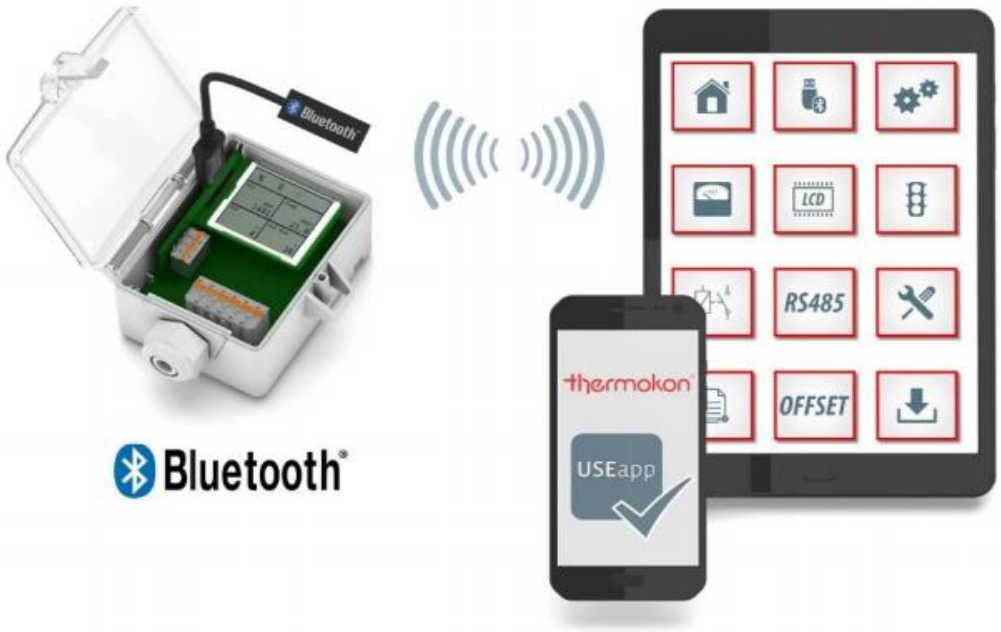


USEapp

Set-up and configuration

EN

Table of Contents

Release history

Version	Release	Modification
1.0 beta	02.05.2017	Beta version for publication
1.1 beta	12.06.2017	Bugfixes - DPA+ Identification - LCD Identification - TLF Identification - Offset
1.2 beta	16.06.2017	Bugfixes - Communication speed optimised with iOS - Display on Android Smartphones - Relay identification - Modbus identification

Thermokon USEapp

This manual describes the installation of the Thermokon USEapp on mobile end devices and the configuration of sensors using USEapp. These instructions should be read carefully before a customized configuration. Please pay special attention to the safety instructions. Damage to the device caused by non-observance of these instructions and safety instructions voids the warranty. The installation and operating instructions for these sensors are included in the respective product data sheets. You can find them also through following link:

https://www.thermokon.de/en/downloadcenter/

System requirements

To use the Thermokon USEapp, a smartphone or tablet with the operating systems iOS version 9 or Android version 5 or higher is required. Furthermore, the mobile device must have a Bluetooth 4.x communication module. For communication between USEapp and a Thermokon sensor from the USE series, the Bluetooth USB dongle is necessarily required. (Thermokon order number: 668262). Third-party Bluetooth dongles are not supported and may cause damage to the device. In such cases, the warranty will be voided. A list of supported devices can be found here:

https://www.thermokon.de/en/product-highlights/use/

- Smartphone with Android 5.0 or later with Bluetooth Low Energy
- Tablet with Android 5.0 or higher with Bluetooth Low Energy
- Smartphone with iOS 9 or higher with Bluetooth Low Energy
- Tablet with iOS 9 or higher with Bluetooth Low Energy

Installation

The Thermokon USEapp is free of charge for the user and can be downloaded and installed via Google Play Store or Apple App Store. Scanning the two QR-codes below, you can directly access the page in the respective stores. Alternatively, there is the possibility to install the app via http://www.thermokon.de/useapp . After successful download and installation, the icon of the USEapp appears on the home screen of your mobile device.

Before the first start

Before you start with the configuration of the Thermokon USE sensors, you should make sure that the latest version of the USEapp is installed on your mobile device. If a current firmware update is available in the Google Play Store or Apple App Store, it should be installed immediately.

All USEapp-enabled products are delivered **fully functional** with a standard configuration. The USEapp provides the possibility to extend the range of application and to adapt the configuration individually based on the specific application. A product overview of the USE family can be retrieved under the following link. All USEapp-compatible sensors are marked.

https://www.thermokon.de/download-archive/Kataloge_Preise_Infos/Brosch%C3%BCren/USE_Brosch%C3%BCre/Product_Overview_USE-family_en.pdf

USEapp-Features

- Communication via Bluetooth Low Energy Module (BLE)
- Individual configuration of output signals
- Setting different measuring ranges
- Subsequent adjustment of external factors (offset)
- Parameterization of the live zero signal (1..10 V etc.)
- Options for the display settings
- Customer-specific parameterization of the traffic-light-function (TLF)
- Setting of the relay behaviour and threshold values
- Modbus address offset (extension)
- Firmware updates
- Setting of maintenance/service intervals

Establish a Connection

1. Mount the sensor according to the mounting instructions in the data sheet.

2. Wire the sensor according to the wiring diagram and installation guidelines in the data sheet.

3. Connect sensor to power supply.

4. Wait for the sensor to boot up (approx. 10 seconds)

5. Insert the Bluetooth dongle into the Micro USB provided on the option board

6. Activate Bluetooth communication on your mobile device. For instructions on how to activate the Bluetooth interface, refer to the description of your mobile device.

7. Start Thermokon USEapp on the mobile device.

8. During the startup process of the USEapp, the automatic detection for available dongles within range is running. Depending on the performance of the smartphone or tablet, the search may take a few seconds.

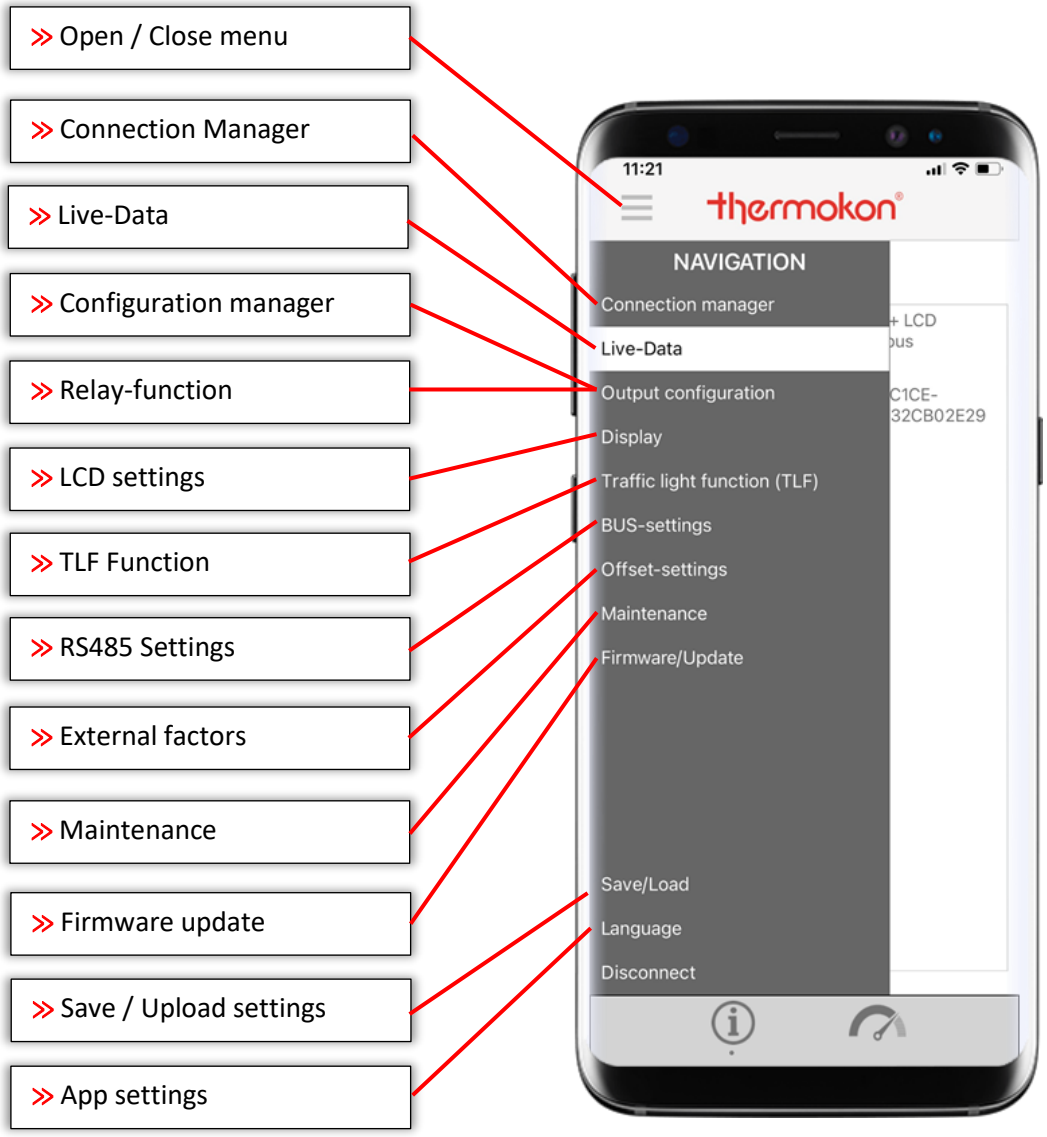
9. After starting the USEapp, the connection manager opens automatically. As soon as one or several dongles are found, they appear in the overview as **Available Dongle.**

When you click on the address or name of the dongle, the connection to the device is established. Reading the data takes a few seconds. After reading the data, the app automatically jumps to the status overview.

Range:

Depending on the local conditions, a distance between dongle and smartphone or tablet of four to five meters should not be exceeded.

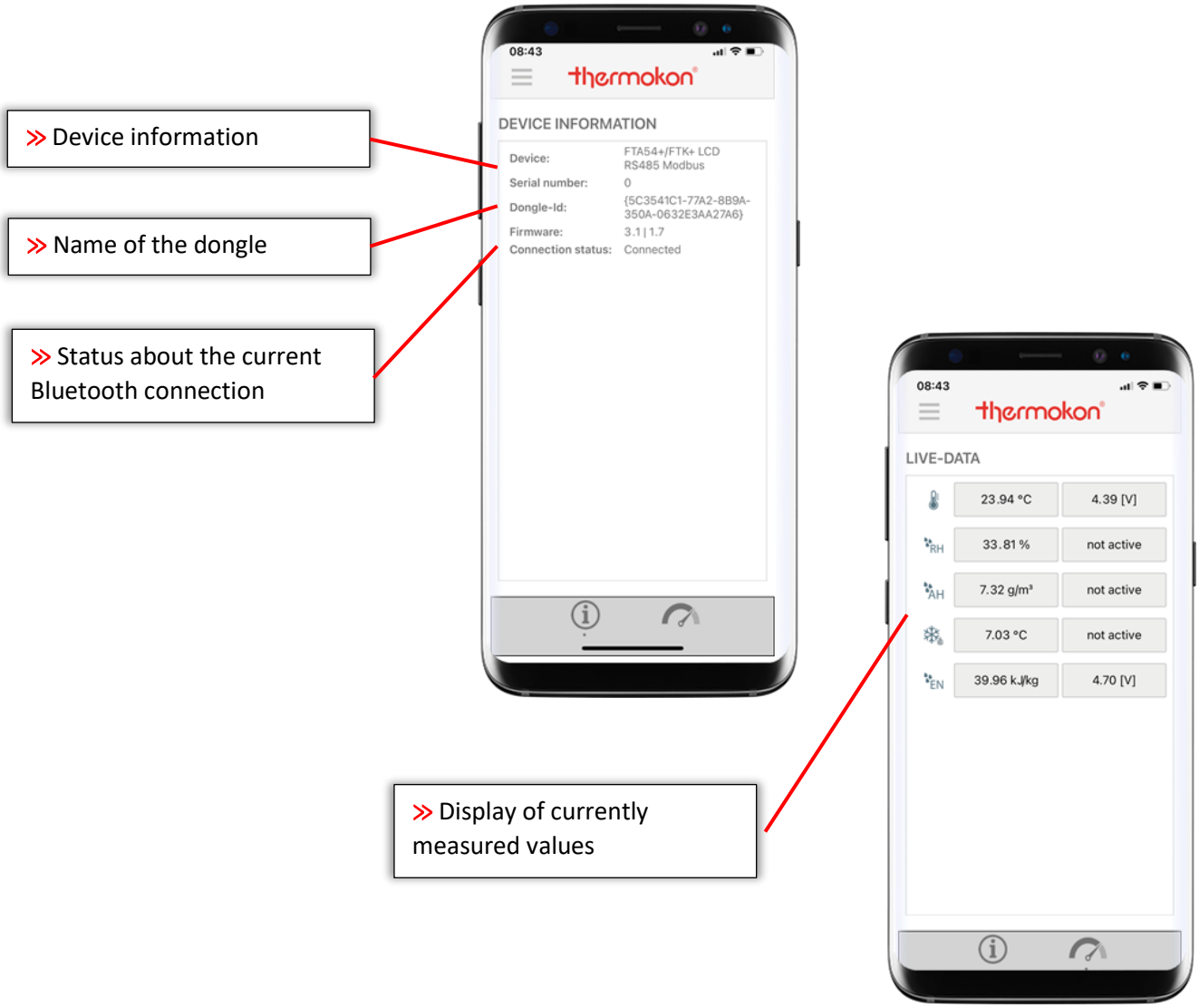
User Interface



Clicking or tapping on the tiles opens the corresponding submenus. On the following pages, the individual menus and functions are described in detail.

Functions / Menus

Home / Status

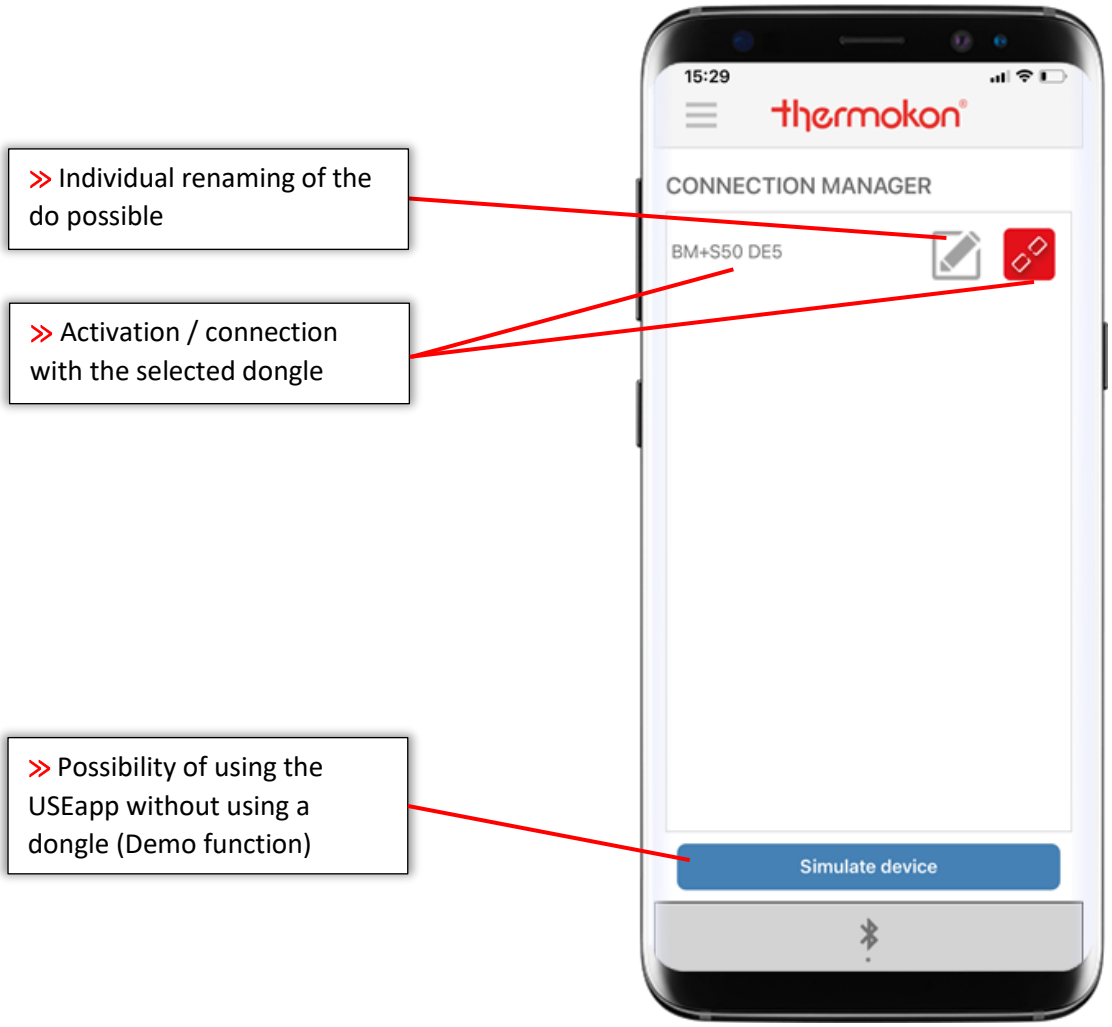


Device information: This area appears as a header in all menus and describes device-specific properties. In addition to the name and serial number of the connected device, the Bluetooth dongle ID and firmware version of the base and option PCB are also displayed. The Connection Status field informs the user whether the connection to the sensor is active or disconnected.

Sensor data: In this field, all available sensor-specific measured variables are displayed. Next to the measured value, the current voltage output value is displayed in parallel in the second column. If a measured variable is not provided via the analogue outputs on the circuit board, 0.00V appears. For detailed information about the configuration of the measured variables and output signals see chapter “Output configuration”.

Datasheet: Clicking on the device name leads directly to the download area of the Thermokon homepage. Data sheets and software descriptions of the devices are available online here.

Connection Manager



Communication with the sensor is established via the connection manager. All Bluetooth dongles available in the near distance are identified and listed in the overview. Each dongle is listed with the ID of the respective dongle. Using the small **pen icon**, it is possible to rename the dongles to create a clear identification. A simple click on the name of a dongle is all that is needed to connect it. The data are then read and the app automatically switches to the Home / Status overview.

Clicking on the button **Simulate device** activates a demo mode. All menus are available and are filled with fictitious values. This mode is suitable for presentation and demonstration purposes and to familiarise yourself with the features of the app.

Language Settings

By clicking on one of the two flags, you can change the menu language of the USEapp. This is only the menu language. The conversion of the units (metric or imperial) is done separately in the initial configuration.

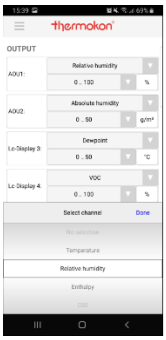
By clicking on **App Manual**, a direct link to the USEapp documentation in the selected language version is created.

Output Configuration

» Possibility to set the measuring system (SI or Imperial) and the voltage range

» Option for setting the measuring range and the values to be measured

» Possible values (depending on the sensor)



- Temperature
- Relative humidity
- Absolute humidity
- Differential pressure
- Volumetric flow
- Dew point
- Enthalpy

Measuring system: Use this drop-down menu to switch between the international (SI) and imperial system of units (Imp). The changeover refers to all measured variables and output signals of a unit. When changing from SI to IMP, for example, the unit of Celsius (°C) in Fahrenheit (°F) for a temperature sensor or the unit of Pascal (Pa) in Inch Water Column (inchWC) for a differential pressure sensor is adjusted and automatically re-scaled.

Voltage range: The output voltage range of 0..5V or 0..10V can be changed via a jumper on the PCB. For devices with USEapp compatibility, it is also possible to define a lower voltage limit greater than 0V (so-called “live zero” signal). This feature provides the user the advantage of being able to quickly detect e.g. cable breaks or device failures, as 0V is not interpreted as a measured value on the receiver side.

The set measuring range is always duplicated linear to the voltage range.

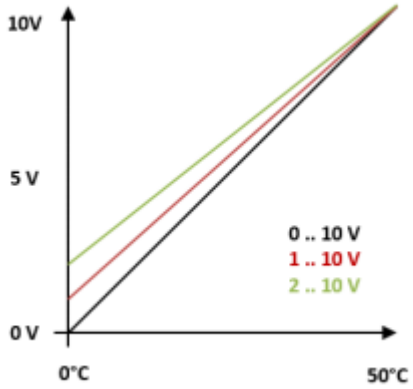
Case study:

Temperature measuring range 0..50°C / voltage range x..10V

Voltage [V]	Temperature [°C]
0	0
5	25
10	50

Voltage [V]	Temperature [°C]
1	0
5,5	25
10	50

Voltage [V]	Temperature [°C]
2	0
6	25
10	50



AOVx: Depending on the product and type, a different number of outputs is available. The channel assignments in the USEapp correspond to the labelling on the board. For sensors with USEapp compatibility, the output channels can be individually configured and parameterised. It is thus possible to provide a measured variable on another channel or to change / exchange measured variables. A measured variable cannot be duplicated on two channels. However, it is possible to change measuring ranges - if several measuring ranges are available. With a humidity sensor, for example, the absolute humidity or dew point can be provided instead of the relative humidity. For a detailed listing of the available measurement variables and measurement ranges, please see page 24.

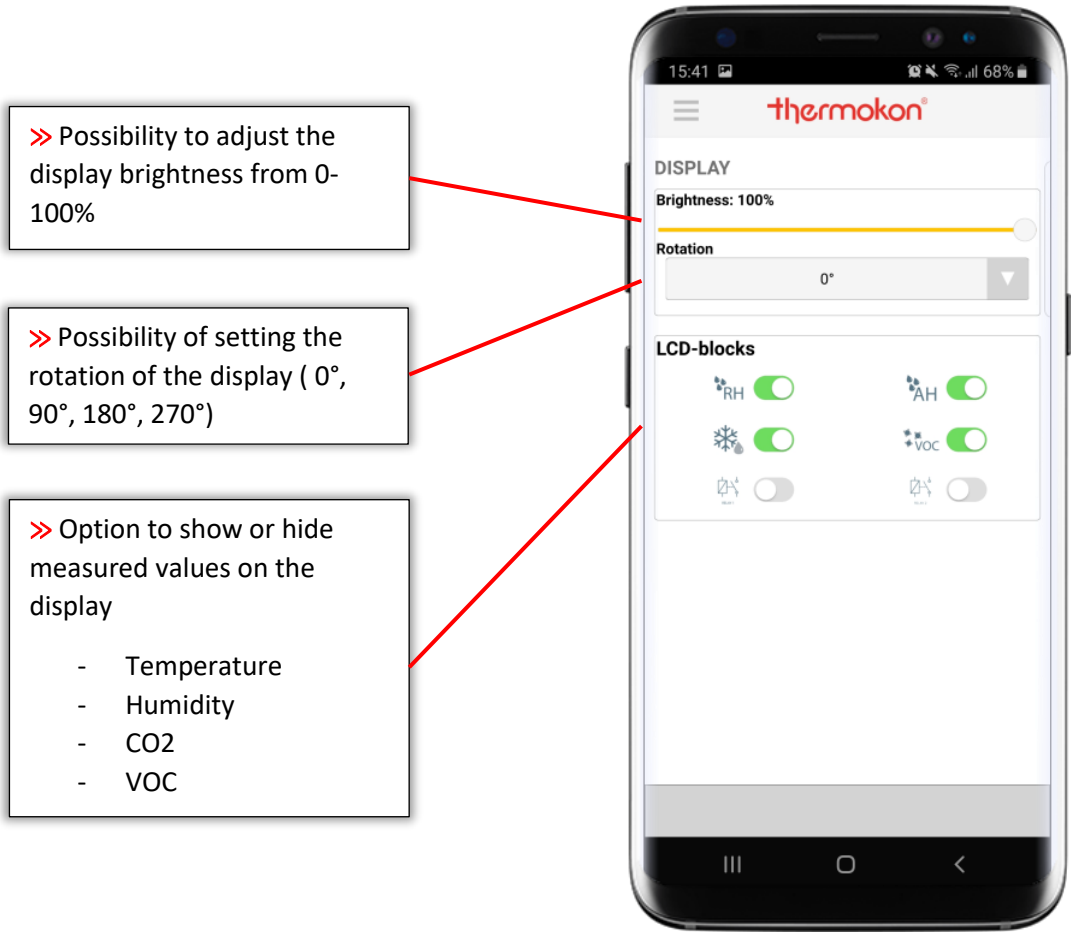
Excursus: What is Live-Zero?

Live-Zero - also known as Offset-Zero - increases the detectability of failures and thus increases operational reliability. The measured value “zero (0)” is not transmitted as a standard signal of the range. For current loops, this offset is fixed at 4 mA. If now a line break or a failure of the transmitter occurs, a signal with 0 mA results, but as the lower range value is at 4 mA, this failure or line break can immediately be detected.

Common and supported live zero signals are:

- 4 ... 20 mA
- 1 … 10 V
- 2 ... 10 V
- 1 … 5 V

LCD Settings

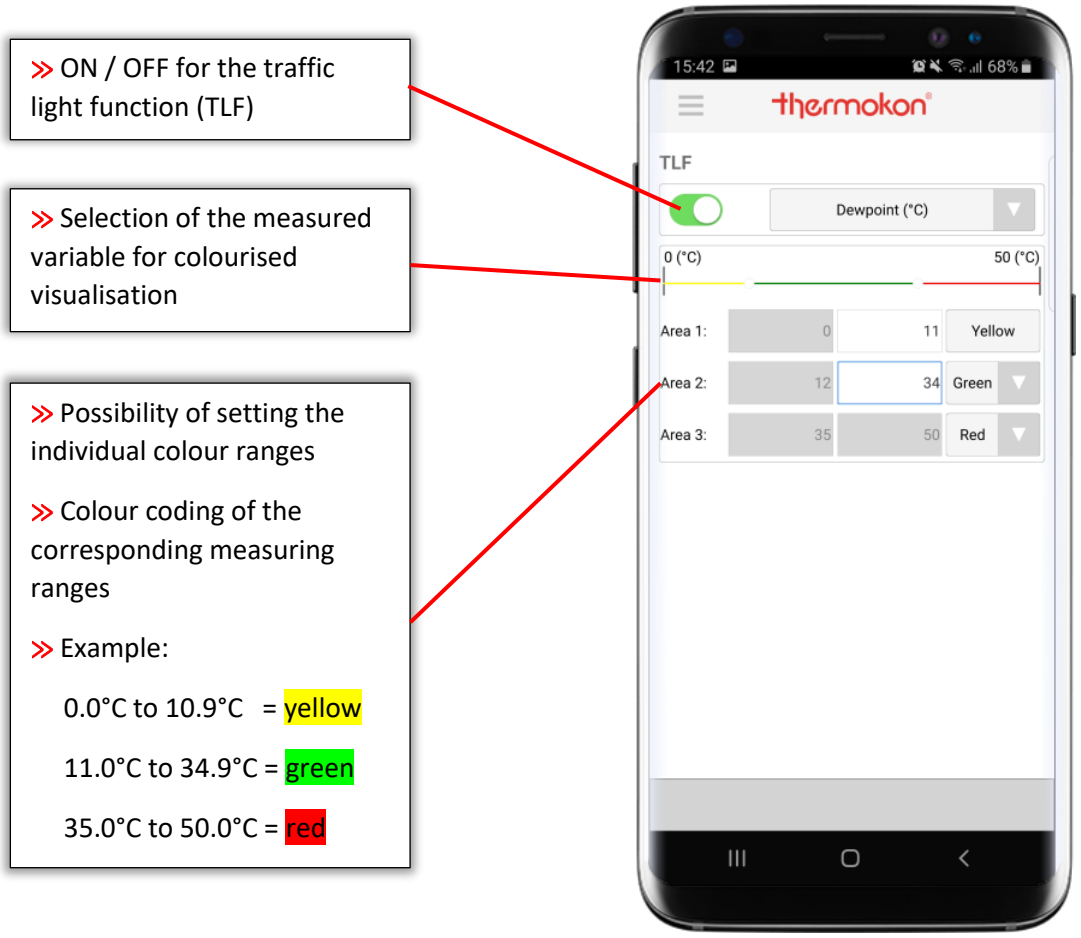


Brightness: Slider to change the LCD brightness. All sensors are delivered ex works with the maximum display brightness (100%).

Rotation: Depending on the mounting and installation position of the sensor, the display can be rotated for better readability. Four standard options (0° / 90° / 180° / 270°) allow the display to be adjusted clockwise. The scaling in the display is automatic.

LCD blocks: In the delivery state, the display shows all measured variables, which are also provided at the output terminals ex-factory. Using USEapp, the user can configure the display and show or hide measured variables in the display. Measured variables are hidden by simply deactivating the values. Of course, these settings can also be undone. A simple activation of the sliders is sufficient.

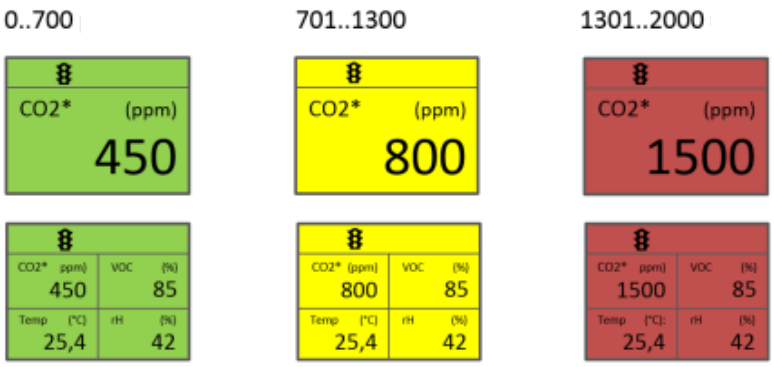
TLF-Function



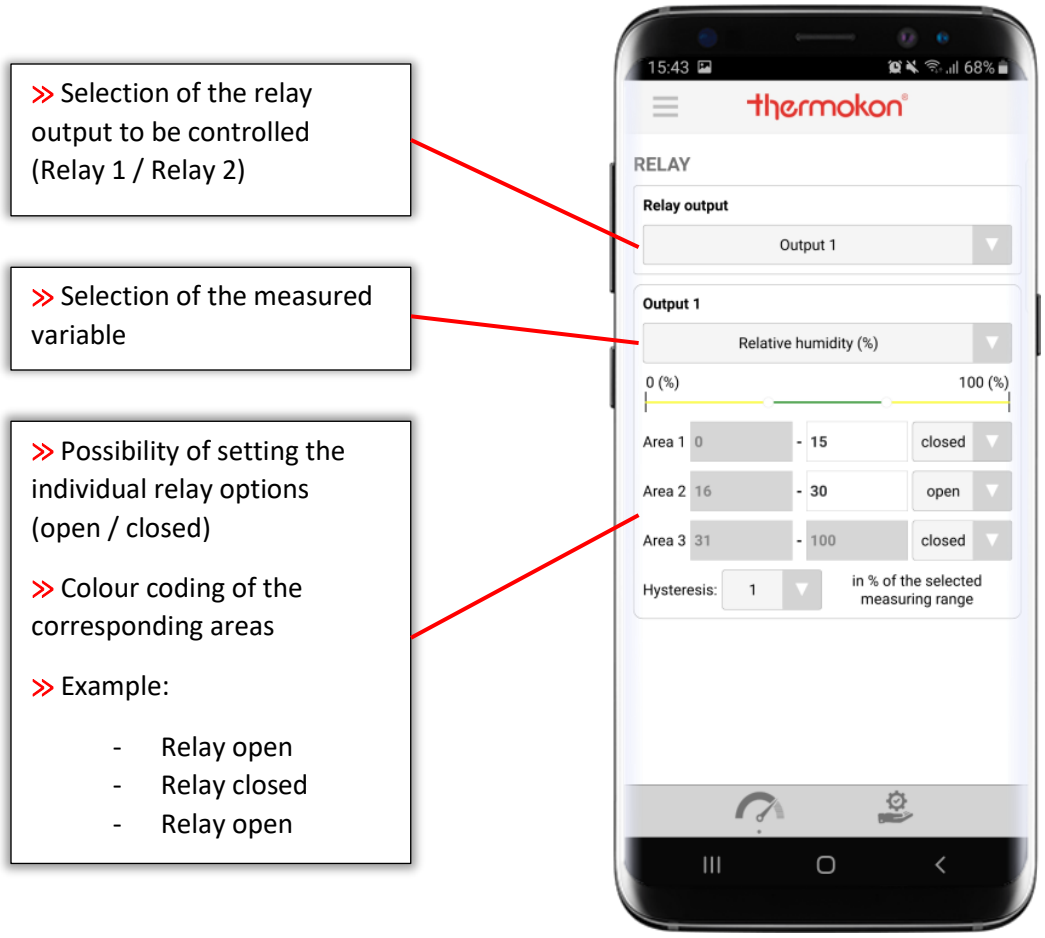
TLF Slider: This slider is used to activate the Traffic Light Function (TLF). With the TLF function active, a measured variable can be visualised in the display in different colours. Depending on the setting, the backlight of the display changes, when thresholds are exceeded.

Measured variable: A measured variable for colour indication can be selected via the drop-down menu. The selection is marked in the display with an * behind the measured variable.

Threshold values: The slider is used to set the threshold values for colour change. The colour of the respective area is determined via the corresponding drop-down menus.



Relay function



Each USE device with relay feature has two independent relays available. The switching points are configured via USEapp. In this way, a 2-point controller can be implemented with any USEapp-compatible sensor. This feature can be used for example for ventilation control, temperature control, humidification and dehumidification etc.

A **hysteresis of +/- 2K** is stored as a standard on all units.

Relay output: Use the drop-down menu to select the relay to be configured.

Measured variable: A measured variable can be assigned to the relay using the drop-down menu.

Slider: The threshold values for the switching behaviour are defined via the slider. The switching states are selected (open / closed) via the drop-down menus below.

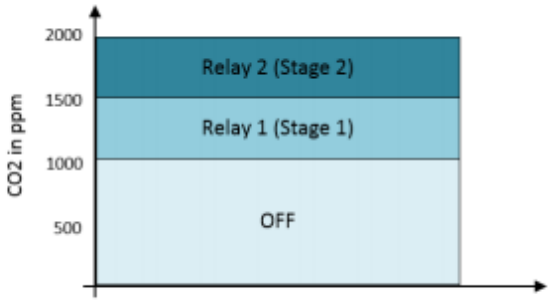
Application examples:

CO2-based Ventilation control

0..1000 ppm - off

1000..1500 ppm - Stage 1

1500..2000 ppm - Stage 2

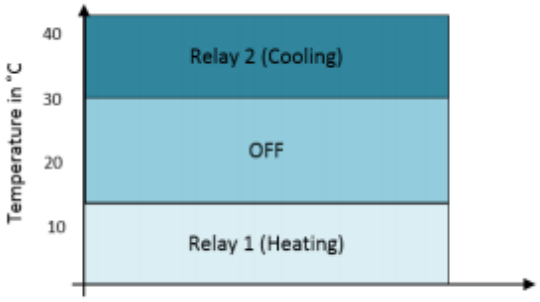


2-Point Temperature control

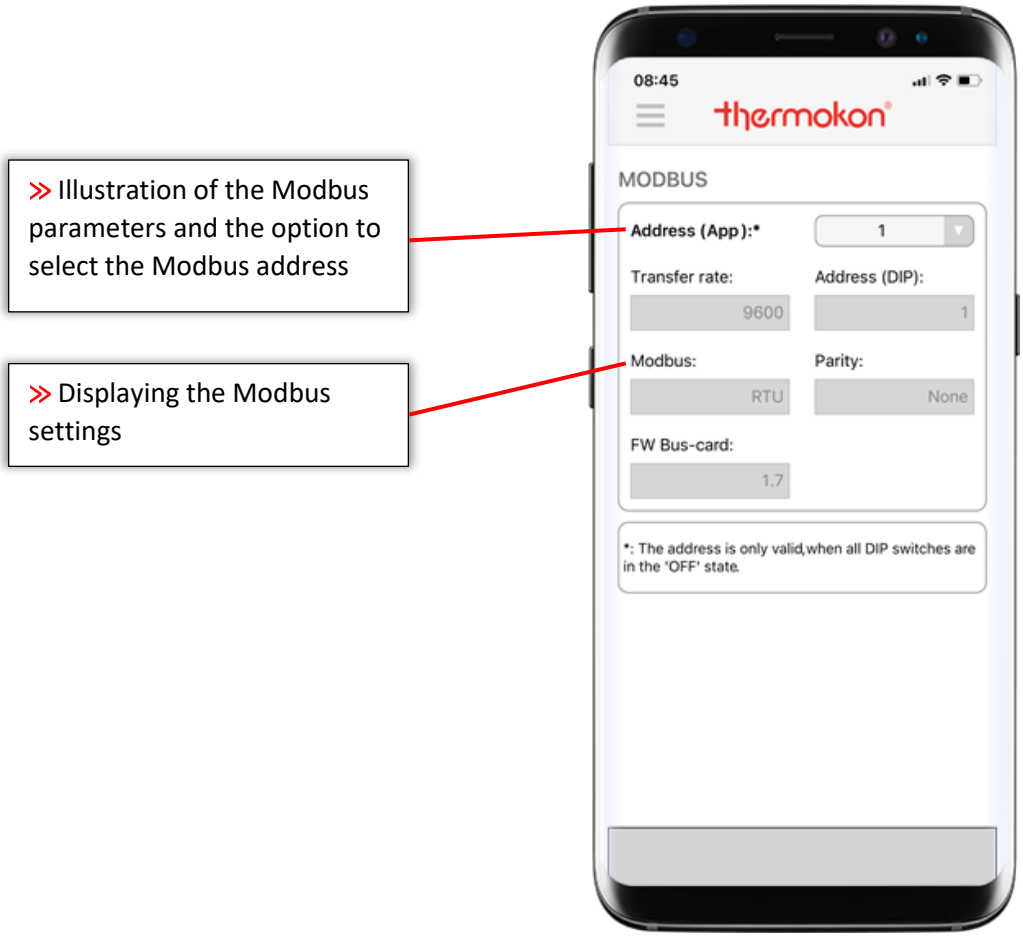
0..14°C - Heating (Relay 1)

15..30°C - OFF

31..40°C - Cooling (Relay 2)

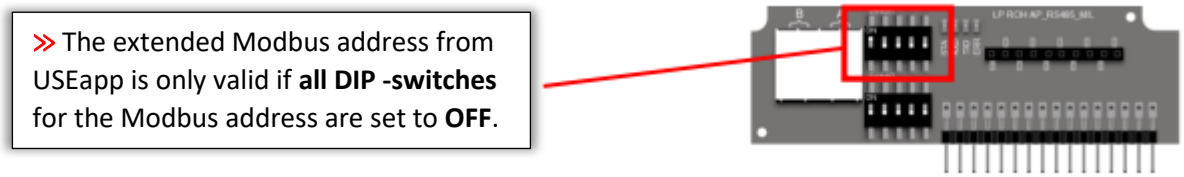


RS485 Modbus



With all Modbus sensors of the USE family, it is possible to assign an address range from 1 to 247. Address assignment from 1 to 31 is possible via the DIP-switches on the circuit board. If this is not sufficient in certain cases, the user can extend the address range up to 247 via USEapp. For this purpose, all DIP-switches for the address range must be set to **OFF**. Using the drop-down menu

Address (APP):* you can now assign an address.



In addition, the USEapp displays all Modbus settings, such as transmission rate, address (DIP), Modbus, parity and firmware version of the Modbus plug-in PCB. These parameters are configured via the second DIP-switch on the Modbus board.

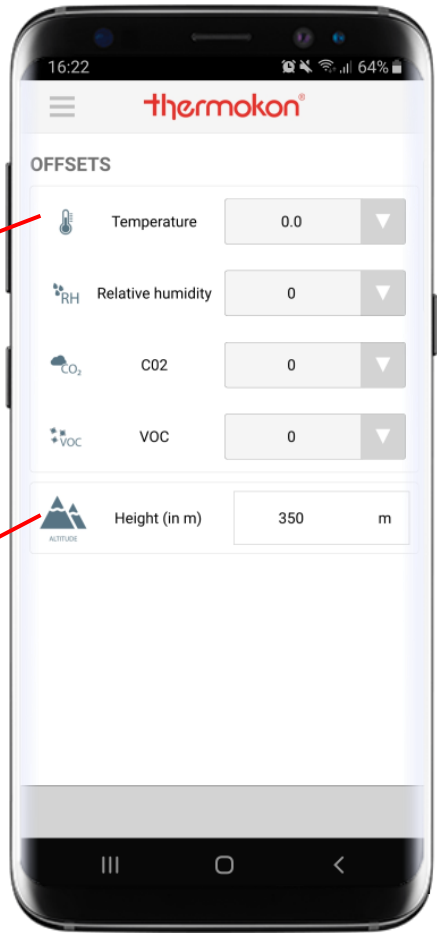
External influencing factors (Offsets)

» Possibility of manual adjustment of measured values for the variables:

- Temperature
- Humidity
- CO2
- VOC

» Storage of location-specific altitudes

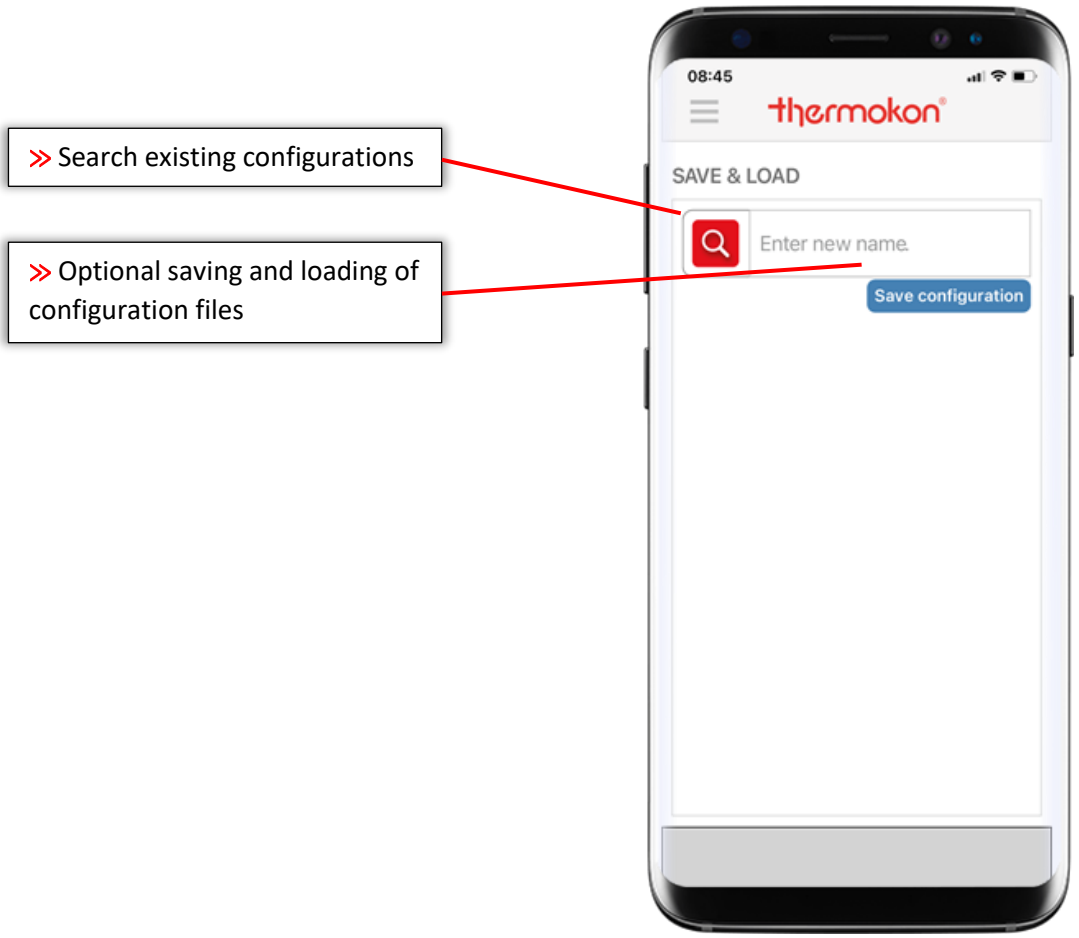
» Relevant in case of extreme altitudes for more precise measurement



The consideration of external factors that could possibly influence the measurement result is easily done via USEapp. For this purpose, there is the possibility to manually adjust the measured values. In the grey field behind the icon of a measured value, the actual measured value is displayed. An offset can be stored via the corresponding drop-down menu. The possible adjustment ranges are listed in the table on pages 22 and 23.

In addition, USEapp offers the option of storing location-specific altitudes in the sensor if necessary. This allows the accuracy to be optimized, when measuring e.g. differential pressure or volume flow. All sensors are delivered default with an altitude of 350 meters above sea level.

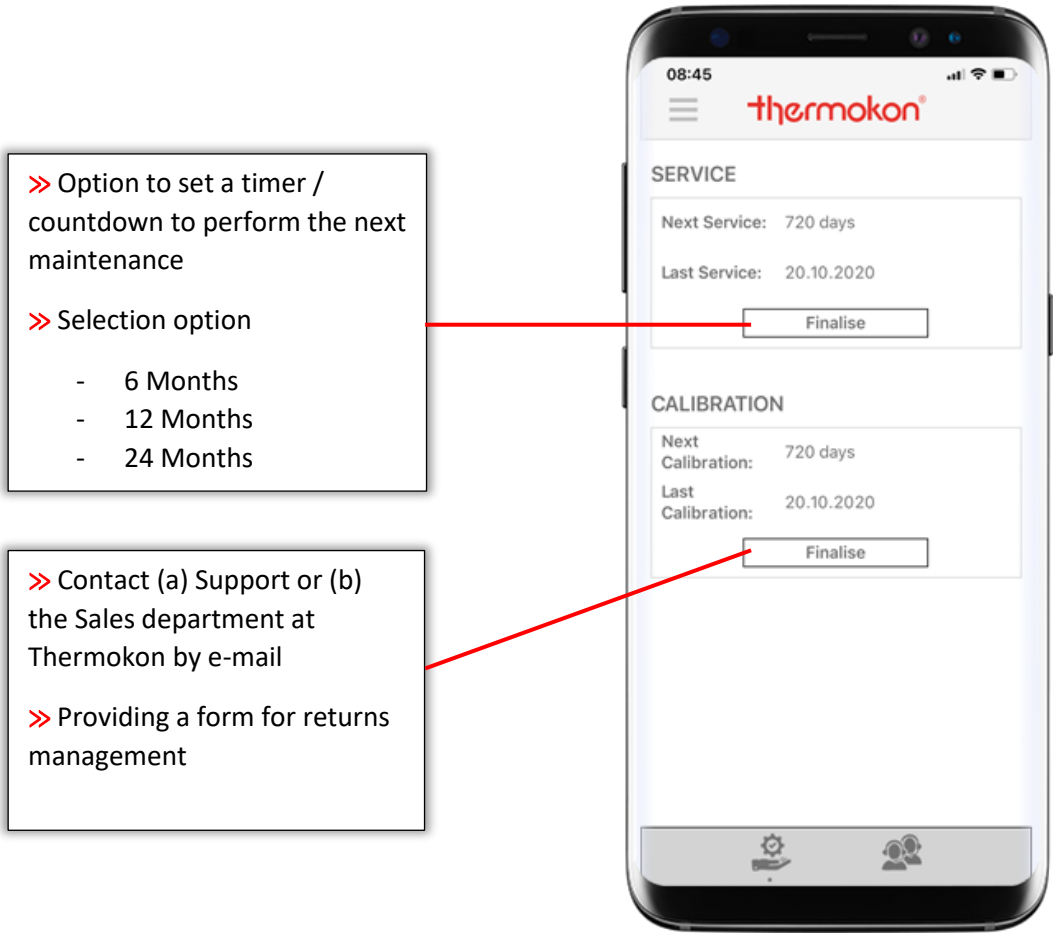
Save and load configurations



USEapp allows the user to save configurations and re-upload them later. When clicking on **Save configuration**, a new window opens to assign a name to the current configuration and to save it. If USEapp is allowed to access the geo-services of the mobile device, the position can be stored where commissioning has taken place. For the user, for example, an even more precise assignment to the project.

Using the **text field**, saved configurations can be searched or filtered specifically by name.

Maintenance & Service



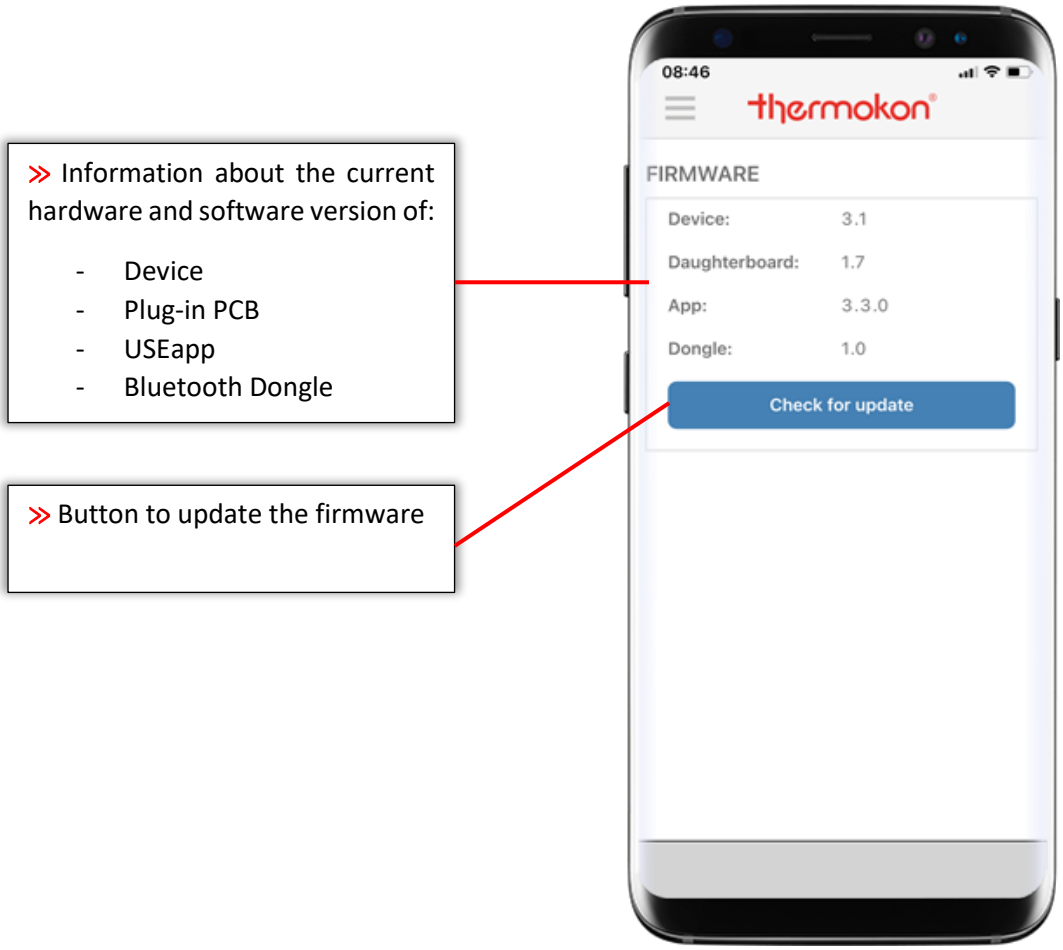
All devices with USEapp support have an integrated operating hours counter. The user can store maintenance and calibration intervals in the sensor via the USEapp in order to be automatically notified by the sensor after a certain period.

After the set period has elapsed, an icon appears in the display of the sensor or, in the case of Modbus-capable devices, a flag is set in a register to notify the user, that maintenance / calibration is required. The intervals can be reset via USEapp or alternatively through Modbus.

The user must store the intervals for maintenance or calibration individually. Both functions are deactivated ex-works.

Important: The sensor continues to measure normally after a period has elapsed and additionally indicates maintenance via icon in the display or Modbus flag.

Firmware Update



Sensors with USEapp support can be updated in a mounted state. After the connection between the USEapp and the sensor has been established, the app compares the latest software version on the server with that of the sensor. If a new firmware is available for the device, the latest version can be transferred to the device via the **Update button**.

IMPORTANT: The tablet / smartphone must have a connection to the mobile data network, otherwise no download of the latest firmware files can take place. The update process is at your own risk. Under no circumstances should the connection be disconnected or interrupted during the update process.

Measuring Ranges International System of Units (SI)

Measured variable	Unit	Measuring range	Offset
Temperature	°C	50°C..+50°C - 20°C..+80°C - 15°C..+35°C - 10°C..+120°C 0°C..+50°C 0°C..+100°C 0°C..+160°C 0°C..+250°C	-3°C..+3°C
Relative humidity	% rH	0..100%	-5%..+5%
Absolute humidity	g/m³	0..50 g/m³ 0..80 g/m³	no adjustment possibility*
Enthalpy	kJ/kg	0..85 kJ/kg	no adjustment possibility*
Dew point	°C	0..50°C -20..80°C	no adjustment possibility*
CO2	ppm	0..2000 ppm 0..5000 ppm	-150ppm..+150ppm
VOC	%	0..100 %	-15%..+15%
CO2 / VOC MIX **	%	100 : 0 (CO2 : VOC) 90 : 10 80 : 20 70 : 30 60 : 40 50 : 50 40 : 60 30 : 70 20 : 80 10 : 90 0 : 100	no adjustment possibility*
Differential pressure	Pa	Depending on sensor	no adjustment possibility*
Volumetric flow	m³/s , m³/h	0..999999	no adjustment possibility*

* No offset adjustment possible, as this is a calculated value

** Ratio [CO2] : [VOC]

Measuring Ranges Imperial System of Units (Imp)

Measured variable	Unit	Measuring range	Offset
Temperature	°F	-30°F..+130°F 0°F..+100°F 0°F..+150°F 0°F..+250°F +40°F..+90°F +40°F..+140°F +40°F..+240°F +30°F..+480°F	-6°F..+6°F
Relative humidity	% rH	0..100%	-5%..+5%
Absolute humidity	gr/ft³	0..50 gr/ft³ 0..80 gr/ft³	no adjustment possibility*
Enthalpy	BTU/lb	0..85 BTU/lb	no adjustment possibility*
Dew point	°F	0..200°F 40..140°F	no adjustment possibility*
CO2	Ppm	0..2000 ppm 0..5000 ppm	-150ppm..+150ppm
VOC	%	0..100 %	-15%..+15%
CO2 / VOC MIX **	%	100 : 0 (CO2 : VOC) 90 : 10 80 : 20 70 : 30 60 : 40 50 : 50 40 : 60 30 : 70 20 : 80 10 : 90 0 : 100	no adjustment possibility*
Differential pressure	inchWC	Depending on sensor	no adjustment possibility*
Volumetric flow	cfm	0..999999	no adjustment possibility*

* No offset adjustment possible, as this is a calculated value

** Ratio [CO2] : [VOC]

Glossary

Sign	Description
°C	Degrees Celsius (unit temperature and dew point SI)
°F	Degrees Fahrenheit (unit temperature and dew point Imp)
%rH	Percentage of relative humidity (SI & Imp)
AOAx	Analogue Output Ampere x
AOVx	Analogue Output Voltage x
BTU/LB	British Thermal Unit per Pound (Unit Enthalpy Imp)
cfm	Cubic feet per minute (unit volume flow Imp)
CO2	Carbon dioxide
g/m³	Grams per cubic meter (unit absolute humidity SI)
gr/ft³	Grain per Cubic Foot (unit absolute humidity Imp)
Imp	Imperial System of Units
inchWC	Inch Water Column (unit differential pressure Imp)
kJ/kG	Kilojoules per kilogram (unit enthalpy SI)
m³/h	Cubic meters per hour (unit volume flow SI)
m³/s	Cubic meters per second (unit volume flow SI)
Pa	Pascal (unit differential pressure SI)
ppm	Parts per million (unit CO2 SI & Imp)
RMA	Return Material Authorization (Goods return form)
SI	International System of Units
VOC	Volatile Organic Compounds / Organic mixed gases
	Fault / sensor failure
	Maintenance / service due
	TLF-function active
	Relay board active

FAQs / Troubleshooting

Q: The USEapp cannot be installed or started on my device

A: Does the smartphone or tablet meet the hardware requirements? The firmware may be outdated or the mobile device may not have a Bluetooth Low Energy chip.

Q: The sensor is not found by the USEapp.

A: Is the sensor supplied with voltage? The LED on the sensor circuit board indicates the status of the device. Do you use a Thermokon Bluetooth dongle? Is it correctly plugged into the Micro USB on the PCB?

Q: Can I use the USEapp without the option board and Bluetooth Dongle?

A: No, the option board with Micro-USB and Bluetooth Dongle by Thermokon is absolutely necessary for communication.

Q: The connection breaks down or is unstable.

A: Is the dongle correctly inserted? Are you within range? Depending on local conditions, the user or mobile device should not be more than 4 - 5 meters away from the sensor / dongle.

Q: Why is the communication speed varying between different mobile devices?

A: The performance of the smartphone or tablet contributes significantly to the speed of communication. With an up-to-date device and the latest software, significantly higher data transfer rates can be achieved than with an older device.

Q: A firmware update is not possible.

A: Does your mobile end device have a connection to the mobile data network? Is the USEapp allowed to access the mobile data usage? Access rights can be managed in your mobile device settings.

Q: Can I also connect the sensor to my PC or mobile device using a standard micro-USB cable and carry out the configuration?

A: No, communication is only possible via a Thermokon Bluetooth dongle in connection with an Android or iOS device. In case of possible damages due to incorrect handling, the warranty will be voided.

Important Notes

Safety instructions – Attention

An authorised electrician may only carry out the installation and assembly of electrical devices (modules).

The device should only be used for the intended application. Unauthorised conversion or modification is prohibited! The modules may not be used in conjunction with devices which directly or indirectly serve human, health or life safety purposes or whose operation may cause danger to people, animals or property. The connection of devices with a power connection may only be carried out when the connecting cable is disconnected!

The following also apply

- Laws, standards and regulations
- The state of the art at the time of installation
- The technical data and the operating instructions of the device

Notes on disposal

As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

General remarks concerning sensors

Especially with regard to passive sensors in 2-wire conductor versions, the wire resistance of the supply wire has to be considered. If necessary, the wire resistance has to be compensated by the follow-up electronics. Due to self-heating, the wire current affects the measurement accuracy, so it should not exceed 1 mA.

When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Sensing devices with a transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage (±0,2 V). When switching the supply voltage on/off, onsite power surges must be avoided.

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Sales tax identification no. DE 112 635 045

Links

Thermokon USE Product family

Warranty Terms and Conditions - dated 01.04.2014

Privacy Policy