BA 212C/07/en/01.00
Nr. 51502192
Software version 1.00 or later

Supplement to
BA 207C/07/en

HART®
Field Communication with SmarTec S CLD 132

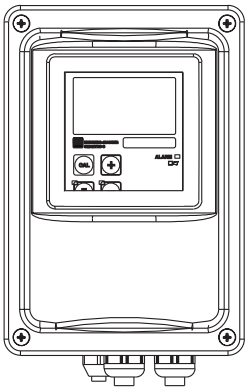
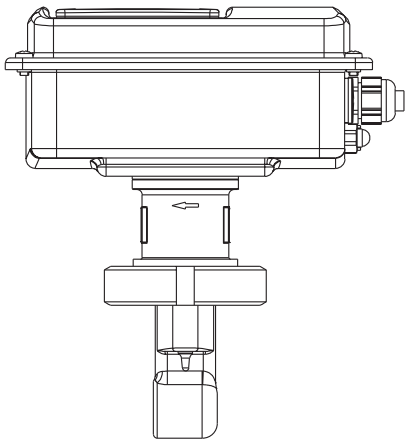
Operating Instructions









HART
FIELD COMMUNICATIONS PROTOCOL

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ISO 9001

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The Power of Know How

You need information on the instrument?
Please read the following chapters:

General information

Safety

You wish to install and start up the instrument.
The required steps are described in these chapters:

Installation

Start-up

You wish to operate or reconfigure the instrument:

Communication

Operating menu

Accessories

Technical data

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Table of contents

1 General information

These operating instructions were designed specifically for the use with transmitters of the SmarTec S CLD 132 family. They contain the specific information on instruments with the HART® interface (**H**ighway **A**ddressable **R**emote **T**ransducer).

Please refer to the corresponding standard operating instructions for information on installation and general transmitter operation: BA 207C/07/en.

1.1 Symbols used

Warning:

This symbol alerts to hazards which may cause serious injuries as well as damage to the equipment if ignored.

Note:

This symbol indicates important items of information.
Ignoring this information may result in malfunction.

2 Safety

2.1 Intended use

Operation via HART® interface

The HART® interface allows the operation via the hand-held terminal DXR 275 or via a HART® interface (Commubox) using the operating program Commuwin II.

2.2 General safety instructions

Warning:

- The notes and warnings in these operating instructions must be strictly adhered to!
- The notes and warnings contained in the standard operating instructions (207C/07/en) must be strictly adhered to!

3 Installation

3.1 System equipment

A complete system equipment comprises the following components:

- Transmitter SmarTec S CLD 132
- Hand-held terminal DXR 275 or
- HART® interface Commubox FXA 191 with PC based operating program Commuwin II.

3.2 Electrical connection

The HART® hand-held terminal DXR 275 and the HART® interface Commubox FXA 191 are connected via the current output 1 of the transmitter.

Connect the hand-held terminal and the interface over a resistance of minimum 250 Ω in the current output 1 circuit.

Note:

Simultaneous operation of Commuwin II and HART® hand-held terminal is only possible, if
- one device is set as primary master, the other device is set as secondary master,
- none of the masters is having continuous communication.

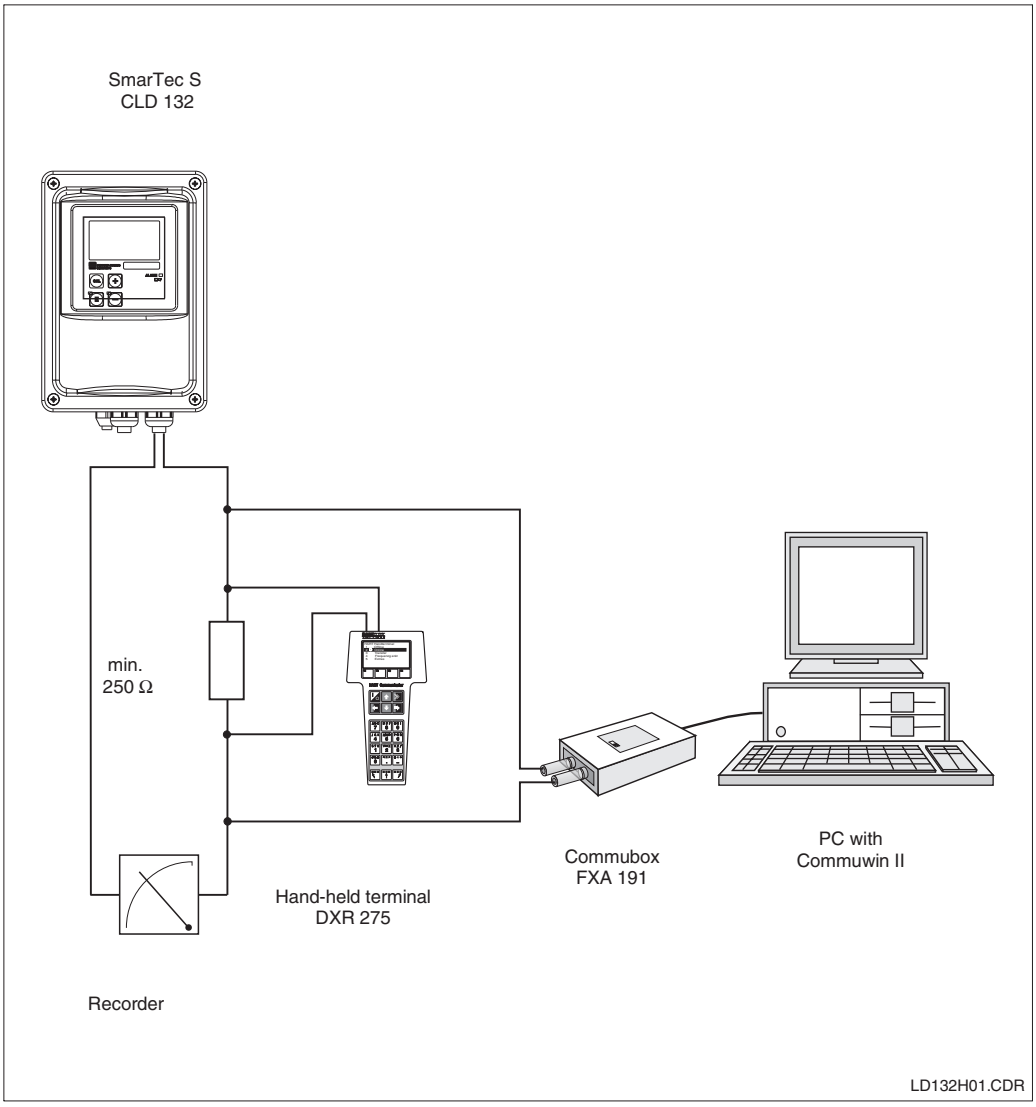


Fig. 3.1 Connection of HART® hand-held terminal DXR 275 or HART® interface Commubox FXA 191

4 Start-up

4.1 Setting of device address

All HART® instruments are factory set to device address 0. This address can be changed due to a multiple network HART® communication (multi-drop operation).

The device address can be set via

- the field operation or
- the hand-held terminal DXR 275 or
- the operating program Commuwin II with universal DD.

Note:

- Valid device address range: 0 .. 15.
- Each address may only be assigned once in a network.
- If a device address ≠ 0 is selected, the current output 1 is automatically set to 4 mA and the instrument automatically switches to multi-drop operation.
- The HART® communication **only** operates via current output 1.

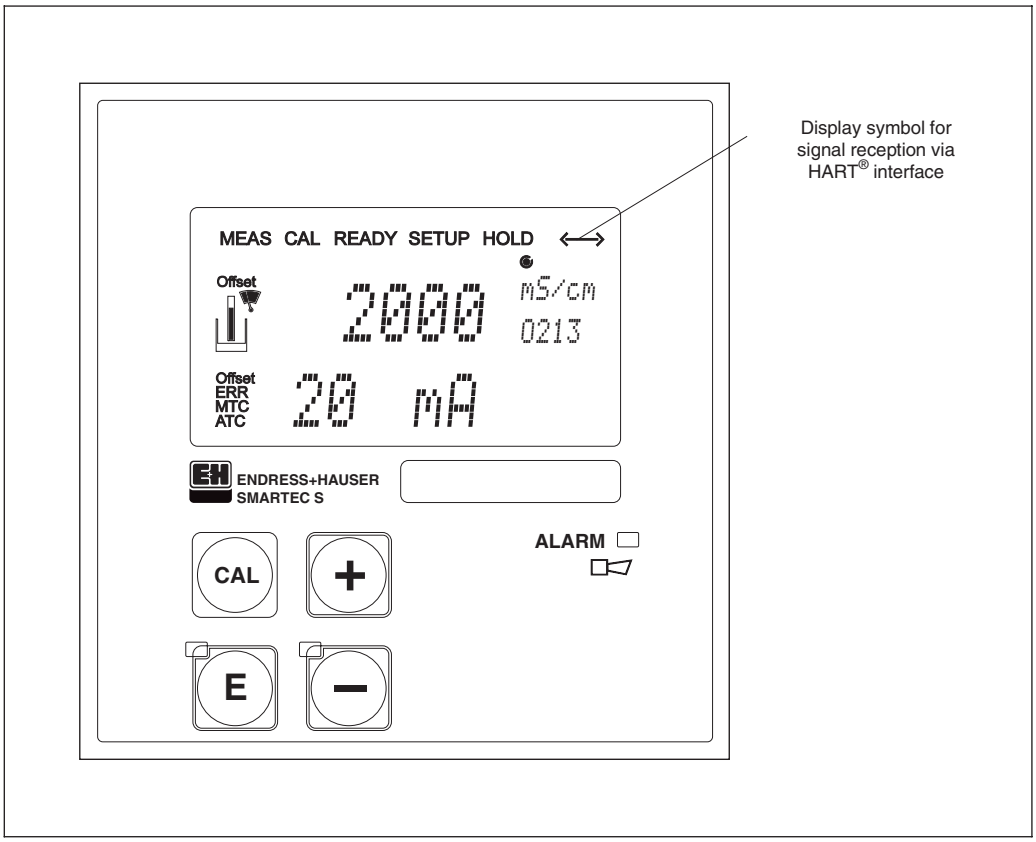


Fig. 4.1 Front membrane SmarTec S CLD 132

5 HART® communication

5.1 Operation via hand-held terminal

The HART® hand-held terminal is operated via pushbuttons. The instrument functions are selected at different menu levels.

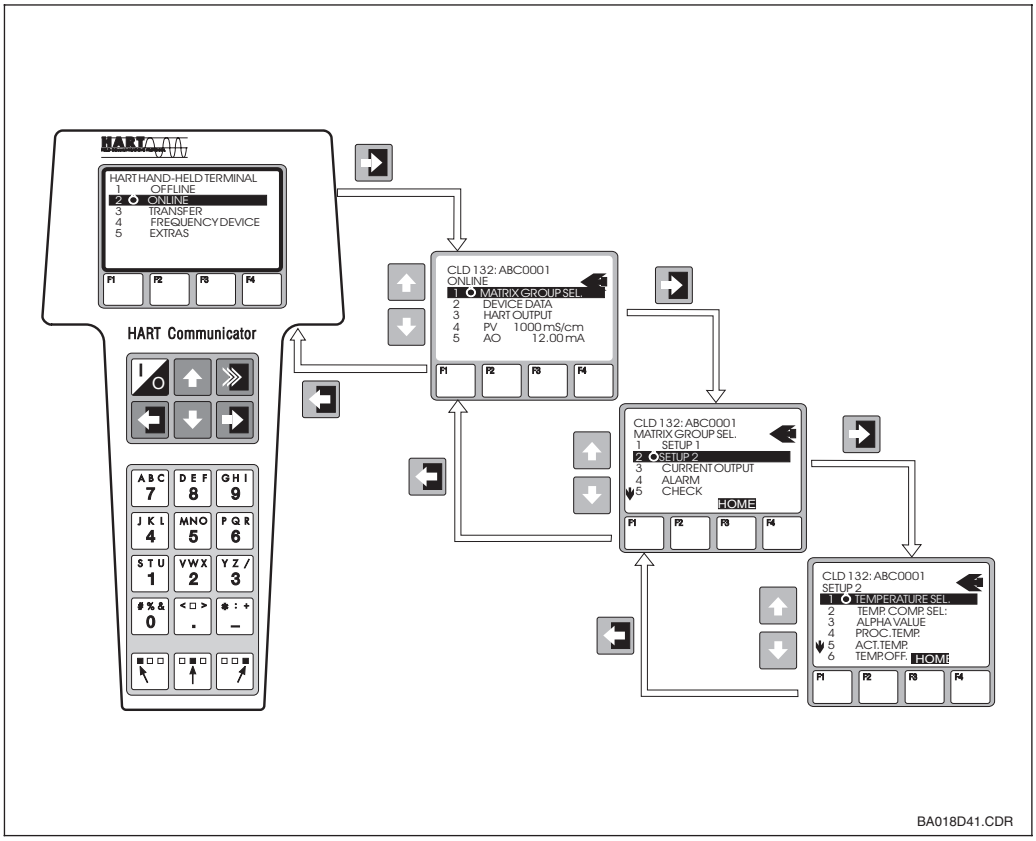


Fig. 5.1 Operation of the hand-held terminal DXR 275

Operating procedure

- Switch on the hand-held terminal:
  - Transmitter not connected:
    ➜ The HART® main menu appears. This menu level appears for any HART® programming, independent of the instrument type. Refer to the operating instructions “Communicator DXR 275".
  - Transmitter is connected:
    ➜ The program goes directly to “Online” menu level. The “Online” menu level is used to display the current data measured, such as pH value, conductivity, temperature etc., and also allows to access the operating matrix via the “matrix group selection” line (Fig. 5.1). All function groups and functions accessible through HART® are displayed in this matrix in a systematic arrangement.
- The function group is selected using “matrix group selection” (e.g. Setup 2) and then the desired function, e.g. “Selection temperature”. All settings or numeric values relating to the function are immediately displayed.
- Enter numeric value or change setting as required.
- Press function key “F2" to call up ”SEND". Press the F2 key to transfer all the values entered and the settings changed to the measuring system.

Press the HOME function key “F3" to return to the ”Online" menu level. Here you can read the current values measured by the transmitter with the new settings.

5.2 Operation via Commuwin II

The transmitter SmarTec S CLD 132 can be operated using the operating program Commuwin II. Commuwin II is a graphical operating program with different communication protocols. Commuwin II is accessed via the HART® interface Commubox FXA 191. Parameter setting is performed either via the operating matrix or the graphical user interface.

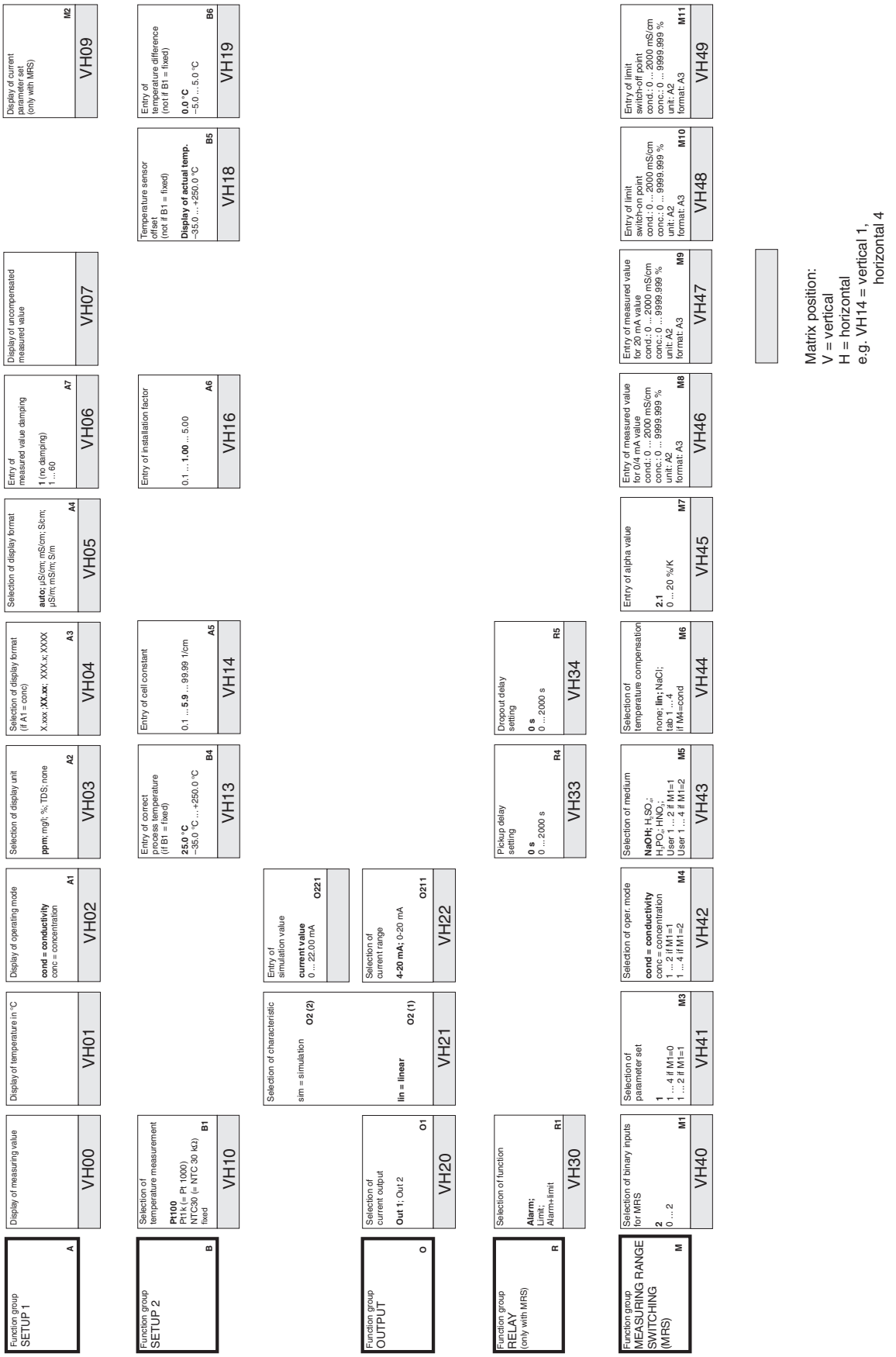
The operating structure is shown on the following pages.

Note:

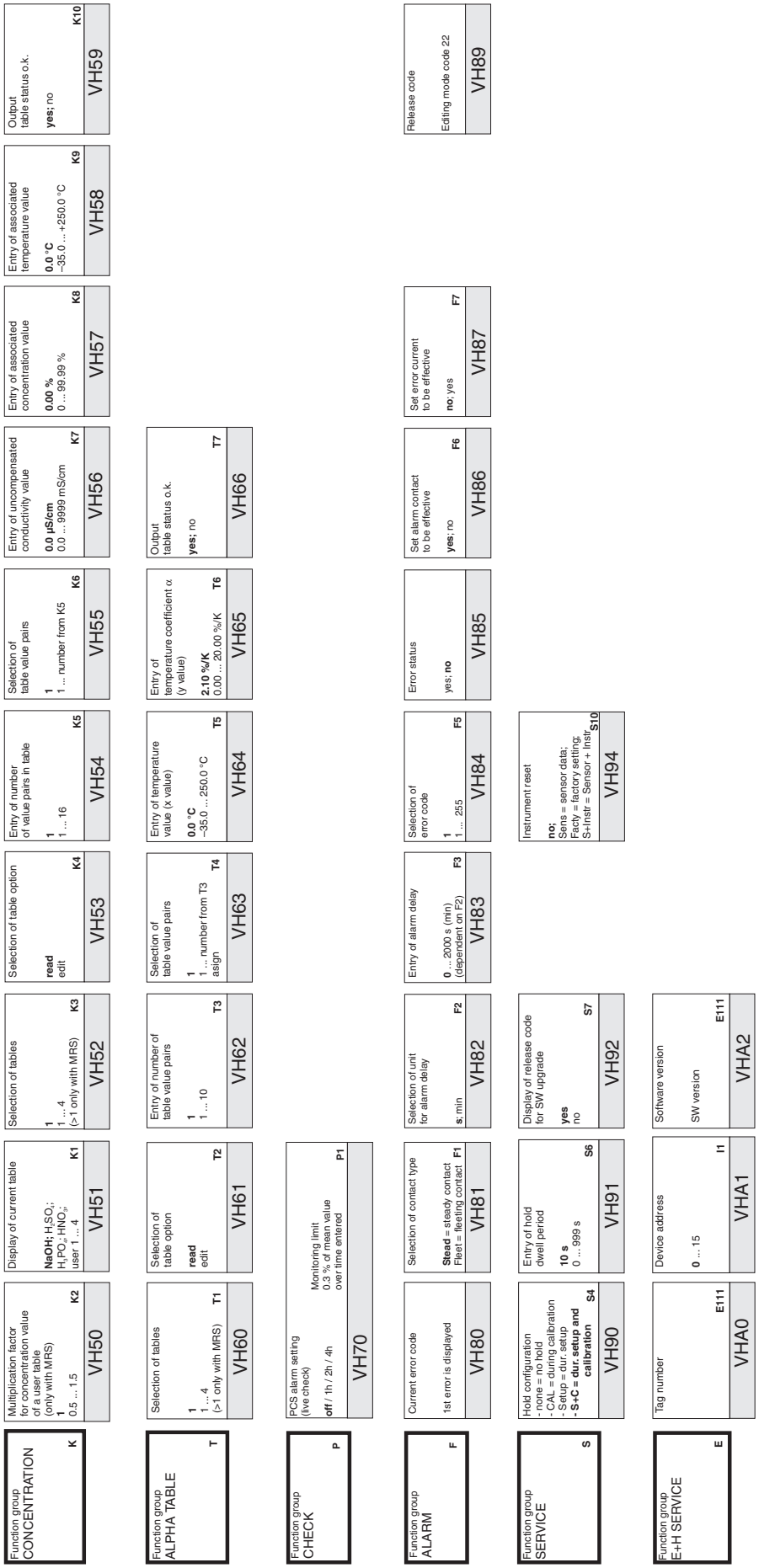
- Refer to the operating instructions BA 124F/00/en for further information on the operation of Commuwin II.
- Remote calibration via the HART® iinterface is not possible.
- All operating fields are accessible via off-line parameter setting, if access code MRS “yes” is selected in matrix position VH 92. If there is no compatibility with the actual device status (e.g. no access code for MRS), error code 03 is displayed after finishing the download. The transmitter then does not return to the normal operating status. In this case, repeat the download with correct data or reset the instrument.

6 Operating menu

Operating menu SmarTec S CLD 132



Matrix position:
V = vertical
H = horizontal
e.g. VH14 = vertical 1,
horizontal 4


Function group CONCENTRATION K
Multiplication factor for concentration value of a user table (only with MRS) 1 0.5 ... 1.5 K2
VH50
Display of current table NaOH: H2SO4; H3PO4; HNO3; user 1 ... 4 K1
VH51
Selection of tables 1 1 ... 4 (>1 only with MRS) K3
VH52
Selection of table option read edit K4
VH53
Entry of number of value pairs in table 1 1 ... 16 K5
VH54
Selection of table value pairs 1 1 ... number from K5 K6
VH55
Entry of uncompensated conductivity value 0.0 µS/cm 0.0 ... 9999 mS/cm K7
VH56
Entry of associated concentration value 0.00 % 0 ... 99.99 % K8
VH57
Entry of associated temperature value 0.0 °C –35.0 ... +250.0 °C K9
VH58
Output table status o.k. yes; no K10
VH59
Function group ALPHA TABLE T
Selection of tables 1 1 ... 4 (>1 only with MRS) T1
VH60
Selection of table option read edit T2
VH61
Entry of number of table value pairs 1 1 ... 10 T3
VH62
Selection of table value pairs 1 1 ... number from T3 asign T4
VH63
Entry of temperature value (x value) 0.0 °C –35.0 ... 250.0 °C T5
VH64
Entry of temperature coefficient α (y value) 2.10 %/K 0.00 ... 20.00 %/K T6
VH65
Output table status o.k. yes; no T7
VH66
Function group CHECK P
PCS alarm setting (live check) off / 1h / 2h / 4h
Monitoring limit 0.3 % of mean value over time entered P1
VH70
Function group ALARM F
Current error code 1st error is displayed
VH80
Selection of contact type Stead = steady contact Fleet = fleeting contact F1
VH81
Selection of unit for alarm delay s: min F2
VH82
Entry of alarm delay 0 ... 2000 s (min) (dependent on F2) F3
VH83
Selection of error code 1 1 ... 255 F5
VH84
Error status yes; no
VH85
Set alarm contact to be effective yes; no F6
VH86
Set error current to be effective no; yes F7
VH87
Release code Editing mode code 22
VH89
Function group SERVICE S
Hold configuration - none = no hold - CAL = during calibration - Setup = dur. setup - S+C = dur. setup and calibration S4
VH90
Entry of hold dwell period 10 s 0 ... 999 s S6
VH91
Display of release code for SW upgrade yes no S7
VH92
Instrument reset no; Sens = sensor data; Facty = factory setting; S+Instr = Sensor + Instr. S10
VH94
Function group E+H SERVICE E
Tag number E111
VHA0
Device address 0 ... 15 I1
VHA1
Software version SW version E111
VHA2

7 Accessories

- **HART® hand-held terminal DXR 275**

The hand-held terminal communicates with any HART® compatible unit via a 4 ... 20 mA line.

For detail information, orders and programming refer to the E+H sales agency in your area (see back page of these operating instructions for addresses).

- **Commuwin II**

Commuwin II is a graphical PC based operating program for intelligent measuring instruments.

Refer to the E+H System Information SI 018F/00/en for further information on Commuwin II. A gratis update of the Commuwin II device description is available via internet http://www.endress.com.

- **Commubox FXA 191**

The Commubox serves as the required unit between the HART® interface and the serial PC interface.

For detail information, orders and programming refer to the E+H sales agency in your area (see back page of these operating instructions for addresses).

8 Technical data

General data

Manufacturer	Endress+Hauser
Instrument designation	SmarTec S CLD 132-xxxxHA/HB

Signal output

Signal output	4 ... 20 mA
Load	250 ... 500 Ω

Electrical data

Supply voltage	100 / 115 / 230 V AC, 48 ... 62 Hz 24 V AC/DC
Power consumption	max. 7,5 VA

Display and user interface

Field operation	via HART® hand-held terminal DXR 275
PC operation	via HART® interface Commubox FXA 191 with operating program Commuwin II
Device address	selectable 0 ... 15

Subject to modifications.

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