Fiber Optic Cable Control Units LVSR 325

Technical description
Software description

Table of Contents

Figures and Tables

1 General Information

Documentation

All entries in this operating manual must be heeded, in particular those in Chapter "Safety Notices".

Carefully store this operating manual where it is accessible at all times.

Qualified personnel

Mounting, commissioning and maintenance of the device must only be carried out by qualified personnel.

Electrical work must be carried out by a certified electrician.

1.1 Explanation of Symbols

The symbols used in this operating manual are explained below.

Attention
This symbol appears in front of text which must be carefully observed. Failure to heed this information can lead to injuries to personnel or damage to the equipment.

Notice
This symbol indicates text which contains important information.

1.2 Declaration of Conformity

The fibre optic cable control units have been manufactured observing current European standards and guidelines.

Notice
The corresponding declaration of conformity can be requested from the manufacturer.

The manufacturer of the product, Leuze electronic GmbH & Co. in D-73277 Owen/Teck, possesses a certified quality assurance system in accordance with ISO 9001.

CE ISO 9001

2 Safety Notices

2.1 Safety Standard

The control units of the series LVSR 325 have been developed, manufactured and tested, observing current safety standards. They correspond to the state of the art.

2.2 Intended Use

Attention
The protection of personnel and device cannot be guaranteed if the device is operated in a manner not corresponding to its intended use.

In particular, unauthorized use includes:

- rooms with explosive atmospheres
- operation for medical purposes
- operation as a safety component according to the EC directive for machines

Fields of application

The control units of the series LVSR 325 have been designed for the following areas of application:

- Labelling machines
- Packaging machinery
- Beverage industry
- Mounting and handling technology

2.3 Working Safety

Safety regulations

Observe the locally applicable legal regulations and the rules of the employers' liability insurance association.

Carefully store this operating manual where it is accessible at all times.

Repair

Repairs must only be carried out by the manufacturer or an authorized representative.

Attention
Access to or changes on the device, except where expressly described in this operating manual, are not authorized.

3 Description

3.1 Features of the Fiber Optic Cable Control Units LVSR 325

The fiber optic cable control units LVSR 325 can be used for both plastic and glass fiber optic cables with a cross-section of 2.2 mm and 4 mm. The small construction enables the application in environments with limited space.

Application and scanning range

The application area of optical sensors is significantly increased through the use of fiber optic cables. Fiber optic cables can either be screwed to the sensor or they form a union together with the sensor. Sensors with fiber optic cables can be used as diffuse reflection light scanners or as throughbeam photo electric sensors. The length of the fiber optic cable can be individually adjusted for each application.

The scanning range of amplifiers equipped with fiber optic cables depends on the material (glass fiber or plastic), on the length, and on the diameter of the fiber optic cable. With respect to the scanning range of the LVSR 325, see Table 1 on page 9.

The pre-failure warning indicates to the user a possible malfunction of the LVSR 325 due to a decreasing signal strength. As a result, increasing contamination of the sensor can be detected and removed in good time.

The pre-failure warning is displayed by a flashing red LED on the LVS and additionally, if selected through software or hand-held-device, through the warning output. Two operating modes of the pre-failure warning are possible:

autoControl principle

- After three consecutive switching cycles without performance reserve, the pre-failure warning is activated. The red LED flashes and the warning output is activated (if selected through software or hand-held-device). The pre-failure warning is again erased after one switching cycle with performance reserve.

static pre-failure warning

- The pre-failure warning is activated during every switching cycle without performance reserve. This operating mode is suitable for alignment and if the object does not move with respect to the sensor.

The following figure illustrates the autoControl principle:

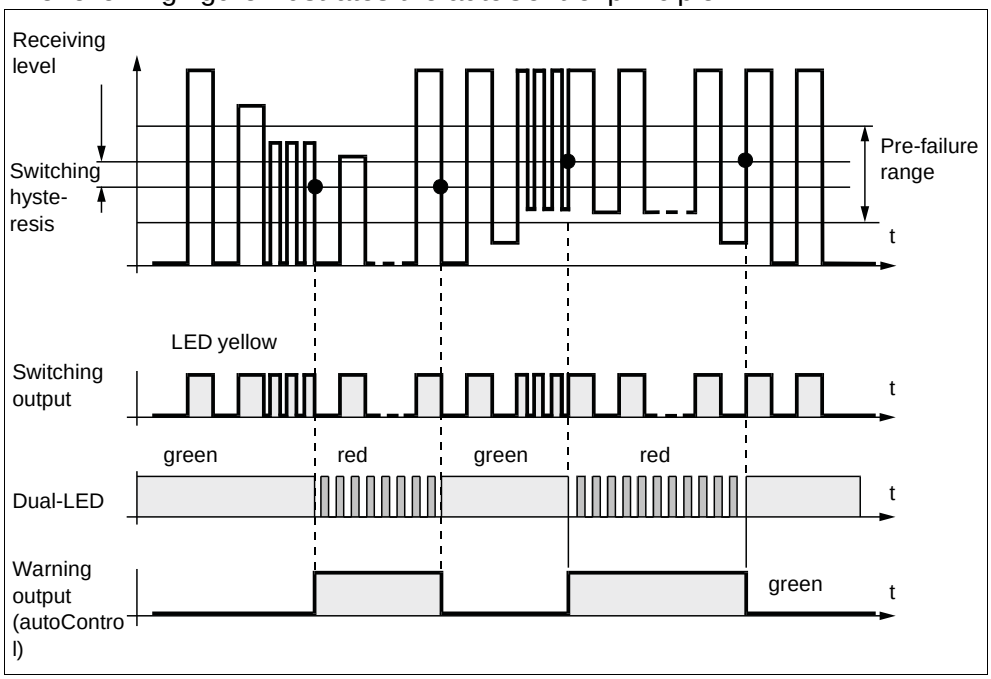

Figure 3.1: Principle of the autoControl warning output

4 Technical Data

4.1 Technical Data LVSR 325

4.1.1 Optical Data and Timing

	LVSR 325
Optical data	
Operating range/scanning range[1]	throughbeam operation: 300 mm/ scanning operation: 80 mm
Light source	LED (modulated light)
Wavelength	660 nm (red light)
Timing	
Switching frequency	1500 Hz
Response time	0,33 ms
Delay before start-up	≤ 300 ms

Table 1: Optical data, Timing

1. *Scanning range relative to white 90%*

4.1.2 Other data

	LVSR 325
Electrical data	
Operating voltage U_B	10...30 V DC (incl. residual ripple)
Residual ripple	≤ 10% of U_B
Bias current	≤ 25 mA
Inputs/outputs	programmable: 2 switching outputs (PNP), antivalent[1] switching output (PNP) and warning output (PNP) switching output (PNP) and control input
Signal voltage high/low	≥ (U_B - 2V) / ≤ 2V
Output current	together max. 200 mA
Control input[2]	inactive ≤ 2 V / active ≥ 7 V
Sensitivity	adjustable via 2 buttons automatically via "Teach-In" (both buttons sim.) step-wise via "+" and "-" button
Mechanical data	
Housing	plastic
Weight	30g
Connection	M 8 dia. connectors, 4 pole, cable 2 m, 4 x 0.2 mm^2
Fiber optic cable connection	screw fastening for: plastic fiber optic cable ∅ 2.2 mm glass fiber optic cable ∅ 4 mm
Environmental data	
Ambient temp. (operation/storage)	-20°C..+70°C / -40°C..+75°C
Protective circuit[3]	2,3
Protection class	IP 65

Table 2: Electrical, mechanical, and environmental data

1. *Factory setting*
2. *Internal resistance 22 kOhm, Delay before start-up/ turn-off ≤ 3 ms*
3. *2=polarity reversal protection, 3=short circuit protection for all outputs*

4.1.3 LED Indicators

LED	LVSR 325
Yellow	switching state
Red	fault display in teach-in mode 1.5 s; feed-back at recognized key depression 65 ms
Flashing red	pre-failure warning (no performance reserve)
Green	ready
Flashing green	display in teach-in mode

Table 3: LED indicators

4.2 Technical Data PPG 01

	PPG 01
Display	LCD, 2x12 digits
Keyboard	key pad
Interface	short-circuit and overload proof
Power supply	9 V block battery
Operating time	approx. 30 h/approx. 100 write/read procedures
Protection class	IP 20
Amb. temperature (operation/storage)	- 20°C ... + 55°C / 0°C ... + 50°C
Weight	approx. 450 g

Table 4: Technical data PPG 01

4.3 Dimensioned and Connection Drawings

4.3.1 LVSR 325

Electrical connection, LVSR 325

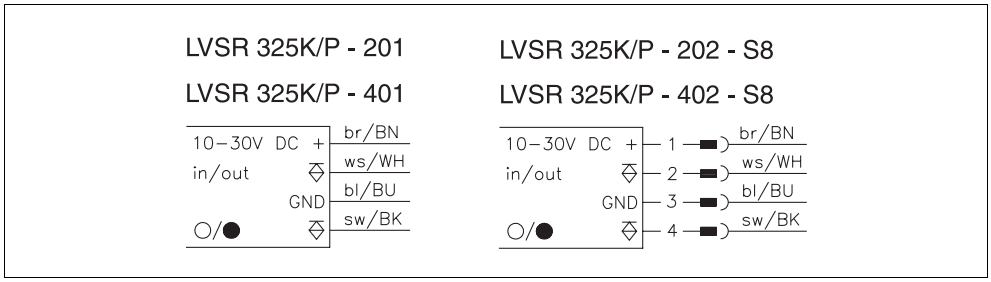

Figure 4.1: Electrical connection, LVSR 325

Dimensioned drawing LVSR 325

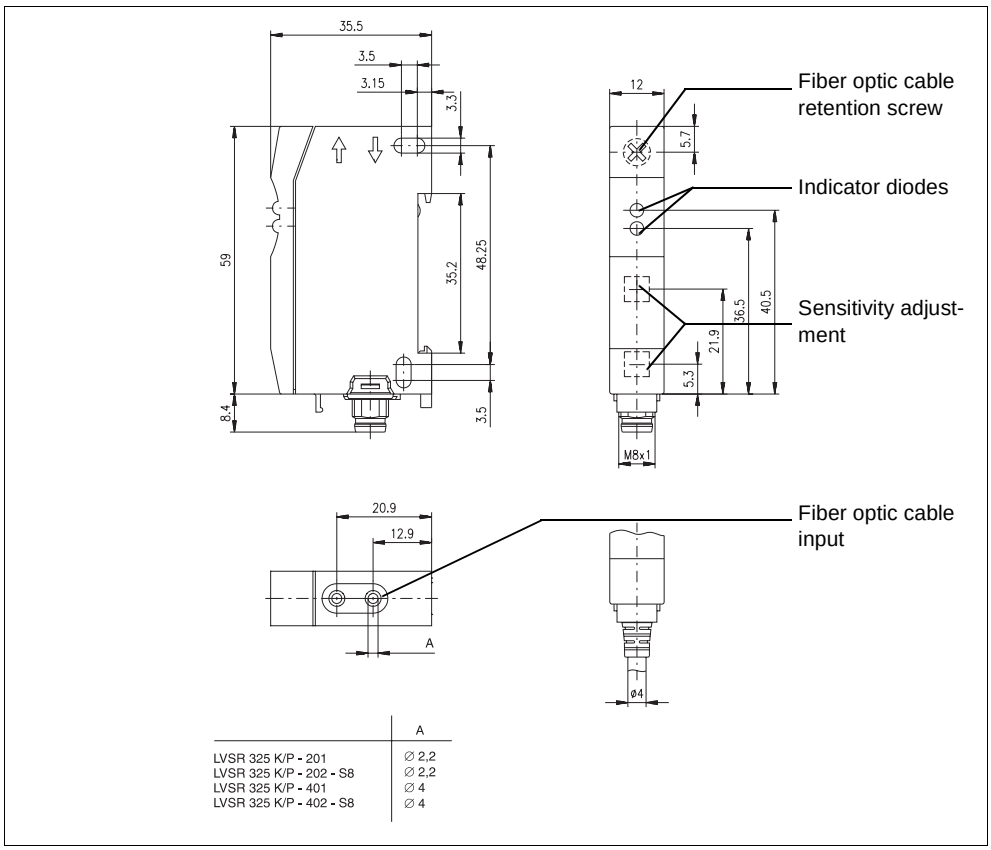

Figure 4.2: Dimensioned drawing LVSR 325

4.3.2 Hand-held device PPG 01

Connection PPG 01

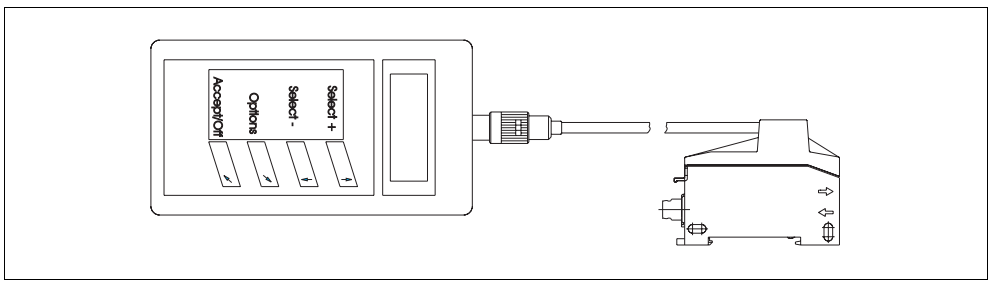

Figure 4.3: Connection PPG 01

Dimensioned drawing PPG 01

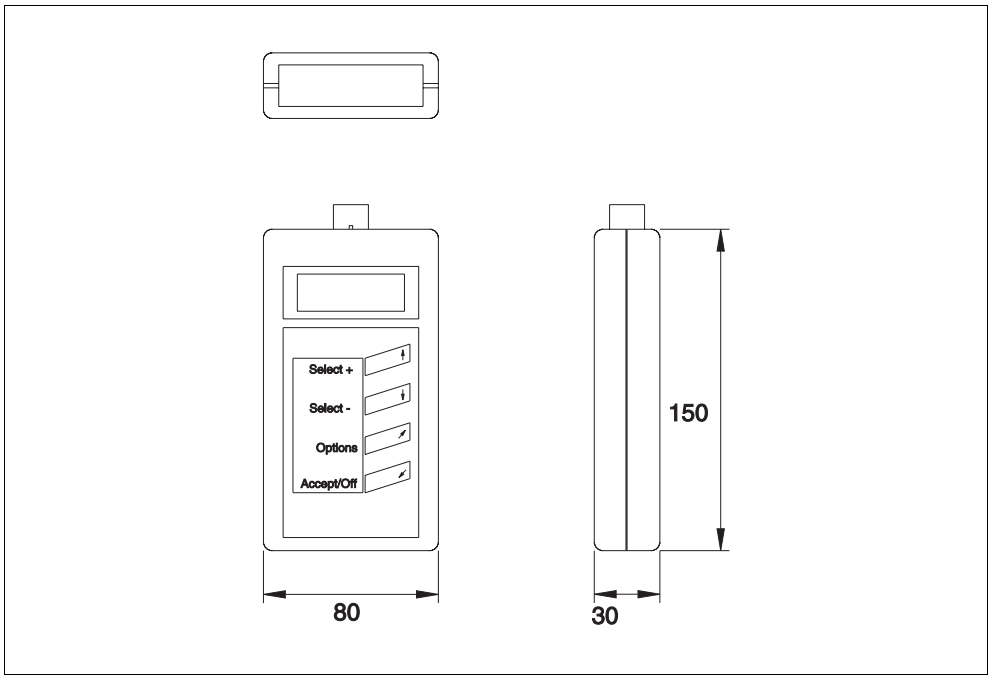

Figure 4.4: Dimensioned drawing PPG 01

4.4 Order Codes

The following order codes are valid for the LVSR 325 and the accessories:

Designation	Order No.	Short Description
LVSR 325-201	50081297	plastic fiber optic cable, cables
LVSR 325-202-S8	50081298	plastic fiber optic cable, M8 plug
LVSR 325-401	50081300	glass fiber optic cable, cable
LVSR 325-402-S8	50081301	glass fiber optic cable, M8 plug
KB-325-2000-4	50081303	programming cable for LVS(R)
PPG 01-D	50081326	hand-held programming device for LVSR 325/German
PPG 01-E	50082021	hand-held programming device for LVSR 325/English
LVSR 325-PS	50082090	programming software for LVSR 325
STV-KB 325	50081304	plug for connection of KB-325-2000-4 to a PC
BK7 KB-713-5000-4	50029173	connection lead angled, 5000 mm
BK7 KB-713-5000-4A	50029174	connection lead axial, 5000 mm

Table 5: Order codes

5 Installation

5.1 Storage, Transportation

Unpacking

- *Check the packaging for any damage. If damage is found, notify the post office or shipping agent as well as the supplier.*
- *Check the delivery contents using your order and the delivery papers:*
  - delivered quantity
  - device type and model as indicated on the name-plate
  - accessories
  - operating manual
- *Save the original packaging for later storage or shipping.*
- *Observe the applicable local regulations when disposing of the packaging materials.*

If you have any questions concerning your shipment, please contact your supplier or your local Leuze electronic sales office.

5.2 Mounting and Connection of the LVSR 325

Installation can be performed using a mounting part which is included in the shipment. Apart from this, the mounting holes can be used for individual mounting of the LVSR 325, depending on the area of application. Additionally, rail mounting is possible. Included in the shipment of plastic fiber optic cables (KF ...) is a cutting device. By using this device, you can individually adjust the fiber optic cable length to your needs. Please note that you should use each cutting opening only once. Otherwise the cut is not optimal. Glass fiber optic cable are ready made by Leuze electronic according to your order.

For installation of the fiber optic cable, proceed as follows:

- *Lead both ends of the fiber optic cable into the fiber optic cable inputs of the sensor. Turn the retention screw 90° in a clock-wise direction (See figure 4.2).*

The fiber optic cable is now connected to the sensor.

Notice
Observe the minimum bending radius of each fiber optic cable.

5.3 Commissioning

Unlock keyboard

The "automatic keyboard lock" is active in the delivery state. To unlock it, proceed as follows:

- *Press both buttons simultaneously for 5 s. The green LED flashes once and displays the unlocking.*

Please note that the keyboard re-locks itself automatically 4 min. after the last action.

5.3.1 Calibration Possibilities on the LVSR 325

In principle there are two possibilities to perform the calibration of the LVSR 325:

1. Manually via the key pad
2. By using the teach-in procedure which is applicable in both the dynamic and static operation mode, i.e. this procedure can be performed with a moving as well as with a static object.

Notice

The teach-in procedure can also be performed via the input function (control input). The adjusted sensitivity value is preserved even with the operating voltage switched off.

Manual adjustment

For manual adjustment of the sensor proceed as follows:

- *Unlock the keyboard as described in Chapter "Commissioning", if not already done.*
- *Bring the object to be detected at the desired distance into the scanning range of the sensor and adjust the sensitivity of the sensor by using the "+" and "-" buttons.*

During this procedure, the red LED flashes at every depressing of a button and the yellow LED displays the switching state. Note that the buttons are equipped with a repeat function. That means, the function repeats itself automatically while the button is pressed.

Notice

The limit of the button potentiometer is reached as soon as the red LED does not react while pressing a button.

Teach-In adjustment

The teach-in procedure is performed via the key pad. For this purpose, proceed as follows:

- *Unlock the keyboard as described in Chapter "Commissioning" if not already done.*
- *Simultaneously press the buttons "+" and "-" for approx. 1 s, until the red LED goes off.*

The sensor is now in "learning mode" and displays this through flashing (2 Hz) of the green LED.

Static/ Dynamic teach-in

Bring the object to be detected into the detection range (static teach-in), or move the object at the desired distance through the detection area (dynamic teach-in).

Notice

Due to a certain performance reserve which is automatically generated, we recommend the dynamic teach-in. As a result, the detection of an object which changes (color) during the production process is better guaranteed.

The green LED flashes shortly with a higher frequency (4 Hz). As soon as the LED returns to the initial frequency, the learning procedure is completed.

To finish the teach-in procedure, press one of the buttons ("+" or "-").

The sensor switches the green LED to permanent light (ready) and the yellow LED displays the switching state. The following figures illustrate the status of the LEDs during the teach-in.

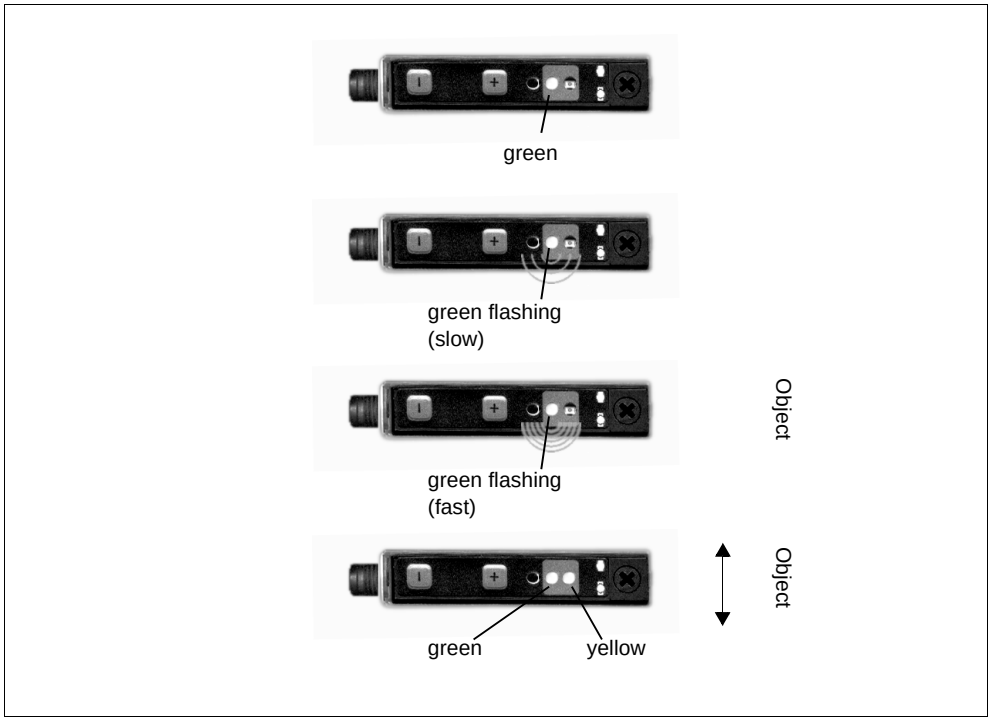

Figure 5.1: LED indicators during teach-in procedure

Notice

The teach-in procedure can not be performed if the sensor does not detect an object or if the light path is interrupted. This is displayed through the red LED for approx. 1.5 s. The last sensitivity adjustment is retained.

6 Programming of the LVSR 325

The programming of the LVSR 325 fiber optic cable control units can be performed either through the programming software LVSR 325-PS or the hand-held programming device PPG 01. Both options are described in the following.

6.1 Software Programming

The program is a multi-language user interface which enables easy and quick reading and editing of the parameters of the LVSR 325. The usage happens menu oriented and with support through extensive help functions. The sensors communicate with the PC via an optical serial interface.

The program displays which sensor is connected. The used program parameters and the read sensor parameter can be saved to the hard disc/disc, printed out or exported to a database for post-processing purposes.

After a short period of learning, the software opens the whole world of programming possibilities of the LVSR 325. Those include:

- Choice of output function: antivalent outputs, warning output etc.
- Delay before start-up: none/ 0.1 s ... 25.5 s
- Shut-down delay/Pulse extensionn/Wiping function
- Choice of input function

Notice
The following procedures and commands are WINDOWS® - standard and are not explained in detail if not required.

6.1.1 Connection of the PC

After removing the cover of the fiber optic cable, the programming cable KB 325-2000-4 is snapped on the LVSR 325 through the adapter mounted on the cable. Connect the 4 pole plug with the connection plug STV-KB-325 and connect this plug to a free serial interface of the PC. More information on the definition of the interface can be found in section "Description of the Menu Commands".

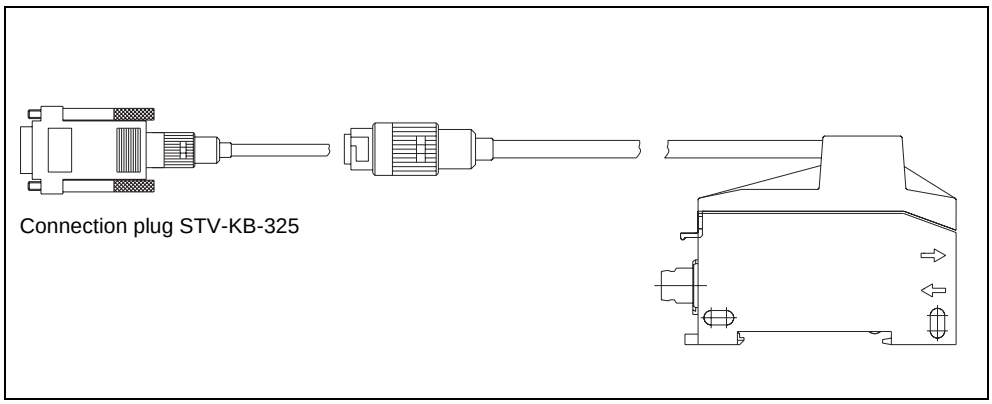

Figure 6.1: Connection of the programming cable to the LVSR 325

6.1.2 Installation of the Programming Software

Installation requirements

Requirements for the installation of the programming software:

- Windows 3.1 or Windows 95/98/NT,
- 486 processor or faster,
- 4 MByte RAM,
- 2 MByte free disk space,
- and a disk-drive for installation of the software.

Starting the Installation File

- *Insert the installation disk 1 into your disk-drive.*
- *Choose **Start** → **Run.** Insert drive and name of the installation file (e.g.: a:\setup.exe) and hit **OK**.*
- *Choose the language which you prefer for the setup and for working with the program and confirm the entry with **Next**.*
- *In the following window, define the path for the installation directory and confirm with **Install**.*

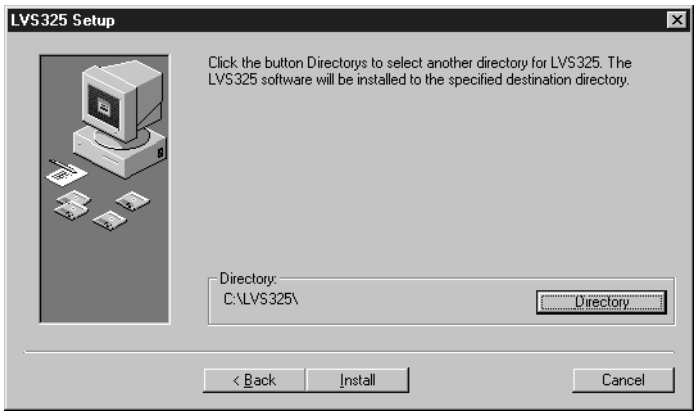

Figure 6.2: Installation directory

- *Follow the installation routine.*

Starting the Program

After finishing the installation routine, the programming software is ready to be used.

- *Choose the LVSR 325 programming software icon from the program group.*

In case no LVSR 325 is connected, the following window opens after the start of the program:

Window without connected LVS

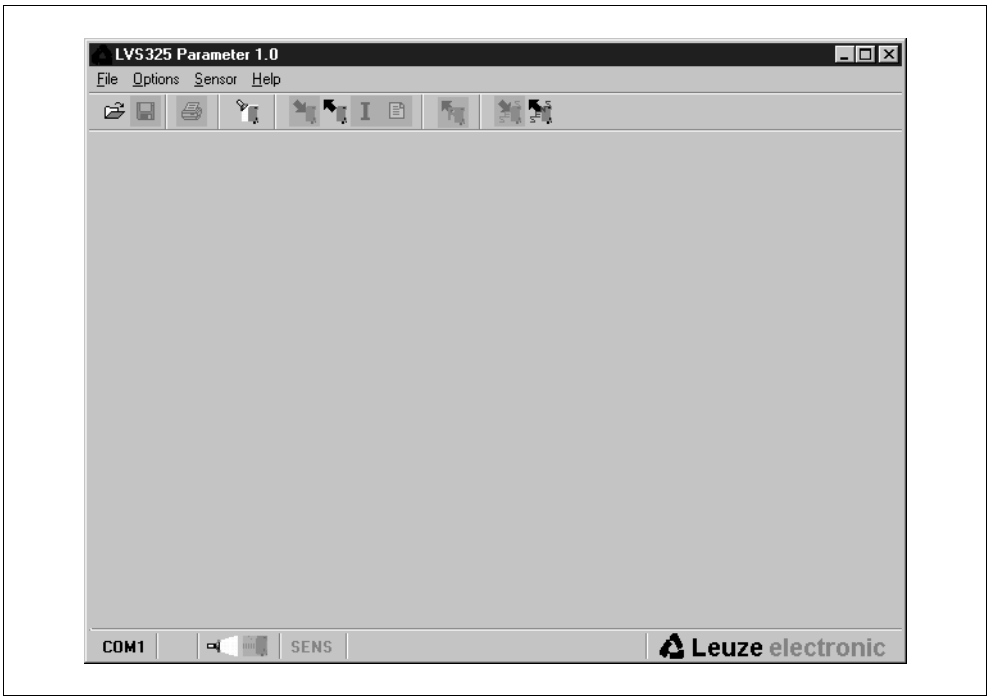

Figure 6.3: Main window without LVSR 325

After having established the connection between LVSR 325 and PC, or after having opened an existing parameter file, the following information is displayed in the main window:

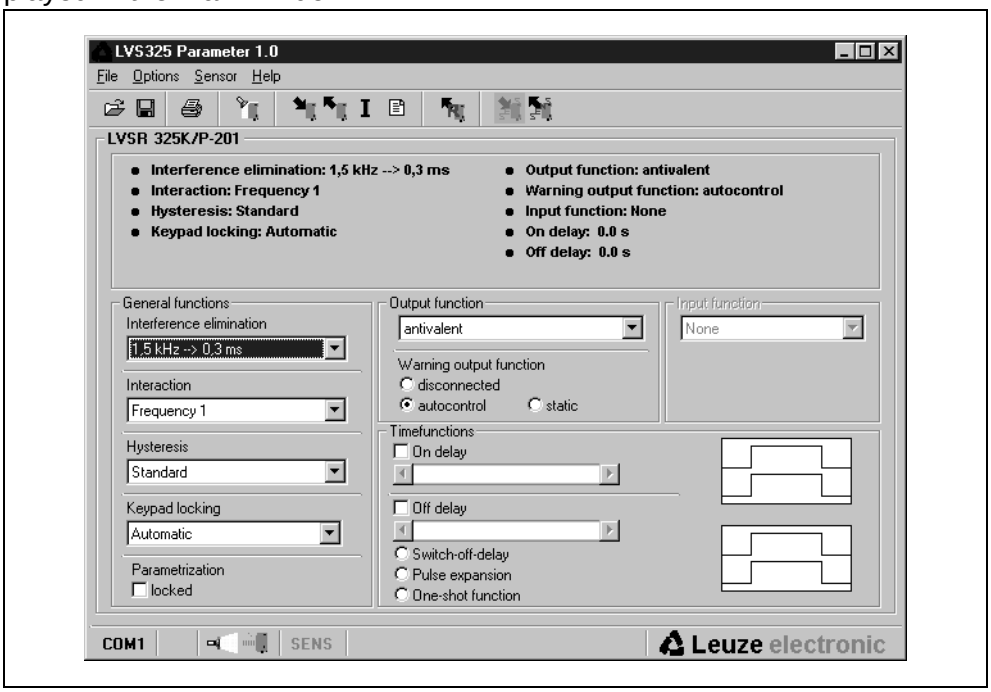

Figure 6.4: Main window with LVSR 325

The software automatically recognizes the connected sensor with its default settings.

6.1.3 Description of the Menu Commands

File The following possibilities are available under this menu item:

- **Open**: Enables opening of already existing parameter files
- **Save**: Opens a window for saving of sensor data. Data sets loaded before, are stored under the same name. If another name is desired choose **Save as ...**.
- **Save as...**: Same function as **Save**, however, choice of file name is always possible.
- **Print**: Using this function, a data sheet with all sensor parameters can be printed. It is possible to insert comments prior to printing. They appear below the parameters. If using the print option via the toolbar, the default printer is automatically used. By using the menu bar, a custom printer can be chosen.

Notice
*The data sheet only opens automatically if the print option is invoked for the first time. If you wish to alter the text, choose the menu item **Sensor** → **Further description**.*

- **Export**: You can export the sensor parameters with a different format. Supported are *.txt and *.csv formats.
- **Exit**: Quits the programming software

Options The following three possibilities are offered under **Options**:

- **Language:** To choose the dialog language.
- **Interface**: To choose the port to which the connection cable to the LVS is connected (standard: COM 1). The programming software automatically recognizes the interface used. Choosing a different port could become necessary if more than one sensor is used. The interface is displayed in the status line of the main window.

Additionally, three check-boxes with the following functions are available in this menu:

- **Tooltips**: This check-box controls the help context sensitivity behavior of the toolbars. Deactivate the box if no help function is desired.
- **Overview display**: This checkbox displays the overview in the upper part of the main window. Deactivate this box if you are working with a smaller resolution.
- **Automatic sensor detection**: If the box is activated, the program automatically loads the sensor data if a sensor is detected on the selected serial interface during the cyclical test.

Sensor This menu item contains all sensor-related commands:

- **Read**: The sensor parameters are read via the selected serial interface. Sensitivity data excluded.
- **Code**: Displays the sensor code.

Notice

Leuze electronic can deliver ready made sensor codes with preset adjustments. The sensor is automatically re-adjusted after inserting such a code and writing it to the sensor.

- **Write**: The sensor parameters are written via the selected serial interface. Sensitivity data excluded.
- **Sensor Description**: Opens the data sheet for adding comments which shall be printed together with the parameter set.
- **Info**: This menu opens a window which displays information on the connected sensor and the current sensor code.
- **Factory settings**: The default settings are read into the software from the sensor. Through the menue item "Write" the sensor is reset to default settings:

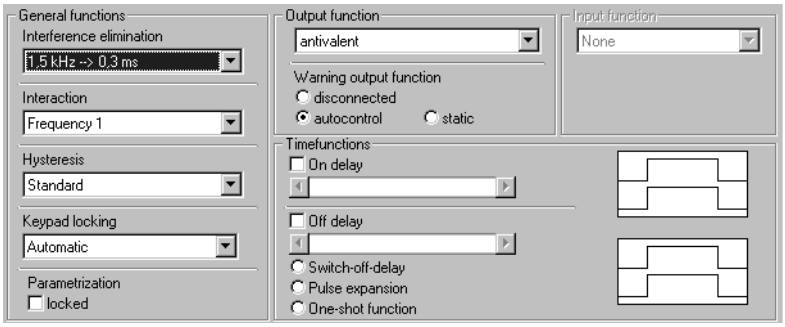

Figure 6.5: Default settings of the LVSR 325

- **Test**: Tests the connection to the sensor and issues a corresponding message.
- **Read sensitivity**: The current sensitivity settings are read. The value can not be changed by the program.
- **Write sensitivity**: The current sensitivity is overwritten with the new value. The new value is usually the one of a former reading operation. There is no possibility to insert a value, except in case you receive a ready made code from Leuze electronic. Sensitivity adjustments are already included in these codes.

Help This menue contains the following two possibilities:

- **Contents**: Opens an extensive help file which can assist you in most of the upcoming problems. Special help is available by pressing **F1**.
- **About ...**: Contains information on manufacturer and program version.

6.1.4 Programming and Adjustment Possibilities

At this point, the various programming possibilities are explained. The software offers an extended functionality. The following settings are possible:

Interference elimination

The switching frequency (Hertz [Hz]) defines the maximum number of switching cycles a sensor can perform during a set time interval. The frequency influences the interference signal filter. The filter depth is the higher, the lower the selected switching frequency is. A large filter depth means the filter can suppress a large number of interference pulses. As a result the sensor can safely work in a heavily influenced environment.

Interaction

The optical electronic sensor delivers light pulses, no permanent light. Neighboring sensors which interfere in respect to their detection range and which work with the same pulse frequency, can therefore suffer from mutual interferences. In order to avoid this, the transmitting signal sequence is selectable in three different frequencies.

Hysteresis

The difference between the activation and deactivation point of the output while the object approaches or moves out of the detection range is described as hysteresis. If the hysteresis has been selected small, both switching points are close to each other. If the object to be detected shows position tolerances near the switching point through vibrating or moving surface, a large hysteresis avoids permanent switching of the output.

Key pad locking

Both buttons can be used for sensitivity adjustment of the sensor or for inducing the teach-in procedure. The key pad can be locked by using the program.

off No lock is active. Any pressing of a button causes a change of the settings.

automatic For information on this function see section "Commissioning".

constant Both buttons are inactive; using them has no effect.

Parameter lock

Activate parameter lock After activation of the box, the current parameters can not be changed until the lock is removed. An exception is the choice of the function as described in section "Key pad locking". Function of the buttons is then retained.

Deactivate parameter lock The sensor is reset to default settings (RESET) by using the following steps:

1. Switch off the operating voltage.
2. Simultaneously press both buttons and switch on the operating voltage.
3. Release buttons.

Notice

The red LED is flashing if the light path was not free or if no object was detected. Take the following measure:

- *Clear the light path (choose shorter distance if required), or bring the object in front of the fiber optic cable and repeat the procedure.*

Output function:

The function of both outputs is selectable. One of the outputs can be used as an input. The following settings are thus available:

- **Antivalent**: Two antivalent switching outputs (WH + BK), light / dark switching
- **Light switching + Warning**: One switching output (light switching) and the warning output (WH)
- **Dark switching + Warning**: One switching output (dark switching) and the warning output (WH)
- **Light switching + Input**: One switching output (light switching) and the input function (WH)
- **Dark switching + Input**: One switching output (dark switching) and the input function (WH)

In addition to that, you can define the function of the warning output here. Depending on your needs, you can either deactivate the warning output through checking of the respective boxes, choose a static function, or you can choose the autoControl function.

Input function:

One sensor connection can be selected for different functions; either as control or linking input. These functions can be activated directly or invertedly.

The direct function is active if a voltage of ≥ 7 V DC is present at the input and inactive with a voltage of ≤ 2 V DC. The negative logic is working the other way around.

Activation The transmitter of the sensor is switched off and all other components work in normal function. The functionality of the sensor can now be tested. Photo electric sensors should react as if the light path were interrupted, light scanners should react as if the detected object moved out of the scanning range.

Light/dark switching The switching outputs change their switching function, that means the make-contact becomes the break-contact and the break-contact becomes the make-contact. The warning output autoControl always works as make-contact.

Linking

The switching signal is generated from the logical linking of the input together with the signal of the transmitter. The following links can be selected:

- **AND**: The switching signal is generated if the linking input is active **and** if the sensor detects an object.
- **OR**: The switching signal is generated if the linking input is active **or** if the sensor detects an object.
- **XOR**: The switching signal is generated in two cases. That means the linking input is active **and** the sensor detects no object **or** the linking input is inactive **and** the sensor detects an object.

Teach-In

The teach-in procedure is performed via the control input.

Activate the input (WH) by connecting the operating voltage.

The sensor is now in "teach-in mode" and displays this through flashing (2 Hz) of the green LED.

Bring the object to be detected into the detection range (static teach-in), or move the object at the desired distance through the detection range (dynamic teach-in).

The green LED flashes shortly with a higher frequency (4 Hz). As soon as the LED returns to the initial frequency, the learning procedure is completed.

Deactivate the input (WH) by disconnecting the operating voltage.

The sensor switches the green LED to permanent light (ready) and the yellow LED displays the switching state. The following figures illustrate the status of the LEDs during the teach-in.

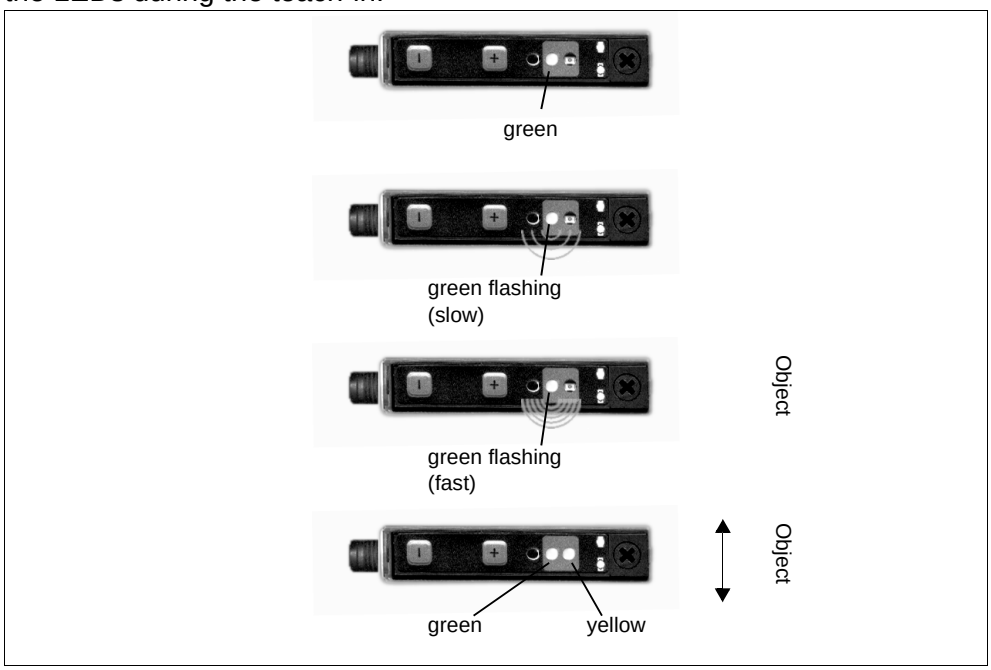

Figure 6.6: LED indicators during teach-in procedure

Notice

The teach-in procedure can not be performed if the sensor does not detect an object or if the light path is interrupted. This is displayed through the red LED for approx. 1.5 s. The last sensitivity adjustment is retained.

Pre-failure warning test (Failure control) The transmitting power is reduced to 50% after activation. If the switching output changes now, the sensor is in a limited functional range; this leads to the pre-failure warning.

Latch During the activation time of the input, the switching outputs are "frozen", that means not moved. Ongoing time functions and the corresponding switching state changes, however, are not influenced. They are processed even during this time and if required the switching outputs are set correspondingly. The pre-failure warning also works normally.

D-Flipflop Here, the sensor works like an edge triggered D-Flipflop. The edge of a pulse is present at the functional input. In the moment of input activation, the current switching state is transferred to the outputs. After that the output state is kept until the input changes its state from "deactivated" to "activated". Ongoing time functions and the corresponding switching state changes, however, are not influenced. They are processed even during this time and if required the switching outputs are set correspondingly. The pre-failure warning also works normally.

Time functions

The LVSR 325 works with four time functions. Those include one delay before start-up and three switching off functions. The delay before start-up can be combined with any of the three turn-off functions.

Delay before start-up (On delay) The selectable delay is T1= 0.1 - 25.5 s. The sensor applies this delay after detection of an object, before switching of the output.

Turn-off delay (Switch off delay) The selectable delay is T2= 0.1 - 25.5 s. This is the period, the sensors delays the switching of the output if the detected object moves out of the scanning range.

Pulse lengthening (Pulse expansion) The minimum pulse duration is T2= 1 - 255 ms. The output state is held at least for the time period T2, independent of what the sensor detects during this period.

Wiping function (One shot function) The output is switched off again exactly after the time period T2, independent of how long the sensor detects its target (pulse output T2= 1 - 255 ms)

6.2 Transmit Parameters and Quit Program

- *Choose menue item **Sensor** → **Write** to transmit the altered parameters to the LVSR 325 or*
- *click on **Write data to sensor** in the toolbar.*

The data is transmitted and a message is displayed.

- *To quit the program, choose **File** → **Exit**.*

The programming software is closed down.

6.3 Programming via Hand-held Device

The PPG 01 is a compact device for programming of the LVSR 325. It offers easy-to-use display and editing of all settings. Direct saving and loading of up to 4 parameter configurations in the hand-held device is possible. The hand-held device also offers the same functionality as the PC software.

Communication is done via an optical interface. In order to do this, the programming cable is snapped-on the LVSR 325 and connected with the hand-held device:

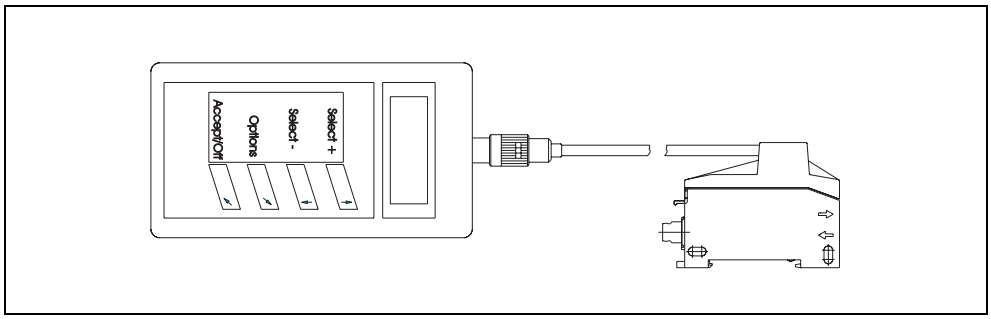

Figure 6.7: Connection of the LVSR 325 with the hand-held device

- *Remove the cover of the fiber optic cable amplifier and snap-on the adapter of the programming cable to the sensor.*
- *Connect the plug of the programming cable with the socket of the hand-held device and lock this connection by turning the plug.*

6.3.1 Using the Hand-held Device

You can switch-on the device by pressing any key. The main menue is started. The device switches itself off 5 minutes after the last action.

The following button functions are available:

- Button ↑ **Select +:** move up in the same menue
- Button ↓ **Select -:** move down in the same menue
- Button ↗ **Options:** move to a lower level menue/trigger function
- Button ↙ **Accept/Off:** enter, trigger function, set parameter, move to higher level menue

6.3.2 Menue Control of the Hand-held Device

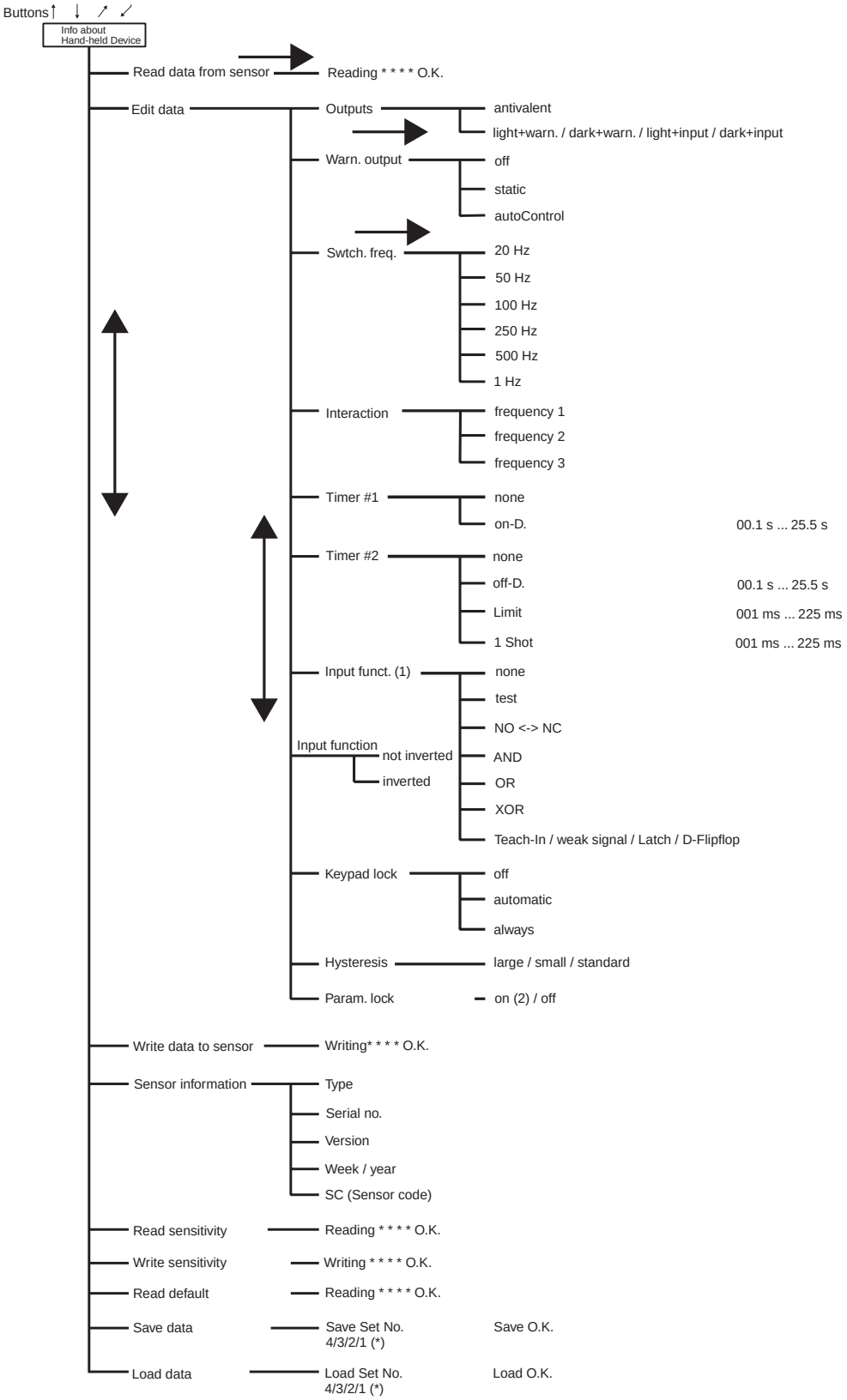

Figure 6.8: Menue control of the hand-held device

Remarks concerning diagram

- On (1): Note that these settings are only possible if an input function is selected.
- On (2): Note that the activated lock can only be deactivated by returning to default settings (RESET)
- On (*): Only confirm with ↗

Leuze electronic GmbH + Co.
Postfach 11 11, D-73277 Owen/Teck
In der Braike 1, D-73277 Owen/Teck
Telefon (0 70 21) 57 30
Telefax (0 70 21) 57 31 99
http://www.leuze.de

Sales and Service

A
Ing. Franz Schmachtl KG
Postfach 362
A-4021 Linz/Donau
Tel. Int. + 43 (0) 732/7646-0
Fax Int. + 43 (0) 732/785036

Zweigbüros:
Kolpingstraße 15
A-1232 Wien
Tel. Int. + 43 (0) 1 /6162180
Fax Int. +43 (0) 1/616218099

Theodor-Körner-Straße 54
A-8010 Graz
Tel. Int. + 43 (0) 316/672185
Fax Int. + 43 (0) 316/672439

Arzlerstr. 42 b, A-6020 Innsbruck
Tel. Int. + 43 (0) 512/265060
Fax Int. + 43 (0) 512/266151

ARG
Neumann SA.
Calle 55 N° 6043 (ex Buenos Aires 945)
1653 Villa Ballester
Provinz Buenos Aires
Argentina
Tel. Int. + 54 (0) 1/767-2388
Fax Int. + 54 (0) 1/764-2026

AUS
Leuze Australasia Pty. Ltd.
48 Skarratt Street
AUS-Silverwater NSW 21 28
Sydney, Australia
Tel. Int. + 61 (0) 2 /97 48 37 88
Fax Int. + 61 (0) 2 /97 48 38 17
E-mail: 100241.3435@compuserve.com

B
Leuze electronic nv/sa
Steenweg Buda 50
B-1830 Machelen
Tel. Int. + 32 (0) 2/253 16 00
Fax Int. + 32 (0) 2/253 15 36
Leuze.info@leuze.be

BR
Leuze electronic Ltda.
Av. Juruá, 150-Alphaville
BR-06455-010 Barueri-S. P.
Tel. Int. + 55 (0) 1 1/72956134
Fax Int. + 55 (0) 1 1/ 72956177
E-mail: leuzeelectronic@originet.com.br

CH
Leuze electronic AG
Ruchstuckstrasse 19
CH-8306 Brüttisellen
Tel. Int. + 41 (0) 1/8340204
Fax Int. + 41 (0) 1/8332626

CZ + **SK**
Schmachtl CZ Spol. SR. O.
Videòska 185
25242 Vestec-Praha
Tel. Int. + 420 (0) 2/44 910701
Fax Int. + 420 (0) 2/44 910700
E-mail: schmachtl/@mbox.vol.cz

CO
Componentes Electronicas Ltda.
P.O. Box 478, CO-Medellin
Tel. Int. + 57 (0) 4/ 3511049
Telex 6 6922
Fax Int. + 57 (0) 4/3511019

D
Lindner electronic GmbH
Schulenburger Landstraße 128
30165 Hannover
Telefon (0 511) 96 60 57-0
Telefax (0511) 96 6057-57
E-mail: lindner@leuze-owen.de

W+M plantechnik
Dipl.-Ing. Wörtler GmbH + Co.
Tannenbergstraße 62
42103 Wuppertal
Telefon (0 202) 37112-0
Telefax (0 202) 318495
E-mail: w+m@rgb.net

Leuze electronic GmbH + Co.
Geschäftsstelle Owen
In der Braike 1
73277 Owen/Teck
Telefon (0 7021) 9850-910
Telefax (0 7021) 9850-911
E-mail: vgo@leuze-owen.de

Leuze electronic GmbH + Co.
Geschäftsstelle Dresden
Niedersedlitzer Straße 60
01257 Dresden
Telefon (0351) 2 80 93 19/20
Telefax (0351) 2 80 93 21
E-mail: vgd@leuze-owen.de

Leuze electronic GmbH + Co.
Geschäftsstelle Frankfurt
Moselstraße 50
63452 Hanau
Telefon (06181) 9177-0
Telefax (06181) 917715
E-mail: vgf@leuze-owen.de

Leuze electronic GmbH + Co.
Geschäftsstelle München
Ehrenbreitsteiner Straße 44
80993 München
Telefon (089) 14365-200
Telefax (089) 14365-220
E-mail: vgm@leuze-owen.de

DK
Desim Elektronik APS
Tuasingevej
DK-9500 Hobro
Tel. Int. + 45/ 98510066
Fax Int. + 45/ 98512220

E
Leuze electronic S.A.
Gran Via de Las Corts
Catalanes, Nr. 641, Atico 4
E-08010 Barcelona
Tel. Int. + 34 9 3/3023080
Fax Int. + 34 9 3/3176520

F
Leuze electronic sarl.
Z.I. Nord Torcy, B.P. 62-BAT 4
F-77202 Marne la Vallée Cedex 1
Tel. Int. + 33 (0) 1 /60051220
Fax Int. + 33 (0) 1/60050365
E-mail: leuze@club-internet.fr

FIN
SKS-tekniikka Oy
P.O. Box 122
FIN-01721 Vantaa
Tel. Int. + 358 (0) 9/852661
Fax Int. + 358 (0) 9/85268230

GB
Leuze Mayser electronic Ltd.
Alington Road, Eynesbury,
GB-St. Neots, Cambs., PE19 2RD
Tel. Int. + 44 (0) 1 480/408500
Fax Int. + 44 (0) 1480/403808

GR
U.T.E. Co ABEE
16, Mavromichali Street
GR-18538 Piraeus
Tel. Int. + 30 (0) 1 /4290710,
4290685, 4290991
Fax Int. + 30 (0) 1/4290770

H
Kvalix Automatika Kft.
Postfach 83
H-1327 Budapest
Tel. Int. + 36 (0) 1 /3794708
Fax Int. + 36 (0) 1/3698488
E-mail: info@kvalix.hu
http://www.kvalix.hu

HK
Electrical Systems Ltd.
14/F Tai Po Commercial Centre
152 Kwong Fuk Road
Tai Po N.T. Hongkong
Tel. Int. + 852 /26566323
Fax Int. + 852/26516808

I
IVO Leuze Vogtle Malanca s.r.l.
Via Soperga 54, I-20127 Milano
Tel. Int. + 39 02/26110643
Fax Int. + 39 02/26110640
E-mail: ivoleuze@tin.it

IL
Galoz electronics Ltd.
P.O. Box 35
IL-40850 Rosh Ha'ayin
Tel. Int. + 972 (0) 3/9023456
Fax Int. + 972 (0) 3/9021990

IND
Global Tech Corp.
403, White House
1482 Sadashir Peth, Tilak Road
Pune 411030, India
Tel. Int. + 91 (0) 212 /470085
Fax Int. + 91 (0) 212 /470086

J
SSR Engineering Co., Ltd.
2-18-3 Shimomeguro
Meguro-Ku. Tokyo
Tel. Int. + 81 (0) 3 /34936613
Fax Int. + 81 (0) 3 /34904073

MAL
Ingermark (M) SDN.BHD
No. 29 Jalan KPK 1/8
Kawasan Perindustrian Kundang
MAL-48020 Rawang,
Selangor Darul Ehsan
Tel. Int. + 60 (0) 3 /6042788
Fax Int. + 60 (0) 3 /6042188

N
Elteco A/S
Postboks 96
N-3901 Porsgrunn
Tel. Int. + 47 (0) 35 /573800
Fax Int. + 47 (0) 35 /573849

NL
Leuze electronic B.V.
Postbus 1276
NL-3430 BG Nieuwegein
Tel. Int. + 31 (0) 30 /6066300
Fax Int. + 31 (0) 30 /6060970
E-mail: info@leuze.nl
http://www.leuze.nl

P
LA2P, Lda.
Rua Almirante Sousa Dias, Loja D
Nova Oeiras, P-2780 Oeiras
Tel. Int. + 351 (0) 1 /4422608/58
Fax Int. + 351 (0) 1/4422808

PL
Rotiw Sp.z.o.o.
Ul. Roździeńskiego 188 B
PL-40203 Katowice
Tel. Int. + 48 (0) 32/596031
Fax Int. + 48 (0) 32/7572734

RCH
Imp. Tec. Vignola S.A.I.C.
Plaza Justicia, Sub El Peral 25
Casilla 93-V
RCH-Valparaiso
Tel. Int. + 56 (0) 32 /257073,
256521, Telex 33 0404
Fax Int. + 56 (0) 32/258571

ROC
Great Cofue Technology Co., Ltd.
4F-8, 39, Sec. 4, Chung Hsin Road
San-Chung City
Taipei Hsien, Taiwan, R. O. C.
Tel. Int. + 886 (0) 2 /29838077
Fax Int. + 886 (0) 2/29853373

ROK
Useong Electrade Co.
No 222, Jail Electron B/D
63, Changsa Dong, Chongno-Gu
Seoul, Korea
Tel. Int. + 82 (0) 2 /6867314/5
Fax Int. + 82 (0) 2/6867316

RP
JMTI Industrial Corporation
No. 5, Saturn Street
Bricktown, Moonwalk
Paranaque, Metro Manila, Philippines
Tel. Int. + 63 (0) 2 /8446326
Fax Int. + 63 (0) 2/8932202

RSA
Countapulse Controls (PTY.) Ltd.
P.O.Box 40393,
RSA-Cleveland 2022
Tel. Int. + 27 (0) 11/6157556-8
Fax Int. + 27 (0) 11/6157513

S
Leuze electronic AB
Headoffice
Box 4025
181 04 Lidingö
Tel. + 46 (0) 8 /7315190
Fax + 46 (0) 8/7315105

SGP
Pepperl + Fuchs Pte. Ltd.
P + F Building
18, Ayer Rajah Crescent, N. 06-03
SGP-Singapore 139942
Tel. Int. + 65 /7799091
Fax Int. + 65 /8731637

SLO
Tipteh d.o.o.
Cesta v Gorice 40
SLO-1111 Ljubljana
Tel. Int. + 386 (0) 61/1232397
Fax Int. + 386 (0) 61/1234769

TR
Arslan Elektronik A. S.
Lülecihendek Cod. Nr. 47
Tophane Karaköy
TR-Istanbul
Tel. Int. + 90 (0) 2 12/2434627
Fax Int. + 90 (0) 212/2518385

USA + **CDN** + **MEX**
Leuze Lumiflex Inc.
300 Roundhill Drive, Unit 4
USA-Rockaway, NJ 07866
Tel. Int. + 1 (0) 973/ 5860100
Fax Int. + 1 (0) 973/ 5863230
E-mail: norstat@mailhost2.planet.net

GB 097/00 - 05/99 Article-No. 500 61 367