Instruction Manual

ALMEMO® 500

Data logger with app

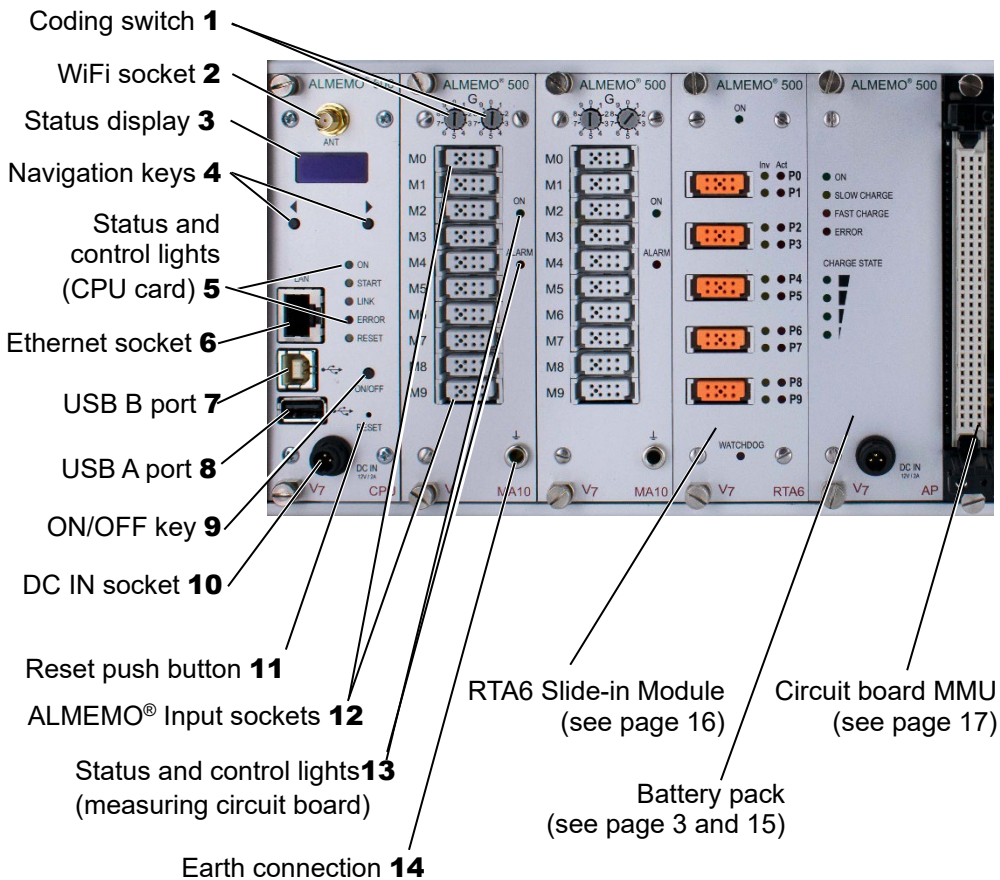V7 Technology

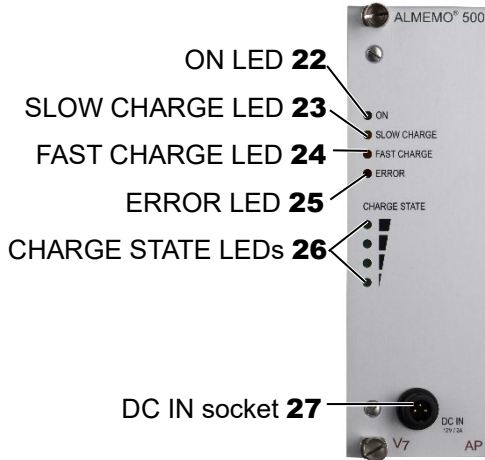English
V2.5
21.04.2022

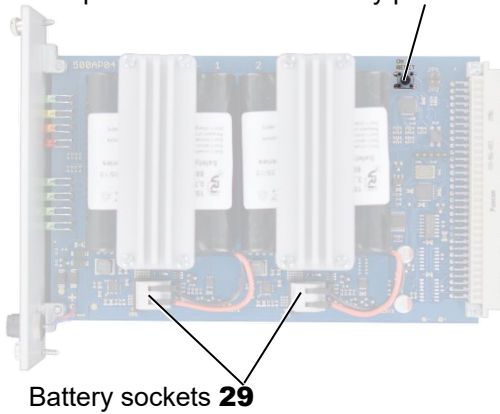# 1 Global Overview

Global Overview of the Data Logger

Coding switch **1**

WiFi socket **2**

Status display **3**

Navigation keys **4**

Status and control lights (CPU card) **5**

Ethernet socket **6**

USB B port **7**

USB A port **8**

ON/OFF key **9**

DC IN socket **10**

Reset push button **11**

ALMEMO® Input sockets **12**

Status and control lights **13** (measuring circuit board)

Earth connection **14**

RTA6 Slide-in Module (see page 16)

Battery pack (see page 3 and 15)

Circuit board MMU (see page 17)

Global Overview of the Battery Pack

ON LED **22**
SLOW CHARGE LED **23**
FAST CHARGE LED **24**
ERROR LED **25**
CHARGE STATE LEDs **26**

DC IN socket **27**

Reset push button of the battery pack **28**

Battery sockets **29**

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3 Explanation of Symbols

 Safety note

! Requirement

→ Request

☞ Notice

➢ Result

3 Reference referring to the general illustration of the data logger (page 2)

Back Text displayed within a software

4 Safety Note ⚠️

→ Please read the Instruction Manual carefully and follow the safety and warning notes.

→ Only operate the measuring instrument in accordance with the intended use.

→ Do not operate the device outside of the indicated environmental conditions. Only operate the device within the technical specifications (see chapter 14 Technical Data).

→ Only open the device for maintenance and care purposes, see chapter 11 Maintenance and Care .

→ Make sure that the static electricity has been discharged before you touch the sensor cable.

→ Do not install sensor cables close to electric power lines.

→ Do not operate the device near fuels or chemicals, not on blasting areas or petrol stations.

→ Only use the supplied mains adapter. Do not open or manipulate the mains adapter.

→ Do not use the device when damaged due to electrostatic discharge, radiation or lightning.

→ Make sure that the batteries are not mechanically damaged, short circuited, or thrown into a fire.

4.1 How to avoid Measuring Errors and product damages

→ Please wait for the device to adapt to the ambient temperature before starting to operate it.

☞ Bringing the device from a cold environment into the operating room may cause condensation on the electronics assembly. Regarding thermocouple measurements, severe temperature changes may cause larger measuring errors.

→ In case a battery pack is used in your system, thermocouple measurements using the device-internal cold junction temperature should be run – if possible – in battery operation (no mains adapter connected).

☞ Using another operating mode (e.g. mains unit operation) for thermocouple measurements may lead to increased measuring errors.

→ Sensors whose power is supplied by the data logger are not galvanically isolated. In case galvanical isolation is required, please contact the technical support (Phone: 08024/3007-38, email: help@ahlborn.com).

→ When connecting a mains adapter please consider the mains voltage.

→ Pay attention to the maximum load capacity of the sensor power supply.

→ Do not make any changes to the measuring device.

→ Do not connect unsuitable peripheral devices to the measuring instrument.

→ Avoid heat, large temperature fluctuations, and increased electromagnetic radiation during operation.

4.2 Intended Use

The ALMEMO® 500 data logger is a measuring instrument and is intended only for measuring various measuring variables. The data logger supports the connection of a vast variety of sensors and peripheral devices with various special features.

A detailed overview on the intended use and on possible measuring tasks is given in the ALMEMO® Manual. To avoid measuring errors and damages to the device, it is recommended to read the relevant chapter for each measuring task and to pay attention to the given notes.

Please pay attention to all information and safety notes listed in this Instruction Manual. Only use the measuring instrument within the technical specifications (see chapter 14 Technical Data). Any other use is considered inappropriate and may result in damage to property or personal injury. Any such usage will result in the loss of the warranty rights.

☞ In case of doubt, please contact our technical support (Phone: 08024/3007-38, email: help@ahlborn.com).

5 Product

5.1 Scope of Delivery

→   When unpacking, please pay attention to damages to the measuring
     instrument as well as to the completeness of the delivery:

measuring instrument ALMEMO® 500 with 2 measuring circuit boards ES500MA10 and 1 CPU card ES500CPU	
12 VDC mains adapter (ZB1212NAx)	
WLAN antenna	
USB data cable	
Ethernet data cable	
Tablet including mains unit and USB charging cable	
Mount for the tablet	
Present copy of the Instruction Manual,	

→   In the event of a damage caused during transportation, please keep the
     packaging material and contact the supplier immediately.

5.2 Description of the Tablet

You will find the description of the provided tablet in the included Instruction
Manual provided by SAMSUNG.

5.3 Description of the Data Logger

☞ You can find a detailed illustration of the data logger on page 2.

Key and switch functions of the data logger

Appearance	Label	Function
	Coding switch **1**	Configuration of the measuring circuit board addresses from G00 to G89
◀▶	Navigation keys **4**	Allow you to - navigate through different menu pages - reset the access point - start firmware updates - reset and retrieve the data logger
●	ON/OFF key **9**	Pressing the key shortly: the device is switched on respectively off Pressing the key long: the device powers off the supply voltage (not recommended)
◉	Reset push button **11**	Pressing the button for at least 3 seconds: triggers a reset of the data logger. ☞ To be able to press the button, a pointed object is required.

Measuring channels

Every measuring circuit board (in the standard configuration two measuring circuit boards are included) features ten ALMEMO® Input sockets **12**. To each input socket, a single ALMEMO® plug can be connected. V5, V6 and D6 sensors can offer up to four measuring channels each. D7 sensors can offer up to ten measuring channels.

Measuring circuit board 1

M0	M000_0 – M000_9
M1	M001_0 – M001_9
M2	M002_0 – M002_9
M3	M003_0 – M003_9
M4	M004_0 – M004_9
M5	M005_0 – M005_9
M6	M006_0 – M006_9
M7	M007_0 – M007_9
M8	M008_0 – M008_9
M9	M009_0 – M009_9

Measuring circuit board 2

M0	M010_0 – M010_9
M1	M011_0 – M011_9
M2	M012_0 – M012_9
M3	M013_0 – M013_9
M4	M014_0 – M014_9
M5	M015_0 – M015_9
M6	M016_0 – M016_9
M7	M017_0 – M017_9
M8	M018_0 – M018_9
M9	M019_0 – M019_9
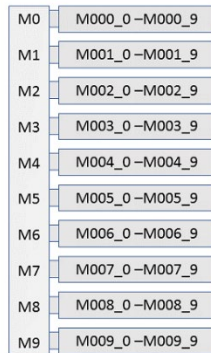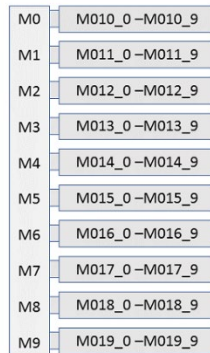
Every measuring channel
has a unique channel
number.

M003_1 PT100

└─Measuring range
─Measuring channel
─ALMEMO® input socket
─Measuring circuit board address
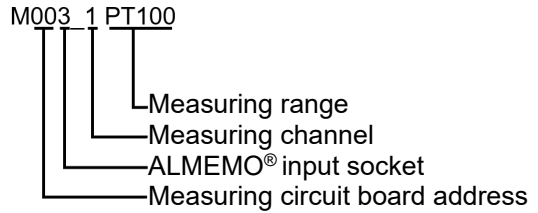
Integrated access point

The data logger features an integrated access point that sets up a WLAN network.

This access point features a static IP address (in the delivery state 192.168.1.1) and is configurable via a website.

As delivered from the factory, the internal DHCP server of the access point is enabled and automatically assigns one IP address to the CPU card and to all connected devices each.

The Status display **3** shows the IP address of the CPU card in the menu."1) Network Conf.".

By means of the IP address of the CPU card you can specify within the app which data logger you want to operate.

☞   Regarding the technical data of the data logger, please refer to chapter 14 Technical Data.

5.4 Description of the Battery Pack (optional)

☞ You can find a detailed illustration of the battery pack on page 3.

Intelligent charging mechanism

In case battery packs are used within the data logger (a maximum of 3 battery packs can be used), an intelligent charging mechanism will be activated to protect the data logger against overload (simultaneous operation and charging process). In case several battery packs are used, the device addresses of the battery packs must be preset at the factory.

Technical data

Technology	Lithium-ions
Battery capacity	15.6 Ah, 3.7 V
Operating time at 500mA (12V) current consumption	Approx. 6 hours ☞ The operating time may vary depending on the connected sensor technology and on the sampling rate used.

Subject to technical modifications!

☞ In case the residual charge of the battery is less than 5%, the ERROR LED **25** flashes, an acoustic signal will sound three times for 2 minutes and the Status display **3** will show the message "*Battery* Charge < 5 % Shut down in …s". In that case, please connect the mains adapter to the battery pack or to the CPU card. If you do not connect the data logger to the mains adapter, the data logger will automatically shut down after two minutes. The current measurement will be stopped; the saved measurement data and the time will be preserved.

☞ For Operation an Loading the Battery Pack see chapter 10 Operation with a Battery Pack (optional).

5.5 Description RTA6 Relay/Trigger/Analog Slide-in Module
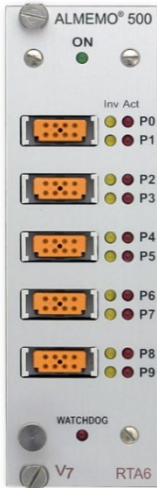
Function of the Relay/Trigger/Analog Slide-in Module

The relay/trigger/analog slide-in module ES 500 RTA6 is a universal trigger output interface for the data logger ALMEMO® 500, featuring up to
10 input /output interfaces (standard 4 solid-state relays (normally open contact) and 2 trigger inputs, optionally featuring further relays and/or analog outputs.

Port addresses

All 10 input / output interfaces of every module can be individually selected as ports P0 to P9. The ports can be set via the ALMEMO® 500 app or in Transparent Mode via the data logger interface.

Power supply

The power for the RTA6 slide-in module will be supplied by the ALMEMO® 500 data logger.

Requirements for the Use of the RTA6 Slide-in Module

☞ The RTA 6 slide-in module can be used starting with software version 1.2.4 of the CPU card.

☞ The measuring circuit boards must feature the revision number R3 or higher. The revision number of the measuring circuit boards will be displayed in the status display in the menu 3) Firmware (on the running data logger press the right navigation key until the menu 3) Firmware will be displayed. The revision number is listed behind the measuring circuit board number (e.g.G00 R3)).

☞ To be able to adjust the settings of the RTA6 slide-in module with the ALMEMO® 500 app, the software version of the app needs to be V1.5.9 or higher.

☞ For Operation and for further information about RTA6 Relay/Trigger/Analog Slide-in Module see Supplementary Instruction Manual ALMEMO® 500 RTA6 Relay/Trigger/Analog Slide-in Module.

5.6 Description Circuit Board MMU

Function of the Circuit board MMU

The MMU input card is intended for fixed installations of sensors (especially temperature sensors). It has a 64-pin female connector strip to which an ALMEMO® 10 MU connector ZA 5690 MU can be plugged. Since the MMU input card is narrower than a measuring circuit card, two MMU input cards can be pushed into the housing of the ALMEMO® 500 data logger instead of one measuring circuit card. Apart from setting the device address (see chapter 8.2.2 Setting the MMU input card address), the MMU input card behaves like a measuring circuit card.

10 sensors can be connected to the ALMEMO® 10 MU connector ZA 5690 MU, each of which has up to 4 measuring channels. Sensors that require a power supply and sensors that require electronics for adaptation cannot be connected to the ALMEMO® 10 MU connector supplied.

The connection of the sensors is done with 4 screw terminals A, B, C and D each in the same way as for each individual ALMEMO® connector (see manual 2020 chapter 4.7.3.1 and chapter 4.1).

Programming is possible for all sensors individually, but is stored in a common EEPROM in the MU connector. Only one cold junction sensor for thermocouples is provided here.
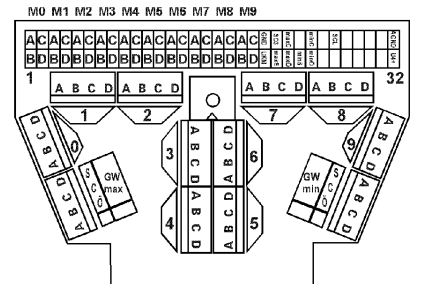
Technical Data

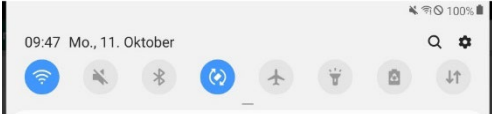| Measuring inputs	10 inputs, electrically isolated, socket strip for ALMEMO® 10-way MU connector
Measuring ranges	All thermocouples, Pt100, Ni100, NTC, Ohm, 2,6 V, 260 mV, 55 mV, 26mV
Sensor voltage	none

Subject to technical modifications without prior notice!

6 Initial Operation

1. Plug the DC connector of the mains adapter into the DC IN socket **10** and connect the mains plug to a wall socket.

☞ In case you intend to use one or several battery packs, please wait until the batteries are fully charged, all CHARGE STATE LEDs **26** have lightened up and the FAST CHARGE LED **24** respectively the SLOW CHARGE LED **23** has gone out.

2. Connect the WLAN antenna to WiFi socket **2**.

3. Connect the ALMEMO® plugs of the desired sensors to the ALMEMO® Input sockets **12**.

4. Please check the setting of the Coding switch **1**.

☞ One measuring circuit board needs to have the measuring circuit board address G00 and the other measuring circuit board needs to have the measuring circuit address G01.

Please change the measuring circuit board address of any replacement measuring circuit board and in case of a system expansion (see chapter 8.2.1 How to change the Measuring Circuit Board Address). Several measuring circuit boards must not have the same measuring circuit board address. The addresses from G90 upwards are reserved i.a. for battery packs and must not be used for measuring circuit boards.

5. Shortly press the ON/OFF key **9**.

➢ The ON LED of the Status and control lights (CPU card) **5** lights up.

➢ The Ahlborn logo appears on the Status display **3** and shortly afterwards, the text "Web Service Initialization…" will be displayed.

➢ On the Status display **3** the menu "1) Network Conf." will be displayed.

☞ The startup phase takes some time since the data logger needs to be initialized and an integrity check of the measured data storage is executed at each system start.

☞ Do not disconnect the data logger from the power supply during the startup phase but rather shut down the device – if necessary – in a controlled manner by shortly pressing the ON/OFF key **9** again.

☞ Without any activity of the Navigation keys **4**, the Status display **3** enters a power saving mode after a while. Push one of the Navigation keys **4** to reactivate the display.

☞ Steps 6 to 12 describe how to connect the data logger to the provided tablet. To connect the data logger to other tablets or smart phones, different action steps might be necessary. The action steps necessary to connect the data logger to an iOS device are listed in the chapter 7.5.3 How to connect an iOS Device to the Data Logger.

6. Press long on the ON/OFF key of the tablet.

➢ The tablet will be switched on.

7. Swipe the display to unlock it.

8. Swipe from the upper display edge downwards.

➢ The status bar will open.

9. Press long on the icon Wi-Fi .

➢ The network overview will open.

10. Select the wireless network **ALMEMO_500_[six digit identification number]**.

☞ You will be able to clearly distinguish between the wireless networks of the measuring devices by means of the six digit identification number. You can also find this number on the nameplate on the bottom of the respective measuring device or on the status display in menu 2) WLAN-SSID.

11. Enter the password ahlborn_wlan.

12. Tap on CONNECT .

13. Press the Home key.

14. Tap on the icon of the ALMEMO® 500 app.

➢ The app will open.

15. In the lower part of the display, tap on Network Settings.

➢ The network settings will be displayed.

16. In the Status display **3** in menu "1) Network Conf." you will find the IP address. Enter this IP address in the field IP Address in the network settings.

```
1) Network Conf.
IP-Address
192.168.11.106
Subnet-Mask :
255.255.255.0
```

17. In the Port field, enter 80 .

18. Tap on ⬚ Save . The network settings will be closed.

19. Enter the following login data:

| User name | Almemo500 |
| Password | Ahlborn2016 |

20. Tap on ⬚ Login .

> ➢ The home display of the app will open.

21. Tap on the icon .

> ➢ The "Display" menu will open.

22. Tap on Start .

> ➢ The measurement will be started.

7 Usage

7.1 How to prepare the Measurements

7.1.1 How to connect and check the Power Supply

How to connect the Power Supply

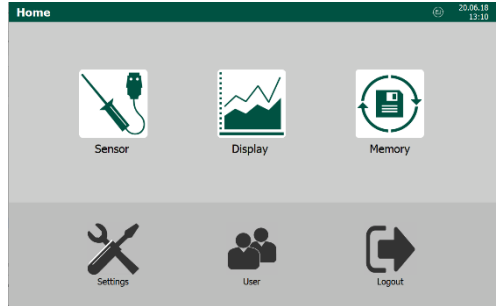→ Plug the DC connector of the network adapter into the DC IN socket **10** and connect the mains plug to a wall socket.

☞ In case you intend to use battery packs, please wait until the batteries are fully charged, all CHARGE STATE LEDs **26** have lightened up and the FAST CHARGE LED **24** respectively the SLOW CHARGE LED **23** has gone out.

☞ The data logger is powered with a supply voltage of 12V DC. The power is supplied by an included mains unit or by optionally available rechargeable battery packs.

How to query the Operating Parameters

→ Press the right one of the Navigation keys **4** repeatedly until the Status display **3** shows menu "5) Supply".

```
5) Supply:
U In:            12V
U CPU:           3.3V
U WLAN:          3.3V
U USB:           5.0V
```

Alternatively:

1. Log in to the ALMEMO® 500 app, respectively press the Back button repeatedly until the home screen appears.

2. Tap on the button Settings ⚒.

3. Tap on the **>** arrow in the line Power supply 🔋.

☞ The operating parameters that can be queried are: supply voltage, CPU voltage, WLAN voltage, USB voltage, remaining time of the battery, battery status, voltage and power of the battery and the mains unit, charging mode, and battery temperature.

☞ To enable the display of the operating parameters of the rechargeable batteries, you need to tick the checkbox next to Update data of battery units, first.

7.1.2 How to connect/disconnect Sensors

How to connect a Sensor

! The data logger needs to be switched off.

→ Connect the ALMEMO® plugs of the desired sensors to the ALMEMO® Input sockets **12**. Make sure that the two locking levers engage correctly.

☞ All standard sensors with ALMEMO® plugs are generally programmed with measuring range and dimension and can therefore readily be connected to every ALMEMO® input socket.

☞ The comprehensive ALMEMO® sensor program and the option to connect your own sensors to ALMEMO® measuring instruments are described in detail in the ALMEMO® Manual (see ALMEMO® Manual, 2020, chapter 3 and chapter 4).

How to disconnect a Sensor

! The data logger needs to be switched off.

→ Press the two locking levers of the ALMEMO® plug and remove it from the input socket.

7.1.3 How to switch the Data Logger on/off

How to switch on the Data Logger

→ Shortly press the ON/OFF key **9**.

➢ The ON LED of theStatus and control lights (CPU card) **5** will light up.

➢ The Ahlborn logo appears on the Status display **3** and shortly afterwards, the text "Web Service Initialization…" will be displayed.

➢ On the Status display **3** the menu "1) Network Conf." will be displayed.

☞ The startup phase takes some time since the data logger must be initialized and an integrity check of the measured data storage is executed at each system start.

☞ Do not disconnect the data logger from the power supply during the startup phase but rather shut down the device – if necessary – in a controlled manner by shortly pressing the ON/OFF key 9 again.

☞   Without any Navigation key activity, the Status display **3** enters a power saving mode after a while. Push one of the Navigation keys **4** to reactivate the status display.

How to switch off the Data Logger

→   Shortly press the ON/OFF key **9**.

➤   The ON LED of the Status and control lights (CPU card) **5** will go out.

☞   Pressing the ON/OFF key **9** for longer than five seconds, the data logger will shut down in an uncontrolled manner. This is not recommended as it may cause the loss of measured data.

7.1.4 How to connect the Tablet with the Data Logger

!   The data logger needs to be switched on.

→   Press long on the ON/OFF key of the tablet.

→   Follow the steps 6 to 20 in chapter 6 Initial Operation.

☞   After a successful first login, please change the login data of the access point as well as the password of the WLAN connection (see chapter 8.1.6 How to configure the Access Point).

7.1.5 How to login to the App

!   The data logger needs to be switched on.

!   The tablet, the PC, or the iOS device must be connected to the data logger.

1. Tap on the 🟢 icon of the ALMEMO® 500 app.

➤   The app will open.

2. Enter the following login data.

    User name   Almemo500

    Password   Ahlborn2016

3. Tap on Login .

☞   Regarding the first login, please follow the steps 14 to 20 in chapter 6 Initial Operation.

7.2 How to perform Measuring Operations

7.2.1 How to start/stop Measuring Operations

! The sensors must be connected.

! The data logger needs to be switched on.

☞ During a measuring operation, measured values are saved in the selected storage cycle interval in the data logger (see chapter 8.1.2 How to set the Storage Cycle Interval of the Data Logger.)

☞ Before starting a measurement operation, make sure the date and time are set correctly (see chapter 8.1.1 How to set Time and Date).

Also make sure that the data storage mode (see chapter 7.2.4 How to set the Data Storage Mode) and the storage cycle interval (see chapter 8.2.1 How to set the Storage Cycle Interval of the Data Logger) are set according to your needs.

If necessary, name or number the upcoming measurement to make it easier to recognize the memory file later (see chapter 7.2.5 How to manage Measurements).

☞ Make sure that no or the desired stop time is set and no or the desired measurement duration is set so that the cyclic measurement is not stopped prematurely.

How to start the Measuring Operation

1. In the home screen of the app, tap on the button ⌦.

➤ The menu Display ⌦ will open.

2. Tap on [**Start**].

➤ The measuring operation will start.

➤ The START LED of the Status and control lights (CPU card) **5** will light up.

➤ In the header of the app, the arrows of the icon 🔄 will start flashing.

☞ 🔄 In case the data storage mode "ring memory" is enabled, the arrows flash in orange.

🔲 In case the data storage mode "linear memory" is enabled, the arrows flash in blue.

The first measuring operation will be saved in the data storage mode "ring memory". When this memory is full, the oldest data will be overwritten.
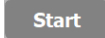
Any further measuring operations will be saved in the data storage mode "linear memory". When this memory is full, the measuring operation will stop automatically.

☞   After a measurement has been started, no further programming is possible. It is not permitted to reconnect sensors, i.e. changes will not be recognized and therefore not be evaluated.

How to stop the Measuring Operation

1. In the home screen of the app tap on the button 📈.

➢   The menu Display 📈 will open.

2. Tap on the button Stop .

➢   The START LED of the Status and control lights (CPU card) **5** will go out.

➢   In the header of the app, the arrows of the icon 🖫 will no longer flash.

☞   You will find the buttons Start and Stop in the menu Memory 🖫 as well.

7.2.2 How to monitor a Measuring Operation

1. In the home screen of the app, tap on the button 📈.

2. Select the desired measured value presentation.

Channel list	Displays all connected measuring channels and their respective measured values.
Measured value display	Displays individual measured values.
Line chart	Displays plots of several selected measuring channels.
User menu	Measuring channels are displayed individually.

Channel list

→   Tap on the tab featuring the icon ▦.

➢   The channel list displays all measuring channels and their parameters.

How to change the displayed Measured Value Functions
1. Tap on the header of one of the three right columns.
2. Tap on the measured value function that shall be displayed.

Measured value display

→   Tap on the tab featuring the icon ▀▀.

Alternatively

→   In the channel list ▤ tap on the line of the measuring channel that shall be displayed in the measured value display.

How to select a Measured Value
1. Tap on the channel number on the upper left side.
2. Tap on the channel number of the measuring channel you want to display.

Line chart

→   Tap on the tab featuring the icon ∿.

➢   The line graph will open and will feature the time of measurement on the x-axis and the measured value of a dimension on the y-axis.

☞   The line graph always displays the measuring data, which has been recorded since the last login.

   If you open a saved measurement during an ongoing measuring operation, the line graph will show the data of the saved measurement. After closing the display of the saved measurement, the line graph will clear itself and then redraw with the current measurement data of the ongoing measuring operation.

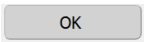   The measurement data of the ongoing measuring operation, which is recorded before and at the time the saved measurement is displayed, will not be displayed in the line graph. However, this data is saved in the data logger.

How to select displayed Measured Values
!   The current measuring operation needs to be started.
1. Tap on the button ✕ **Settings**.
➢   The configuration of the line graph will open.

2. Tap on the header of the column Channel.

3. Tick the checkboxes next to those measured values you want to display by tapping on the checkboxes.

☞ You can select a maximum of 20 measuring channels. By default, the first 20 measuring channels are selected.

4. Untick the checkboxes next to those measured values you do not want to display by tapping on the checkboxes.

5. Tap on the button OK .

6. Tap on the button Save settings .

How to display Measured Values on the right Y-Axis

1. Tap on the button ✕ **Settings** .

➢ The configuration of the line graph will open.

2. In the line of the measuring channel whose measured values you want to be displayed in the right y-axis, tap on the cell of the column Axis.

3. Tap on Right axis.

➢ The measured values of the measuring channel will be displayed on the right y-axis.

How to choose the Dimensions of the Y-Axis

! Measuring channels must be assigned to the right y-axis.

1. Tap on the button ✕ **Settings** .

➢ The configuration of the line graph will open.

➢ The column Axis will show on which y-axis the dimensions of the measuring channels will be displayed.

2. In the lower left corner, tap on the field next to Axis 1 Axis 1 .

3. Tap on the dimension that shall be displayed on the left y-axis.

4. In the lower right corner, tap on the field next to Axis 2 Axis 2 .

5. Tap on the dimension that shall be displayed on the right y-axis.

6. Tap on the button Save settings .

How to change the Colour of the Measured Value Graphics

1. Tap on the button ✕ **Settings** .

➢ The configuration of the line graph will open.

2. In the column Colour tap on the cell of the measuring channel.

3. Tab on the desired colour.

4. Tap on the button Save settings .
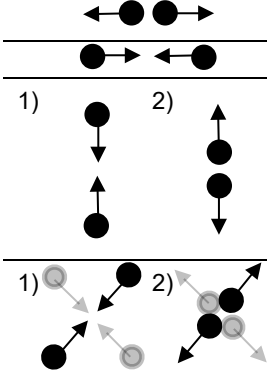
How to change the Time and Date Format

1. Tap on the button ✕ **Settings** .

➢ The configuration of the line graph will open.

2. Tap on the end of the line date and time format.

3. Tap on the format in which the time of measurement shall be displayed.

4. Tap on the button Save settings .

How to scale the Axes

1. Tap on the button ☰ on the upper right side.

2. Tap on the button featuring the desired scaling method.

➢ The button will light up in red.

Possible Scaling Methods

 Manuell	The axes can be arbitrarily scaled by swipe gestures.

	Zoom into the time axis
	Zoom out of the time axis

1) 2) 	1) Zoom out of the y-axis (axes) 2) Zoom into the y-axis (axes)
1) 2) 	1) 1) Zoom out of the x- and y-axis (axes) 2) Zoom into the x- and y-axis (axes)

☞ Axes are jointly scaled.

How to scale y-axes individually

Tap on the y-axis you want to scale.

The y-axis will be highlighted in bold.

Scale the y-axis.

Tap on the line graph.

 Auto	The scaling of the time axis and the y-axis (axes) is fixed. The most recent measured values will be displayed continuously. The current setting of the x-axis will be kept.
 Gesamte Messung	The entire measurement will be displayed. X- and y-axes will be scaled automatically.

How to show or hide the Legend

1. Tap on the button ☰ on the upper right side.

2. Tap on the checkbox in the section legend next to On/Off.

➢ When the checkbox is ticked, the legend is visible.

How to display Saved Measurements

☞ Even during an ongoing measurement operation it is possible to display saved measurement data.

If you open a saved measurement during an ongoing measuring operation, the line graph will show the data of the saved measurement. After closing the display of the saved measurement, the line graph will clear itself and then redraw with the current measurement data of the ongoing measuring operation.

The measurement data of the ongoing measuring operation, which is recorded before and at the time the saved measurement is displayed, will not be displayed in the line graph. However, this data is saved in the data logger.

1. Tap on the button ☰ on the upper right side.

2. Tap on the arrow ❯ next to Load meas. data.

3. Tap on the measurement you want to load.

4. Tap on the button ⎡ Load ⎤.

➢ The measurement will be displayed on the line graph.

☞ The scaling will automatically be set to Manual.

☞ While a saved measurement is displayed, no new measurement operation can be started and no ongoing measurement operation can be stopped.

How to exit the Display of a Saved Measurement

→ Tap on the button ⎡ ⬅ Back ⎤.

➢ The current measurement will be displayed again.

➢ Measurements can again be stopped and started.

User menu

→ Tap on the tab featuring the icon 🖳.

How to set up a User Menu

1. Tap on the button ⎡ Add ⎤.

2. In the field next to User menu template, enter the name of the user menu.

3. Tap on one of the user menu formats. ▤ ▤ ▤

4. Tap on ⎡ Add ⎤.

5. Tap on a cell.

6. Tap on the field next to Channel.

7. Tap on the channel number of the measuring channel you want to be displayed in the selected cell.

8. Tap on the field next to Measured value.

9. Tap on the measured value function that you want to display in the selected cell.

10. Tap on Set cell .

→ Repeat the steps 5 to 10 to fill further cells.

How to empty Cells

1. Tap on any cell.

2. Tap on Empty cell .

How to monitor Measured Value Parameters

In response to certain events, all measured values are displayed with additional symbols or highlighted in colour in the channel list, the measured value display, and the user menu.

24.81 °C	Measured value
43.42 °C	Maximum limit value is overshot
2.25 °C	Minimum limit value is undershot
OVERRANGE 10000 g/kg	Measuring range overrange (flashing)
UNDERRANGE 0 g/kg	Measuring range underrange (flashing)
BREAK ---- ----	Sensor breakage (flashing)
U-LOW ---- ----	Sensor voltage too low (flashing)
📍	Damped measured value
REL	Relative value to a reference value

↗	Measured value changed due to sensor correction or scaling
M̄	Ongoing averaging
▸D ▸H ▸L ▸M ▸A	Output function enabled: difference, maximum value, minimum value, average value, alarm value
CT CT	Temperature compensation CT enabled: value fixed, measured
CP CP	Atmospheric pressure compensation CP enabled: value fixed, measured

7.2.3 How to detect a Sensor Breakage

In case of a sensor breakage, the field of the missing measured value will show the BREAK symbol in the measured value display.

In addition, the ALARM LED of the Status and control lights**13** (measuring circuit board) will light up.

7.2.4 How to set the Data Storage Mode

☞ As soon as a measurement has been started, the arrows of the icon 🖺 will start flashing in the header of the app.

In case the data storage mode "ring memory" is enabled, the arrows flash in orange.

In case the data storage mode "linear memory" is enabled, the arrows flash in blue.

The first measuring operation will be saved in the data storage mode "ring memory". When this memory is full, the oldest data will be overwritten
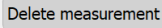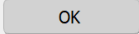
Any further measuring operations will be saved in the data storage mode "linear memory". When this memory is full, the measuring operation will stop automatically.

How to change the Data Storage Mode from linear memory to ring memory

☞ You can only change the data storage mode from linear memory to ring memory after all saved measurements have been deleted. Therefore, you should export all measurements, whose data you might need, before changing the data storage mode (see chapter 7.3 How to export Measurements from the Database).

! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button 🖴.

2. Tap on the arrow **>** next to Manage measurements

3. Tap on the checkbox in the header.

➢ The checkboxes in every line will be ticked.

4. Tap on the button Delete measurement .

5. Tap on the button OK .

➢ The next measurement will be saved in the data storage mode ring memory.

☞ To be able to save further measurements in the data storage mode ring memory, all saved measurements must be deleted again.

7.2.5 How to manage Measurements

How to label the next Measurement

! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button ✖.

2. Tap on the arrow **>** next to Data logger.

3. Tap on the field next to Name of measurement.

4. Enter a name for the measurement.

5. Tap outside of the field.

➢ The next measurements that will be started will receive the listed name complemented with an ascending index.

How to delete Measurements
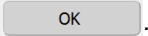
! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button 🖫.

2. Tap on the arrow **>** in the line Manage measurements.

3. Tap on the checkbox positioned at the end of the line of the measurement that you want to delete.

4. Tap on the button `Delete measurement`.

5. Tap on the button `OK`.

➢ The measurement will be deleted from the database of the data logger.

☞ To delete all measurements at once, in step 3 you need to tap on the checkbox in the header. As a result, the checkboxes of all measurements will be ticked.

7.2.6 How to query the Memory Status

→ In the home screen of the app, tap on the button 🖫.

➢ As soon as a measurement has been started, the arrows of the icon 🖫 will start flashing.

☞ 🖫 In case the data storage mode "ring memory" is enabled, the arrows flash in orange.

🖫 In case the data storage mode "linear memory" is enabled, the arrows flash in blue.

➢ In the line memory status the memory used will be displayed in percent.

➢ The entire memory and the free memory will be displayed.
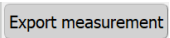
➢ The name and the start time of the measurement most recently started will be displayed.

➢ While a measurement is running, the estimated duration is displayed based on the free memory and on the sampling rate.
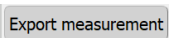
7.3 How to export Measurements from the Database

☞ Measurements saved to the database can be directly saved on a USB flash drive. Alternatively, the measurements can be saved on a PC via an Internet browser or automatically via the software ALMEMO® Control.

7.3.1 How to save Measurement Data on a USB Flash Drive

1. Plug a USB flash drive into the USB A port **8** .

2. In the home screen of the app, tap on the button 🖴 .

3. Tap on the tab featuring the icon 🖹 .

4. Tap on the arrow **>** next to Export measurement.

5. Tap on the measurement you want to export.

6. Tap on the button Export measurement .

7. Tap on the field below Storage location.

8. Tap on USB flash drive.

9. Tap on Export .

➢ Measurement data will be saved on the USB flash drive to a .csv file in the folder "Exports". You can open these files in Microsoft Excel or in AMR WinControl.

➢ The progress of the export in percent will be indicated in red in the footer of the app.
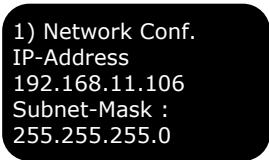
7.3.2 How to save Measurement Data to a PC via an Internet Browser

1. In the home screen of the app, tap on the button 🖴 .

2. Tap on the tab featuring the icon 🖹 .

3. Tap on the arrow **>** next to Export measurement.

4. Tap on the measurement you want to export.

5. Tap on the button Export measurement .

6. Tap on the field below Storage location.

7. Tap on Local export.

8. Tap on Export.

➢ Measurement data will be saved to a.csv file to the internal memory of the data logger.

➢ The progress of the export in percent will be indicated in red in the footer of the app.

9. Connect your PC to the data logger (see chapter 7.5.1 How to connect a PC to the Data Logger).

10. Open an Internet browser.

11. On the Status display **3** in the menu "1) Network Conf.", you will find the IP address.

> 1) Network Conf.
> IP-Address
> 192.168.11.106
> Subnet-Mask :
> 255.255.255.0

12. In the input line of the Internet browser, enter the IP address and add /web (e.g. 192.168.11.106/web).

13. Press ENTER.

➢ The website of the data logger will open.

14. Click on the folder Exports.
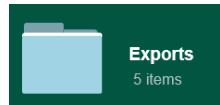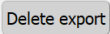
> **Exports**
> 5 items

➢ All measurement data that has been saved to the internal memory of the data logger as .csv file will be displayed.

15. Click on the desired.csv file and open or save it.

7.3.3 How to delete Exported Measurements from the Internal Memory of the Data Logger respectively from a USB Flash Drive

! To delete an exported measurement from a USB flash drive, the USB flash drive must be plugged into the USB A port **8** .

1. In the home screen of the app, tap on the button 🔘.

2. Tap on the tab featuring the icon 🔳.

3. Tap on the arrow **>** in the line Delete exported measurements.

4. Tap on the measurement you want to delete.

☞ The storage medium to which the measurement has been saved will be displayed in the column Storage location.

5. Tap on the button Delete export .

➢ The.csv file of the measurement will be deleted from the internal memory of the data logger respectively from the USB flash drive. However, the measurement still remains on the database of the data logger as long as you do not delete the measurement as described in chapter 7.2.5 How to manage Measurements.

7.3.4 Exporting time segments from several measurements

1. Connect the data logger to the ALMEMO® Control program as described in chapter **Fehler! Verweisquelle konnte nicht gefunden werden. Fehler! Verweisquelle konnte nicht gefunden werden.**.

2. In the Main menu click on File.

3. Click on Convert a file.

4. Click on A500 Messwertspeicher Export (.CSV)…

➢ The Data memory menu is displayed.

5. Click on Memory Readout.

6. Select a storage location on the PC.

➢ The database is saved as a .sqlitedb file in the desired storage location.

➢ The table in the Measured value memory menu shows the measurements contained in the database with their name (first column), their start time (second column) and their end time (third column).

7. In the table click on the row where the measurement from which you want to export a time slice is displayed.

☞ You can select several measurements at the same time to save them to individual files in the same file folder on the PC. To do this, hold down the CTRL key and click on the corresponding lines so that the desired measurements are highlighted.

8. To export a time section that does not correspond to the measurement start and end times, click on the checkbox Memory Readout- Time Interval so that a check mark is set and enter the start time and the end time in the fields Start date (in the format dd.mm.yyyy), Start time (in the format hh:mm:ss), End date (in the format dd.mm.yyyy) and End time (in the format hh:mm:ss).
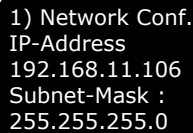
☞ If you want to select a time section that spans several measurements, all corresponding measurements must be selected. Several files will then be saved, each containing the section of a measurement that lies within the time section.

9. If you want to save the time stamp in the export file in coordinated universal time (UTC) instead of the time set in the data logger, click on the checkbox Using Coordinated Universal Time (UTC) in the section Select export settings so that a check mark is set.

10. If the measurement is to be split and saved to multiple export files if it exceeds 128 MB, click the checkbox Split large CSV files so that a check mark is placed.

11. If in the export file the measurement values are to be combined into one line despite small time differences in the time stamps, click on the checkbox Compress measurement data so that a check mark is set. Click the checkbox next to Split if the time difference is greater than and select a time.

12. If in the export file the measurement values are to be combined into one line despite small time differences in the time stamps, click on the checkbox Suppress milliseconds data so that a check mark is set.

13. In the section Working directory , click the button 🖹.

14. Select the file folder where the selected measurement(s) will be exported and saved.

15. Click on OK.

16. Click on the Button Export measurements.

➢ The measurement will be exported to one or more files. This may take some time.

➢ The measurement(s) will be saved as a .csv file, a .txt file, and a .sqlite file in the selected folder.

7.4 How to Save the Database to a PC

Saving the database to a PC via an internet browser

1. Connect your PC to the data logger (see chapter 7.5.1 How to connect a PC to the Data Logger).

2. Open an Internet browser.

3. Read off the IP address in the status display **3** in the menu „1) Network Conf.".

> 1) Network Conf.
> IP-Address
> 192.168.11.106
> Subnet-Mask :
> 255.255.255.0

4. Enter the IP address in the address line of the Internet browser and add **/web**. (for example 192.168.11.106/web)

5. Press ENTER.

➢ The web page of the data logger opens.

6. Click on the folder Database .
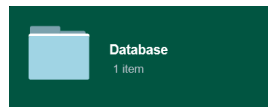
> **Database**
> 1 item

7. Click on the file Measure.sqlitedb .

> .sqlitedb **Measure.sqlitedb**
> 142 MB (29.02.2000 19:55:35)

➢ The .sqlitedb file is saved in the Downloads folder on the PC.

➢ The .sqlitedb file contains the database and can be accessed in the ALMEMO® Control program via the menu Main Menu>File>Convert a file>500 Messwertspeicherexport (.csv)… >Load Database. The measurements or time segments can then be exported from the database as .csv file (see chapter 7.3.4 Exporting time segments from several measurements).

7.5 How to connect the Data Logger to other Devices

7.5.1 How to connect a PC to the Data Logger

How to establish a WLAN Connection

! The WLAN interface of your PC must be activated.

1. Select the WLAN network ALMEMO_500_[six digit identification number]

☞ The baud rate for the USB connection with the data logger ALMEMO® 500 is set to 921 600 baud in the data logger and cannot be changed.

☞ You will be able to clearly distinguish between the WLAN networks of the measuring devices by means of the six digit identification number. You can also find this number on the nameplate on the bottom of the respective measuring device.

2. Enter the password ahlborn_wlan.

3. Click on Connect.

➢ Via the WLAN connection, you can use the ALMEMO® 500 app, the AMR WinControl program and the ALMEMO® Control program.

How to establish an Ethernet Connection

1. Connect the plug of the Ethernet data cable to the Ethernet socket **6**.

2. Connect the other plug of the Ethernet data cable to the Ethernet socket in your PC.

➢ Via the Ethernet connection, you can use the ALMEMO® 500 app, the AMR WinControl program and the ALMEMO® Control program.

How to establish a USB Connection

☞ For the connection via USB, a USB driver must be installed on the PC, which can be downloaded from the following link:

https://www.ahlborn.com/en_UK/service/downloads/drivers

For the installation of the USB driver on the PC see additional instructions ALMEMO® 500 USB driver for PC.

☞ Via the USB connection the data logger is only accessible via the AMR WinControl program. The app and the ALMEMO® Control program cannot be used via the USB connection.

1. Connect the USB-B plug of the USB data cable to the USB B port **7**.

2. Connect the USB A plug of the USB data cable to a USB A port of the PC.

How to read the Number of the COM Ports

3. On your PC keyboard, press the Windows key and the R key simultaneously.

➢ The dialog box Execute will open.

4. Enter devmgmt.msc and press Enter.

➢ The dialog box Device Manager will open.

5. Click on the arrow next to Connections (COM & LPT).

6. Note the COM port number right after ELMO GMAS.

➢ Via the USB connection, you can use the AMR WinControl program.

☞ To be able to install the required driver on your PC (Windows 7 or newer), Windows update must be activated and an Internet connection must be established. See also supplementary Instruction manual "How to Install the USB driver under Windows 7"

How to connect via a Company Network

! The IP address of the access point of the ALMEMO® 500 should be changed to a static IP address, matching the address space of your company (see chapter 8.1.6 How to configure the Access Point).

☞ Ask your IT department to provide you with a static IP address for the access point of the ALMEMO® 500 that is adapted to the address space of your company.

! The DHCP server of the access point of the ALMEMO® 500 must be disabled (see chapter 8.1.6 How to configure the Access Point).

1. Connect your PC to the company network.

2. Switch the data logger off.

3. Connect one of the plugs of the Ethernet data cable to the Ethernet socket **6** and the other one to an Ethernet port of the company network. A switch may be necessary.

4. Switch the data logger on.

5. In the Status display **3** in menu "1) Network Conf.", note down the IP address that the DHCP server of your company network has assigned to the data logger.

```
1) Network Conf.
IP-Address
192.168.11.106
Subnet-Mask :
255.255.255.0
```

6. Via the company network connection you can use the ALMEMO® 500 app, the AMR WinControl program and the ALMEMO® Control program.

☞ When starting the app or one of the programs, please remember that the IP address of the data logger has changed. The IP address is no longer the IP address of the access point but is now assigned by the company network and can be found in the Status display **3** in menu "1) Network Conf."

7.5.2 How to use the ALMEMO® 500 App on your PC

! The data logger must be connected to the PC via WLAN, Ethernet, or via the company network.

1. Please install the ALMEMO® 500 app from our website https://www.ahlborn.com/en/service/downloads/apps

2. To open the app, click on the icon 🖊.

3. In the lower area of the screen, click on Network settings.

4. In the Status display 3 in menu "1) Network Conf.", note down the IP address. Enter the IP address in the field IP address.

5. In the field Port, enter **80**.

6. Click on the button Save.

```
1) Network Conf.
IP-Address
192.168.11.106
Subnet-Mask :
255.255.255.0
```

7. Enter the following Login data:

| User name | Almemo500 |
| Password | Ahlborn2016 |

8. Click on the button Login.

➢ The home screen of the app will appear.
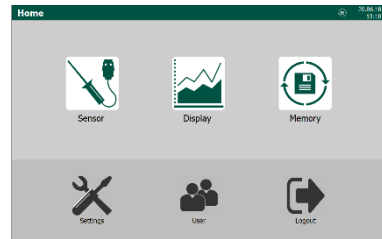
7.5.3 How to connect an iOS Device to the Data Logger

! The data logger needs to be switched on.

1. Switch on the iOS device and unlock it.

2. Open the app Settings.

3. Enable the WLAN interface.

➢ Available WLAN networks will be searched and displayed.

4. Tap on the WLAN network ALMEMO_500_[six digit identification number].

☞ You will be able to clearly distinguish between the WLAN networks of the measuring devices by means of the six digit identification number. You can also find this number on the nameplate on the bottom of the respective measuring device or on the Status display **3** in menu 2) WLAN-SSID.

5. Enter the password ahlborn_wlan.

➢ Tap on Connect.

☞ You can download the ALMEMO® 500 app from the app store.

7.5.4 How to use the ALMEMO® 500 App on Android Devices

! The data logger needs to be switched on.

! The ALMEMO® 500 app must be installed on the Android device.

☞ You can download the ALMEMO® 500 app from the Google Play Store.

1. Switch the Android device on.

2. Enable the WLAN interface.

3. Available WLAN networks will be searched and displayed.

4. Tap on the WLAN network ALMEMO_500_[six digit identification number].

☞ You will be able to clearly distinguish between the WLAN networks of the measuring devices by means of the six digit identification number. You can also find this number on the nameplate on the bottom of the respective measuring device or on the Status display **3** in menu 2) WLAN-SSID.

5. Enter the password ahlborn_wlan and connect the Android device to the WLAN network.

6. To open the app, click on the icon 🌐.

7.5.5 How to use AMR WinControl

! The data logger must be connected to the PC via Ethernet, USB, WLAN, or the company network (see chapter 7.5.1 How to connect a PC to the Data Logger).

1. Install the AMR WinControl program.

2. Open the AMR WinControl program.

3. Enter the activation code.

4. Click on Start program.

5. Click on Settings.

6. Click on Add connection.

7. Depending on the type of the connection, click on Network (for WLAN or Ethernet) or COM Port (for USB).

8. In the Status display 3 in menu "1) Network Conf.", note down the IP address.

> 1) Network Conf.
> IP-Address
> 192.168.11.106
> Subnet-Mask :
> 255.255.255.0

9. Enter the IP address in the field next to IP address or Host.

10. Select 10001. as TCP port.

Alternatively

8. For the connection type COM port click on the corresponding COM port designation.

9. For the device number, enter the device address of the data, see chapter 8.1.4 How to change the Device Address .

10. Click on OK.

7.5.6 How to use ALMEMO® Control

! The data logger must be connected to the PC via Ethernet, WLAN, or the company network (see chapter 7.5.1 How to connect a PC to the Data Logger).

1. Install the ALMEMO® Control program.

2. Open the ALMEMO® Control program.

3. Click on Interface.

4. Click on the tab ALMEMO 500.

5. In the Status display **3** in menu "1) Network Conf.", note down the IP address

```
1) Network Conf.
IP-Address
192.168.11.106
Subnet-Mask :
255.255.255.0
```

6. Enter the IP address in the field next to IP address or host.

7. In the field next to Port enter 80.

8. Enter the user name you use in the ALMEMO® 500 App in the field next to Login.

9. In the field next to Password enter the password you use in the ALMEMO® 500 App.

10. Click on Ok.

11. Click on Search for connected devices.

7.5.7 Further Connection Possibilities

Data logger as access point

WLAN Access-Point

WLAN network

☞ See supplementary Instruction Manual "How to connect the data logger ALMEMO® 500 to a WLAN network as relay-bridge".

SWITCH

Ethernet network
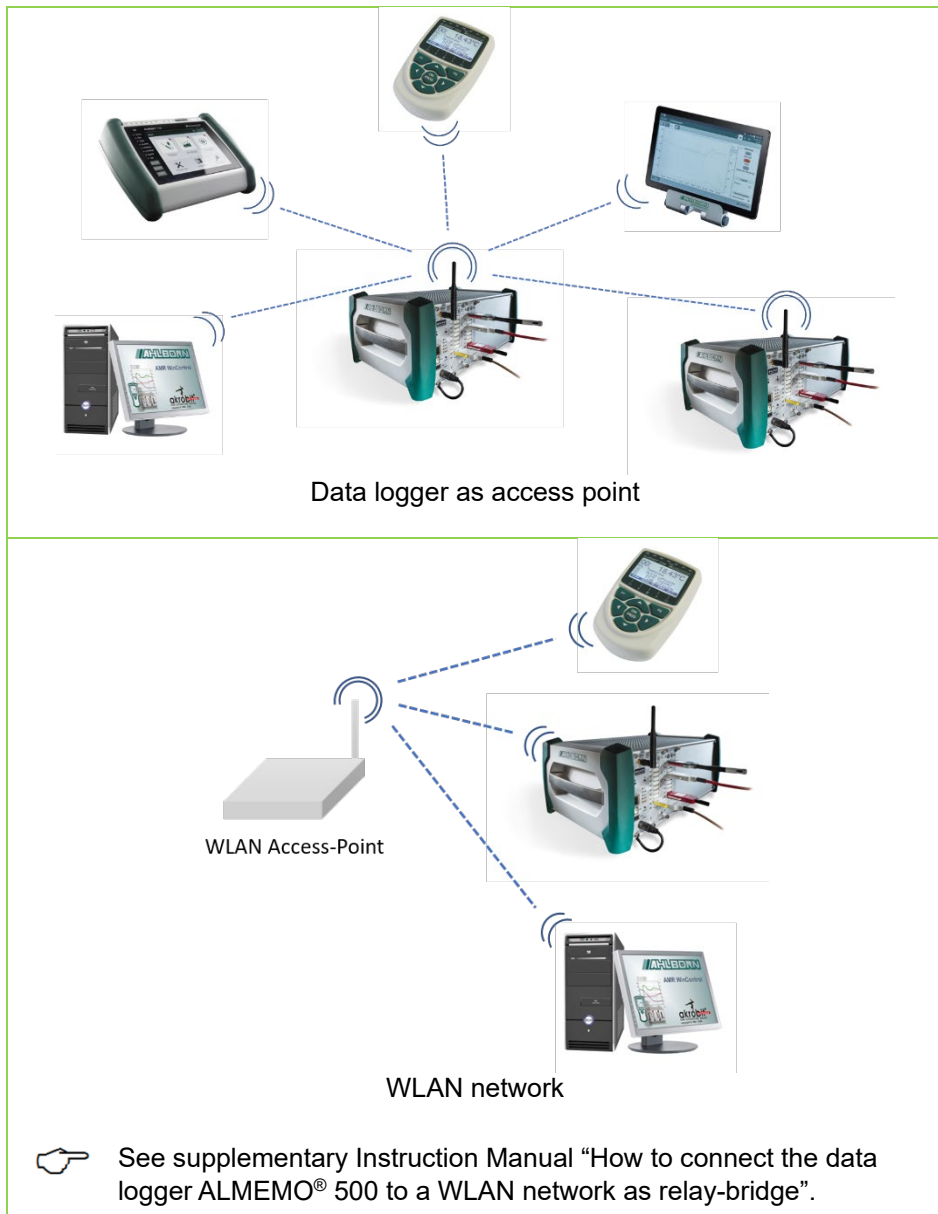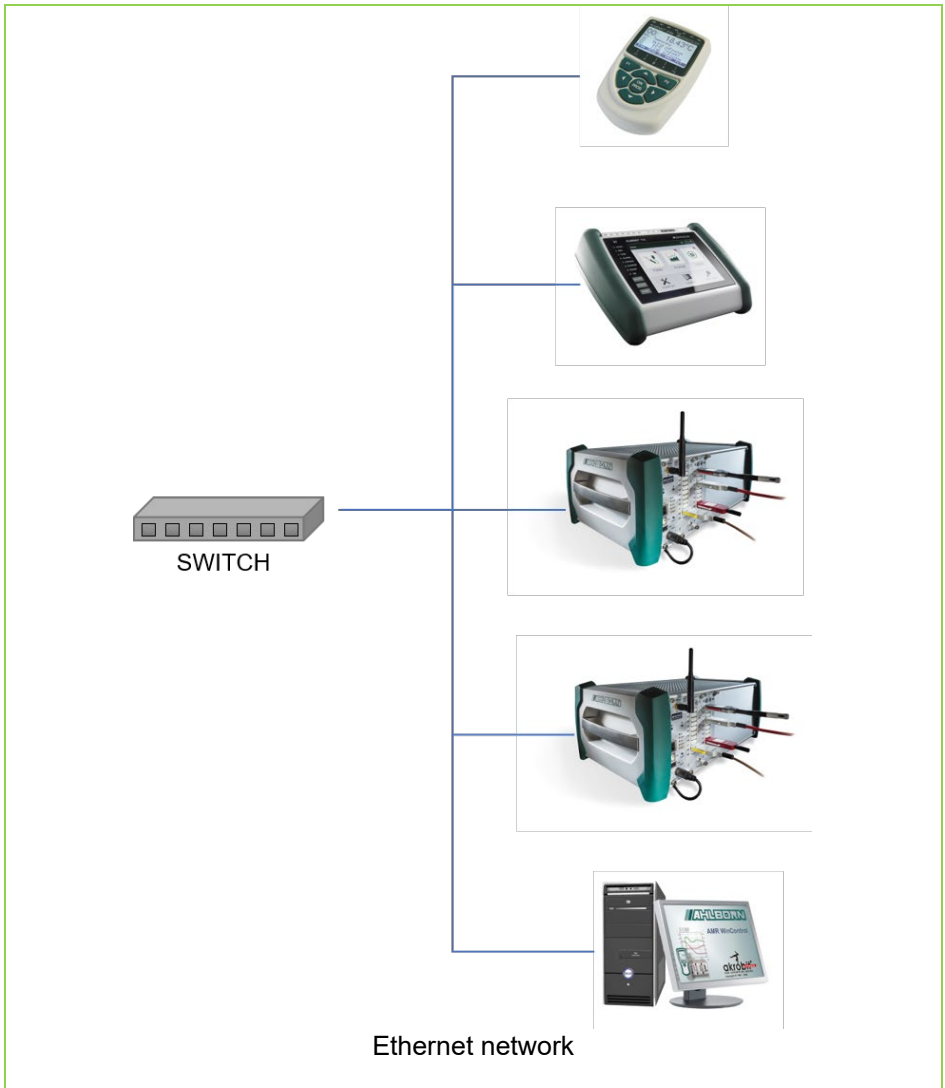
☞ For more detailed information, please consult your technical adviser;
see **www.ahlborn.com** under CONTACT.

7.6 Overview on the Menus of the App

Sensor list

Calibration data	
Sensor channels	Channel locking
	Range selection
	Channel designation and function abbreviation
	Measured value smoothing
	Averaging functions
	Measured value output
	Limit values
	Limit value actions
	Analog output
	Scaling values
	Element flags
	Correction values
	Channel compensation
	Cross-section area
Sensor configuration D6/D7	

Display

Channel list
Measured value display
Line graph
User menu

Memory

Manage memory and measurement
Export measurement

Settings

|		
Device list	Data logger settings (measuring circuit board=MCB)	
	Device settings (MCB)	Macros
		Operating parameters
		Device compensation
		Calibration data
	Power supply (MCB)	
	About the device (MCB)	
	Sensor overview (MCB)	Calibration data
		Sensor channels
		(as above)
		Sensor configuration D6/D7
	Output modules	
Data logger (memory settings)		
Settings (data logger)		
Current supply		
Memory		
About the device		

User

Logout

8 Settings

8.1 How to set the Data Logger

8.1.1 How to set Time and Date

! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button ⚒.
2. Tap on the arrow **>** next to Settings.
3. Tap on 🗓.
4. Tap on the current date.
5. Tap on the number of hours, number of minutes, or number of seconds in the field next to [▲|▼].
6. Delete the number via the keyboard and enter the current time.

8.1.2 How to set the Storage Cycle Interval of the Data Logger

! The current measurement needs to be stopped.

☞ The storage cycle interval of the data logger can either be set globally for all measurement circuit boards or individually for each measuring circuit board (see chapter 8.2.2 Setting the MMU input card address). Data can either be stored during the scanning cycle or during the output cycle.

☞ For further information on how to set the measured value output (and the measured value storage) of one single measuring channel, see chapter 8.3.4 How to set Measuring Channel Functions.

☞ The measured values of all sensors are stored according to the storage cycle interval to the database.

Data of V5, V6, and D6 sensors are measured at **conversion rate** and recorded from the data logger according to the **scanning cycle**. The conversion rate can be set to 2.5, 10, 50, or 100 measurement operation per second. The scanning cycle can be set from 0.001s to 99,999s.

The measured values of D7 sensors are measured by the sensor with the sensor specific measuring rate and recorded by the

measuring device according to the scanning cycle. The shortest scanning cycle is determined by the fastest measuring rate and the number of the connected D7 sensors.

It is therefore possible to record slow sensors (V5, V6, and D6) in combination with fast D7 sensors in one scanning cycle.

The **scanning time** is the time that is required by the measuring device to carry out one single scan of all measuring channels (V5, V6, and D6). The scanning time results from the number of channels to be measured and the configured conversion rate. In addition, the time for special measurements and (for thermo couples) the time for cold junction measurements needs to be added.

The **output cycle** is an additional (data logger internal) storage cycle interval that enables for example a fast measured value acquisition during a slow storage process of the measured values (e.g. triggering fast limit value actions during slow measured value recording). The output cycle can be set from 1s to 24h.

How to save Data in the Output Cycle

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Data logger.
3. Tap on the checkbox next to Update cycle data of the devices.
4. Tick the checkbox next to Save in output cycle.
5. Tap on the field next to Output cycle and enter the desired storage interval of the cycle.
6. Tap outside of the field.
➢ The measured data of all measuring circuit boards is saved according to the new output cycle.

How to save Data in the Scan Cycle

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Data logger.
3. Tap on the checkbox next to Update cycle data of the devices.
4. Tick the checkbox next to Save in scan cycle.
5. Tap on the field next to Scan cycle and enter the desired storage interval of the cycle.

6. Tap outside of the field.

➢ The measured data of all measuring circuit boards is saved according to the new scan cycle.

8.1.3 How to set Storage Location and Size of the Database

! The current measurement needs to be stopped.

1. In case you want to use a USB flash drive as storage location, please plug a USB flash drive in the USB A port 8 .

2. In the home screen of the app, tap on the button ✖.

3. Tap on the arrow **>** next to Data logger.

4. Tap on the field next to Location of measurement memory.

5. Tap on the desired storage location.

➢ The size of the free memory is displayed next to field Free disk space.

6. Tap on the field next to Measurement memory size.

7. Enter the desired storage size that shall be used for the database.

8. Tap outside of the field.

9. Briefly press the ON/OFF key 9.

➢ The data logger is switched off. The ON LED of the Status and control lights (CPU card) 5 goes out.

10. Briefly press the ON/OFF key 9.

➢ The data logger is switched on. The ON LED of the Status and control lights (CPU card) 5 is on.

➢ The storage location and the storage size are set.

☞ The USB port can provide a maximum of 500mA (5V). In case you intend to connect an external hard disk, please add an external mains adapter to power the hard disk.

☞ You will find further information regarding the export of measured data in chapter 7.3 How to export Measurements from the Database .

8.1.4 How to change the Device Address

! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button ✗.

2. Tap on the arrow **>** next to Settings.

3. Tap on the field next to Device address for AMR WinControl.

4. Enter the desired device address.

☞ All measuring devices you want to use in AMR WinControl, must have different device addresses configured.

8.1.5 How to set Start and Stop Mode

! The current measurement needs to be stopped.

1. In the home screen of the app, tap on the button ✗.

2. Tap on the arrow **>** next to Device list.

3. Tap on the arrow **>** next to a measuring circuit board.

4. Tap on the arrow **>** next to Data logger settings.

5. Tap on the field next to Start mode and select the desired start mode.

Manual, limit value, trigger	The measurement will start as soon as you tap on the **Start** button.
	Alternatively, the measurement can also be started by a limit value action or by a trigger signal .
Start time	Every day, the measurement starts at the set time.
Start time/ date	The measurement starts at the indicated date at the set time.

6. In the field next to Start time you can enter a start time if desired.

7. In the field next to Start date you can enter a start date if desired.

8. Tap outside of the field.

9. Tap on the field next to Stop mode and select the desired stop mode.

Manual, limit value, trigger	The measurement will stop as soon as you tap on the ⬛ Stop button. Alternatively, the measurement can also be stopped by a limit value action or a trigger signal .
Stop time	Every day, the measurement stops at the set time.
Stop time/ date	The measurement stops at the indicated date at the set time.
Measuring period	The measurement stops after a set measuring period.

10. In the field next to Stop time, you can enter a stop time if desired.

11. In the field next to Stop date, you can enter a stop date if desired.

12. In the field next to Measuring period, you can enter a measuring period if desired.

13. Tap outside of the field.

➢ The measurement will now start and/or stop according to the set start/stop mode.

☞ In case you have set different start/stop modes for different measuring circuit boards, the measurement will be started as soon as the first start time is reached. The measurement will be stopped as soon as the first stop time is reached.

8.1.6 How to configure the Access Point

How to deactivate the DHCP Server in the ALMEMO® 500 App

! The data logger must either be connected to the tablet via WLAN or to the PC via Ethernet or WLAN.

1. In the home screen of the app, tap on the button ✖.

2. Tap on the arrow **>** next to Settings.

3. Untick the checkbox next to Obtain IP address automatically.

➢ The DHCP server of the access point of the ALMEMO® 500 will no longer assign IP addresses. This is necessary in case a further DHCP server is available in the network.

☞ If no further DHCP server is available in the network, in the app you should manually set the IP address of the CPU card to a static IP address using the app.

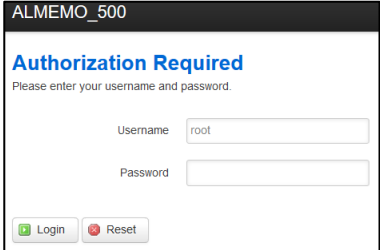→ In the field next to IP address, enter the static IP address.

How to open the Configuration Site

☞ You can either configure the access point via tablet or via the PC.

! The data logger must either be connected to the tablet via WLAN or to the PC via Ethernet or WLAN.

1. Open an Internet browser.
2. Enter the IP address of the access point of the ALMEMO® 500 (set by the factory to **192.168.1.1**) into the address line of the Internet browser.
3. Tap on ENTER.
4. The Login screen of the access point will open.
5. Enter the username (factory-set to **root**) in the field next to Username.

> ALMEMO_500
>
> **Authorization Required**
> Please enter your username and password.
>
> Username   root
>
> Password
>
> ▣ Login   ⊗ Reset

5. Enter the password (factory-set to **Ahlborn2016**) in the field next to Password.
6. Click on the ▣ Login button.
   ➢ The configuration site of the access point will open.

How to change the IP Address of the Access Point

→ Follow the steps 1 to 6 in the section How to open the configuration site.

7. Click on Network .
8. Click on Interfaces .
9. Click on ▱ Edit next to LAN
10. In the tab General Setup enter the desired IP address in the filed next to IPv4 address.
11. Click on Save & Apply .

➢ The IP address has been changed. To access the configuration site of the access point again, you must enter the new IP address in the address line of the Internet browser.

How to deactivate the DHCP Server

☞ Before deactivating the DHCP server for the access point, set a static IP address that matches the Ethernet network over which the data logger is to be operated and the access point is to be set (see above). Otherwise, the configuration page of the access point is no longer accessible.

→ Follow the steps 1 to 6 in the section How to open the configuration site.

7. Click on Network .

8. Click on Interfaces .

9. Click on [🖉 Edit] next to LAN.

10. Scroll to the section DHCP server.

11. In the tab General Setup tick the checkbox next to Disable DHCP for this interface.

12. Click on [Save & Apply].

➢ The DHCP server of the access point of the ALMEMO® 500 will no longer assign IP addresses. This is necessary in case a further DHCP server is available in the network.

☞ If no further DHCP server is available in the network, in the app you should manually set the IP address of the CPU card to a static IP address (see sections How to deactivate the DHCP Server in the ALMEMO® 500 App).

How to change the WLAN SSID

→ Follow the steps 1 to 6 in the section How to open the configuration site.

7. Scroll down to the section Wireless.

8. Click on the WLAN SSID written in blue ALMEMO_500_[six digit identification number].

9. Scroll down to the section Interface Configuration.

10. In the tab General Setup enter the WLAN-SSID you want to assign to the access point in the field next to ESSID.

11. Click on Save & Apply .

➢ The WLAN SSID has been changed.

➢ All WLAN connections to this access point will be disconnected.

How to change the Network Key

→ Follow the steps 1 to 6 in the section How to open the configuration site.

7. Scroll down to the section Wireless.

8. Click on the WLAN SSID written in blue ALMEMO_500_[six digit identification number]

9. Scroll down to the section Interface Configuration.

10. Click on the tab Wireless Security.

11. In the field next to Key enter the new network key.

12. Click on Save & Apply .

➢ The network key has been changed.

➢ All WLAN connections to this access point will be disconnected.

How to change the Password of the Configuration Site for the Access Point

→ Follow the steps 1 to 6 in the section How to open the configuration site.

7. Click on System .
8. Click on Administration .

9. In the section Router Password enter the desired password in the field next to Password.

10. In the field next to Confirmation enter the same password.

11. Scroll down and click on Save & Apply .

➢ The password has been changed.

How to reset the Access Point to its Factory Setting

! The data logger must not be connected to a PC or a network via an

Ethernet data cable.

1. Continue pressing the right one of the Navigation keys **4** until the Status display **3** displays the menu "1) Network Conf.".

2. Press and hold the right one of the Navigation keys 4.

➢ The Status display 3 shows the menu "WLAN Module".

3. Press the left one of the Navigation keys 4 to confirm with YES.

➢ The access point will be reset.

☞ The resetting process may take several minutes. Please be patient.

➢ The Status display **3** displays "Press any key".

4. Switch the data logger off and then on again to reboot the system.

8.1.7 How to assign a static IP Address to a CPU Card

! The data logger must either be connected to the tablet via WLAN or to the PC via Ethernet or WLAN.

1. In the home screen of the app tap on the button ⚒.

2. Tap on the arrow **>** next to Settings.

3. Tick the checkbox next to Obtain IP address automatically.

4. In the field next to IP address enter the static IP address.

8.1.8 How to query Information on the Data Logger

1. In the home screen, tap on the button ⚒.

2. Tap on the arrow **>** next to About the device.

➢ The serial number, the software version of the CPU card, the link to the PDF file of the Instruction Manual as well as the website of the Ahlborn company will be displayed.

How to query recent messages

1. In the home screen, tap on the button ⚒.

2. Tap on the arrow **>** next to About the device.

3. Tap on the arrow **>** next to Messages.

➢ The most recent messages of the data logger will be displayed.

How to query Operating Parameters

→ Continue pressing the right
one of the Navigation keys
4 until the Status display **3**
shows the menu "5)
Supply".

```
5) Supply:
U In:              12V
U CPU:            3.3V
U WLAN:           3.3V
U USB:            5.0V
```

Alternatively

1. In the home screen, tap on the button ✕.

2. Tap on the arrow **>** next to Power supply ▯.

☞ The operating parameters that can be queried are:
supply voltage, CPU voltage, WLAN voltage, USB voltage, remaining
time of the battery, battery status, voltage and power of the battery
and the mains unit. To enable the display of the operating parameters
of the rechargeable batteries, you need to tick the checkbox next to

Update data of the battery pack.

8.2 How to set the Measuring Circuit Board

8.2.1 How to change the Measuring Circuit Board Address

! The data logger needs to be switched off.

→ Use a screwdriver to turn the Coding switch **1** until the arrow of the
coding switch points to the desired number.

☞ The measuring circuit board addresses of the individual measuring
circuit boards must be encoded in ascending order starting from G00,
whereby the left coding switch represents the first digit and the right
coding switch represents the second digit.
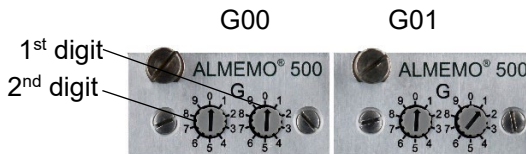
☞ Several measuring circuit boards must not have the same measuring
circuit board address. The addresses from G90 upwards are

reserved i.a. for battery packs and must not be used for measuring circuit boards.

If both MMU input cards and measuring circuit cards are used in a data logger, the device addresses must be coded in ascending order and must not be the same.

8.2.2 Setting the MMU input card address

→ If the MMU input card is inserted in the data logger, switch off the data logger and pull the MMU input card out of the housing of the data logger in the same way as you would pull a Battery Pack, see chapter 10.2 How to remove the Battery Pack from the Housing of the Data Logger.

→ Turn the coding switches so that the slot of the coding switch wheel points to the desired number.

☞ The MMU input card addresses of the individual MMU input cards must be coded in ascending order from G00, where the left coding switch represents the 10s digit and the right coding switch represents the 1s digit of the device address

Example:
MMU input card address 01

☞ Several MMU input cards must not have the same MMU input card address. If both MMU input cards and measuring circuit cards are used in a data logger, the device addresses must be coded in ascending order and must not be the same. The addresses from G90 onwards are reserved for battery plug-in units, among others, and must not be used for measuring circuit cards.

8.2.3 How to set the Storage Cycle Interval of a Measuring Circuit Board

! The current measurement needs to be stopped.

☞ The storage cycle interval of the data logger can either be set globally for all measurement circuit boards or individually for each measuring circuit board (see chapter 8.1.2 How to set the Storage Cycle Interval of the Data Logger). Data can either be stored during the scanning cyle or during the output cycle.

☞ For further information on how to set the measured value output (and the measured value storage) of one single measuring channel see chapter 8.3.4 How to set Measuring Channel Functions.

☞ The measured values of all sensors are stored according to the storage cycle interval to the database.

Data of V5, V6, and D6 sensors are measured at **conversion rate** and recorded from the data logger according to the **scanning cycle**. The conversion rate can be set to 2.5, 10, 50, or 100 measurement operation per second. The scanning cycle can be set from 0.001s to 99,999s.

The measured values of D7 sensors are measured by the sensor with the sensor specific measuring rate and recorded by the measuring device according to the scanning cycle. The shortest scanning cycle is determined by the fastest measuring rate and the number of the connected D7 sensors.

It is therefore possible to record slow sensors (V5, V6, and D6) in combination with fast D7 sensors in one scanning cycle

The **scanning time** is the time that is required by the measuring device to carry out one single scan of all measuring channels (V5, V6, and D6). The scanning time results from the number of channels to be measured and the configured conversion rate. In addition, the time for special measurements and (for thermo couples) the time for cold junction measurements needs to be added.

The **output cycle** is an additional (data logger internal) storage cycle interval that enables for example a fast measured value acquisition during a slow storage process of the measured values (e.g. triggering fast limit value actions during slow measured value recording). The output cycle can be set from 1s to 24h.

How to save Data in the Output Cycle

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, the storage cycle of which you want to adjust.
4. Tap on the arrow **>** next to Data logger settings.
5. Tick the checkbox next to Save in output cycle.
6. Tap on the field next to Output cycle and enter the desired storage interval of the cycle.
7. Tap outside of the field.
➢ The measured data of this measuring circuit board is saved according to the new output cycle.

How to save Data in the Scan Cycle

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board the storage cycle of which you want to adjust..
4. Tap on the arrow **>** next to Data logger settings .
5. Tick the checkbox next to Save in scan cycle.
6. Tap on the field next to Scan cycle and enter the desired time for the scan cycle.
7. Tap outside of the field.
➢ The measured data of this measuring circuit board is saved according to the new scan cycle.

8.2.4 How to query the Storage Cycles of all Measuring Circuit Boards

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Data logger.
3. Tick the checkbox next to Update cycle data of the devices.

➢ The cycles for the storage of the measuring circuit boards are being updated and displayed.

8.2.5 How to set the Conversion Rate of the Measuring Circuit Board

! The current measurement needs to be stopped.

1. In the home screen, tap on the button ✖.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, whose conversion rate you want to adjust.
4. Tap on the arrow **>** next to Data logger settings.
5. Tap on the field next to Conversion rate.
6. Tap on the desired conversion rate.

☞ A low conversion rate increases the measuring accuracy.

8.2.6 How to set Macros

☞ Macros are a number of serial commands that can be executed on the basis of trigger events or in case of limit value actions.For further information on the single commands, see ALMEMO® Manual, 2020, chapter 6 Operation via the serial interface.

☞ You can set up to 5 macros for one measuring circuit board.

! The current measurement needs to be stopped.

1. In the home screen, tap on the button ✖.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, whose macros you want to adjust.
4. Tap on the arrow **>** next to Device settings.
5. Tap on the arrow **>** next to Macros.
6. Tap on the field next to the name of the macro you want to adjust.

7. Enter the individual serial commands. Separate each command with the character | (AltGr + <).

8. Tap outside of the field.

➢ The macro is set and can be used in case of limit value actions (see chapter 8.3.4 How to set Measuring Channel Functions.

8.2.7 How to set Operating Parameters

! The current measurement needs to be stopped.

1. In the home screen, tap on the button ✕.

2. Tap on the arrow **>** next to Device list.

3. Tap on the arrow **>** next to the measuring circuit board whose operating parameter you want to adjust.

4. Tap on the arrow **>** next to Device settings.

5. Tap on the arrow **>** next to Operating parameter.

How to change Mains Hum Suppression to 60 Hz

☞ As default, the mains hum suppression is set to 50 Hz.

→ Follow the steps 1 to 5.

→ Tick the checkbox next to 60 Hz hum suppression.

➢ The mains hum suppression is reduced to 60 Hz.

☞ To reset the mains hum suppression to 50 Hz, untick the checkbox next to 60 Hz hum suppression.

How to delete all Maximum, Minimum and Average Values at each Start

→ Follow the steps 1 to 5.

→ Tick the checkbox next to At start delete maximum / minimum / average values.

How to set the Hysteresis

→ Follow the steps 1 to 5.

6. Tap in the field next to Hysteresis.

7. Enter the desired hysteresis.

8. Tap outside of the field.

☞ The hysteresis can be adjusted from 0 to 99 digits. By default, the hysteresis is set to 10 digits.

How to set the Sensor Voltage

☞ The setpoint sensor voltage is automatically derived from the minimal sensor voltage of the sensors and can be changed to a higher value if required.

→ Follow the steps 1 to 5.

6. Tap in the field next to Sensor voltage, setpoint.

7. Tap on the desired sensor voltage.

➢ The sensor voltage will be set to the new setpoint sensor voltage.

8.2.8 How to set the device compensation values

! The current measurement needs to be stopped.

1. In the home screen tap on the button ✕.

2. Tap on the arrow **>** next to Device list.

3. Tap on the arrow **>** next to the measuring circuit board, whose device compensation values you want to adjust.

4. Tap on the arrow **>** next to Device settings.

5. Tap on the arrow **>** next to Device compensation values.

6. Tap in the field next to Atmospheric pressure .

7. Enter the atmospheric pressure that you want to specify for the atmospheric pressure compensation.

8. Tap in the field next to Temperature compensation.

9. Enter the temperature that you want to specify for the temperature compensation

10. Tap outside of the field.

☞ If you delete the temperature of the temperature compensation, the temperature will automatically be set to 25.0°C.

☞ Next to cold junction compensation temperature, the cold junction temperature will be displayed. This temperature is measured by two precision NTC sensors in the ALMEMO® input sockets M0 and M9, is linearly interpolated, and is used for all thermo couple elements as cold junction temperature.

8.2.9 Information on how to query the Measuring Circuit Board

How to query Device Type, Software Version, Device Option and Serial Number

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, about which you want to query information.
4. Tap on the arrow **>** next to About the device.

Power supply

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, about which you want to query information.
4. Tap on the arrow **>** next to Power supply.

Calibration Data

1. In the home screen, tap on the button ⚒.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, about which you want to query information.
4. Tap on the arrow **>** next to Device settings.
5. Tap on the arrow **>** next to Calibration data.
➢ The serial number and the end date of the calibration interval will be displayed.

☞ If you tick the checkbox next to Calibration message, the app will display a report after the expiry of each calibration interval of the data logger and of the connected sensors.

8.3 How to set a Sensors

8.3.1 How to display the Sensor

1. In the home screen, tap on the button ⌁.
➢ All sensors that are connected to one measuring circuit board will be displayed together with the measuring point number (Mx)(measuring circuit board address and number of the ALMEMO® input socket), the sensor type (type), possibly a description, the software version, and the serial number.
➢ On the top left above the table a field indicates to which measuring circuit boards the displayed sensors are connected.
2. Tap on the field above the table.
3. Tap on the name of the measuring circuit boards whose sensors you want to display.

Alternatively

1. In the home screen tap on the button ✕.
2. Tap on the arrow **>** next to Device list.
3. Tap on the arrow **>** next to the measuring circuit board, whose sensors you want to display.
4. Tap on the arrow **>** next to Sensor overview ⌁.
➢ All sensors connected to this measuring circuit board will be displayed.

8.3.2 How to query the Calibration Data and set the calibration interval

How to query the Calibration Date

1. Display the sensors of one measuring circuit board.
2. Tap on the arrow **>** next to the sensor, whose calibration data you want to query.

3. Tap on the arrow **>** next to Calibration data.

➢ The end date of the calibration interval will be displayed.

How to set the Calibration Interval

! The current measurement needs to be stopped.

1. Display the sensors of one measuring circuit board.

2. Tap on the arrow **>** next to the sensor, whose calibration interval you want to adjust.

3. Tap on the arrow **>** next to Calibration data.

4. Tap on the field next to Calibration interval.

5. Enter the requested calibration interval in months.

6. Tap outside of the field.

➢ The new calibration interval has been set.

☞ If you tick the checkbox next to Calibration message, the app will display a report after the expiry of each calibration interval of the data logger and of the connected sensors.

8.3.3 How to set the Sensor Configuration

☞ You can adjust the sensor configuration of D6 and D7 sensors. The sensor configuration of V5 and V6 sensors can be adjusted via the measuring channel function or in the ALMEMO® Control software.

☞ The sensor configuration allows the setting of variables that determine how the input signals in the probe connector are processed into measurement data such as measuring range, measuring rate, averaging time, measured value attenuation and other probe-specific variables.

! The current measurement needs to be stopped.

1. Display the sensors of one measuring circuit board.

2. Tap on the arrow **>** next to the sensor, whose sensor configuration you want to adjust.

3. Tap on the arrow **>** next to Sensor configuration (D6, D7).

➢ The set sensor configuration will be displayed.

4. Tap on the filed next to the channel number of the measuring channel, whose range you want to adjust.

5. Tap on the requested range.

➢ You can adjust further sensor specific parameters by clicking on the field next to the parameter name and entering the requested size.

8.3.4 How to set Measuring Channel Functions

! The current measurement needs to be stopped.

1. Display the sensors of one measuring circuit board.

2. Tap on the arrow **>** next to the sensor, in which you want to adjust a measuring channel function.

3. Tap on the arrow **>** next to Sensor channels.

4. Tap on the arrow **>** next to the measuring channel, whose measuring channel function you want to adjust.

How to lock a measuring channel

☞ Depending on the locking level, the channel locking protects the measuring channel against the change of the measuring channel functions.

☞ Before adjusting the measuring channel function, the locking level must be reduced to such a level, that the activated channel locking is disabled.

☞ A higher locking level implies the channel locking of lower locking levels.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Channel locking.

6. Tick the checkbox of the highest locking level you want to set.

7. To disable a locking, tap on the checkbox next to the locking level you want to disable. Higher activated locking levels will also be disabled.

How to set Measuring Range, Multiplexer, Reference Channel, and Dimension

☞ While setting the new measuring range, the standard dimension and multiplexer for this range will be automatically set. All settings of the measuring channel functions of the measuring channel will be deleted.

 ! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Range selection.

6. Untick the checkbox next to Locking level 1.

7. Tap on the field next to Range.

➢ All possible measuring ranges will be displayed.

8. Tap on the desired measuring range.

9. Tap on the field next to Multiplexer.

➢ All settings possible for the multiplexer will be displayed.

10. Tap on the desired multiplexer setting.

11. Tap on the field next to Reference channel 1, in case you need a reference measuring point based on which a derived measured value shall be calculated.

12. Tap on the desired reference channel.

☞ It is only possible to select measuring channels that are on the same measuring circuit board. Only the measuring channel of the measuring circuit board that is queried for the calculation of the derived measured value is indicated. The sensor with the desired measuring channel must be connected to the right ALMEMO® input socket.

13. If you need two reference measuring points for the calculation of a derived measured value, tap on the field next to Reference channel 2.

14. Tap on the desired reference channel.

15. If you want to change the dimension of the measuring channel, untick the checkbox next to Locking level 3.

16. Tap in the field next to Dimension.

17. Enter the desired dimension.

18. Tap outside of the field.

☞ If you set a range of calculation as measuring range in the measuring channel, the measuring channel becomes an arithmetic channel. For further information on the individual ranges, see ALMEMO® Manual, 2020, chapter 6.3.3 Selecting the measuring range.

How to assign Channel Designation and establish a Function Channel

☞ The channel designation will be displayed in all measured value displays. The channel designation helps to individually label the sensor type, the measuring location or the operational purpose.

☞ You can provide every measuring channel with a 10 digit (20 digits for D7 sensor) designation existing of ASCII characters (except for; / | #).

A „!" at the end of a designation indicates than a customer-specific linearization table respectively a multi-point calibration is active within the plug.

The following table lists all possible function abbreviations that can stand at the beginning of a channel designation and that imply certain special functions.

*J	Defines a temperature sensor (NTC, Pt100) for external cold junction compensation (see ALMEMO® Manual, 2020 chapter 6.7.3 Measure cold junction temperature with external sensor).
#J	Implies for a thermocouple to use an internal cold junction sensor (see ALMEMO® Manual, 2020, chapter 6.7.3).
*T	Defines a temperature sensor (NTC, Pt100) as a reference for temperature compensation.
*P	Defines an atmospheric pressure sensor as a reference for atmospheric pressure compensation.
#N	Has the following effect for flow measurements: conversion of measurement conditions of temperature compensation and atmospheric pressure compensation to standard conditions
*R	The measured value is provided as an operand for the sensors of this and all other measurement circuit boards.

> To be able to use this measured value on another measured circuit board, the desired measuring circuit board must have an activated measuring channel featuring the measuring range MesR .
>
> ☞ See Supplementary Instruction Manual: How to activate a function channel MesR (ALMEMO® 500).

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Channel designation, function abbreviation.

6. Tap on the field next to Channel designation.

7. Enter the desired channel designation.

8. If you want to use the measuring channel as function channel, tap on the button ⬤ next to the desired function.

➢ The function channel is established and the function abbreviation will automatically be put in front of the channel designation.

How to set the Measured Value Smoothing

☞ The measured value smoothing serves to smooth respectively steady measured values by a sliding averaging over a set period of time for fluctuating measured values (e.g. for flow measurements with turbulence).

☞ The measured value smoothing has the following effect:

$$\overline{M}=(\sum_i m_i)/N$$
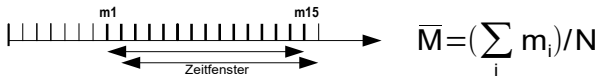
The smoothed measured value also applies to all following evaluation functions. The measured value smoothing can therefore also be used in combination with the averaging function.

☞ The measured value smoothing will be adjusted in the range of 0 to 99 according to the number of the values averaged at a time.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Measured value smoothing.

6. Tap on the field next to Measured value smoothing.

7. Enter the number of the values averaged at a time.

➢ The resulting time slot (s) = measured value smoothing / conversion rate * (V5 channels +1) will be displayed.

How to set the Averaging Function

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Averaging function.

6. Tap on the field next to Averaging mode .

7. Tap on the desired averaging mode.

CONT	Averaging of all measured values of the measuring channel from start to stop of the measurement.
CYCL	Averaging of all measured values in one scan cycle.

➢ After the measurement has been started, the measured values will be averaged and the average value as well as the number of the averaged values will be displayed in the averaging function. They can also be shown in the measured value display.

☞ To record averaged values either the output function must be enabled (see section How to set the Measured Value Output) or a function channel featuring the range M(t) must be established (see section How to assign a Channel Designation and establish a Function Channel.

☞ You can delete the average value separately or together with all maximum and minimum values by ticking the checkbox of the delete function you prefer.

How to set the Measured Value Output

☞ If a measured value output that reads out a function value (e.g. maximum value) instead of a measured value has been set, only the appropriate function value will processed when saving to memory, analog output, and digital output.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Measured value output.

6. Untick the checkbox next to Locking level 4.

7. Tap on the field next to Output function.

8. Tap on the desired output function.

☞ The cycle factor determines the number of times that the function value or measured value will be read out. The function value will be read out once per x cycles, as the cycle factor defines.

The cycle factor can be set from 0 to 99 cycles. If the cycle factor is set to 0, the cycle factor will not be read out.

9. Tap on the field next to Cycle factor.

10. Enter the desired cycle factor in units of cycles.

11. Tap outside of the field.

How to set Limit Values

☞ For every measuring channel you can set a maximum limit value and a minimum limit value.

In case the maximum limit value is overshot, an acoustic signal sounds, the ALARM LED of the Status and control lights**13** (measuring circuit board) lights up, and the maximum value of the measuring channel of the measured value display will be displayed in red.

In case the minimum limit value is undershot, an acoustic signal sounds, the ALARM LED of the Status and control lights**13** (measuring circuit board) lights up, and the minimum value of the measuring channel of the measured value display will be displayed in blue.

Since the minimum and maximum values remain colored, you can still see at the end of the measurement if the limit values have been over- or undershot.

The alarm state (the sound of the acoustic signal and the light of the ALARM LED) persists until the measured value over- respectively undershoots the limit value again by the hysteresis.

The hysteresis setting can be modified in the range of 0 to 99 digits. The hysteresis is preset to 10 digits.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Limit values.

6. Untick the checkbox next to Locking level 7.

➢ The current maximum and minimum values will be displayed.

7. Tap on the field next to Limit value, maximum.

8. Enter the desired maximum limit value.

9. Tap on the field next to Limit value, minimum.

10. Enter the desired minimum limit value.

11. Tap on the field next to Hysteresis. Enter the desired hysteresis in digits.

How to set Limit Value Actions

☞ In addition to the alarm state described in the previous section, limit value actions can be set.

☞ The limit value action is only active until the measured value has returned to within the limit value by the hysteresis.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to limit value actions.

6. Untick the checkbox next to Locking level 6.

7. Tap on the field next to Action- maximum.

8. Tap on the desired limit value action.

Alarm only	No limit value action has been set.
Start measuring	Measurement starts as soon as the limit value has been under- or overshot.
Stop measuring	Measurement stops as soon as the limit value has been under- or overshot.

Single measurement "Manually"	If the limit value is over- or undershot, a single scan of all measuring channels will be performed.
Set timer to zero	The value of the channel, in which the measuring range "Time" is set, will be set to zero in case the limit value is over or undershot.
Macro 5 to 9	The selected macro will be started in case the limit value is over- or undershot.

9. Tap on the field next to Action- minimum.

10. Tap on the desired limit value action.

How to set Scaling Values

☞   The scaling of a measured value has the following effect:

Displayed measured value = (corrected measured value – base value) x Factor

☞   The factor is adjustable in the range of -1.9999 to +1.9999.

Using the exponents, the comma can either be shifted to the left (using a negative number) or to the right (using a positive number).

!   The current measurement needs to be stopped.

→   Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Scaling values.

6. Untick the checkbox next to Locking level 5.

7. Tap on the field next to Base value.

8. Enter the base value.

9. Tap on the field next to Factor.

10. Enter the factor.

11. Tap on the field next to Exponential.

12. Enter the exponents.

☞   If scaling values are set in a measuring channel, the measured value will be displayed in the measured value display featuring the adjustment arrow ↗.

How to set the Correction Values Zero-Point and Gain

☞ The correction of a measured value has the following effect:

Corrected measured value= (measured value – zero point) x gain

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Correction values.

6. Untick the checkboxes next to Locking level 2 and Locking level 4.

7. Tap on the field next to Zero point.

8. Enter the desired zero point.

9. Tap on the field next to Gain.

10. Enter the desired gain value.

☞ If correction values are set in a measuring channel, the measured value will be displayed in the measured value display featuring the adjustment arrow ↗ .

☞ Calibration offset and calibration factor are correction values, which – for some sensors – are set by the factory. These values will be displayed, they can, however, not be changed.

How to enable Element Flags for sensor specific additional Functions

☞ Element flags can be activated for some measuring ranges.

For more information on the individual element flags, see ALMEMO® Manual, 2020, chapter 6.10.3 Element flags.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Element flags.

6. Untick the checkbox next to Locking level 1.

7. Tap on the checkbox next to the element flag you want to enable.

How to set Compensation Values

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Channel compensation.

> ➢ All compensation values that are used in this measuring channel for compensation will be displayed.

☞ The compensation values used are retrieved from the measuring channels with the corresponding function abbreviations in the channel designation (see chapter 8.3.4 How to set Measuring Channel Functions, section How to assign a Channel Designation and establish a Function Channel).

In case several identical function abbreviations are used within one measuring device, the function value with the corresponding function abbreviation of the next smaller channel number will always be used as compensation value for a measuring channel.

☞ As long as no function abbreviations have been assigned to the channels, internal measured and programmed values are used for the compensation in this measuring channel.

☞ By tapping on the arrow **>** next to Device compensation, the menu device compensation will open and show the currently used compensation values (see chapter 8.2.88 How to set the device compensation).

How to enter a Cross-Section Area

☞ During a volume flow measurement in a flow channel, the cross-section area is multiplied by the medium flow velocity. For further information on volume flow measurement see ALMEMO® Manual, 2020, chapter 3.7.4 Volume Flow Measurement.

! The current measurement needs to be stopped.

→ Follow the steps 1 to 4.

5. Tap on the arrow **>** next to Cross-section area.

6. Tap on the field next to Cross-section area.

7. Enter the cross-section area of the flow channel in cm^2.

8. Tap outside of the field.

8.3.5 How to enable a new Measurement Channel

! The current measurement needs to be stopped.

1. Display the sensors of the measuring circuit board.

2. Tap on the arrow **>** next to the sensor, in which you want to enable a new measurement channel.

3. Tap on the arrow **>** next to Sensor channels.

4. Tap on the checkbox next to the measuring channel you want to enable.

➢ The measurement channel has been enabled.

☞ Enabling a measuring channel may take several seconds.

5. Tap on the arrow **>** next to the measuring channel you have just enabled.

6. Tap on the arrow **>** next to Range selection.

7. Untick the checkbox next to Locking level 1.

8. Tap on the field next to Range.

9. Tap on the desired measuring range.

8.3.6 How to disable a Measuring Channel

☞ If a measuring channel is disabled, it will not appear in the measured value display and its measured data will not be saved.

! The current measurement needs to be stopped.

1. Display the sensors of the measuring circuit board.

2. Tap on the arrow **>** next to the sensor, of which you want to disable a measuring.

3. Tap on the arrow **>** next to Sensor channels.

4. Tap on the checkbox next to the measuring channel you want to disable.

➢ The measuring channel has been disabled. By tapping on the checkbox once again you can re-enable the measuring channel. All measuring channel functions that were set before disabling the channel will be restored.

☞ Enabling /disabling a measuring channel may take several seconds.

8.4 How to set a Measured Value Function

1. In the home screen of the app tap on the button .
2. Tap on the tab featuring the icon .
3. Tap on the channel number at the top left of the screen.
4. Tap on the channel number of the measuring channel, whose maximum, minimum and average values you want to delete.

8.4.1 How to delete Maximum, Minimum or Average Values

→   Follow the steps 1 to 4.
5. Tap on the measured value.
6. Tap on the field next to the channel number.
7. Tap on the measured value function you want to use

Delete maximum value	Deletes the maximum value measured so far.
Delete minimum value	Deletes the minimum value measured so far.
Delete average value	Deletes the average value measured so far.
Delete all maximum, minimum, and average values	Deletes the maximum, minimum, and average value measured so far.

8.4.2 How to zero-set or adjust the Measured Value

→   Follow the steps 1 to 4.
5. Tap on the measured value.
6. Tap on the field next to the channel number.
7. Tap on the measured value function you want to use.

Zero-setting	Transforms the measured value into a base value and from then on subtracts the base value from the measured value. To display the actual measured value again, the base value must be deleted. (see chapter 8.3.4 How to set Measuring Channel Functions, How to set Scaling Values)
Temporary zero-setting	The function is the same as the one of "Zero setting". The base value will be deleted as soon as the sensor is disconnected or the device is switched off.
Adjustment	The measured value is saved as zero-point correction and will be subtracted from the measured value from then on. ☞ If a base value has been set instead of zero, the measured value will display the negative base value after the adjustment.
Setpoint adjustment	The measured value will be corrected to a defined setpoint, which has been entered previously. ! The sensor must be set to the setpoint in advance (e.g. boiling water)

8.5 How to configure the ALMEMO® 500 App

8.5.1 How to manage User Rights

How to add new User Rights

! You must be logged in to the app as administrator.

1. In the home screen of the app, tap on the button User 👥.

2. At the top right of the screen tap on Add.

3. Enter a username.

4. Choose a user role.

☞   **Administrators** have all operating options in the app. **Viewers** can view measurements and all configurations but are not allowed to make any changes.

   5. If desired, enter a comment

   6. Enter a password.

   7. Tap on Add

How to delete a User

   !   You must be logged in on the app as administrator.

   1. In the home screen of the app, tap on the button User 👥.

   2. Tap on the waste bin 🗑 next to the user you want to delete.

   3. Tap on Delete.

☞   It is not possible to delete the user, who is currently logged -in.

☞   An administrator is allowed to delete other administrators.

How to view User Data

   1. In the home screen of the app, tap on the button User 👥.

   2. Tap the line of the user, whose data you want to view.

☞   It is not possible to change the user profile. Only the comment can be changed.

8.5.2 How to query the WLAN SSID of the connected Data Logger

   1. In the home screen, tap on the button ✖.

   2. In the header of the app, tap on the icon 📶.

   ➢ The WLAN SSID will be displayed.

8.5.3 How to log out as a User

In the home screen, tap on the button 🔚 to log out of the app.

9 Access Data

	Factory default login data	Changing procedure
WLAN	SSID: ALMEMO_500_[six digit number] (six digit identification number, can also be found on the nameplate)	See chapter 8.1.6 How to configure the Access Point
	Network key: ahlborn_wlan	
ALMEMO® 500 app	User name: Almemo500	See chapter 8.5 How to configure the ALMEMO® 500 App
	Password: Ahlborn2016	
Configuration site of the access point	IP address data logger: 192.168.1.1	See chapter 8.1.6 How to configure the Access Point
	User name: root	
	Password: Ahlborn2016	

10 Operation with a Battery Pack (optional)

10.1 Before the First Use of the Battery Pack

☞ For safety reasons, the battery sockets will be unplugged prior to shipment in order to properly interrupt the power supply of the battery pack provided by the battery.

→ In case the battery pack was delivered together with the data logger, please remove the battery pack from the housing of the data logger; see also chapter 10.2 How to remove the Battery Pack from the Housing of the Data Logger.

1. Pin the Battery sockets **2** to the nearest pin header.

2. Press the Reset push button of the battery pack **28**.

➢ At first, all LEDs of the battery pack will light up. In the following only the ON LED **22** and the CHARGE STATE LEDs **26** will continue to light.

➢ The battery pack was successfully reset.

3. Slide the battery pack into the housing of the data logger.

4. Tighten the knurled screws of the battery pack

☞ Fully charge the batteries before the first use. See chapter 10.3 How to charge Batteries.

10.2 How to remove the Battery Pack from the Housing of the Data Logger

! Make sure the data logger is switched off.

! Make sure the data logger is disconnected from the power supply.

1. Loosen the knurled screws that hold the battery pack in place.

2. Remove the battery pack from the housing of the data logger.

⚠ Make sure no short-circuits occur on the printed circuit board. Do not place any conductive piece (e.g. screwdriver) on the printed circuit board. Short-circuits will cause damage to the product.

⚠️ Protect the assembly from electrical discharge. Only handle the assembly within a safe electrostatic environment.

10.3 How to charge Batteries

☞ The CHARGE STATE LEDs **2** indicate the current charging level of the battery packs.

All LEDs light up	Battery charge >80%
The three lowes LEDs light up	Battery charge >60%
The two lowes LEDs light up	Battery charge >40%
Lowest LED lights	Battery charge >20%
Lowest LED flashes slowly	Battery charge <20%
Lowest LED flashes fast	Battery charge <10%
Lowest CHARGE STATE LED and ERROR LED flash fast	Battery charge <5%
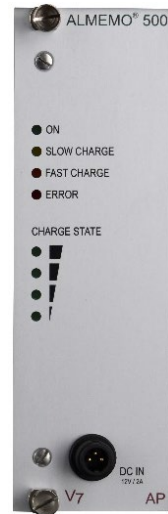
☞ As long as the data logger is turned off, the battery pack will be charged fast.
In case the data logger is switched on, the battery pack will be charged slowly to avoid system overload and excessive heating.

The supply and the charging of the battery can be done in three possible charging scenarios:

Via the Battery Pack

→ Connect the DC plug of the mains adapter to the DC IN socket **27** of the battery pack and the mains plug to a wall socket.

Via the CPU Card

→ Connect the DC plug of the mains adapter to the DC IN socket **10** of the CPU card and the mains plug to a wall socket.

Simultaneously via the CPU Card and the Battery Pack

→ Connect the DC plug of the mains adapter to the DC IN socket **10** of the CPU card and the DC plug of another mains adapter to the die DC IN socket **27** of the battery pack. Connect the mains plugs to a wall socket.

Charge more than one Battery Compartement simultaniously

☞ If several battery compartments are inserted in the data logger, a mains adapter must be connected to each battery compartment at the same time in order to charge the batteries.

→ Connect the DC plug of the mains adapter to the DC IN socket **2** of the battery compartment and the mains plug to an electrical socket. Repeat this step for each battery compartment.

➢ The batteries are fully charged as soon as all CHARGE STATE LEDs light up and the SLOW respectively the FAST CHARGE LED goes out.

10.4 How to query the Battery Power Supply

1. Log in to the ALMEMO® 500 app, or tap on the Back button until the home screen appears.
2. Tap on the button Settings ⚒.
3. Tap on the arrow **>** next to Power supply 🔋.
4. Tap on the checkbox next to the text Refresh data of the battery pack.

➢ The battery voltage, the charging current, the battery status, the charging mode and the battery temperature of every battery pack used will be displayed. The estimated remaining runtime will be displayed if no mains adapter is connected to the data logger while refreshing data of the battery pack.

10.5 How to deactivate Measuring Channels of the Battery Pack

☞ By default, the measuring channels of the battery pack are activated. The measuring channels measure the battery voltage, the current, the battery status and the battery temperature for each battery.

In case you deactivate a measuring channel, it will no longer be listed in the measured value display and its measuring data will not be recorded.

1. In the home screen, tap on the button Settings ✖.

2. Tap on the arrow **>** next to Device settings.

3. Tap on the arrow **>** next to the battery pack you want to deactivate.

4. Tap on the arrow **>** next to Sensor overview.

5. Tap on the arrow **>** next to the battery whose measuring channels you want to deactivate.

6. Tap on the arrow **>** next to Sensor channel.

7. Tap on the checkbox next to the measuring channel you want to deactivate such that the checkbox is no longer ticked.

➢ The measuring channel is deactivated.

10.6 How to clean the Battery Pack

→ Remove the battery pack from the housing of the data logger, see chapter 10.2 How to remove the Battery Pack from the Housing of the Data Logger.

→ Remove dust with low pressured compressed air.

⚠ Only use low atmospheric pressures. High atmospheric pressures may cause damage to the electronics assembly.

10.7 How to query Information about the Battery Pack

1. In the home screen, tap on the button Settings ⚒.

2. Tap on the arrow **>** next to Device list.

3. Tap on the arrow **>** next to the battery pack whose information you want to query.

4. Tap on the arrow **>** next to About the device.

➢ Device type, software version, device option and serial number will be displayed

10.8 How to ship the Battery Pack

☞ For safety reasons, the power supply of the battery pack provided by the battery must be properly interrupted before shipping the battery pack or the device with the integrated battery pack.

→ Remove the battery pack from the housing of the data logger, see chapter 10.2 How to remove the Battery Pack from the Housing of the Data Logger.

1. Remove the Battery sockets **29** from their respective pin headers.

➢ The power supply is now properly interrupted.

2. In case you want to ship the battery pack together with the device, please slide the battery pack back into the housing of the data logger.

3. Tighten the knurled screws of the battery pack.

11 Maintenance and Care

How to clean the Housing

- ! The data logger needs to be switched off.
- ! The data logger needs to be disconnected from the power supply.
- → If soiled, clean the housing with a damp cloth.

⚠ Do not use aggressive detergents or solvents for cleaning.

How to clean measuring circuit boards and the CPU card

- ! The data logger needs to be switched off.
- ! The data logger needs to be disconnected from the power supply.
1. Loosen the knurled screws that hold the measuring circuit boards and the CPU card in place.
2. Remove the measuring circuit boards and the CPU card from the housing of the data logger.
3. Remove dust with low pressured compressed air.

⚠ Only use low atmospheric pressures. High atmospheric pressures may cause damage to the electronics assembly..

⚠ Protect the assembly from electrical discharge. Only handle the assembly within a safe electrostatic environment.

How to maintain the battery pack

- → Please charge your batteries on a regular basis and permanently provide a sufficient charging level.

☞ Deep discharges will severely limit the operating life of the battery.

- → Clean the battery pack on a regular basis, see chapter 10.6 How to clean the Battery .

12 Questions and Answers

Question	Possible cause	Possible solution
The status display remains off. The status and control lights do not light up.	Incorrect supply voltage or empty battery	Charge batteries / exchange mains unit.
The data logger does not boot .	There are very large measurements in the database and the integrity check takes a few minutes.	Wait for a while during the boot process. Press the Reset push button **11** for at least three seconds (to do so, you will need a sharp pointed object). After releasing the button, the data logger will reboot. Reset the web service (see below)
The navigation keys cannot be operated.	The system is operating at full capacity and does not respond.	Press the Reset push button **11** for at least three seconds (for this purpose you need a pointed item). After releasing the button, the data logger will reboot. Disconnect the data logger from the power supply. Eventually remove the battery packs
It is not possible to establish a WLAN connection to the data logger.	WLAN login data is incorrect	Turn the data logger off and then on again. Try to establish a connection via Ethernet. Reset the access point (see chapter 8.1.6).
WLAN network of the data logger cannot be found.	incorrect configuration of the access point (e.g. unintentional deactivation of the WLAN)	Turn the data logger off and then on again. Try to establish a connection via Ethernet Reset the access point (see chapter 8.1.6).
Login to the app fails .	User data incorrect, IP address incorrect, app connected to the wrong network, or database corrupt.	Check user data, IP address, and network. Switch the data logger off and on again. Make a web service reset (see further below).

The USB flash drive is not recognized.	The USB flash drive is defect or corrupt. Web service does not recognize USB flash drive.	Check the storage medium on a PC. Replace the USB flash drive. Make a web service reset (see further below).
The CHARGE STATE LEDs do not display the correct battery status.	Battery sockets are not connected or battery pack is not initialized correctly.	Switch the data logger off and disconnect the device from the power supply. Loosen the knurled screws of the battery pack and remove the battery pack from the data logger housing. Make sure that the battery sockets are plugged on the pin header (see chapter 10.1 Before the First Use). Press the Reset push button of the battery pack **28**.

Web service reset

☞ Attention: During a web service reset, all measured values and user settings saved in the data logger will be deleted.

→ Switch off the data logger while pressing the right navigation key, keep the navigation key and the ON/OFF key pressed until a triple signal tone is heard.

➢ A single beep and then a triple beep will sound.

➢ The web service reset has been performed.

→ In case we could not answer your question, please contact the technical support (phone +49 (0)8024/3007-38, e mail help@ahlborn.com).

13 Warranty and Disposal

Warranty

Before leaving the factory, every device has passed several quality tests. For proper functioning, a 2 year warranty is granted beginning with the day of delivery. Before returning the device, please pay attention to the information provided in chapter 12 Questions and Answers. In case of a defect, please use – if possible – the original packing material and attach a precise description of the defect as well as of the corresponding boundary conditions.

The following cases are excluded from warranty:

- Unauthorized interventions and changes within the device performed by the customer
- Operation outside the indicated environmental conditions applicable for this product
- Use of improper power supply and peripheral devices
- Improper use of the device
- Damage due to electrostatic discharge or lighting
- Disregard of the Instruction Manual

We reserve the right to make changes in product features in favor of technical progress or due to new construction elements.

Disposal

The symbol of a crossed-out waste bin implies that the product must be disposed of separately in the European Union. This applies to the product itself as well as to all accessory components labeled with this symbol. The products must not be discarded via the unsorted municipal waste.

→ Dispose of defect rechargeable batteries / empty batteries in accordance with the legal requirements.

→ When no longer in use, the product must be disposed of at the collecting point specified for electrical and electronic equipment. In doing so, please observe the local disposal regulations.

→ Dispose of the packing material in accordance with local regulations.

14 Technical Data

Default configuration

Measuring inputs	20 ALMEMO® input sockets
	For all ALMEMO® sensors (V5, V6, D6, D7)
Channels (standard)	Up to 200 measuring channels
Expansion	Up to 90 ALMEMO® input sockets depending on the housing
Precision class	AA see Catalog p. 01.04
Measuring rate V5, V6, D6 sensors	100 / 50 / 10 / 2,5 mops
Input range	In the measuring range 2.6V: -2 to +3V
	In all other measuring ranges: -1.9 to 2.9V
Overload	±12V
Input current	100pA
Measuring current	Pt100: 1mA, Pt1000: 0,1mA
System accuracy at 2.5 mops	0.02% of measured value ±2 digit
Temperature drift	0.003%/K (30ppm)
Galvanic isolation for analog sensors	Using semiconductor relays (50 V)
	Additional galvanic isolation between measuring inputs and power supply (device ground)
Sensor power supply	6 / 9 / 12V, per card, maximum 400mA, per data logger maximum 1.2 A
Interfaces	2 USB ports for additional memory and networking, Ethernet,
	WLAN for accessing the web service and networking
Equipment: Control unit	Industrial tablet with preinstalled app ALMEMO® 500
Memory	4GB SD memory card (sufficient for up to 600 million measured values)
Date and time-of-day:	Real-time clock (4.7ppm) buffered with lithium battery
Power supply: Mains adapter	ZB1212NAx, 100 to 240 VAC
Rechargeable battery/ies (accessory)	to 12 VDC, minimum 2 A galvanically isolated
	2 lithium batteries, total of 13.8 Ah,
	Integrated high-speed charging (3 hours)

Current consumption without input and output modules	ca. 300 mA without sensor / sensor technology (standard configuration)
Housing	Desktop housing TG6: 390 x 160 x 260 (mm) (WxHxD) Weight approx. 4 kg
	Desktop housing TG8: 497 x 160 x 260 (mm) (WxHxD)
	Weight approx. 4.5 kg
	Rack housing BT8: 483 x 132 x 273 mm (WxHxD) Weight approx. 4.5 kg
Suitable conditions	Operating temperature: -10 to +50 °C
	(storage temperature: -20 to +60 °C)
	Ambient humidity: 10 to 90 % RH (non-condensing)

Subject to technical modifications without prior notice!

15 Declaration of Conformity

//AHLBORN

Doc-Nr. CE_MA500_001_20181005_R1.doc

EU-Konformitätserklärung
EU-Declaration of Conformity
nach/according to EN 17050-1

Hersteller:
Manufacturer: Ahlborn Mess- und Regelungstechnik GmbH
Adresse:
Address: Eichenfeldstrasse 1
                                   83607 Holzkirchen
                                   Germany

bestätigt, dass das Produkt
declares, that the product

Produktbezeichnung:
Product Name: Messwerterfassungsanlage ALMEMO® 500
Produkt Typ:
Product Type: MA500CPUA20...
Produkt Optionen:
Product Options: BT8B, TG6B, TG8B

den nachfolgenden Europäischen Anforderungen und Richtlinien entspricht und folglich das CE
Zeichen trägt.
conforms to following European Product Specifications and Regulations and carries the CE
marking accordingly.

2014/35/EU	Niederspannungsrichtlinie
	Low Voltage Directive
2014/30/EU	EMV Richtlinie
	EMC Directive
2014/53/EU	R&TTE Richtlinie
	R&TTE Directive

Angewandte harmonisierte Normen   Sicherheit *(Safety)*
und technische Spezifikationen: EN 61010-1: 2010+A1
Applied harmonised standards and   EMV *(EMC)*
technical specifications: EN 61326-2-3: 2013 Tabelle 2

Holzkirchen, 05.10.2018
Ort, Datum der Ausstellung
Place, date of issue

Christian Schmidt /   Qualitätsmanagement
Entwicklungsleitung

Subject to technical modifications without prior notice!

16 Subject Index

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Besides greatest diligence, the possibility of incorrect information
cannot be excluded!
Subject to technical modifications without prior notice!

You will find the present and further Operating Instruction,
as well as the ALMEMO® Manual
on **www.ahlborn.com** under the tab
SERVICE on DOWNLOADS.

PLEASE KEEP THIS INSTRUCTION MANUAL
FOR FURTHER REFERENCE