

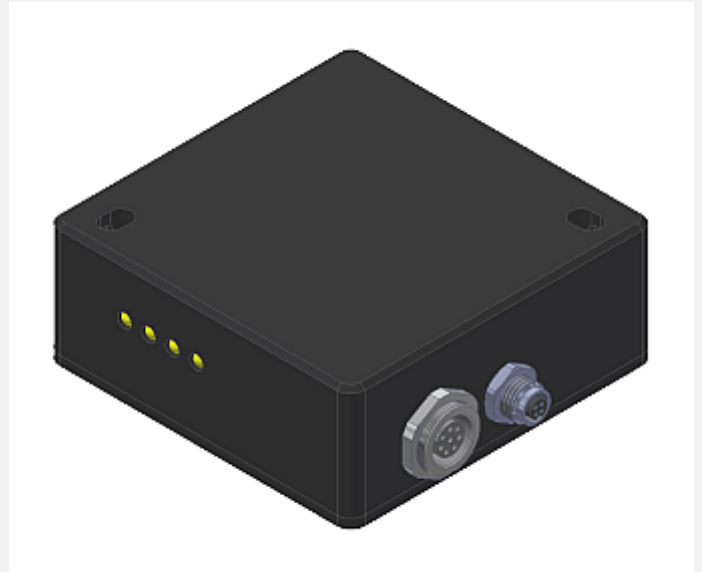
SPECTRO-1 Series

▶ SPECTRO-1-CONLAS-ANA-SC

Stroke Control

Monitoring of the die-cutting process of paper strips or metal and plastic strips

- Electronic control unit for control of a laser analog light barriers of A-LAS Series (e.g. A-LAS-F12-d0.3-20/50-C-1m)
- High scan frequency (> 500 kHz)
- Insensitive to outside light (red light laser 670 nm)
- 1 digital input (0V/+Ub)
- 1 analog output (0...10V or 4...20mA, selectable via software)
- 4 digital output (max. 60 kHz switching frequency)
- Switching state indication by means of 4 yellow LEDs
- RS232 interface (USB or ETHERNET converter available)
- Parameterizable via Windows® software, scope function
- Compact design, sturdy metal housing



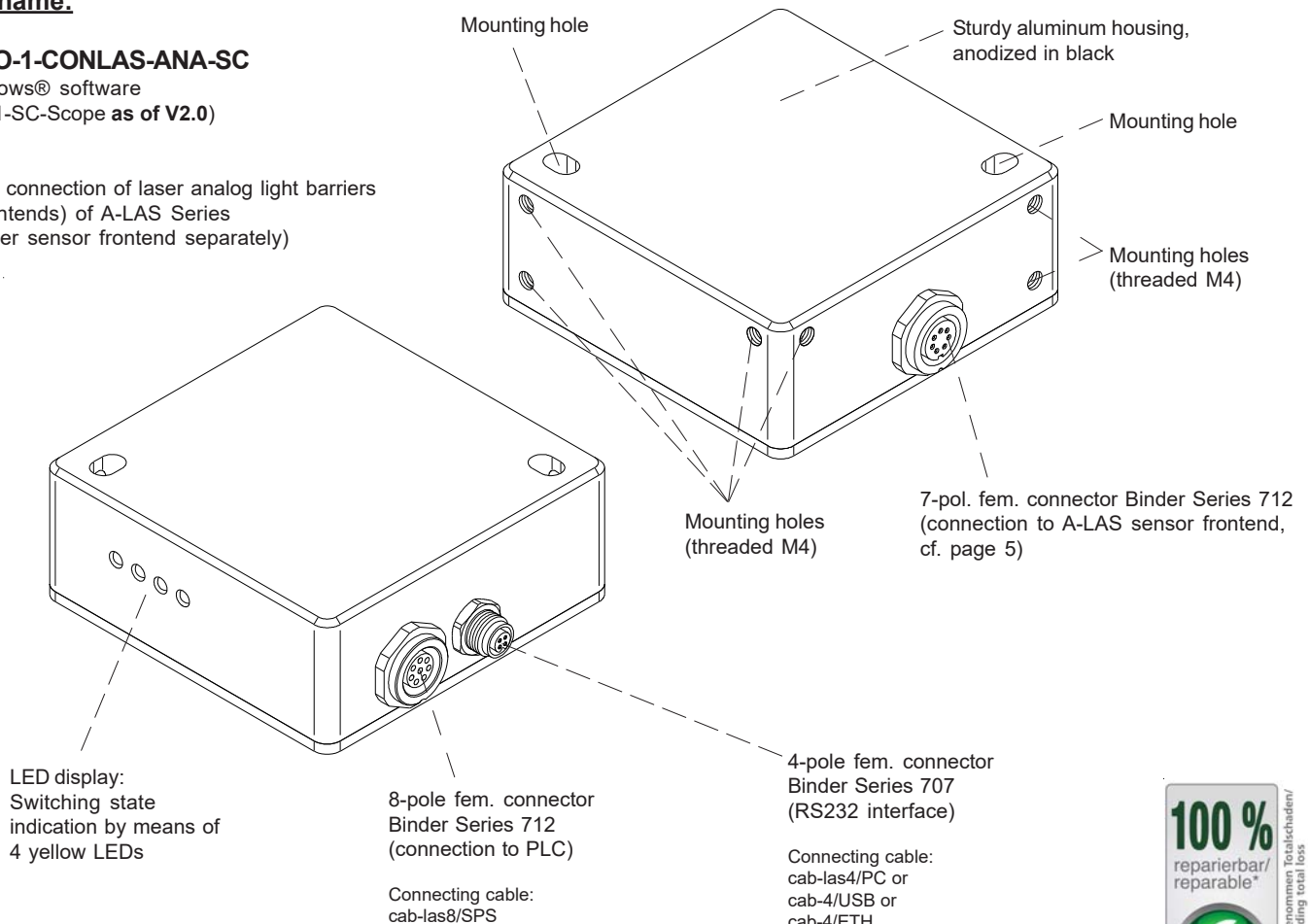
Design

Product name:

SPECTRO-1-CONLAS-ANA-SC

(incl. Windows® software
SPECTRO1-SC-Scope as of V2.0)

Suitable for connection of laser analog light barriers (sensor frontends) of A-LAS Series (please order sensor frontend separately)





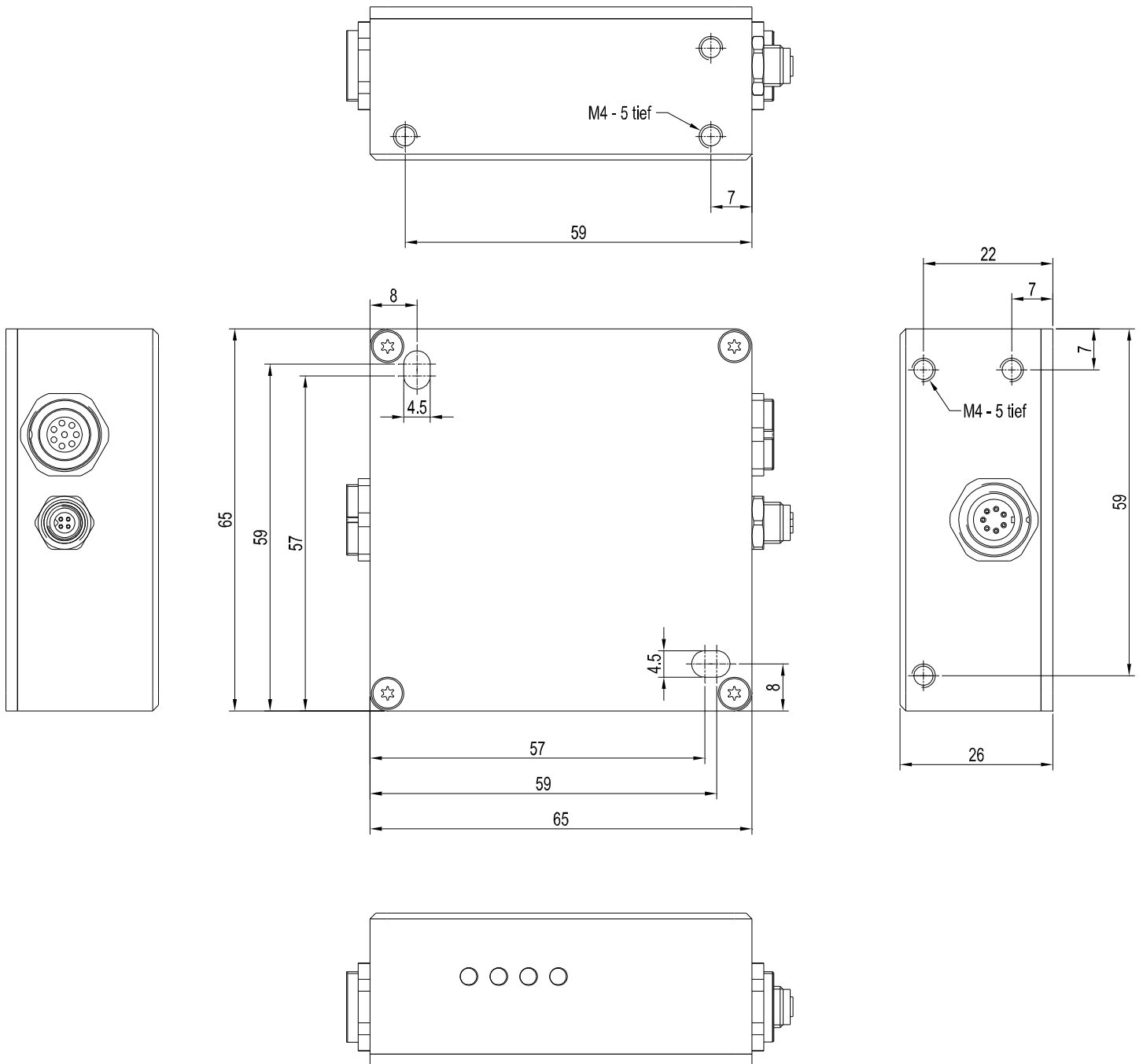
Technical Data

Type	SPECTRO-1-CONLAS-ANA-SC
Voltage supply	+24VDC ($\pm 10\%$), reverse polarity protected, overcurrent protected
Current consumption	< 160 mA
Max. switching current	100 mA, short circuit proof
Digital input (1x)	IN0 (Pin 3): digital (0V/+24V)
Digital outputs (4x)	OUT0 and OUT3 (Pin 5 to 8): digital (0V/+24V), npn/pnp-able (bright-/dark-switching, can be switched)
Analog output (1x)	ANALOG (Pin 4): voltage 0 ... +10V or current 4 ... 20mA, adjustable via PC software
Switching state indication	4 yellow LED visualize the physical state of the outputs OUT0 and OUT3
Interface	RS232
Scan frequency	> 500 kHz
Switching frequency	max. 60 kHz
Transmitter (light source)	via external sensor frontend: solid-state laser, 670 nm, DC-operation, 0.39 mW max. opt. power, laser class 1 acc. to DIN EN 60825-1.
Measuring range	depends on the sensor frontend used
Receiver	by means of external sensor frontend
Ambient light	max. 5000 Lux
Size of light spot	depends on the sensor frontend used
Housing dimensions	LXWxH approx. 65 mm x 65 mm x 26 mm (without connectors)
Housing material	aluminum, anodized in black
Enclosure rating	IP64
Type of connector	connection to PLC: 8-pole fem. connector (Binder series 712) connection to PC: 4-pole fem. connector (Binder series 707) connection to sensor frontend: 7-pole fem. connector (Binder series 712)
Connecting cables	to PLC: cab-las8/SPS or cab-las8/SPS-w to PC/RS232 interface: cab-las4/PC or cab-las4/PC-w to PC/USB interface: cab-4/USB or cab-4/USB-w to PC/Ethernet interface: cab-4/ETH (no connecting cable is required to connect the sensor front end)
Operating temp. range	-20°C ... +55°C
Storage temperature range	-20°C ... +85°C
EMC test acc. to	DIN EN 60947-5-2



Dimensions

SPECTRO-1-CONLAS-ANA-SC
(Electronic control unit)



All dimensions in mm

Connector Assignment

Connection SPECTRO-1-CONLAS-ANA-SC to PLC:
8-pole fem. connector Binder Series 712

Pin:	Color:	Assignment:
1	white	GND (0V)
2	brown	+24VDC ($\pm 10\%$)
3	green	IN0 (Digital 0: 0 ... 1V, Digital 1: +Ub - 10%)
4	yellow	ANALOG (voltage 0...+10V <u>or</u> current 4...20mA)
5	grey	OUT0 (Digital 0: Type 0 ... 1V, Digital 1: Type +Ub - 10%)
6	pink	OUT1 (Digital 0: Type 0 ... 1V, Digital 1: Type +Ub - 10%)
7	blue	OUT2 (Digital 0: Type 0 ... 1V, Digital 1: Type +Ub - 10%)
8	red	OUT3 (Digital 0: Type 0 ... 1V, Digital 1: Type +Ub - 10%)

Connecting cable:
 cab-las8/SPS-(length)
 cab-las8/SPS-w-(length)
 (standard length 2m)

cab-las8/SPS-...
 (max. length 25m, outer jacket: PUR)

cab-las8/SPS-w-...
 (max. length 25m, outer jacket: PUR)

Connection SPECTRO-1-CONLAS-ANA-SC to PC:
4-pole fem. connector Binder Series 707

Pin:	Assignment:
1	+24VDC (+Ub, OUT)
2	GND (0V)
3	RxD
4	TxD

Connection via RS232 interface at the PC:

Connecting cable:
 cab-las4/PC-(length)
 cab-las4/PC-w-(length) (angle type 90°)
 (standard length 2m)

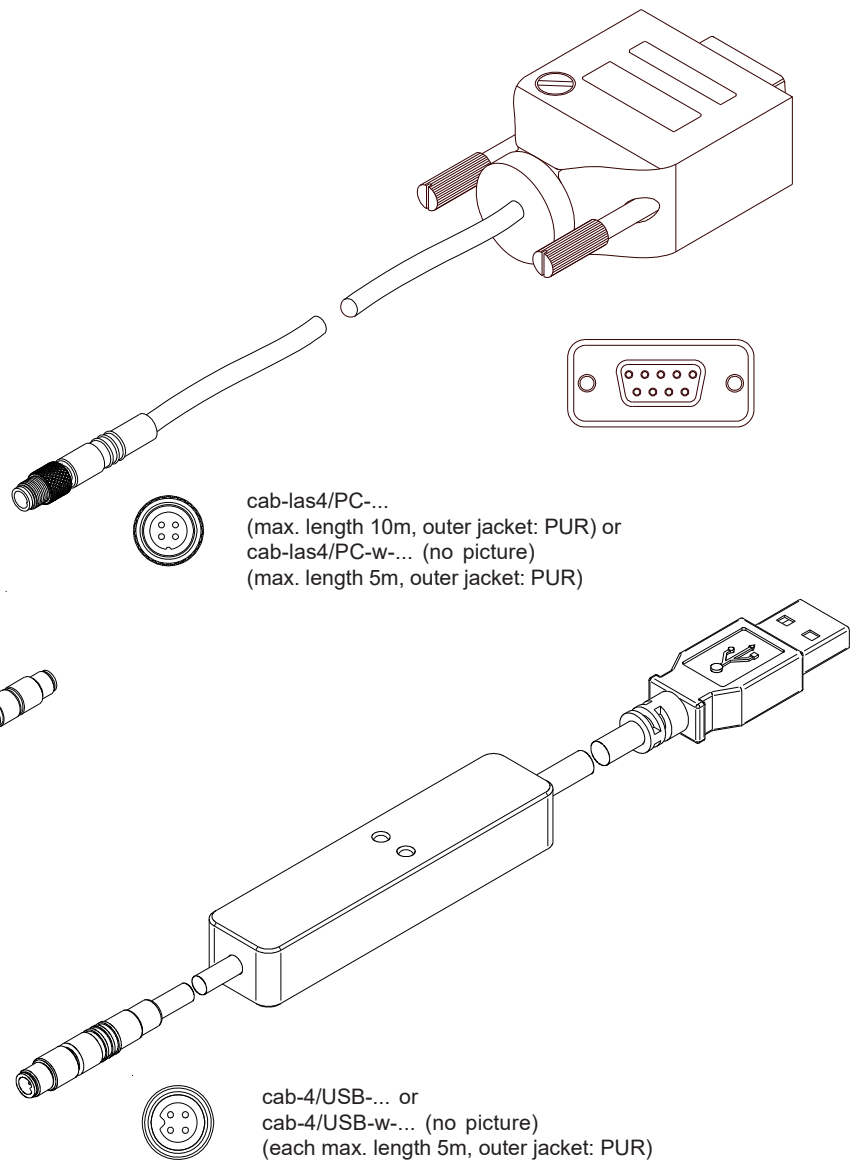
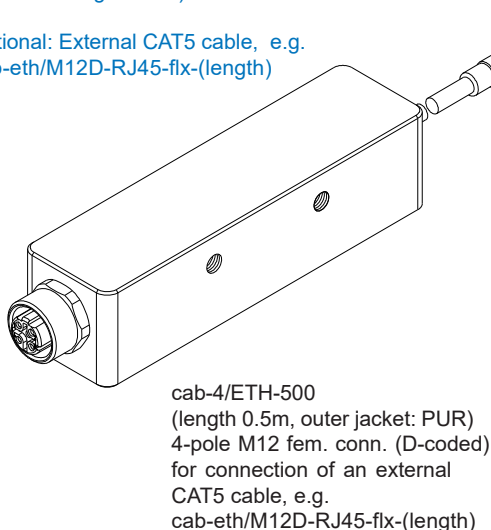
alternative:
Connection via USB interface at the PC:

USB converter (incl. driver software):
 cab-4/USB-(length)
 cab-4/USB-w-(length) (angle type 90°)
 (standard length 2m)

alternative:
Connection to local network via Ethernet bus:

Ethernet converter (incl. software „SensorFinder“):
 cab-4/ETH-500
 (standard length 0.5m)

Optional: External CAT5 cable, e.g.
 cab-eth/M12D-RJ45-flx-(length)



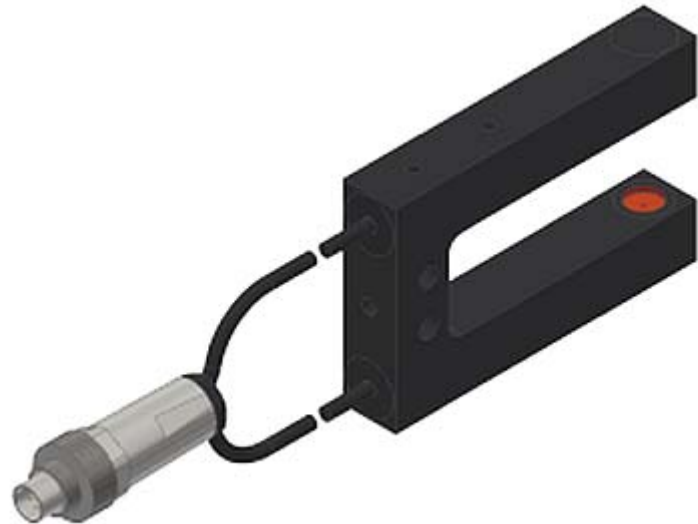
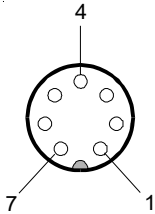


Connection Frontend

Connection of a sensor front end of the A-LAS Series (split design or fork design with integrated cable) to the SPECTRO-1-CONLAS-ANA-SC:

Assignment A-LAS-...-C-(cable length)

Pin:	Assignment:
1	GND (0V)
2	+5V
3	Intensity
4	+5V
5	ANALOG
6	Clock
7	GND (0V)



Connection directly to SPECTRO-1-CONLAS-ANA-SC (no additional connecting cable necessary)

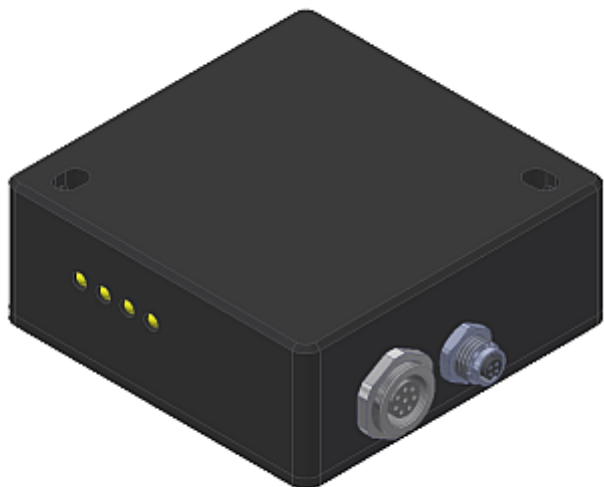
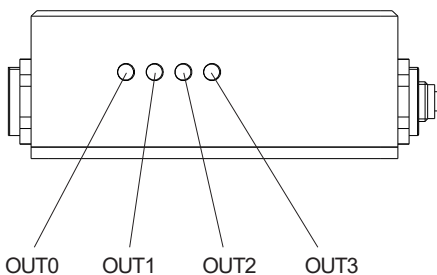
Fork design with integrated cable, e.g.:
A-LAS-F12-d0.3-20/50-C-1m



LED Display

LED display:

By means of the two LEDs the physical state of the two outputs OUT0 to OUT3 is visualized:





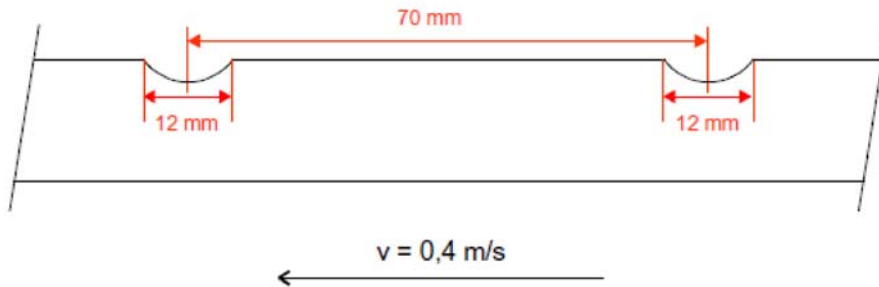
Short description of the functions of the electronic control unit SPECTRO-1-CONLAS-ANA-SC:

Semi-circular gaps are punched in endless cigarette paper strips.

The task is to synchronise the position of the gap with the punching stroke.

The punching stroke either may come too soon, too late, or not at all. It also may be that the light barrier sees no gap. All possible states are output through the outputs OUT0 to OUT3. In addition, an analog output can be activated, which maps the position of the punch stroke within the recess of 0-10V or 4-20mA. The PLC can then react correspondingly and decelerate or accelerate the feed, or even switch off the feed.

Example:

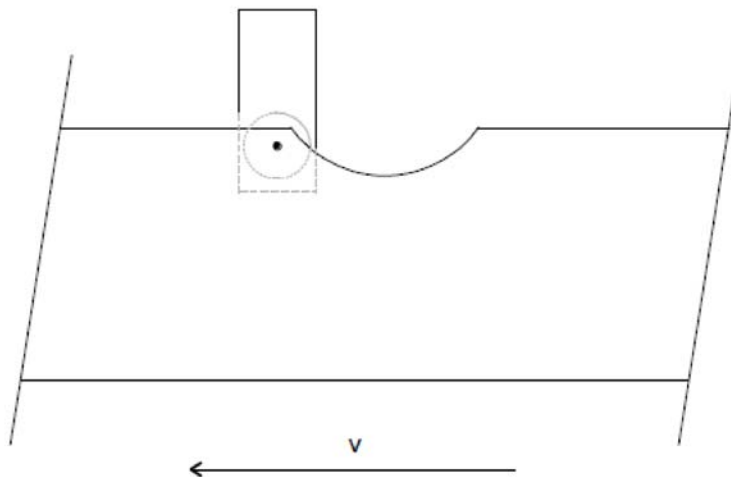


Hardware used:

1. For example an A-LAS-N-F12-d0.3-20/50-C-1m is used to detect the start and end of the gap..
2. Evaluation of the signals (A-LAS-... gap) and of the punching signal (input IN0) is performed by a SPECTRO-1-CONLAS-ANA-SC control unit.
3. Corresponding connecting cables.

Configuration:

The A-LAS-... light barrier must be positioned in such a way that the edge of the punching stroke signal that is selected in the software is present at sensor input IN0 exactly at the moment when the laser spot is exactly in the middle of the gap!!!



Evaluation:

When the laser spot of the A-LAS becomes free (gap starts), the electronic evaluation unit starts an internal counter.

The following counter readings are saved at certain moments.

CNT STROKE is the counter reading when the punching stroke occurs.

CNT GAP is the counter reading when the gap is over. It is equal to the length of the gap.

CNT PERIOD is the time from gap to gap, i.e. one complete period.

The STROKE TOLERANCE parameter defines a tolerance window for the punching stroke within the gap.

Parameterization

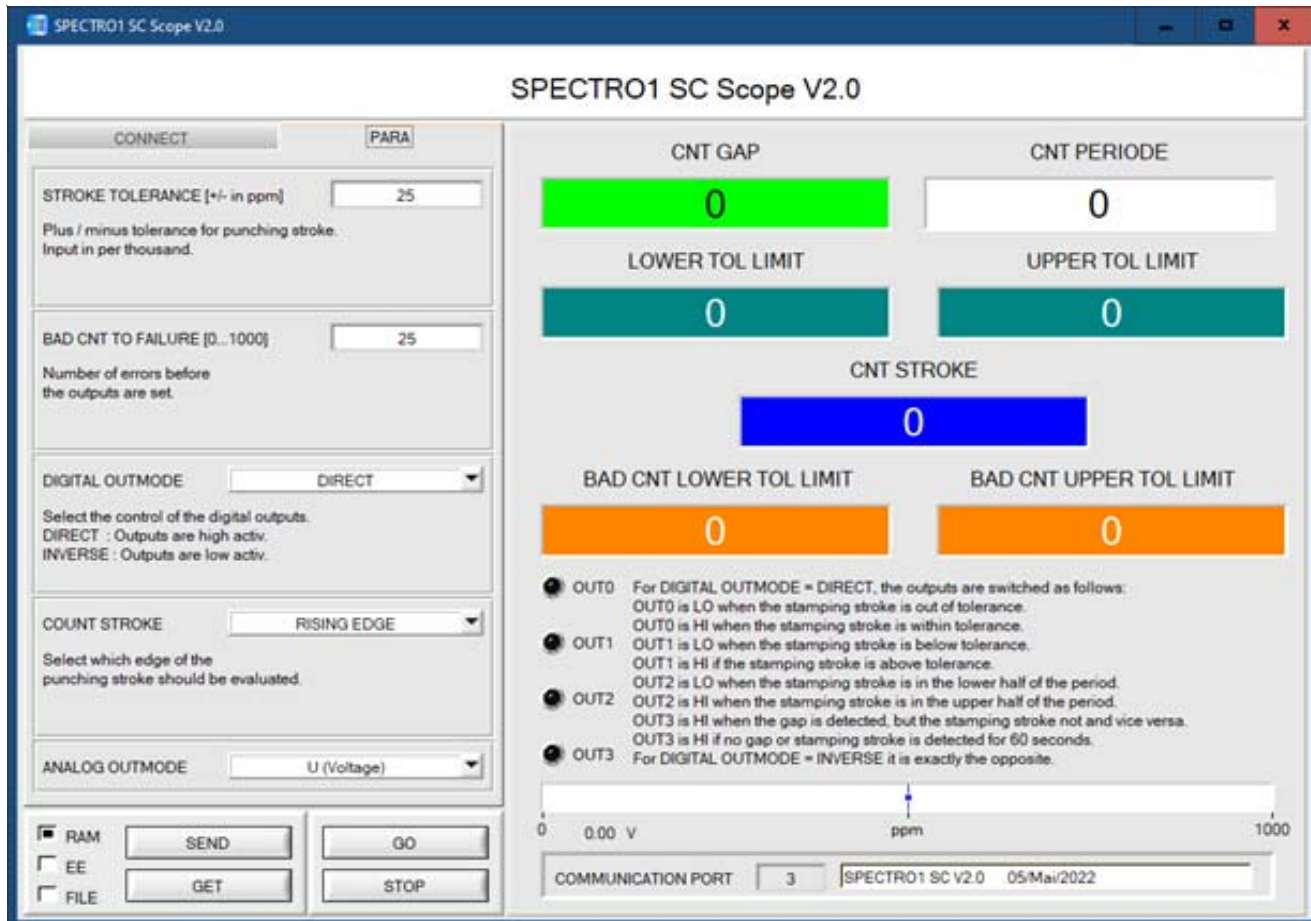
Windows® user interface:

(The current software version is available for download on our website).

The PC software facilitates the parameterisation of the sensor system.

Parameters and measured values can be exchanged between the PC and the sensor either via RS232 or Ethernet (using an Ethernet converter). All parameters can be stored in the sensor's non-volatile EEPROM via the interface.

The software provides various display elements and a graphic window for the visualisation of all the data that are important for parameterisation.



These displays show the counter readings at which an event has occurred.

The counter reading almost exactly is equal to the value in microseconds.

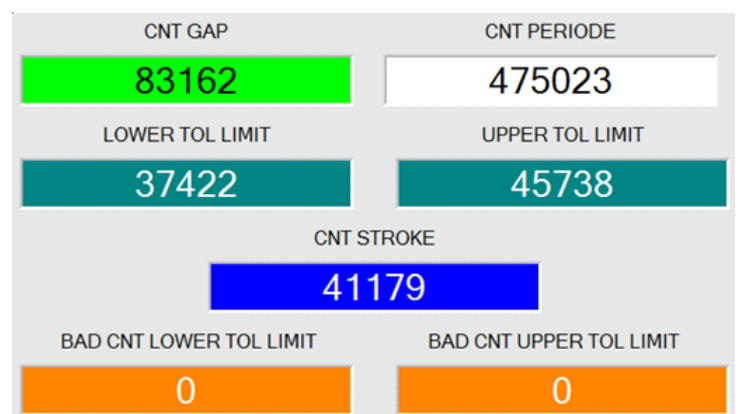
CNT PERIOD: Time from gap to gap.

CNT GAP: Length of the gap.

CNT STROKE: Moment of the punching stroke.

LOWER TOL LIMIT and **UPPER TOL LIMIT** show the tolerance window.

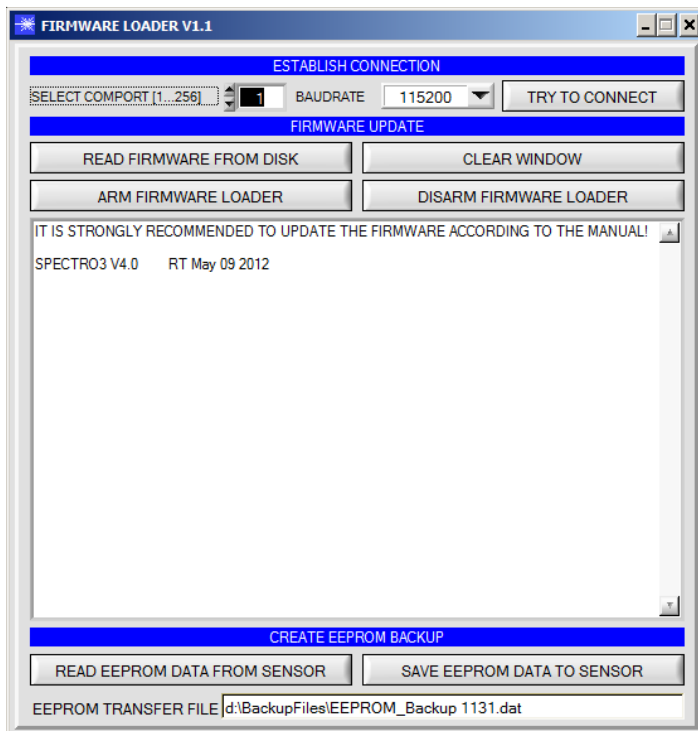
BAD CNT LOWER TOL LIMIT and **BAD CNT UPPER TOL LIMIT** show how many identical errors have occurred in sequence.





Firmware Update

Firmware update by means of the software „FirmwareLoader“:



The software „Firmware 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.



Laser Information

For the use of sensor frontends of A-LAS Series in connection with an electronic control unit SPECTRO-1-CONLAS-ANA-SC the following is valid:

The laser transmitters of A-LAS-N-...-C series and FK-...-LAS-IR series comply with laser class 1 according to EN 60825-1. Under reasonably foreseeable conditions a class 1 laser is safe. The reasonably foreseeable conditions are kept during specified normal operation. The use of these laser transmitters therefore requires no additional protective measures.

The laser transmitters of A-LAS-N-...-C series and FK-...-LAS-IR series are supplied with a laser information label „CLASS 1 Laser Product“.

