MEETINSTRUMENTATIE

Turfschipper 114 | 2292 JB Wateringen | Tel. +31 (0)174 272330 | www.catec.nl | info@catec.nl

Datalogger DLU

Instructions for Use

9.1711.10.0x0

Doc. No. 021821/07/18

THE WORLD OF WEATHER DATA

Safety Instructions

- Before operating with or at the device/product, read through the operating instructions.
  This manual contains instructions which should be followed on mounting, start-up, and operation.
  A non-observance might cause:
  - failure of important functions
  - endangerment of persons by electrical or mechanical effect
  - damage to objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or **Adolf Thies GmbH & Co. KG**. Only components and spare parts supplied and/or recommended by **Adolf Thies GmbH & Co. KG** should be used for repairs.
- Electrical devices/products must be mounted and wired only in a voltage-free state.
- **Adolf Thies GmbH & Co KG** guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
- All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
- The device / product is designed for a specific application as described in these operating instructions.
- The device / product should be operated with the accessories and consumables supplied and/or recommended by **Adolf Thies GmbH & Co KG** .
- Recommendation: As it is possible that each measuring system / device / product may, under certain conditions, and in rare cases, may also output erroneous measuring values, it is recommended using redundant systems with plausibility checks for **security-relevant applications**.

Environment

- As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "*ElektroG*" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.

- Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, please arrange for recycling as the packaging materials are designed to be recycled.

Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although these operating instructions have been drawn up with due care, **Adolf Thies GmbH & Co KG** can accept no liability whatsoever for any technical and typographical errors or omissions in this document that might remain.
- We can accept no liability whatsoever for any losses arising from the information contained in this document.
- Subject to modification in terms of content.
- The device / product should not be passed on without the/these operating instructions.

Table of Contents

1 Device design 7

2 Application / setup of the dataloggers 9

3 Installation 12
3.1 Recommendation for site selection 12
3.2 Mechanical installation 12
3.3 Electrical installation 13
3.3.1 Wiring 13
3.3.2 Accumulator 14
3.3.3 Solar Panel 15
3.3.4 Potential-free switch outputs 16
3.3.5 RS485 interfaces (COM1 / COM2) 17
3.3.6 Measuring transducer supply 18

4 Operation 19
4.1 Display options 20
4.2 Adjusting parameters 20
4.2.1 Password dialogue 21
4.2.2 Selection mode 22
4.2.3 Editing mode 23
4.3 Switch off datalogger 24
4.4 Network Module (optional) 25
4.4.1 Set up network access 26
4.4.1.1 Establishing the Contact with DHCP-Server 26
4.4.1.2 Establishing the Contact without DHCP-server 26
4.4.1.3 Setting via serial Interface 27
4.4.2 Checking LAN connection 28
4.4.2.1 Testing connection with the diagnosis tool “ping” 28
4.4.2.2 SFTP connection 30
4.4.2.3 Telnet connection 34
4.4.3 Users 35

5 Measured value acquisition 38

6 Data output 40
6.1 Data output via network (only logger with Ethernet module) 40
6.1.1 The log directory 41
6.1.2 The configuration directory 42
6.1.3 The measured value directories 44
6.2 Data output via SD card 47
6.2.1 Recommendations SD-CARD 49

6.3 Data output via COM1, COM2 and USB 49
6.4 Data line 50
6.5 End line 51

7 Communication 52
7.1 Command interpreter THIES 52
7.1.1 Structure of the commands (requests) 53
7.1.2 Structure of the response telegram 53
7.1.3 Optional framing with 16Bit CRC 54
7.2 Commands 55
7.2.1 Command ArchID 56
7.2.2 Command BP_COM1 56
7.2.3 Command BP_COM2 57
7.2.4 Command BP_USB 57
7.2.5 Command BR_COM1 58
7.2.6 Command BR_COM2 58
7.2.7 Command BR_USB 59
7.2.8 Command DEL_MEM 59
7.2.9 Command DF_INI 60
7.2.10 Befehl DHCP 60
7.2.11 Command DS 60
7.2.12 Command DS_ESC 61
7.2.13 Command DD 61
7.2.14 Command FB 61
7.2.15 Command HI 62
7.2.16 Command ID 62
7.2.17 Command IP_ADDR 63
7.2.18 Command IP_GW 63
7.2.19 Command IP_SNM 64
7.2.20 Command KY 64
7.2.21 Command LA 64
7.2.22 Command LL 65
7.2.23 Command mm 65
7.2.24 Command MM 66
7.2.25 Command MM_MEAN 66
7.2.26 Command MM_EX 66
7.2.27 Command RS 67

7.2.28 Command STOP_ST 67
7.2.29 Command SV 67
7.2.30 Command XX 68
7.2.31 Command ZZ 68
8 WEB-Server 69
8.1 Display of the Instantaneous Values 69
8.2 Archived Data Values 70
8.2.1 Settings for the WEB server 70
8.3 User 71
8.4 IP 71
8.5 NTP 72
8.6 SFTP 72
8.7 Date 73
9 Technical data 74
10 Dimensioned drawing 77
11 Wiring diagram 78
12 Maintenance 78
13 Accessories (optional) 79
14 EC Declaration of Conformity 80

Tables

Table 1: Device design 7
Table 2 : terminal allocation 10
Table 3: Measuring transducer supply 18
Table 4: Symbols (keys) in the display 19
Table 5: Files on SD card 48
Table 6: Data output with command DS 49
Table 7 : Status word 51
Table 8 : Command list 55

Figures

Figure 1: Layout plan of the connections 9
Figure 2: Example of the earthing of the device 13
Figure 3: Angle of inclination for solar panel (here 45°) 15
Figure 4 : Potential-free switch outputs 16
Figure 5: COM1 / COM2 (full/half-duplex) 17

Figure 6: Dialogue page 1 20
Figure 7: Password dialogue 21
Figure 8: Selection mode....22
Figure 9: Editing mode 23
Figure 10: Reset key 24
Figure 11: Information box "Shutdown DLU" 24
Figure 12: Dialogue “Reset yes” 25
Figure 13 : Opening of the console window via the start menu 28
Figure 14:Window with successful connection (top) and without connection (bottom) 29
Figure 15: Settings for login (programme WinSCP) 30
Figure 16: Login (programme WinSCP)....31
Figure 17: Password input (programme WinSCP) 31
Figure 18 : Content start folder (programme WinSCP) 32
Figure 19 : Content of measured value folder “log” (programme WinSCP) 33
Figure 20: Settings for Telnet connection (Tera Term)....34
Figure 21: Example (request for the datalogger ID) 34
Figure 22: Example (response to the request of the Datalogger ID) 35
Figure 23: Settings for SSH connection (Tera Term) 36
Figure 24: Password request for SSH connection (Tera Term)....36
Figure 25: Successful SSH connection (Tera Term)....37
Figure 26 : Start directory 41
Figure 27 : Log directory....41
Figure 28 : Extract from a log file 42
Figure 29 : Configuration directory 43
Figure 30 : Extract from a configuration file 43
Figure 31 : Example of a measurement data archive....44
Figure 32 : Excerpt from a day file (archive with a measured value) 45
Figure 33 : Excerpt from a DESCFILE.INI file....46
Figure 34: **Dialogue page “SD card”** 47
Figure 35: WEB-Server 69
Figure 36: Display current values 69
Figure 37: DLU settings....70
Figure 38: IP-address....71
Figure 39: NTP usage 72

Figure 40: SFTP usage 72
Figure 41: Set the date 73
Figure 42: Datalogger DLU 78

1 Device design

Designation	Order No.	Equipment
Datalogger DLU	9.1711.10.000	
Datalogger DLU	9.1711.10.010 [1)]	With ethernet module

Table 1: Device design

Equipment:

- **Datalogger DLU** in the plastic housing for carrier rail mounting.
- Selectable voltage supply.
- 2.4” colour LCD (320 x 240 pixel).
- Possible to display and adjust the adjustable parameters in the display through touch operation or via the interfaces USB, COM1, COM2 and Ethernet.
- 2 x counter inputs for precipitation sensors.
- 2 x interfaces for the connection of Thies serial sensors.
- 1 x Pt100 input for temperature acquisition (configurable measuring current).
- 1 x input 0 … 1V for the connection of a rel. humidity sensor.
- 3 x analogue inputs for current and voltage (±10V, ±20mA), freely configurable.
- 2 x potential-free switch outputs.
- 2 x freely configurable RS485 interfaces (half-duplex / full-duplex) with the following functionality:

  Connection of sensors with THIES or Modbus interpreter
  or
  output of a data telegram
  or
  command interpreter (for commands, configuration and data output).
- 2 x USB interface for commands, data output and configuration.
- 1 x SD card slot for data output / data transport and FW update.

- [1)] **Optional:**
  Network interface for commands, data output and configuration and web presentation.

Scope of supply:

1 x Datalogger DLU 9.1711.00.000.

1 x Operating instructions

1 x Wiring diagram (order-related connection diagram: datalogger,
Measuring transducer etc.

2 Application / setup of the dataloggers

The Datalogger DLU is a complete measurement system for the acquisition and saving of the measurement data from a wide variety of sensors, like e.g.

- Precipitation sensors with pulse outputs.
- Sensors with measuring resistance (e.g. Pt100 temperature sensor).
- Analogue humidity sensors (±2.4V).
- Analogue sensors (±10V or ±20mA).
- Serial sensors (e.g. WSC11).

The following interfaces are used for commands and data output:

- USB (see **Figure 1,** marking ①).
- Ethernet (see **Figure 1,** marking ③).
- COM1 (dependent on the configuration).
- COM2 (dependent on the configuration).

The output of the data can also take place via a memory card (SD card).

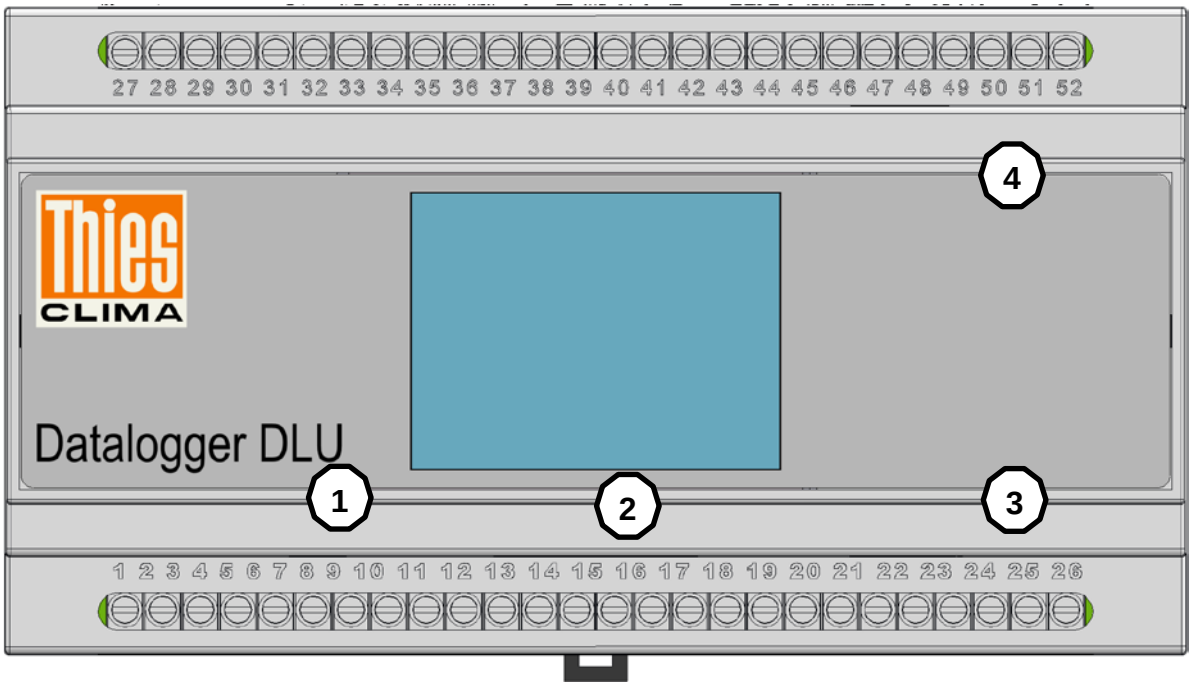


Figure 1: Layout plan of the connections

The points 1 to 4 mark the positions of the input/output interfaces in the housing:

① Slave USB connection (USB 2.0 micro B jack)

② SD card slot

③ Network connection (RJ45 jack)

④ Master USB connection (USB 2.0 type A jack)

Following table shows the allocation of the connection terminals of the datalogger:

Terminal	Signal	
1	Supply 24Vac/dc	
2		
3	+	12V accumulator
4	-	
5	+	12V solar
6	-	
7	12V	Sensor supply
8	GND	
9	A	PT100
10	a	
11	e	
12	E	
13	+	0-1V humidity
14	-	
15	Supply +	Analogue IN1
16	IN+	
17	IN-	
18	Supply -	
19	Supply +	Analogue IN2
20	IN+	
21	IN-	
22	Supply -	
23	Supply +	Analogue IN3
24	IN+	
25	IN-	
26	Supply -	
27	GND / AGND	
28	THIES serial 2	CLK (clock)
29		DI (data)
30	THIES serial 1	CLK (clock)
31		DI (data)
32	12V supply (switchable)	+
33		-
34	COM2	RX+
35		RX-
36		TX+
37		TX-
38		GND-COM2
39	COM1	RX+
40		RX-
41		TX+
42		TX-
43		GND-COM1
44	Digital OUT2	+/-
45		+/-
46	Digital OUT1	+/-
47		+/-
48	Digital IN2	+
49		-
50	Digital IN1	+
51		-
52	Earth	

Table 2 : terminal allocation

The installation of this rail-mounted device (9 HP, horizontal pitches) is envisaged in distributor systems with common 35mm mounting rails (DIN rail) and covers with a 45mm cut-out measurements. The wiring is connected via jack terminals in the lower and upper device section (see **Figure 1**).

The datalogger is powered by an external 12V accumulator and can therefore work independently from the mains. The accumulator is not part of the scope of supply.

It is also possible to power the logger with 24V AC/DC by means of a mains adapter.

A solar panel can be connected via separate terminals.

An integrated power management, fed by the solar input or the input for 24V AC/DC, charges the external 12V accumulator.

When the accumulator is disconnected, the clock is buffered by several hours with a buffer capacitor.

Operation is guaranteed in a wide temperature range from -20° to 70°C.

The device can be simply operated by means of touch control directly on the display or via the interfaces USB, Ethernet, COM1 and COM2. A colour LCD with 320 x 240 pixels acts as a display.

The scanning of the measured values is configurable in the range from one second to 60 minutes. The precipitation pulses are constantly measured.

The data is saved with time and date in accordance with the configured memory cycle (1s to 60 minutes) in a non-volatile Flash data store (64MB) (i.e. the data is retained even without supply). The data store is designed as a so-called ring memory. Once the ring memory is full, the oldest data set is always the next to be overwritten.

For the checking of the sensors or the measurement inputs, the data logger can be switched into the maintenance mode. In this mode, the sensor measured values do not go into the memory. I.e. values determined during the maintenance mode are shown in the display as usual, but are not taken into account for the calculation of memory values.

The data and/or measured values can be read out with the optional PC programme “Mevis”.

Note

The following DLL versions are necessary for the compatibility with the PC programme “Mevis”:

DL16 Archive Reader DLL Version V1.17.0.0

DL16 FTP DLL Version V5.29.0.0

---

3 Installation

Attention
The device must only be installed and wired by qualified skilled personnel. The generally valid codes of practice and the respectively valid regulations and standards are to be adhered to.

3.1 Recommendation for site selection

The device is designed for installation indoors. In the case of outdoor use, an additional enclosure with an appropriate protection class is necessary.

Note
Please consider the temperature area of application and protection class when choosing the site

3.2 Mechanical installation

The datalogger is designed for snap-on installation onto a normal 35mm mounting rail (Hut-, TS35). The mounting rail must be at least as long as the housing width (157mm, 9TE).

Sequence:

- Install a 35mm mounting rail with a length of at least 9HP (157mm) at the installation location.
- Place the Datalogger DLU on the mounting rail that the top edge of the rail grips into the corresponding groove of the Datalogger DLU.
- Insert a screwdriver (blade width <4mm) into the slot of the clip and pull the clip downward. The slot is located in the middle of the bottom edge of the housing.
- Press the datalogger DLU completely onto the mounting rail.
- Let go of the clip. The clip snaps in place behind the mounting rail.
- Check whether the housing is firmly fitted onto the rail, by light shaking.

3.3 Electrical installation

3.3.1 Wiring

In order to build a low-noise (i.e. EMC-compliant) measurement system, the data and measuring lines must be shielded. Thorough earthing of the shielding is to be ensured. Depending on local conditions, a distinction is to be made between:

- **Metal housing**:
  Shields of the lines contact directly to EMC cable glands.
- **Plastic housing or no housing**:
  Produce shield connections via suitable rails or metallic installation plate with appropriate clamps/adhesive bands (see **Figure 2**). The clamps must ensure large-area contact to the cable shield.

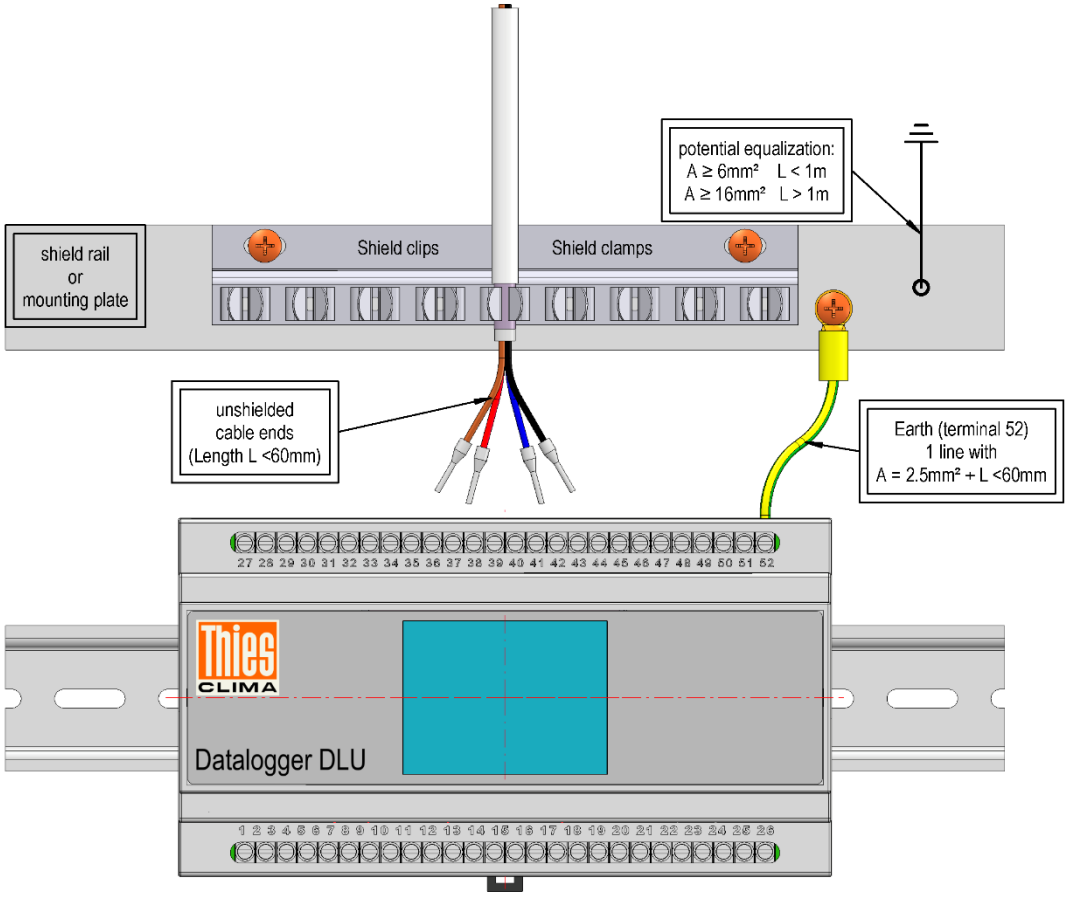


Figure 2: Example of the earthing of the device

The functional earth of the Datalogger DLU (terminal 52) is to be connected with a 2.5mm² cable (L <6cm) to an earthed shield rail or mounting rail.

For potential equalisation we recommend the use of the shortest possible cable (≤1m) with a cross-section of at least 6mm² between metal housing and/or shield rail or mounting plate and the protective earth (earthing strip or site equipotential rail).

Attention:
A voltage reversal of the connection lines can lead to the destruction of the device.

Lightning protection measures:

Especially when the device is used outdoors, the installation of additional protective elements (surge arrestor, such as e.g. varistors) and additional network filters (for the 230V network) is to be recommended.

3.3.2 Accumulator

When utilising the 24VAC supply input, we additionally recommend the use of an optional accumulator (Item No. 210375). Ensure the following polarity when connecting (**red** = **+**, **black** = **-**)!

Replacement or charging is necessary, at the latest, if the displayed voltage sinks below 9.0V. However, discharge of the accumulator under 11.0V should be avoided, because no significant capacity is present any more. The service life of the accumulator is substantially shortened by operation under 10.5V! The new accumulator should be “freshly” charged again before installation, because by self-discharging (approx. 3% per month) it is possible that it may no longer have its maximum capacity. The saved data is retained during changing. The internal clock time is buffered for several hours. Before the accumulator is disconnected, the data should be backed up. After connection, the data logger starts the boot loader, which starts the normal firmware after approx. 10 seconds.

Notes:
When changing the accumulator when the mains supply is switched on, it is to be ensured that the red cable does not come into contact with the housing parts (short-circuit).

During installation it is to be ensured that all connections are switched to voltage-free and that people and/or devices are not endangered!

3.3.3 Solar Panel

Electrical Connection:

The connection of the optional 12V solar panels is to be carried out in accordance with the wiring diagram (see **chapter 11**). We recommend that the solar panel be earthed to protect it against excess voltages. The integrated 12V solar controller carries out temperature-guided control for optimal charging of the accumulator. The maximum power of the solar panel of 20W should not be exceeded, otherwise the controller could be damaged. Because of the temperature control the accumulator should always be close to the datalogger.

Alignment:

- Direction: the solar panel is always to aligned to the highest solar altitude (south in the northern hemisphere and vice versa) in order to receive optimal power. Use a compass if necessary.
- Angle: the optimal angle of inclination (see **Figure 3**) is dependent on the latitude of the site. If the data logger is to be used throughout the year, we recommend an angle of inclination for optimal performance in winter:

  Angle of inclination = latitude + 15°

  (Note: does not apply to Arctic regions because of maximum angle of inclination of 90°)

  Example for Berlin: latitude 50.3° ---> angle of inclination = 50.3° + 15° = 65.3°

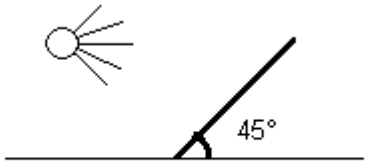


Figure 3: Angle of inclination for solar panel (here 45°)

Note:
A partial shadow caused by the structure or site, e.g. due to sensors or traverses attached above the solar panel, must always be avoided.

Maintenance:

- Dust, snow, leaves etc. on the solar panel reduce the amount of light and the energy yield deteriorates. For this reason, the solar panel surface should be cleaned if necessary.

3.3.4 Potential-free switch outputs

The datalogger possesses 2 potential-free switch outputs that can be switched dependent on the configuration.

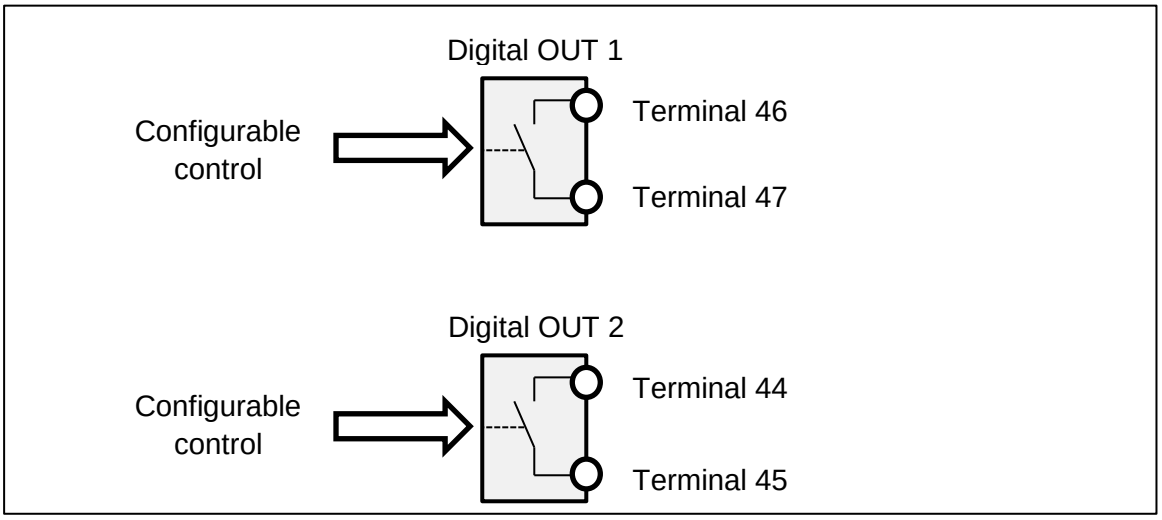


Figure 4 : Potential-free switch outputs

The switch outputs are equipped with a current limit of approx. 100mA and can switch voltages up to 42VAC/DC.

3.3.5 RS485 interfaces (COM1 / COM2)

The datalogger possesses 2 full/half-duplex-capable RS485 interfaces that are controlled independently from the configuration.

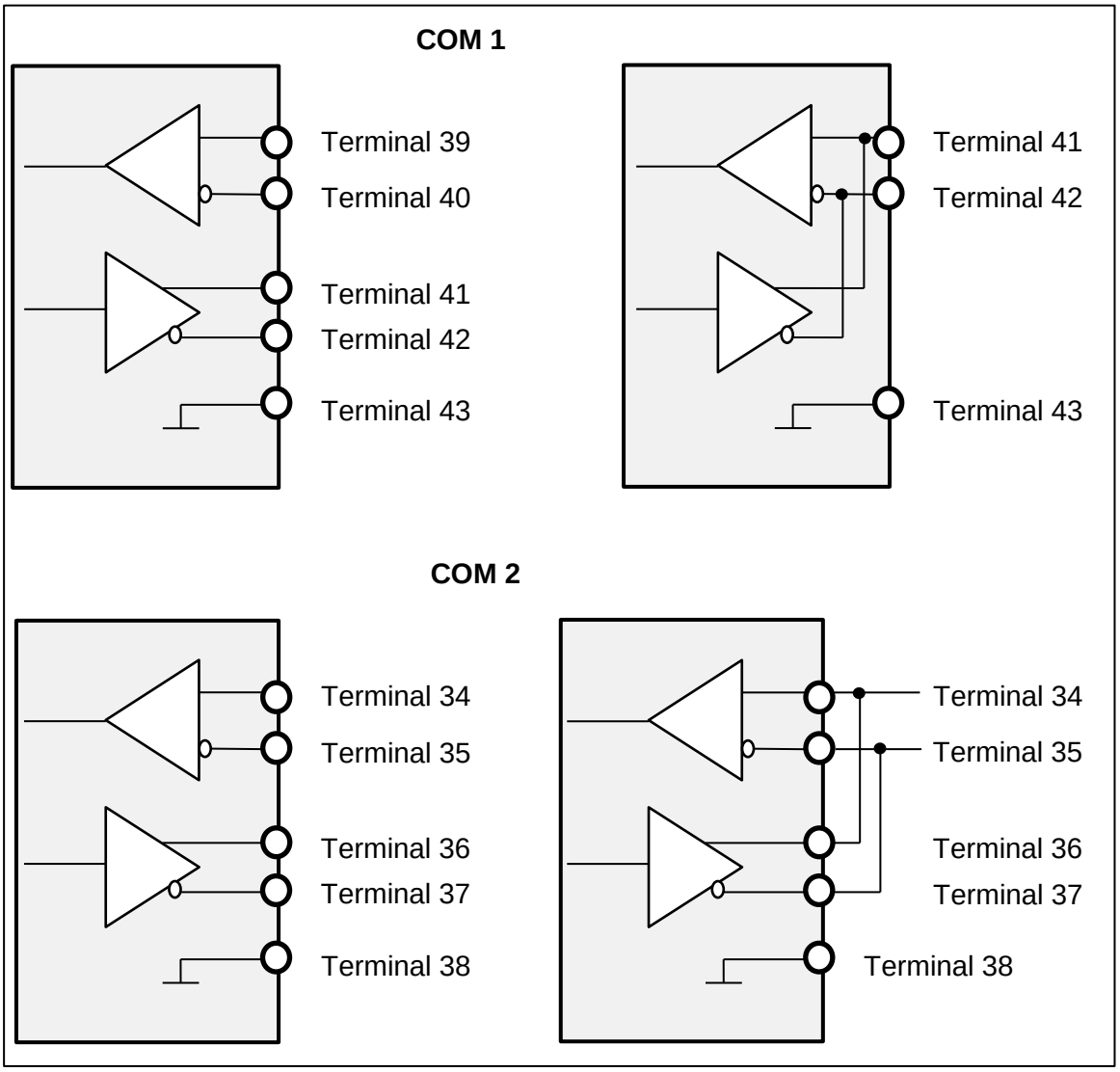


Figure 5: COM1 / COM2 (full/half-duplex)

Note

In the half-duplex operation of the interface COM2, 2 jumpers must be provided externally (34-36, 35-37).

The interface COM1 is galvanically separated from the data logger voltage supply.

3.3.6 Measuring transducer supply

The datalogger possesses various outputs for the supplying of connected measuring transducers that are controlled dependently on the configuration.

Terminal	Signal
7	12V
8	GND
15	3.3V or 5V or 12V
18	GND
19	3,3V or 5V or 12V
22	GND
23	3,3V or 5V or 12V
26	GND
32	12V
33	GND

Table 3: Measuring transducer supply

Note:

The configurable supply voltages are electronically protected against overloading (short circuit) and overtemperature.

4 Operation

When the accumulator is connected, the data logger automatically starts the so-called bootloader (for the loading of new firmware) and re-initialises itself. The boot loader waits 10 seconds and then starts the current firmware automatically. After the first switching on, the time and date on the display should be checked.

```
Bootloader  V02.02
Wait time:  10s
```

The colour graphic display (320 x 240 pixel, 24Bit RGB) possesses a resistive touch surface via which the entire operation of the datalogger is performed.

All actions are carried out via touch events (pressing) on the symbols shows in the display. The following table shows the available symbols (keys).

Symbol (Button)	Meaning
	Shut down / reset of the datalogger
	Page back
	Page forward
	Activating selection/editing mode
	Push cursor position left
	Shift cursor position to the right
	Increment value at cursor position
	Decrement value at cursor position
	End selecting/editing mode
Ok	End editing mode
	End selection/editing mode without saving

Table 4: Symbols (keys) in the display

4.1 Display options

The datalogger shows all measured values and parameters in accordance with the configuration on different pages (dialogue pages). In the 1st line, every dialogue page shows the current page number and the total number of pages.

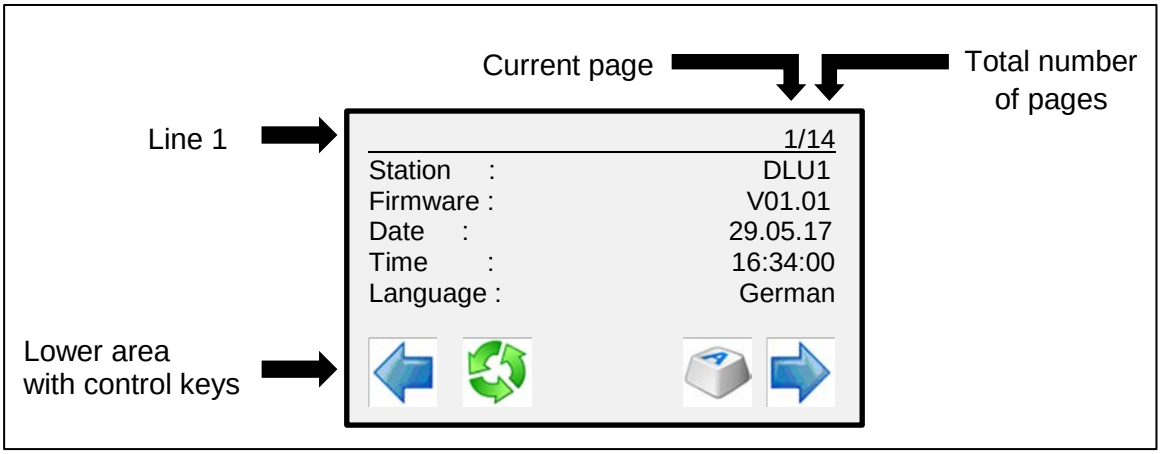


Figure 6: Dialogue page 1

The keys for flicking forwards and backwards are located in the lower part of each dialogue page. Additional control keys are displayed dependent on the dialogue page and/or configuration.

The meanings of the keys are shown in **Table 4**.

4.2 Adjusting parameters

All dialogue pages that show the button

contain changeable parameters. If the valid password has already been set, pressing the key leads to a change in the “selection mode”, otherwise the password dialogue is displayed.

4.2.1 Password dialogue

Before the “selection mode” can be activated, the corresponding password must be set. The following figure shows the password dialogue.

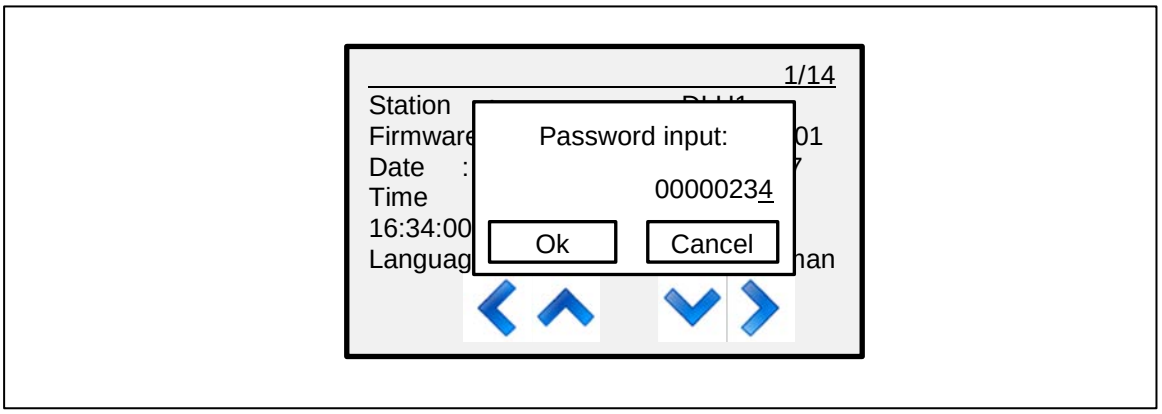


Figure 7: Password dialogue

The password is input with the 4 keys below the input field (“<”, “^”, “v”, “>”) and must be confirmed by pressing the “Ok” button.

4.2.2 Selection mode

The following figure shows the selection mode for the 1st dialogue page.

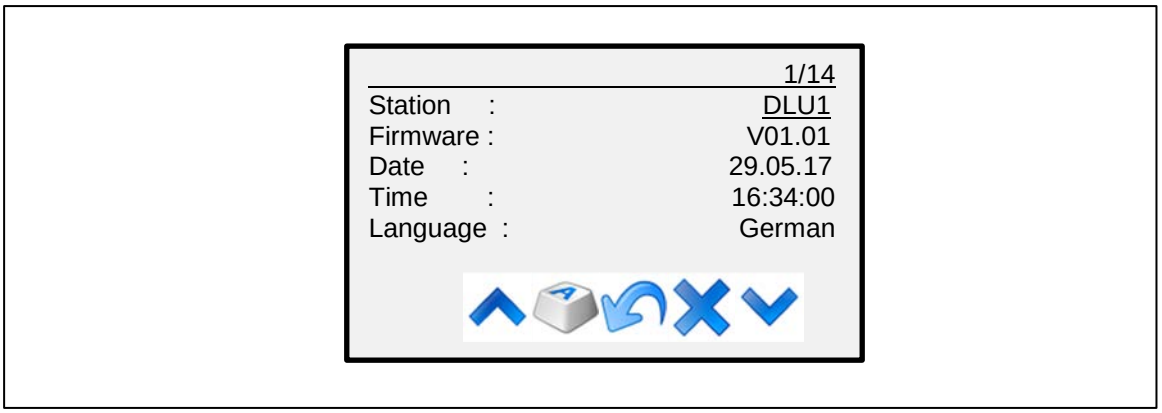


Figure 8: Selection mode

In the selection mode, one can move between the editable entries by pressing the keys

Pressing one of the keys

takes one out of the selection/editing mode. If the changes carried out are not saved, then the key “X” must be pressed.

Renewed pressing of the key “A” causes a switch into the editing mode for the selected entry.

4.2.3 Editing mode

The following figure shows the editing mode for the entry “Station” on the 1st dialogue page.

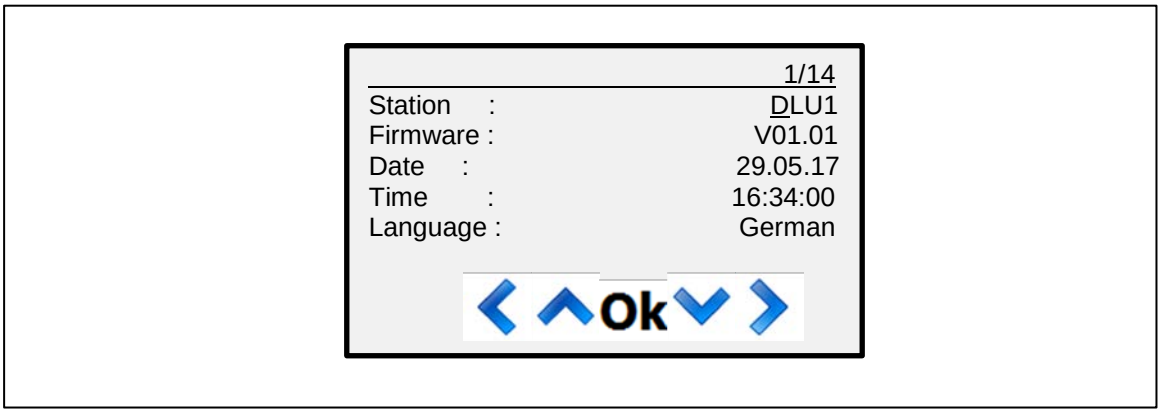


Figure 9: Editing mode

In the editing mode, the content for the current cursor position can be changed by pressing the keys

for numerical values, this increments / decrements the selected position and for texts it moves forwards / backwards through a list with the available ASCII characters.

The cursor can be pushed to the left and/or right by pressing the keys

To leave the editing mode and change to the selection mode press the key “OK”.

4.3 Switch off datalogger

If the datalogger comprises the option with network interface, it is not permitted to switch off the supply abruptly. In this case, the datalogger must be shut down by the **Command RS** or pressing the key “Reset” on the 1st dialogue page.

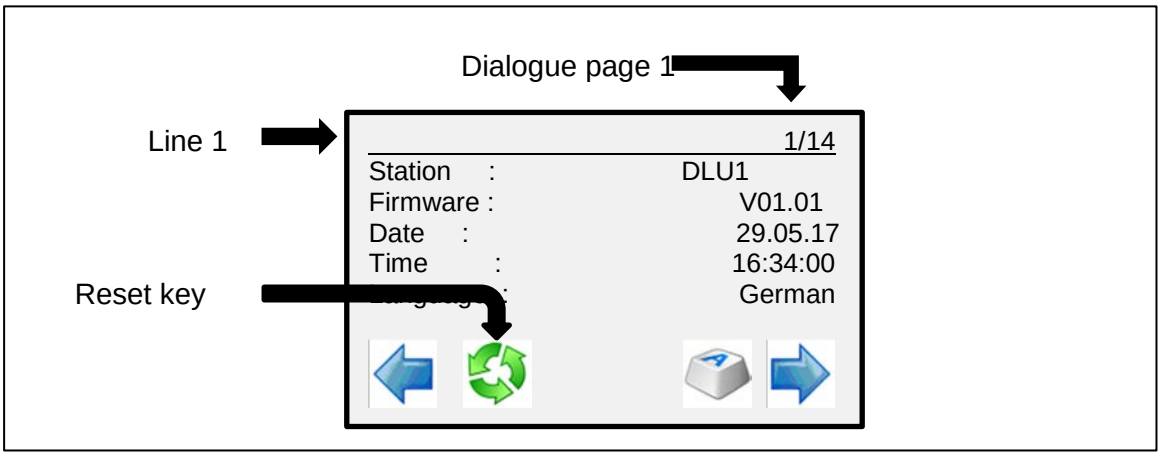


Figure 10: Reset key

After pressing the key “Reset”, the LINUX system in the datalogger is shut down. This is displayed with the information box “Shutdown DLU”.

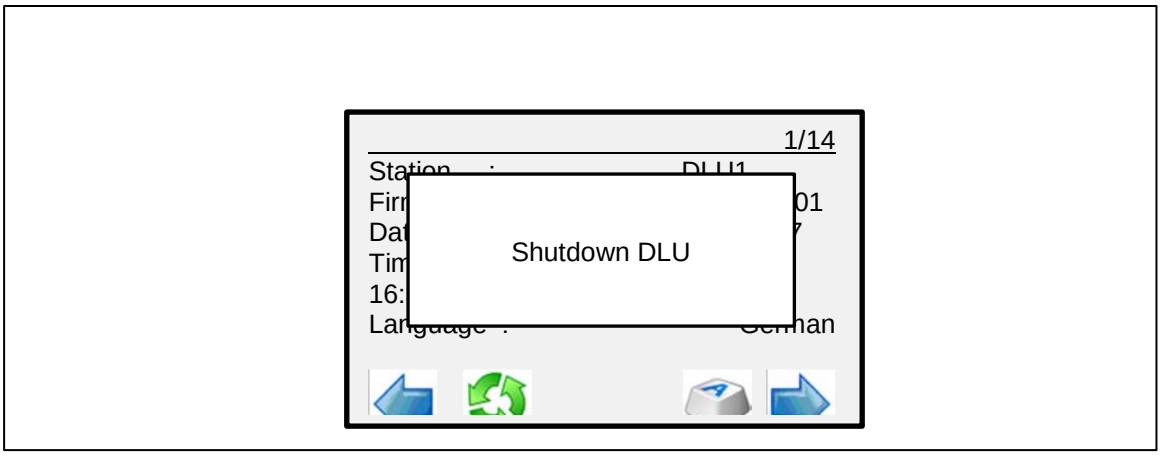


Figure 11: Information box "Shutdown DLU"

The shutting down lasts approx. 15s, then a dialogue appears with the possibility of carrying out a restart of the datalogger. In this state, the datalogger can be separated from the supply.

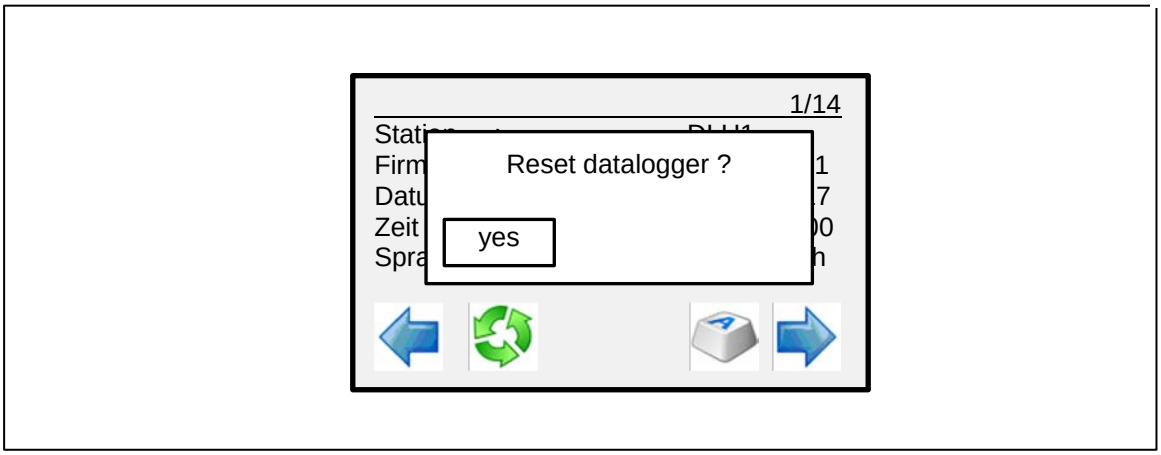


Figure 12: Dialogue “Reset yes”

Pressing the key “yes” carries out a restart of the datalogger.

Attention:

Switching off the supply without shutting down the data logger can lead to damage and failure of the network interface!

4.4 Network Module (optional)

The Datalogger DLU is optionally fitted with an Ethernet connection. Via this network access, the Datalogger DLU can be configured and data collected. Several users can access the Datalogger DLU at the same time, via Telnet (Teletype Network), SFTP (Secure File Transfer Protocol), or WEB.

Attention

The network module cannot be retrofitted!

4.4.1 Set up network access

In order to be able to use the interface, the logger must first be connected to the Ethernet via a LAN cable.

4.4.1.1 Establishing the Contact with DHCP-Server

Upon delivery, “DHCP” is active in the Datalogger DLU, i.e. the superordinate server assigns its network settings (IP address, IP mask, gateway) to the Datalogger DLU.

Most of the networks are set-up that way, that the IP-address is assigned automatically. For more information please contact your network administrator.

Before starting the DLU must be connected to the local network, and the local network must support the service of „DHCP“.

After starting the DLU, please use the arrow key on the DLU display until the dialogue with the IP-settings is displayed.

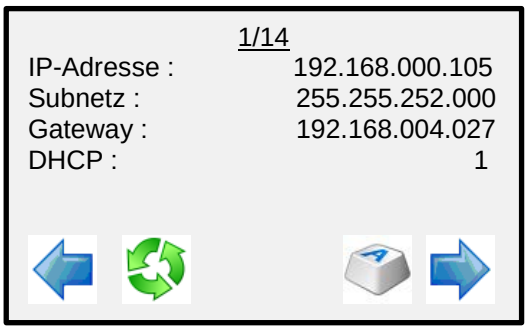


Figure 13: Dialogue of the IP-settings

Approx. 3 minutes after the start, the system adjusts the IP-address to the value, which was received from the DHCP server. Afterwards, the DLU can be contacted via a WEB browser by entry of the IP-address. After the datalogger is embedded in the network, please change the IP-address into a standard address by means of a WEB browser. You will receive a standard IP-address from your network administrator. This is necessary so that the datalogger is accessible always at the same IP-address. In order to define the IP-address please select the settings in a WEB browser. The pre-set user is „admin“, the password „1111“. Via the key „IP-settings“ you will reach the range of settings for the network. Here, you should set the standard IP-address, and switch off the DHCP.

4.4.1.2 Establishing the Contact without DHCP-server

When the DHSP service is no more active in your network, the network parameters must be set manually. For this, the parameters might be set in the display or serially via USB.

Setting in the Display:

Select the dialogue for setting the IP-settings by the arrow key.

And press the key in the display. Enter the password „000234“. Afterwards, the DHCP must be switched off. For this, please reset the entry DHCP to „0“. After this, all other network parameters can be changed. For correct IP-settings please contact your network administrator.

4.4.1.3 Setting via serial Interface

Connect the DLU to a PC via a USB cable. The PC installs automatically a new serial COM interface. Please start a terminal program, for ex. TeraTerm, and select the re-installed interface. The communication parameters are 115200 baud, 8 data bits, 1 stop bit. In the settings please activate the „local echo“ so that you can see your entry on the display.

The settings of the ethernet interface can be changed via the commands 00IP_DHCP, 00IP_ADDR, 00IP_SNM, 00IP_GW.

For example:

00KY00234

00IP_DHCP0

00IP_ADDR192.168.002.123

00IP_SNM255.255.255.000

00IP_GW192.168.002.001

Remark:

The IP settings can be changed only when the DHCP service is switched off.

The IP address and IP mask must in every case be correctly set for the net used. The gateway must only be set if the Datalogger DLU is to be accessed from the internet (from externally) via a gateway (transition) into the local network (company).

You can ask your system administrator for the IP address, the IP mask and the gateway address. With other connections to the Ethernet e.g. via routers, you can define the settings based on the manual for the router and its settings.

The addresses must be set on the Datalogger DLU via the touch display or via one of the serial interfaces e.g. USB with remote maintenance commands. For details on setting, see the corresponding chapter in these operating instructions.

If a valid IP address setting already exists and this is to be altered, this can also be carried out via a Telnet connection (Port 8900) with the corresponding remote maintenance commands (Command IP_ADDR / Command IP_GW / Command IP_SNM)

Attention:

The Datalogger DLU uses only the IPv4 format for the IP address! This means every 4 figures between 0 and 255 are separated by a dot e.g. 192.168.7.74.

Attention:

After the IP adjustment, the Datalogger DLU must perform a system restart before the change becomes active!

4.4.2 Checking LAN connection

With the diagnosis tool “ping”, one can check whether the Datalogger DLU can be contacted in the network. If the data logger cannot be contacted in this test, the settings and connections must be checked. In SFTP and Telnet, there are additional possibilities of error when entering the address or, if applicable, in the port number.

4.4.2.1 Testing connection with the diagnosis tool “ping”

After the LAN connection has been set up, access to the Datalogger DLU with a PC can be tested. For this, a console window (terminal) must be opened. On the operating system Windows, this is carried out by starting the application “cmd.exe” (➔click on “Start” ➔ entering of “cmd.exe” in the editing field on the left next to the magnifying glass ➔ press Return/Enter key).

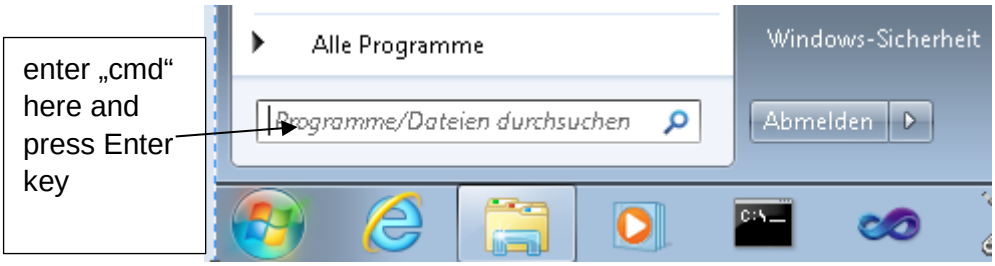


Figure 13 : Opening of the console window via the start menu

In the console window, enter the command “ping” followed by a space and the IP address of the Datalogger DLU. To carry out the command, press the enter button. If connection is successful, a message appears in the window; the message is similar to that in the following picture (top half):

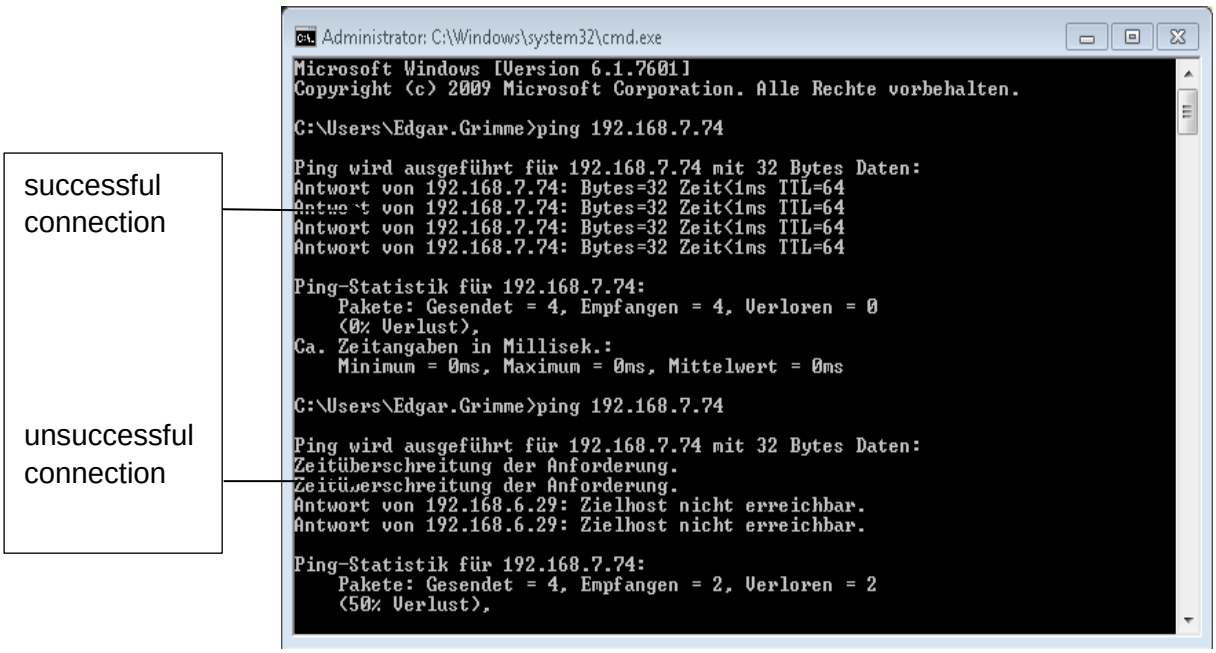


Figure 14:Window with successful connection (top) and without connection (bottom)

The window can be closed by entering “exit” and pressing the enter button.

4.4.2.2 SFTP connection

For this access, a programme that supports SFTP is necessary. The following example shows access with the programme WinSCP.

1. Starting of the programme WinSCP, entering of the DLU IP-address in the input field “computer name”, entering of the user name in the input field “user name” and entering of the password in the input field “password”.

!!! Following figures changed!!!

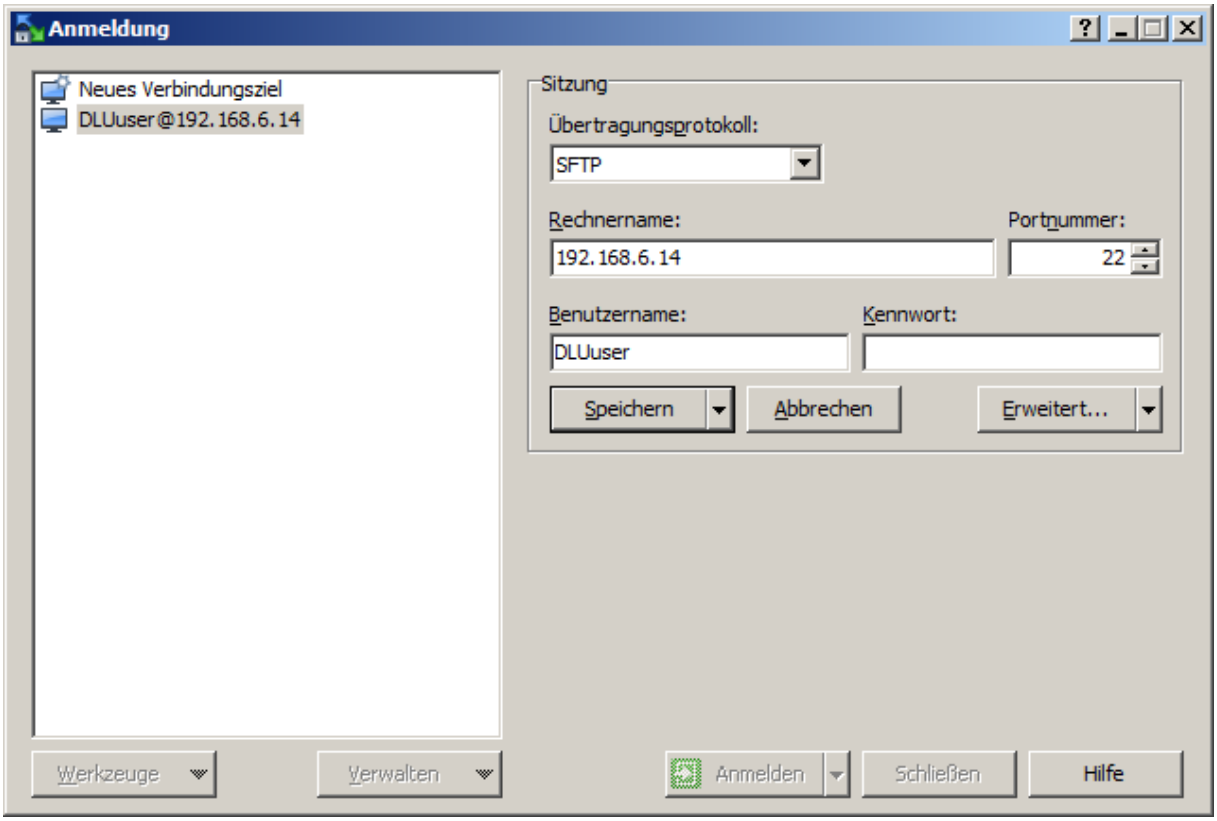


Figure 15: Settings for login (programme WinSCP)

Save the settings with the button “Save”.

2. Select the saved session in the login window (e.g. DLUuser@192.168.6.14) and click on the “login”.

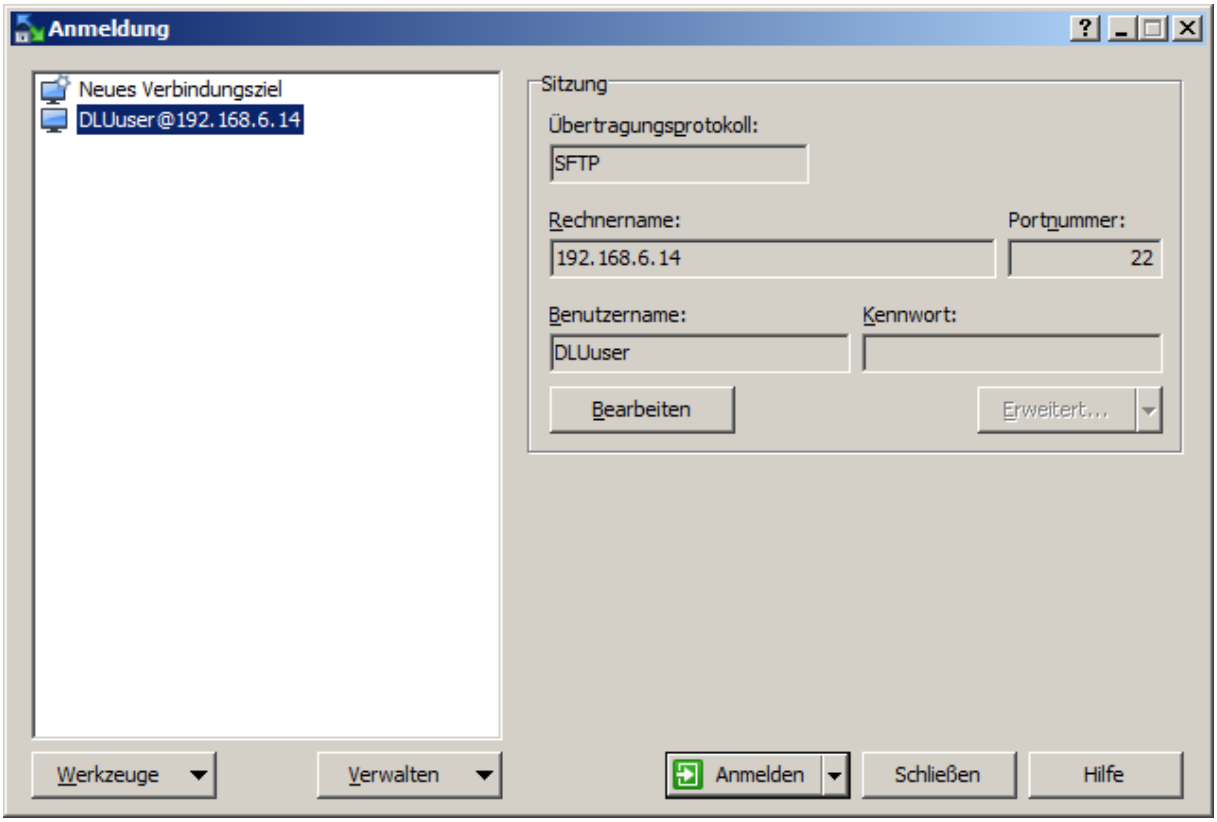


Figure 16: Login (programme WinSCP)

3. Enter the password and press button “Ok” (password for user “DLUuser” is “user4DLU”).

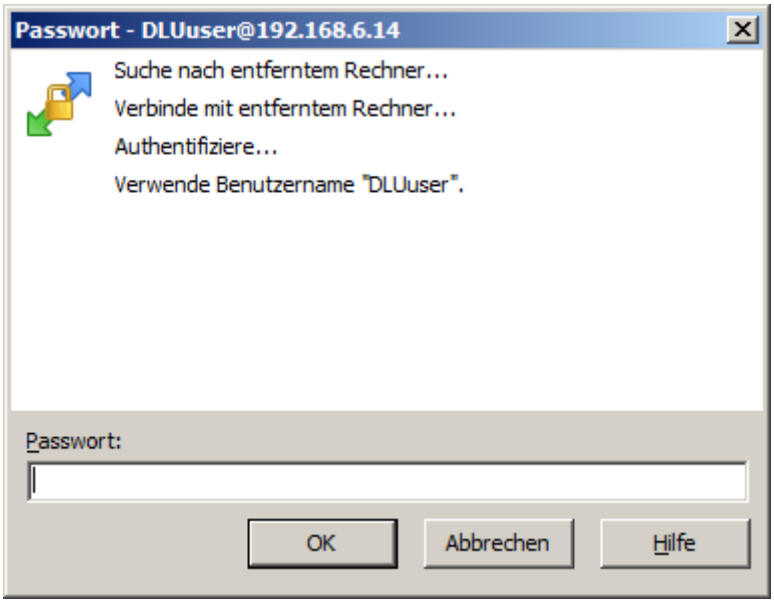


Figure 17: Password input (programme WinSCP)

If the password input window appears again, it can have the following causes:

- Incorrectly typed user name (case-sensitive).
- Incorrectly entered password (case-sensitive).
- Login not present.

4. If connection is successful, the content for the start folder (/home/DLUuser/) of the Datalogger DLU is displayed.

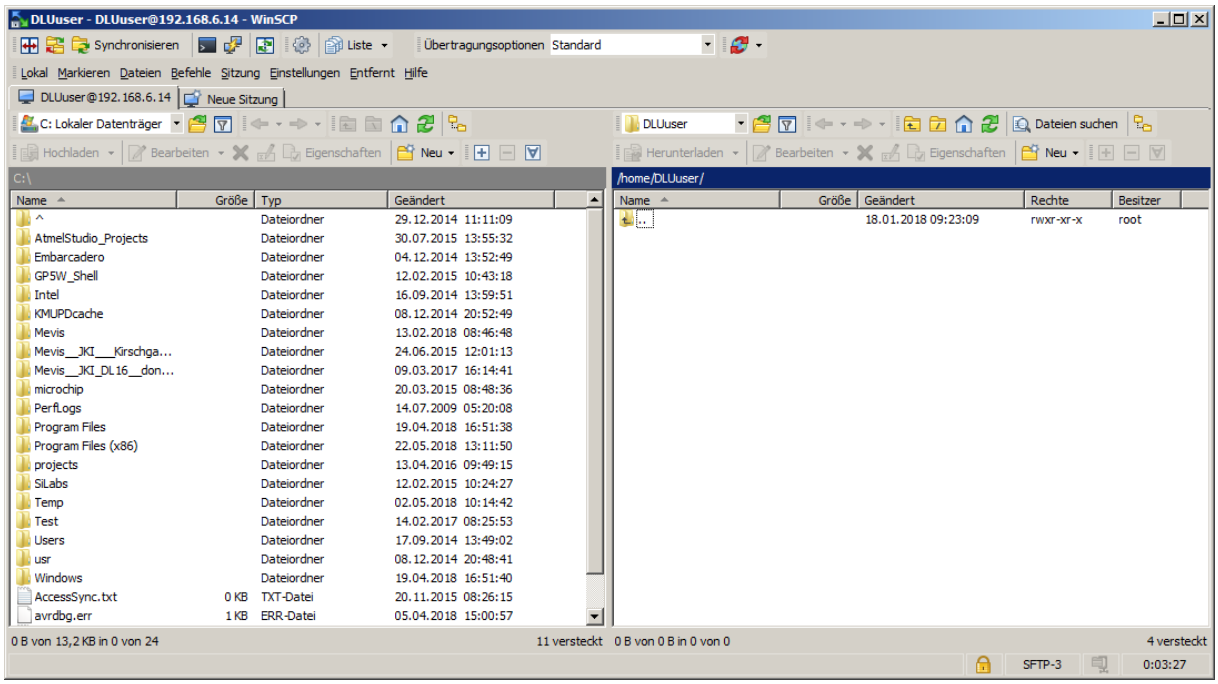


Figure 18 : Content start folder (programme WinSCP)

5. View of the saved measured values in the folder “log” (/var/opt/thies/DLU/log/).

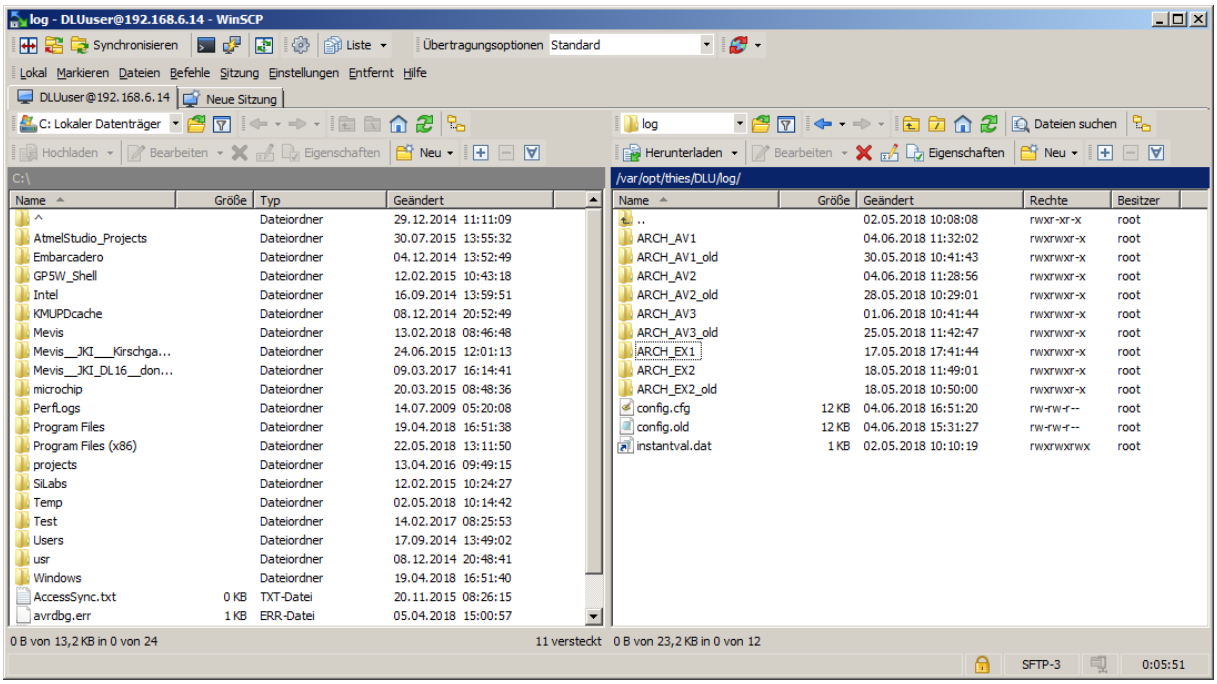


Figure 19 : Content of measured value folder “log” (programme WinSCP)

The content of the folder “log” can be copied (downloaded) to any desired destination. The contents of the files are readable and can be displayed with a text editor. The nomenclature of the file names and the contents of the files are described in **chapter 6.1**.

4.4.2.3 Telnet connection

A Telnet-capable programme is required for this access. In the following example, the terminal programme “Tera Term” is used.

1. Start the programme (Tera Term). The following start window appears:

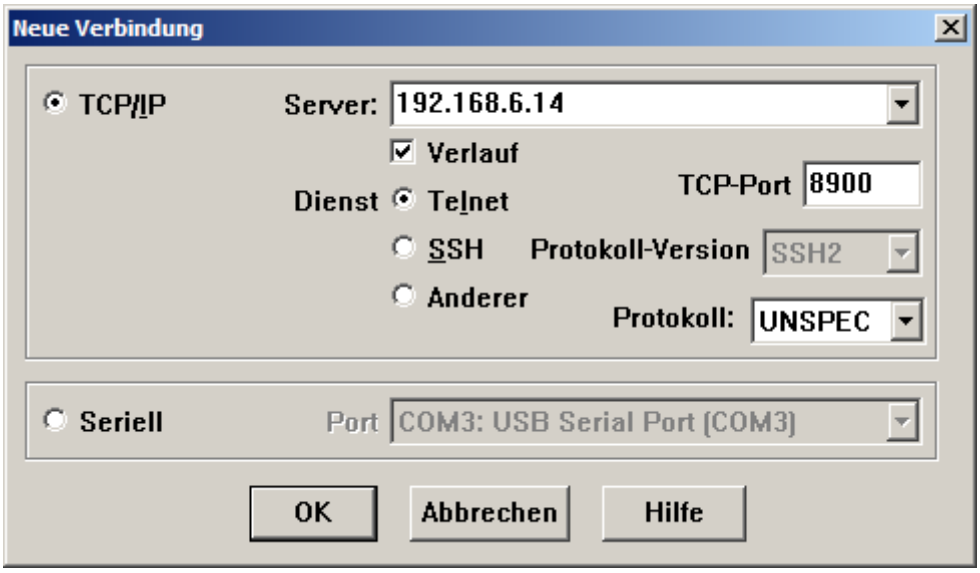


Figure 20: Settings for Telnet connection (Tera Term)

In the input mask, select the option “TCP/IP”, enter the IP address of the Datalogger DLU in the editing field “Server:”, selecting the option “Telnet” under “Service” and setting the “TCP-Port” 8900. The connection is produced by clicking the “OK” button.

2. If no connection can be produced, the error message “No connection with host” appears after a few seconds.
   If the connection is successfully established, an empty terminal window appears. The commands from **chapter 7.2** can be carried out in the window. The command “**99ID”** can be input for the requesting of the datalogger. The command is sent by pressing the button “Enter”. If the characters are not displayed in the input, the option “local echo” must be activated (➔settings/terminal settings).

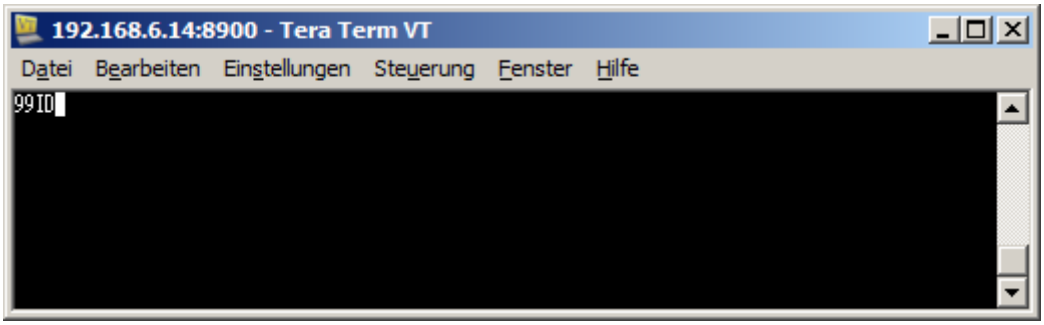


Figure 21: Example (request for the datalogger ID)

3. The following figure shows the possible response from the Datalogger DLU:

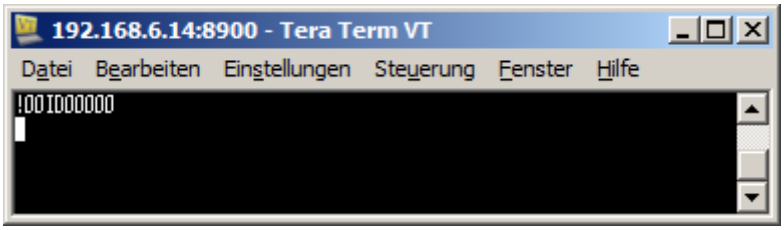


Figure 22: Example (response to the request of the Datalogger ID)

In the above example, the Datalogger DLU responds with the ID “0”.

4.4.3 Users

The Datalogger DLU possesses the following user settings upon delivery:

- Admin (user name: DLUadmin, password: admin4DLU).
- DLUuser (user name: DLUuser, password: user4DLU).

The user “Admin” can create new users, delete existing ones, reset passwords, read all data logger data and change the configuration of the data logger DLU.

The user “DLUuser” can read all data logger data and change the configuration of the Datalogger DLU.

Attention:

The administrator login password should be changed upon commissioning! The password must not be forgotten. Otherwise, no setting can be made via Ethernet. Then user settings can no longer be changed, not even via the display!

The creation of new users and the changing of existing user settings takes place exclusively via an SSH connection. The following figure shows the necessary settings for the programme “Tera Term”. The IP address of the Datalogger DLU must be entered in the input field “Server”.

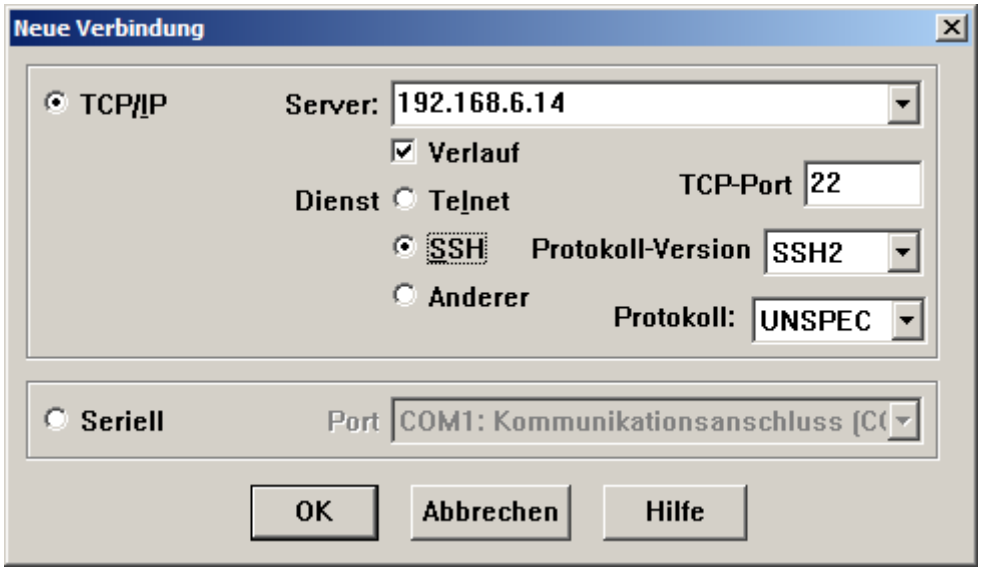


Figure 23: Settings for SSH connection (Tera Term)

After the button “OK” has been clicked, the login mask opens. The user must log in here as the administrator (user “DLUadmin”).

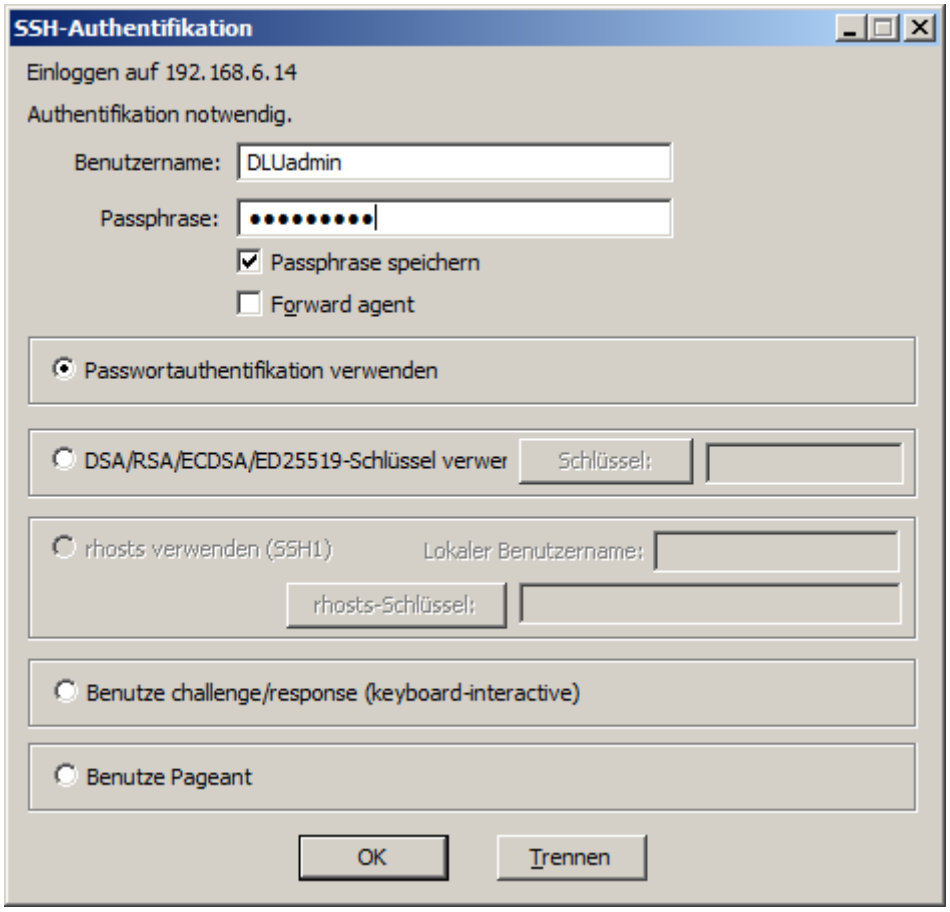


Figure 24: Password request for SSH connection (Tera Term)

If login is successful, a work window appears that is similar to the example shown below:

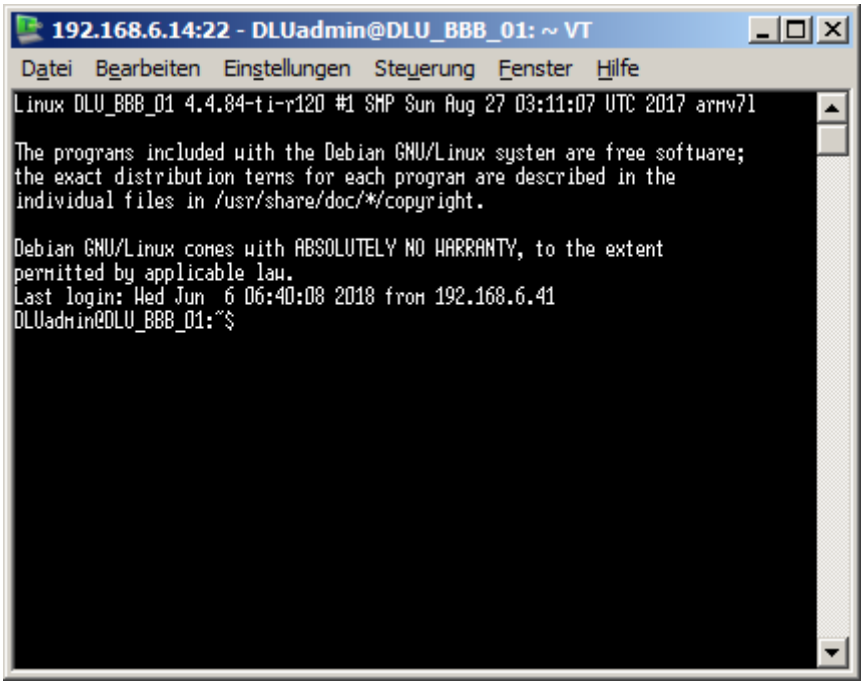


Figure 25: Successful SSH connection (Tera Term)

The administrator can now change user settings or create new users.

5 Measured value acquisition

All configured channels are read according to the configured measure interval (1s to 1 hour), and processed and saved in the configured calculation period. The saving is carried out internally, in a non-volatile, 64Mbyte ring memory. If the ring memory is full, then the measured values in the “oldest” sector of the memory are deleted.

Note

The measured values are not saved in maintenance mode.

The processing of the measured values in the calculation period is dependent on the configuration (e.g. averaging).

The data logger distinguishes between average and extreme values, and between different calculation periods. Average values are saved in archives with the designation “AVx” and extreme values in archives with the designation “EXy”. The placeholders “x” and “y” represent indexes that can accept values from 1 to 16. For each of these 16 average and 16 extreme value archives are possible. Average values with the same calculation period are in the same average value archive (this also applies to the extreme values).

Note

In the data output on SD card, average values are saved in directories with the name “ARCH_AVx” and extreme values in directories with the name “ARCH_EXy”. The placeholders “x” and “y” can accept values from 1 to 16.

The allocation of channels to an average or extreme value archive can be retrieved with the **Command DF_INI**. The archive name (e.g. “**Command** AV1” or “EX1”) is stated as a parameter for the command. If the stated archive exists, the design is issued in the form of an INI file. The sequence of the sections also defines the sequence in the data output. The request for the 1st average value archive (“AV1”) is shown below as an example.

00DF_INI AV1

[1]
Name=PT100
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=0
TypeID=3
UnitID=3
ExtremID=0
PairRef=1
AvType=0
[2]
Name=analogue IN 1
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=1
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[3]
Name=analogue IN 2
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=2
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[4]
Name=analogue IN 3
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=3
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[5]
Name=rel. humidity
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=4
TypeID=4
UnitID=4
ExtremID=0
PairRef=1
AvType=0
[6]
Name=precipitation1
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=5
TypeID=11
UnitID=9
ExtremID=0
PairRef=1
AvType=0
[7]
Name=precipitation2
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=6
TypeID=11
UnitID=9
ExtremID=0
PairRef=1
AvType=0
[8]
Name=int. temperature
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=7
TypeID=3
UnitID=3
ExtremID=0
PairRef=1
AvType=0
[9]
Name=battery voltage
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=8
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[10]
Name=battery current
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=9
TypeID=15
UnitID=19
ExtremID=0
PairRef=1
AvType=0
[11]
Name=sync. serial1
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=10
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[12]
Name=sync. serial2
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=11
TypeID=14
UnitID=17
ExtremID=0
PairRef=1
AvType=0
[13]
Name=seconds
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=12
TypeID=12
UnitID=13
ExtremID=0
PairRef=1
AvType=0
[14]
Name=milliseconds
ClassID=24
ObjectID=0
Offset=0
Size=0
LinkID=13
TypeID=12
UnitID=13
ExtremID=0
PairRef=1
AvType=0

6 Data output

Basically, there are 5 possibilities on the datalogger for outputting (exporting) the data:

- Serial interface COM1 (dependent on the configuration).
- Serial interface COM2 (dependent on der configuration).
- Network interface (optional).
- Serial interface USB (Slave) .
- SD card (memory card Secure Digital).

Data output via the interfaces COM1, COM2 and USB is carried out by the **Command DS**.

A so-called terminal programme can be used for serial communication. The communication settings of the terminal programme (connection to a serial interface or USB) and datalogger (COM1, COM2, USB) must agree.

Data output via the SD card takes place via a touch event on the display.

All output data are issued in the ASCII format (plain text). Thanks to this, you are in a position to look at, process and print your datasets, including with text processing programmes. You are therefore also in a position to further process your files via the ASCII interface with standard software such as e.g. spreadsheets, databanks etc..

6.1 Data output via network (only logger with Ethernet module)

If the datalogger is in a network and the Ethernet settings are correct, data can be collected from the Datalogger DLU via the network. Configuration is described in chapter 4.4.1.

There are the following possibilities for collecting data from the logger via Ethernet:

1. Telnet (Teletype Network)
2. SFTP (Secure File Transfer Protocol)

1. Telnet is a character-oriented protocol via TCP (Transmission Control Protocol) with which all commands from **chapter 7.2 Command** can be used. The commands are to be configured both for collecting data and for the datalogger. Depending on the login, some commands cannot be used. The command “DS” via the Ethernet access is not permitted. Access requires the port 8900 as described in **chapter 4.4.2.3**.
2. SFTP is a file-oriented format which is supported e.g. by the programme “WinSCP” (see **chapter 4.4.2.2**).

SFTP access lends itself to the collection of the saved measured values. If one opens an SFTP connection and has logged in successfully, one sees the main directory for the DLU data.

Figure 26 : Start directory

At least 3 folders exist, there is a “Log” folder for DLU log files, a folder for the DLU configuration file, and at least one folder for measured values. There can be up to a maximum of 16 average value archives (folders) and 16 extreme value archives. For each average value and extreme value folder there can also be a folder with the ending “_old”. The archives identified with “old” are created if the data structure of the archive changes. Then the old measured values remain in the archives with old and in the archives “ARCH_AVx” and/or “ARCH_EXx” are the new measured values with new measured value structure. An archive structure always changes when a measured value is added, deleted or renamed. Addition and deletion takes place e.g. when the measurement cycle for a measured value changes.

If the memory is full, the archives with the ending _old are deleted first. If these do not exist, the oldest files are deleted in each directory in order to create space for new data.

6.1.1 The log directory

The archive “log” appears as follows in Windows Explorer:

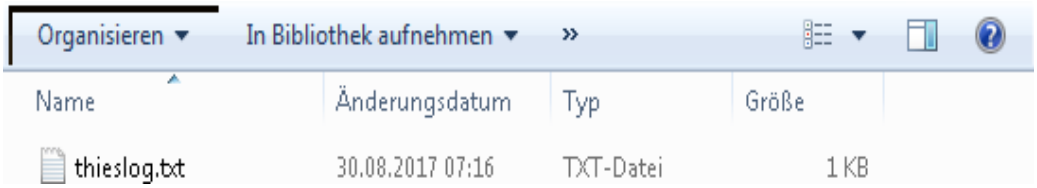


Figure 27 : Log directory

The file can be downloaded with the Windows Explorer or another FTP programme of the data logger DLU and e.g. saved on a PC. The file can then be opened with a text editor e.g. Notepad. If the file becomes larger than 8KB, the file is renamed thieslog.old and a new one is created. If a file with the ending old already exists, this is overwritten when a new file is created.

The content can look as follows:

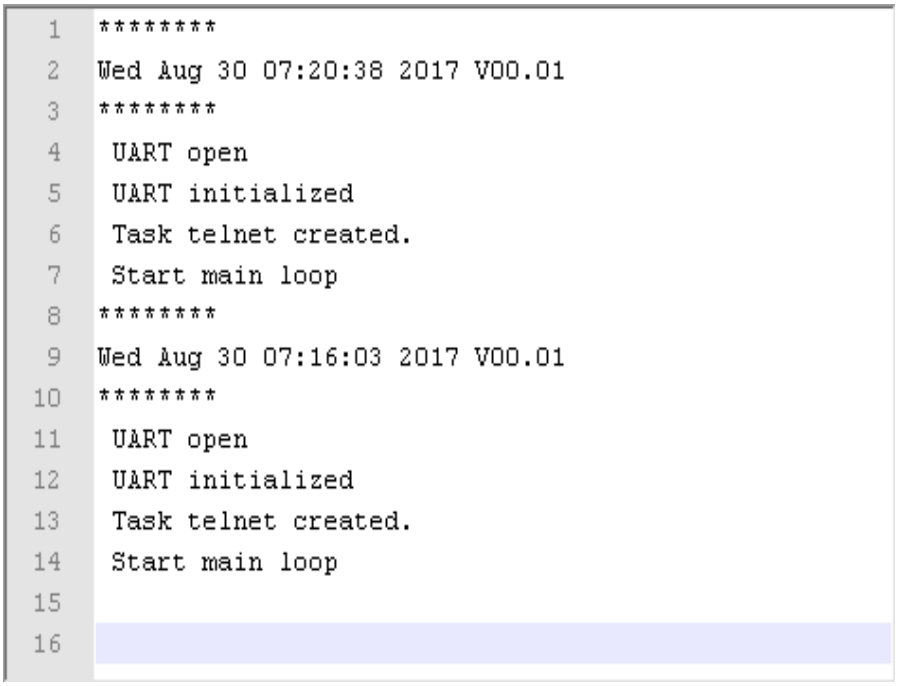


Figure 28 : Extract from a log file

6.1.2 The configuration directory

The logger configuration is filed in the folder “config”. When the configuration is changed, the previous configuration file is renamed as config.old and the new one is saved in the folder. An existing config.old is overwritten by the new one. The files can be downloaded, edited and deleted like the log files.

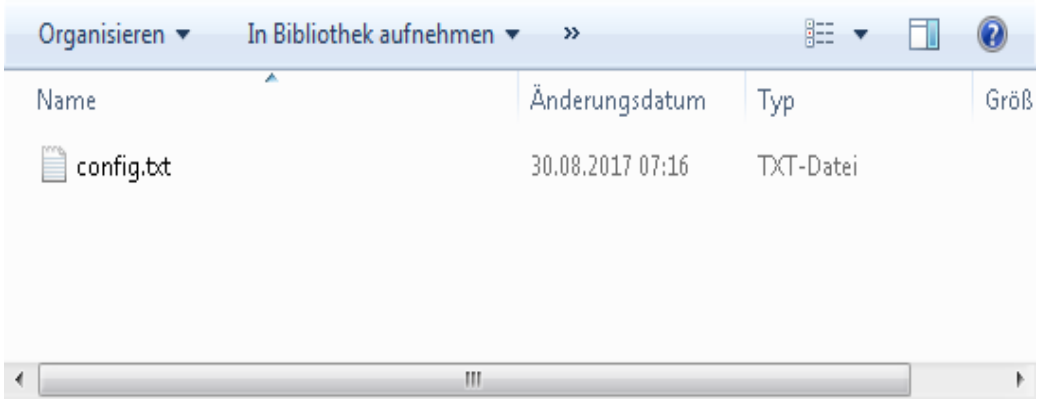


Figure 29 : Configuration directory

The following is an excerpt from a configuration file. The excerpt shows the IP address 192.168.7.74 as it is set upon delivery.

```
906  USB_FRM=8N1
907  COM1_BR=96
908  COM1_FRM=8N1
909  COM2_BR=96
910  COM2_FRM=8N1
911  IP-A=3232237386
912  IP-SNM=4294966272
913  IP-GW=3232236545
914  PwrSave=0
915  Linux=1
916  StName=
917  DispOff=0
918  TS1B=0
919  TS1E=0
920  TS1O=0
921  TS2B=0
```

Figure 30 : Extract from a configuration file

6.1.3 The measured value directories

With the Datalogger DLU there is always at least one archive ARCH_AV1, in which average values are deposited in day files. The name of a day file is formed from the day's date, starting with the year, e.g. 20170831 for 31 August 2017, and the ending ".txt". In addition, there exists in the archive a configuration file DESCFILE.INI, which describes the data. All measured values in an archive possess the same memory timing. Measured values with different memory/measurement intervals use different archives. Average values are filed in archives with the name ARCH_AVx, in which x can be a number from 1 to a maximum of 16.

Extreme values are filed in archives with the name ARCH_EXy, in which y can be a figure from 1 to a maximum of 16. It may be that there is no extreme value archive if no extreme values are to be saved.

If the configuration changes in an archive, the current directory is renamed. The ending "_old" is added to it (e.g. ARCH_AV1_old), as a result of which the old data is retained until there is no longer enough memory space available for the new data. Only then are the archives deleted.

All data and directories can be deleted at any time, dependent on the user rights.

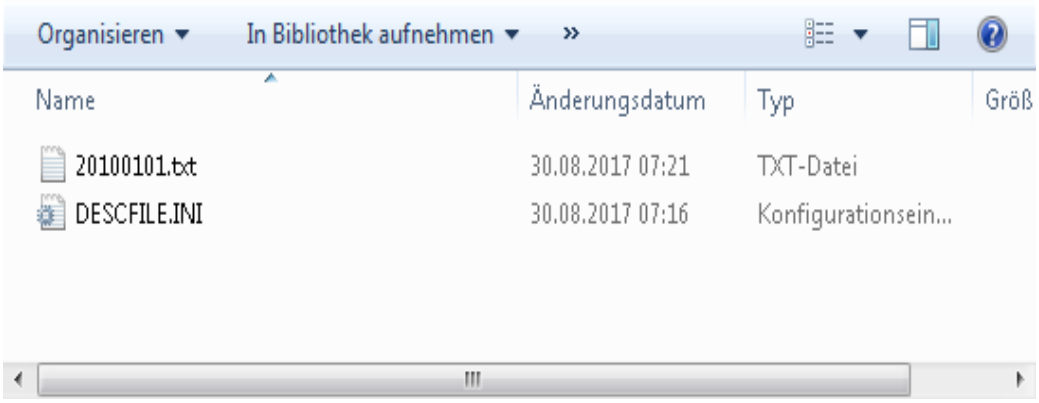


Figure 31 : Example of a measurement data archive

The above picture shows the content of an archive with the configuration file and only one day file. Each archive possesses files with the same name. For continuous, i.e. uninterrupted, operation of the Datalogger DLU, the names of the day files are consecutive. In this, all the day files of an archive are the same size. If files possess different sizes measured values must be missing in the smaller files. Possible causes can be power failures or operation in maintenance mode.

The following picture shows an excerpt of the content of a day file:

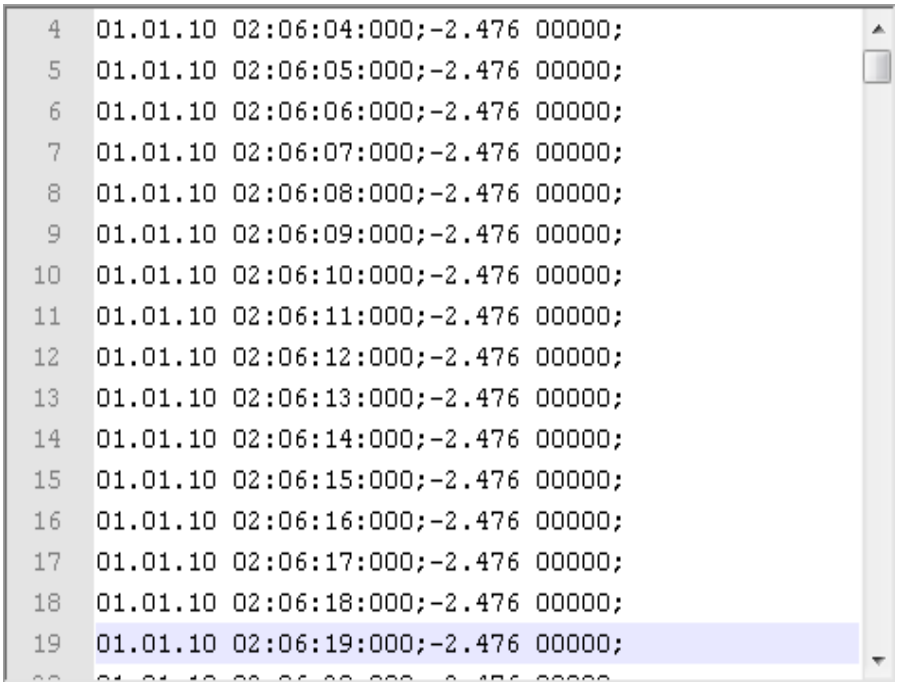


Figure 32 : Excerpt from a day file (archive with a measured value)

Every day file contains the measured values in the form of data lines. Every data line begins with the time stamp, which consists of the date followed by a space and the time. The time stamp is followed by the measured values, separated by “;”. A measured value consists of the value (e.g. -2.476) and its status (e.g. “00000”). The space character is used to separate value and status. A flawless measured value is represented by the status “0”.

```
1  [1]
2  Name=PT100
3  ClassID=0
4  ObjectID=0
5  Offset=0
6  Size=0
7  LinkID=0
8  TypeID=3
9  UnitID=3
10 ExtremID=0
11 PairRef=0
12 AvType=0
13 [2]
14 Name=Analog IN 1
15 ClassID=0
16 ObjectID=0
```

Figure 33 : Excerpt from a DESCFILE.INI file

The configuration file DESCFILE.INI (INI-Format) is used by the PC programme Mevis for the interpreting of measured values in the day files. On the basis of this data, the user can ascertain the sequence of the measured values in the day file.

The section names correspond to consecutive numbers from 1 to a maximum of 100 (e.g. [1]) and identify the position of the measured value (including status) in the data line (after the time stamp). Each section contains keys and values that describe the measured value in question (e.g. name=PT100).

6.2 Data output via SD card

If there is an SD card in the datalogger, the corresponding dialogue page is shown in the display.

Note

The dialogue page “SD card” is always the last page.

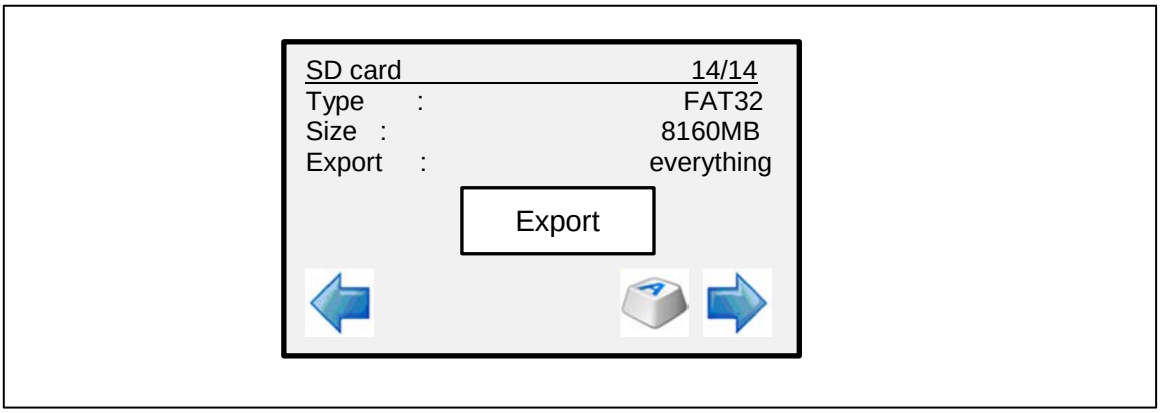


Figure 34: **Dialogue page “SD card”**

Information from the inserted SD card is shown in the top part of the dialogue page, as well as an editable entry on the setting of the data to be exported. The data output is caused by a touch event on the key “Export”.

The data files are saved on the SD card in the following directory:

D:\aaa\bbbbbbbbbb\ccccccccccccccccccccccccccccccccccc

D

Root directory of the SD card (e.g. “E”)

aaa

Directory „DLU“

bbbbbbbbbb

Directory according to the station name (e.g. “DLU_____”)

ccccccccccccccccccccccccccccccccccc

Directory according to the HW-ID of the data logger (e.g. “HW_ID_

533331003846344D3330313034363038”)

The following table shows the exported files:

Subfolder	File name	Content
-	config.txt	Configuration (INI file).
-	config_ChList.bid	Channel configuration (binary format).
-	config_DevList.bid	Devices configuration (binary format).
-	logfile.txt	Log file in the ASCII format.
ARCH_AVx	YYYYMMDD.txt YYYY year MM month DD day	Day file for the average value archive “x”, with the measured values in the ASCII format.
ARCH_EXy	YYYYMMDD.txt YYYY year MM month DD day	Day file for the extreme value archive “y”, with the measured values in the ASCII format.

Table 5: Files on SD card

One can export from any dataloggers on an SD card by saving the data in a directory, depending on the clear datalogger hardware ID.

If the data of a datalogger are exported again onto the same SD card, existing data on the SD card is overwritten. This is only a problem if the configuration of the datalogger has changed between the export processes.

Comments:

The user is responsible for using a SD card with enough free storage.

The write-protection switch of the SD card is not used by the datalogger.

We urgently recommend that the data be backed up on other media.

Do not remove the card during writing.

Liability on our part for the loss of the data on the SD card is ruled out.

*Only recommended SD cards are to be used (see also **chapter 6.2.1**).*

6.2.1 Recommendations SD-CARD

Notes on SD card:

Not all cards available on the market can be tested for compatibility with the data logger. Problems can therefore arise in rare exceptional cases.

The SD cards must be formatted with the standard "FAT16"-, "FAT32"- or "ExFAT" format (delivery state of SD cards).

6.3 Data output via COM1, COM2 and USB

Data is output via the interfaces COM1, COM2 and USB using the **Command DS,** individually for each average and/or extreme value archive.

The following table shows the possible parameters of the command.

Parameter	Example	Meaning
1	AV1	Stating of the archive with 3 and/or 4 places ("AV1" to "AV16" or "EX1" to "EX16")
2[1]	170529101000	Start point of the form YYMMDDHHNNSS (YY: year, MM: month, DD: day, HH: hours, NN: minutes, SS: seconds)
3[1]	170530101000	End point of the form YYMMDDHHNNSS (YY: year, MM: month, DD: day, HH: hour, NN: Minute, SS: seconds)

Table 6: Data output with command DS

1): The parameters start and end point are optional.

The archived measured values are output in lines, in so-called data rows. The data output is concluded by the end line.

Note:

Only data lines are written in the output via SD card (writing of the day file). The end line is only output with the command DS.

Note on the USB slave interface

For communication via USB it is necessary to have an installed VCP driver (Virtual COM Port) on the PC used. VCP drivers ensure that a USB device is available as an additional COM port on the PC. The user software can then treat the USB device like a standard COM port. The parameters (baud rate, data bits and parity) must correspond to the setting of the USB slave interface of the datalogger.

The driver is available from FTDI (FT245R): http://www.ftdichip.com/

In addition, installation guides in English for different operating systems can be downloaded there.

6.4 Data line

The data is output in a line with a fixed telegram length. Each line starts with the time stamp, followed by the measured values including status word. The separator between measured value and status word is the semicolon, separator between the measured values and the time stamp is the semicolon. The status word represents a 16-bit integer value without a sign and is always output with 5 places. All data lines are concluded by “CR LF”. A dot is used as a decimal separator. Incorrect values are identified by a status word unequal 0. The end of the data output is identified with an end line with the command DS.

Note:

The time stamp of a data line refers to the end of the measurement.

The status word is bit coded, i.e. every single bit represents a particular status and/or error. The following table shows the meaning of the individual bits.

Bit number	Function	Description
Bit 0		
Bit 1	ADC error	An error has occurred in the AD implementation.
Bit 2	ADC timeout	The AD implementation has not been concluded in the predefined time.
Bit 3	Wire break	A cable break has been detected.
Bit 4	MAX	The channel value has exceeded the configured maximum value.
Bit 5	MIN	The channel value has fallen short of the configured minimal value.
Bit 6	Checksum	The checking of the checksum yielded an error.
Bit 7	Framing	The checking of the data frame yielded an error.
Bit 8	AV buffer low	The number of valid measured values in the average value buffer is too low.
Bit 9	Linked channel index	The channel index for a connected channel is incorrect.
Bit 10	Invalid character	An invalid character was detected.
Bit 11	String too long	The received/decoded string is too long.
Bit 12	Maths error	The calculation being used as the basis caused a mathematical error (e.g. an attempted division by 0)
Bit 13	MODBUS	A MODBUS exception has been received.

Bit number	Function	Description
Bit 14	Archiving off	The channel is not archived.
Bit 15	Channel off	The channel is switched off.

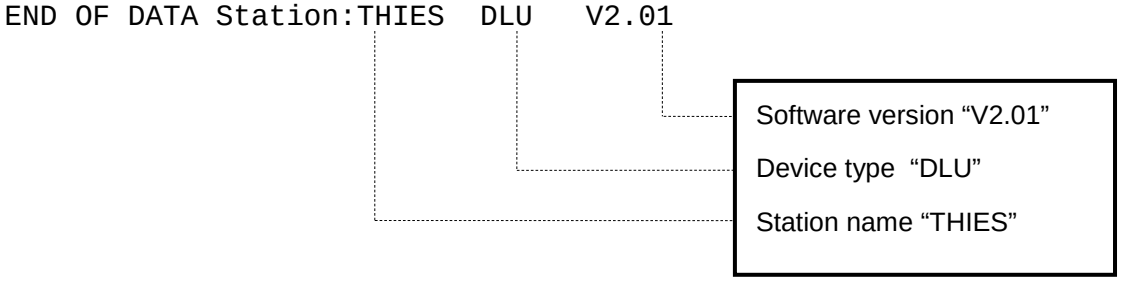
Table 7 : Status word

The following example shows the request with the command DS and the response lines from the datalogger.

```
00DS AV2 180605112500 180605112600
05.06.18 11:25:00.000;  2.0;00000;
05.06.18 11:25:05.000;  2.0;00000;
05.06.18 11:25:10.000;  2.0;00000;
05.06.18 11:25:15.000;  2.0;00000;
05.06.18 11:25:20.000;  2.0;00000;
05.06.18 11:25:25.000;  2.0;00000;
05.06.18 11:25:30.000;  2.0;00000;
05.06.18 11:25:35.000;  2.0;00000;
05.06.18 11:25:40.000;  2.0;00000;
05.06.18 11:25:45.000;  2.0;00000;
05.06.18 11:25:50.000;  2.0;00000;
05.06.18 11:25:55.000;  2.0;00000;
05.06.18 11:26:00.000;  2.0;00000;
END OF DATA Station:TK         DLU v02.01
```

6.5 End line

The end line is only output when the command DS is used.



7 Communication

Communication with the Datalogger DLU can take place via the following interfaces:

- USB
- COM1 (dependent on the configuration)
- COM2 (dependent on the configuration)
- Ethernet (optional)

Baud rate and framing can be set for the interfaces USB, COM1 and COM2. The interfaces COM1 and COM2 also allow the selection of the duplex mode (half or full duplex).

The optional network interface (Ethernet) comprises a Telnet server (port number: 8900). The IP address can be adjusted in the data logger by command or on the display.

The data exchange takes place in the ASCII format with the THIES command interpreter.

The behaviour (configuration) of the data logger can be changed with the available commands (see **chapter 7.2**).

Upon the starting of the datalogger, the character string “universal logger”, software version, hardware ID and serial number is output.

Example: universal logger
V02.01
533331003846344D3330313034363038
00000000

7.1 Command interpreter THIES

The THIES command interpreter defines the interface between a master (e.g. PC) and the data logger as a slave. The datalogger (slave) is always passive in this, i.e. it only responds to requests from the master.

The requests from the master (commands) and the response telegrams from the datalogger (slave) contain only ASCII characters. The following special characters can be used in this:

- \r ➔ carriage return
- \n ➔ line feed
- STX ➔ start of text
- ETX ➔ end of text

7.1.1 Structure of the commands (requests)

The requests and/or commands have the following structure:

<ID>Command<Space><Parameter><CR>

ID:	Identification number (“00” to “99”)
Command:	Command containing 2 to 12 characters (see command list)
Space:	Optional space character (if the command contains figures)
Parameter:	Parameter value with representable ASCII characters
<CR>:	Carriage Return (13_{dec}; 0x0D)

If the command also comprises figures, a space character must be sent as separation from the parameter.

The optional parameter can accept the following values:

- Parameter value with 1 to 10 places (decimal value without sign, represented in ASCII).
- Character string with up to 256 characters.

If the master sends a command without parameter, then the datalogger responds with the set parameter.

If the command is sent with parameter, it is set in the data logger and output in the response telegram (➔if necessary, a password level is taken into account).

7.1.2 Structure of the response telegram

The response telegrams have the following structure:

!<ID>Command<Space><Parameter><CR>

ID:	Identification number (“00” to “99”)
Command:	Command comprising 2 to 12 characters (see command list)
Space:	Optional space character (if the command contains figures)
Parameter:	Parameter value with representable ASCII characters
<CR>:	Carriage return (13_{dec}; 0x0D)

The response telegram always begins with a “!”.

If the command also comprises figures, the datalogger sends a space character as separation between command and parameter.

The parameter is dependent on the implementation in the datalogger and can accept the following values:

- Parameter value with 1 to 10 places (decimal value without sign, represented in ASCII).
- Character string with up to 256 characters.

Note:

The structure of the response telegram can in some cases differ from the standard (e.g. the measured value telegram)!

Only if the received “ID” agrees with the one set in the data logger, does the data logger send a response telegram.

7.1.3 Optional framing with 16Bit CRC

Optionally, the commands can be sent with a framing and 16-bit CRC checksum.

<STX><Command><CCCC><ETX>

<STX>: STX characters (0x02)
<Command>: Command with ID and optional parameter, but without end identifier \r (➔see **Structure of the commands (requests)**)
<CCCC>: 16Bit CRC in ASCII representation (4 characters)
<ETX>: ETX characters (0x03)

The data logger identifies the call variant with framing and 16-bit CRC and also sends the response in this format.

<STX><Response><CCCC><ETX>

<STX>: STX characters (0x02)
<Response>: Response with ID and parameter (➔see **Structure of the response telegram**)
<CCCC>: 16Bit CRC in ASCII representation (4 characters)
<ETX>: ETX characters (0x03)

The initial value of the 16-bit CRC is 0xffff.

7.2 Commands

The following table shows the available commands, and the corresponding passwords for reading and writing:

Command	Initial value factory setting	Description	Password reading[1] / writing[2]	
Command ArchID	0	Reading of the archive ID.	Without	-
Command BP_COM1	0 (8N1)	Choosing of the framing for COM1.	Without	User
Command BP_COM2	0 (8N1)	Choosing of the framing for COM2.	Without	User
Command BP_USB	0 (8N1)	Choosing of the framing for USB.	Without	User
Command BR_COM1	96	Choosing of the baud rate for COM1.	Without	User
Command BR_COM2	96	Choosing of the baud rate for COM2.	Without	User
Command BR_USB	2560	Choosing of the baud rate for USB.	Without	User
Command DEL_MEM	-	Delete all archived measured values.	-	Admin
Command DF_INI	-	Readout archive configuration.	Without	-
Command DS	-	Readout archived measured values.	Without	User
Command DS_ESC	-	Stop readout process	Without	Without
Command DD	-	Reading/setting date	Without	User
Command FB	1	Quick start mode.	Without	User
Command HI	-	Read hardware ID	Without	-
Command ID	0 (THIES) 1 (MODBUS)	Identification number and/or slave address.	Without	User
Command IP_ADDR	0	IP address	Without	User
Command IP_GW	0	IP-Gateway	Without	User
Command IP_SNM	0	IP subnet mask	Without	User
Command KY	0	Set key / password.	Without	Without
Command LA	0	Language used in the display.	Without	User
Command LL	-	Logger status.	Without	-
Command mm	0	Output of the instantaneous values.	Without	User
Command MM	0	Output of the instantaneous values.	Without	User
Command MM_MEAN	0	Output of the average values.	Without	User
Command MM_EX	0	Output of the extreme values.	Without	User
Command STOP_ST	0	Start/stop archiving.	Without	Admin
Command RS	0	Request reset source or carry out reset.	Without	User
Command SV	-	SW version.	Without	-
Command XX	-	Read/set station name.	Without	User
Command ZZ	-	Read/set time	Without	User

Table 8 : Command list

[1)]: Command without parameter (used to read the set parameter).

[2)]: Command with parameter (used to write a new parameter).

User password: 234

7.2.1 Command ArchID

<id>ArchID<parameter><CR>	Archive ID
Access:	Reading
Description:	With the command “ArchID”, the archive identification number is read.
Parameter description:	
Value range:	0...99999999
Initial value:	0

7.2.2 Command BP_COM1

<id>BP_COM1<parameter><CR>	Setting the framing COM1
Access:	Reading / writing
Description:	With the command BP_COM1, the desired framing is set for COM1.

Parameter description:

Parameter	Description
8N1	8 data bits, no parity, 1 stop bit
8O1	8 data bits, uneven parity, 1 stop bit
8E1	8 data bits, even parity, 1 stop bit
8S1	8 data bits, Space parity, 1 stop bit
8M1	8 data bits, Mark parity, 1 stop bit

Value range:	8N1 / 8O1 / 8E1 / 8S1 / 8M1
Initial value:	8N1

7.2.3 Command BP_COM2

<id>BP_COM2<parameter><CR> Setting the framing COM2

Access: Reading / writing

Description: With the command BP_COM2, the desired framing is set for COM2.

Parameter description:

Parameter	Description
8N1	8 data bits, no parity, 1 stop bit
8O1	8 data bits, uneven parity, 1 stop bit
8E1	8 data bits, even parity, 1 stop bit
8S1	8 data bits, space parity, 1 stop bit
8M1	8 data bits, mark parity, 1 stop bit

Value range: 8N1 / 8O1 / 8E1 / 8S1 / 8M1

Initial value: 8N1

7.2.4 Command BP_USB

<id>BP_USB<parameter><CR> Setting of framing USB

Access: Reading / writing

Description: With the command BP_USB, the desired framing is set for USB.

Parameter description:

Parameter	Description
8N1	8 data bits, no parity, 1 stop bit
8O1	8 data bits, uneven parity, 1 stop bit
8E1	8 data bits, even parity, 1 stop bit
8S1	8 data bits, space parity, 1 stop bit
8M1	8 data bits, mark parity, 1 stop bit

Value range: 8N1 / 8O1 / 8E1 / 8S1 / 8M1

Initial value: 8N1

7.2.5 Command BR_COM1

<id>BR_COM1<parameter><CR> Setting of the baud rate COM1

Access: Reading / writing

Description: With the command BR_COM1, the desired baud rate is set for COM1.

Parameter description:

Parameter	Description
12	1200baud
24	2400baud
48	4800baud
96	9600baud
192	19200baud
384	38400baud
576	57600baud
1152	115200baud
2304	230400baud

Value range: 12 / 24 / 48 / 96 / 192 / 384 / 576 / 1152 / 2304

Initial value: 96

7.2.6 Command BR_COM2

<id>BR_COM2<parameter><CR> Setting the baud rate COM2

Access: Reading / writing

Description: With the command BR_COM2, the desired baud rate is set for COM2.

Parameter description:

Parameter	Description
12	1200baud
24	2400baud
48	4800baud
96	9600baud
192	19200baud
384	38400baud
576	57600baud
1152	115200baud
2304	230400baud

Value range: 12 / 24 / 48 / 96 / 192 / 384 / 576 / 1152 / 2304

Initial value: 96

7.2.7 Command BR_USB

<id>BR_USB<parameter><CR> Setting of the baud rate USB

Access: Reading / writing

Description: With the command BR_USB, the desired baud rate is set for USB.

Parameter description:

Parameter	Description
12	1200baud
24	2400baud
48	4800baud
96	9600baud
192	19200baud
384	38400baud
576	57600baud
1152	115200baud
2304	230400baud
2560	256000baud

Value range: 12 / 24 / 48 / 96 / 192 / 384 / 576 / 1152 / 2304 / 2560

Initial value: 2560

7.2.8 Command DEL_MEM

<id>DEL_MEM<parameter><CR> Delete archive

Access: writing

Description: With the command “DEL_MEM”, all saved (archived) measured values are deleted.

Parameter description: 1 deleting all archives

Value range:

Initial value:

7.2.9 Command DF_INI

<id>DF_INI<parameter><CR>		Readout archive configuration
Access:		Reading
Description:		With the command “DF_INI”, the available archive name and its configuration are read.
Parameter description:		AAAABBBBBB
	AAAA	Stating of the archive with 3 and/or 4 places (“AV1” to “AV16” or “EX1” to “EX16”).
	AAAABBBBBB	With the parameter “ARCH_NAMES”, all archive names are output
Value range:		see parameter description
Initial value:	-	

7.2.10 Befehl DHCP

<id>DHCP<parameter><CR>		Switch DHCP on or off
Access:		Reading / writing
Description:		The command „DHCP“ determines if the IP address is requested automatically by the DHCP server or is used the fixed address.
Parameter description:	0	IP- settings of preset values
	1	IP-settings will be requested ans accenpted by the DHCP-Server at start
Value range:		0, 1
Initial value:		1

7.2.11 Command DS

<id>DS<parameter><CR>	Readout archive
Access:	Reading / writing
Description:	With the command “DS”, the archived measured values are output in lines separated by semicolon characters. If no parameter is stated, all archived measured values are output.

Parameter description:	AAAA BBBBBBBBBBBB EEEEEEEEEEEE AAAA: Stating of the archive with 3 and/or 4 digits (“AV1” to “AV16” or “EX1” to “EX16”) BBBBBBBBBBBB: Starting time of the form YYMMDDHHNNSS (YY: year, MM: month, DD: day, HH: hour, NN: minute, SS: second) EEEEEEEEEEEE: Ending time of the form YYMMDDHHNNSS (YY: year, MM: month, DD: day, HH: hour, NN: minute, SS: second)
Value range:	see parameter description
Initial value:	

7.2.12 Command DS_ESC

<id>DS_ESC<CR>	Stop readout process for archive
Access:	Reading / writing
Description:	With the command “DS_ESC”, the readout of an archive (➔Command DS) is stopped.
Value range:	
Initial value:	

7.2.13 Command DD

<id>DD<parameter><CR>	Date
Access:	Reading / writing
Description:	With the command “DD”, the current date is read or set.
Parameter description:	YYMMDD YY: year MM: month TT: day
Value range:	
Initial value:	

7.2.14 Command FB

<id>FB<parameter><CR>	Quick start mode
Access:	Reading / writing
Description:	With the command “FB”, the quick start mode is set.
Parameter description:	0: quick start mode switched off 1: quick start mode switched on
Value range:	0...1
Initial value:	1

7.2.15 Command HI

<id>HI<parameter><CR>	Hardware ID
Access:	Reading
Description:	With the command “HI”, the 128-bit hardware identification number (clear identification) is read.
Parameter description:	32 places in hexadecimal representation Example 533331003846344D3330313034363038
Value range:	
Initial value:	

7.2.16 Command ID

<id>ID<parameter><CR>	Identification number
Access:	Reading / writing
Description:	This command sets the identification number (THIES interpreter) and/or the slave address (MODBUS RTU Interpreter). A response telegram is only sent if the ‘id’ contained in the command agrees with the one set in the weather station. An exception to this is the generic ‘id’, to which all weather stations respond (THIES Interpreter). After the ‘id’ has been changed the device responds immediately with the new ‘id’.
Parameter description:	99 generic ‘id’ (THIES interpreter) 0 broadcast slave address (MODBUS RTU interpreter)
Value range:	0 to 99 (THIES interpreter) 1 to 247 (MODBUS RTU interpreter)
Initial value:	0 (THIES interpreter) 1 (MODBUS RTU interpreter)

7.2.17 Command IP_ADDR

<id>IP_ADDR<parameter><CR>	IP address
Access:	Reading / writing
Description:	With the command “IP_ADDR”, the IP address of the data logger is set.
Parameter description:	AAA.BBB.CCC.DDD
	AAA Byte0 (hi-byte)
	BBB Byte1
	CCC Byte2
	DDD Byte3 (lo-byte)
Value range:	0…4294967295 (in 4-byte notation)
Initial value:	0

7.2.18 Command IP_GW

<id>IP_GW<parameter><CR>	IP gateway
Access:	Reading / writing
Description:	With the command “IP_GW”, the gateway of the data logger is set.
Parameter description:	AAA.BBB.CCC.DDD
	AAA Byte0 (hi-byte)
	BBB Byte1
	CCC Byte2
	DDD Byte3 (lo-byte)
Value range:	0…4294967295 (in 4-byte notation)
Initial value:	0

7.2.19 Command IP_SNM

<id>IP_SNM<parameter><CR>	IP subnet mask
Access:	Reading / writing
Description:	With the command “IP_SNM”, the IP subnet mask of the data logger is set.
Parameter description:	AAA.BBB.CCC.DDD AAA Byte0 (hi-byte) BBB Byte1 CCC Byte2 DDD Byte3 (lo-byte)
Value range:	0…4294967295 (in 4-byte notation)
Initial value:	0

7.2.20 Command KY

<id>KY<parameter><CR>	Key/password
Access:	Reading / writing
Description:	With the command “KY”, the value is set for the key (password). To change parameters, the necessary password must be set.
Parameter description:	0 no password 234 password for user level
Value range:	0 / 234
Initial value:	0

7.2.21 Command LA

<id>LA<parameter><CR>	Language
Access:	Reading / writing
Description:	With the command “LA”, the language used in the display is set.
Parameter description:	0 German 1 English
Value range:	0 / 1
Initial value:	0

7.2.22 Command LL

<id>LL<parameter><CR>	Logger status
Access:	Reading / writing
Description:	With the command “LL”, the current logger status is read out.
Parameter description:	1 Output of the device descriptors re. serial sensors 2 Output of binary configuration 3 Output of MEVIS compatible configuration 10 Output of the number of data bytes in the input FIFO for the communication with the LINUX board 11 Output of data bytes in the input FIFO for the communication with the LINUX board 12 Output of the data bytes in the input FIFO for the communication with the LINUX board (non-representable characters with #xx) 20 Output of the ASCII table for LCD (ASCII value, height and width)
Value range:	
Initial value:	0

7.2.23 Command mm

<id>mm<parameter><CR>	Output of the instantaneous values
Access:	Reading / writing
Description:	With the command mm, all configured instantaneous values are output in one line.
Parameter description:	1 Instantaneous values in accordance with archive AV1 2 Instantaneous values in accordance with archive AV2 … 16 Instantaneous values in accordance with archive AV16
Value range:	1…16
Initial value:	

7.2.24 Command MM

<id>MM<parameter><CR>	Output der instantaneous values
Access:	Reading / writing
Description:	With the command MM, all configured instantaneous values are output in lines, with pre- and post-text (channel name / unit). If the call takes place with the parameter STS, the status words are output in brackets in addition to the instantaneous values.
Parameter description:	ADC Output of the raw values of the ADC STS Output der instantaneous values with status word
Value range:	
Initial value:	

7.2.25 Command MM_MEAN

<id>MM_MEAN<parameter><CR>	Output of the average values
Access:	Reading
Description:	With the command MM_MEAN, all current measured values are output in accordance with configuration, in lines, with pre- and post-text (channel name / unit).
Parameter description:	
Value range:	
Initial value:	

7.2.26 Command MM_EX

<id>MM_EX<parameter><CR>	Output of the extreme values
Access:	Reading
Description:	With the command MM_EX, all current extreme values are output according to the configuration, in lines, with pre- and post-text (channel name / unit).
Parameter description:	
Value range:	
Initial value:	

7.2.27 Command RS

<id>RS<parameter><CR>	Reset
Access:	Reading / writing
Description:	With the command RS, the reset source is requested (reading without parameter) or a reset carried out (writing with any desired parameter). The following reset sources can be output: GENERAL RESET BACKUP RESET WATCHDOG RESET SOFTWARE RESET USER RESET
Parameter description:	1 Shut down data logger 2 Shut down data logger and carry out reset
Value range:	
Initial value:	

7.2.28 Command STOP_ST

<id>STOP_ST<parameter><CR>	Archiving
Access:	Reading / writing
Description:	With the command “STOP_ST”, the archiving of the measured values is started and/or stopped.
Parameter description:	0 Start archiving (archiving has started) 1 Stop archiving (archiving has stopped)
Value range:	0 / 1
Initial value:	0

7.2.29 Command SV

<id>SV<CR>	SW version
Access:	Reading
Description:	With the command SV, the software version number can be read.
Parameter description:	-
Response telegram:	-
Value range:	-
Initial value:	-

7.2.30 Command XX

<id>XX<parameter><CR>	Station name
Access:	Reading / writing
Description:	With the command “XX”, the station name is read or set (max. 10 places).
Parameter description:	XXXXXXXXXX X: Representable ASCII character
Value range:	
Initial value:	

7.2.31 Command ZZ

<id>ZZ<parameter><CR>	Time
Access:	Reading / writing
Description:	With the command “ZZ”, the current time is read or set.
Parameter description:	HHMMSS HH: hour MM: minute SS: second
Value range:	
Initial value:	

8 WEB-Server

The DLU contains a WEB server which supports the display of instantaneous- and archive values. The WEB server is selected by entering the IP-address in an internet explorer

for example by:

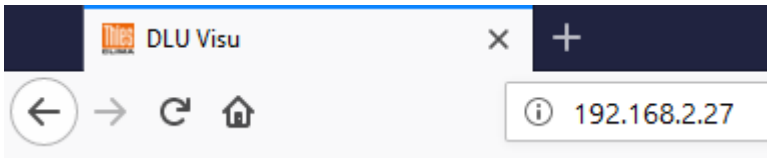


Figure 35: WEB-Server

8.1 Display of the Instantaneous Values

The instantaneous values of the datalogger are displayed afterwards. The display is based on the configuration.

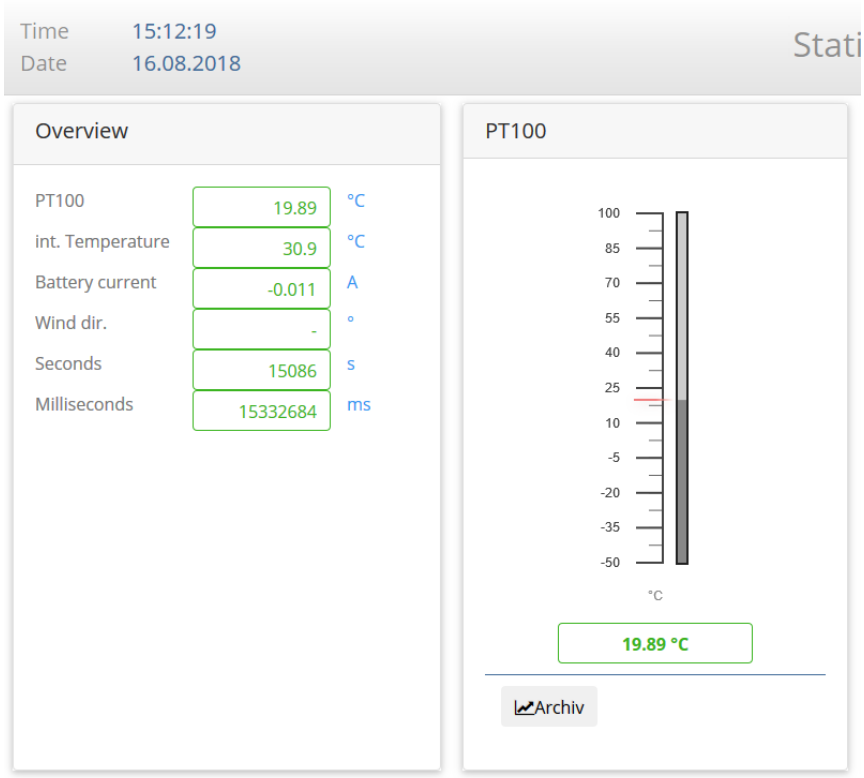


Figure 36: Display current values

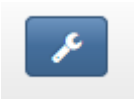
After a re-start it might last up to 3 minutes until the data of the WEB server appear on the display.

8.2 Archived Data Values

The archived values of the logger can be displayed graphically via the key “archive”.

The time period for the displayed values can be selected from 6 defined and specified time ranges.

8.2.1 Settings for the WEB server

The settings of the WEB server can be changed via the key  Settings can be carried out for the user, IP-configuration, NTP, SFTP and date / time. Via the key „About“ you will receive information on the software versions.

The user settings are reached via the user name „admin“ and the password „1111“. In the settings the user and the password can be changed on the register card “user”.

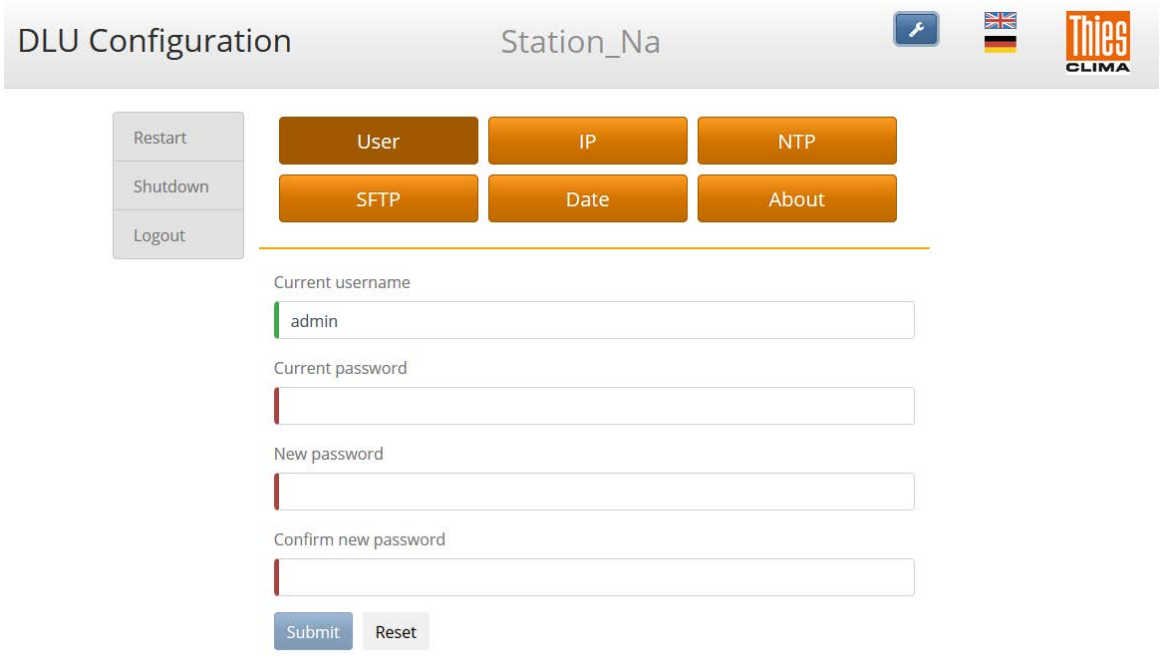


Figure 37: DLU settings

8.3 User

In this section are defined the application information for the WEB settings. The user name „admin“ und password „1111“ are preset. After the change of settings, and the loss of “user name” and “password” there is no chance anymore for changing the system settings.

8.4 IP

The IP-settings are changed via the key IP.

Settings cannot be changed with active DHCP. Only when the DHCP is switched off the modification of the addresses is possible. The entry of the gateway address is required when using the NTP. The settings are transmitted to the datalogger via the key “Submit”.

It is recommended to switch off the DHCP after the first start, and to use a standard IP-address. For assignment of the IP-addresses please contact your network administrator.

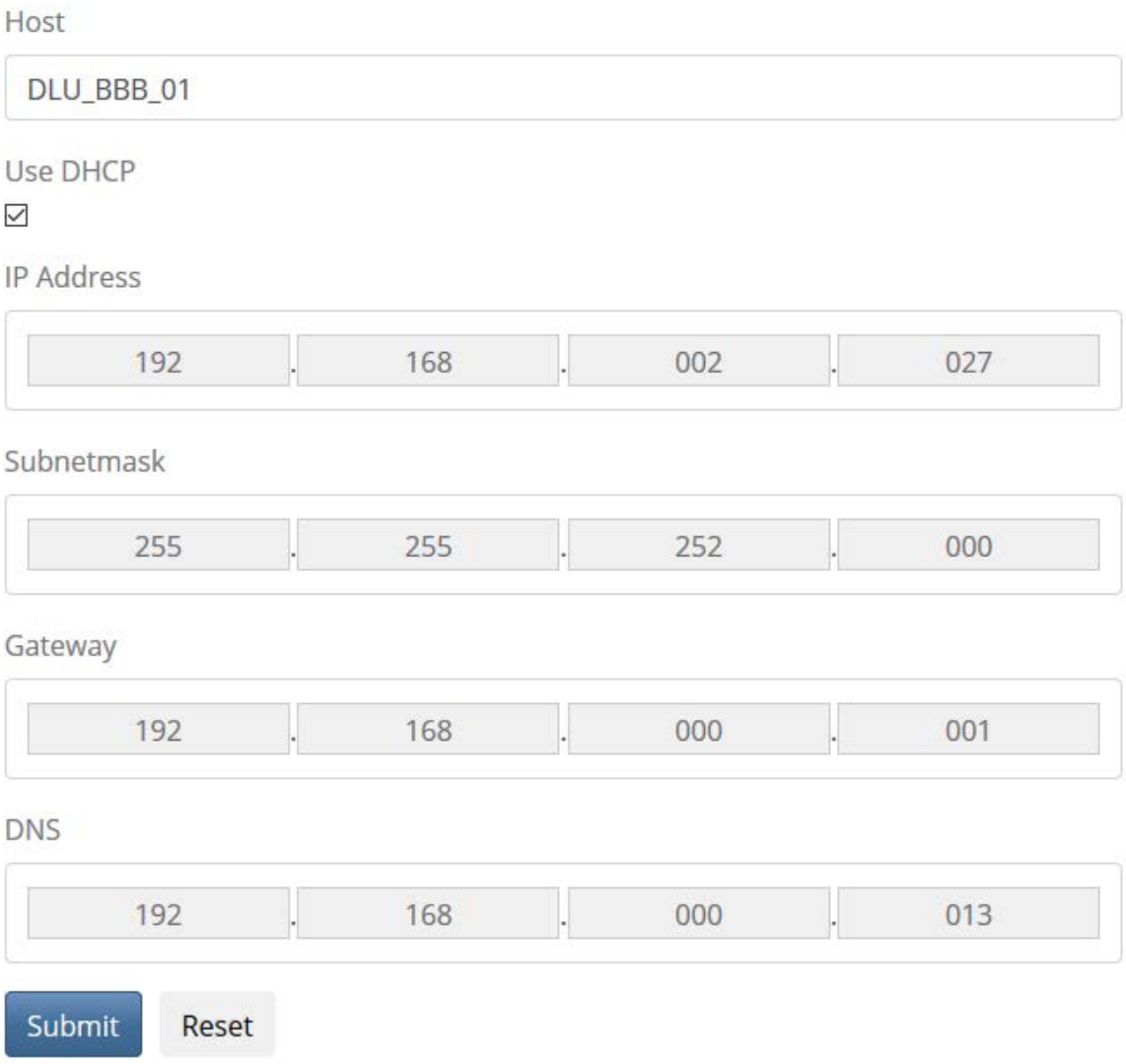


Figure 38: IP-address

8.5 NTP

The internal time can be synchronized automatically via NTP. The synchronizing occurs every 10 minutes on the 11. second. The time of the DLU is then switched over to UTC automatically.

The time cannot be changed via „date“ with active NTP. Via the key „Refresh“ the connection to and the function of the NTP server can be tested.

Figure 39: NTP usage

8.6 SFTP

An additional user with access to the data can be determined via SFTP. The preset user is „DLUuser“ with the password „User4DLU“. Other users can be compiled here. Deleting of users must be carried out via the Linux-console, see 4.4.3.

Figure 40: SFTP usage

8.7 Date

Date and time can be set in this chapter. The settings are active only when NTP is switched off.

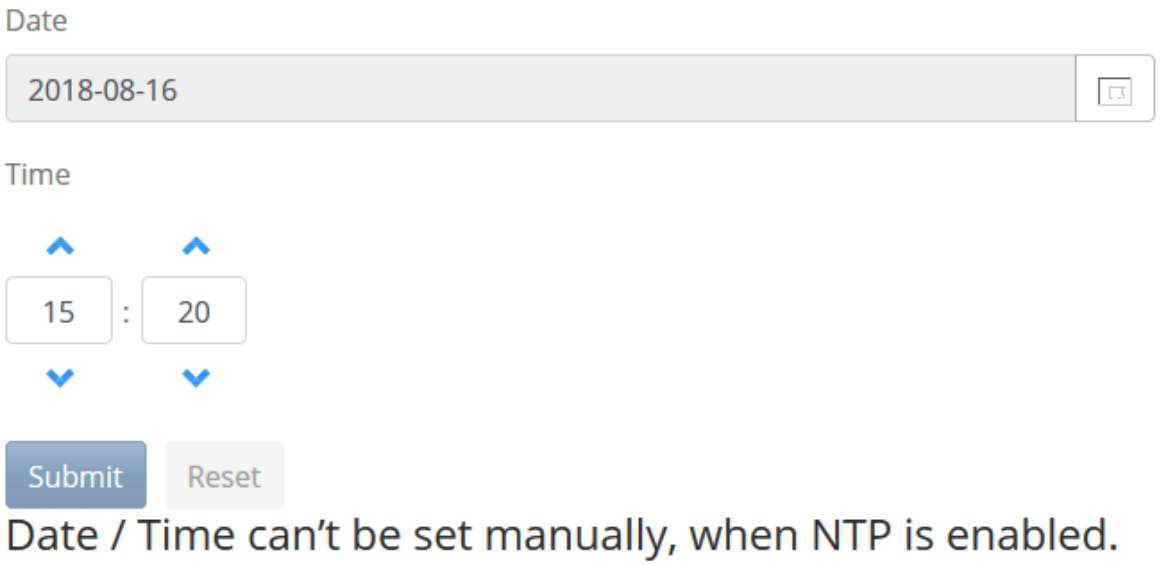


Figure 41: Set the date

9 Technical data

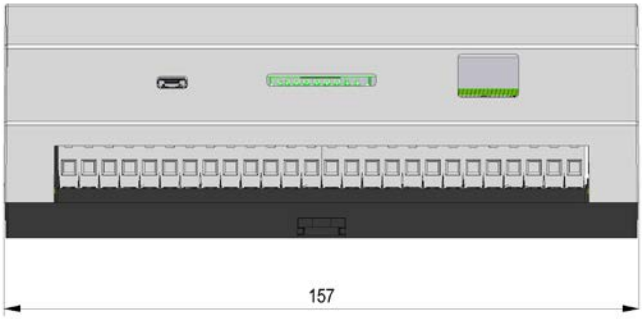
Housing	plastic
Protection class	IP 20
Current supply	
Supply	24VAC, ± 20%, 0.5A (max. 2A) 24VDC, ± 25%, 0.5A (max. 2A)
Accumulator	12VDC, 7Ah
Solar panel	Nominal voltage 15 … 18V (max. 23.5V open-circuit voltage), max. 20W
Average electricity consumption Inactive: COM1, COM2, digital outputs Active: Pt100, analogue IN1, analogue IN2, Analog IN3, rel. humidity, battery current measurement, battery voltage measurement, measuring int. temperature	max. 32mA (Display on, max. clock frequency) min. 1.7mA (Display off, power saving mode active)
Ambient conditions	
Operating temperature	-20 ... +70°C
Storage temperature	-30 ... +80°C
Humidity	max. 100% rel. H, non-condensing
Configurable sensor supply	
3.3V	max. 1.5A (with electronic fuse)
5V	max. 0.5A (with electronic fuse)
12V	max. 1.5A (with electronic fuse)
Analogue measurement	
A/D converter	16-bit resolution with differential inputs and 50/60Hz suppression
Accuracy analogue	±0.1% of the measuring span of the sensors, without long-term drift ±0.1°C
Channels	1. supply voltage / battery voltage 2. battery current (±4A) 2. temperature Pt100 (-40...70°C) 3. rel. humidity (±2 V / 0 … 1V correspond to 0 … 100% r. H.) 4. analogue input 1 (±10V or ±20mA) 5. analogue input 2 (±10V or ±20mA) 6. analogue input 3 (±10V or ±20mA) Input resistance voltage measurement (±10V): min. 100kΩ Input resistance voltage measurement (up to ±2V): min. 10MΩ Input resistance current measurement: typ. 200Ω Input resistance battery current measurement: typ. 2mΩ

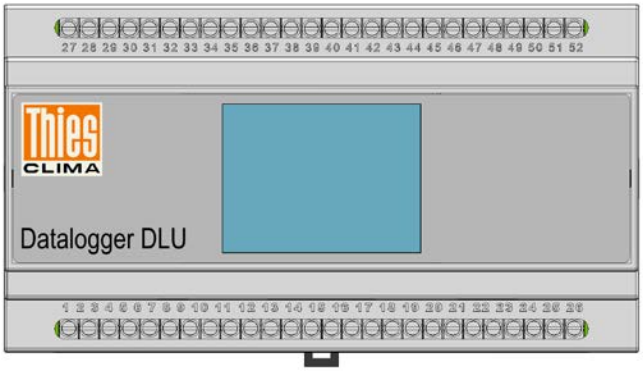
Digital measurement (inputs/outputs)	
Pulse inputs	2 channels (e.g. reed contact precipitation rocker) Supply: 5V over 10kΩ pull-up Switching threshold of the Schmitt trigger input circuit: Positive (V_{T+}) : 1,3 ... 2,2V Negative (V_{T-}) : 0,6 ... 1,5V Hysteresis ($V_{T+} - V_{T-}$) : 0,4 ... 1,2V
Thies spec. inputs	2 channels for the connection of Thies synchronous-serial transducers
COM1	Potential-free RS485 interface: - Half/full-duplex mode can be switched by SW. - Connection of serial sensors possible. - Command interpreter available. - Baud rates from 1200 Baud to 230400 Baud. - Framing adjustable (8N1, 8E1, 8O1, 8S1, 8M1).
COM2	RS485 interface: - Termination (120 Ω) switchable by SW. - Connection of serial sensors possible. - Command interpreter available. - Baud rates of 1200 Baud to 230400 Baud. - Framing can be set (8N1, 8E1, 8O1, 8S1, 8M1).
Digital outputs	2 potential-free, electronic switching contacts with current limitation Current limitation: typ. 0,2A max. voltage with opened contact: 50VDC, 35VAC
Measuring rate	1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30s 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 in
Memory rate	1, 5, 10, 15, 20 30s 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60min
Time base	Real-time clock with automatic leap year recognition. Accuracy adjustable (+2.8 ... –2.8 minutes/day)
Storage capacity	Firmware: 1MB (flash, uploadable via USB or SD card) Data: 64MB (flash) Configuration: 64kB (flash)
Number of data sets	Dependent on the configuration Example: 276192 data sets (14 channels)
Storage period	Dependent on the configuration Example: 191.8 days (14 channels, memory rate 1min)
Data output	
USB	USB 2.0 full speed device, type B jack, type FTDI (FT234XD), VIRTUAL COM PORT driver: **www.ftdichip.com**
COM1	RS485 half or full duplex (potential-free)
COM2	RS485 half or full duplex
Ethernet	Telnet / FTP
Memory Card	SD card formatted with FAT16 / FAT32 / ExFAT, compatible with Microsoft® Windows® and MS-DOS® Compatibility to all cards on the market cannot be guaranteed; the card is therefore to be checked beforehand in combination with the datalogger!

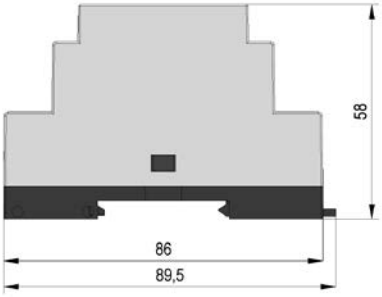
General	
Control	On the device: - 2.4 inch colour display with touch function By remote control: - via COM1 or COM2 or Ethernet or USB
LCD display	2,4” – colour display (320 x 240 Pixel)
Mounting type	Snap-in mounting 35mm standard rail DIN EN 60 715, TH35 9TE
Connection type	32 terminal, ∅ max. 2.5mm²
Dimension	157 x 86 x 58.5mm (9TE)

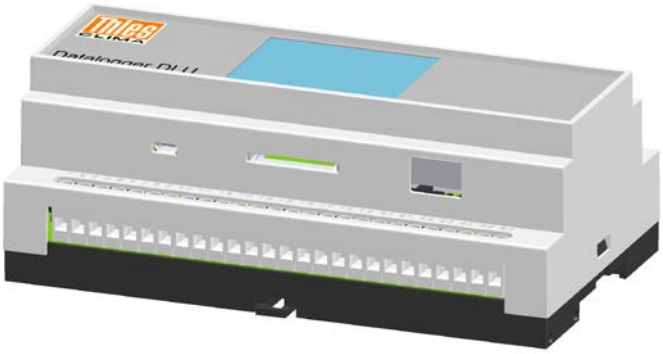
[1] Accumulator and solar panel are not in the scope of supply.

10 Dimensioned drawing









11 Wiring diagram

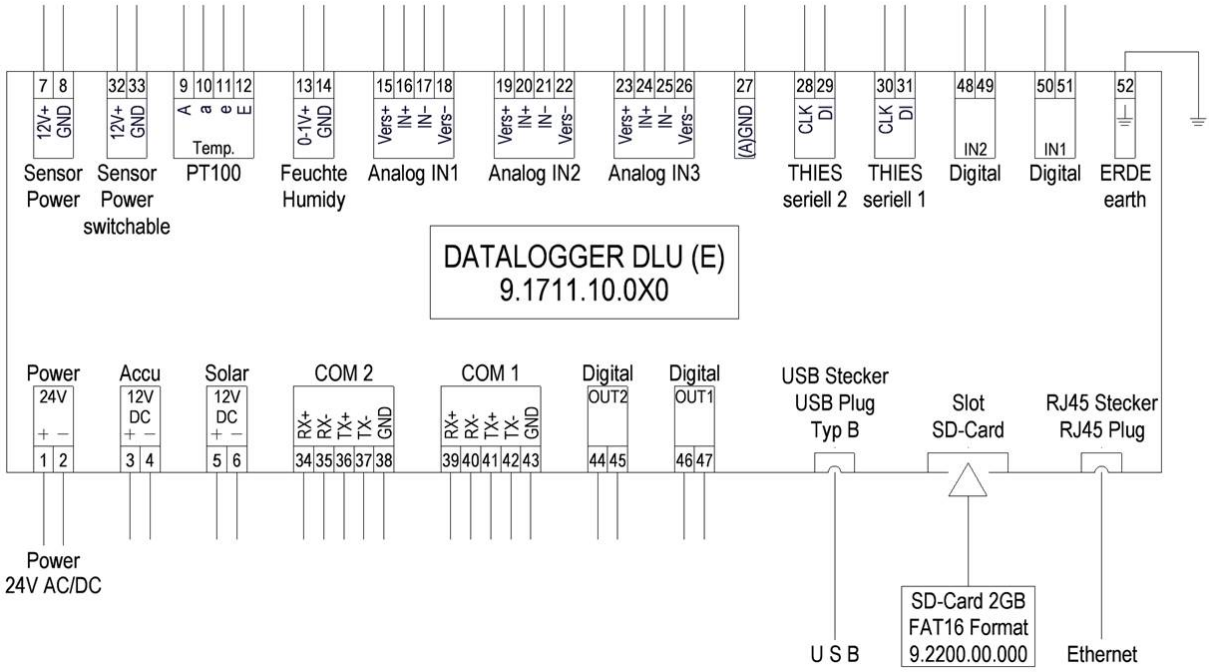


Figure 42: Datalogger DLU

Notes:

*EMC-compliant installation of the cables: see **chapter 3.3.1**.*

*Outputs of optocoupler: see **chapter 3.3.4**.*

12 Maintenance

The Datalogger DLU is maintenance-free.

Cleaning:
A slightly moistened cloth, without chemical cleaning agents, should be used for the cleaning of the housing.

Storage:
A dry, dust-free room with temperatures between -20 ... +50°C is required for the storage of the Datalogger DLU. We recommend storing the device in a cardboard box.

13 Accessories (optional)

BATTERY 12V 7AH Takes care of the buffering with solar panel supply.	210 375	Nominal capacity: 12V, 7Ah
SD - CARD 2 GB Used for data storage / data transport	9.2200.00.000	Storage capacity: 2GB
Protective housing for the external mounting of devices with top-hat rail mounting. Equipment: - plastic housing with transparent cover, - top-hat rail, - built-in mains adapter, - Cable glands. • Further protective housings on enquiry.	9.3293.00.000	Housing: Dimensions: 252 x 162 x 120mm (L x B x T) Material: plastic Protection class: IP 67 Mains adapter: Primary: 85 ... 264V AC, 4 5... 65Hz Secondary: 24V DC; 60W

Further accessories upon enquiry.

14 EC Declaration of Conformity

Document-No.: 001201 **Month: 07 Year: 18**

Manufacturer: **A D O L F T H I E S G m b H & C o. K G**
Hauptstr. 76
D-37083 Göttingen
Tel.: (0551) 79001-0
Fax: (0551) 79001-65
email: Info@ThiesClima.com

This declaration of conformity is issued under the sole responsibility of the manufacturer

Description of Product: **Datalogger DLN, Datalogger DLU**

Article No.	**5.1756.00.000**	**9.1711.00.000**	**9.1711.10.000**	**9.1711.10.010**

specified technical data in the document: **021738/02/14; 021786/10/15; 021820/07/18**

The indicated products correspond to the essential requirement of the following European Directives and Regulations:

2014/30/EU	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
2014/35/EU	DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
552/2004/EC	Regulation (EC) No 552/2004 of the European Parliament and the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation)
2011/65/EU	DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
2012/19/EU	DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

EN 61000-6-2	Electromagnetic compatibility Immunity for industrial environment
EN 61000-6-3	Electromagnetic compatibility Emission standard for residential, commercial and light industrial environments
EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Place: Göttingen Date: 25.07.2018
Signed for and on behalf of:

Legally binding signature: issuer:

Thomas Stadie, General Manager

Joachim Beinhorn, Development Manager

This declaration certificates the compliance with the mentioned directives, however does not include any warranty of characteristics.
Please pay attention to the security advises of the provided instructions for use.

Talk to us about your system requirements.
We will be happy to advise you.

ADOLF THIES GMBH & CO. KG
Meteorologie und Umweltmesstechnik
Hauptstraße 76 · 37083 Göttingen · Germany
Tel. +49 551 79001-0 · Fax +49 551 79001-65
info@thiesclima.com

www.thiesclima.com