

RLS Series

▶ RLS-CTR-20/90

- Insensitive to outside light due to clocked white light
- Working range typ. 10 ... 40 mm
- Parameterisable under Windows®, RS232 interface
- Analog output (0 ... +10V)
- Switching output (npn-/pnp, 100 mA, short-circuit-proof)
- Operating indication by means of a green LED
- Switching state indication by means of a yellow LED
- Scratch-resistant glass covers of optics
- Sturdy aluminum housing

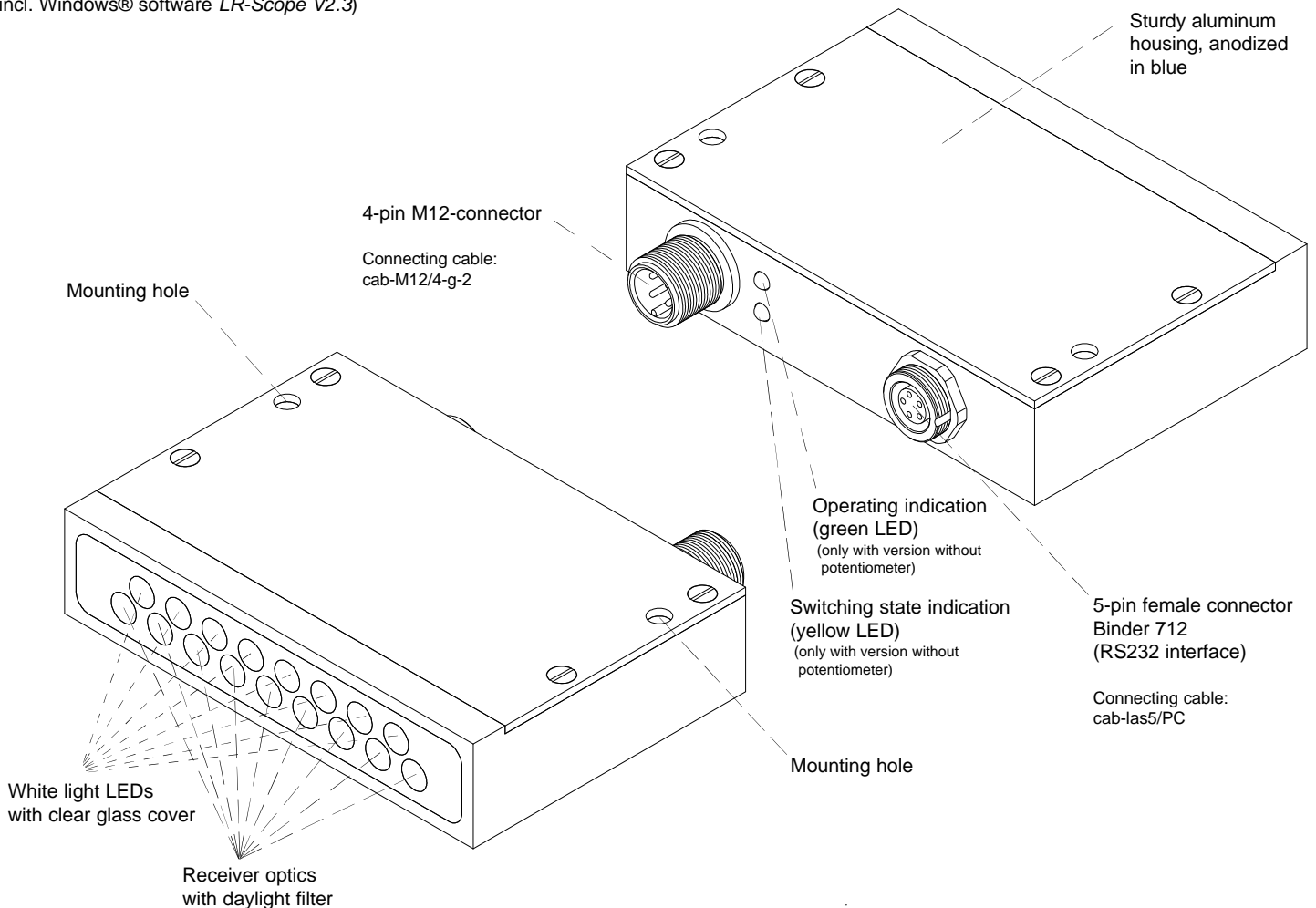


Design

Product name:

RLS-CTR-20/90 (with two LEDs)
RLS-CTR-20/90-P (with potentiometer)

(incl. Windows® software *LR-Scope V2.3*)



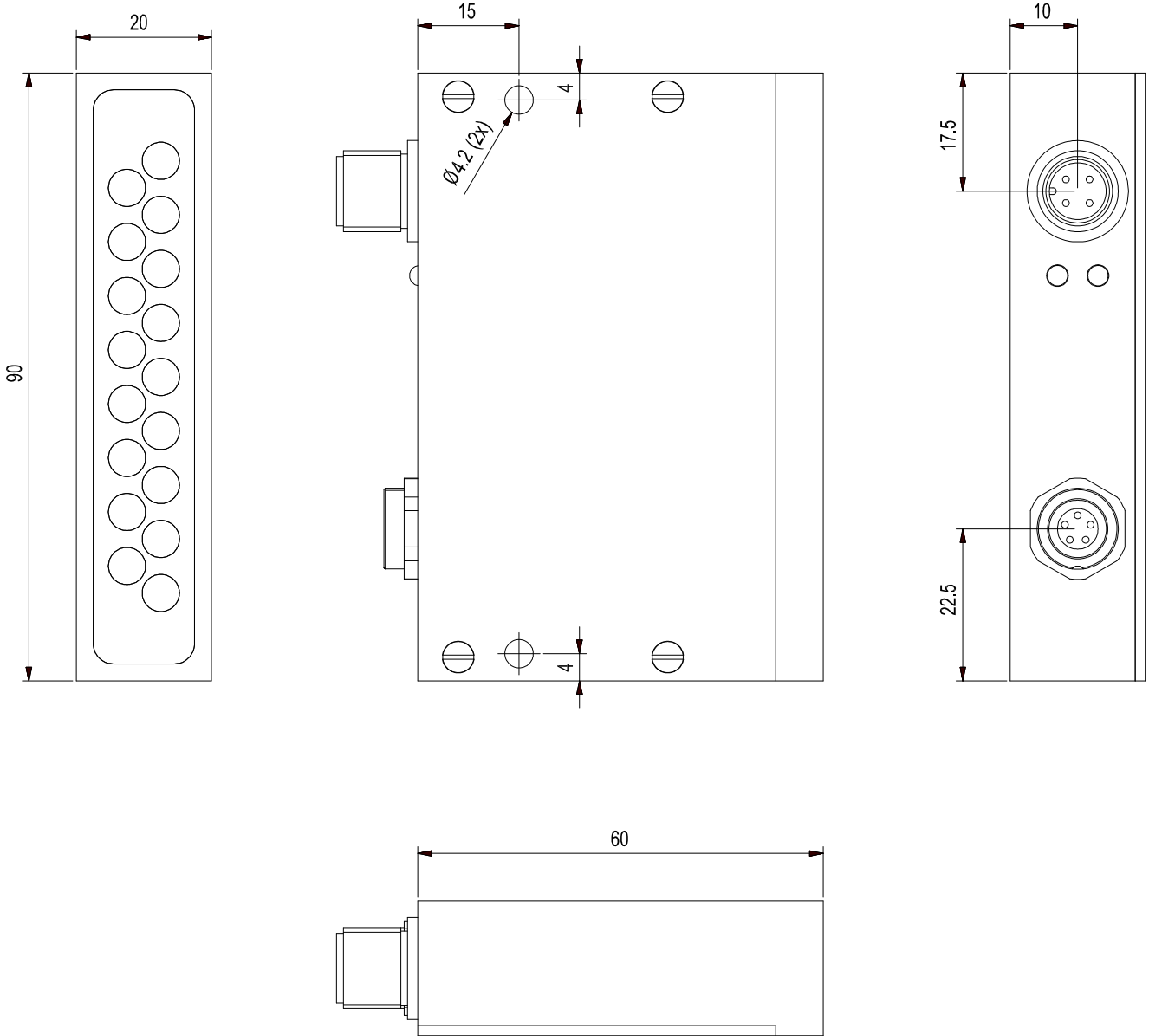


Technical Data

Model	RLS-CTR-20/90
Light source	8x white light LEDs, AC-operation
Light spot size	in 20 mm distance: typ. 80 mm x 10 mm (beam divergency typ. 5°)
Optical filter	Daylight filter
Voltage supply	+12VDC ... +30VDC, reversed polarity protected, overcurrent protected
Operating mode	Pulsating light operation, 100 kHz
Ambient light	up to 5000 Lux
Enclosure rating	IP67 (optics), IP54 (electronics)
Current consumption	typ. 110 mA
Interface	RS232, parameterisable under Windows®
EMC test acc. to	IEC - 801...
Type of connector	Connection to PLC: 4-pin M12-connetor, connection to PC: 5-pin female connector Binder Series 712
Operating temperature	-20°C ... +55°C
Storage temperature	-20°C ... +85°C
Housing	Aluminum, anodized in blue
Max. switching current	100 mA, short-circuit-proof
Switching frequency	typ. 1 kHz
Output DIGITAL (1x)	Qinv or Q, adjustable via PC: Qinv: npn n.c. / pnp n.o. Q: pnp n.c. / npn n.o.
Sensitivity (switching threshold)	parameterisable under Windows® (adjustable: threshold / tolerance window)
Output ANALOG (1x)	0V ... +10V
Pulse lengthening	0 ms ... 100 ms
Range	typ. 10 mm ... 40 mm
Luminous power	adjustable under Windows®, with type RLS-CTR-20/90-...-P in addition by means of potentiometer
Averaging	max. 32000 values (adjustable under Windows®)
Switching state indication	only with type RLS-CTR-20/90 (without potentiometer): by means of a yellow LED
Operating indication	only with type RLS-CTR-20/90 (without potentiometer): by means of a green LED

Dimensions

RLS-CTR-20/90:
(version with two LEDs)



All dimensions in mm

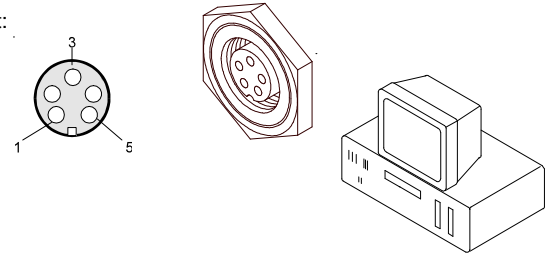
Connector Assignment

**Connection to PLC:
4-pin M12 connector**

Pin No.:	(Color)	Assignment:
1	(brn)	+12VDC...+30VDC
2	(wht)	ANALOG (0 ... +10V)
3	(blu)	GND (0V)
4	(blk)	OUTPUT (0V)

**Connection to PC:
5-pin female connector Binder 702**

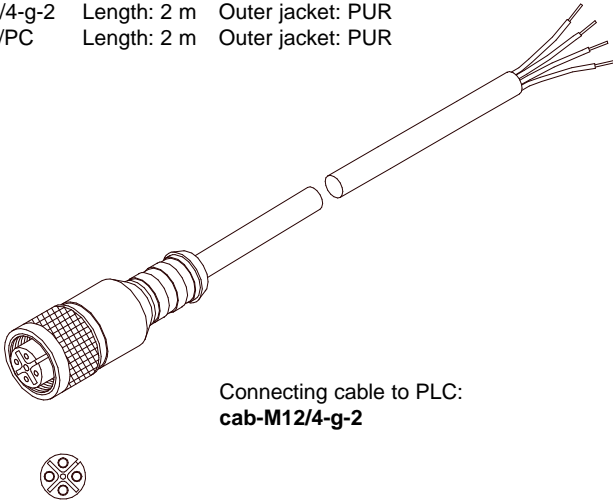
Pin No.:	Assignment:
1	GND (0V)
2	TX0
3	RX0
4	n.c.
5	n.c.



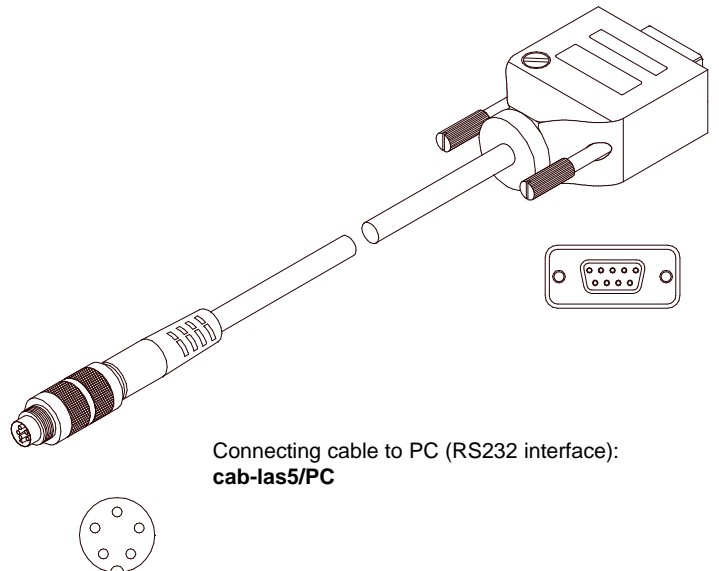
Connecting Cables

Connecting cables:

cab-M12/4-g-2 Length: 2 m Outer jacket: PUR
 cab-las5/PC Length: 2 m Outer jacket: PUR



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



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

LED Display

RLS-CTR-20/90:

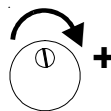
(with two LEDs for operating indication and switching state indication, without potentiometer)

- **LED green for operating indication**
LED on = Sensor in operation
- **LED yellow for switching state indication**
LED on = Object detected

Potentiometer

RLS-CTR-20/90-...-P:

(with one potentiometer, without LEDs)



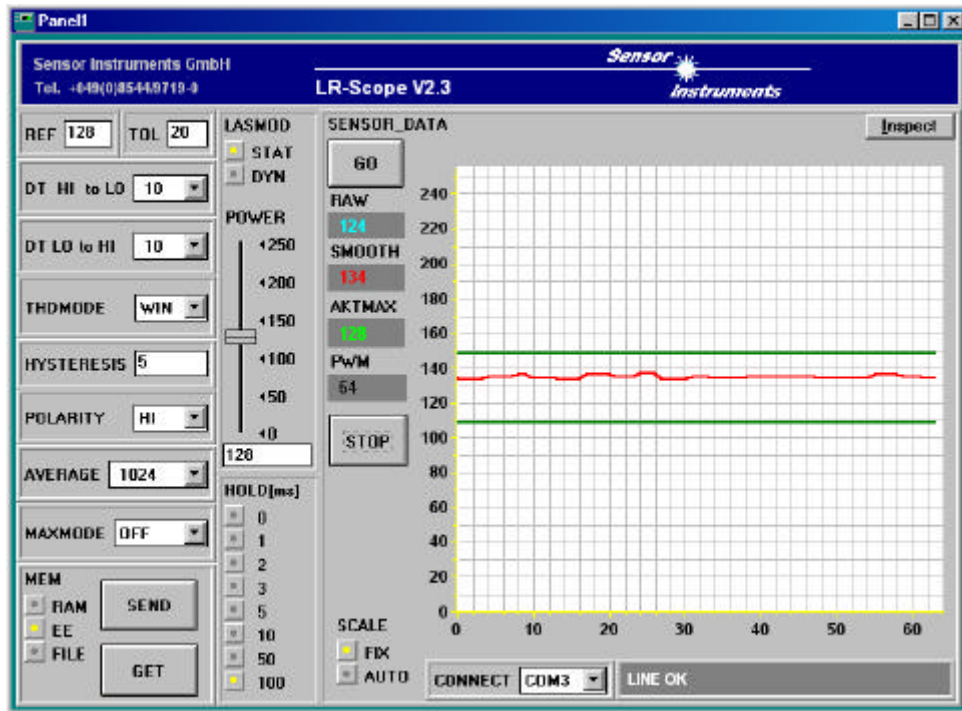
3-revolutions-potentiometer for luminous power setting

Rotation clockwise: Increase of luminous power
(leads to an increase of the analog signal)

Parameterization

Parameterization under Windows® with software LR-Scope V2.3:

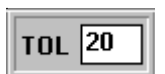
The reflective light sensors RLS-... are parameterized under Windows® with software LR-Scope V2.3. The RS232 interface parameters and measured values can be exchanged between PC and the RLS sensor. All the parameters can be stored in the non-volatile EEPROM of the RLS sensor.



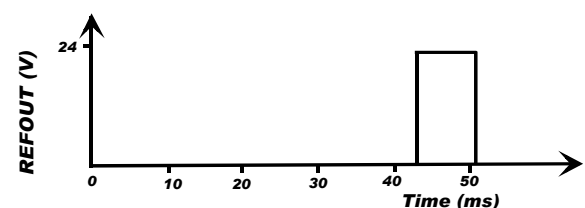
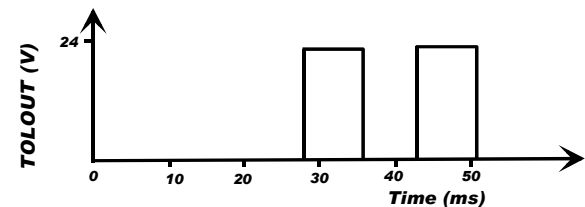
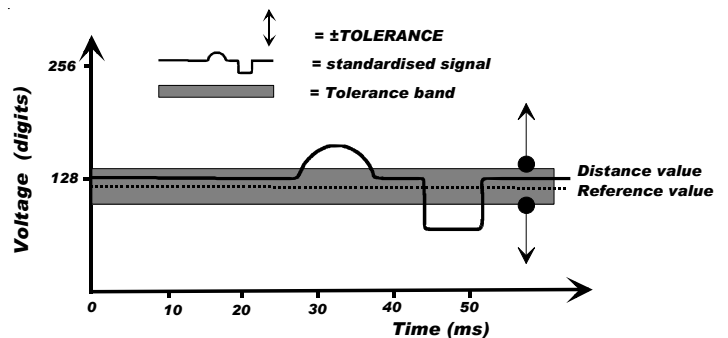
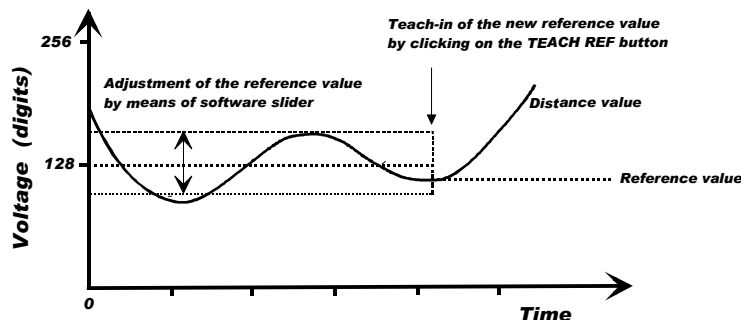
Parameter setting:



Reference:
After a mouse-click on this edit-box the reference value can be specified here by entering a numerical value. The REF value (setpoint value) corresponds with the luminous power that is reflected to the receiver from the respective object.



Tolerance:
With this edit-box a tolerance band can be applied around the currently specified reference value (setpoint value of the luminous power reflected from the object). If the set tolerance limit is exceeded, this leads to a change of switching state at pin 4 of the 4-pole M8 connector (digital output TOLOUT).



Parameterization

LASMOD

STAT
 DYN

POWER

↑250
↑200
↑150
↑100
↑50
↑0

128

Setting of luminous power (LASMOD):

In this function group the luminous power at the RLS sensor can be adjusted.

STAT:

With this selection button the luminous power at the RLS sensor is constantly kept at the value that is set at the slider.

DYN:

The luminous power at the RLS sensor is automatically and dynamically adjusted by means of the amount of radiation reflected from the object. By way of dynamic adaptation of the luminous power the µC software tries to keep the current maximum value detected at the receiver in the range of 100 to 200 A/D values. In this operating mode the POWER slider has no effect.

POWER:

With this slider the luminous power is adjusted to a fixed value between 0 and 255 in STAT mode. Any change only becomes effective after the SEND button is pressed.

HOLD[ms]

0
 1
 2
 3
 5
 10
 50
 100

Pulse lengthening (HOLD):

The sensors of RLS Series operate with minimum scan times in the range of 100µs. For this reason most of the PLCs that are connected to the digital error output TOLOUT have difficulties with the safe detection of the resulting short changes of switching states. By activating the respective HOLD selection button a pulse lengthening at the digital output of the RLS sensor of up to 100 ms can be set.

THDMODE HI

THDMODE:

In this function field one of three possible positions of the monitoring thresholds with respect to the reference value can be selected.

LOW:

The monitoring threshold lies below the current reference value. If the current measured value falls below this threshold, the digital error output TOLOUT is activated.

HI:

The monitoring threshold lies above the current reference value. If the current measured value rises above this threshold, the digital error output TOLOUT is activated.

WIN:

The monitoring thresholds form a symmetric tolerance band around the current reference value. If the current measured value violates this tolerance band, the digital error output TOLOUT is activated.

HYSTERESIS 5

HYSTERESIS:

The hysteresis setting value applies an additional switching threshold around the currently set tolerance threshold. The switching hysteresis has an effect on the digital output TOLOUT. It increases the signal stability at the digital output of the sensor.

POLARITY LO

POLARITY:

Determines the polarity change of digital output TOLOUT in case of exceeding of a tolerance threshold (LO = Low-active; HIGH = High-active).

AVERAGING -4-

AVERAGING:

Determines the number of measured values (raw data) over which the sensor signal arriving at the receiver is averaged (noise suppression).

MAXMODE ON

Automatic threshold correction (MAXMODE):

With this function field automatic correction of the monitoring thresholds can be switched on and off.

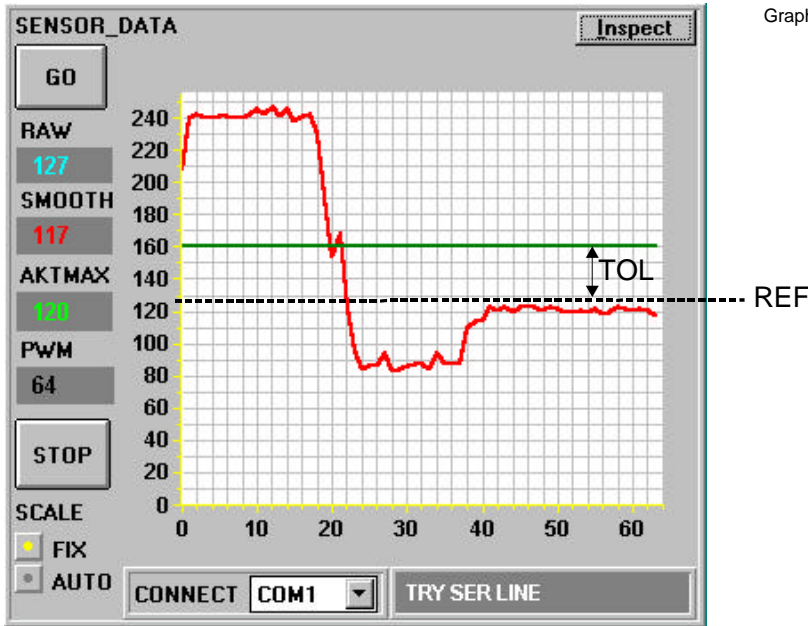
Parameterization

LR-Scope as an aid for sensor adjustment (graphic display):

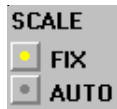
Fine adjustment of the RLS sensor is facilitated by the graphic display of the analog signal (raw signal from the receiver diode). For this purpose measurement data transfer from the RLS sensor to the PC must first be activated by clicking on the GO button.

Starting graphical representation (GO/STOP):

Graphical representation under Windows® is started by clicking on the GO field. Clicking on the STOP field stops the graphical representation on the PC monitor.



Graphical representation of the calculated MEASURE signal



SCALE setting:

These selection buttons are used for setting the scaling type of the y-axis.

FIX: Fixed y-axis scaling (value range 0 ... 255 - resulting from 8-bit A/D conversion)

AUTO: Automatic adaptation of y-axis scaling to the current measured values (zoom function)



Interface selection (CONNECT):

In the CONNECT software field the serial interface that is used can be selected (COM1 to COM4). The LINE OK or TIME OUT message provides information about success or failure of connection setup between sensor and PC.



Print mode (Inspect):

Clicking on the Inspect field starts a printout of the signals displayed on the monitor.

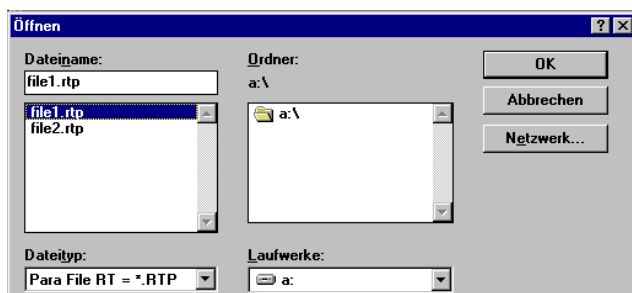


Parameter readout and storing (MEM) from the laser sensor or file:

After a mouse-click on the GET "software button" the parameters can be read out from the RAM or EEPROM of the sensor or from a file on the harddisk or on a floppy disk, depending on the switch position.

With the SEND software button the parameters entered with software sliders or software switches can be transferred to the RAM or EEPROM of the sensor.

If the FILE switch is activated, the parameters can be stored in a freely selectable file on floppy disk or hard disk.



When the FILE switch in the MEM field is activated a pc_file_name field will appear in the graphic windows which provides information about the file currently selected. Another file can be selected or created by clicking on FILE on the pc_file_name field.

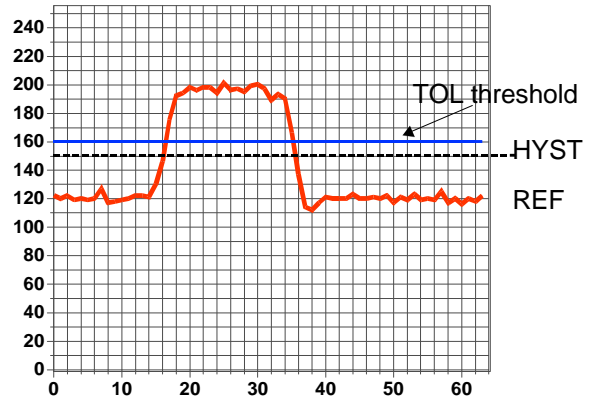


Parameterization

LR-Scope as an aid for threshold setting:

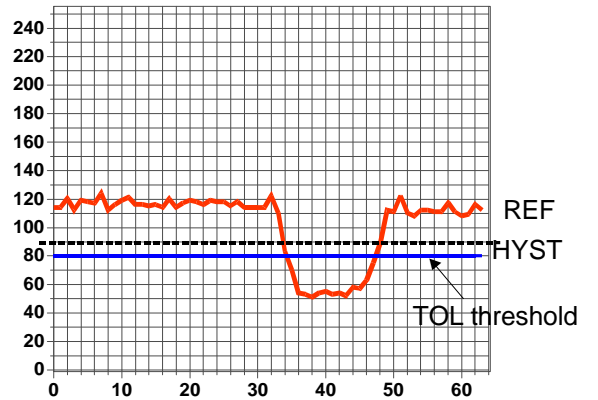
Threshold mode THDMODE HI:

In this mode the monitoring threshold lies above the current reference value.
 The distance of the TOL threshold from the reference value REF is determined by the TOL presetting value.
 In this mode the hysteresis range lies below the TOL threshold.



Threshold mode THDMODE LOW:

In this mode the monitoring threshold lies below the current reference value.
 The distance of the monitoring threshold from the reference value REF is determined by the TOL presetting value.
 In this mode the hysteresis range lies above the TOL threshold.



Threshold mode THDMODE WIN:

This mode operates with two monitoring thresholds that lie symmetrically around the current reference value REF. The distance of the monitoring thresholds from the reference value REF is determined by the TOL presetting value.
 In this mode the two hysteresis ranges lie within the tolerance band.

