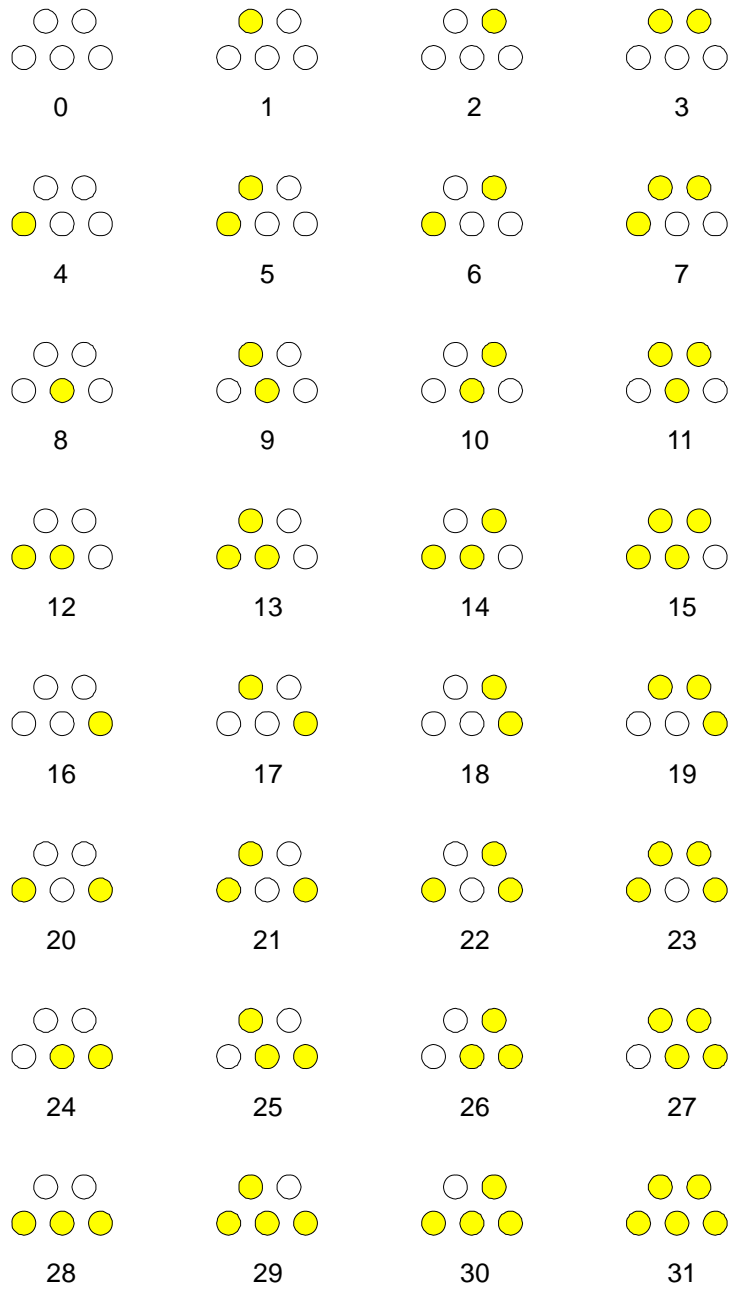
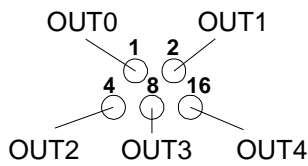
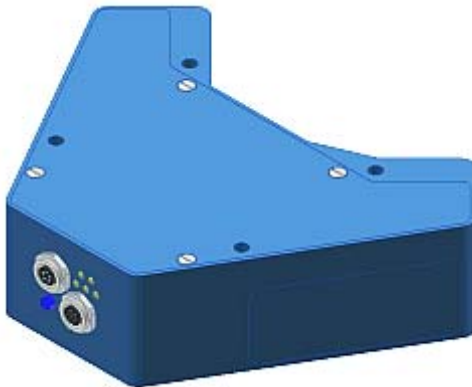
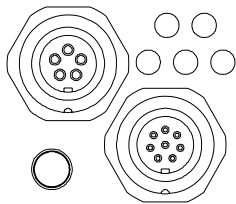


LED Display

Visualization of the color/gloss code:

The color/gloss code is visualized by means of 5 yellow LEDs at the housing of the color/gloss sensor. At the same time the color code indicated at the LED display is output as 5-bit binary information at the digital outputs OUT0 ... OUT4 of the 8-pole PLC connector.

In the DIRECT mode the maximum number of teach vectors to be taught is 5. These 5 teach vectors can be directly output at the 5 digital outputs. The respective detected color/gloss code is displayed by means of the 5 yellow LEDs at the color/gloss sensor housing.

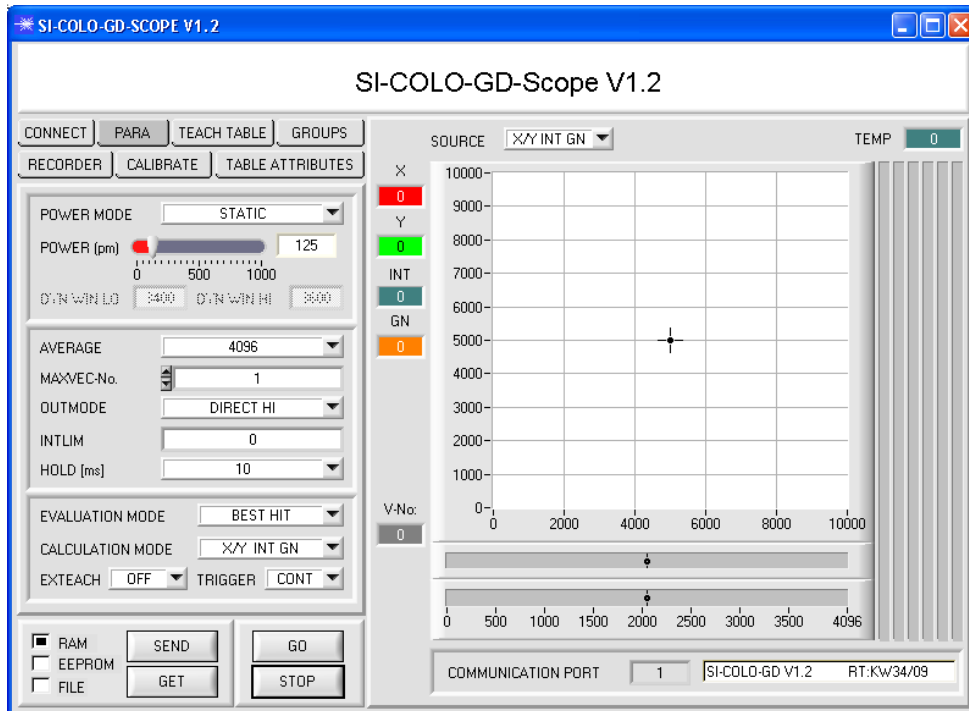


„Error“ or „not detected“

Parameterization

Windows® user interface:

The Windows® user interface facilitates the teach-in process at the color sensor and supports the operator in the task of adjustment and commissioning of the color sensor.



The color sensor is parameterized under Windows® with the SI-COLO-GD-Scope software.

The RS232 interface is used for setting parameters such as:

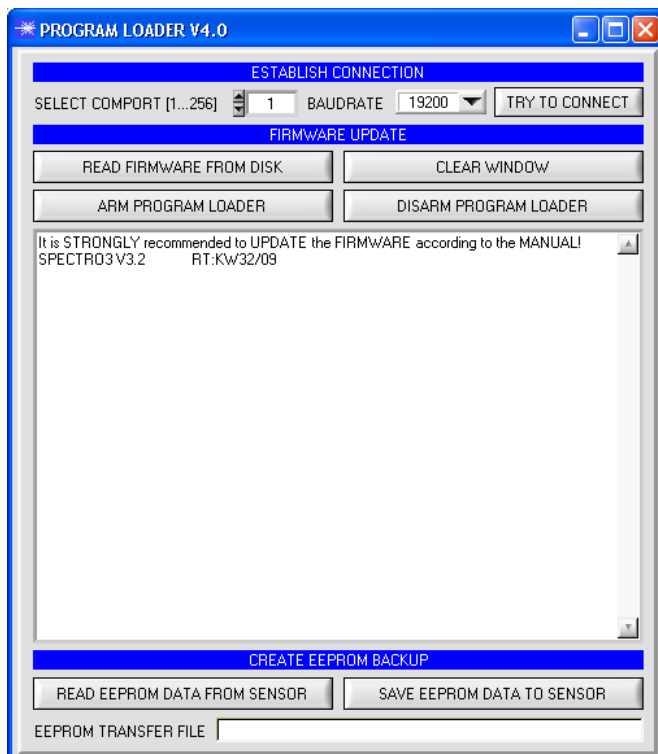
- Averaging over a maximum of 32768 values
- Number of colors to be checked
- Light power of the white-light LED
- Automatic light power control ON/OFF
- Pulse lengthening up to 100ms max.
- External or continuous trigger
- Minimum intensity required for color evaluation

Under Windows® representation of the color value on a PC in numeric form and in a color chart, and representation of RGB values in a time chart.

In addition the current RGB values are displayed as a bar chart.

Firmware-Update

Firmware Update by means of the software „Program Loader“:



The software „Program Loader“ allows the user to perform an automatic firmware update. The update will be carried out through the RS232 interface.

An initialisation file (xxx.ini) and a firmware file (xxx.elf.S) are required for performing a firmware update. These files can be obtained from your supplier. In some cases an additional firmware file for the program memory (xxx.elf.p.S) is also needed, and this file will be automatically provided together with the other two files.

A plausibility check is performed after the initialisation file has been loaded with the Program Loader. If the initialisation file was changed or damaged, it will not be possible to perform a firmware update.

When the plausibility check is successfully completed, the instructions contained in the initialisation file will be carried out step by step.

The complete memory contents of the micro-controller in the sensor will be deleted in a firmware update. This means that both the program in the program memory and the data in the data memory will be lost.

The new firmware automatically writes the correct data to the program memory again.

However, the parameter settings, temperature curves, linearization curves, etc. that are stored in the data memory (EEPROM) will be deleted.

With the Program Loader V4.0 software the data will be saved in the EEPROM, and can be written back again after successful firmware update. For this purpose the software creates an EEPROM backup file.