Operating manual

DLUI-HD

IContent

1 For information

Read these operating instructions before starting the recorder. Keep the operating instructions in a place that is accessible to all users at any time. The following installation and operating instructions have been compiled with great care but it is not feasible to take all possible applications into concideration. If questions remain regarding a specific application, please contact the supplier of the device.

With special models please note specifications in the delivery note.

The recorder, described in this operating manual, are carefully designed and manufactered using state-of-the-art technology. Every component undergoes strict quality inspection in all stages of manufacture.

Knowledge required

Install and start the recorder only if you are familar with the relevant regulations and derectives of your country and if you have the qualification required. You have to be acquainted with the rules and regulations on measurement and control technology and electric circuits, since this recorder is “electrical equipment” as defined by EN 50178. .

2 Signs, abbreviations

Warning!
A non-observance can cause injuries to persons or lead to demolition of the device.

Attention!
A non-observance can cause a faulty operation of the device.

Information!
A non-observance can have influence on the operation of the device or cause unintentional reactions of the device.

3 Disposal

Disposal

Dispose instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the sensor is supplied

4 For your safety

- Select the appropriate recorder with regard to scale range, performance and specific measurement conditions prior to installing and starting the instrument.
- Observe the relevant national regulations (e. g. standards) and observe the applicable standards and directives for special applications (e. g. with hazardous locations).
  If you do not observe the appropriate regulation, serious injuries and/or damage can occur!
  Contact with supply voltage carrying non-insulated parts may cause an electric shock with injury and death.

- Make sure that the recorder is only used within the electrical limits all the time.
- Observe the ambient and working conditions outlined in chapter “Technical data” (page 6).
- Ensure that the recorder is only operated in accordance with the provisions i. e. as described in the following instructions.
- Do not carry out changes or interferences with the recorder which are not describes in these operating instructions.
- Remove the recorder from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.
- Have repairs performed by the manufacturer only.
- Open circuit before removing connection / cover
- Do not overheat the recorder
- Faulty installation and insufficient maintenance may lead to malfunctions of the DLUI-HD which may affect the

5 Before mounting

- Check if a completely assembled recorder is supplied.
- Inspect the recorder for possible damage during transportation. Should there be any obvious damage, inform the transport company and supplier without delay.
- Keep the packaging, as it offers optimal protection during transportation.
- Ensure that the touch screen will not be damaged.

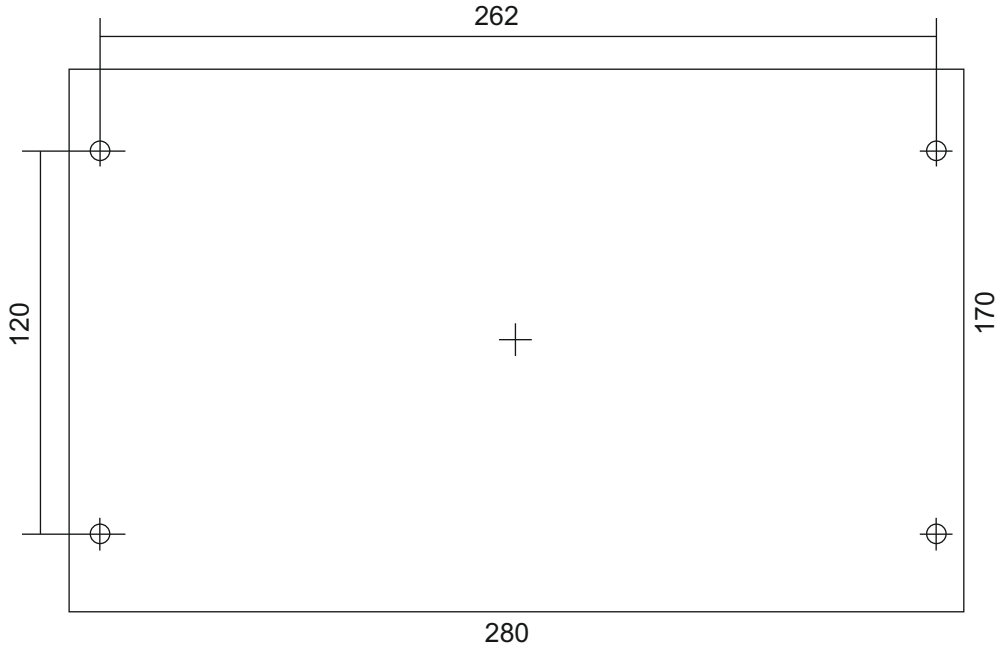
- Cable cross section: Power supply: AWG12 – AWG24 (0,2 - 2,5 mm²)
  Sensor circuit points/Output signal: AWG16 – AWG28 (0,14 - 1,5 mm²)

6 Wall and panel mounting

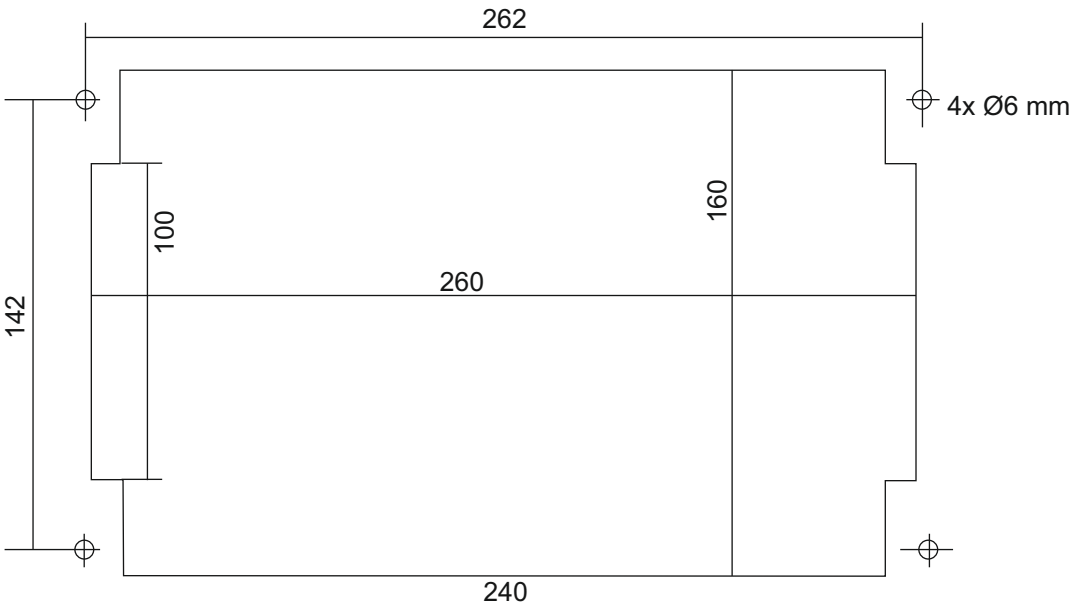
Wall mounting

Dimensions in mm

Dimensions enclosure: 280x170x90 mm
Bore holes: Ø6 mm



Cut-out panel



7 Technical data

Input		
Sensors:	4, 8, 12 inputs:	analog or digital, freely to use
	Supply:	internally or externally
	Option analog:	sampling rate 10 ms
Current:	Range:	4...20 mA, 0...20 mA
	Resolution:	0,0001 mA
	Input resistance:	33Ω
Voltage:	Range:	0...1 V
	Resolution:	0,05 mV
	Input resistance:	100 kΩ
Voltage:	Range:	0...10 V, 0...30 V
	Resolution:	0,5 mV
	Input resistance:	100 MΩ
RTD:	Sensor:	Pt100, Pt1000
	Range:	-200...850 °C
	Resolution:	0,1 °C
Pulse:	Pulse length:	100 µs minimum
	Frequency:	0...1 kHz
	Voltage:	30 V maximuml
Interface:	RS485:	Modbus RTU
	Option:	other interfaces on request
Semiconductor:	KTY81	
Output		
Switching contact:	Relays:	4x changeover (freely programmable)
	Contacts:	230 VAC, 6 A
	Function:	Alarm management, collective alarm
Sensor signal:	Analog current:	looped (sensors with own signal output)
		The sensor signal is used for the DLUI-HD and e.g. for a SPS
Interface:	Network:	TCP/IP RJ45 plug contact
	RS485:	Modbus RTU
	USB:	stick, cable
Accuracy		
Sensors:	see specification of the sensor	
Data logger DLUI-HD:		
Current:	±0,003 mA, ±0,05%	
Voltage:	0...1 V:	±0,2 mV, ±0,05%
	0...10 V, 0...30 V:	±2 mV, ±0,05%
RTD:	Pt100:	±0,2 °C (-100...400 °C)
		±0,3 °C (other ranges)
	Pt1000:	±0,2 °C (-100...400 °C)
Supply		
Voltage:	Standard:	100...240 VAC, 50-60 Hz
	Option:	24 VDC
Sensor supply:	1 integrated power unit:	24 VDC, 25 W, 130 mA max. for each sensor (at 4 inputs)
	2 integrated power units:	24 VDC, 25 W, 130 mA max. for each sensor (at 8, 12 inputs)
Ambient conditions		
Temperature:	Operation range:	0...+50 °C
	Storage:	-20...+70 °C

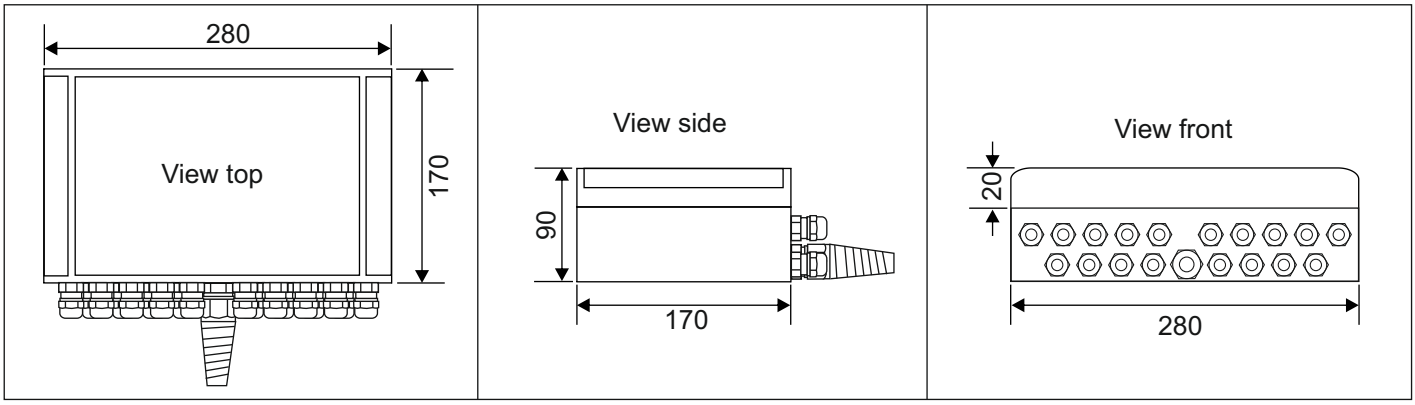
7 Technical data (continued)

Mechanics		
Enclosure:	Type:	aluCase AC with clip-on design covers
	Dimensions:	280 x 170 x 90 mm
	Material:	diecast aluminium
	Mounting:	covered screw channels
	Colour:	aluminium white
	Front foil:	Polyester
	Weigth:	7,3 kg (with options)
	Cable input:	18 screwed cable glands PG12 (sensors, supply, alarm relays) 1 screwed cable gland with bend relief (RJ45 Ethernet)
Display:	Size:	7"
	Type:	TFT transmissive
	Use:	Graphik, curves, statistics
	Menu languages:	german, english
Protection:	IP 65	
Electrical connection:	Plug-in terminal strip:	0,2...2,5 mm² (supply, relays)
	Plug-in terminal strip:	0,14...1,5 mm² (sensors, interface)
Memory card:	SD memory:	2 GB (standard)
	Option:	up to 4 GB

Options

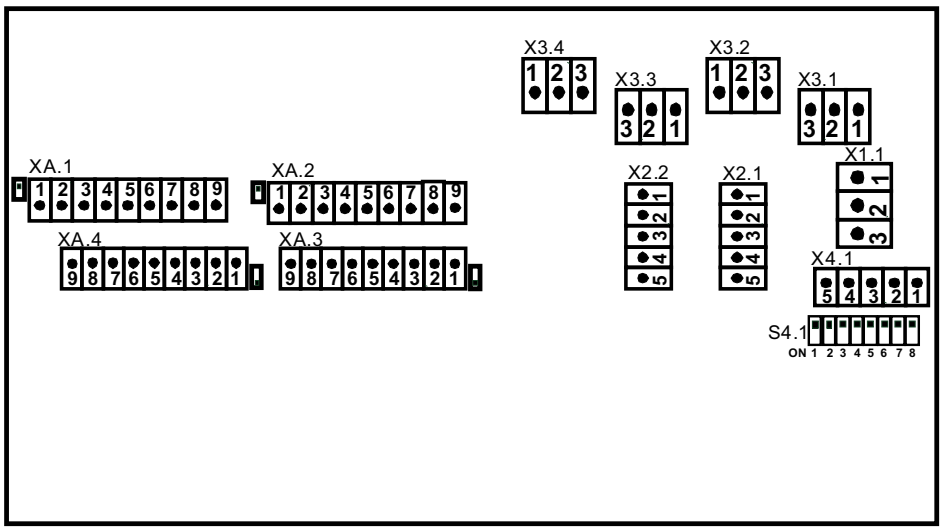
Webserver
Software for data evaluation (PC version)
Software for data evaluaion (Client/Server version) for 5, 10 or 20 DLUI-HD

8 Dimensions (in mm)



9 Connection diagrams

9.1 DLUI-HD with 4 channels



X1.1:
Power supply

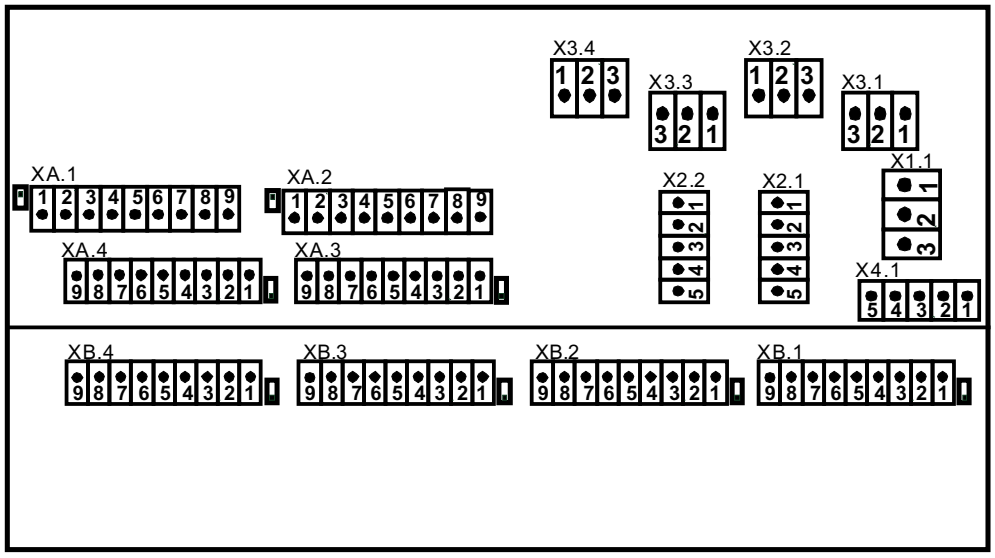
X2.1, X2.2:
For internal use

X3.1 - X3.4:
Alarm relay 1 – 4

X4.1, S4.1:
For CAN, RS485, R120 configuration

XA.1 - XA.4:
Sensor channels 1 – 4

9.2 DLUI-HD with 8 channels



X1.1: Power supply

X2.1, X2.2:
For internal use

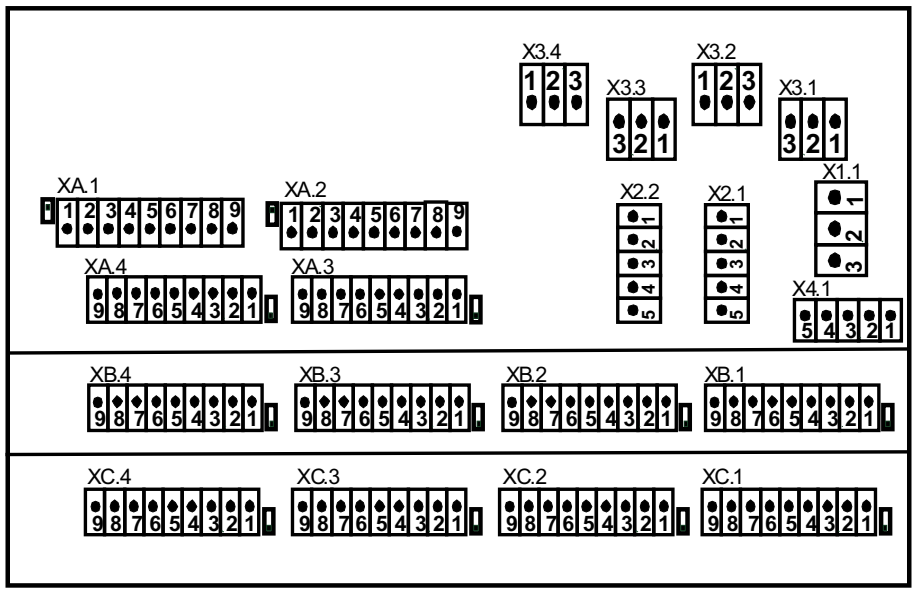
X3.1 - X3.4:
Alarm relay 1 – 4

X4.1:
For CAN, RS485, R120 configuration

XA.1 - XA.4:
Sensor channels 1 – 4

XB.1 - XB.4:
Sensor channels 5 – 8

9.3 DLUI-HD with 12 channels



X1.1: Power supply

X2.1, X2.2:
For internal use

X3.1 - X3.4:
Alarm relay 1 – 4

X4.1:
For CAN, RS485, R120 configuration

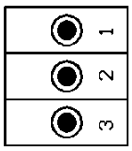
XA.1 - XA.4:
Sensor channels 1 – 4

XB.1 - XB.4:
Sensor channels 5 – 8

XC.1 - XC.4:
Sensor channels 9 – 12

9.4 Power supply DLUI-HD standard version 100...240 VAC

X1.1

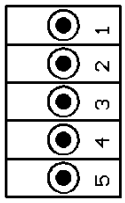


L1
N
PE

100...240 VAC, 50...60 Hz

9.5 X2.1 and X2.2 by standard version 100...240 VAC, wired ex works

X2.1, X2.2

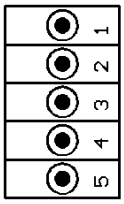


L1'
N‘
PE‘
GND
U+ (24 VDC)

Only for internal use

9.6 Power supply by special version 24 VDC

X2.1

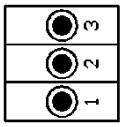


GND
U+ (24 VDC)

External supply 24 VDC (X2.2 not used!)
Internal power supplies 100...240 VAC/24 VDC are not assembled!
The supply voltage 24 VDC connect directly to terminal 4 and 5.

9.7 Connection 4x alarm relay, maximum 230 VAC, 6 A

X3.1 - X3.4



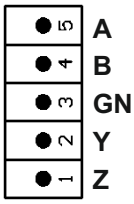
NO
COM
NC

X3.1: Alarm relay 1
X3.2: Alarm relay 2
X3.3: Alarm relay 3
X3.4: Alarm relay 4

NC and COM are closed on: alarm, voltage breakdown, sensor break

9.8 Connection bus systems X4.1 and S4.1

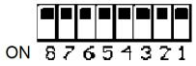
X4.1



A
B
GND
Y
Z

For DLUI-HD with 4 channels

S4.1

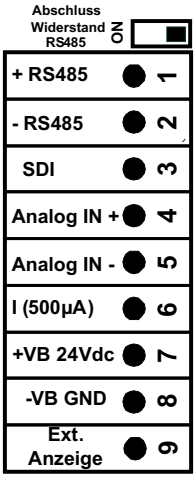


RS485 Modbus	S2, S3, S7	ON
Terminating 120 R	S1, S8	ON

9 Connection diagrams

9.9 Connector pin assignment for all sensors XA.1 - XA.4, XB.1 - XB.4, XC.1 - XC.4

XA.1 - XA.4
XB.1 - XB.4
XC.1 - XC.4



RS485 terminating resistor ON/OFF

RS485-A (+)

RS485-B (-)

SDI (Data transfer for sensors with SDI-function)

ANALOG IN + (Current and voltage signal)

ANALOG IN - (Current and voltage signal)

Current source 500 µA

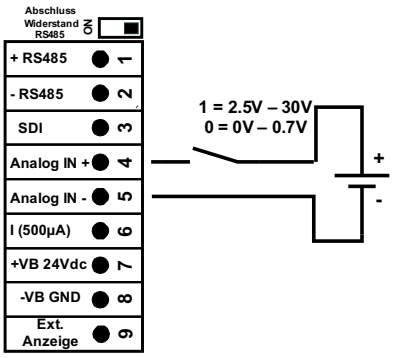
+VB, 24 VDC sensor power supply

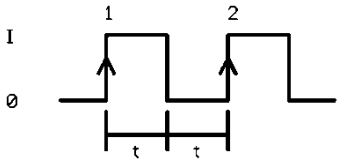
-VB, GND Sensor

Support pin (e. g. for external routing 4...20 mA)

10 Connection diagrams of the different sensor types

10.1 Connection pulse sensors





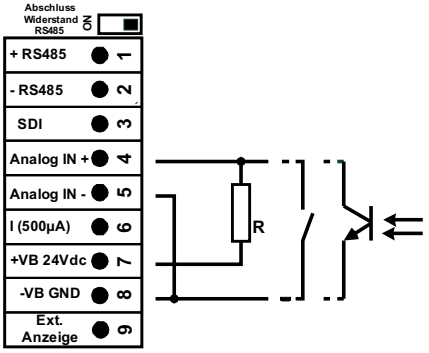
Signal level 0: low = 0...0,7 VDC

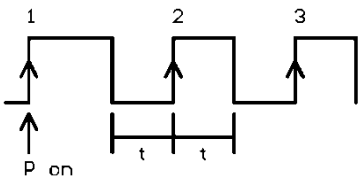
Signal level 1: high = 2,5...30 VDC

t = 400 µs

Maximum frequency: 1000 Hz
(duty cycle 1:1)

Input resistance: minimum 100 kΩ

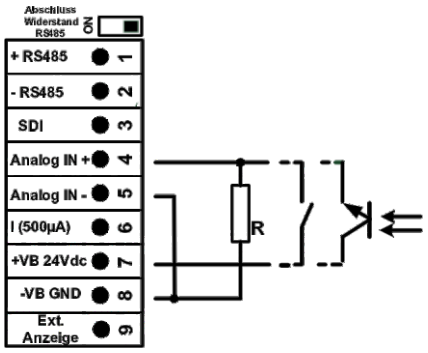
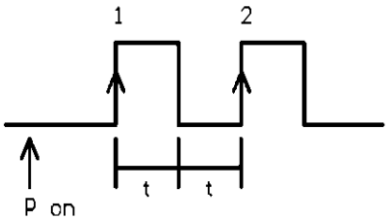
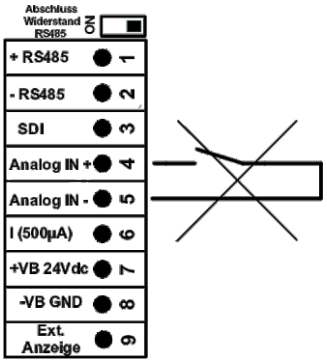




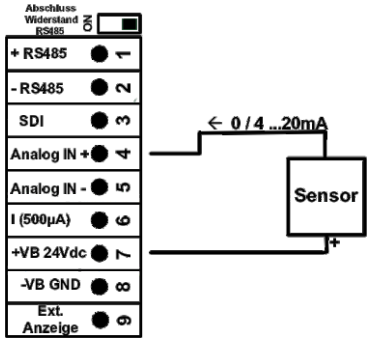
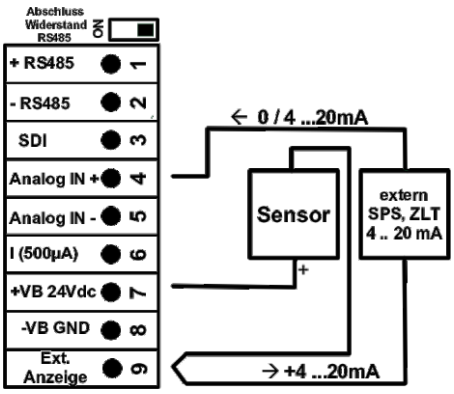
External resistance necessary:
R = 4k7

Attention: The DLUI-HD is counting a consumption unit on switching „Power on.

10.1 Connection pulse sensors (continued)

<table>
<tr>
<td> 
</td>
<td> 
</td>
<td>External resistance neccessary:
R = 4k7</td>
</tr>
<tr>
<td> 
</td>
<td></td>
<td>It won‘t work!</td>
</tr>
</table>

10.2 Analog current signal, 2-, 3- and 4-wire technology

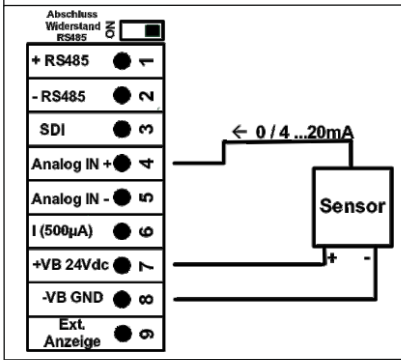
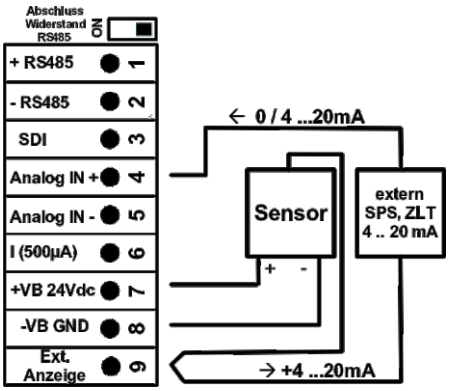
<table>
<tr><td colspan="2">Sensors with output (0)4...20 mA in 2-wire technology</td></tr>
<tr>
<td> 
</td>
<td>DLUI-HD</td>
</tr>
<tr>
<td> 
</td>
<td>DLUI-HD with external routing

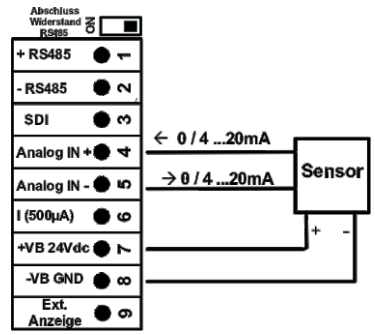
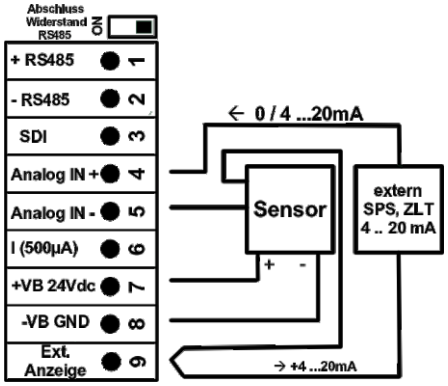
To route the current signal (0)4...20 mA to an external display, PLC or ZLT, etc., please use support pin 9.

Please make sure that the circuit is closed in any case.

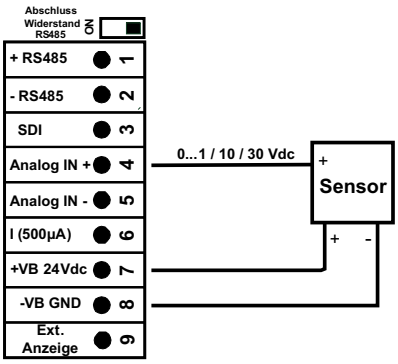
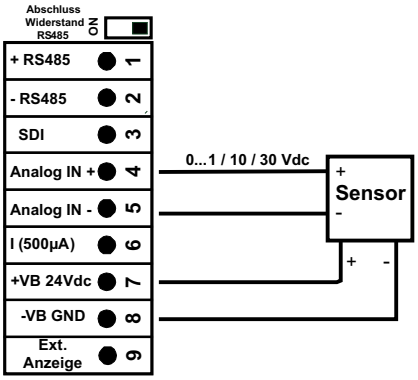
(e. g. for pressure or temperature sensors with (0)4...20 mA)</td>
</tr>
</table>

10.2 Analog current signal, 2-, 3- and 4-wire technology

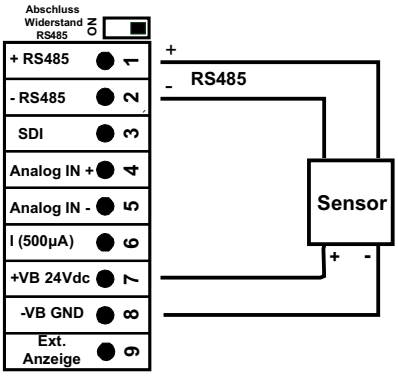
Sensor with output (0)...20 mA in 3-wire technology	
	DLUI-HD
	DLUI-HD with external routing To route the current signal (0)4...20 mA to an external display, PLC or ZLT, etc., please use support pin 9. Please make sure that the circuit is closed in any case.

Sensors with output (0)4...20 mA in 4-wire technology	
	DLUI-HD
	DLUI-HD with external routing To route the current signal (0)4...20 mA to an external display, PLC or ZLT, etc., please use support pin 9. Please make sure that the circuit is closed in any case.

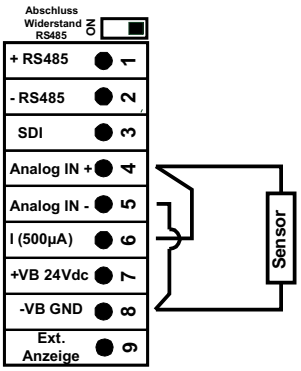
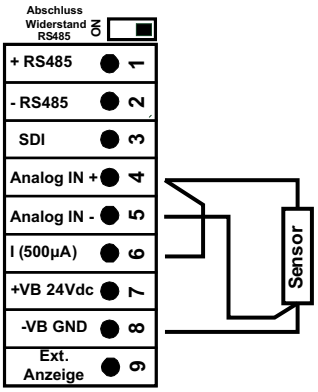
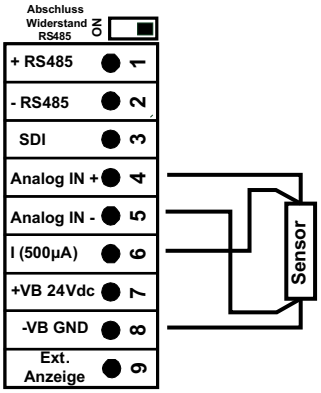
10.3 Analog voltage signal 3- and 4-wire technology (0...1 VDC, 0...10 VDC, 0...30 VDC)

	Sensors with voltage output in 3-wire technology
	Sensors with voltage output in 4-wire technology

10.4 Connection with RS485

	Sensors with RS485 interface

10.5 Pt100, Pt1000 and KTY81 in 2-, 3- and 4-wire technology

	Pt100, Pt1000, KTY81 in 2-wire technology
	Pt100, Pt1000, KTY81 in 3-wire technology
	Pt100, Pt1000, KTY81 in 4-wire technology

11 Connect the DLUI-HD with a PC

11.1 Connect a PC

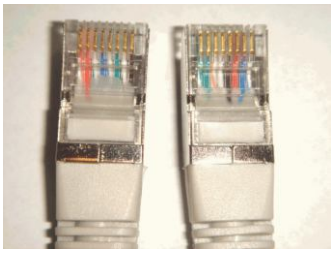
Important:

The IP addresses of PC and DLUI-HD must be statically assigned (DHCP off) and have to be in the same network.

If the IP address of the DLUI-HD has changed, you have to rebboot!

Remark:
IP address of the DLUI-HD: See chapter 12.3.5.3 on page 32 (Network settings)
Reboot of the DLUI-HD: See chapter 12.3.5.7 on page 36 (Factory reset)

With a crossover cable, which has a RJ45 plug on each side, or an Ethernet cable with a crossover adapter, the DLUI-HD can be connected with a PC.



Crossover cable with RJ45-plug

Crossover adapter

After connecting the DLUI-HD via a suitable cable to the PC, you can make graphical and tabular data evaluations with the software Soft Basic (Option).

11.2 Network settings for Windows PC‘s

Windows 7:

Start > Control panel > Network and Sharing center > Adapter > Networking > Properties > Internet Protocol Version 4 (TCP/IPv4) > Use the Following IP address > enter IP address and Subnet mask

After this: OK > OK > Close

Windows Vista:

Start > Control panel > Network and Sharing center > Network connection > Networking > Properties > Internet Protokol Version 4 (TCP/IPv4) > Use the Following IP address > enter IP address and Subnet mask

After this: OK > OK > Close

Windows XP:

Start > Properties > Control Panel > Network connection > Networking > Properties
> Internet Protocol Version (TCP/IP) > Use the Following IP address > enter IP address and Subnet mask

After this: OK > OK > Close

12 General

The operation is largely self-explanatory and menu-driven via the touch panel.
The selection of the respective menu items occur via short "tapping" with the finger or a soft round pen.

Attention: Please use no pens or other objects with sharp edges!
The foil can be damaged!

After sensors are connected, they also have to be configured.

Inputs or changes can be made with all white deposit fields.
The measured values can be represented as a curve or values.

Words in green font refer mainly to the pictures in the section of the chapter, but also on important menu paths or menu items that are related to are in green font.

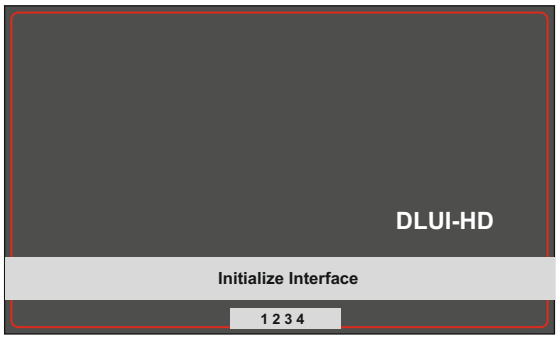
The menu navigation is generally in a green font!

The table of contents and chapter references in blue font contain links to the respective chapter title.

12.1 Main menu (Home)

From the main menu you can reach every available item.

12.1.1 Initialization



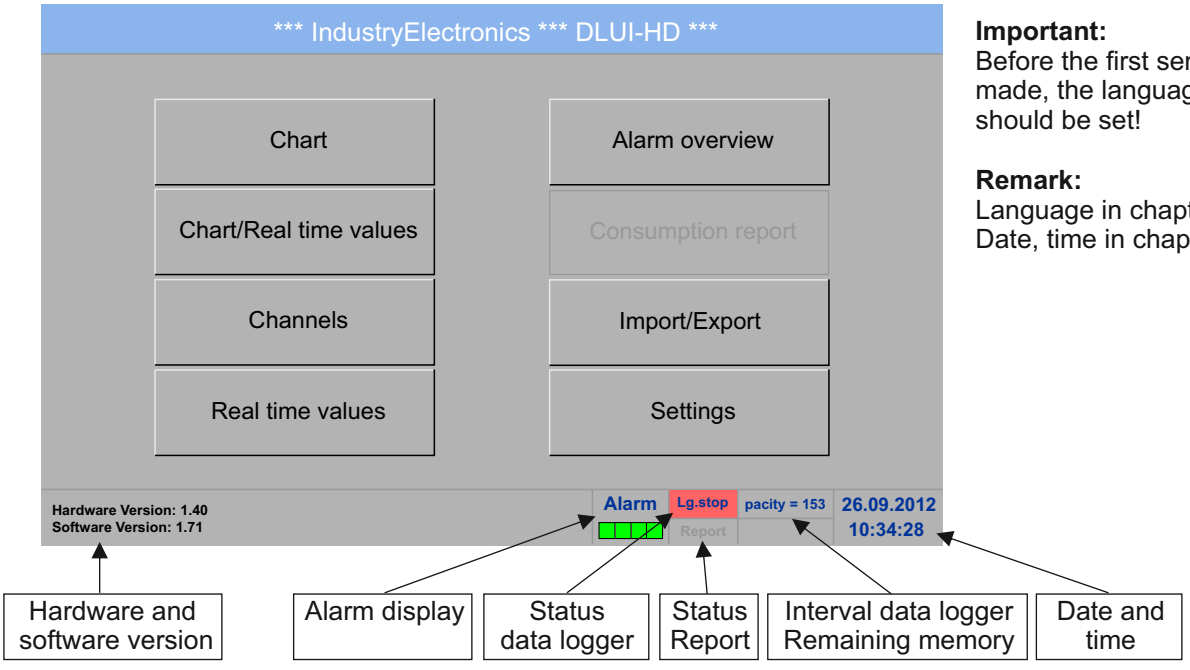
After switching on the DLUI-HD all channels are initialized and the main menu will appear.

Attention:
For the first initiation, there may be no channels preset!

As described in chapter „Sensor Settings“ (12.3.3), select appropriate configurations and set!

12.1.2 Main menu

Remark: After initialization the device is in mode Channels. For this „Main menu“ press the Back button.



Important:
Before the first sensor setting is made, the language and time should be set!

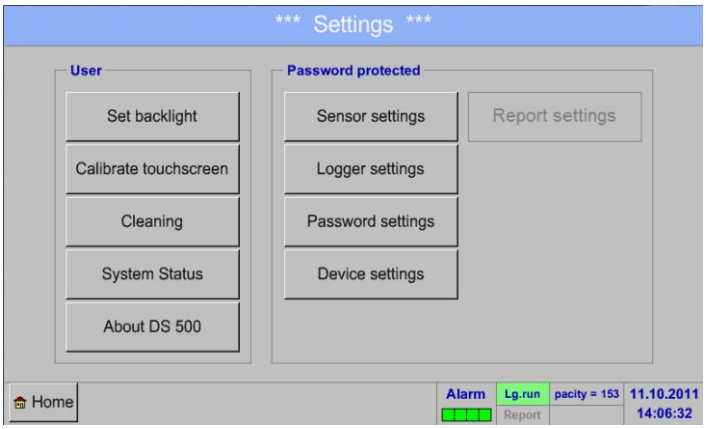
Remark:
Language in chapter 12.2.4.1
Date, time in chapter 12.2.4.2

12.2 Overview

The settings are all protected by a password!
Settings or changes are generally confirmed with OK!

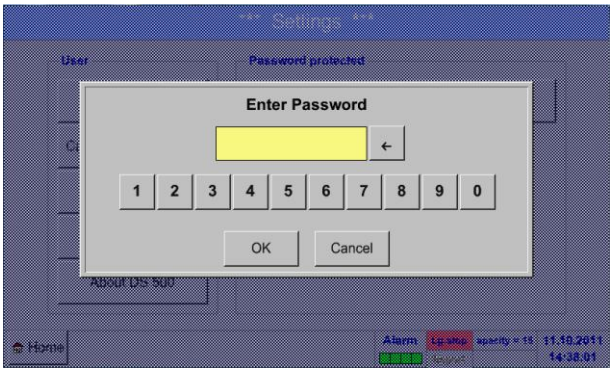
Remark:
If you go back to main menu and then again one of the setting menus is called, you must enter the password again.

Main menu > Settings

	Overview of the Settings

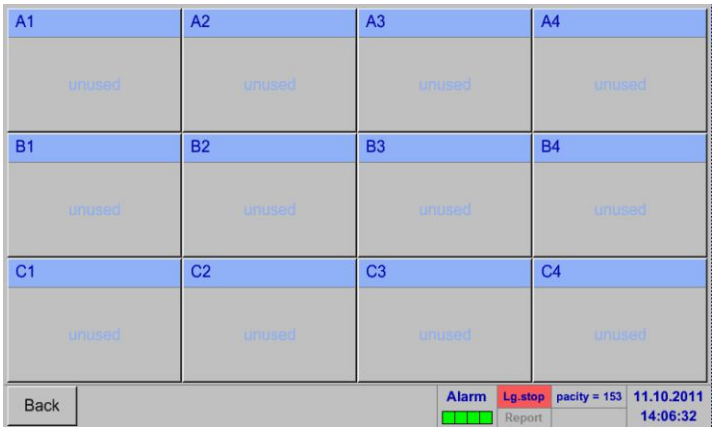
12.2.1 Password settings

Main menu > Settings > Password settings

	Factory settings for password at the time of delivery: 0000 (4 times zero). If required, the password can be changed in the Password settings. The new password must be entered two times in a row and in each case confirmed with OK.
	If an incorrect password is entered there appears Enter password or New password repeat in red font. If you can't remember the password, please use Master password in order to enter a new password. **Remark:** The master password is supplied together with the instrument's documentation.

12.2.2 Sensor settings

Main menu > Settings > Sensor settings



An overview of the available channels appears after entering the password.
Depending on the version, 4, 8 or 12 channels.

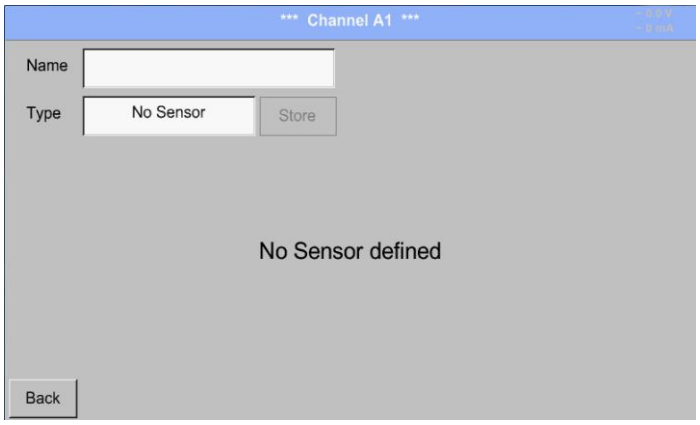
Remark:
Usually no channels preset!

Remark:
Depending on the DLUI-HD:

No extension board	> 4 channels/setups
One extension board	> 8 channels/setups
Two extension boards	> 12 channels/setups

12.2.2.1 Choice of sensor type (Example 0...10 V)

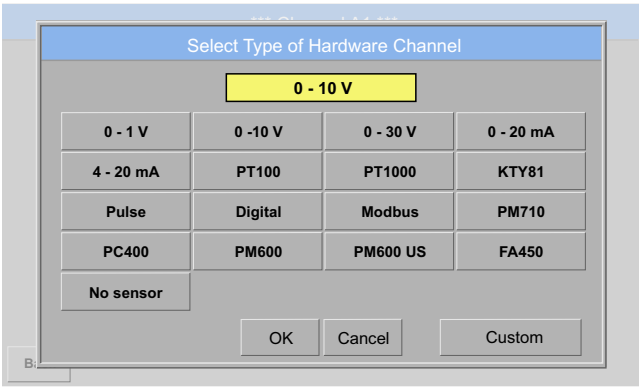
Main menu > Settings > Sensor settings > A1



If still no sensor has been configured, the Type **No Sensor** appears.

By pushing the description field Type **No Sensor** the list of sensor types appears (see next step).

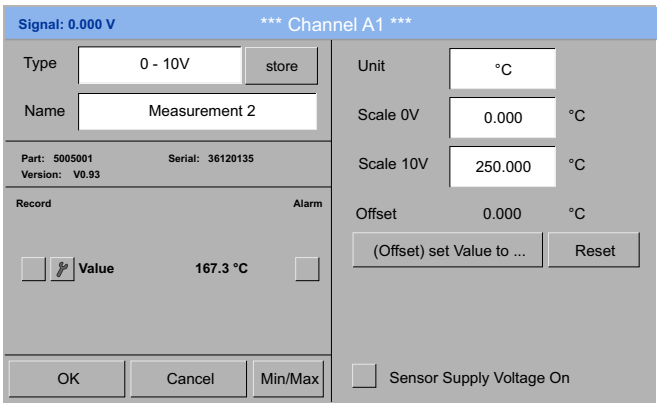
Main menu > Settings > Sensor settings > A1 > Type description field > 0 - 10 V



No the Type **0 - 10 V** is selected an confirmed with OK.

12.2.2.1 Sensor settings

Main menu > Settings > Sensor settings > A1



Select the unit and then enter the required scaling.

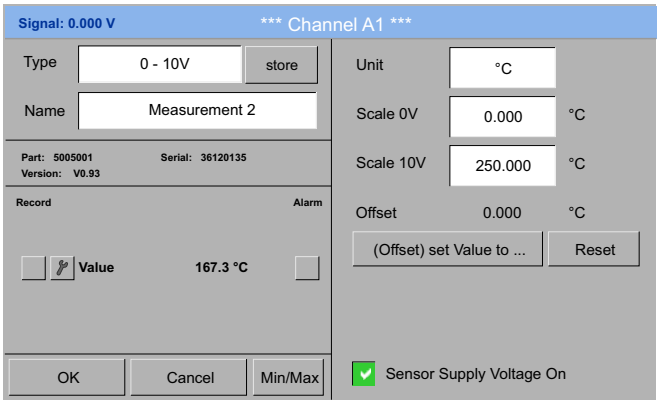
For the scaling of the sensor (here for example Type **0 - 10 V** corresponds to 0 - 250 °C) please see in the data sheet of the connected sensor.

For Scale 0V enter the lower scaling value and for Scale 10V the upper scaling value.

Finally it is possible to enter a name Name for this measurement.

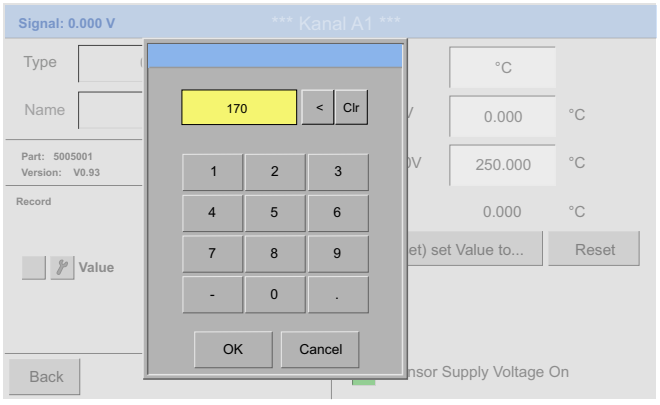
If all inputs are done, confirm this by pressing OK. This confirmation brings the red font (after input, without OK) back to the black font (e. g. **Unit** changes into **Unit**). With this, the configuration of the sensor is finished.

Main menu > Settings > Sensor settings > A1



If the used sensor needs a voltage supply, mark Sensor Supply Voltage On.

Mein menu > Settings > Sensor settings > A1



With button (Offset) Set Value to ... the measured values of the sensor can be shifted by a defined value.

The positive or negative difference of the Offsets is indicated.

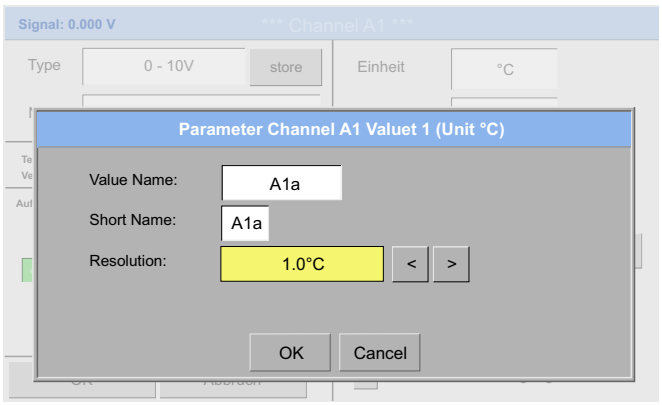
With button Reset the Offset can be reset to zero.

12.2.2.2 Name the measurement data and define the decimal places

Remark:
The Resolution of the decimal places, the Short Name and Value Name are found under the **Tool button**.

Tool button

Main menu > Settings > Sensor settings > A1 > Tool Button



For the recorded Value there can be entered a Name with 10 characters and later in menu item Graphics/Real time values it is easier to identify it.

Otherwise the Name is, for example, A1a.
The channel name is A1 and a is the first measurement data at the channel, the Second b and the Third c.

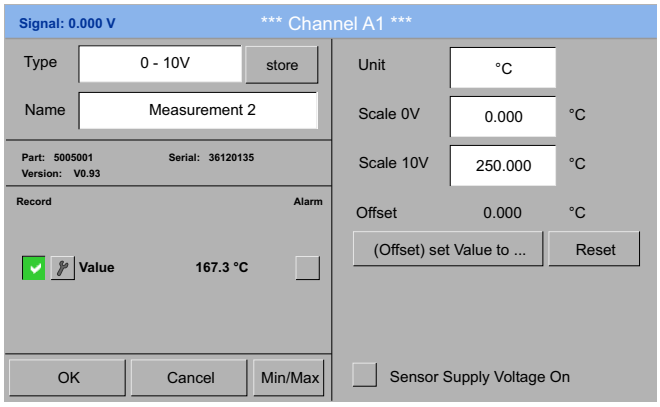
The Resolution of the decimal places is simply adjustable by pushing right and left
(0 to 5 decimal places).

See also chapter 12.2.2.7 Label and setting the description fields

Important:
In the menu items Main menu > Settings > Sensor settings and Main menu > Real time values the Value Name is displayed only by the DLUI-HD standard version with 4 channels.
The Short Name is used only in these two menu items by the DLUI-HD versions with one or two extension boards (8 or 12 channels).

12.2.2.3 Recording measurement data

Main menu > Settings > Sensor settings > A1 > Record Button



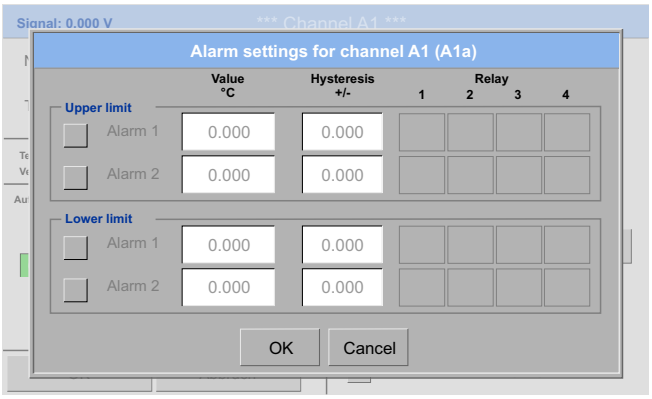
Use the Record buttons to select the measurement data that will be stored by **activated data logger**.

Attention:
Before the selected measurement data are recorded, the data logger must be activated after the settings (See chapter 12.2.3 Logger settings (data logger)).

12.2.2.4 Alarm settings

Main menu > Settings > Sensor settings > A1 > Alarm Button

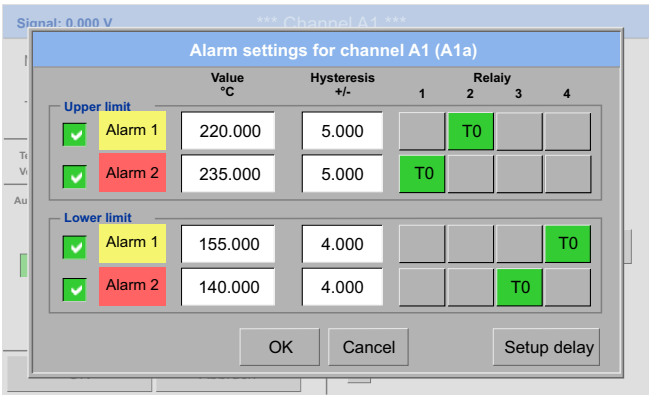
By pushing an alarm button, the following window appears:



In the alarm settings an Alarm 1 and Alarm 2 incl. Hysteresis can be entered for each channel.

In the menu Alarm overview (can be reached from the main menu), the alarm settings are clearly represented.

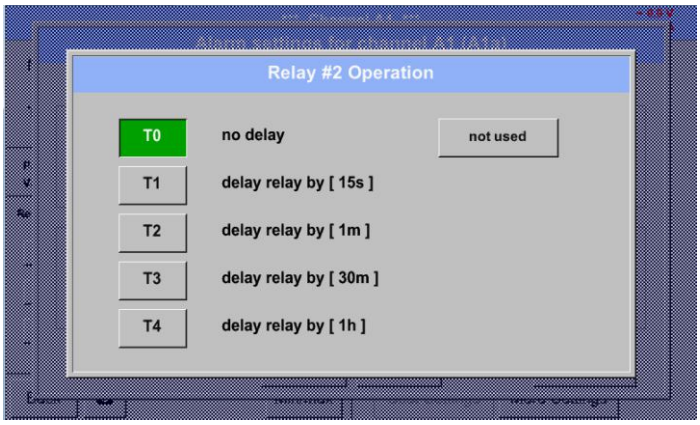
Main menu > Settings > Sensor settings > A1 > Alarm Button > Alarm 1, Alarm 2 Buttons > Relay Buttons



E.g. set the Alarm 1 to relay 2 and relay 4 and the Alarm 2 to relay 1 and relay 3.

Remark: It can be set one of any relay as Alarm 1 or Alarm 2 thirty-two times.

Main menu > Settings > Sensor settings > A1 > Alarm Button > Relay Buttons



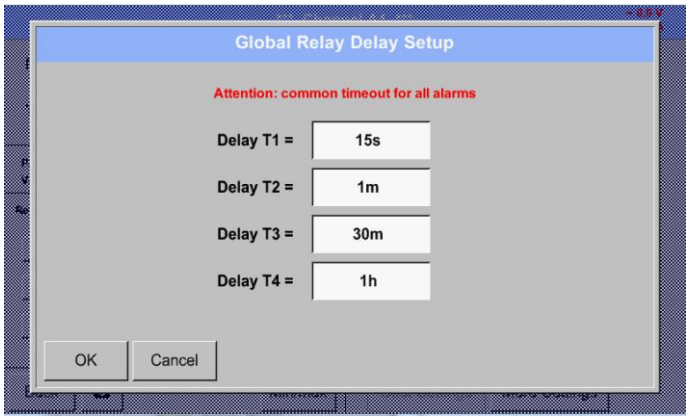
It is possible to select from 5 different delays.

T0 is preset to no delay.

The delays (T1 to T4) are free definable but are common valid for all relays.

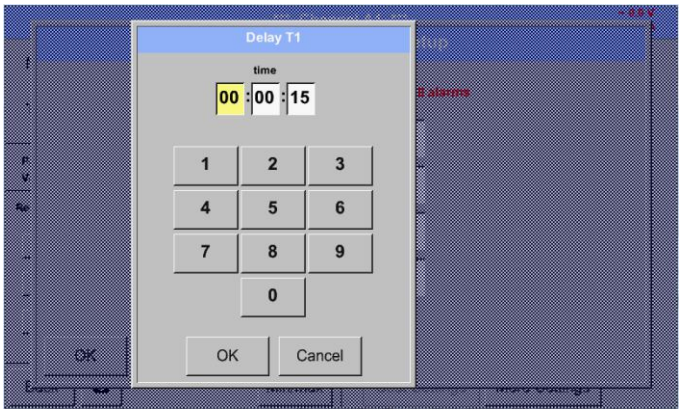
12.2.2.4 Alarm settings

Main menu > Settings > Sensor settings > A1 > Alarm Button > Setup Delay



The delays (T1 to T4) are free definable but are common valid for all relays.

Main menu > Settings > Sensor settings > A1 > Alarm Button > Setup Delay > Description field delay T1



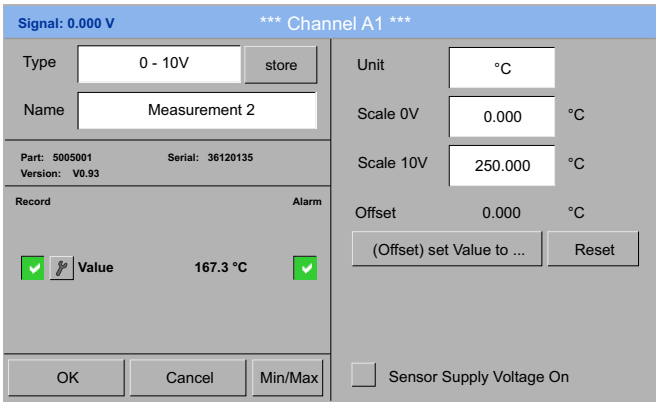
By changing the text field values the new delay time could be defined. Here for Delay T1.

Delay T0 is preset and can't be changed and it is an immediate alarm.

Confirmation by pressing the OK button.

Same procedure for the remaining delay times is to apply.

Main menu > Settings > Sensor settings > A1

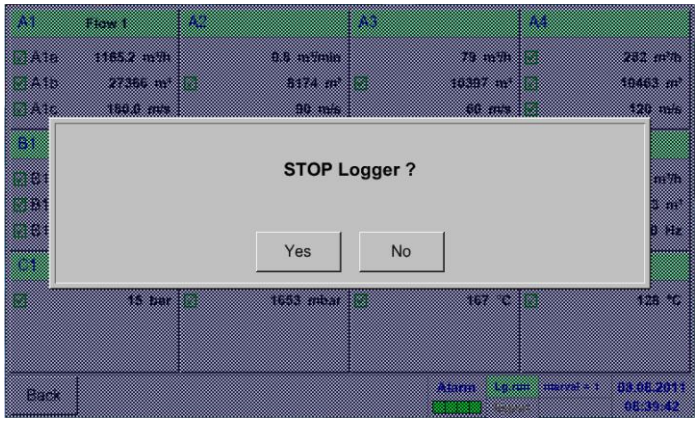


After the alarm activation at channel A1.

The settings finished by pushing the OK button!

12.2.2.7 Label and set the description fields

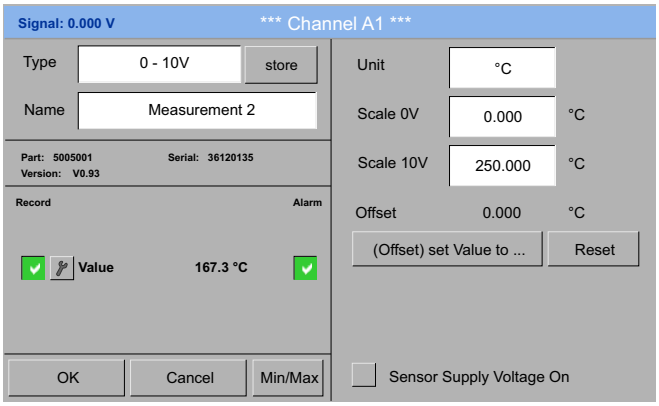
Main menu > Settings > Sensor settings > A1



If the data logger is activated, the following window will appear and via pushing Yes it can be disabled.

(Only activated, if already settings and recordings are made)

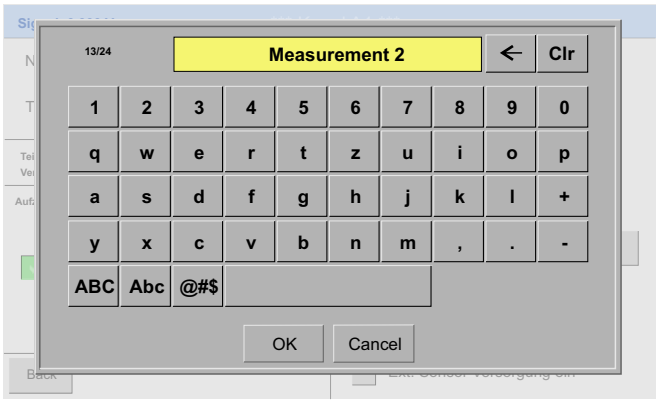
Remark:
If sensor settings are defined or changed, the data logger must be stopped.



Changes or entries can be made by pressing the highlighted white fields.

The Alarm (See chapter 12.2.2.4 Alarm settings) **and Record buttons** (See chapter 12.2.2.3 Recording measurement data) **the Resolution of the decimal places and Short Name or Value Name** (See chapter 12.2.2.2 Name measurement data and define the decimal places) **are all described in chapter 12.2.2 Sensor settings.**

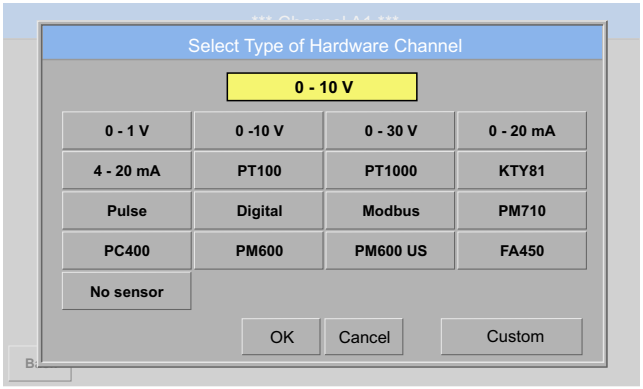
Main menu > Settings > Sensor settings > A1 > name description field



It is possible to enter a name with 24 characters.

12.2.2.7 Label and set the description fields

Main menu > Settings > Sensor settings > A1 > Type description field

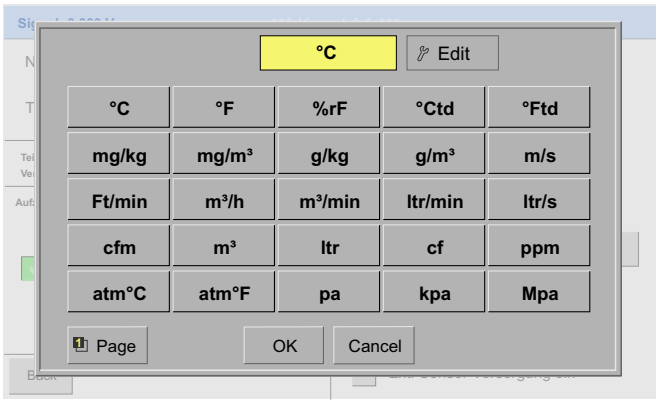


You can choose the following options, after pushing the Type description field.

(shown in figure)

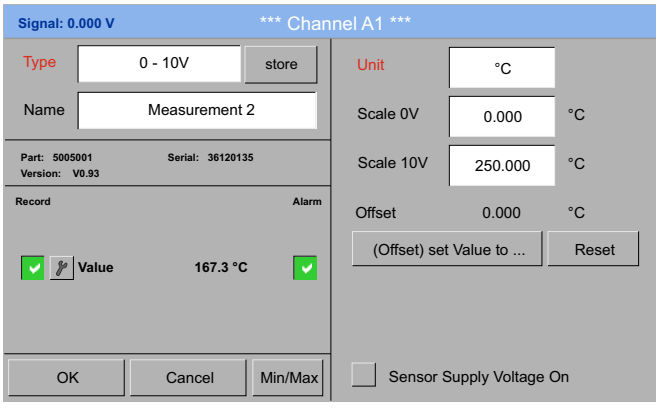
See also chapter 12.2.2.8 Configuration of analogue sensors

Main menu > Settings > Sensor settings > A1 > Unit description field



A preset selection of suitable Units.

Hauptmenü > Einstellungen > Sensor Einstellung > A1

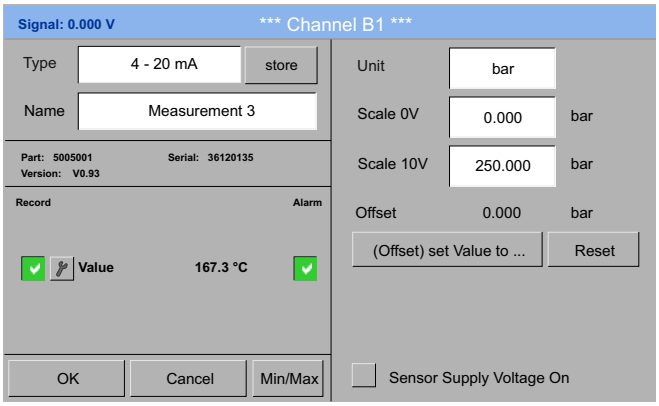


The red labeled description fields indicate, that different values, such as the Type and the Unit, have been changed or added.

Remark:
After confirming with OK, the font is black again and the values and settings are accepted.

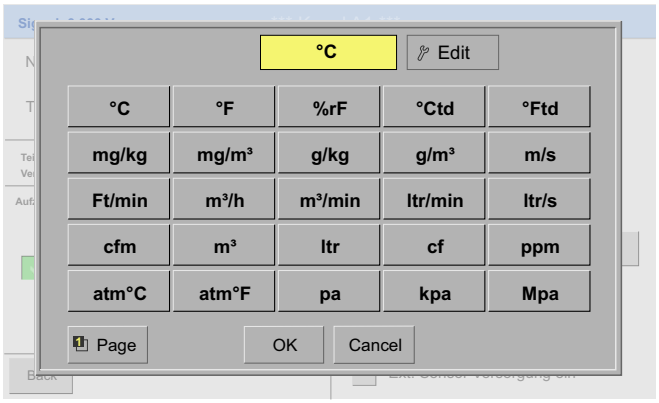
12.2.2.8.1 Type 0/4 - 20 mA

Main menu > Settings > Sensor settings > B1 > Type description field > 4 - 20 mA



Example for Type **4 - 20 mA**.

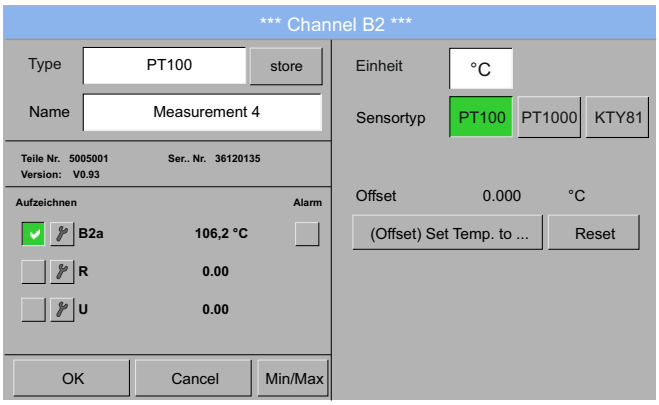
Main menu > Settings > Sensor settings > B1 > Unit description field



A preset selection of suitable units by Type 0 - 1/10/30 V and 0/4...20 mA.

12.2.2.8.2 Type PT100x and KTY81

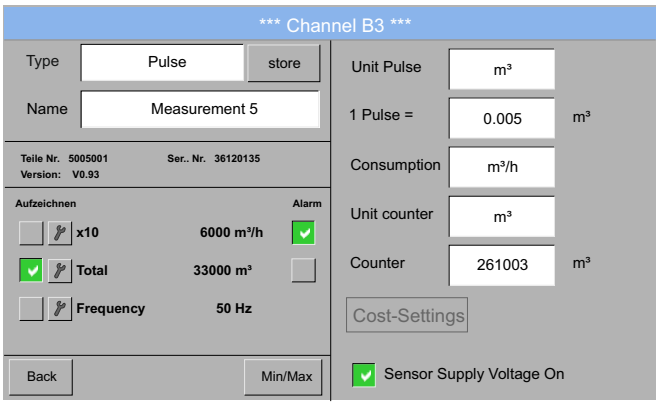
Main menu > Settings > Sensor settings > B1 > Type description field > PT100



Here the sensor type PT100 and the Unit in °C are chosen, alternatively the sensor types PT1000 and KTY81, as well as the Unit °F can be selected.

12.2.2.8.3 Type Pulse (Pulse ration)

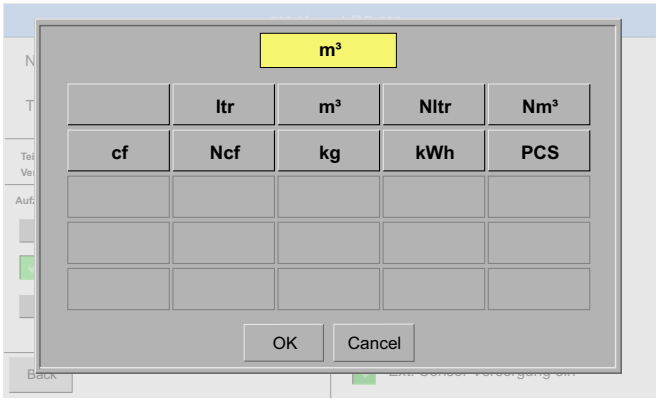
Main menu > Settings > Sensor settings > B3 > Type description field > Pulse



Typically the value with unit of 1 Pulse is standing on the sensor and can directly entered to the 1 Pulse = description field.

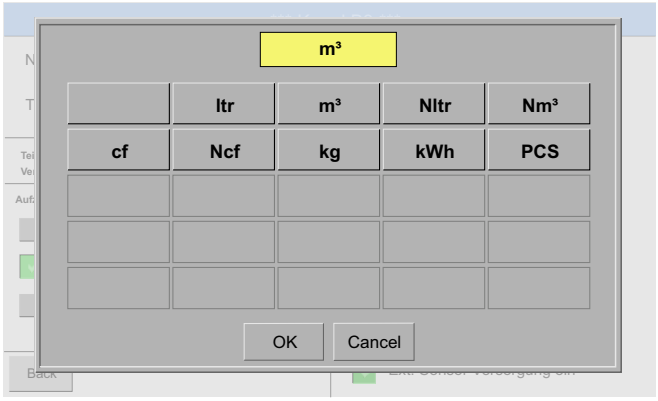
Remark:
Here, all description fields are already labeled or occupied.

Main menu > Settings > Sensor settings > B3 > Unit Pulse



By Unit Pulse you can choose between a flow volume or a power consumption unit.

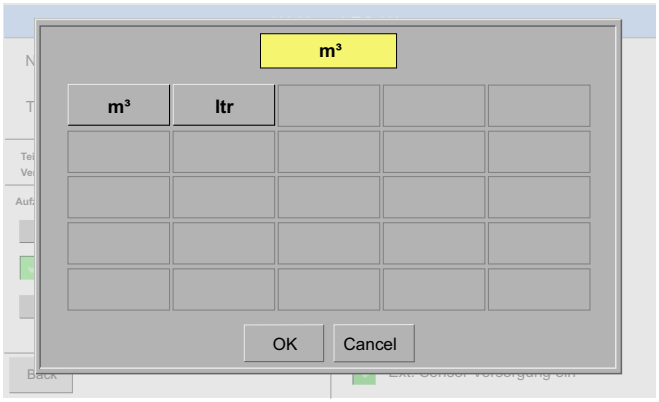
Main menu > Settings > Sensor settings > B3 > Consumption



Unit of current Consumption by Type **Pulse**

Remark:
Example with the unit cubic meters.

Main menu > Settings > Sensor settings > B3 > Unit Pulse



he available Units for the Unit of Counter by Type **Pulse**

The counter can be set any time to any value you need.

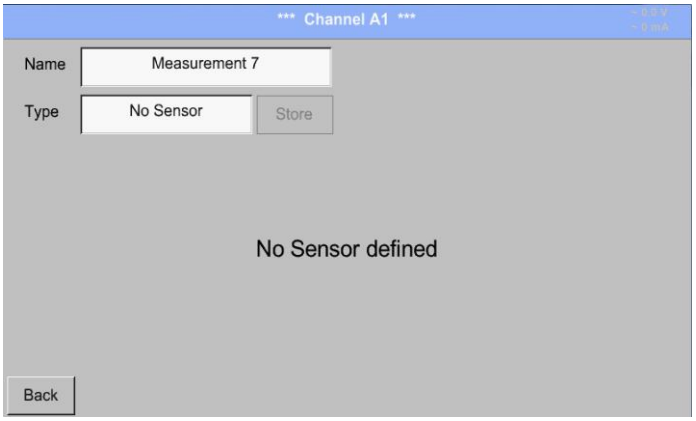
12.2.2.8.5 Type RS485

Main menu > Settings > Sensor settings > C4 > Type description field > RS485

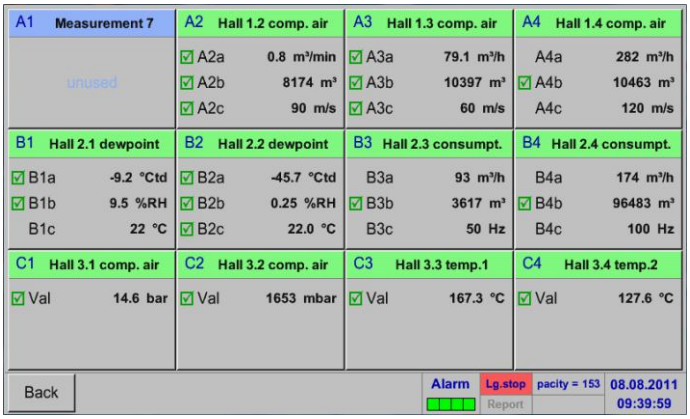
With the RS485 bus/interface, customer-specific systems (conventional,PLC, SCADA) can be connected with the DLUI-HD.

12.2.2.8.5 Type No Sensor

Main menu > Settings > Sensor settings > A1-C4 > Type description field > No Sensor



Is used to declare a not currently needed channel as No Sensor defined.



If you go to Type **No Sensor** back, channel A1 will appear as unused.

12.2.3 Type Modbus

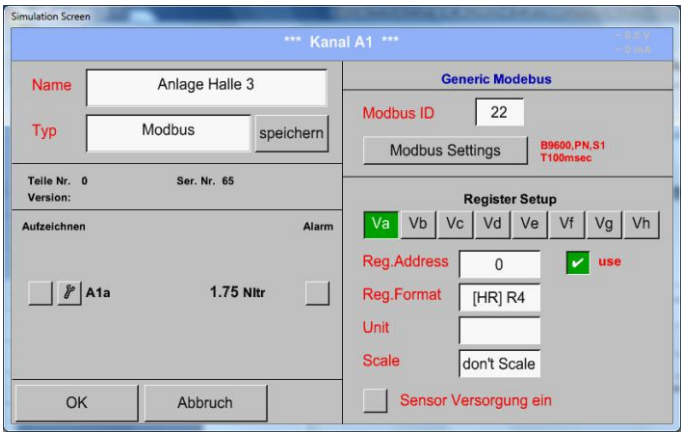
12.2.3.1 Choice and activation of the sensor type

First step: Choose an unused sensor channel
Main menu > Settings > Sensor settings > A1

Second step: Choose type Modbus
Main menu > Settings > Sensor settings > A1 > Type description field > Modbus

Third step: Confirm with OK
Now, a Name (See chapter 12.2.2.7 Label and setting the description fields) **can be determined.**

Main menu > Settings > Sensor settings > A1 > Va > use

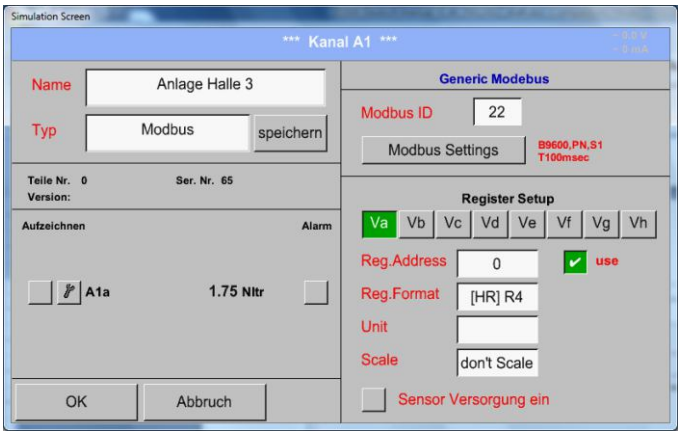


Via Modbus it is possible to read out up to 8 Register-Values (from Input or Holding Register) of the sensor.

Selection by the Register Tabs Va –Vh and activation by pressing of the corresponding Use button.

12.2.3.2 Modbus settings

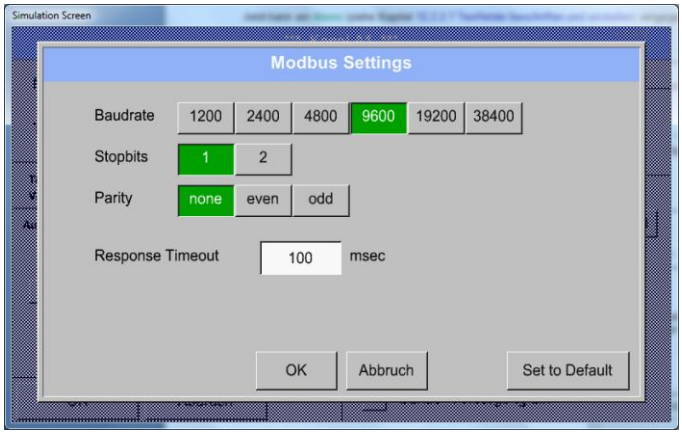
Main menu > Settings > Sensor settings > A1 > Modbus Settings > Modbus ID description field



Please insert here the specified Modbus ID of the sensor, allowed values are 1 -247, (e.g.. here Modbus ID = 22)

For setting the Modbus ID on the sensor please see sensor-datasheet.

Main menu > Settings > Sensor settings > A1 > Modbus Settings > Modbus ID description field



In this menu are the serial transmission settings Baudrate, Stopbit, Parity and Response Timeout to define.

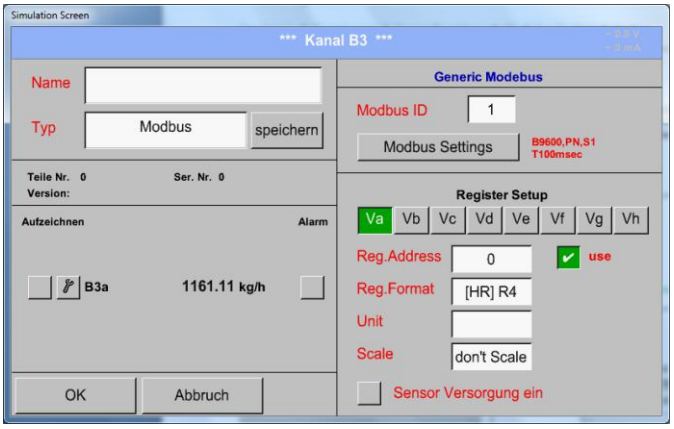
For the required settings please see the sensor datasheet.

Confirmation by pressing OK button.

For resetting to the default values please press Set to Default.

12.2.3.2 Modbus settings

Main menu > Settings > Sensor settings > A1 > Reg. Address description field

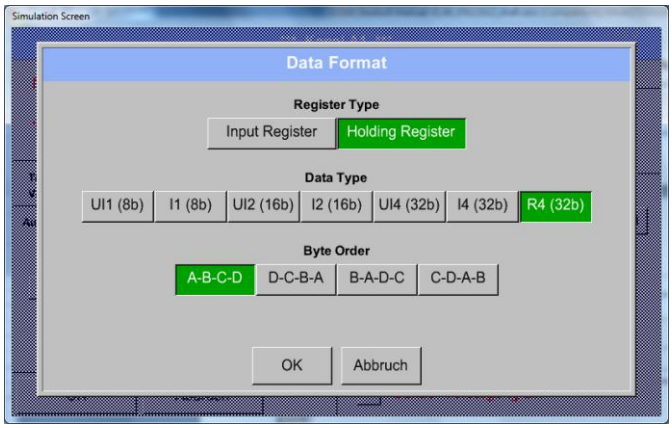


The measurement values are kept in the registers of the sensor and can be addressed via Modbus and read by the DLUI-HD.
This requires to set the desired register addresses in the DLUI-HD.

Entering the register / data address is here in decimal with 0-65535

Important:
Required is the correct register-address.
It should be noted that the register-number could be different to the register-address (Offset). For this please consult the sensor data sheet.

Main menu > Settings > Sensor settings > A1 > Reg. format description field



With the buttons Input Register and Holding Register the corresponding Modbus-register type will be selected.

The number format and transmission order of each value needs to be defined by Data Type and Byte Order. Both have to be applied in correct combination.

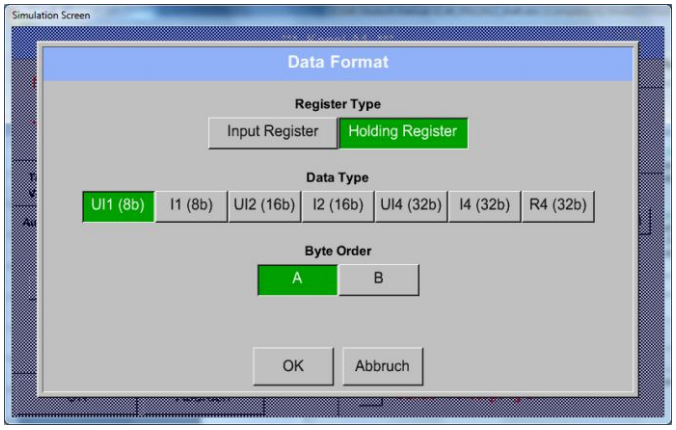
Supported Data types:

Data Type:	UI1(8b) = unsigned Integer	=>	0	-	255
	I1 (8b) = signed integer	=>	-128	-	127
	UI2 (16b) = unsigned Integer	=>	0	-	65535
	I2 (16b) = signed integer	=>	-32768	-	32767
	UI4 (32b) = unsigned Integer	=>	0	-	4294967295
	I4 (32b) = signed integer	=>	-2147483648	-	2147483647
	R4 (32b) = floasting point number				

Byte Order:
The size of each Modbus-register is 2 Byte. For a 32 bit value two Modbusregister will be read out by the DS500. Accordingly for a 16bit Value only one register is read.
In the Modbus Specification the sequence of the transmitted bytes is not defined clearly. To cover all possible cases, the byte sequence in the DLUI-HD is adjustable and must adapted to the respective sensor. Please consult here for the sensor datasheet.
e.g.: High byte before Low Byte, High Word before Low Word etc
Therefore the settings have to be made in accordance to the sensor data sheet.

Examples:

Holding Register - UI1(8b) - value: 18

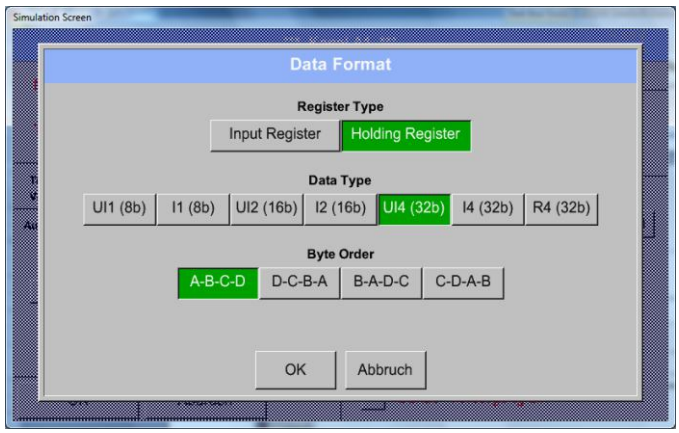


Selection Register Type Holding Register,
Data Type U1(8b) und Byte Order A / B

	HByte	LByte
18 =>	00	12

Data Order	1. Byte	2. Byte
A	00	12
B	12	00

Holding Register - UI4(32) - value: 29235175522 > AE41 5652

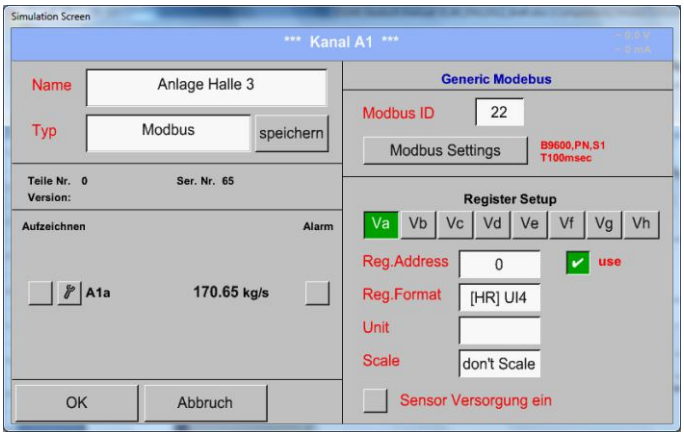


Selection Register Type Holding Register,
Data Type U1(32b) und Byte Order A-B-C-D

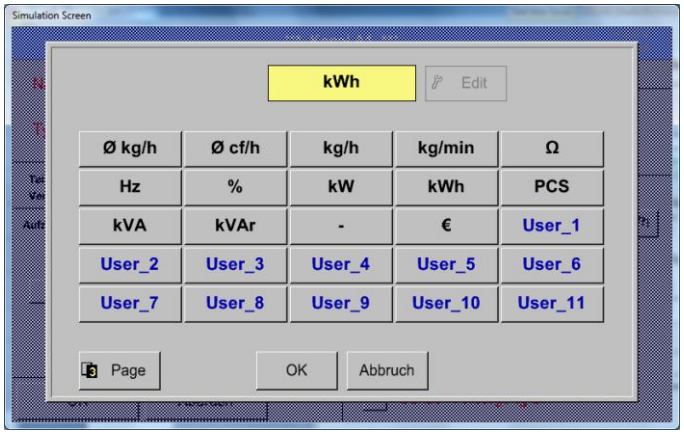
	HWord		LWord	
	HByte	LByte	HByte	LByte
29235175522 =>	AE	41	56	52

Data Order	1.Byte	2.Byte	3.byte	4.Byte
A-B-C-D	AE	41	56	52
D-C-B-A	52	56	41	AE
B-A-D-C	41	AE	52	56
C-D-A-B	56	52	AE	41

Main menu > Settings > Sensor settings > A1 > Unit description field



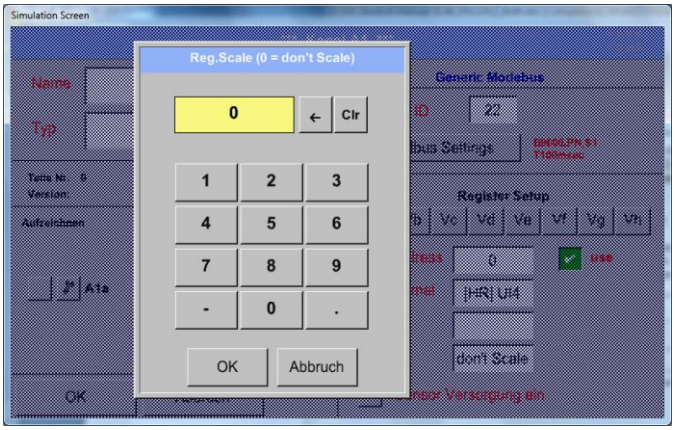
By pressing the description field Unit
the list with the available units appear



Please select the unit by pressing the respective button e.g. m³/h.
For validation of the unit please push the button OK
To move through the list please press the button Page.
In case the unit is **no**t available it is possible to create a user defined unit.
Therefore please select one of the User_X buttons..

12.2.3.2 Modbus settings

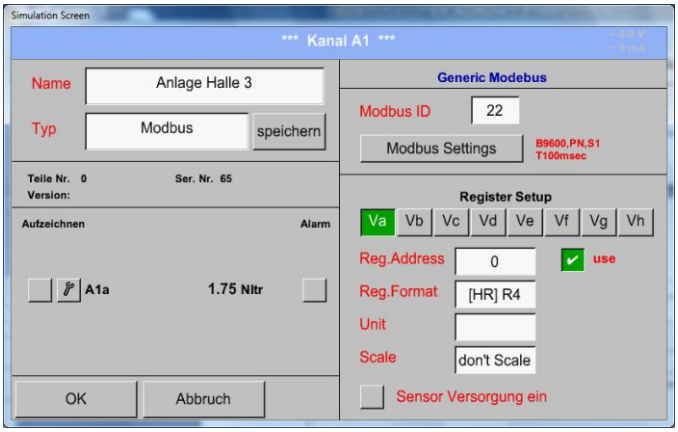
Main menu > Settings > Sensor settings > A1 > Scale description field



The use of this factor allows to adapt the output value by the same.

By default or value = 0 no scaling is applied and displayed in the field is don't scale

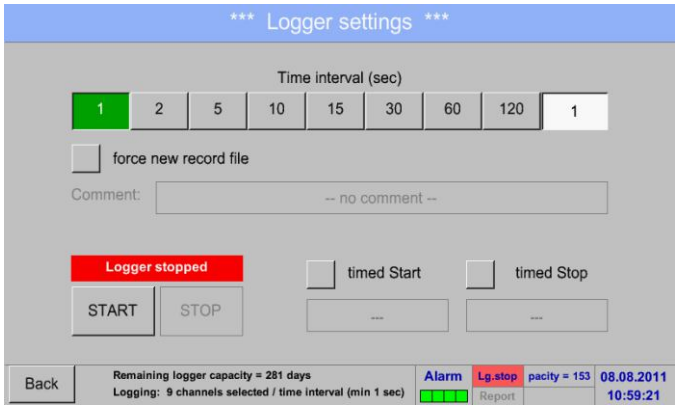
Main menu > Settings > Sensor settings > A1 > OK



By pressing the OK button the inputs are confirmed and stored.

12.2.4 Logger settings (date logger)

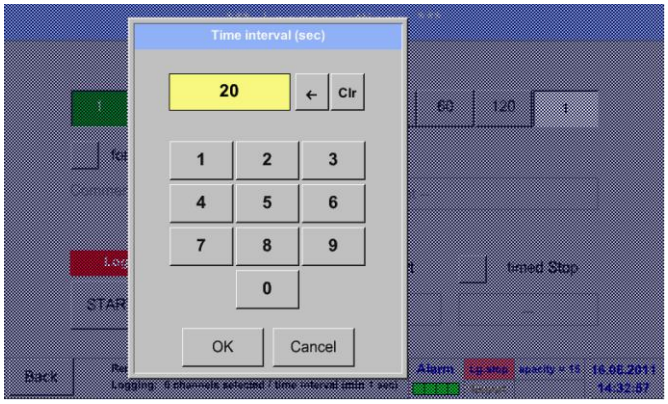
Main menu > Settings > Logger settings



In the top row you can select the predefined Time intervals 1, 2, 5, 10, 15, 30, 60 and 120 seconds for recording.

Remark: If more than 12 measurement data are recorded at the same time, the smallest possible time interval of the data logger is 2 seconds.

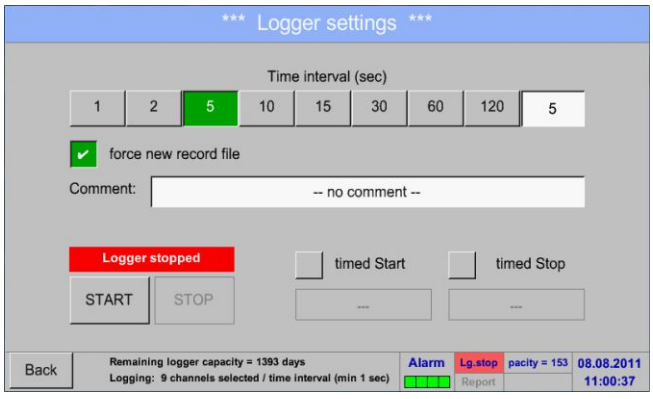
And if more than 25 measurement data are recorded at the same time, the smallest possible time interval of the data logger is 5 seconds.

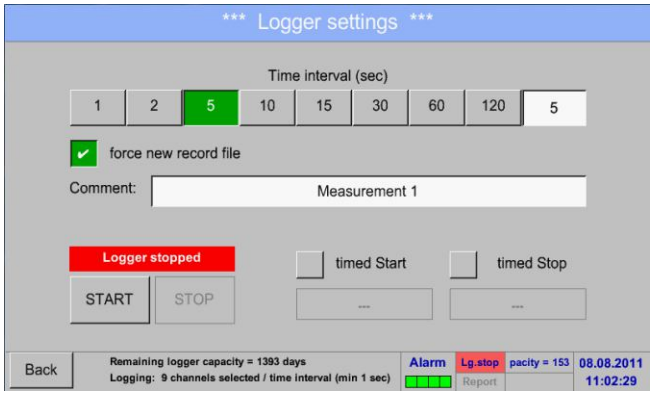


A different, individual Time interval can be entered in the highlighted white description field right at the head, where the currently set Time interval is always displayed.

Remark:
The largest possible Time interval is 300 seconds.

Main menu > settings > Logger settings > force new Record file button
or
Main menu > settings > Logger settings > force new Record file button > Comment description field





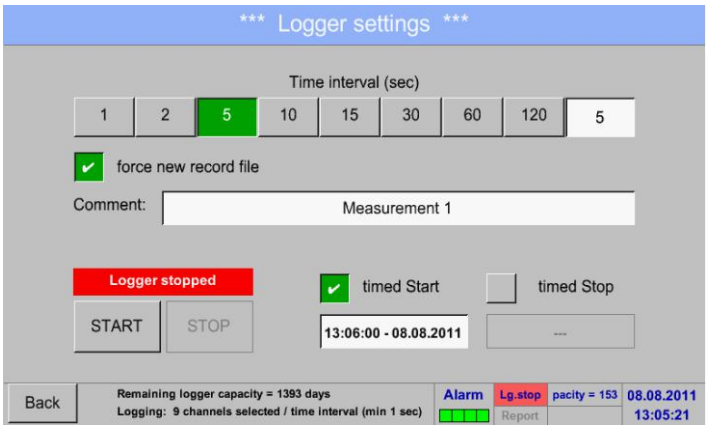
A new recording file will be created by pushing the force new record file button and a name or comment can be entered by the choice of the Comment description field.

Important:

If a new recording file should be created, the force new record file button must be activated. Otherwise, the last applied recording file is used.

12.2.4 Logger Einstellung (Datenlogger)

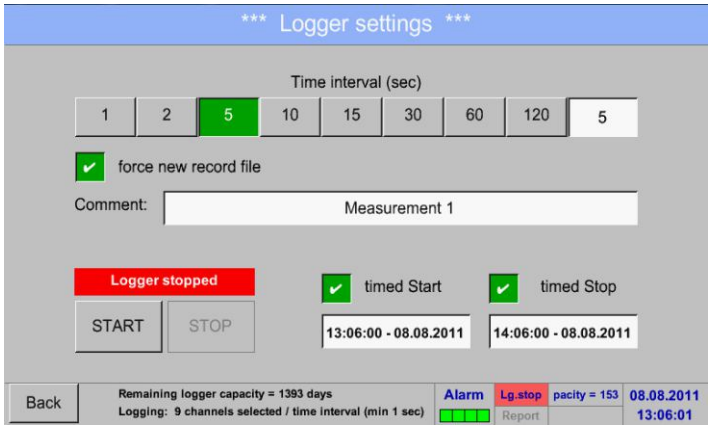
Main menu > settings > Logger settings > timed Start button



By pushing the timed Start button and then the date/time description field below, the date and the start time can be set for a data logger recording.

Remark:
If the start time is activated, it will automatically be set at the current time plus a minute.

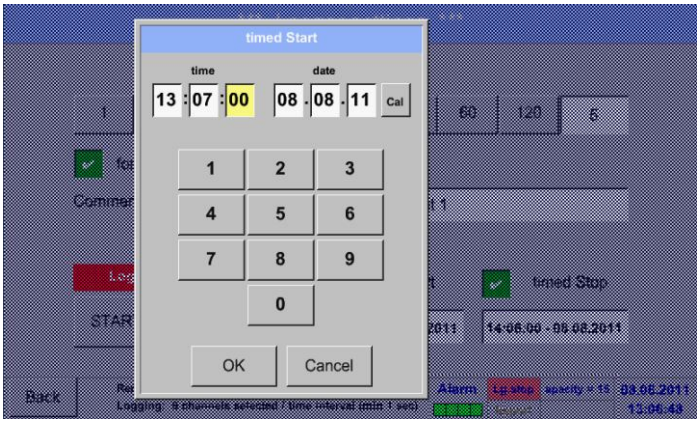
Main menu > settings > Logger settings > timed Stop button



By pushing the timed Stop button and then the date/time description field below, the date and the stop time can be set for a data logger recording.

Remark:
If the stop time activated, it will automatically be set to the current time plus an hour.

Main menu > settings > Logger settings > timed Start button/timed Stop button > Date/Time description field



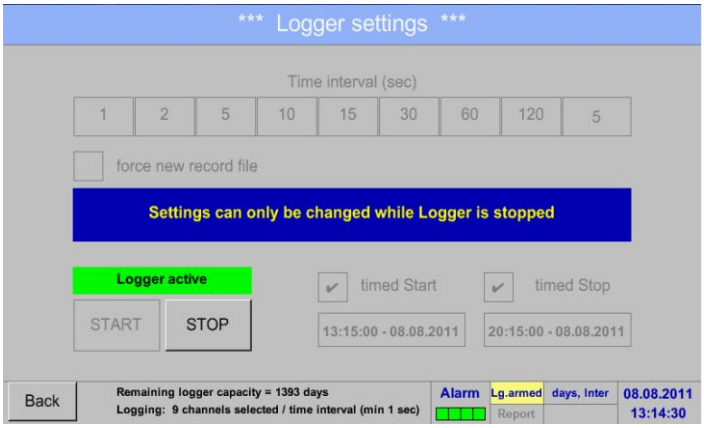
After pushing the date/time description field a window will appear where the yellow marked area of the time or date can always be set and changed.

12.2.4 Logger settings (data logger)

Main menu > settings > Logger settings > timed Start button/timed Stop button > Date/Time description field > Cal button

With the Cal button the desired date can be easily select from the calendar.

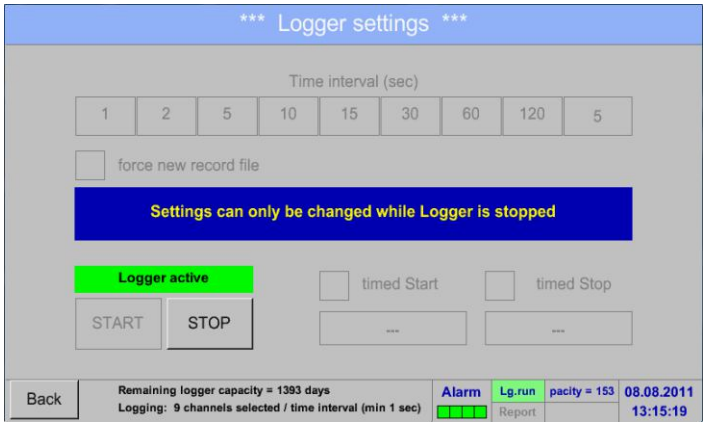
Main menu > settings > Logger settings > Start button



After the start and stop time activation and the created settings, the Start button will be pushed and the data logger is armed.

The data logger starts the recording at the set time!

Main menu > settings > Logger settings > Start button/Stop button



The data logger can be started without activated time settings, use the Start and Stop buttons for activate and disable.
Left below there will be shown how many values are recorded and how long there still can be recorded.

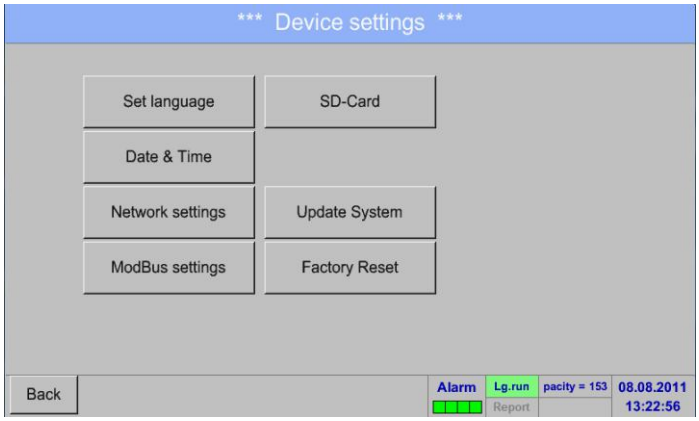
Remark:
The settings cannot be changed, if the data logger runs.

Important:

If a new recording file should be created, the force new record file button must be activated. Otherwise, the last applied recording file is used.

12.2.5 Device settings

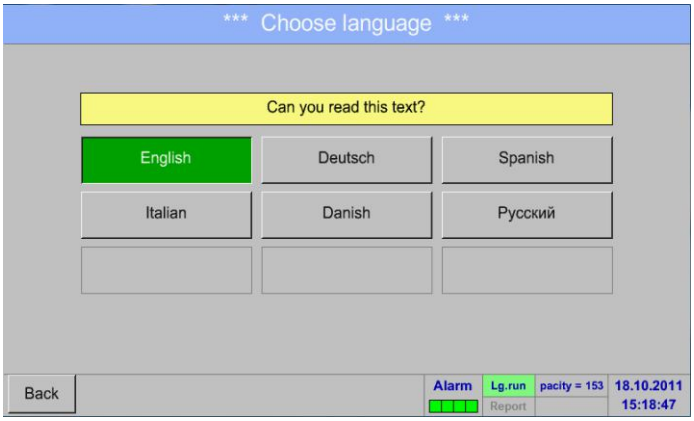
Main menu > Settings > Device settings



Overview of Device settings

12.2.5.1 Set language

Main menu > Settings > Device settings > Set language

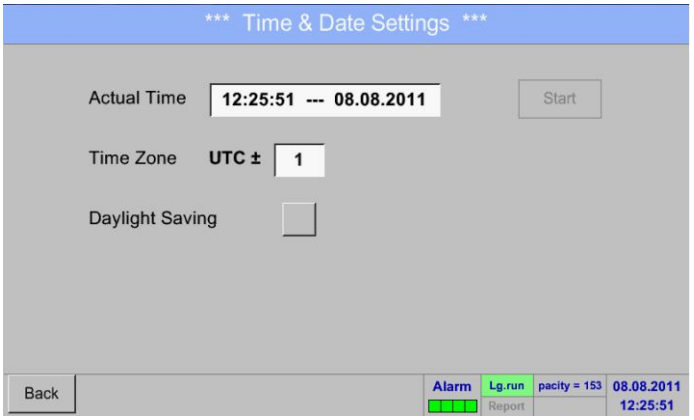


Here you can select one of 12 languages for the DLUI-HD.

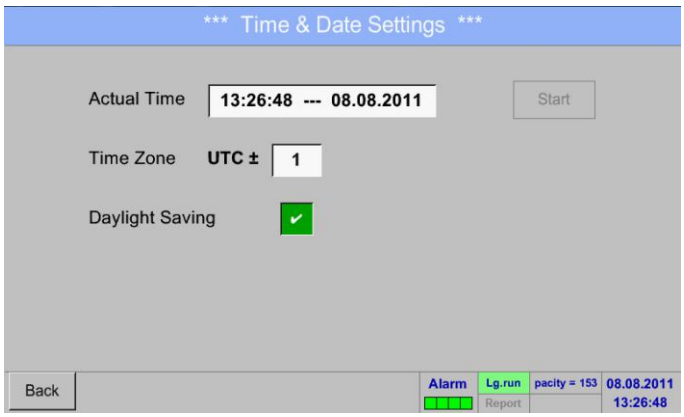
Remark:
Currently is not every language available!

12.2.5.2 Date & Time

Main menu > Settings > Device settings > Date & Time



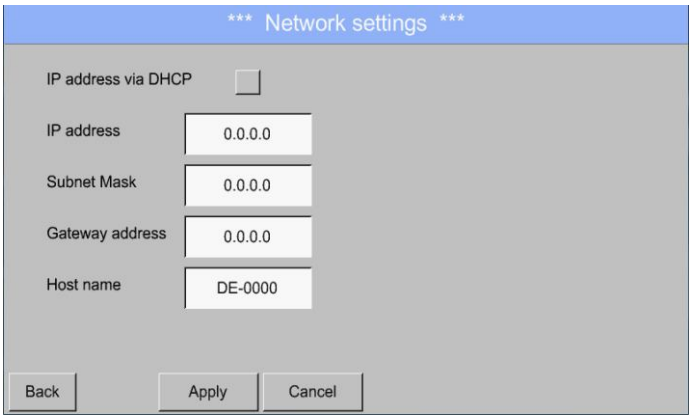
By pushing the Time Zone description field and enter the correct UTC, you can set the correct time all over the world.



The summer and winter time switchover is realized by pushing the Daylight Saving button.

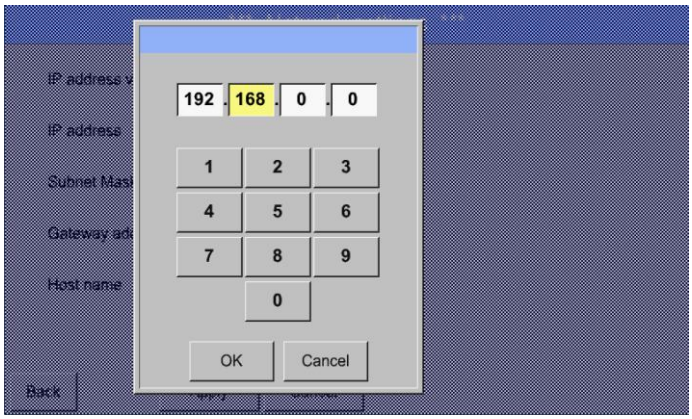
12.2.5.3 Network settings

Main menu > Settings > Device settings > Network settings



Here you can set up and made a connection, with or without DHCP, to a computer.

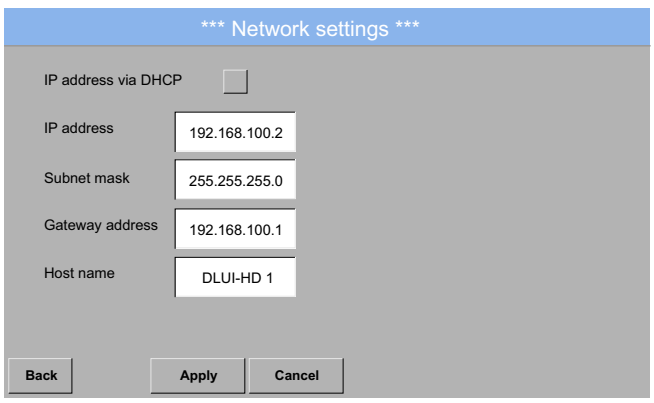
Remark:
With activated DHCP (green hook), the automatic integration of the DS 500 in an existing network is possible, without a manual configuration.



After pushing, for example the IP address description field, the command window appears, where in the selected yellow area a partial IP address can be entered manually.

The Host name can be entered or changed by pushing the description field.

Subnet Mask and Gateway address are entered in the same way!

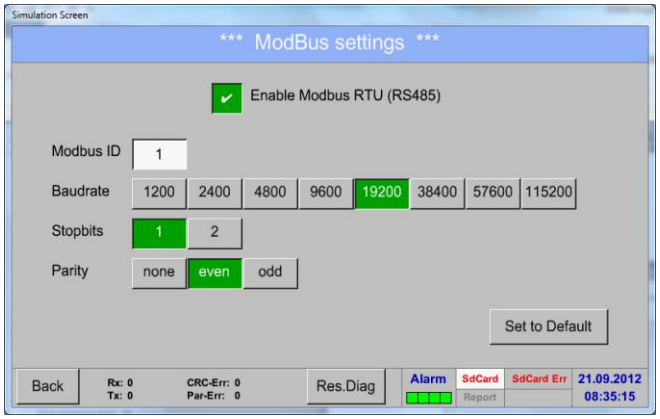


For example a IP-Address out of address range of the class C-Net

Remark:
Private Address range Class A-Net
10.0.0.0 bis 10.255.255.255
Private Address range Class B-Net
72.16.0.0 bis 172.31.255.255
Private Address range Class C-Net 192.168.0.0 bis 192.168.255.255
Subnetz Mask: e. g. 255.255.255.0

12.2.5.4 ModBus settings (Slave)

Main menu > Settings > Device settings > ModBus settings



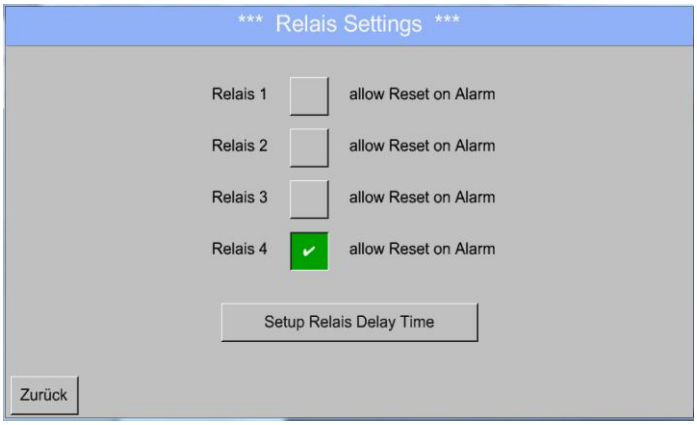
In this menu the transmission parameter Modbus ID, Baudrate, Stoppbits und Parity will be set. With activation of Enable Modbus RTU(RS485) the Modbus is enabled.

By pressing Set to Default the default values will be set.

Default values: Baudrate: 19200
Stoppbit: 1
Parity: even

12.2.5.5 Relais settings

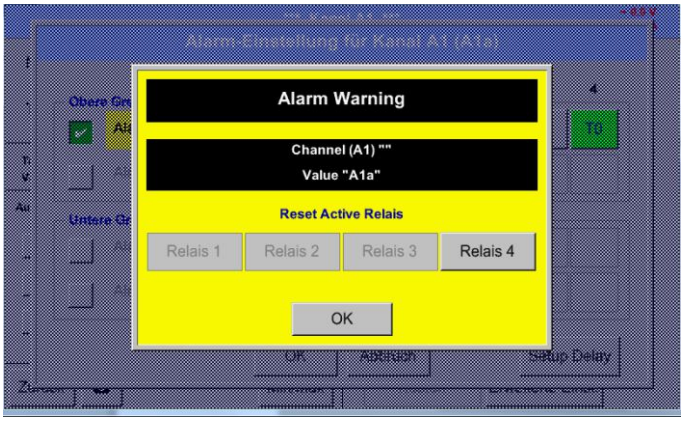
Main menu > Settings > Device settings > Relais settings



By activated relais button it is allowed / possible to turn off the corresponding alarm relays in the popup appearing in alarm case.

Setting is only possible in the password protected Device Settings menu.

Default values at delivery are **not allowed**.



In case of an alarm e.g. here alarm 1(Yellow) for channel A1 a popup will be displayed.

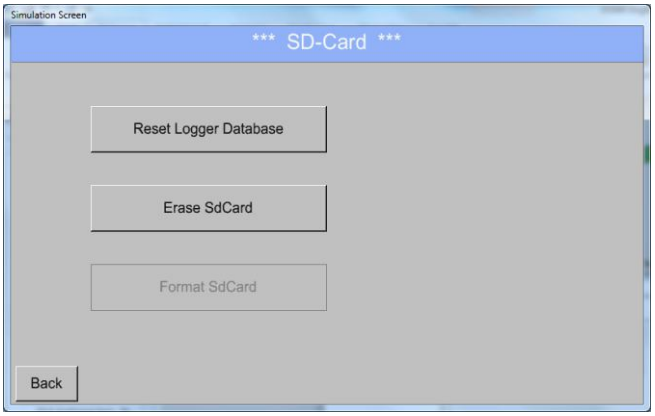
If in the Relay Settings the turning off of Relay 1 was allowed by pressing Relay 1 button switches this off.

By confirming with OK the popup will be closed.

12.2.5.6 SD-Card

Main menu > Settings > Device settings > SD-Card > Reset Logger Database

Main menu > Settings > Device settings > SD-Card > Erase SdCard



By pressing Reset Logger Database all actual stored data on SD-Card will be blocked for use in DLUI-HD. Nevertheless all data are still stored and available for external use only.

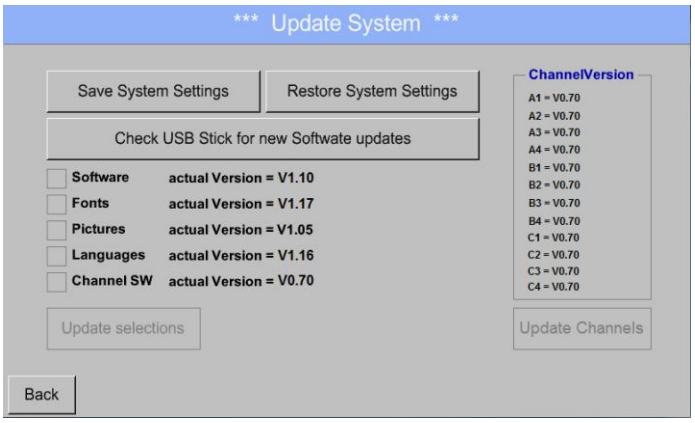
By pressing Erase SdCard all Data on the SD-Card will be deleted.

12.2.5.7 Update System

Important: Before the update, save the System setting on a USB stick!

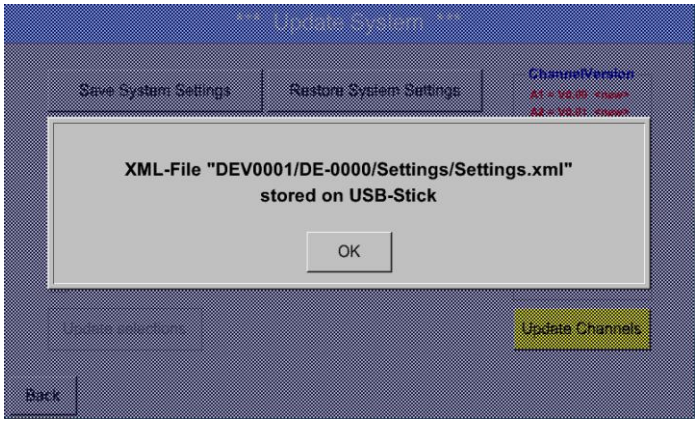
Remark: The highlighted yellow fields shows, which kind of update is available!

Main menu > Settings > Device settings > Update system



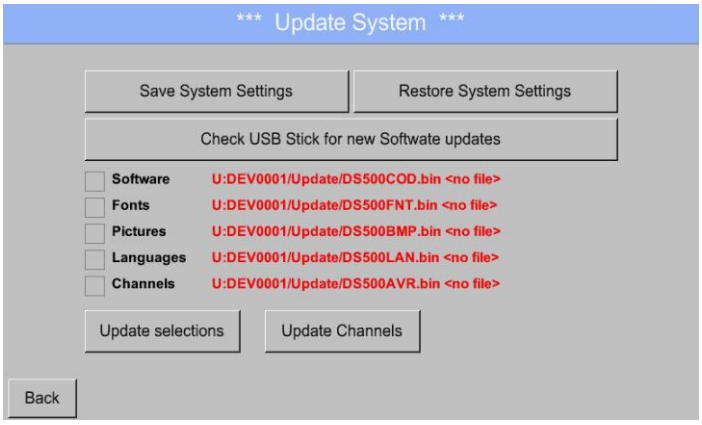
Overview of the Update System features

Main menu > Settings > Device settings > Update system > Save System Settings

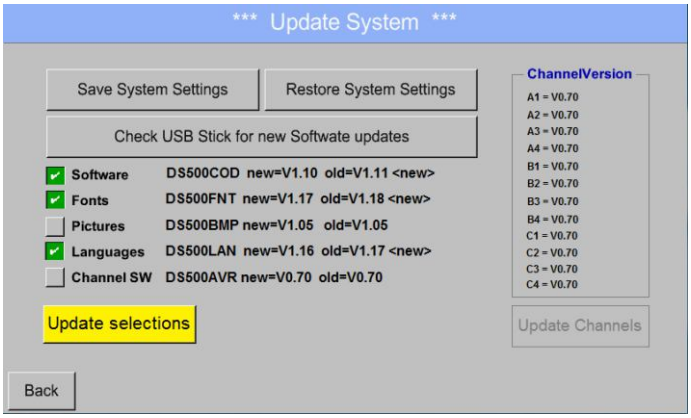


Stores the channel and system settings in XML format on a USB stick.

Main menu > Settings > Device settings > Update system > Check USB Stick for ...



If after pushing the Check USB Stick for new Software updates button the following messages in the window appears, the DLUI-HD is not connected properly with the USB stick or no files are available.



If the DLUI-HD is correctly connected to USB, the font will be black and left the different update options (with a green hook) are showed.

And right aside it shows the current (old) and another (new) available versions..

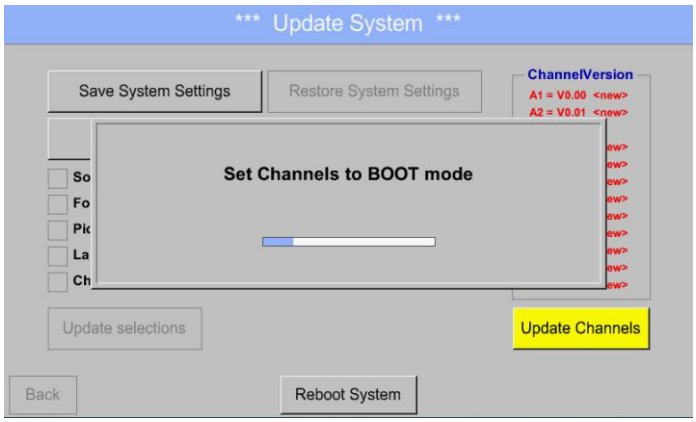
If you want to install an older software version, you must push the Check USB Stick for new Software updates button and select an older version to install.

Main menu > Settings > Device settings > Update system > Update selections

DLUI-HD update for all selected options (software, fonts, etc.).

Important:
If the Reboot system button after the update appears, he must be pushed to restart the DLUI-HD.

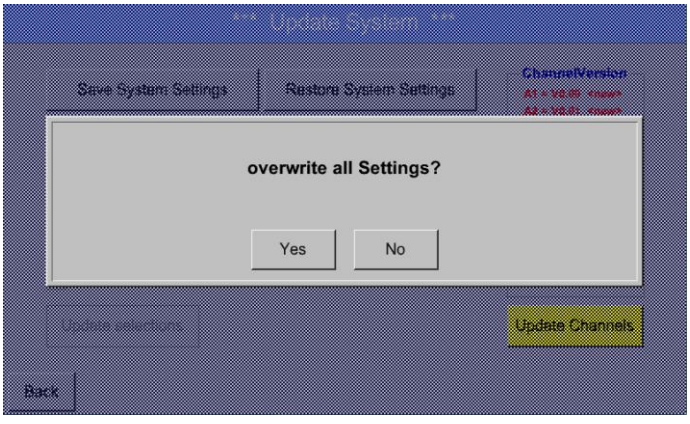
Main menu > Settings > Device settings > Update system > Update Channels



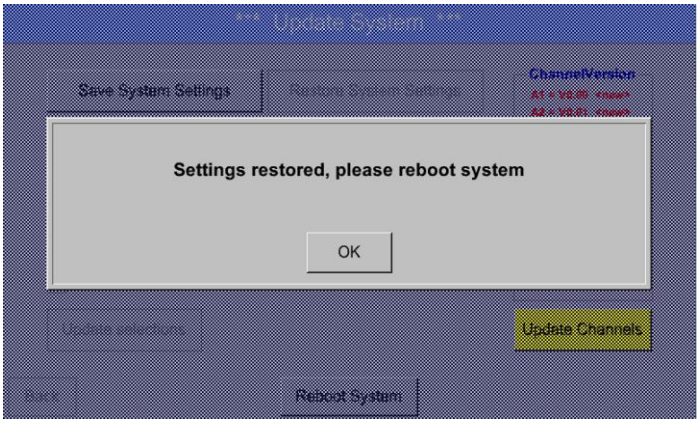
Update for the available channels of the DLUI-HD.

Important:
If the Reboot system button after the update appears, he must be pushed to restart the DLUI-HD..

Main menu > Settings > Device settings > Update system > Restore System Settings



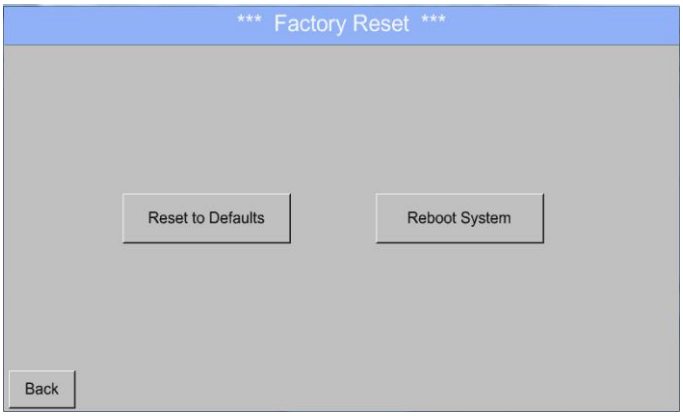
With the help of the Restore System Settings button the channel and system settings can be reset to the last saved version.



Important:
If the channel and system settings have been reset you have to push OK and then the Reboot system button.

12.2.5.8 Factory Reset

Main menu > Settings > Device settings > Factory Reset



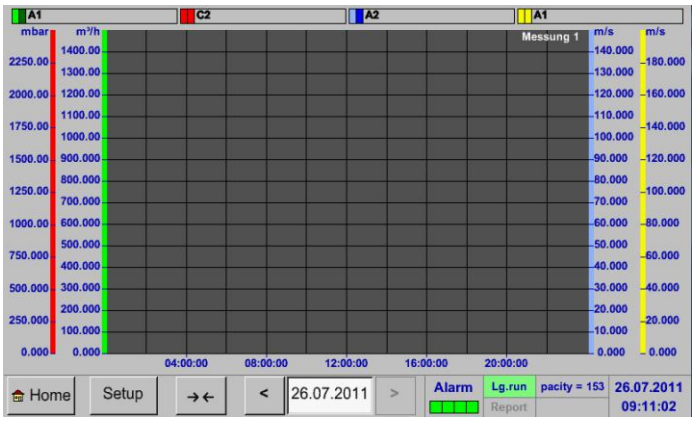
If needed push the Reboot System button to restart the DLUI-HD and with button Reset to Defaults you can reset the device to the factory configuration.

12.3 Chart

Main menu > Chart

Attention:
In the Chart there can be represented only records that have already finished!

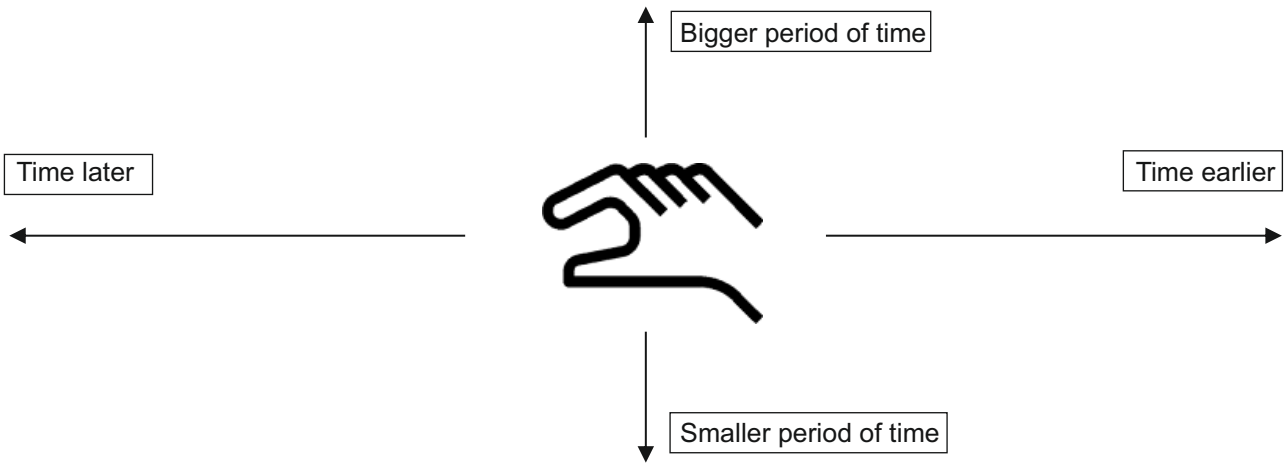
Current records can be seen in Chart/Real time values.
(See chapter 12.4 Chart/Real time values)

	Running measurement, there are no values represented!

Zoom and scroll options in the time domain of the Chart:

	Maximal an entire day can be represented (24h).
	The smallest possible range is represented, depending on the time interval of the recording.

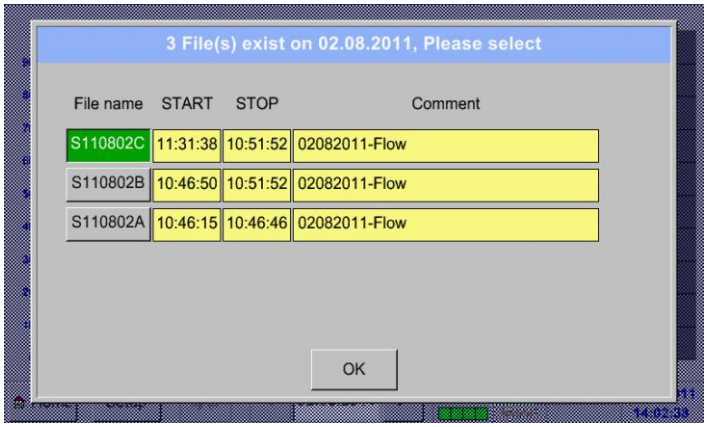
Additional zooming and scrolling options in Chart and Chart/Real time values:



12.3 Chart

Main menu > Chart > Date description field

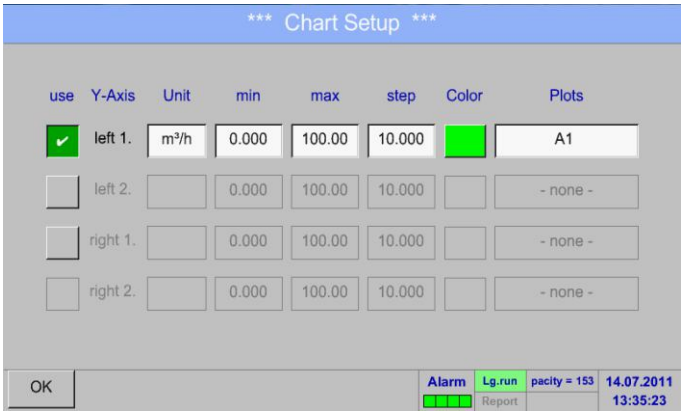
By pushing the date description field (center bottom) the calendar, from which the appropriate date can be selected conveniently, appears.



Stored measuring data can be select here by time (START and STOP), Comment and File name (contains English date).

Main menu > Chart > Setup

In the Setup, you can make up to four different y-axis labels and in addition choose a Unit, the grid (min, max, step) and several channels (Plots) and a Colour.

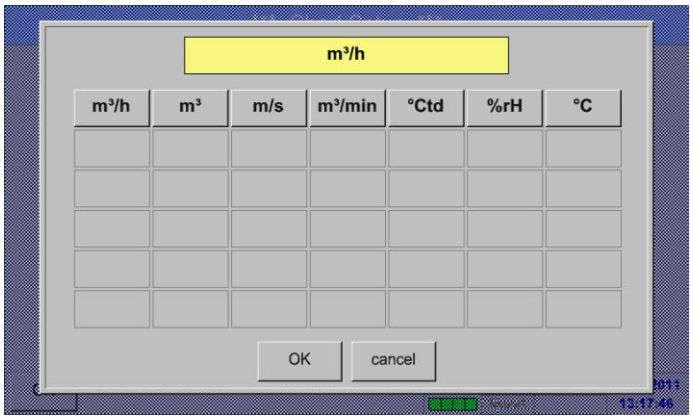


1.
The y-axis left 1. is already enabled, you can choose a Colour for it.

Remark:
Grid setting is already possible at this point, but later when a record is selected it is more reasonable!

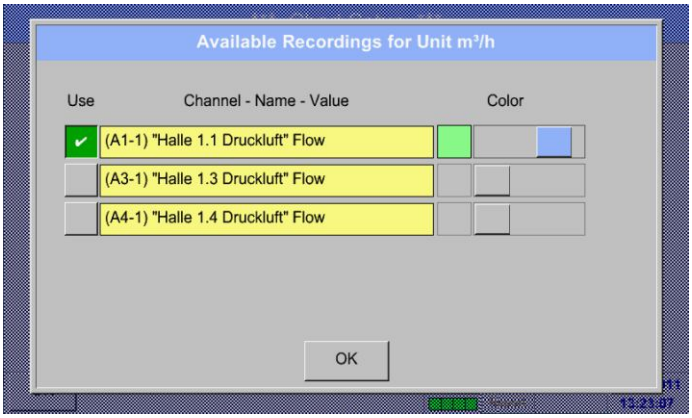
12.3 Chart

Main menu > Chart > Setup > Unit description field



2.
Select the Unit of the represented recording from the menu.

Main menu > Chart > Setup > Plots description field



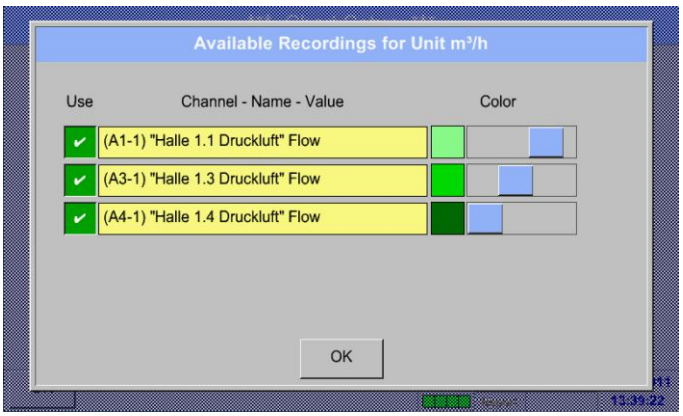
3.
Now, you can choose the desired recording and colour intensity (in Colour).

Main menu > Chart > Setup

4.
Now, the grid can be set with min, max, and step.

12.3 Chart

Main menu > Chart > Setup > Plots description field



5.
Several recordings with the same unit can be represented in one y-axis, with the help of various colour intensities.

Main menu > Chart > Setup

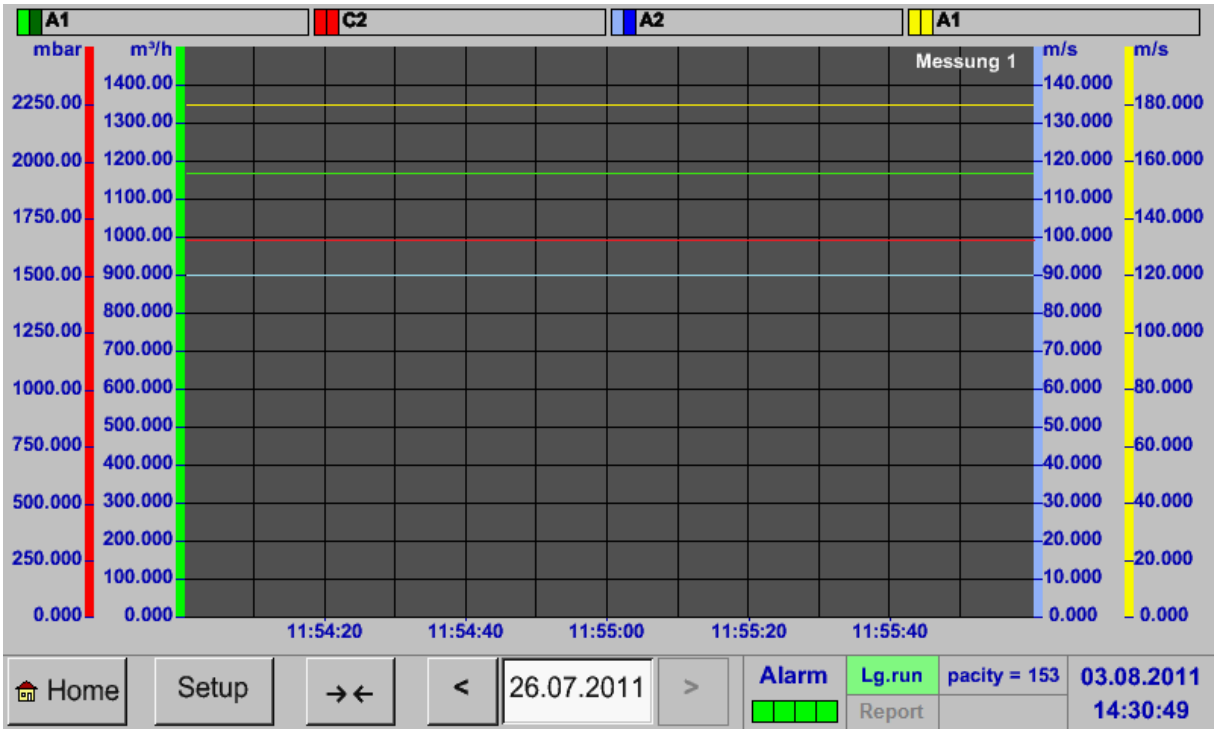
6.
The Plots description field shows on what channel the measured data were recorded and there can be seen how much recordings on one y-axis are represented.

In the same way the remaining y-axes can be labeled!

Four different grid settings with various Units and Colours.

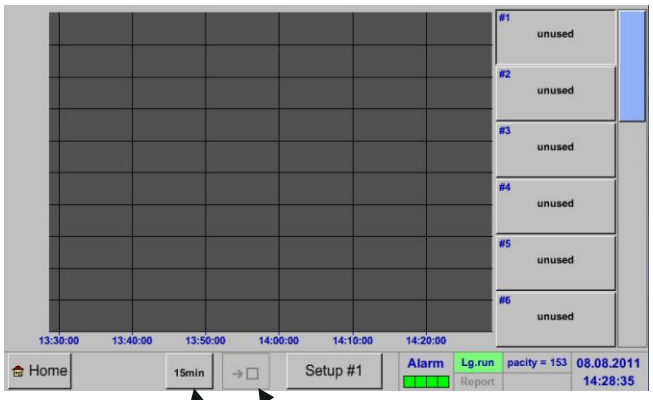
12.3 Chart

Main menu > Chart



12.4 Chart / Real time values

Main menu > Chart/Real time values

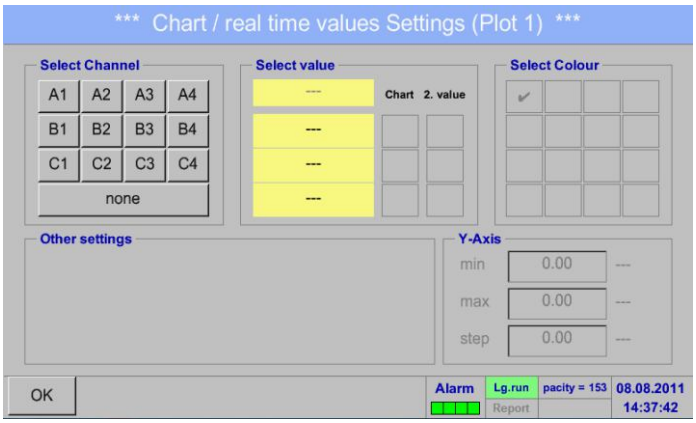


One or more channels for the recording and presentation of measured data can be selected here, such as a dewpoint sensor or several different sensors.

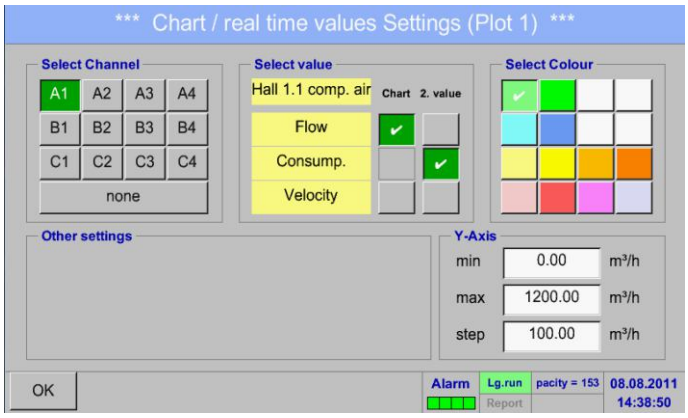
After pushing this button currently recorded measurement data in the current time range are represented..

Quick access to predefined time periods 24 h, 8 h, 1 h, 15 min and 2 min. At the push of a button the chart for the selected time range is displayed.

Main menu > Chart/Real time values > Setup #1 - #12



In this menu item, up to twelve channels (depending on the version of the DLUI-HD) can be activated at the same time and viewed in Main > Chart/Real time values.



Here the channel A1 chosen.

For each channel, you can select a value to be represented in the Chart and one to display (2. values).

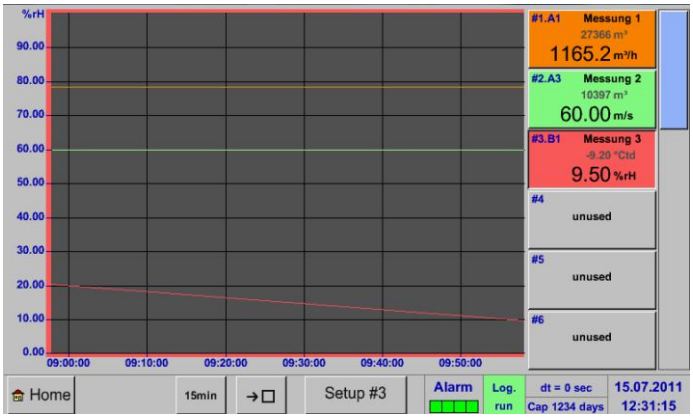
In addition, it can be set, like in Main > Chart, a colour and the grid (min, max, step) of the y-axis.

12.4 Chart / Real time values

Main menu > Chart/Real time values

Channel A1:
Elected the flow as Chart and consumption as 2. values (number with the smaller font size) and the colour orange.

If several channels are logged, all charts will be represented. But there is only the y-axis of the selected channel represented (here: Setup #2).

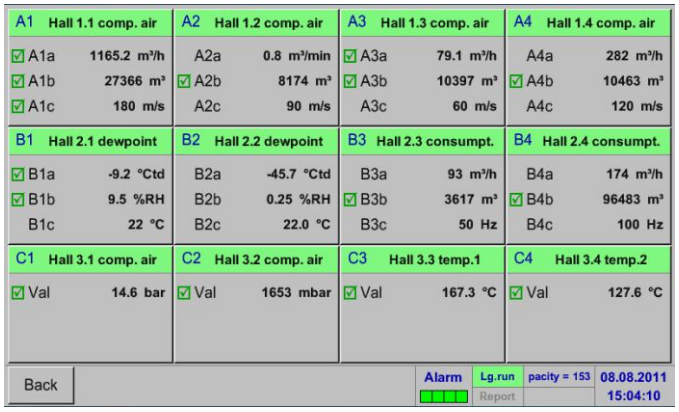


If there is no grid entered in the setup , min will be 0, max 100 and step 10 (Setup #3).

In the same way the remaining setups can be set!

12.5 Channels

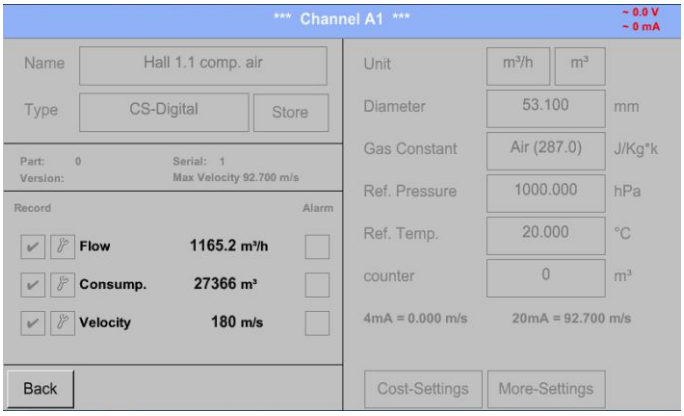
Main menu > Channels



The overview of Channels shows the current measured values of all connected sensors.

Exceeds or falls below the set alarm limits, the respective measured value flashes yellow (alarm 1) or red (alarm 2).

Main menu > Channels > A1

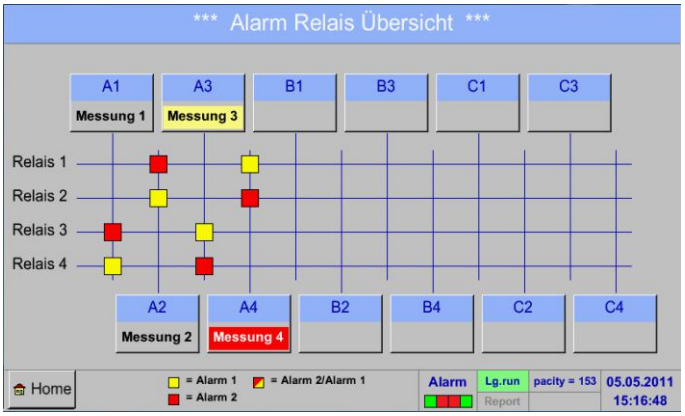


Each channel can be selected and the settings viewed and checked, but no changes can be made here.

Remark:
Please, make changes in the Settings!

12.6 Alarm overview

Main menu > Alarm overview

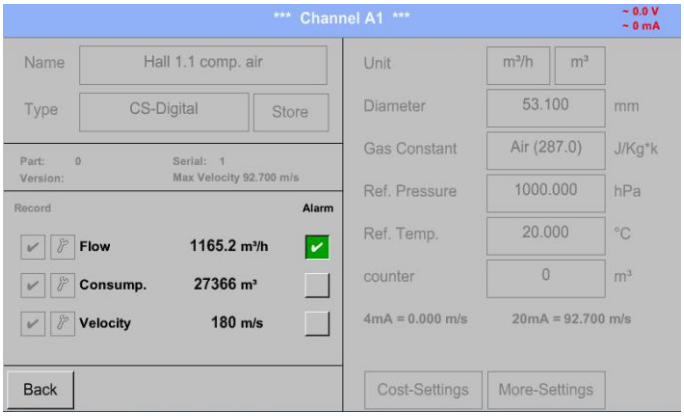


In the Alarm overview, you can immediately see whether there is an alarm 1 or alarm 2.
You can see also in other menu items:
Main > Real time values and
Main > Settings > Sensor settings
The channel name will appear yellow invers (alarm 1) or inverse red (alarm 2).
In addition, you can see which relay had been set for the channel as the alarm 1 or alarm 2.
This is indicated by the yellow and red or red/yellow squares on the intersections between measuring channel and relay.

HERE: Alarm1 for channel A3 and alarm 2 for channel A4.

12.6 Alarm overview (continued)

Main menu > Alarm overview > A1



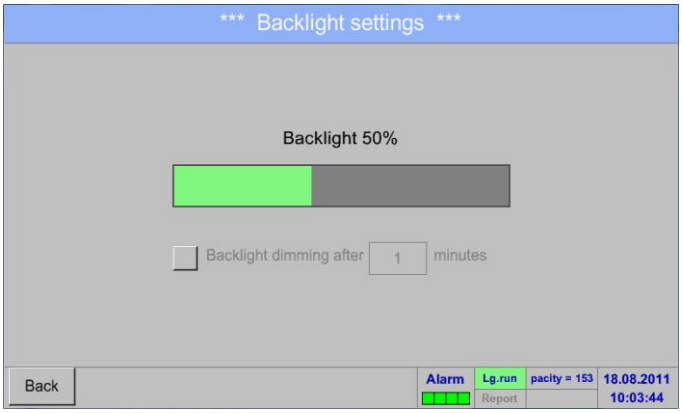
Like in Main> Real time values, individual channels can be selected here, to detect which and how much the value has exceeded or below the alarm range.

Remark:
The alarm parameters can be set and/or modified here.

12.7 Further setting options

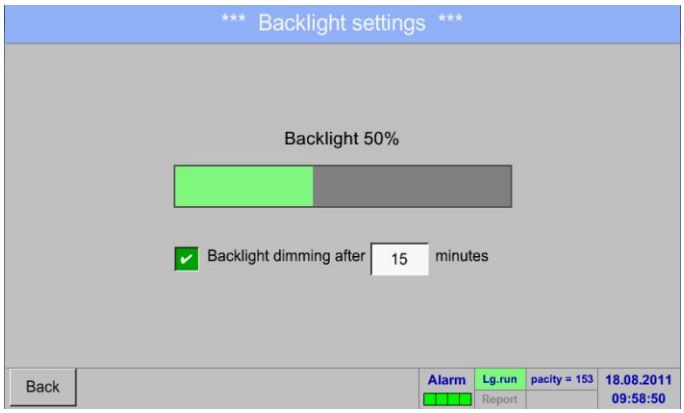
12.7.1 Set backlight

Main menu > Settings > Set backlight



Here you adjust the desired Backlight (15-100%) of the display directly.

e.g. Backlight to 50 %



With the help of the Backlight dimming after button, after a definable time interval (here after 15 minutes), the Backlight can be reduced to the minimum.

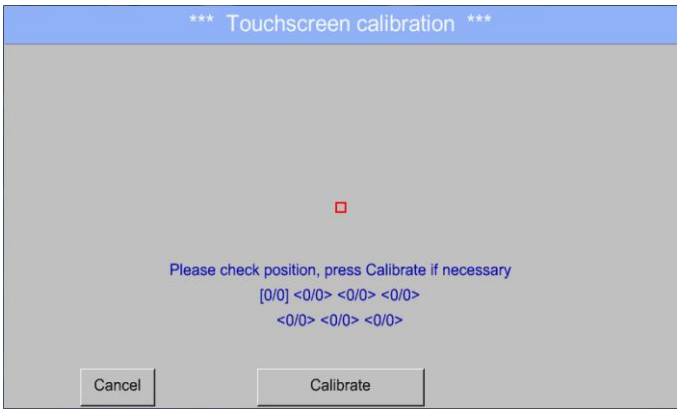
As soon as the dimmed screen is operated again, the Backlight is committed automatically on the last set value before dimming.

Remark:
At the first touch, the Backlight in our example is reset to 50%, after that a "normal" function operation is possible.

Important:
If the Backlight dimming after button is not activated, then the Backlight stays permanently on, in the currently set brightness.

12.7.2 Calibrate touch-sceen

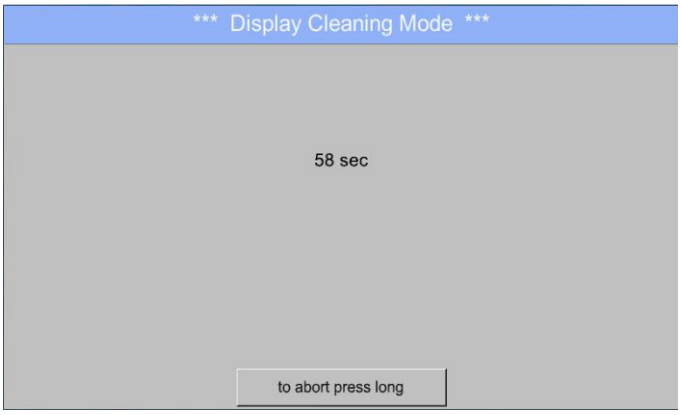
Main menu > Settings > Touchsceen calibration



If necessary, the touch-screen calibration can be changed here.
Push Calibrate and it appears, 1. left above, 2. bottom right and 3. in the middle, a calibration cross that must be pushed consecutively.
If the calibration finished and the touch-screen display averaged, you can confirm with OK.
Is this not the case, so you can repeat the calibration with the help of the Cancel and Calibrate buttons.

12.7.3 Cleaning

Main menu > Settings > Cleaning



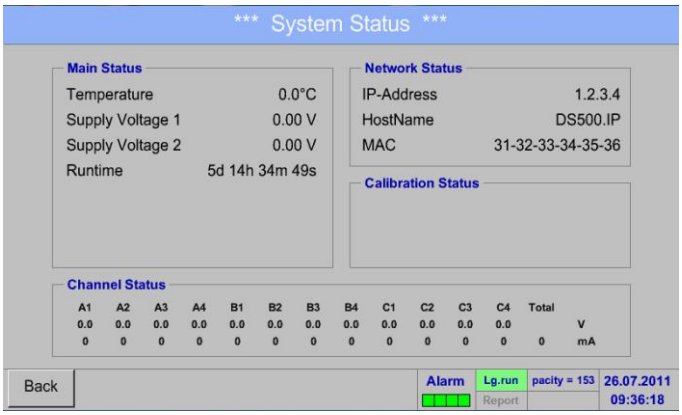
This function can be used for cleaning the touch panel during running measurements.

If one minute is not enough time to clean, the process can be repeated at any time.

Is the cleaning faster finished, then you can push the to abort press long button (for one or two seconds) to cancel.

12.7.4 System Status

Main menu > Settings > System Status



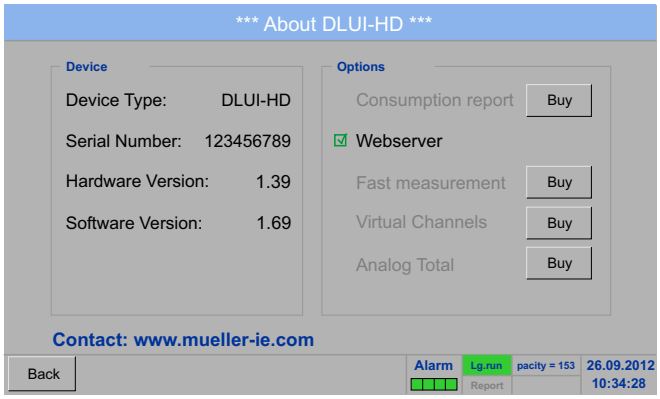
The function System Status offers an overview, fitting voltages and currents on the individual and the entire channels, as well as the power supply of the power supply units.

In addition, it offers the most important network information, such as IP, host name and MAC.

By the Runtime, you always know how long the DLUI-HD was in total in operation.

12.7.5 About DLUI-HD

Main menu > Settings > About DLUI-HD



Brief description of the Hardware and Software Version, as well as the Serial Number of the DLUI-HD.

Under options, you can buy four additional, different functions, if you haven't done this by ordering.

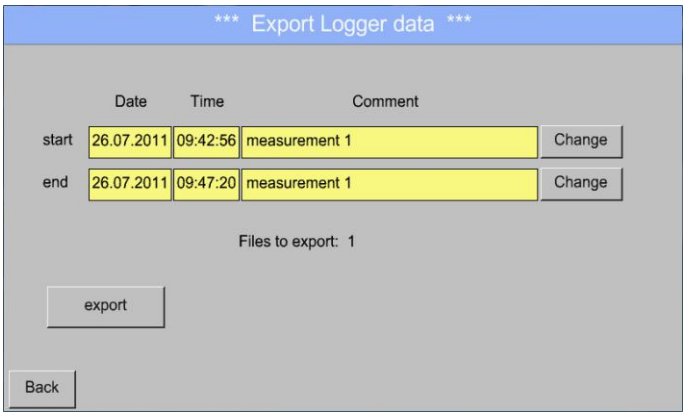
12.8 Export Data

Recorded data can be transferred to a USB stick, by using Export Data.

Main menu > Export Data

With Export Logger data, Export system settings and Export Report the recorded measurement data and saved settings can be transferred to a USB stick.

Main menu > Export Data > Export Logger data



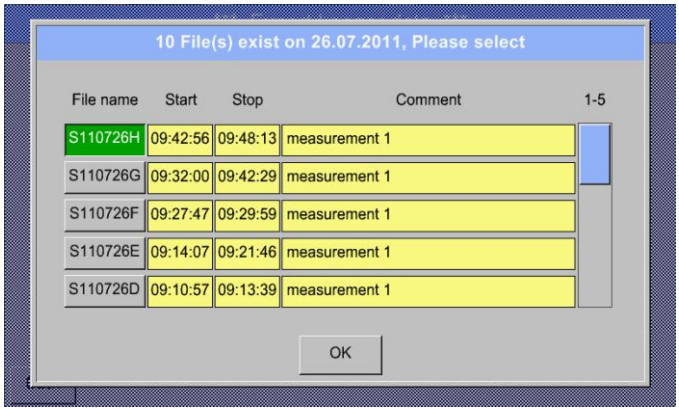
Use the Change buttons to adjust a period between start and end. Stored measurement data in this period are exported.

Main menu > Export Data > Export Logger data > Change

The selected date is always green, and the date numbers of the Sundays are red, like in the calendar.

On days, where measurement data were recorded, the date numbers are optical highlighted.

12.8 Export Data



If there have been recorded several measurements on the same date, they appear after the date selection with OK.

Now a recording can be selected comfortable.

Main menu > Export data > Export Logger data > export

The measurement data of the selected period are exported to a USB stick.

Main menu > Export data > Export system settings

By using Export system settings, all existing sensor settings can be exported to a USB stick.

Main > Export data > Export Report

By using Export Report, all existing **reports** can be exported in CSV-format to a USB stick.

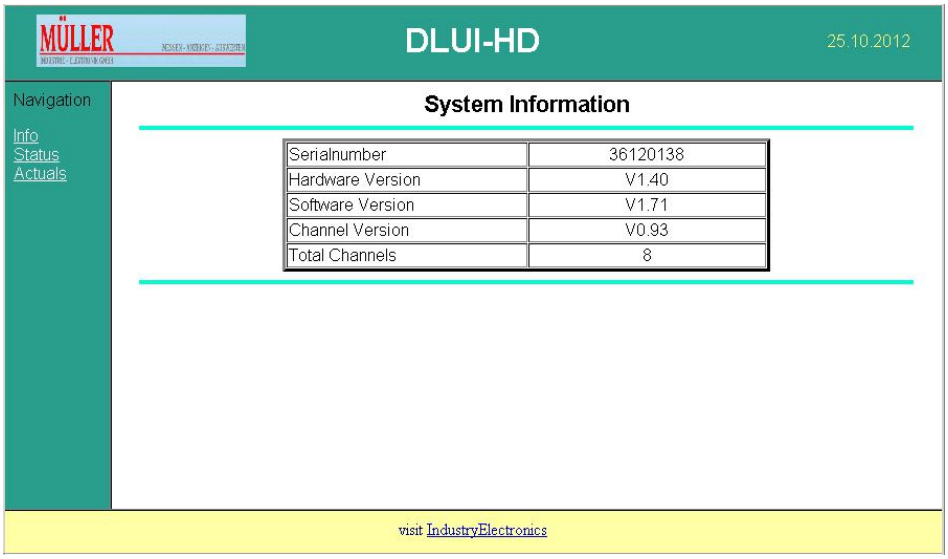
12.9.3 Webserver (option)

With an Internet Browser and the IP-Address of the DLUI-HD you can check the following options worldwide.

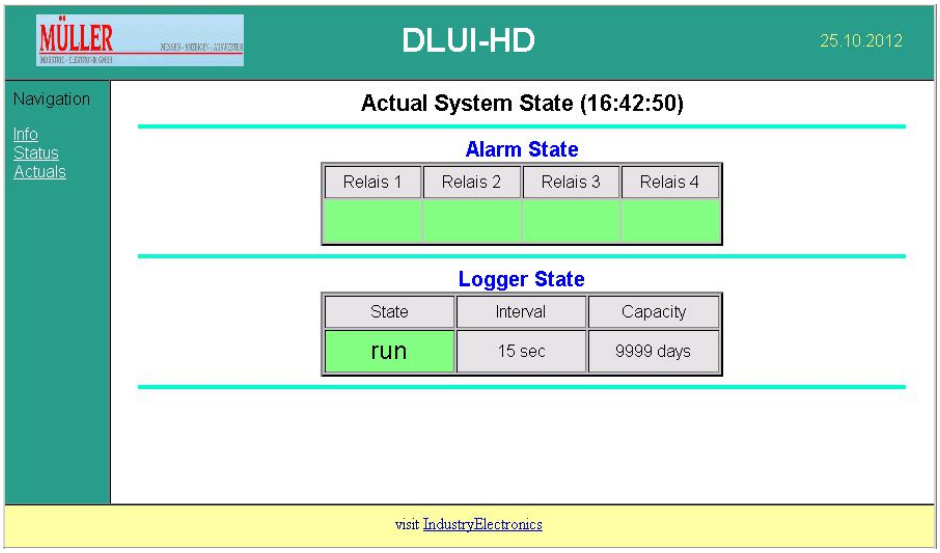
http://<IP-Address of the DLUI-HD>

Remark: The IP-address of the DLUI-HD yon can see in the chapters 12.7.4 System Status and 12.2.4.3 Network settings.

12.9.3.1 Info

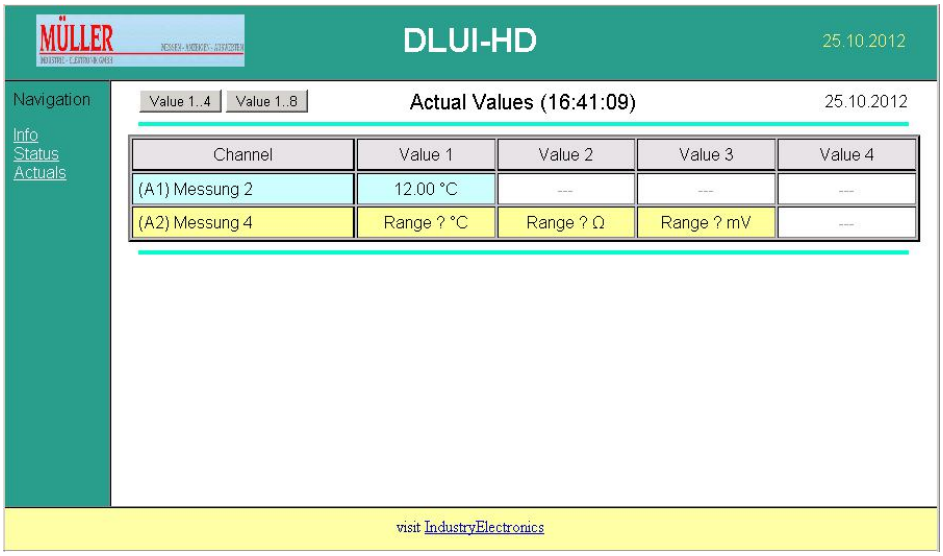


12.9.3.2 Status



12.9.3 Webserver (option)

12.9.3.3 Actuals

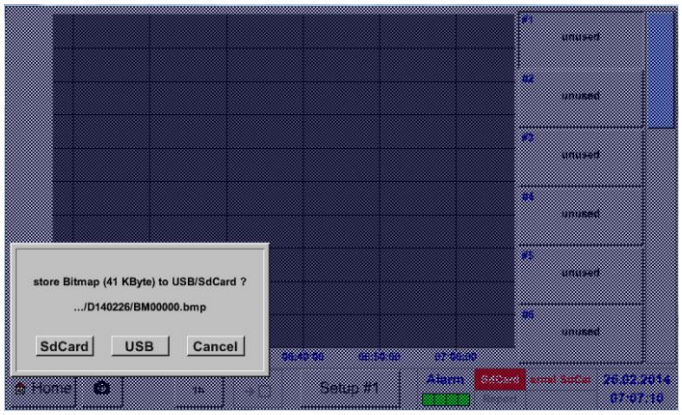


12.10 Screenshot function

This function allows you to store a copy of the screen of the menus Chart, Chart / Real time Values, Channels and Real time Values to a USB-Stick or SD-Card. Mainly foreseen to save not logged data.

12.10.1 Screenshot saving

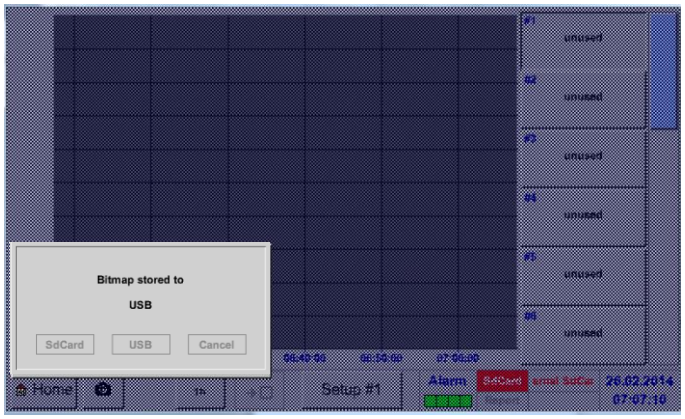
Main menu > Chart >
Main menu > Chart / real time Values >
Main menu > Channels >
Main menu > Real time Values >
Main menu > Settings > Sensor Settings >



Here, the location of USB stick or SD card can be selected.

Screenshots are stored in directories defined per day and here numbered consecutively.

Directory naming; DYYMMTT
D=fix(for Date)
YY = Year
MM= Month
TT= Day



Path: DEV0001/Hostname/Bitmap

For Hostname see
Main menu > Settings > System Status

Example: first Screenshot 26. Februar 2014

\\DEV0001/DE-5001/Bitmap/D140226/B00000.bmp

12.10 Sceenshot function

12.10.2 Screenshots export

The screenshots stored on the SD card can be exported to a USB stick

Main menu > Export data

With Export Screenshots the recorded screenshots data can be transferred to a USB stick.

Main menu > Export Data > Export Screenshots

Use the Change buttons to adjust a period between start and end. Stored bitmaps data in this period are exported.

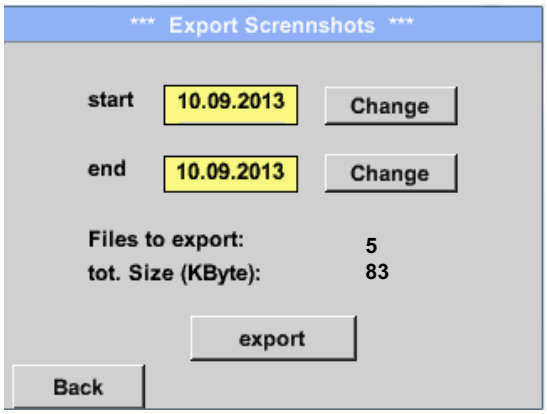
Main menu > Export Data > Export Screenshots > Change

The selected date is always green, and the date numbers of the Sundays are red, like in the calendar.

On days, where measurement data were recorded, the date numbers are optical highlighted.

12.10.2 Screenshots export

Main menu > Export data > Export Sceenshots > Export



The screenshots of the selected period are exported to a USB stick.