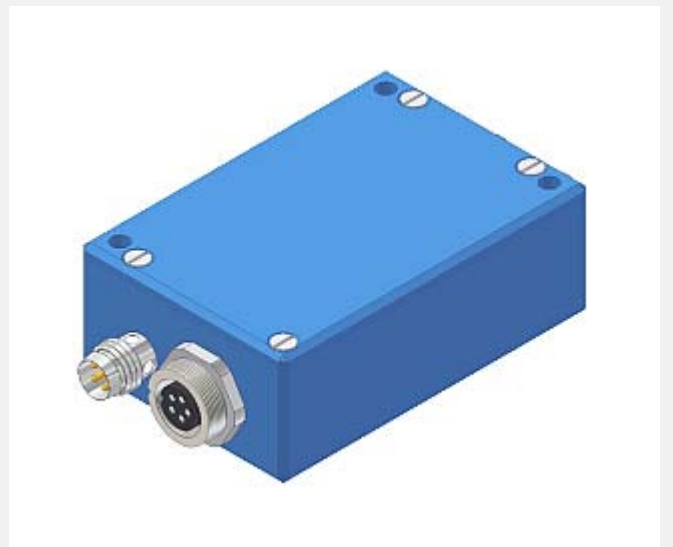# A-LAS Series

▶ **SI-CON4**   **Electronic Control Unit**

- For control of A-LAS analog laser light barriers
- 100%-check of objects (tolerance band monitoring)
- Positioning and thickness check of objects (in µm-range)
- High trigger accuracy (in µm-range)
- High switching frequency
- Threshold correction can be activated via PC
- Adjustment of trigger threshold and tolerance band
  via Windows® software
- Output polarity can be switched via software
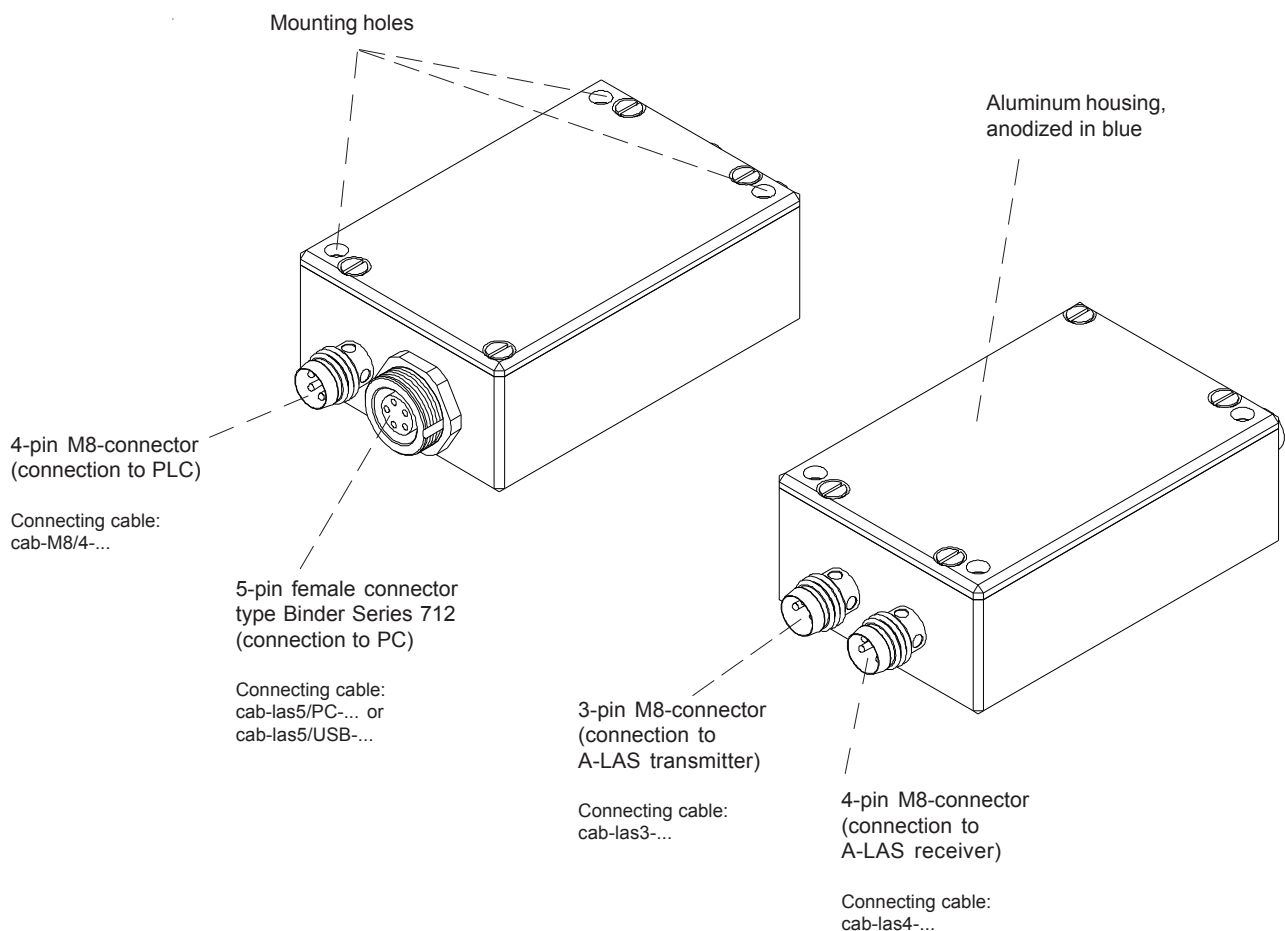- Dirt accumulation compensation

Design

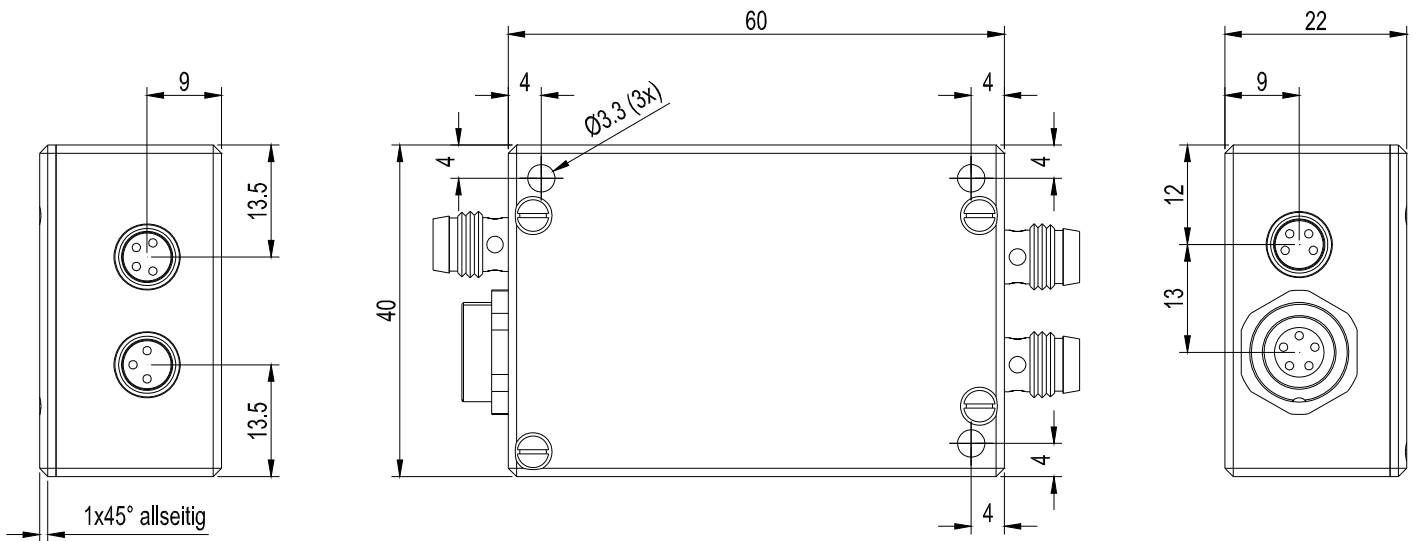**Product name:**

SI-CON4
(incl. Windows® PC software A-LAS-Scope)

Mounting holes

Aluminum housing,
anodized in blue

4-pin M8-connector
(connection to PLC)

Connecting cable:
cab-M8/4-...

5-pin female connector
type Binder Series 712
(connection to PC)

Connecting cable:
cab-las5/PC-... or
cab-las5/USB-...

3-pin M8-connector
(connection to
A-LAS transmitter)

Connecting cable:
cab-las3-...

4-pin M8-connector
(connection to
A-LAS receiver)

Connecting cable:
cab-las4-...

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(2017-07-10) *SI-CON4 / Page 1 of 6*
(—)
Subject to alteration

Technical Data

| Model	SI-CON4
Power supply	+24VDC ± 10%, reversed polarity protected, short-circuit protected
Current consumption	max. 150 mA
Resolution	0,4% (100% = aperture size of A-LAS sensor)
Minimal detectable object	< 10 µm (depends on the aperture used with A-LAS sensor)
Operating temperature range	-20°C ... +55°C
Storage temperature range	-20°C ... +85°C
Enclosure rating	IP64
Threshold correction	Can be activated via software A-LAS-Scope
ANALOG output	0V ... 10V
DIGITAL output	adjustable on the PC: Qinv: NPN bright-switching (NPN normally closed) / PNP dark-switching (PNP normally open) Q: NPN dark-switching (NPN normally open) / PNP bright-switching (PNP normally closed)
Current control input (I-CONTROL):	Laser power adjustable via software A-LAS-Scope
Switching state display	Visualisation by means of one LED (integrated in the M8 connector)
Connector type:	Connection to the PLC: 4-pole M8-connector Connection to the PC: 5-pole female connector Binder Series 712 Connection to the sensor unit : A-LAS transmitter: 3-pole M8-connector, A-LAS receiver: 4-pole M8-connector
Dynamic switching output (pulse lengthening)	Can be activated via software A-LAS-Scope (0ms ... 200ms)
Max. switching current	100 mA, short-circuit-protected
Switching frequency	typ. 6 kHz
Band width (analog signal)	1 kHz (-3 dB)
Scanning frequency	typ. 25 kHz
Interfacing	RS232, parameterizable under Windows®
Housing material	Aluminium, anodized in blue
Housing dimensions	LxWxH approx. 60 mm x 40 mm x 22 mm (without connector)
EMC test acc. to	DIN EN 60947-5-2 CE

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(—)
Subject to alteration

Dimensions

All dimensions in mm

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(2017-07-10) *SI-CON4 / Page 3 of 6*
(—)
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Connector Assignment

Connection SI-CON4 to A-LAS transmitter:
3-pole M8-connector

Pin:	Assignment:
1	+5V
3	GND (0V)
4	I-CONTROL (0V...+5V)
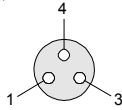
Connecting cable:
cab-las3-(length)
cab-las3-w-(length)   (angle type 90°)
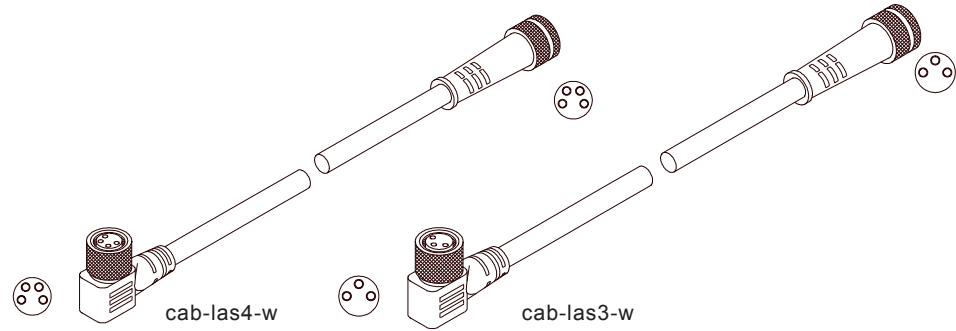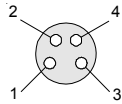(standard length 1m,
also available lengths: 2m, 3m, 5m)
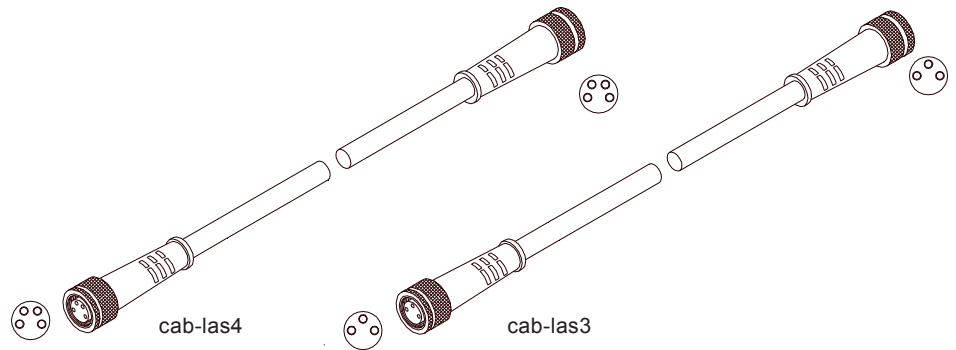
cab-las4   cab-las3

Connection SI-CON4 to A-LAS receiver:
4-pole M8-connector

Pin:	Assignment:
1	+12VDC
2	GND (0V)
3	SHIELD
4	ANALOG (0V...+12V)
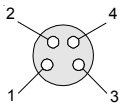
Connecting cable:
cab-las3-(length)
cab-las3-w-(length)   (angle type 90°)
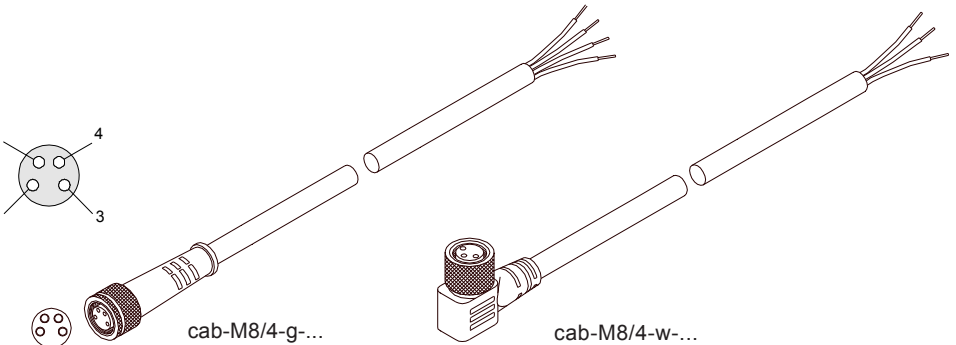(standard length 1m,
also available lengths: 2m, 3m, 5m)

cab-las4-w   cab-las3-w

Connection SI-CON4 to PLC:
4-pole M8 connector

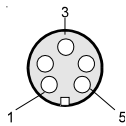| Pin:	wire of cable:	Assignment:
1	brown	+Ub (+24VDC ± 10%)
2	white	ANALOG (0V ... +10V)
3	blue	GND (0V)
5	black	DIGITAL OUT

Connecting cable:
cab-M8/4-g-(length) or
cab-M8/4-w-(length) (angle type 90°)
(standard length 2m, also available length: 5m)

cab-M8/4-g-...   cab-M8/4-w-...

Connection SI-CON4 to PC:
5-pole fem. connector Binder Series 712

Pin:	Assignment:
1	0V (GND)
2	TxD
3	RxD
4	+24VDC (+Ub, OUT)
5	not connected

Connection via RS232 intertface at PC:
Connecting cable:
cab-las5/PC-(length) or
cab-las5/PC-w-(length) (angle type 90°)
(standard length 2m, also available length: 5m)

cab-las5/PC-...

alternative:
Connection via USB-interface at PC:
Connecting cable (incl. driver software):
cab-las5/USB-(length)
cab-las5/USB-w-(length)
(standard length 2m, also available lengths: 0.5m, 1m)

cab-las5/USB-...

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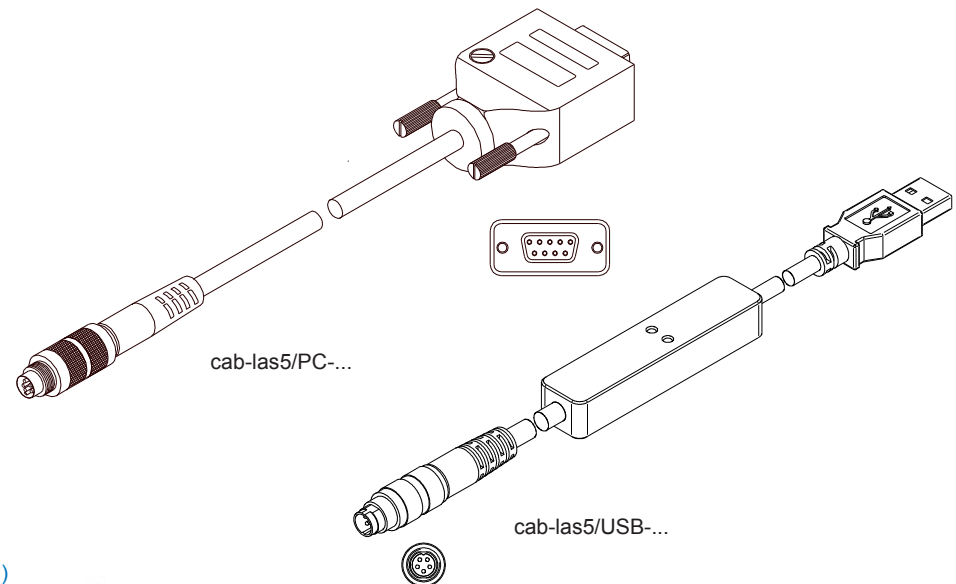
Parameterization

A-LAS-Scope Windows® software

The SI-CON4 control unit can be easily parameterized with the help of the Windows® user interface. For this purpose the SI-CON4 control unit is connected to the PC by way of the cab-las5/PCor cab-las5/USB interface cable. When parameterization is finished, the PC can be disconnected again.
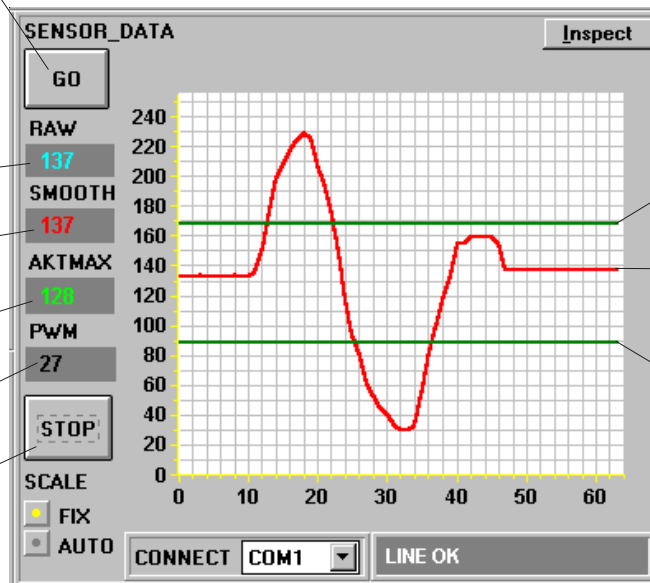
Windows® user interface:
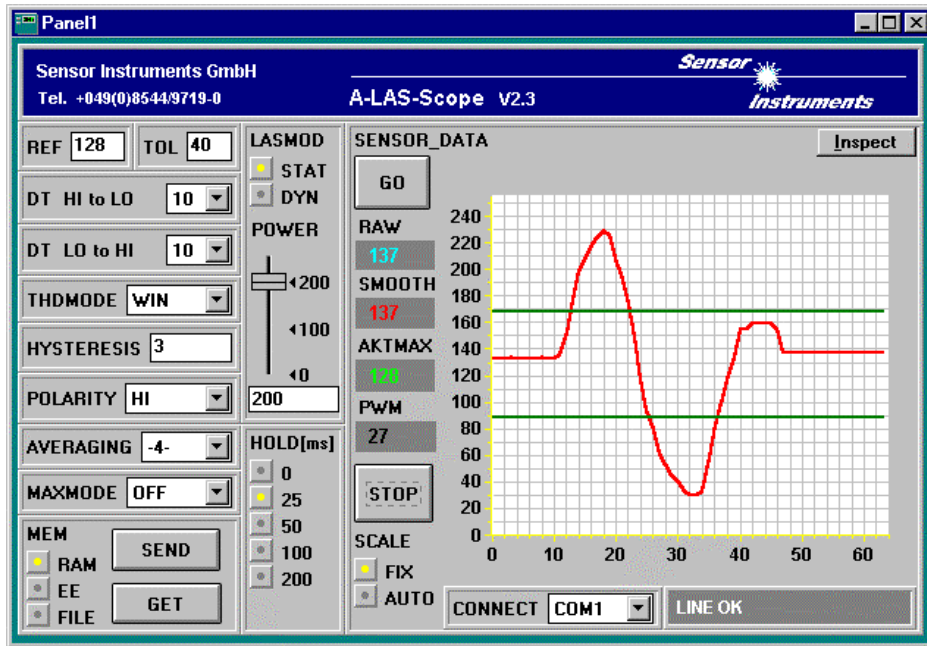
Display of the current measurement data in numerical and graphical form:

Activation of the measurement data field (serves as a setting aid in static operation). The measurement data are displayed in "digits" with an 8-bit resolution of the measurement range. The operating measurement range (aperture) is displayed in the range from 0 to 255. The resolution is: Aperture size / 256.

Display of the raw data

Display of the averaged value

Display of the current maximum value

Display of the laser power

Interruption of measurement data transfer

Tolerance band display

Current measurement signal

Tolerance band display

Parameterization

Setting of the reference value:

REF 128

Display of the current measurement data in numerical and graphical form, activation of the measurement data field, serves as a setting aid in static operation. The measurement data are displayed in "digits" with an 8-bit resolution of the measurement range. The operating measurement range (aperture) is displayed in the range from 0 to 255. The resolution is: aperture size / 256.

Setting of the tolerance value:

TOL 20

Depending on the THDMODE, a tolerance window is applied to the reference value (with THDMODE WIN), or the position of the lower threshold (with THDmODE LOW) or of the upper threshold (with THDMODE HIGH) is determined.

Functional principle:
If the measurement signal lies within the tolerance field in WIN mode, a change of switching state is performed "in the window" as HIGH (or LOW, depending on the selected polarity). If, however, the measurement signal leaves the tolerance range, a change of switching state is performed "out of the window", e.g. LOW (or HIGH, depending on the selected polarity).
In LOW or HIGH mode a change of switching state is performed when the respective active threshold is exceeded in upward or downward direction.

Setting of the time constant (with activated automatic threshold correction = MAXMODE ON):

DT HI to LO 4

The threshold follows the decreasing maximum value.

DT LO to HI 12

The threshold follows the increasing maximum value.

Setting of the threshold mode:

THDMODE HI

HIGH   Upper threshold activated
LOW   Lower threshold activated
WIN   Both thresholds activated (tolerance window)

Additional settings:

Setting of the switching hysteresis

Polarity selection

Setting of the mean value

Activation of automatic threshold correction

Setting of the laser power

Pulse lengthening of the switching output