



UVR610

FREELY PROGRAMMABLE
UNIVERSAL CONTROLLER



General programming information User manual

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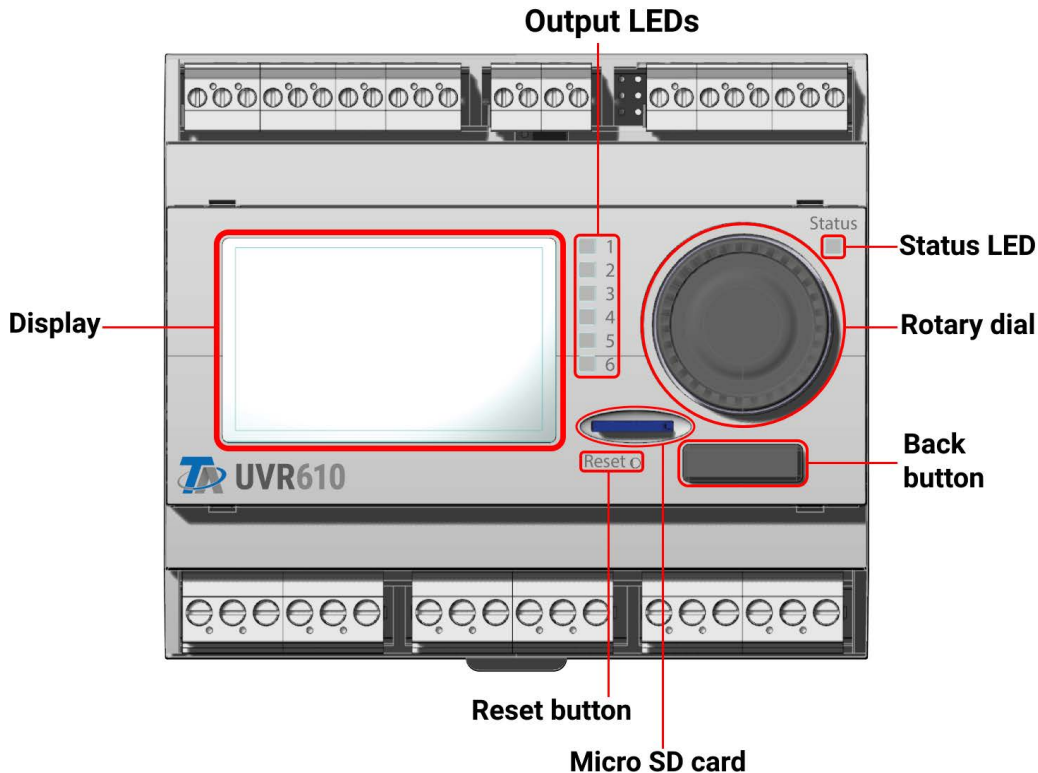
Principles

This manual is designed as a guide to programming directly on the device, but also provides important information about the elements required for programming with the TAPPS2 programming software (functions, inputs and outputs, etc.).

Programming with TAPPS2 is always recommended. It enables the programmer to draw (= program) all program operations in the form of a graphical flow chart and to define parameters for them accordingly.

Nevertheless it is important to know how to use the "programming mechanisms" on the device itself in order to be able to make changes on site.

Device overview



The **display** is used to navigate within the controller, to program functions, read in values, access other devices, etc.

The **dial** to the right of the display is used for navigation. A clockwise rotation moves you down the menu; anti-clockwise moves you up.

Pressing the dial opens the selected menu/allows you to change the selected value/parameter. (= Enter button)

Pressing the **back button** below the dial will exit a menu.

Pressing "Enter" or "Back" relates to the value/menu item framed on the display.

The six **output LEDs** to the right of the display, arranged one above the other, are indicators for the operation of the switching outputs. A green LED indicates an active output.

The single **Status LED** to the top right of the dial provides information about the status of the system and controller. If it flashes green, this means the controller is starting up. A continuous green light shows normal operation. Orange means there is a "message", for example concerning a collector overtemperature shutdown. Red means there is a "fault", such as a DL sensor failure.

Briefly pressing the **Reset button** restarts the device. For a total reset, press and hold the button until the Status LED stops quickly flashing orange and starts slowly flashing red.

The **micro SD card** supplied is used for data management of function data and firmware.

Planning basics

To ensure efficient programming, the following order must be adhered to:

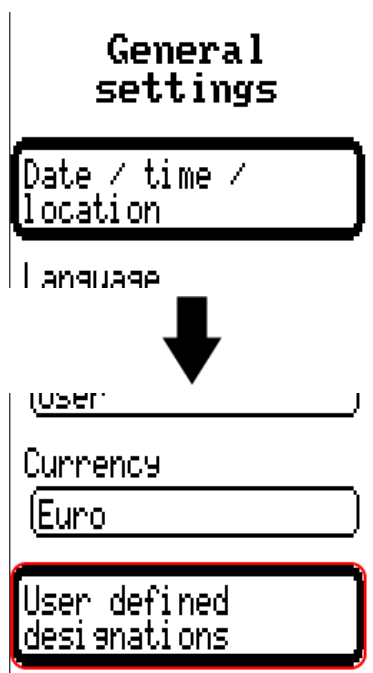
1	A prerequisite for programming and defining parameters is an accurate hydraulic scheme.
2	Using that scheme, you must define what should be controlled and how .
3	Based on the required control functions, you must define the sensor positions and draw them on the scheme.
4	In the next step, all sensors and outputs are assigned the required input and output numbers. As all the sensor inputs and outputs have different characteristics, it is not possible to simply number them consecutively. The input and output numbers must therefore be assigned as instructed in this manual.
5	After that, the functions are selected and their parameters are programmed.

Designations

All elements can be designated by selecting a predefined designation from various designation groups or from the user defined designations.

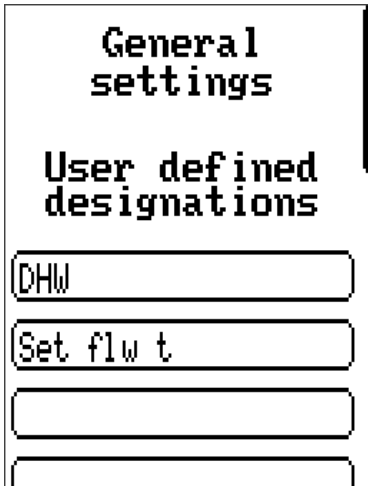
You can also assign a number from 1 to 16 to every designation.

In the "**General settings**" menu, all user defined designations from the **technician** or **expert** level can be created, changed or deleted globally.

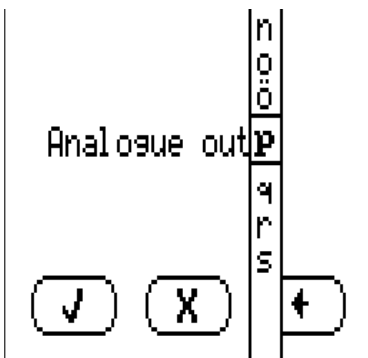


Shown only in technician or expert mode

View with previously defined designations



Entries are made up of letters, numbers and symbols entered consecutively.




Up to 100 different designations can be defined by the user. The maximum number of characters per designation is 24.

Designations defined previously are available for all elements (inputs, outputs, functions, fixed values, bus inputs and outputs).

General information on programming parameters

for inputs, outputs, fixed values, functions, default settings, and CAN and DL inputs and outputs.

If displayed, entries must be confirmed with .

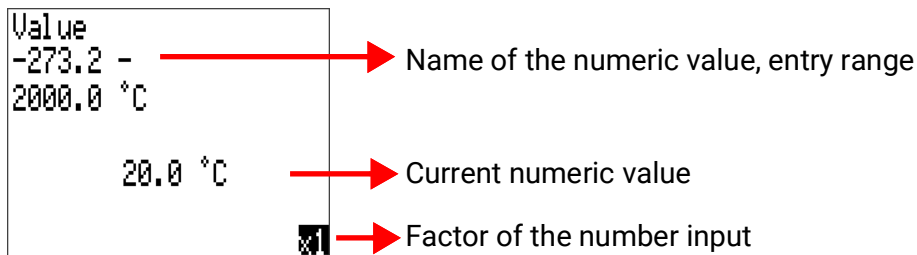
If you want to discard your entries, select .

Example:



Entering numeric values


The following window is displayed for entering numerical values:



The current value is shown (example: 22.0 °C).

The top line shows the name of the value, then the entry range (example: -273.2 – 2000.0 °C).

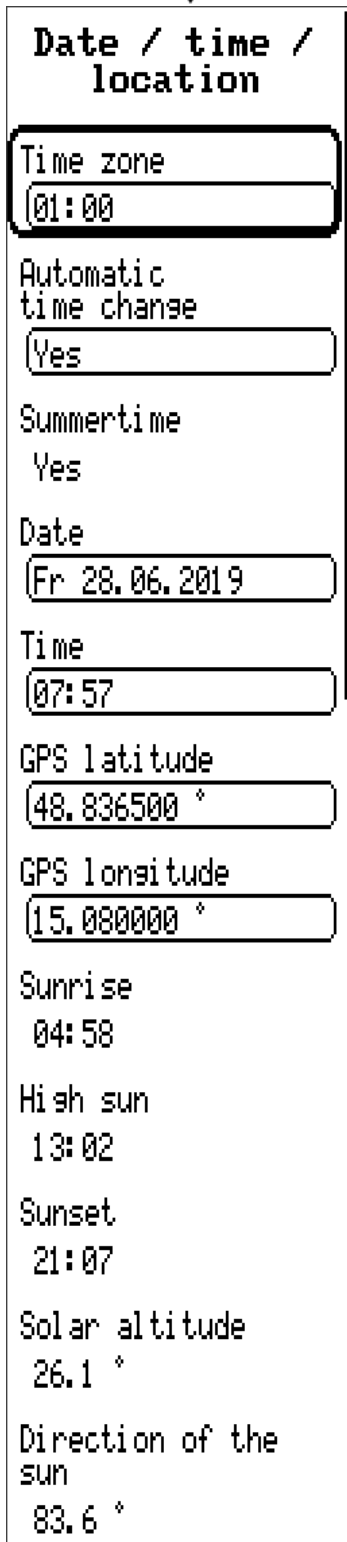
The value is entered by turning the rotary dial. As there are no symbols for confirming or rejecting a value, the entry is confirmed by pressing the dial or rejected by using the back button.

Holding the wheel changes the factor ( in the example), to enable faster entry of high numbers. Each limit stop on the wheel changes the number by the factor (x1, x10, x100, x1k).

Date / time / location



The entry **Date / Time / Location** can be found under the general settings.



The system value parameters are displayed first

- **Time zone** – 01:00 means the time zone "UTC + 1 hour". UTC stands for "Universal Time Coordinated", also known as GMT (= Greenwich Mean Time).
- **Automatic time change** – If "Yes", the time will switch over automatically to summertime according to the specifications of the European Union.
- **Summertime** – "Yes" if summertime is active. Can only be changed if the "Automatic time change" is set to "No"
- **Date** – The current date (dd.mm.yy).
- **Time** – The current time
- **GPS latitude** – Geographical latitude according to GPS (= global positioning system)
- **GPS longitude** – Geographical longitude according to GPS
- **Sunrise** – Time
- **High sun** – Time
- **Sunset** – Time
- **Solar altitude** – Specified in ° as measured from the geometric horizon (0°), zenith = 90°
- **Direction of the sun** – Specified in ° as measured from the north (0°)
North = 0° East = 90° South = 180° West = 270°

The values for geographical latitude and longitude are used to determine the location-specific solar data. That data can be used in functions (e.g. shading function).

The factory default settings for the GPS data are for the location of Technische Alternative Amalien-dorf, Austria.

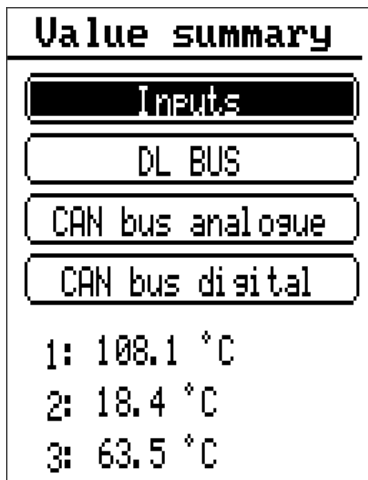
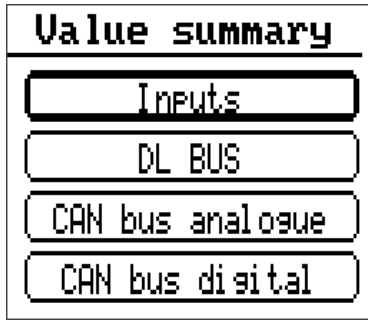
Next, the location-specific solar data is displayed.

Power reserve

In the event of power failure, the controller has a power reserve for about 3 days for the time and date.

Value summary

This menu item shows the current values for **inputs** 1 – 16, the **DL inputs** and the analogue and digital **CAN inputs**.



If an entry is selected, the corresponding values are listed below.

Inputs

The controller has 6 inputs for analogue signals (measurements), digital signals (ON/OFF) or pulses. This menu displays the inputs with their designation and the current measurements or status.

Example of a programmed system; input 1 is still unused:

Inputs	
1:	T.collector 1 108.1 °C
2:	T.collector 2 18.4 °C
3:	T.solar rtn 63.5 °C
4:	unused



Programming the parameters

Sensor type and measured variable

Once the required input is selected, the sensor type can be defined.

Input 1
Type
unused

First, you must specify the basic type of input signal.

- Digital
- Analogue
- Pulse

Digital

Select the **measured variable**:

- Off / On
- Off / On (inverse)
- No / Yes
- No / Yes (inverse)

Analogue

Select the **measured variable**:

- **Temperature**
 - Select the sensor type: **KTY (2 k Ω /25°C** = formerly Technische Alternative's standard type), **PT 1000** (= current standard type), room sensors: **RAS, RASPT, THEL** thermocouple, **KTY (1 k Ω /25°C), PT 100, PT 500, Ni1000, Ni1000 TK5000**
- **Solar radiation** (sensor type: **GBS01**)
- **Voltage** (max. 10V DC)
- **Resistance**
- **Humidity** (sensor type: **RFS**)
- **Rain** (sensor type: **RES**)

Also select the process variable for the measured variables Voltage, Current (input 8 only), Resistance:

- | | | |
|-------------------------------------|---|-------------------------|
| • Dimensionless | • Absolute humidity | • Amperage mA |
| • Dimensionless (,1) | • Pressure bar, mbar, Pascal | • Amperage A |
| • Performance factor | • Litre | • Resistance |
| • Dimensionless (,5) | • Cubic metre | • Frequency |
| • Temperature °C | • Flow rate (l/min, l/h, l/d, m³/min, m³/h, m³/d) | • Speed km/h |
| • Global radiation | • Output | • Speed m/s |
| • CO₂ content ppm | • Voltage | • Degree (angle) |
| • Percent | | |

Then a use scaling for the value range must be defined.

Example: Voltage/global radiation

Scaling
Input value 1 <input type="text" value="0.00 V"/>
Target value 1 <input type="text" value="0 W/m<sup>2</sup>"/>
Input value 2 <input type="text" value="10.00 V"/>
Target value 2 <input type="text" value="1500 W/m<sup>2</sup>"/>

0.00 V equates to 0 W/m², 10.00 V yields 1500 W/m².

Pulse input

Inputs 1 - 6 can capture pulses with **max. 10 Hz** and a pulse duration of at least **50 ms**.

Select the measured variable

Input 6

Type

Measured variable

Wind speed

A quotient must be entered for "**Wind speed**". This is the signal frequency at **1 km/h**.

Example: The **WIS01** wind sensor issues one pulse (=1Hz) per second at a wind speed of 20 km/h. Therefore the frequency at 1 km/h equals 0.05 Hz.

Quotient

Setting range: 0,01 – 1,00 Hz

Flow rate

A quotient must be entered for the "**Flow rate**" measured variable. This is the flow rate in litres per pulse.

Quotient

Setting range: 0,1 – 100,0 l/pulse

Pulse

This measured variable is used as the input variable for the "Meter/Counter" function, as a pulse counter with "Pulses" as its unit.

User defined

For the "User defined" measured variable, both the quotient and the unit must be entered.

Quotient <input type="text" value="0.00005 l/Imp"/>	Quotient <input type="text" value="0.00125 kWh/imp"/>
Unit <input type="text" value="l"/>	Unit <input type="text" value="kWh"/>
Time unit <input type="text" value="/h"/>	

Setting range for quotient: 0.00001 – 1000.00000 units/pulse (5 decimal places)

Units: l, kW, km, m, mm, m³.

For l, mm and m³ the unit of time must be selected as well. For km and m the units of time are pre-defined and cannot be changed.

Example: For the "Energy meter" function, the unit "kW" can be used. In the example above, 0.00125 kWh/pulse was selected, which equates to 800 pulses /kWh.

Designation

Enter the input designation by selecting a predefined designation from various designation groups or from the user defined designations.

Sensor type Analogue / Temperature:

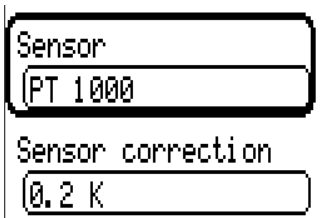
- **General**
- **Generator**
- **Consumer**
- **Line**
- **Climate**
- **User** (user defined designations)

You can also assign a number from 1 to 16 to every designation.

Sensor correction

The option of sensor correction is available for the measured variables Temperature, Solar radiation, Humidity and Rain. The corrected value is utilised for all calculations and displays.

Example: PT1000 temperature sensor



The image shows a two-line menu. The first line is labeled 'Sensor' and has 'PT 1000' selected. The second line is labeled 'Sensor correction' and has '0.2 K' selected.

Average



The image shows a two-line menu. The first line is labeled 'Average' and has '1.0s' selected.

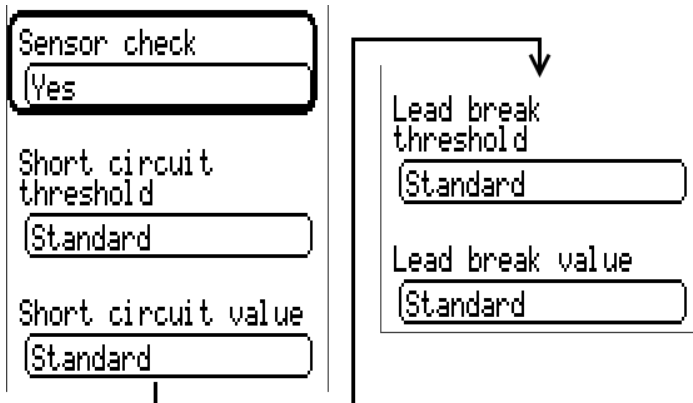
This setting refers to the average of the measurements **over time**.

Averaging over 0.3 seconds leads to extremely rapid reactions on the part of the display and the unit. However, this can be expected to cause fluctuations of the value.

A large average value leads to inertia and is only recommended for sensors for the heat meter.

For simple measuring tasks, around 1 - 3 seconds should be selected. For hygienic domestic hot water heating with the ultra-fast sensor, 0.3 - 0.5 seconds should be selected.

Sensor check for analogue sensors



When "**Sensor check**" is active (setting: "**Yes**"), a short circuit or a lead break will **automatically** generate an error message.

Example:

Inputs
1: T.collector 1 -9999.9 °C

Sensor error

When "**Sensor check**" is active, Sensor error is available as an input variable for functions: status "**No**" for a sensor that is working correctly and "**Yes**" for a defect (short circuit or lead break). This allows the controller to react to the failure of a sensor, for example.

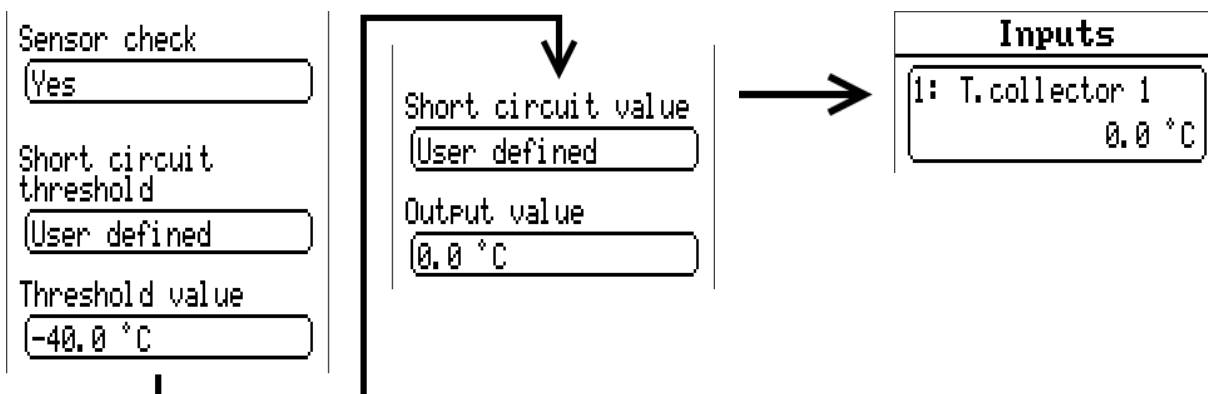
In System values / General, a sensor error for **all** inputs is available.

If the **Standard** thresholds are selected, a short circuit will be indicated if the value falls below the lower **measurement limit** and a lead break will be indicated if the value exceeds the upper **measurement limit**.

The **Standard** values for temperature sensors are -9999.9 °C for a short circuit and 9999.9 °C for a lead break. Those values are utilised in the internal calculations in the event of an error.

By selecting the thresholds and values appropriately, a fixed value can be specified for the controller in the event of sensor failure, in order to allow a function to continue operating in emergency mode.

Example: If the temperature value falls below the threshold of -40 °C (= "Threshold value"), a value of 0.0 °C (= "Output value") is issued and displayed for that sensor (fixed hysteresis: 1.0 °C). At the same time the "Sensor error" status is set to "**Yes**".



Example: Sensor 1 has fallen below -40 °C, so 0 °C is issued as the measurement, and a sensor error is displayed at the same time.

Resistance table for various sensor types

Temp. [°C]	0	10	20	25	30	40	50	60	70	80	90	100
PT1000 [Ω]	1000	1039	1078	1097	1117	1115	1194	1232	1271	1309	1347	1385
KTY (2kΩ) [Ω]	1630	1772	1922	2000	2080	2245	2417	2597	2785	2980	3182	3392
KTY (1kΩ) [Ω]	815	886	961	1000	1040	1122	1209	1299	1392	1490	1591	1696
PT100 [Ω]	100	104	108	110	112	116	119	123	127	131	135	139
PT500 [Ω]	500	520	539	549	558	578	597	616	635	654	674	693
Ni1000 [Ω]	1000	1056	1112	1141	1171	1230	1291	1353	1417	1483	1549	1618
Ni1000 TK5000 [Ω]	1000	1045	1091	1114	1138	1186	1235	1285	1337	1390	1444	1500

The standard type used by Technische Alternative is **PT1000**.

KTY (2 kΩ) was the factory-fitted standard type until 2010/2011.

PT100, PT500: As these sensors are more susceptible to external interference, their sensor leads must be **screened** and the **Average time** should be increased. Nevertheless the accuracy specified in the technical data for PT1000 sensors **cannot be guaranteed**.

NTC sensors

Sensor <input type="text" value="NTC"/> R25 <input type="text" value="1.00 kΩ"/> Beta <input type="text" value="1000"/>	For evaluating the NTC sensors, the R25 value and the beta value must be specified. The nominal resistance R25 is always based on 25 °C. The beta value refers to the characteristic of an NTC sensor in relation to 2 resistance values.
--	---

Beta is a material constant and can be calculated from the manufacturer's resistance table using the following formula:

$$B = \frac{\ln \frac{R1_{(NT)}}{R2_{(HT)}}}{\frac{1}{T1_{(NT)}} - \frac{1}{T2_{(HT)}}}$$

As the beta value is not a constant over the total temperature curve, the anticipated limits of the measuring range must be determined (e.g. for a cylinder sensor from +10 °C to +100 °C or for an outside sensor from -20 °C to +40 °C).

All temperatures in the formula must be given as absolute temperatures in K (Kelvin) (e.g. +20 °C = 273.15 K + 20 K = 293.15 K)

ln Natural logarithm

R1_(NT) Resistance at the minimum temperature of the temperature range

R2_(HT) Resistance at the maximum temperature of the temperature range

T1_(NT) Minimum temperature of the temperature range

T2_(HT) Maximum temperature of the temperature range

Outputs

The controller has **10 outputs**.

The entry **Outputs** in the main menu takes you to an overview.

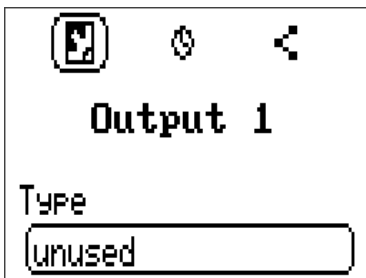
Outputs are shown with their name and current status.

Example:

Outputs	
1: Solar PUMP 1	Auto/OFF
2: Solar PUMP 2	Auto/OFF
3: Htg circ. PUMP	Auto/OFF
4: Boiler demand	Auto/OFF

Programming the parameters

Once the required output is selected, the output type can be defined.



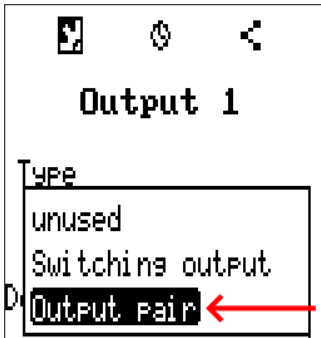
First, you must specify the basic output type.

Output type

The following different output types exist, although they are not available for selection for all outputs:

- **Switching output**
- **Output pair**
- **0-10V**
- **PWM**

Outputs 1+2, 3+4, 5+6, 7+8 and 9+10 as an output pair



These outputs can be used as single switching outputs or as an output pair together with the following switching output (e.g. to control a mixer drive).

The output pairs **1+2**, **3+4** and **5+6** are available as standard. The output pairs **7+8** and **9+10** require the use of auxiliary relays (relay modules).

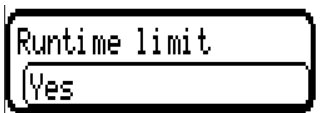
The output pair is only programmed at the first of the affected outputs (e.g. output 1 for output pair 1+2).

Runtime



The mixer runtime must be entered for **every** output pair.
If a mixer runtime of 0 is entered, the output pair will not be utilised.

Runtime limit



When the runtime limit is active, output pair control is terminated if the remaining runtime of 20 minutes has counted down to 0. The remaining runtime is reloaded if the output pair is switched to manual mode, is switched by a message (to dominant ON or OFF), changes its direction of control, or if enabling is switched from OFF to ON.

If the runtime limit is deactivated, the remaining runtime only counts down to 10 seconds and output pair control is not terminated.

If two different functions act on the two outputs in the output pair simultaneously, the output with the lower number ("OPEN" command) will be activated.

Exception: the "**Message**" function – if the simultaneous command comes from this function, the output with the higher number ("CLOSE" command) will be activated.

All switching outputs

Delay

 Run-on

A start delay and a run-on time can be defined for all switching outputs

All outputs

Manual mode can be restricted to certain user groups (User, Technician, Expert) for all outputs

Manual mode
 can be changed by

Outputs 7 to 10 as analogue outputs

Type

 Switching output
 Output pair

These outputs provide a voltage between 0 and 10 V, e.g. for output-dependent control of burners (burner modulation) or speed control of electronic pumps.

The output can be issued either as a voltage (**0-10 V**) or as a **PWM** signal.

They can be controlled by the PID function, or by other functions. The "Scaling" provides the option of matching the **analogue value** of the source (with or without decimal place) to the control range of the device being controlled.

In **PWM** (pulse width modulation) mode, a square wave signal is created with a voltage level of about **10 V** and a frequency of **1 kHz** with a variable duty factor (0 - 100 %).

If multiple functions (analogue values) act simultaneously on one analogue output, the higher value is output.

For cases where an analogue output is activated by a **digital command**, an output voltage of 0.00 V and 10.00 V (or 0.0 % – 100.0 % for PWM) can be defined. Digital commands are dominant over links with an analogue value.

The activation of the analogue output via "**Dominant off**" and "**Digital on**" is possible by means of the following digital signals:

<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> Dominant off <input type="text" value="5.00 V"/> </div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> Digital on <input type="text" value="10.00 V"/> </div>
Example: Output value 5,00V	Example: Output value 10,00V
Dominant off (from messages)	Dominant on (from messages)
Manual off	Manual on
	Digital on
	Anti-blockierschutz

Outputs status of the analogue outputs

Output status

ON if

Act. > threshold

Act. < threshold

0.00 V

For the output status you can define whether the ON status should be issued above or below an adjustable threshold.

Example: If the analogue output is over 3.00 V, the output status switches from OFF to ON.

Output status

ON if

Act. > threshold

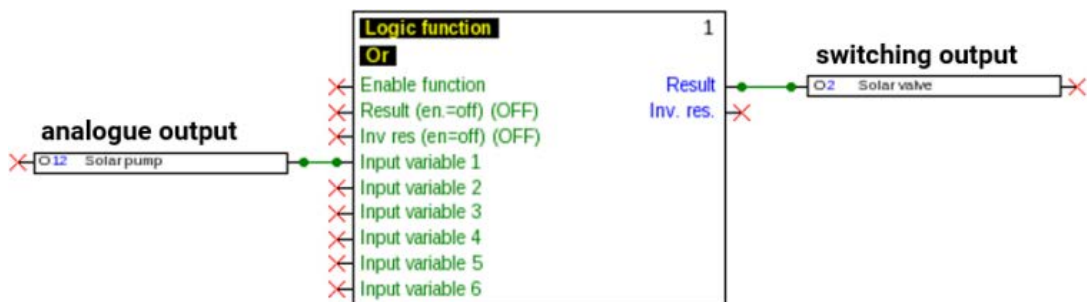
Threshold

3.00 V

Depending on the technical attributes of the pump being controlled, it may thus be possible to set the output status to be ON only when the pump is actually running.

If you want an analogue output (A7 – A10) to be switched **together with** a switching output, it can only be done by means of appropriate programming.

Example: As soon as the output status of the analogue output switches to ON, that ON command is forwarded to the switching output via the logic function.



Display in the Outputs menu

The display in the menu shows the operating state of the analogue output. The output status can be changed by selecting it.

<pre>7: Solar PUMP [Auto] 0.0 %</pre>	<ul style="list-style-type: none"> •Auto: Output issued according to the source and scaling •Manual: Adjustable value •Manual/OFF: Output issued according to "Dominant off" setting •Manual/ON: Output issued according to "Digital on" setting
↓	
<pre>7: Solar PUMP [Auto] Manual Manual/OFF Manual/ON</pre>	

Examples of different scalings

Correcting variable of PID function: Mode 0-10 V, correcting variable 0 should correspond to 0 V, correcting variable 100 should correspond to 10 V:

```
Scaling
Input value 1
[0]
Target value 1
[0.00 V]
Input value 2
[100]
Target value 2
[10.00 V]
```

Temperature value, e.g. from an analogue function: Mode PWM, the temperature 0 °C should correspond to 0%, 100.0 °C should correspond to 100%:

The temperature is transferred in 1/10 °C **without the decimal point**.

```
Input value 2
[1000]
Target value 2
[100.0 %]
```

Burner output, e.g. from the functions DHW demand or Maintenance: Mode 0-10 V, burner output of 0.0% should correspond to 0 V, 100.0% should correspond to 10 V:

The percentage is transferred in 1/10% **without the decimal point**

```
Input value 2
[1000]
Target value 2
[10.00 V]
```

Designation

Enter the output designation by selecting a predefined designation from various designation groups or from the user defined designations.

- **General**
- **Climate**
- **User** (user defined designations)

You can also assign a number from 1 to 16 to every designation.

Overview of outputs

		Switching output N/O relay	Switching output N/O + N/C relay	Switching output Potential-free N/O + N/C relay	Output pair for mixer, etc.	0-10V or PWM
Outputs	1	x			x	
	2	x			x	
	3	x			x	
	4	x			x	
	5	x			x	
	6		x	x	x	
	7	x ¹			x ¹	x
	8	x ¹			x ¹	x
	9	x ¹			x ¹	x
	10	x ¹			x ¹	x

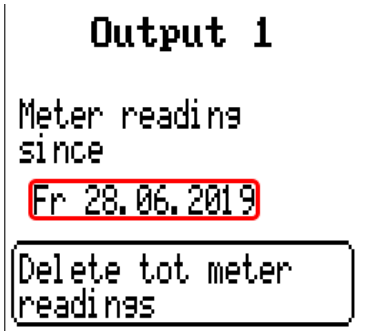
¹ Switching outputs and output pairs 7 – 10 only possible with additional PCBs

Output meter



Selecting this icon allows you to see the hours run and pulses (times switched on) for every output.

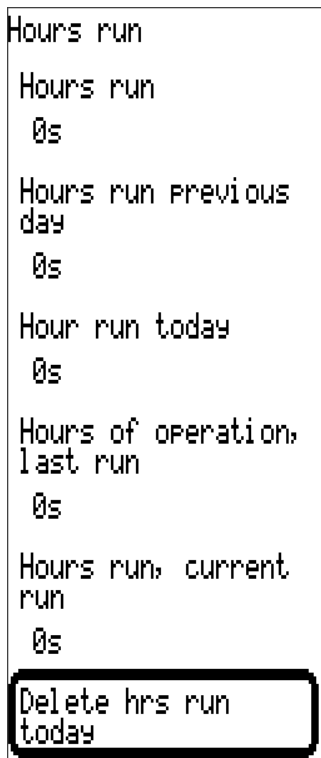
Example: For output 1, the meter readings since 28-06-2019 can be viewed.



If you tap the button, you will be asked whether you want to delete the **total** meter readings and the "**Previous day**" readings for the hours run meter **and** the pulse counter. The "**Today**" and "**Last run**" and "**Current run**" readings will not be deleted.

Answer by tapping either the tick (= Yes) or the cross (= No).

After the deletion, the current date will be displayed.



The meter shows the total hours run, the hours run the previous day and today, and the previous runtime and the current runtime.

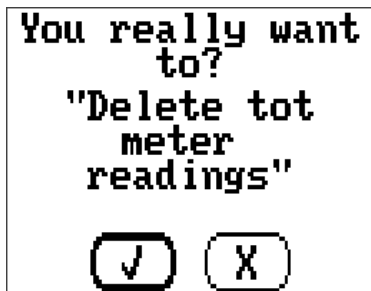
If you tap the button, you will be asked whether you want to delete the hours run counted today. This will not delete the "Last run" and "Current run".

<pre>Pulses Pulses 0 Pulses previous day 0 Pulses today 0</pre>	<p>Below the hours run, the pulses (how many times switched on) can be viewed.</p> <p>The meter shows the total number of pulses (times switched on), the number of pulses on the previous day and the number today.</p>
<pre>Delete pulses today</pre>	<p>If you tap the button, you will be asked whether you want to delete the pulses counted today.</p>

- **CAUTION:** The meter readings are saved to the internal memory every hour. Therefore, in the event of a power failure, no more than 1 hour of metering can be lost.
- When loading function data, you will be asked whether you want to apply the saved meter readings (see manual "Programming Part 1: General information").

Meter reset

If you tap a "Delete" button, you will be asked whether you want to delete the total meter readings or today's meter reading.



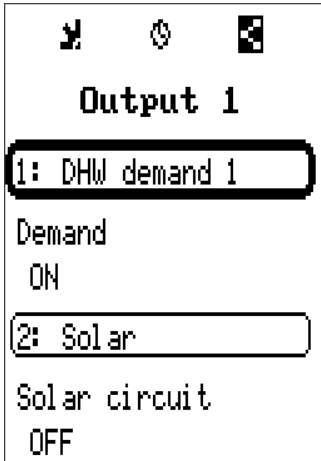
Answer the confirmation prompt by tapping either the tick (J) (= Yes) or the cross (X) (= No). After the deletion of the total meter readings, the current date will be displayed.

Display of links <



When you select this icon, the output's links to the functions will be displayed.

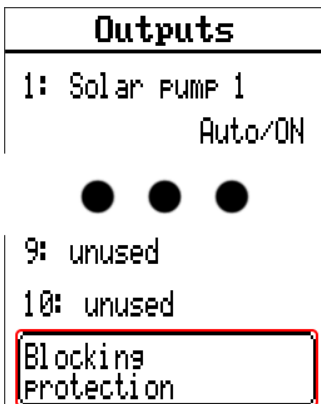
Example:



In this example, output 1 is controlled by two functions, and it has just been switched on by function 1 (DHW demand 1).

Tapping a function takes you directly to the menu for that function.

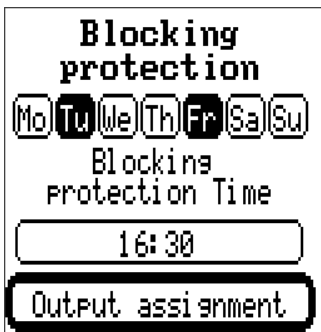
Blocking protection



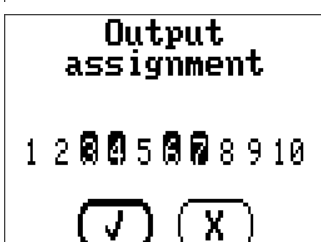
Circulating pumps which do not run for a long period (e.g. heating circuit pump during the summer) often encounter start-up problems as a result of corrosion. This problem can be avoided by starting the pump periodically for 30 seconds.

Analogue outputs (7-10) are activated with the speed set under **Output value, digital/manual mode**. This setting must be made separately for each analogue output.

The menu item **Blocking protection** added after output 10 allows you to specify a time and all the outputs to receive blocking protection.



The outputs selected in the Output assignment will be switched on for 30 seconds on Tuesday and Friday at 4:30 p.m. if the output has not been active since the last controller start or since blocking protection was last initiated.

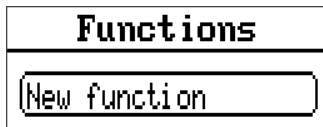


The outputs 3, 4, 6 and 7 were selected.

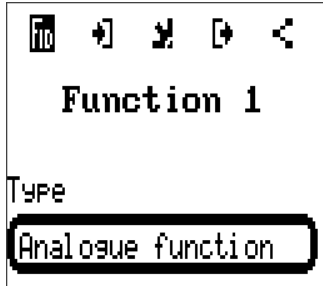
The controller does not switch on all the outputs at the same time, but instead begins with one output, switches to the next after 30 seconds, and so on.

Functions

Functions are created, programmed and linked in this menu. This section only describes how functions and links are created. For more detailed information on the various function modules, see the **Programming: functions instructions**.

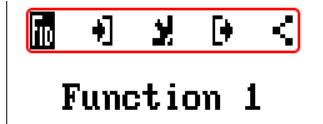


Creating a new function



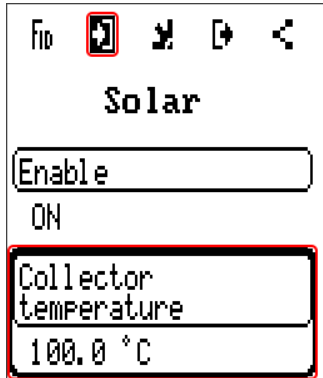
Under **Type** you select which function is to be created.

The line at the top of the "Function" menu provides access to **fiD** (type and designation), **input variables**, **parameters**, **output variables** and **links**.



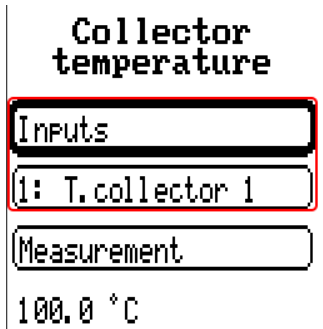
The menu whose symbol is highlighted in black is displayed.

Example: Linking the "collector temperature" input variable to an input



Selecting the symbol for **input variables**

Selecting the required input variable



The first entry shows various sources for values; **Inputs** is selected

The required input is selected

Fixed values

Value summary
Inputs
Fixed values
Outputs
Functions
Messages

In this menu you can define up to 64 fixed values, which can be used as input variables for functions, for example.

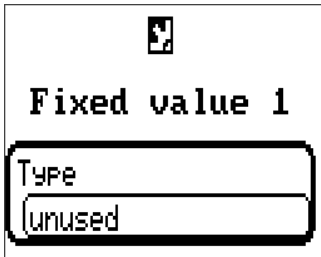
When this item is selected in the main menu, the fixed values already defined are displayed together with their designation and their current value or status.

Example:

Fixed values
1: Min. Buffer Hts 1 20.0 °C
2: Min. Buffer Hts 2 0.0 °C
3: unused
4: unused

Programming the parameters

Example: Fixed value 1



Fixed value type

Once the required fixed value is selected, the fixed value type can be defined

- Digital
- Analogue
- Pulse

Digital

Select the **measured variable**:

- On / Off
- No / Yes

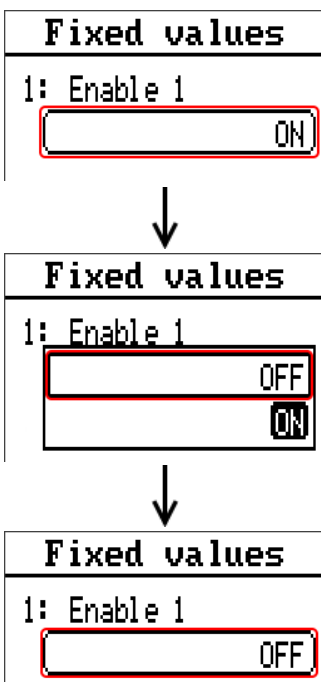
Select whether the status can be changed via a selection box or simply by a click



Changing a digital fixed value

Pressing a button allows you to change the fixed value, either via a **drop-down box** or by a **single press** ("click"). If the drop-down box does not open/the status does not change, the status from the logged-in user level cannot be changed.

Example: Changeover from **ON** to **OFF** via a selection box



Analogue

Select from a wide range of function quantities

Typ
Analog

Funktionsgröße
dimensionslos
dimensionslos (,1)

Arbeitszahl

● ● ●

For fixed values, the function quantity "Time" (shown as: 00:00) is also available.

After assigning the **designation**, you must define the permitted limits and the current fixed value. The value can be adjusted in the menu within those limits.

Example:

Minimum
50.0 °C

Maximum
65.0 °C

Value
50.0 °C

Changing an analogue fixed value

Tapping the button allows you to change the fixed value via the dial. If the value does not appear on a light background, that status cannot be changed from the logged-in user level.

1: Set temperature
50.0 °C

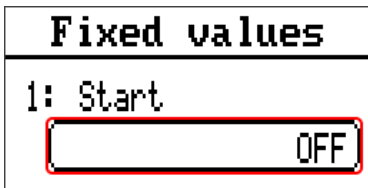
↓

1: Set temperature
50.0 -
65.0 °C

50.0 °C

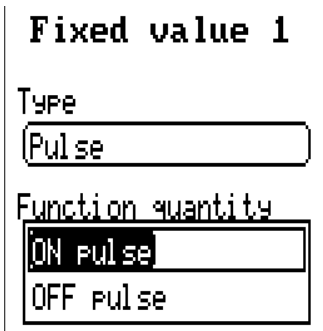
Pulse

A fixed value of this type allows short **pulses** to be generated by tapping it in the menu “Fixed values”.



A pulse can also be triggered in the menu of the fixed value by tapping.

Function quantity



Select the **function quantity**: When activated, either an ON pulse (from OFF to ON) or an OFF pulse (from ON to OFF) will be generated, depending on the settings made here.

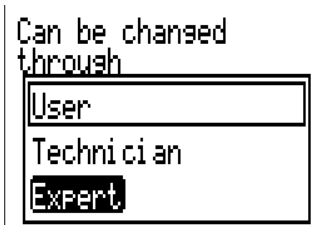
Designation

Enter the fixed value designation by selecting a predefined designation or one of the user defined designations.

You can also assign a number from 1 to 16 to every designation.

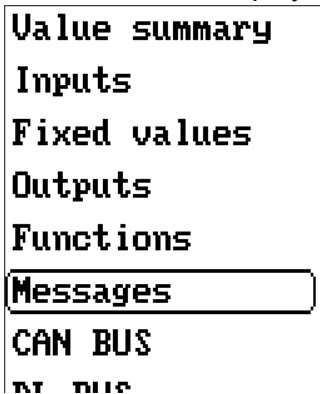
Restriction of change authority

For **all** fixed values, you can set the user level from which the fixed value can be changed:

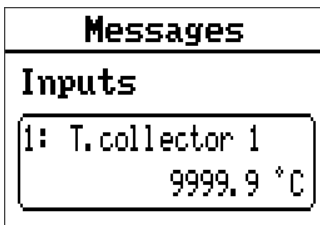


Messages

This menu item displays activated messages.



Example: Message 1 is active.



Pop-up window

If a message is triggered, a pop-up window is displayed.



Message/warning/fault/error: Type of message displayed

Overtemperature (ex.): Name of message (designation of the initiating message function)

Warning tone off: Deactivation of beeping sound

Delete message: The message cannot be deleted until the cause of the message has been eliminated.

Reset fault (only available for "Fault" message type): Deletes the fault (if the cause of the message has been eliminated) and a brief pulse is output on selected outputs (see output variables of the message function).

Hide message: The pop-up message is hidden from view

CAN bus

The CAN network allows communication between CAN bus devices. When analogue or digital values are sent via CAN outputs, other CAN bus devices can utilise those values as CAN inputs.

This menu contains all of the information and settings needed to set up a CANopen network. Up to 62 CAN bus devices can be operated in one network.

Every CAN bus device must be given its own node number in the network.

The **cable topology** of a CAN bus network is described in the installation instructions.

```
Value summary
Inputs
Fixed values
Outputs
Functions
Messages
CAN BUS
DL BUS
M-Bus
```



```
CAN BUS
Data logging
CAN settings
CAN analogue
inputs
CAN digital
inputs
CAN analogue
outputs
CAN digital
outputs
```

Datalogging

This menu is not visible in the User mode.

```

Datalogging
Datalogging
Settings
Datalogging
Analogue
Datalogging
Digital
  
```

In this menu, the settings for datalogging are defined via CAN bus or on the SD card of the controller for analogue and digital values.

Datalogging Settings

```

Datalogging
Settings
Datalogging on
SD card
Yes
Interval time
30s
  
```

Here, you can define whether the logging values are stored on the SD card for the controller and if so, at what intervals.

The logged daily log files are stored in the directory „LOG/year“. Logging only takes place when the SD card is inserted.

If the memory available on the SD card falls below 50 MB, the oldest daily log files will be automatically deleted. The logged values can be read out using **Winsol** software on the SD card (see **Winsol** manual).

Datalogging Analogue / Digital

The settings apply to both datalogging on the SD card for the controller and for CAN datalogging with the C.M.I.

Each controller can issue a maximum of 64 digital and 64 analogue values that are defined in this sub-menu.

The sources for the logged values can be inputs, outputs, function output variables, fixed values, system values, and DL and CAN bus inputs.

Note: Digital inputs must be defined within the range of **digital** values.

Any number of counter functions (but a maximum of 64 analogue values) can be logged. Like all other analogue values, the counter values to be logged are entered into the "Analogue datalogging" list.

CAN datalogging requires at least version 1.25 on the C.M.I. datalogger and a Winsol version of at least 2.06.

CAN datalogging is only possible with the C.M.I. datalogger. In contrast to data recording via the DL bus, the data to be logged via the CAN-bus can be freely selected. There is no constant data output.

When requested by a C.M.I., the controller saves the current values to a logging buffer and locks it to prevent it from being overwritten (when requests are received from another C.M.I.) until the data is read out and the logging buffer has been enabled again.

The settings required on the C.M.I. for datalogging via CAN bus are described in the C.M.I.'s online help.

CAN settings

CAN settings	
Node	1
Designation	UVR610
BUS rate	50 kbit/s (standard)

Node

Define a unique CAN node number for the device (setting range: 1 – 62). The device with node number 1 provides the time stamp for all other CAN bus devices.

Designation

Every controller can be given its own designation.

Bus rate

The standard bus rate of the CAN network is 50 kbit/s (50 kBd), which is specified for most CAN bus devices.

Important: All devices in the CAN bus network must have the same transfer rate in order to be able to communicate with each other

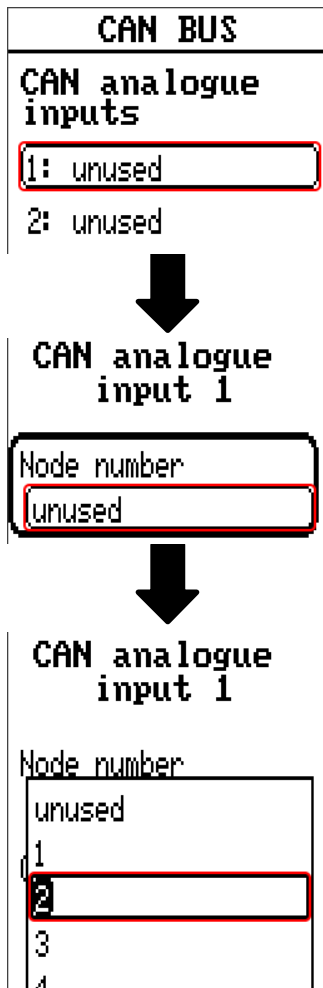
The bus rate can be set to between 5 and 500 kbit/s, with lower bus rates allowing longer cable networks.

Bus rate [kbit/s]	Maximum permissible total bus length [m]
5	10.000
10	5.000
20	2.500
50 (standard)	1.000
125	400
250	200
500	100

In the event of a total reset from the "Data admin" menu, the settings for the node number and bus rate are retained.

CAN analogue inputs

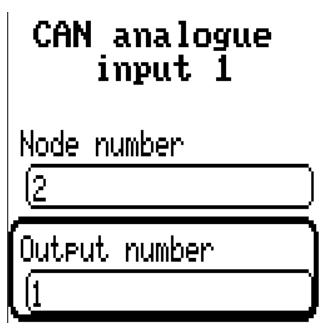
Up to 64 CAN analogue inputs can be programmed. They are defined by specifying the **transmission** node number and the number of the **transmission** node's CAN output.



Node number

After the node number of the **transmission node** is entered, the other settings can be specified. The number of a CAN analogue output is taken from the device with that node number and applied here.

Example: On CAN analogue **input 1**, the output number applied is that of CAN analogue **output 1** from the device with node number 2.



Designation

Every CAN input can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the other controller inputs.

Example:

Designation
Temperature actual value
T.collector
1

CAN bus timeout

Define the timeout time for the CAN input (minimum value: 5 minutes).

CAN BUS timeout
5m

As long as the information continues to be read from the CAN bus, the **network error** for the CAN input will be "No".

If the value has not been updated for longer than the set timeout, the **network error** changes from "No" to "Yes". You can then define whether the controller should issue the last value transmitted or a definable substitute value (only when the measured variable is set to **User**).

The **network error** can be selected as the source of a function input variable, which allows the controller to react appropriately to a failure of the CAN bus or transmission node.

In **System values** / General, a network error for **all** CAN inputs is available.

Sensor check

If you set "Sensor check" to "Yes", the sensor error of the sensor supplying the CAN input is available as an input variable for a function.

Sensor check
Yes

Measured variable

If "Measured variable" is set to "**Automatic**", the unit of measurement specified by the transmission node will be applied in the controller

Measured variable
Automatic

If you select "User", you can select a unit of your own, a sensor correction and, if sensor check is active, a monitoring function.

Measured variable
Automatic
User defined

Every CAN input is assigned its own unit, which can differ from the unit used by the transmission node. A range of units is available to choose from.

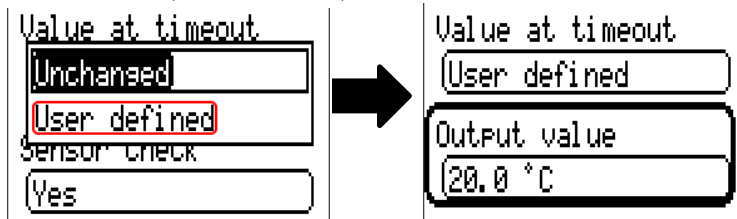
Unit
Temperature °C

This setting is only displayed if "Measured variable" is set to "User".

Value at timeout

This setting is only displayed if "Measured variable" is set to "User".

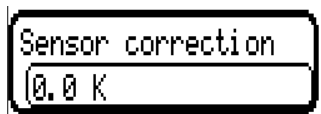
If the timeout time is exceeded, you can define here whether the controller should issue the last value transmitted ("Unchanged") or a definable substitute value.



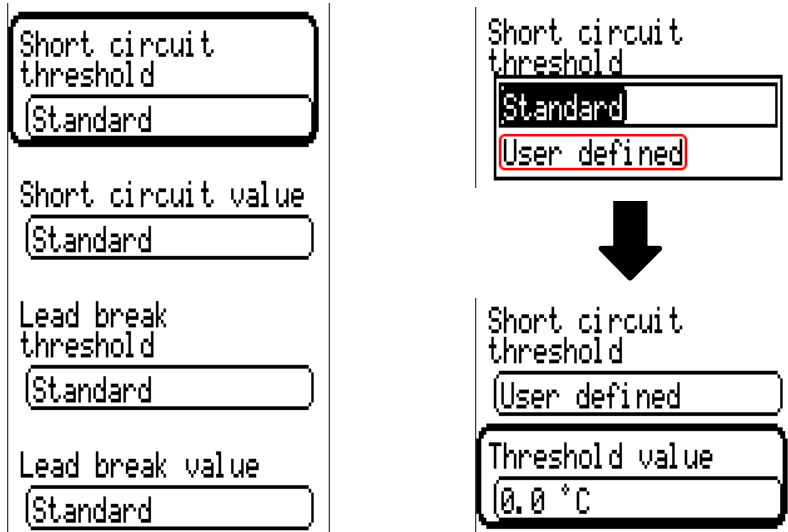
Sensor correction

This setting is only displayed if "Measured variable" is set to "User".

The value of the CAN input can be corrected by applying a fixed value.



Sensor error



This setting is only displayed if **sensor check is active** and "Measured variable" is set to "User".

When "Sensor check" is active, the **sensor error** of a CAN input is available as an input variable for functions: status "No" for a sensor that is working correctly and "Yes" for a defect (short circuit or lead break). This allows the controller to react to the failure of a sensor, for example.

If the **Standard** thresholds are selected, a short circuit will be indicated if the value falls below the **measurement limit** and a lead break will be indicated if the value exceeds the **measurement limit**.

The **Standard** values for temperature sensors are -9999.9 °C for a short circuit and 9999.9 °C for a lead break. Those values are utilised in the internal calculations in the event of an error.

By selecting the thresholds and values for short circuit and lead break appropriately, a fixed value can be specified for the controller in the event of sensor failure at the transmission node, in order to allow a function to continue operating in emergency mode (fixed hysteresis: 1.0 °C).

The short circuit threshold must be defined below the lead break threshold.

In System values / General, a sensor error for all inputs, CAN inputs and DL inputs is available.

CAN digital inputs

Up to 64 CAN digital inputs can be programmed. They are defined by specifying the **transmission** node number and the number of the transmission node's CAN output.

Their parameters are programmed in almost exactly the same way as for the CAN analogue inputs.

Under **Measured variable / User** the **Display** for the CAN digital input can be changed from Off / On to No / Yes and you can define whether the controller should issue the last status transmitted ("Unchanged") or a definable substitute status when the timeout time is exceeded.

CAN analogue outputs

Up to 32 CAN analogue outputs can be programmed. They are defined by specifying the **source** in the controller.

CAN BUS	
CAN analogue outputs	
1:	unused
2:	unused
3:	unused



CAN analogue output 1	
	unused



Specify the source in the controller which supplies the value for the CAN output.

- **Inputs**
- **Outputs**
- **Functions**
- **Fixed values**
- **System values**
- **DL bus**

Example: Source, Input 1

CAN analogue output 1	
	Inputs
1:	T.collector 1
	Measurement
	50.0 °C

Designation and transmission condition

Every CAN analogue output can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the inputs.

Example:

Designation
Temperature actual value
T.collector
1

Transmission condition

Example:

Transmission condition
If change >
1.0 K
Blocking time
10s
Interval time
5m

If change > 1.0 K	If the current value has changed by more than 1.0 K compared to the last transmitted value, a new transmission is made. The unit used by the source is applied to the output value (minimum setting: 0.1 K).
Blocking time 10 s	If the value changes by more than 1.0 K within 10 seconds of the last transmission, the value is nevertheless only transmitted again after 10 seconds (minimum setting: 1 sec.).
Interval time 5 m	The value is transmitted every 5 minutes even if it has not changed by more than 1.0 K since the last transmission (minimum setting: 1 minute).

CAN digital outputs

Up to 32 CAN digital outputs can be programmed. They are defined by specifying the source in the controller.

Their parameters are programmed in exactly the same way as for the CAN analogue outputs except for the transmission conditions.

Designation and transmission condition

Every CAN digital output can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the inputs.

Example:

```

Designation
┌───────────────────┐
│ Output general    │
├───────────────────┤
│ Heat PUMP demand │
├───────────────────┤
│ 1                 │
└───────────────────┘
    
```

Transmission condition

Example:

```

Transmission
condition
┌───────────┐
│ If change  │
│ No         │
├───────────┤
│ Blocking time │
│ 10s         │
├───────────┤
│ Interval time │
│ 5m          │
└───────────┘
    
```

If change Yes/No	Transmission of the value if a status change occurs
Blocking time 10 s	If the value changes within 10 seconds of the last transmission, the value is nevertheless only transmitted again after 10 seconds (minimum setting: 1 sec.).
Interval time 5 m	The value is transmitted every 5 minutes even if it has not changed since the last transmission (minimum setting: 1 minute).

Active CAN nodes

```

32: UVR610
1: CMI
    
```

If the back button is pressed in the main menu view, the network overview opens. All active CAN nodes with node number and device designation are displayed here. Select an x2 device to be able to access it.

This view shows a UVR610 with node number 32 in the CAN bus network, and a C.M.I. with node number 1.

To return to the menu of your own controller, the controller itself is selected in this overview (example: **32: UVR610**).

DL bus

The DL bus acts as a bus cable for various sensors and/or for datalogging by C.M.I. or D-LOGG. The DL bus is a bidirectional data link and is only compatible with products from Technische Alternative. The DL bus network operates independently of the CAN bus network

This menu contains all of the information and settings needed to set up a DL bus network.

The **cable topology** of a DL bus network is described in the controller's installation instructions.

```

Value summary
Inputs
Fixed values
Outputs
Functions
Messages
CAN BUS
DL BUS
M-Bus
Control
  
```



```

DL BUS
DL settings
DL input
DL output
  
```

DL settings

```

DL settings
Data output
No
Yes
  
```

You can use this button to activate or deactivate data output for datalogging via the DL bus and for display on the RAS-PLUS room sensor. The C.M.I. can be used for DL datalogging. Only the input and output values and the 2 heat meters are included in the data output; the values of the network inputs are not included.

DL input

Sensor values from DL bus sensors are transferred via a DL input.

Up to 32 DL inputs can be programmed.

Example: Programming the parameters of DL input 1

DL BUS	
DL input	
1:	unused
2:	unused
3:	unused



DL input 1	
Type	unused
	Digital
	Analogue

Select: Analogue or digital

DL input 1	
Type	Analogue
DL bus address	1
DL bus index	1

DL bus address and DL bus index

Every DL sensor must have its own **DL bus address**. Setting the address of a DL sensor is described in the sensor's datasheet.

Most DL sensors can measure various different values (e.g. flow rate and temperatures). Every value measured must be given its own **index** number. The applicable index number can be found in the DL sensor's datasheet.

Designation

Every DL input can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the other controller inputs.

Example: Designation

Temperature actual value
T. solar flow
1

DL bus timeout

As long as the information continues to be read from the DL bus, the **network error** for the DL input will be "No".

If the controller scans the DL sensor value three times and no value is transmitted, the **network error** changes from "No" to "Yes". You can then define whether the controller should issue the last value transmitted or a definable substitute value (only when the measured variable is set to **User**).

The **network error** can also be selected as the source of a function input variable, which allows the controller to react appropriately to a failure of the DL bus or DL sensor.

In System values / General, a network error for **all** DL inputs is available.

Sensor check

Sensor check
Yes

If you set "Sensor check" to "Yes", the sensor error of the sensor supplying the DL input is available as an input variable for a function.

Measured variable

Measured variable
Automatic

If "Measured variable" is set to "Automatic", the unit of measurement specified by the DL sensor will be applied in the controller

If you select "User", you can select a unit of your own, a sensor correction and, if sensor check is active, a monitoring function.

Measured variable
Automatic
User defined

Every DL input is assigned a unit, which can differ from the unit used by the DL sensor. A wide range of units is available to choose from.

Unit
Temperature °C


This setting is only displayed if "Measured variable" is set to "User".

Value at timeout

This setting is only displayed if "Measured variable" is set to "User".

If a timeout is set, you can define here whether the controller should issue the last value transmitted ("Unchanged") or a definable substitute value.

Value at timeout
Unchanged
User defined



Value at timeout
User defined
Output value
0.0 °C

Sensor correction

This setting is only displayed if "Measured variable" is set to "User".

The value of the DL input can be corrected by applying a fixed differential value.

Sensor correction
0.0 K

Sensor error

Short circuit threshold	Standard
Short circuit value	Standard
Lead break threshold	Standard
Lead break value	Standard

Short circuit threshold	Standard
	User defined
↓	
Short circuit threshold	User defined
	Threshold value
	0.0 °C

This setting is only displayed if **sensor check** is active and "Measured variable" is set to **"User"**.

When **"Sensor check"** is active, the **sensor error** of a DL input is available as an input variable for functions: status **"No"** for a sensor that is working correctly and **"Yes"** for a defect (short circuit or lead break). This allows the controller to react to the failure of a sensor, for example.

If the **Standard** thresholds are selected, a short circuit will be indicated if the value falls below the **measurement limit** and a lead break will be indicated if the value exceeds the **measurement limit**.

The **Standard** values for temperature sensors are -9999.9 °C for a short circuit and 9999.9 °C for a lead break. Those values are utilised in the internal calculations in the event of an error.

By selecting the thresholds and values for short circuit and lead break appropriately, a fixed value can be specified for the controller in the event of sensor failure at the transmission node, in order to allow a function to continue operating in emergency mode (fixed hysteresis: 1.0 °C).

The short circuit threshold must be defined below the lead break threshold.

In System values / General, a sensor error for all inputs, CAN inputs and DL inputs is available.

DL digital inputs

The DL bus is configured for the transfer of digital values as well as analogue. However, there is not yet any use for this at present.

The parameters are programmed in almost exactly the same way as for the DL analogue inputs.

Under Measured variable / User the Display for the DL digital input can be changed to No / Yes.

Bus load of DL sensors

A 2-pole cable provides **both** the power supply and the signal transfer for DL sensors. An additional power supply by means of an external power supply unit (such as with the CAN bus) is not possible. As the DL sensors have a relatively high power demand, the **"bus load"** must be considered:

The UVR16x2 controller supplies **100%** of the bus load. The bus loads of the DL sensors are listed in the technical data of each DL sensor.

Example: The DL sensor FTS4-50DL has a bus load of **25%**. Consequently up to four FTS4-50DL sensors can be connected to the DL bus.

DL output

Analogue and digital values can be transmitted to the DL bus network via a DL output. For example, a **digital command** to activate an O₂-DL O₂ sensor can be output.

Example: Programming the parameters of DL output 1

DL BUS	
DL output	
1:	unused
2:	unused
3:	unused



DL output 1	
	unused

Specify the source in the controller which supplies the value for the DL output.

- Inputs
- Outputs
- Functions
- Fixed values
- System values
- CAN bus analogue
- CAN bus digital

Example: Digital value; source: the result of a logic function

DL output 1	
	Functions
2:	Logic
	Result
	OFF

Designation and destination address

Specify the designation and the destination address of the DL sensor to be activated.

For the activation of the O₂ sensor, the index has no effect and can be ignored.

Example:

Designation		Destination address	
	User defined		DL bus address
	O ₂ sensor		1
			DL bus index
			1

M-Bus

(The UVR610-MODB controller has no M-Bus interface)

The M-Bus is a master/slave system for reading data from energy and volume meters (electricity, heat, water, gas).

The M-Bus input is designed for up to 4 M-Bus "unit loads". Up to 4 M-Bus meters, each with 1 unit load, can therefore be connected. The controller (master) cyclically reads the values from the individual devices. The interval time is adjustable.

As a master, the controller is therefore suitable for the parallel connection of up to four M-Bus meters (slaves).

In total, a maximum of 32 M-Bus values can be read per module. There must only be one master in the M-bus system.

This menu contains all the information and settings needed to set up an M-Bus network.

For the use of the M-Bus interface, the corresponding jumper must be inserted in the correct position (see installation instructions "Jumper position J1 and J2").

Settings

M-Bus
M-Bus settings
M-Bus input

In the M-Bus menu/settings, the general settings for the M-Bus and the addresses of the M-Bus devices are defined.

M-Bus settings
Baud rate
2400
Interval time
01m 00s
M-Bus device 1
Enable
No
Address
0
List
M-Bus device 2
• • •

Baud rate

The standard baud rate of the M-Bus devices is 2400 Bd. The factory setting does therefore not usually need changing.

Interval time

The readout intervals can be adjusted from 30 seconds to 2 days. Longer intervals use up less battery life in battery operated M-Bus meters

M-Bus device 1-4

For every connected M-Bus device, enabling must be set to "Yes" and the slave address must be entered (between 0 and 250). The slave address is set at the M-Bus device in accordance with the manufacturer's instructions. The same slave address cannot be used twice in the M-Bus network.

For a connected M-Bus device, device information and data received can be read by pressing the "List" button.

```
M-Bus device 1
Enable
[No]
Address
[0]
List
```



```
M-Bus settings

Device information

Identification
number: 0x0
Manufacturer: 0x0
Version field: 0
Device type: 0
Miscellaneous
Access number: 0
Status field: 0x0
Configuration
field: 0x0
Control info field:
0x0

Received data

Value number:
[telegram/byte]
value
1: [0/0] 0
2: [0/0] 0
3: [0/0] 0
```

After 255 access attempts, the access number is reset to 0.

Device information

Information about the device and manufacturer is shown at the top.

Received data

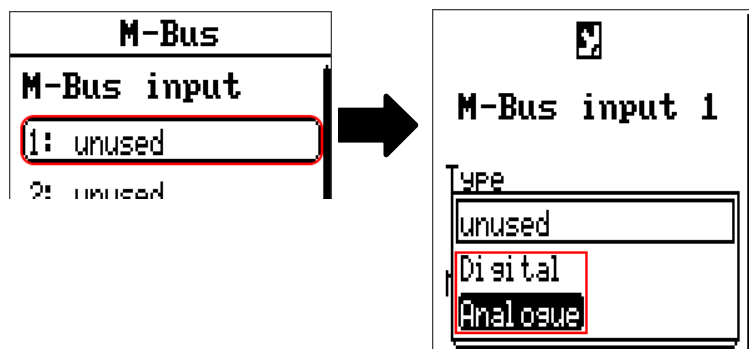
Up to 128 values per meter can be shown here. The order is defined according to the telegram address and the **start byte**. In addition, the value read is shown with the unit.

The manuals issued by the M-Bus device manufacturers contain more details about the values.

M-Bus input

Up to 32 M-Bus inputs can be programmed.

Example: Programming the parameters of M-Bus input 1



Available for selection: Analogue or digital

In most cases, analogue (numeric) values are applied.

General

Device: Entry of the device number as per the device settings (1-4)

Data type: Selection between value or device information

M-Bus value number: entry of the value number from the "List" of device information read (C.M.I. menu M-Bus settings)

Divisor / factor: Entry of a divisor or factor to adjust the value read to the actual quantity (e.g. correct positioning of the decimal point).

Designation

Every M-Bus input can be given its own designation. The designation can be selected from various designation groups or can be user defined. In addition, up to 16 index numbers can be issued.

Measured variable

If the measured variable is set to "Automatic", the unit of measurement specified by the M-Bus device will be applied in the module.



If you select "**User def.**", you can select a **unit** of your own, a **sensor correction** and, if the **sensor check** is set to active, a monitoring function.

Measured variable	User defined
Unit	Temperature °C
Sensor correction	0.0 K
Value at timeout	Unchanged

Every M-Bus input is assigned a **unit**, which can differ from the unit used by the M-Bus device. A wide range of units is available to choose from.

Sensor correction

The value of the M-Bus input can be corrected by applying a fixed differential value.

Value at timeout

This setting is only displayed if the measured variable is set to "User def.". This application is not yet available.

Sensor check

If you set the sensor check to "**Yes**", the **sensor error** of the M-Bus value is available as a digital input variable for a function.

This application is only useful if user defined threshold and output values are specified for the sensor error

Sensor check	Yes
--------------	-----

Sensor error

This setting is only displayed if the measured variable is set to "User def." and the sensor check is active.

Sensor error: Status "**No**" for a correct value **within** the threshold values and "**Yes**" for a value **outside** the thresholds. This allows the controller to react to the failure of an M-Bus device, for example.

In order to make good use of the sensor check, the short circuit and lead break thresholds should be changed from "Standard" to "**User defined**" and the required threshold values defined. The required short circuit and lead break values will subsequently also be defined by the user.

If the measurement read is below the defined **short circuit threshold** or **exceeds** the **lead break threshold**, the relevant **output values** will be applied instead of the measurement.

By selecting suitable thresholds and output values, a fixed value can be specified for the module in the event of a measurement failure, to allow a function to continue operating in emergency mode (fixed hysteresis: 10 or 1.0 °C).

The short circuit threshold must be defined below the lead break threshold.

Example: Temperature

Sensor check	<input type="text" value="Yes"/>
Short circuit threshold	<input type="text" value="Standard"/> <input type="text" value="User defined"/>



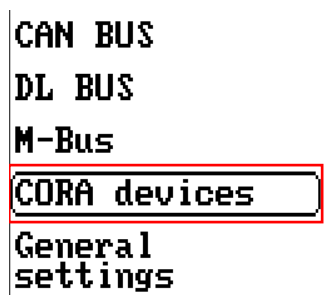
Sensor check	<input type="text" value="Yes"/>
Short circuit threshold	<input type="text" value="User defined"/>
Threshold value	<input type="text" value="10.0 °C"/>
Short circuit value	<input type="text" value="User defined"/>
Output value	<input type="text" value="50.0 °C"/>
Lead break threshold	<input type="text" value="User defined"/>
Threshold value	<input type="text" value="100.0 °C"/>
Lead break value	<input type="text" value="User defined"/>
Output value	<input type="text" value="70.0 °C"/>

If the measurement is below 10 °C, 50 °C will be issued; if it exceeds 100 °C, 70 °C will be issued.

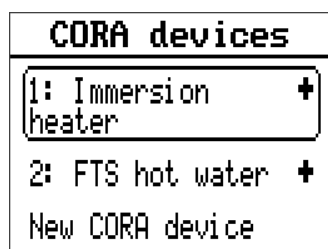
CORA devices

CORA devices can be connected via CORA-DL. They are connected at the controller's DL bus. Devices connected via CORA-DL do not affect the DL bus load.

From serial number UVR610-071000, all UVR610 variants **with display** are equipped with CORA wireless.

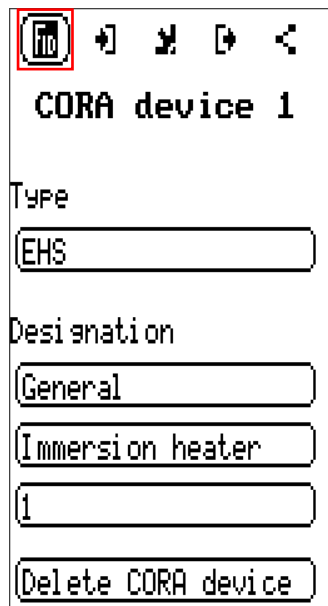


This menu allows CORA devices to be set and programmed wirelessly, and transmitted values to be imported.



fiD sub-menu

When you have created a CORA device, select its type:



Type defines the device type with which a connection is to be established.

To assign a **designation**, first select a designation group, then the designation itself. An index number from 1-16 can also be assigned.

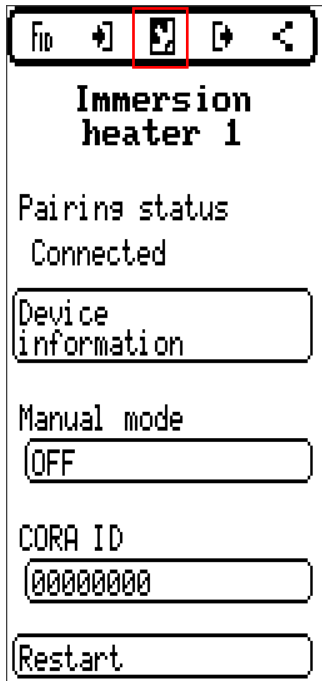
To **delete** an entry

Input variables



Variables sent to the CORA device.

Parameters



Pairing status indicates whether the wireless connection with the device is established.

Device information opens a menu similar to the **Version** menu of the paired device, in addition to displaying the date and time of the last packet received wirelessly.

Manual mode On/Off

Specifies the **CORA ID** of the device to which the connection is to be made

Restart: Restart the device

Output variables



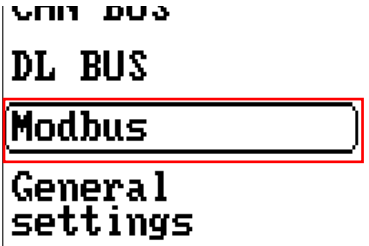
Variables received by the CORA device.

Example: The EHS immersion heater issues the following variables:

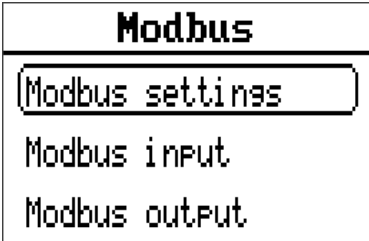
- Timeout (Yes if timeout)
- Current output
- Higher output level
- Lower output level
- Temperature 1 (sensor input 1)
- Temperature 2 (sensor input 2)
- High limit safety cut-out temperature
- Electronics temperature
- Fault code

Modbus

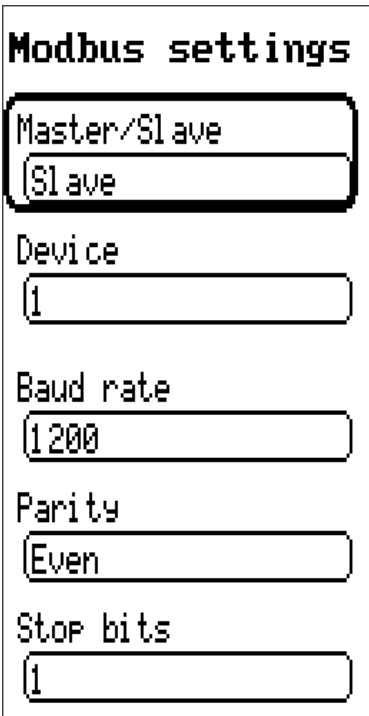
(Only for UVR610-MODB controllers)



The UVR610-MODB controller can be used as master or slave for Modbus RTU485. In this menu, the Modbus settings are made and the inputs/outputs are programmed.
Only the **Modbus RTU485** protocol is supported.




Modbus settings



Controller programmed as **master** or **slave**
Device number 1-247 (only shown if programmed as slave)
Baud rate
Parity (Even/Odd/None)
Stop bits (1 or 2)

Modbus input

Inputs can be programmed as **analogue** (numerical value) or **digital** (On/Off or Yes/No).



Modbus input 1

Type

Device

Function

Address

Data type

Byte order

Designation

Interval time

Divisor

Factor



Type

Select Analogue/Digital

Device/function/address

Master mode: Details about the Modbus device (slave) from which the values are applied.

Slave mode: The device's own number is specified in the device settings. The function is defined by the input type selected. The address of the module is issued automatically and counts upwards irrespective of the input number and type.

Data type/byte sequence

Only for analogue values: Details about the data type of the device from which the value is applied.

Designation

Every Modbus input can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the other inputs.

Interval time

The readout intervals can be set from 10 seconds to 30 minutes (only possible in master mode).

Divisor/factor

Only for analogue values: Input of a divisor or factor for adjusting the applied value to the actual variable (e.g. correct position of the decimal point).



Unit

Sensor correction

Start value

Value at timeout

Sensor check

Short circuit threshold

Short circuit value

Lead break threshold

Lead break value

Exception Code

Unit

Every Modbus input must be assigned a unit, as the transmitted data is dimensionless. A wide range of units is available to choose from.

Sensor correction

The value of the Modbus input can be corrected by applying a fixed differential value.

Start value

Definition of a start value which is shown after the device is restarted until a new value is applied by the Modbus.

Sensor check

The sensor check can only be activated for analogue Modbus inputs. If you set the sensor check to "Yes", the sensor error of the Modbus value is available as a digital input variable for a function.

This application is only useful if user defined threshold and output values are specified for the sensor error.

Short-circuit threshold/value; lead break threshold/value

These 4 values can be changed from Standard to User defined, which

opens an additional value input field.

If the value falls below the short-circuit threshold, the short-circuit value is output.



If the value exceeds the lead break threshold, the lead break value is output.

Exception code

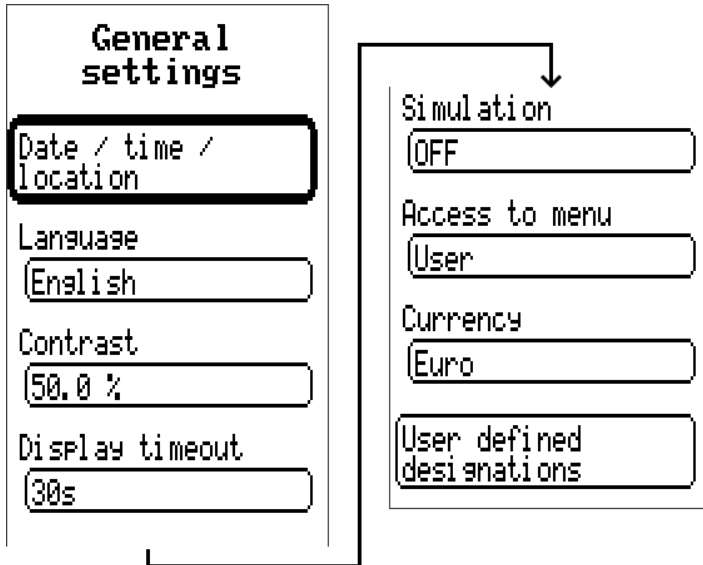
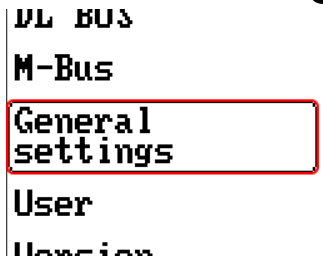
Error code for retrieval problems with the slave device. The code is not refreshed until the interval time has expired.

Modbus output

Outputs can be programmed as **analogue** (numerical value) or **digital** (On/Off or Yes/No).

<div style="text-align: center;">  </div> <p>Modbus output 1</p> <p>Functions</p> <p>1: Solar 1</p> <p>Solar circuit</p> <p>OFF</p> <p>Type</p> <p>Analogue</p> <p>Designation</p> <p>Temperature actual value</p> <p>T. solar flow</p> <p>1</p> <p>Device</p> <p>1</p> <p>Function</p> <p>6 - Preset single register</p> <p>Address</p> <p>1</p> <p>Data type</p> <p>8-bit signed integer</p> <p>Byte order</p> <p>Big-endian</p> <p>Divisor</p> <p>1</p> <p>Factor</p> <p>1</p> <div style="text-align: center;">  </div>	<p>First, select the value to be transmitted (function, fixed value, system value, DL bus, CAN bus). The two following entries depend on your selection.</p> <p>The current value is displayed.</p> <p>Type Select Analogue/Digital</p> <p>Designation Every Modbus output can be given its own designation. The designation can be selected from various designation groups or can be user defined, as for the other inputs.</p> <p>Device/function/address <u>Master mode:</u> These details relate to the target device (slave) and are therefore only available in master mode. <u>Slave mode:</u> The device's own number is specified in the device settings. The function is defined by the input type selected. The address of the module is issued automatically and counts upwards irrespective of the input number and type.</p> <p>Data type/byte sequence Only for analogue values: Details about the data type of the output value in the bus converter (matched to the target device).</p> <p>Divisor/factor Only for analogue values: Input of a divisor or factor for adaptation of the output value to the target device. Only whole numbers without a unit can be output to the Modbus. Example: 37.5 °C is output as "375". If only "37" is to be output, enter 10 as the divisor.</p>	<p>Transmission condition</p> <p>If change ></p> <p>1</p> <p>Blocking time</p> <p>10s</p> <p>Send in intervals</p> <p>No</p> <p>Transmission condition</p> <p>If change</p> <p>Yes</p> <p>Blocking time</p> <p>10s</p> <p>Send in intervals</p> <p>No</p> <p>Exception Code</p> <p>No Respond</p>	<p>Transmission condition</p> <p>Analogue: <u>If change > 1.0 K:</u> If the current value has changed by more than 1.0 K compared to the last transmitted value, a new transmission is made. The unit used by the source is applied (minimum value: 0.1 K). <u>Blocking time 10 s:</u> If the value changes by more than 1.0 K within 10 seconds of the last transmission, the value is still only retransmitted after 10 seconds (minimum value: 1 second). <u>Interval time 5 m:</u> The value is transmitted every 5 minutes even if it has not changed by more than 1.0 K since the last transmission (minimum value: 1 minute).</p> <p>Digital: <u>If change Yes/No:</u> The value is transmitted whenever a status change occurs. <u>Blocking time 10 s:</u> If the value changes within 10 seconds of the last transmission, the value is still only retransmitted after 10 seconds (minimum value: 1 second). <u>Interval time 5 m:</u> The value is transmitted every 5 minutes even if it has not changed since the last transmission (minimum value: 1 minute).</p> <p>Exception code Error code for retrieval problems with the slave device. The code is not refreshed until the interval time has expired.</p>
---	---	---	---

General settings



Some menu items are only displayed in expert and/or technician mode.

This menu allows settings to be made which then take effect for all other menus and displays.

Language

Select the display language.

Contrast

Screen contrast in percent.

Brightness

Select the brightness of the display to match the surroundings (setting range: 5.0 – 100.0%)

Display timeout

The display will be switched off if the user does not do anything for the period of time set here.

Tapping the touchscreen surface re-activates the display (setting range: 5 seconds to 30 minutes)

Simulation

Option of activating the simulation mode (only possible in Expert mode):

- No averaging of the outside temperature in heating circuit control.
- All temperature inputs are measured as PT1000 sensors, even if a different sensor type is defined.
- The RAS features of room sensors are ignored.

Select from: OFF

Analogue – Simulation with the EWS16x2 development set

CAN Simboard – Simulation with SIM-BOARD-USB-UVR16x2 for simulation in a system

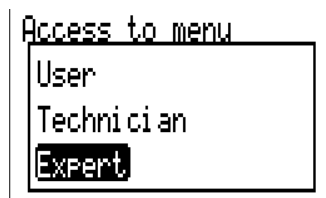
The simulation mode is ended automatically when you exit the Expert level.

Currency

Select the currency for yield metering.

Access to menu

Definition of the user levels from which access to the main menu is permitted.

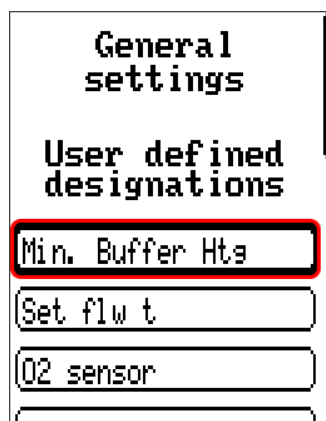


If only **technicians** or **experts** are permitted to access the menu, the relevant **password** must be entered to reach the main menu.

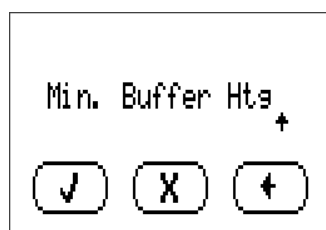
User defined designations

In this menu, you can enter, change or delete user defined designations **for all elements of the controller**. This menu can only be selected from within the Technician or Expert level.

View with designations defined previously



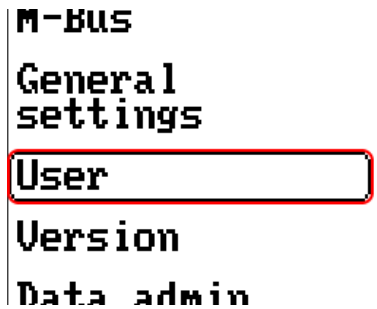
Entries are made up of letters, numbers and symbols entered consecutively.



Up to 100 different designations can be defined by the user. The maximum number of characters per designation is **23**.

Designations defined previously are available for all elements (inputs, outputs, functions, fixed values, bus inputs and outputs).

User



Current user



Select whether the user is an **Expert**, **Technician** or **User**.

To enter the Technician or Expert level a **password** must be entered, which can be set by the programmer.

When function data is loaded from the Expert or Technician level, the controller returns to the User level and applies the programmed passwords.

When the controller is started, the controller is always in the User level.

Changing the password



An **Expert** can change the passwords for Technician and Expert. A **Technician** can only change the Technician password.

There are no restrictions regarding the length of the password or the type of characters that can be used.

To change a password, you must first enter the old password.

List of permitted actions

User	Displays and permitted actions
User	<ul style="list-style-type: none"> • Function overview with options for control • Access to main menu only if enabled for "User" in the "General settings" • Summary of values • Inputs: display only, no access to the parameters • Outputs: changes to the output status of the outputs enabled for User, display of hours run, no access to the parameters • Fixed values: changes to the value or status of the fixed values enabled for User, no access to the parameters • Functions: display of the function status, no access to the parameters • Messages: display of active messages, hiding and deleting messages • CAN and DL bus: no access to the parameters • General settings: language, brightness and display timeout can be altered • User: change of user (with password entry) • System values: setting the date, time, location data, display of System values
Technician	<p>Additionally:</p> <ul style="list-style-type: none"> • Access to main menu only if enabled for Technician or User in the "General settings" • Changes to the parameters for inputs (except for type and measured variable), no creation of new ones • Changes to the parameters for outputs (except for type; status only if enabled for User or Technician), no creation of new ones • Changes to the parameters for fixed values (except for type and measured variable; value and status only if enabled for User or Technician), no creation of new ones • General settings: Changes to user defined designations and creation of new ones, selecting the currency • Functions: changes to user defined input variables and parameters; output variables are visible • All settings in the CAN and DL bus menus • Data administration actions
Expert	All actions and all displays are accessible

Automatic changeover

Normally, the controller automatically switches back to **user mode** 30 minutes **after login** as an expert or technician.

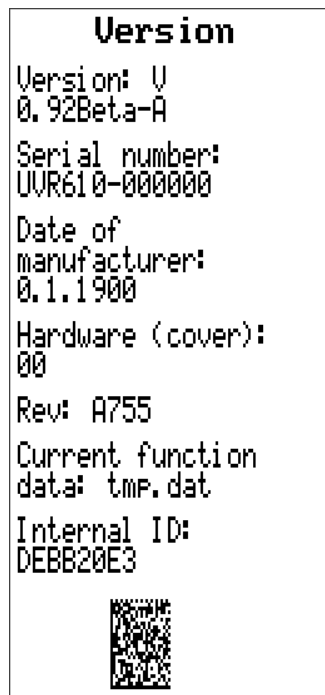
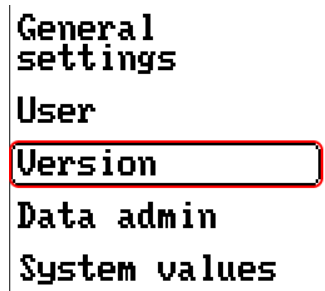
For programming or test purposes, this automatic changeover can be switched off. To do so, an expert selects "Change expert password", first enters the old password, then enters **nothing** (not "0" either) and confirms this with the tick.

The same can be done for the Technician password.

When new programming is loaded, the controller returns to the User level and the Expert password set by the programmer will apply.

Version and serial number

This menu displays the serial number, internal production data and the name of the current function data.



The serial number is also visible on the controller's rating plate (upper side panel).

Data administration

Can only be operated in technician or expert mode.

You can perform the following actions in this menu:

- Save, load or delete function data
- Load firmware
- Load or delete a function overview
- Display the status of the data transfer
- Restart the controller

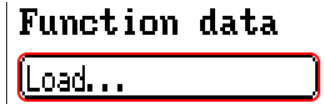
```
User
Version
Data admin
System values
```

Funktionsdaten

```
Data admin
Function data
Load...
Save...
Carry out
total reset
Current function
data: tmp.dat
```

Name of the current function data

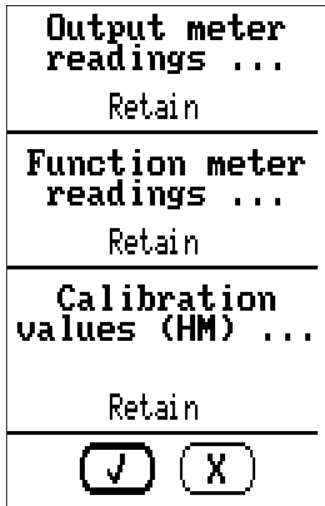
Load...



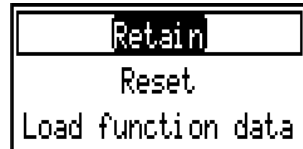
Function data can be loaded from the SD card onto the controller or other x2 devices. Multiple function data can be saved to the SD card.

The data transfer is only possible after a **technician** or **expert password** has been entered for the target device.

After selecting the function data required (*.dat file), you will be prompted to specify how the meter readings and the heat meter's calibration values should be treated.



You can choose from the following actions:



Retain	The meter readings and calibration values in the controller will be applied. Example of use: After programming is changed using TAPPS2
Reset	The meter readings and calibration values will be reset to zero
Load function data	The meter readings and calibration values applied will be taken from the function data being loaded onto the controller. Example of use: Replacement of a controller. The function data is taken from the old controller and its meter readings are to be loaded onto the new controller.

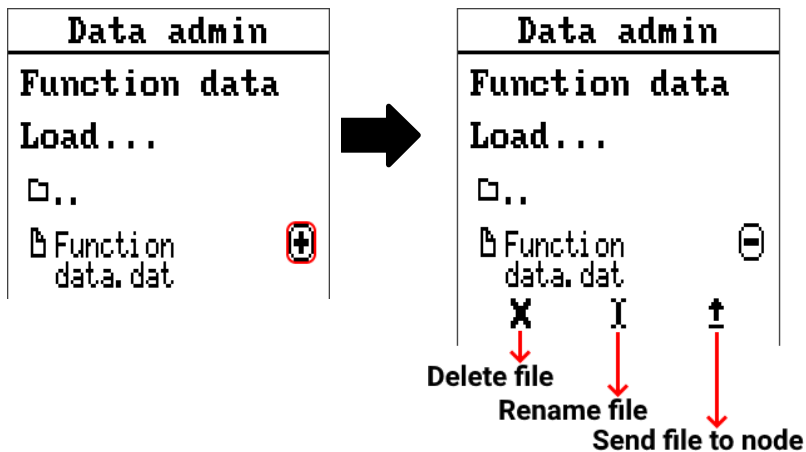
Tapping ✓ loads the new function data, X cancels the action.

If function data is loaded onto the controller, a _Backup.dat file is created on the SD card with the old function data.

Once the function data is loaded, the controller returns to the User level.



Deleting, renaming and sending saved files

In order to rename or delete saved files, tap the plus symbol. The following options then appear for selection:



Return from this selection by tapping the icon again.

Delete file

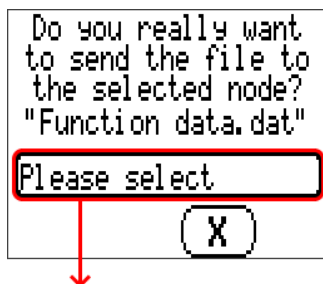
A confirmation prompt appears, which you can confirm by tapping . Tapping  cancels the action.


Rename file

The file name can be changed using a keyboard (Umlauts are not possible). The file name must be no longer than 63 characters with no dots or accents.

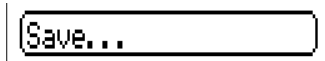
Send file to selected nodes

This allows you to send function data to other CAN bus devices with x2 technology (e.g. RSM610, CANEZ2, CAN-I/O45).



Select the node number and then tap .

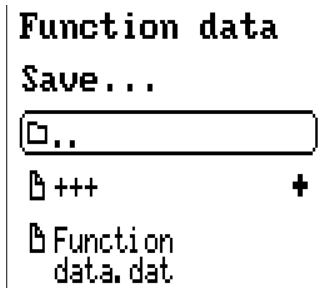
Save...



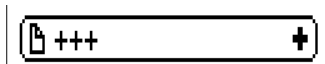
The current function data can be saved to the **SD card**.

You can give the function data a name of your own. More than one set of function data can be saved.

Example:



In this example there are already several sets of function data saved on the SD card.



If you want to save the function data under a **new** name, tap on the button. You can then enter a new name and save the file (accents on letters are not possible). The file name must be no longer than 63 characters with no dots or accents.

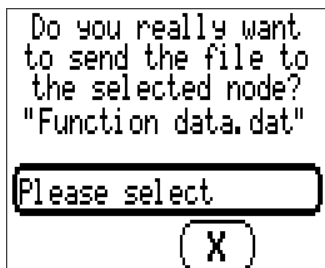


Tap the plus symbol to load function data from a different x2 device onto the controller SD card.



The button pops up and the arrow symbol is selected.

Now a node query appears and it is possible to enter a new file name.



Function overview

TA-Designer min. version **1.25**, UVR610 min. firmware version **1.27**



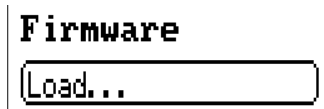
From the SD card, the function overview (*.tfo file) can be loaded onto the device or deleted on the device. Multiple files can be saved to the SD card.

When you select the file a confirmation prompt will appear, as the function overview currently on the device will be overwritten.

"Delete..." deletes the function overview saved on the device. When you select the file a confirmation prompt will appear.

Answer the confirmation prompt by tapping either  (= Yes) or  (= No).

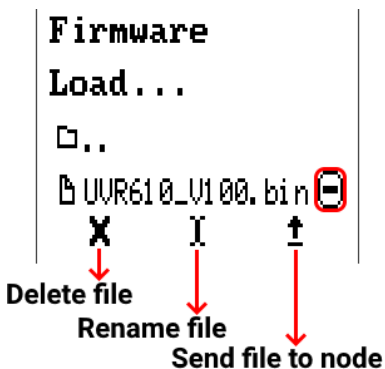
Firmware Load...



Firmware (= operating system, file *.bin) can be loaded from the SD card onto the controller or other x2 devices (Except: other UVR16x2) on the CAN bus. More than one operating system version may be saved on the SD card.

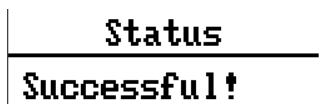
The data transfer is only possible after a technician or expert password has been entered for the target device.

As when loading function data, the saved firmware files can be deleted, renamed or loaded onto other x2 devices.



Return from this selection by tapping the icon again.

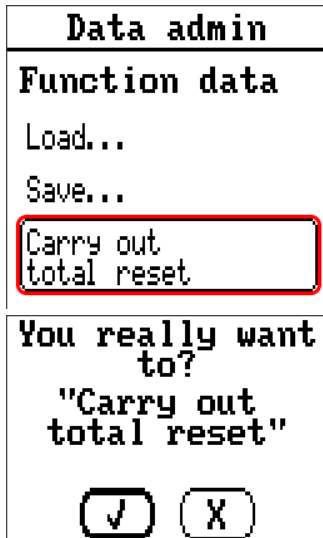
Status



This indicates whether a data administration transfer of data from the SD card to the controller or vice versa was successful or not.

This status display does not apply to data transfers **from** another controller, a C.M.I. or a CAN monitor.

Total reset



A **total reset** can only be carried out from the Technician or Expert level and requires confirmation when prompted.

A **total reset** deletes the function modules, the parameter settings of all inputs and outputs, bus inputs and outputs, fixed values and system values. The settings for the CAN node number and the CAN bus rate are retained. After tapping the screen you will be asked to confirm that you want a total reset to be carried out.

Answer by selecting either (= Yes) or (= No).

If a total reset is carried out, a _Backup.dat file is created on the SD card with the old function data.

Restart



At the end of the "Data admin" menu, there is an option to restart the controller following a confirmation prompt, without disconnecting the power from the controller.

Reset



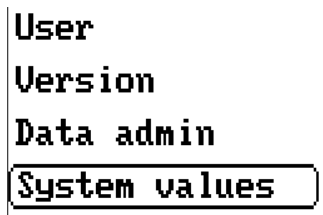
Pressing the reset button on the front of the controller briefly (with some narrow stick) and releasing it before the beep ends will restart the controller (= reset).

Change-Log

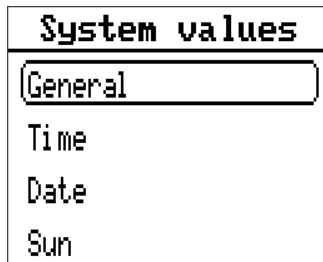
Every change in the controller is recorded with the exact date and time in the CHANGE.LOG file on the controller SD card and can therefore be traced.

System values

This menu displays the status of system values that are available for selection as the source for function input variables and CAN and DL outputs.



The system values are divided into **4 groups**:



General system values

When programmed accordingly, these system values allow monitoring of the controller system.

- **Controller start**
- **Sensor error inputs/CAN/DL**
- **Network error CAN/DL**
- **Mains frequency**
- **CAN node**
- **CAN connection**
- **Message (type: message/warning/fault/error)**
- **Serial number**

Controller start generates a 20 second pulse 40 seconds after the device is switched on or reset, and is used for monitoring the controller starts (e.g. after power failures) in the datalogging feature. The interval time in datalogging should be set to 10 seconds for these starts.

The **sensor errors** and **network errors** are global digital values (No/Yes) which are not connected to the error status of a specific sensor or network input.

If any one of the sensors or network inputs has an error, the status of the corresponding group changes from **No** to **Yes**.

A system value „Message“ indicates whether a message of the stated type is currently active on the controller.

Time system values

- **Second** (seconds of the current time)
- **Minute** (minutes of the current time)
- **Hour** (hour of the current time)
- **Second pulse**
- **Minute pulse**
- **Hour pulse**
- **Summertime** (digital value OFF/ON)
- **Time** (hh:mm)

Date system values

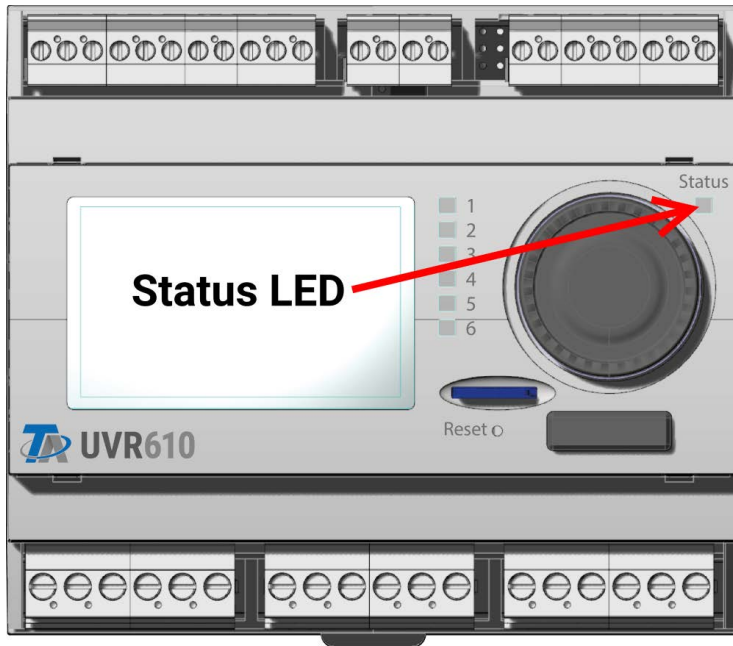
- **Day**
- **Month**
- **Year** (without the century)
- **Day of the week** (starting with Monday)
- **Calendar week**
- **Day of the year**
- **Day pulse**
- **Month pulse**
- **Year pulse**
- **Week pulse**

The pulse values generate a single pulse per time unit.

Sun system values

- **Sunrise** (time)
- **Sunset** (time)
- **Minutes until sunrise** (on the same day, does not go beyond midnight)
- **Minutes since sunrise**
- **Minutes until sunset**
- **Minutes since sunset** (on the same day, does not go beyond midnight)
- **Solar altitude** (see Shading function)
- **Direction of the sun** (see Shading function)
- **Solar altitude > 0°** (digital value yes/no)
- **High sun** (time)

LED indicator light



The indicator light can indicate a variety of statuses by means of three colours.

Indications at controller start

Indicator light	Explanation
Steady red light	The controller is booting up (= start routine after switching on, resetting or updating)
Steady orange light	Hardware is initialising after booting up
Flashing green light	After hardware initialisation, the controller waits about 30 seconds to receive all the information necessary for a function (sensor values, network inputs)
Steady green light	Normal operation of the controller

An active **message** can be displayed by a change in the LED indicator light. This can be set in the **Parameter menu** of the "**Message**" function.

Subject to technical modifications as well as typographical and printing errors. This manual is only valid for devices with the corresponding firmware version. Our products are subject to constant technical advancement and further development. We therefore reserve the right to make changes without prior notice.

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