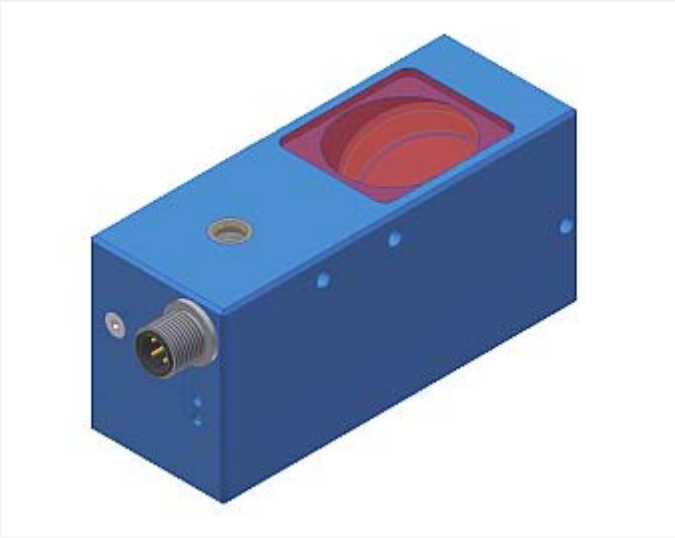
R-LAS Series

R-LAS-LT-110-HD2

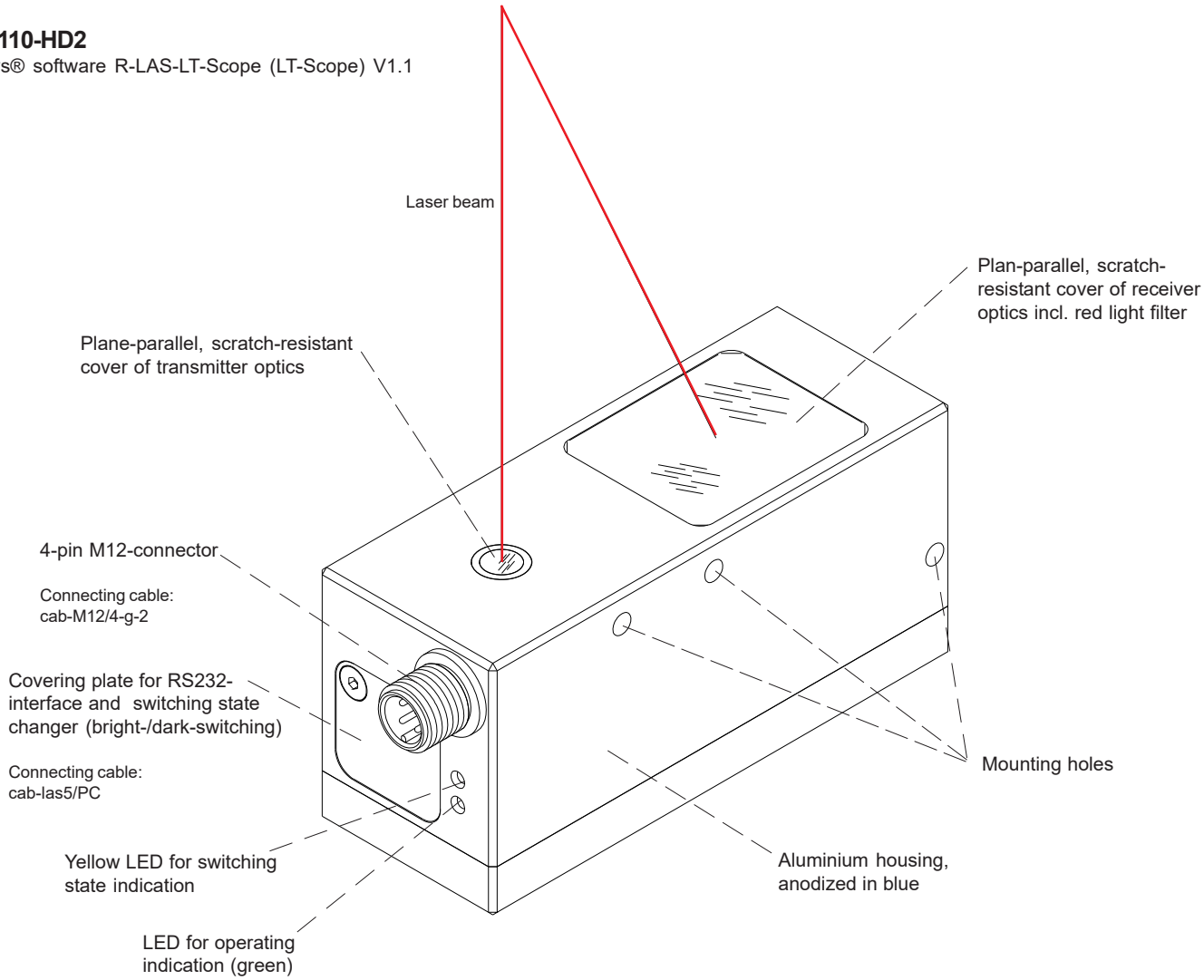
- 110 mm reference distance, 3 mm working range
- Insensitive to outside light, evaluation independent of intensity
- Automatic laser power adjustment
- Parameterisable under Windows®
- RS232 interface
- Very high dynamic range (detection of extrem dark or extrem bright objects)
- High reproducibility (typ. 0.2 mm, independent of color)
- Visible laser spot (typ. 0.3 mm in focus), laser class 2
- Scratch-resistant optics, sturdy aluminum housing



Design

Product name:

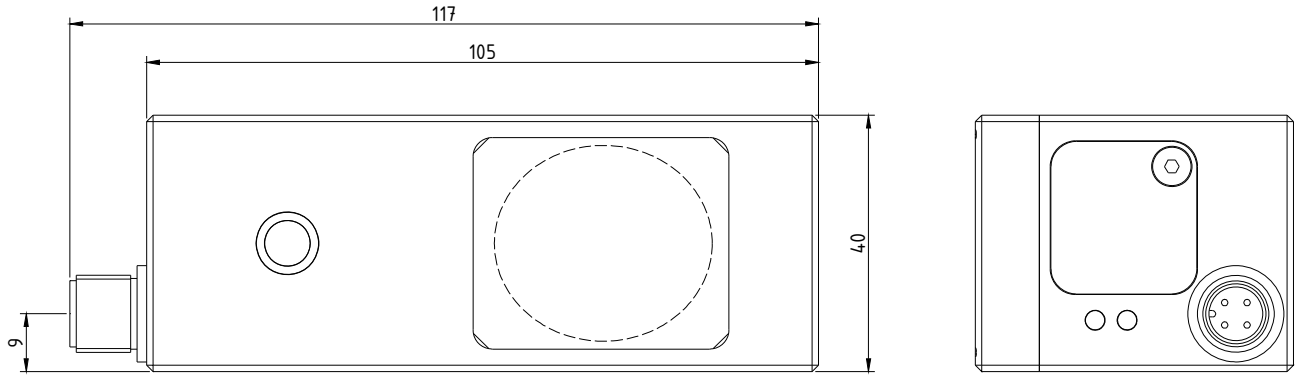
R-LAS-LT-110-HD2
incl. Windows® software R-LAS-LT-Scope (LT-Scope) V1.1

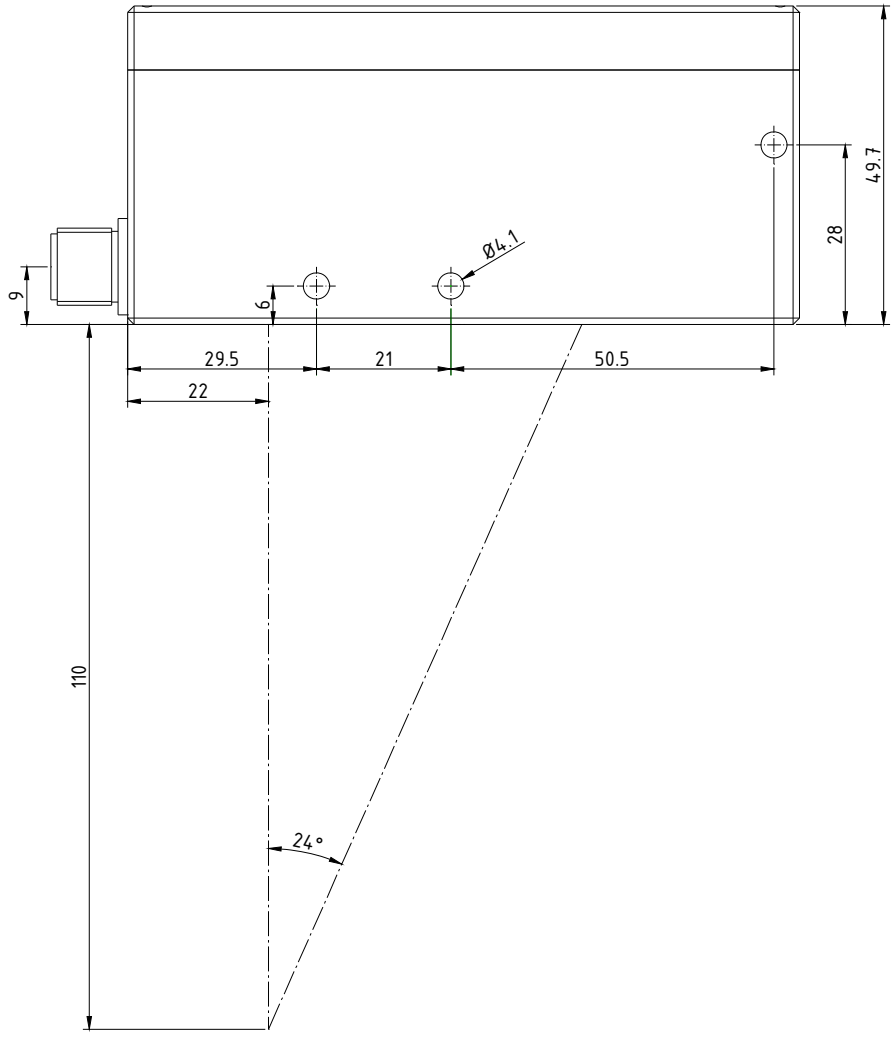


Technical Data

Model	R-LAS-LT-110-HD2
Laser	Solid-state laser, 670 nm, AC-operation, 1 mW max. opt. power, laser class 2 acc. to DIN EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.
Reference distance	110 mm
Measuring range	typ. ± 1.5 mm
Min. detectable object	typ. 0.3 mm
Repeatability	typ. 0.2 mm (independent of color) (target coming from the side or target moved directly to the sensor)
Optical filter	Red light filter RG630
Voltage supply	+24VDC (± 10%), reverse-polarity protected, overcurrent protected
Operation	typ. 100 kHz
Ambient light	up to 5000 Lux
Enclosure rating	IP67
Current consumption	approx. 100 mA
Interface	RS232, parameterisable under Windows®
EMC test acc. to	DIN EN 60947-5-2 CE
Type of connector	Connection to PLC: 4-pole M12-connector, connection to PC: 5-pole female connector Binder Series 712
Operating temperature range	-20°C ... +55°C
Storage temperature range	-20°C ... +85°C
Housing	Aluminum, anodized in blue
Pulse lengthening	0 ms, 25 ms, 50 ms, 100 ms, 200 ms (parameterisable under Windows®)
Max. switching current	100 mA, short-circuit protected
Switching frequency	typ. 300 Hz
Inputs	Digital 0V/+24V 0V: LASER OFF +24V: LASER ON
Outputs	NPN n.c. / PNP n.o., PNP n.c. / NPN n.o. (adjustable via PC) 1x reference output (switching threshold)
Bright-/dark switching	parameterisable under Windows®
Laser power adjustment	parameterisable under Windows®
Switching hysteresis	parameterisable under Windows®
Switching state indication	by means of a yellow LED
Operation indication	by means of a green LED

Dimensions





(All dimensions in mm)

Connector Assignment

Connection to PLC:

4-pole M12-connector

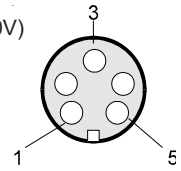
Pin:	Color:	Assignment:
1	brn	+24VDC (± 10%)
2	wht	+24V: LASER ON 0V or not connected: LASER OFF
3	blu	GND (0V)
4	blk	REFOUT (100mA)

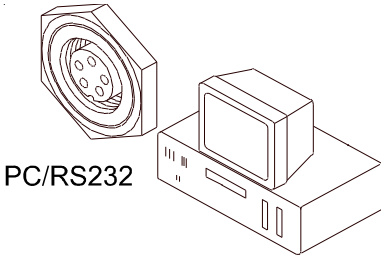
Connecting cable:
cab-M12/4-g-(length)
(standard length 2m, also available in 5m)

Connection to PC:

5-pin female connector Binder 712

Pin :	Assignment:
1	GND (0V)
2	TX0
3	RX0
4	n.c.
5	n.c.

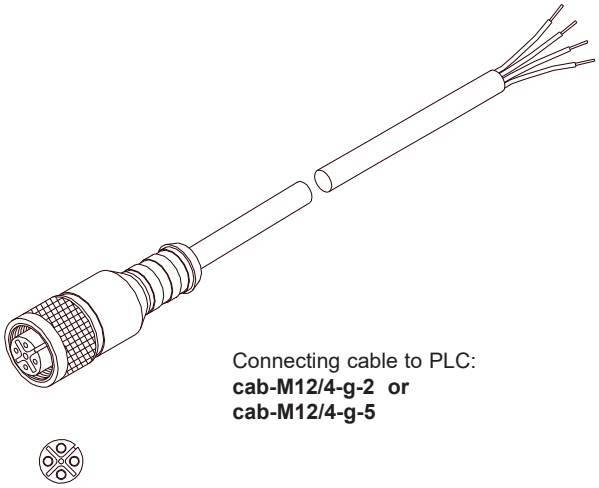




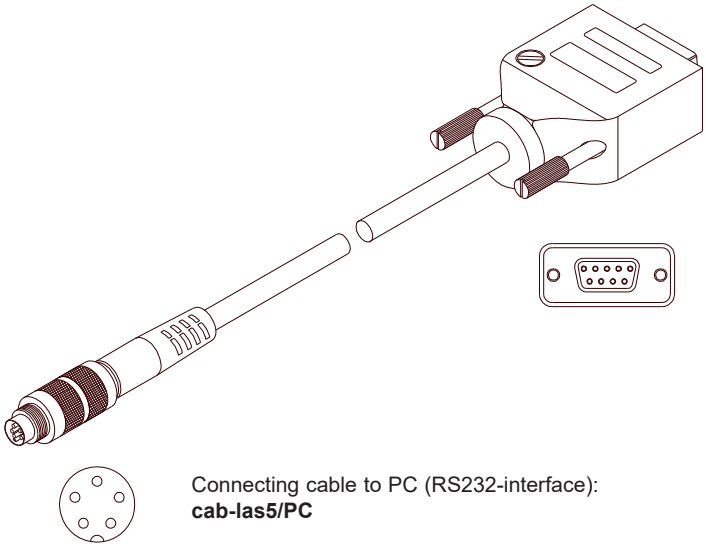
Connecting Cables

Connecting cables:

to PLC:	**cab-M12/4-g-2**	Length: 2m	Outer jacket: PUR
	cab-M12/4-g-5	Length: 5m	Outer jacket: PUR
to PC:	**cab-las5/PC**	Length: 2m:	Outer jacket: PUR



Connecting cable to PLC:
cab-M12/4-g-2 or
cab-M12/4-g-5

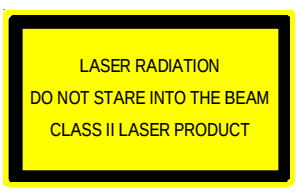


Connecting cable to PC (RS232-interface):
cab-las5/PC

Laser Warning

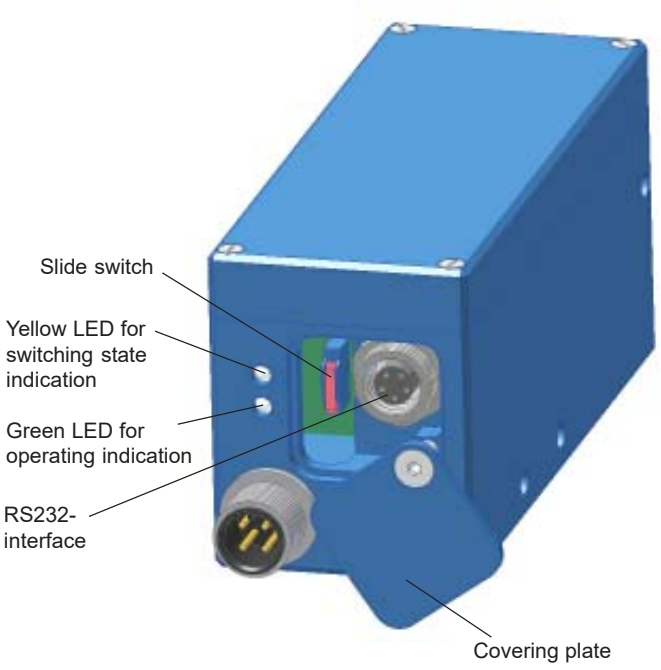
The R-LAS-LT laser reflex sensors comply with laser class II according to EN 60825-1. The use of these laser sensors therefore requires no additional protective measure.

The R-LAS-LT laser reflex sensors are supplied with a laser warning label.



Setting

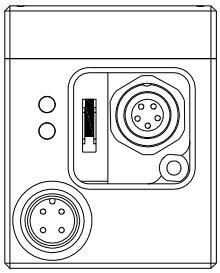
With the R-LAS-LT-110-HD2 parameter input is performed under Windows® by means of software R-LAS-LT-Scope (LT-Scope) through the serial RS232 interface (cf. page 6). The access to the RS232 interface is enabled by screwing off the covering plate. Moreover, a slide switch under the covering plate is used for output polarity setting (alteration switch).



with POLARITY = LO
(preset under LT-Scope)
switch position above -->
yellow LED lights up --> Output HIGH

yellow LED lights up

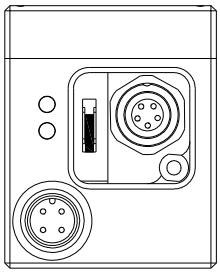
green LED lights up

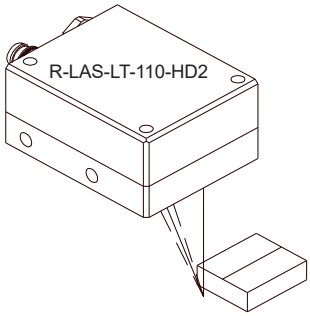


with POLARITY = LO
(preset under LT-Scope)
switch position below-->
yellow LED does <u>not</u> light up --> output LOW

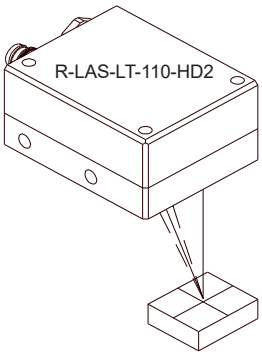
yellow LED does not light up

green LED lights up

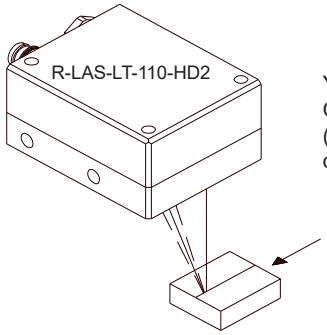




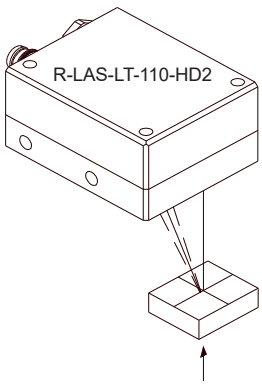
Yellow LED lights up:
OUTPUT = HIGH
(object is outside of the laser beam)



Yellow LED lights up:
OUTPUT = HIGH
(object is too far away from sensor,
distance > reference distance REF)



Yellow LED does not light up:
OUTPUT = LOW
(object is in the laser beam path,
distance < reference distance REF)



Yellow LED does not light up:
OUTPUT = LOW
(object distance < reference distance REF)

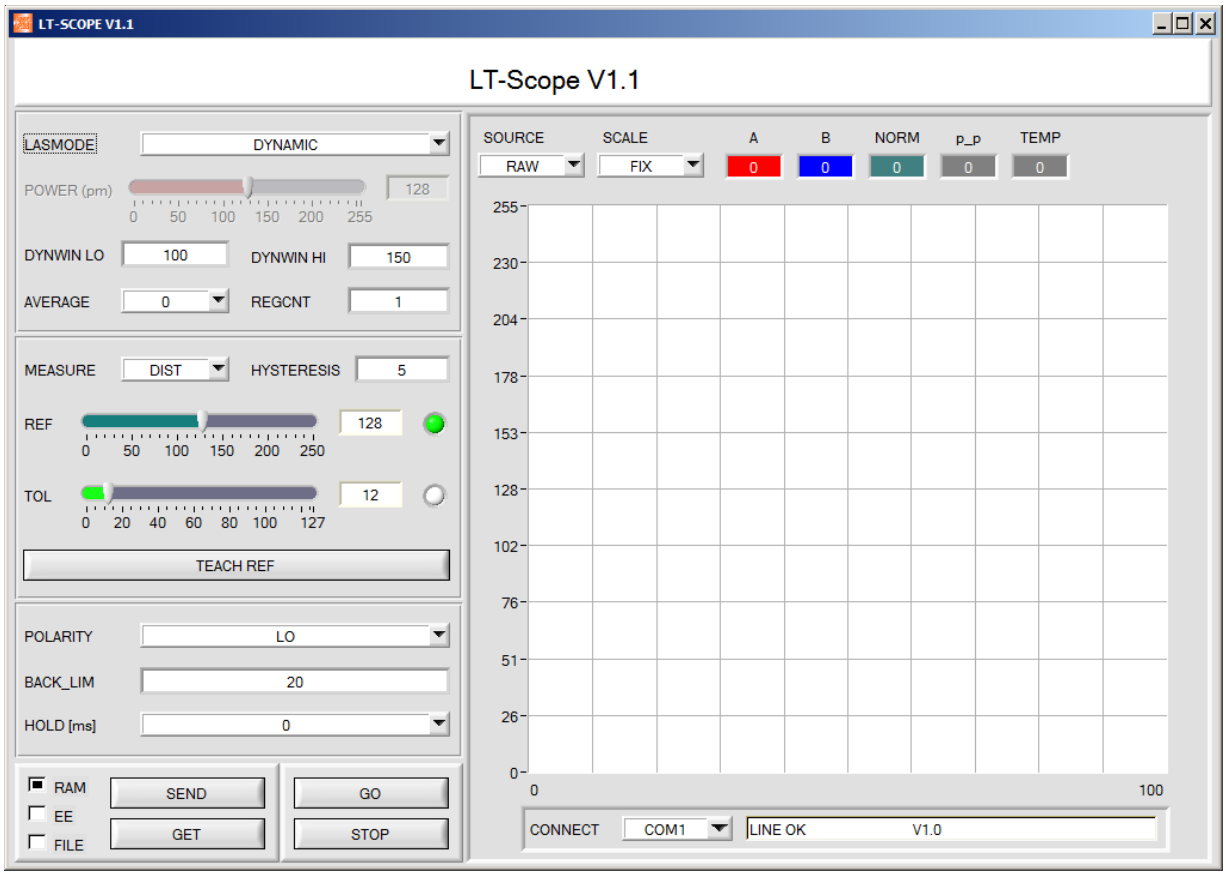
LASER EIN/AUS:
Mit HIlfe eines digitalen Eingangssignals kann der Laser ein- bzw. ausgeschaltet werden (Pin 2, weiß):
+24V = LASER EIN
0V oder nicht belegt = LASER AUS

Parameterization

Windows® user interface:

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

The R-LAS-LT-110-HD2 sensor is parameterized under Windows® with the R-LAS-LT-Scope (LT-Scope) software.
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 R-LAS-LT-110-HD2 sensor.



The RS232 interface is used for setting sensor parameters such as e.g.:

- LASMODE: In this function group the laser operating mode and the laser power at the R-LAS-LT-110-HD2 sensor can be adjusted.
- POWER: With this slider the laser power is adjusted to a fixed value between 0 and 255 in STAT mode.
- DYNWIN LO: Lower limit of the setpoint range (minimum permissible intensity).
- DYNWIN HI: Upper limit of the setpoint range (maximum permissible intensity).
- AVERAGE: Determines the number of measuring points over which the sensor signal is averaged (noise suppression)
- REGCNT: Time constant with activated automatic laser power control (DYNAMIC-mode)
- MEASURE: Selects the operating mode of the R-LAS-LT-110-HD2 sensor
- HYSTERESIS: The hysteresis setting value applies a switching threshold around the upper and lower tolerance threshold and around the currently set reference value
- REF: With this slider, or with the edit box, the reference value (setpoint value, corresponds with the standardized distance value) for the respective application can be set.
- TOL: With this slider, or with the edit box, a tolerance band can be applied around the respective reference value (setpoint value, standardised distance value).
- TEACH REF: When this button is pressed the currently measured STANDARD signal value is set as a new reference in STANDARD mode
- POLARITY: Determines the polarity change of the digital output when the tolerance limits are exceeded.
- BACK_LIM: In this edit box a threshold for the minimum background intensity (background limit) can be pre-set.
- HOLD: By activating the respective HOLD selection button a pulse lengthening at the digital output of the R-LAS-LT-HD2 sensor of up to 200 ms can be set

Applications

Positioning to painted car body components

The automobile industry often faces the task of positioning on already painted car body components (as a rule with a robot). For this purpose, the distance or the edge between robot and body component must be detected with an accuracy of only a few tenths. Because of the different paint finishes (from black to white), the dynamic range of the employed laser sensor has to meet highest demands.

By means of automatic laser power correction, the R-LAS-LT-110-HD2 laser reflex sensor adapts itself almost without any problems to the respective surface, which means that bright and dark bojects can be detected with highest accuracy.