



Thermocyclical Individual Room Control

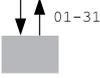
Menu of ZE Central Unit

01.05.2016 (5.46)

ThermoZYKLUS ■

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D-82131 Gauting

All menus of the Central Unit ZE are described below. The following conventions are applicable:

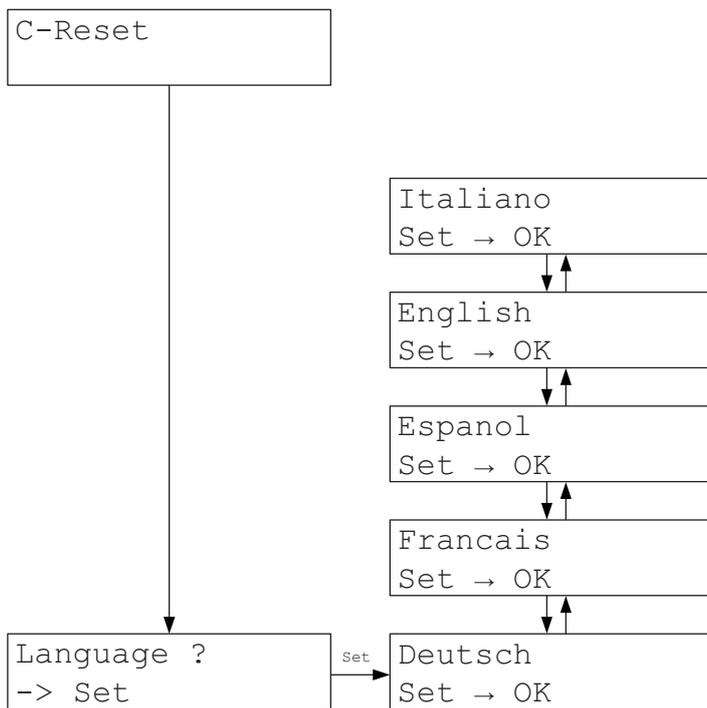
-  Press the UP button (top right)
-  Press the DOWN button (bottom right)
-  Press the UP and DOWN button in any order
-  Press the SET button (bottom middle)
-  Press the RETURN button (bottom left)
-  Press button 4 times
-  Count from 01 to 31 with the UP and DOWN button
- Rx Designation for local units (e.g. RG, RS, RF)
- Sx Designation for switchgear or valve drives (e.g. ST, SK, SF)

Navigating between the different entries on a menu screen is usually possible with the SET button and the RETURN button.

The display light switches off if no button is pressed for 30 seconds. The display returns to the normal display after another 30 seconds.

When local units are generally referred to below, this means local units such as RG and RS and RS as well as the internal room sensor of the ZE central unit.

The respective context also indicates whether the designation ST switching step only refers to the individual relay in a relay box or the entire box with several relays.



After each restart of the ZE central unit (e.g. after applying the operating voltage) the option of selecting the language for all menus is provided for approximately 3 seconds. This is the only place in the menu where the language can be changed. If this opportunity is missed, the ZE must be restarted (e.g. by switching the operating voltage Off and On again).

```
Heating -normal
      Fr 10:30:00
```

```
Heating -economy
      Fr 10:30:00
```

```
Heating -frost
      Fr 10:30:00
```

```
Cooling -normal
      Fr 10:30:00
```

```
Cooling -economy
      Fr 10:30:00
```

```
Cooling -OFF
      Fr 10:30:00
```

```
Temper. -normal
      Fr 10:30:00
```

```
Temper. -economy
      Fr 10:30:00
```

```
Temper. -frost
      Fr 10:30:00
```

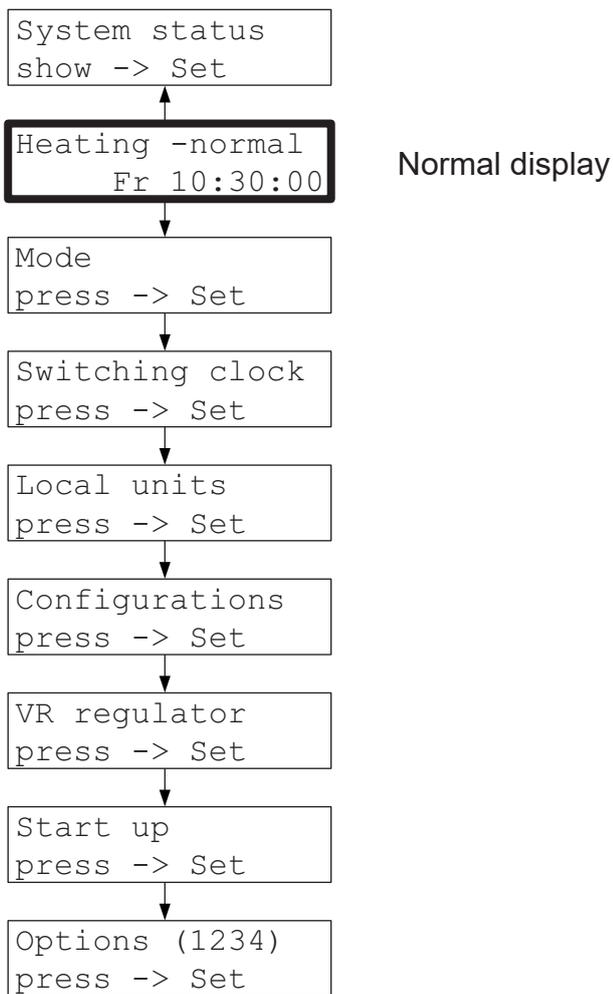
The display returns to the normal mode after the language selection.

The ZE mode is displayed in the 1st line (heating/cooling/temper and normal, economy or frost/off).

Weekday, date and time appear at the right on the 2nd line. Nothing normally appears on the left. Only if a unit belonging to the system reports an error !E appears at the far left. In this case, the cause for the error messages should be looked for in the status menus. If one of the devices powered by batteries shows a low battery status the !B sign is displayed at the 2nd position from the left. The corresponding device can then be identified in the menu Status 1: total.

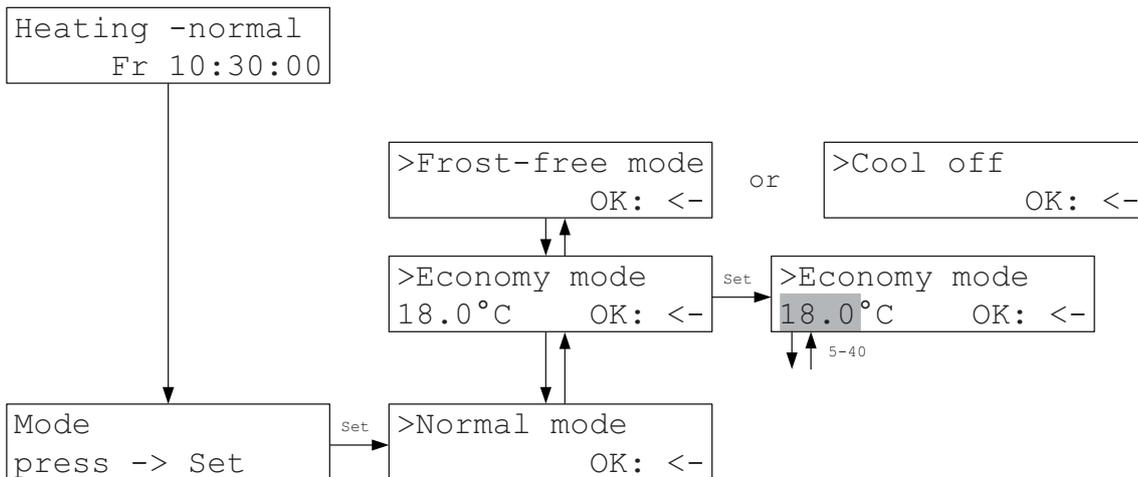
```
Heating -normal
!E   Fr 10:30:00
```

```
Heating -normal
!B  Fr 10:30:00
```



The following submenus can be selected via the main menu:

- | | |
|-----------------|---|
| System status | - Information about the system and the connected devices. |
| Mode | - Normal, Eco, Antifrost/off for the whole system. |
| Switching clock | - Switching clocks for all local units. |
| Local units | - Set temperatures and mode of all local units. |
| Configurations | - Different settings the user can perform. |
| Flow control | - Control of a connected THZ VR flow control (option) |
| Start up | - Fundamental settings only to be made by the specialist. |
| Options | - Activation of optional functions |



In the Mode menu the modes Normal, Economy and Frost-free (or cooling off) can be set. In Normal mode the set temperatures set individually in the local units apply. In Economy mode the same set economy temperature is given to all local units in the system. In Frost-free mode a set temperature of 5 °C is set for all local units. In Cooling off mode the set temperature is set uniformly to 40 °C. When switching back to Normal mode, the individually set set values apply again.

For example, if 20 °C is set as set temperature in one room while 19 °C is set in another room and the economy temperature is set at 18 °C economy mode switches both rooms to 18 °C. Resetting to normal mode restores the old values of 20 °C and 19 °C again.

With the Temper function only heating works in economy mode and frost-free mode; switching to cooling does not occur.

The ZE central unit features 2 switching clock systems that can be set alternatively in the start-up - switching clock menu. This means that only one of the two systems can be active. The two switching clock systems are designated as Clock (small) and Clock (large) (or with small and large clock).

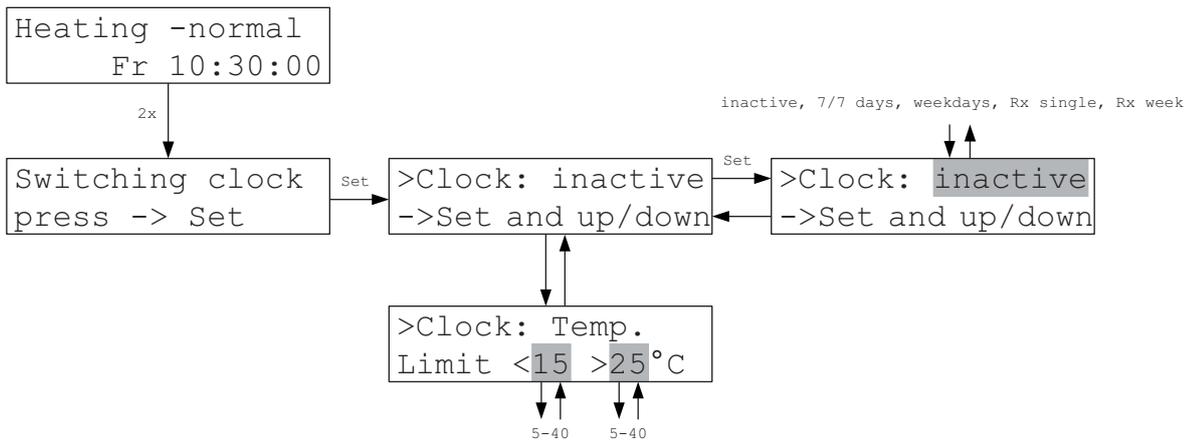
The small clock relates to the classical night lowering. A start and end time can be defined for each day; the lowering temperature calculated from night lowering then applies to the period between, the lowering time. It is determined by subtracting the night lowering from the set temperature set in the local unit. The resulting set temperature for the lowering period is therefore relative to the set temperature set on the local unit.

The small switching timer relates to the period and permits only one lowering time per day. It is therefore somewhat restricted in its options but can be operated very easily and intuitively in the menu of the ZE.

The large switching clock consists of a set of altogether 30 independent switching clocks that allow realising also very difficult switching pattern. The switching clocks can be freely assigned to the individual rooms or to groups of rooms; they can be combined and limited to specific periods determined by calendar dates. 10 switching points with different characteristics can be defined for each day.

The large clock is event-related. This means that at a particular time the set value of a room is switched to a specific value but it is not limited to this value; subsequent events (e.g. from other switching clocks) can switch it to a different value. Apart from the greater complexity, this is the essential difference to the small switching clock, which records the lowering temperature for the lowering period.

The large switching clock facilitates all preferences but its operation is naturally more challenging. Although all functions can be set in the menu of the ZE the settings are more elaborate and less clearly arranged. The large clock is best set with the PC using the PC-i program, which permits a very convenient and clearly arranged handling of the many different options.



In the clock menu, specific night lowering and the times at which this night lowering shall be activated and deactivated again can be entered for each day, each weekday or for each individual local unit.

The clock is inactive when delivered. The type of switching clock must first be selected in order to activate it:

- 7/7 days: each day of the week is treated identically and the same for all local units.
- Weekdays: each weekday is treated individually but the same way for all local units.
- Rx single: each day of the week is treated the same way but different between local units.
- Rx week: each day of the week is treated individually and, in addition, different between local units.

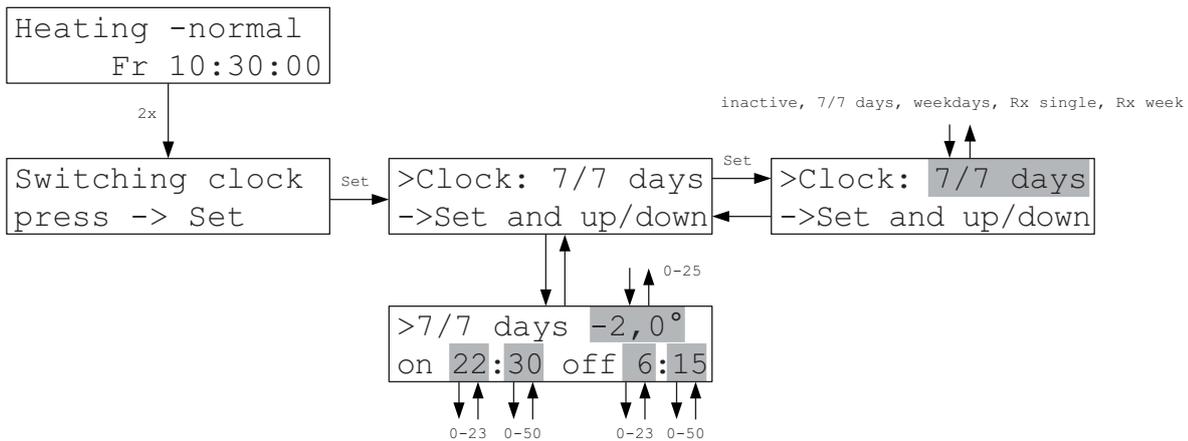
Attention: If the mode of a local unit is set to frost-free (or cooling off) it is overridden by the switching clock.

When the clock is inactive, the limit values for the behaviour of the clock in the Temper function can be entered. They then apply for the entire switching clock. The value <15 >25 °C is preset.

The limit values have the following meaning only in the Temper function:

If night lowering lies within the limits it is actively selected by heating or cooling. If lowering drops below the lower limit it is not actively cooled down but heating only prevents that the temperature drops below the set value. If lowering exceeds the upper limit it is not actively heated but cooling only prevents that the temperature rises above the set value.

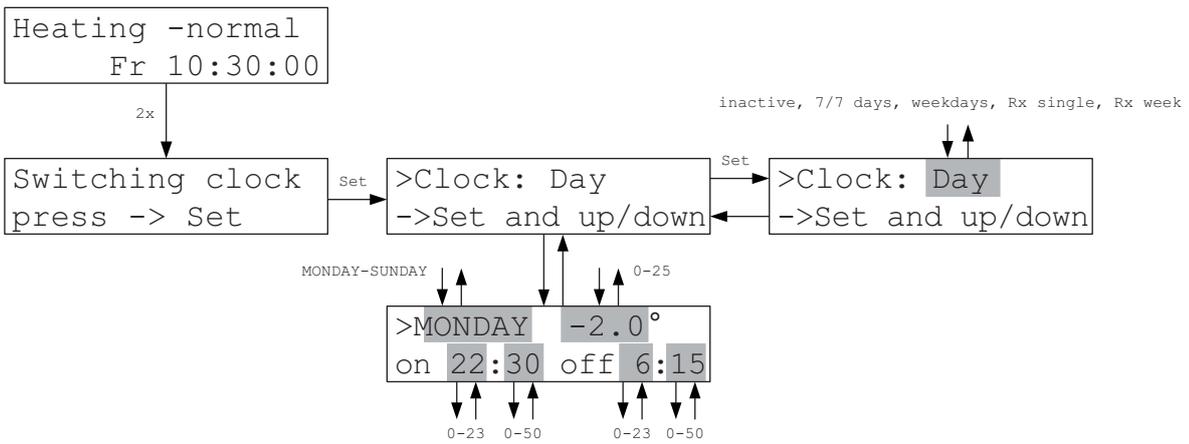
This approach allows realising an economy function: if heating but not cooling is desired at night, a night temperature below the lower limit is set. Only heating may take place then at night but no cooling. The time when this economy function exactly kicks in can be defined by selecting the lower and upper limit.



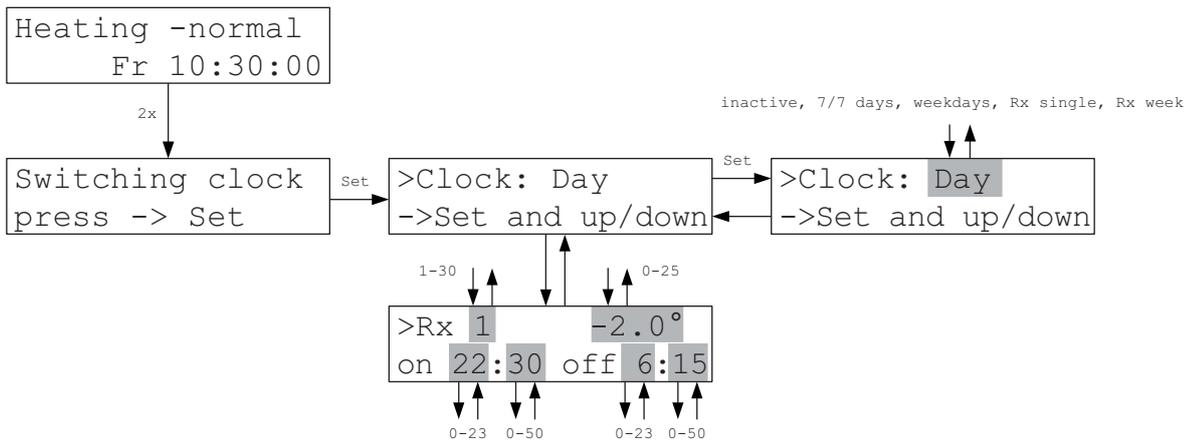
In the 7/7 days menu a lowering temperature and the start and end time of the lowering period can be set for each day and all local units together. All local units then have the same switching program on all days.

The lowering temperature is subtracted from the set temperature set in the local unit to calculate the set temperature during the lowering period. Different set temperatures at different local units therefore also cause different temperatures during the lowering period. If a local unit is set to 20 °C, for example, and another one to 21 °C a lowering temperature of -2 °C produces a set value during the lowering period of 18 °C in one and 19 °C in the other local unit.

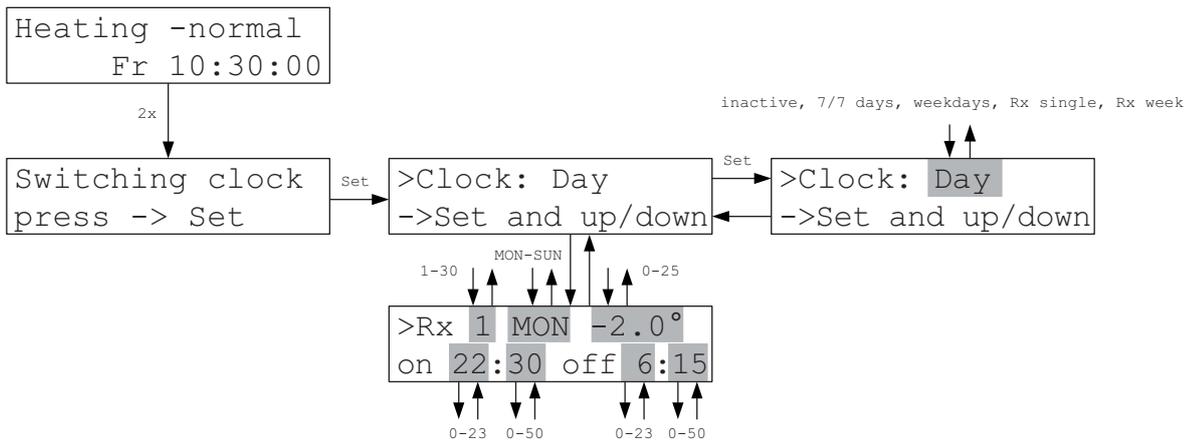
Attention: If the end time is smaller than the starting time the end time is moved automatically to the next day. A starting time of 23:00 and an end time of 6:00 causes night lowering of 23:00 on the evening of the first day until 6:00 h on the morning of the second day.



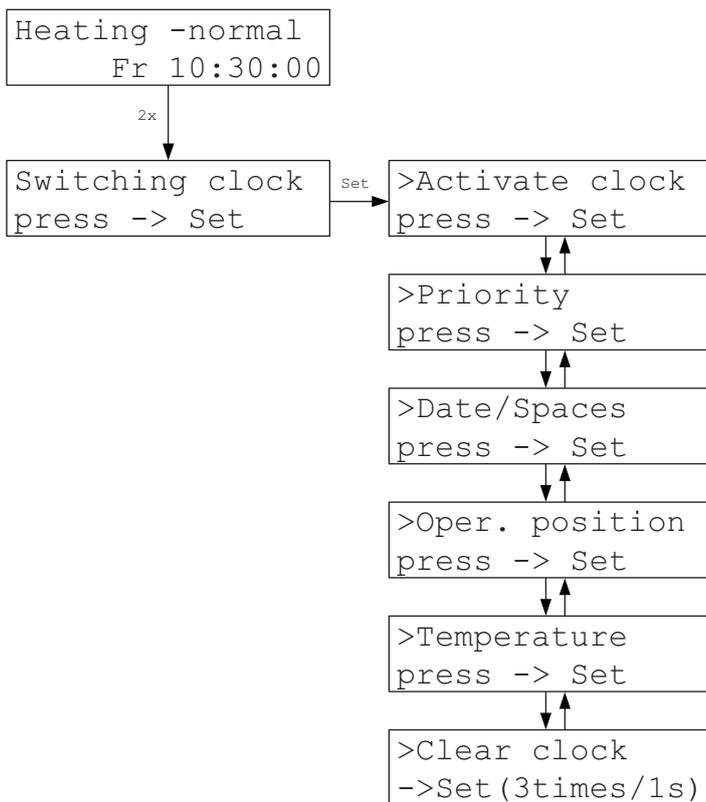
All local units have the same switching program on the selected weekday.



Each local unit has the same switching program each day of the week. However, different local units have different programs.



Each local unit has a different switching program each day of the week. Different local units also have different programs.



The large switching clock includes up to 30 individual clocks which are all completely independent of each other.

Each clock within the large switching clock is made up of individual switching points. A switching point contains a time and a temperature. Once the time has arrived, the rooms concerned are controlled to this temperature until a new switching point sets a new temperature. The Day C setting adopts the setpoint from the respective local unit. If the setpoint is changed on the local unit this change becomes effective immediately in spite of the switching clock being active. This allows programming times where the user can determine the temperature himself.

Switching clocks either apply always or for certain periods. They apply to one or several rooms of a ZE. They apply to heating/ tempering or cooling. If switching clocks overlap in terms of time or rooms, a priority can be defined (1 = high priority, 2 = low priority).

Each switching clock contains up to 80 switching points, 10 switching points for All days and 7 * 10 switching points for the weekdays (Monday - Sunday). All switching points entered overlap. However, switching points for weekdays have priority over switching points for All days.

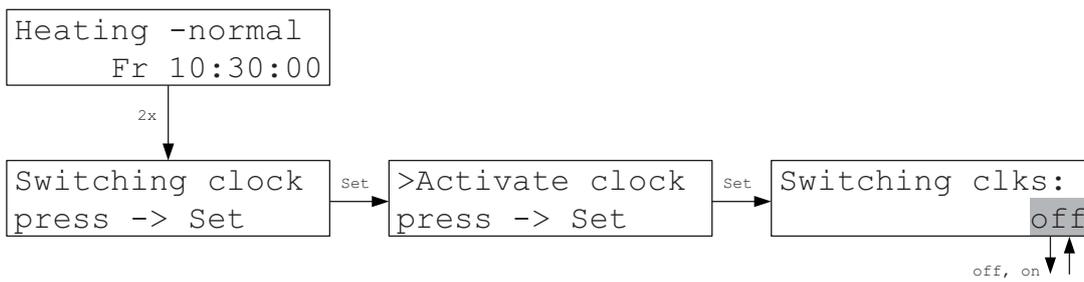
The limit values for the characteristics of the switching clock can be entered for the Tempering function. They then apply for all 30 switching clocks. The value <15 >25°C is preset.

Attention:

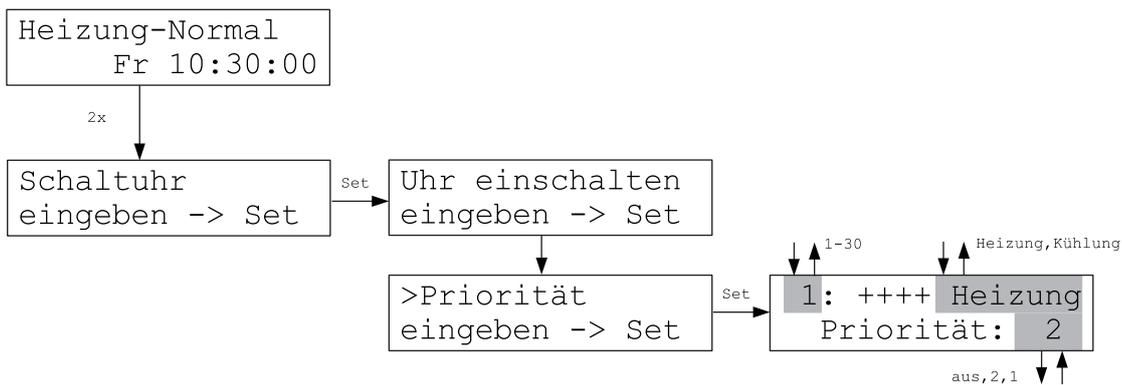
The settings under Operating mode (for the entire ZE) and Mode (for the single Rx) have priority over the switching clocks.

Attention:

If changes in the switching clocks shall become effective immediately a ZE Reset must be performed (e.g. by interrupting the power supply for approx. 10 seconds. Otherwise, changes become effective only with the respective next switching point.



The large switching clock can be switched on or off completely. This then applies for all 30 single switching clocks.



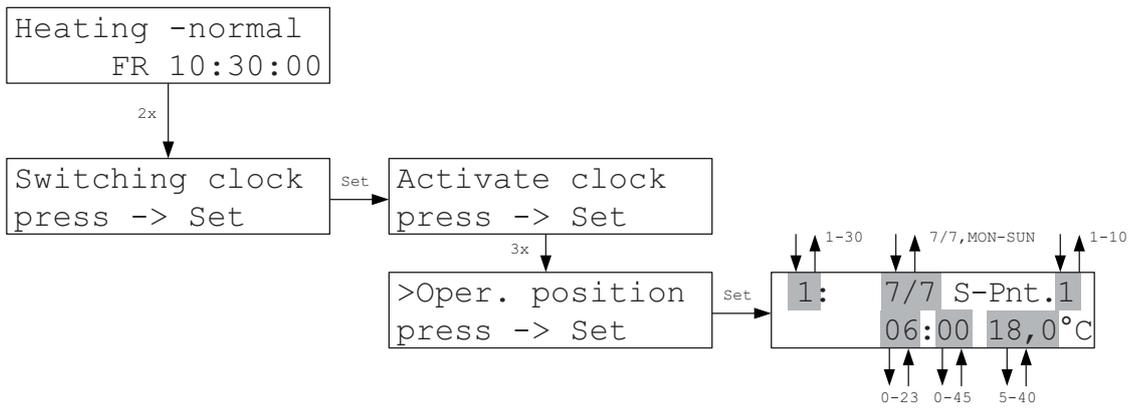
First, one of the 30 switching clocks is selected.

Next, it is determined whether it shall apply to heating/tempering or cooling.
(Switching clocks set for heating also apply to tempering.)

Finally, the priority over the other switching clocks is determined:

- 1 = high priority
- 2 = low priority
- off = the switching clock is deactivated.

The setting under priority then allows activating or deactivating single switching clocks.

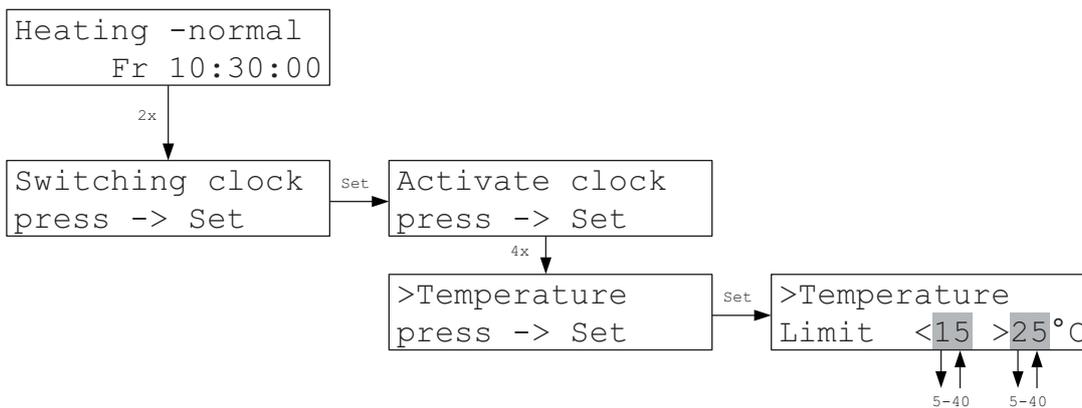


First, one of the 30 switching clocks is selected.

Next, the day is defined; either all days (7/7) or a specific weekday.

One of the 10 possible switching points of the day is then selected.

The switching time can now be entered and then the target temperature to which the switching clock shall switch at this time.



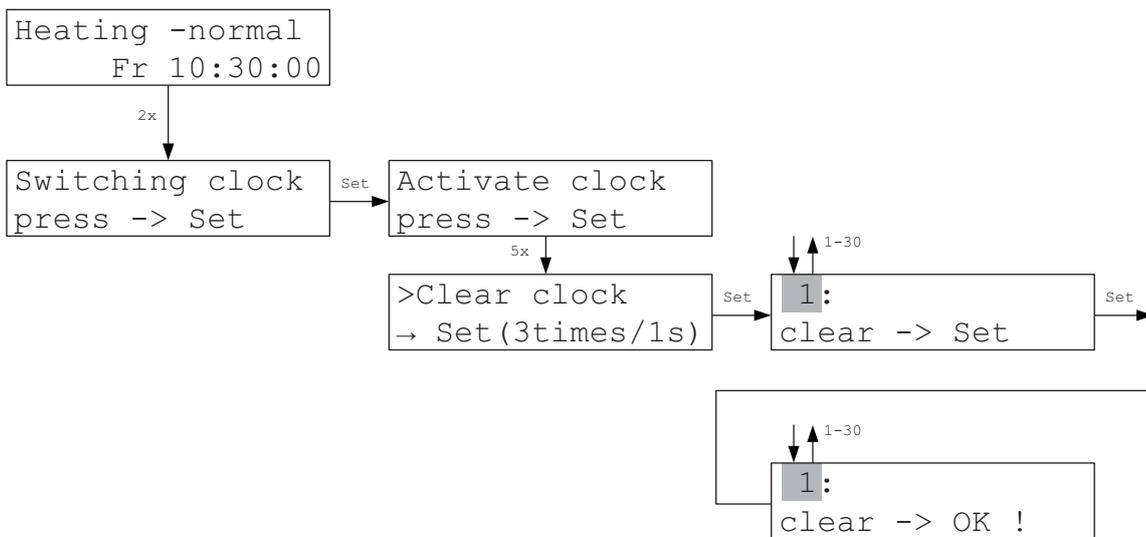
The limit values for the characteristics of the switching clock can be entered for the Tempering function. They then apply for all 30 switching clocks. The value <15 >25°C is preset.

The limit values have the following meaning only in the Temper function:

If a switching clock sets a setpoint within the limits this setpoint is actively selected by heating or cooling.

With an absolute setpoint which is smaller than the lower limit active cooling down does not take place but heating prevents the temperature from dropping below the setpoint. With an absolute setpoint which is greater than the upper limit active heating does not take place but cooling prevents the temperature from rising above the setpoint. However, a setpoint specified manually by Rx (= manual setpoint) is actively selected in any case through heating or cooling.

This approach allows realising an economy function: if heating but not cooling is desired at night, a night temperature below the lower limit is set. Only heating may take place then at night but no cooling. The time when this economy function exactly kicks in can be defined by selecting the lower and upper limit.



First, one of the 30 switching clocks is selected.

All settings of this switching clock can then be cleared together with the Set key.



The local units menu allows changing the set temperature and the mode of each local unit from the central unit. The values set manually on the local units are thereby overwritten. For RS local units this is the only means of entering the set temperature.

The Day mode activates the set target temperature.

The Night mode sets the set temperature for 8 hours on the value set in the Settings-Night temperature menu.

The Frost mode sets the set temperature to 5 °C (when heating).

The Off mode sets the set temperature to 40 °C (when cooling).

The Party mode activates the set temperature set on the local unit for 8 hours.

When tempering, switching to cooling is blocked in the modes Night and Frost.

The actual temperature and the name of the local unit, if assigned, is displayed in the 2nd line (see Designate Rx Settings menu).

Additional notes may be shown in the 2nd line (alternating with the name):

Update! - The data is refreshed, a change is not possible for 1-2 minutes.

Sw. clock! - Changing the set temperature is not possible because a lowering period of the small clock is active (the mode can be changed).

Economy! - Changing the set temperature is not possible because economy mode is active (the mode can be changed).

- Frost! / Off! - Changing the set temperature is not possible because frost-free (or cooling off) is active (the mode can be changed).
- No humidity Rx! - Humidity regulation has been selected for the local unit (in the Start up menu - Humidity) although the local unit is not equipped with a humidity sensor.

The set temperature for a room is generally determined according to the following priorities:

1) If humidity regulation is active, it determines the set temperature. Other settings are taken into consideration only if humidity regulation is not active.

2) The modes Night / Frost (Off) / Party determine the set temperature second in line. Additional settings matter only in the Day mode.

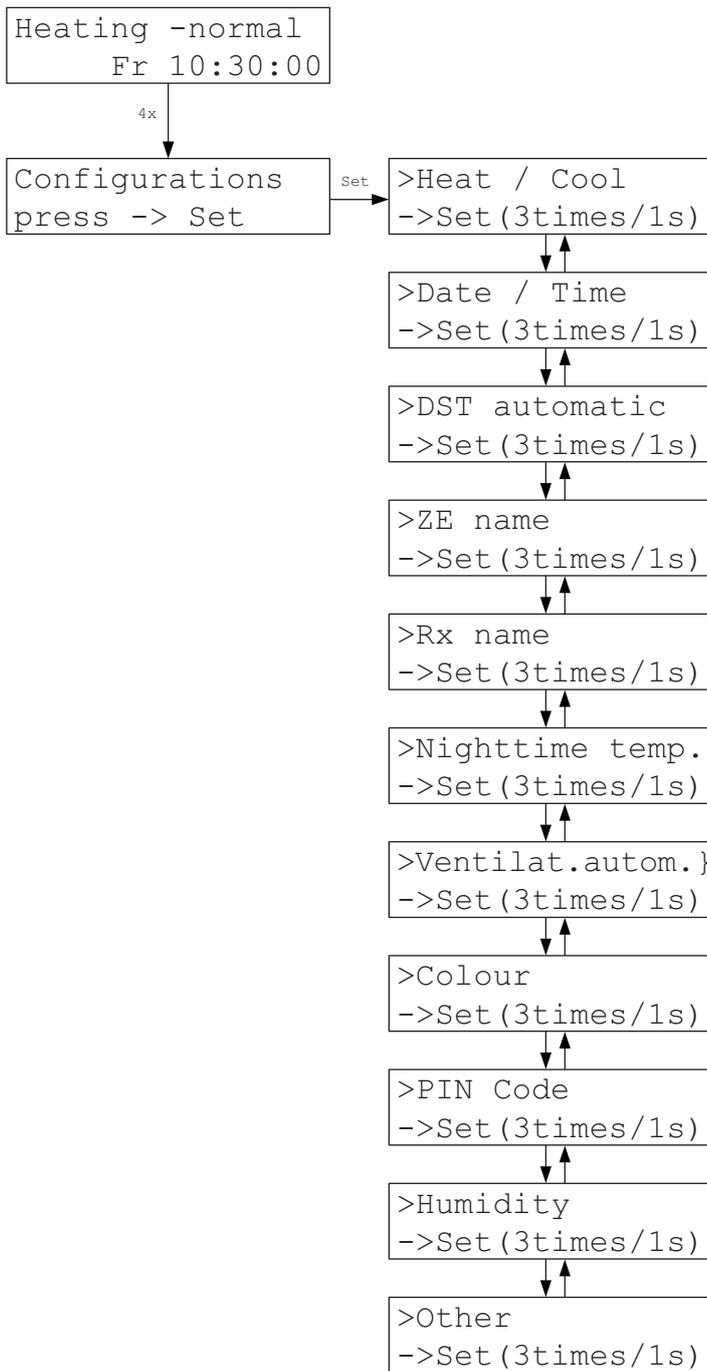
3) The operating mode of the ZE central unit determines the set temperature third in line. Additional settings matter only in the Normal mode.

4) The lowering period of the small clock determines the set temperature fourth in line. Additional settings matter only when the small clock is inactive or not in a lowering period.

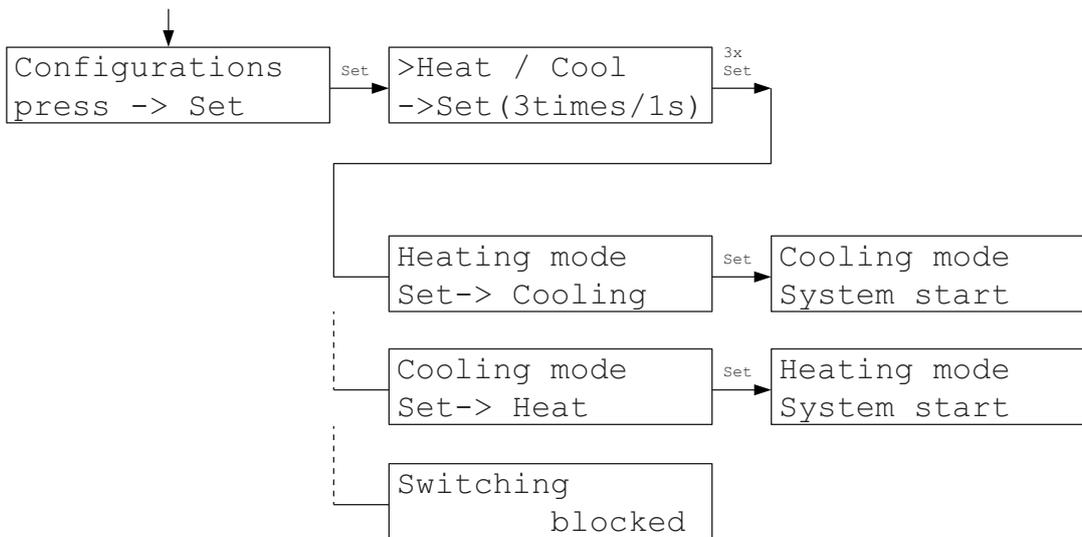
4) A switching point of the large clock also determines the set temperature fourth in line. (Because the small and large clock can only be used alternatively, both have priority 4). Additional settings matter only if the large clock is not active or Day°C is set as temperature of the switching point.

Attention: The switching point only gains at the time of switching. Later changes of the set temperature overwrite the temperature value of a switching point that has already passed. (The large clock is event-related!)

5) Finally, the value entered on the local unit (or in the local units menu) determines the set temperature.

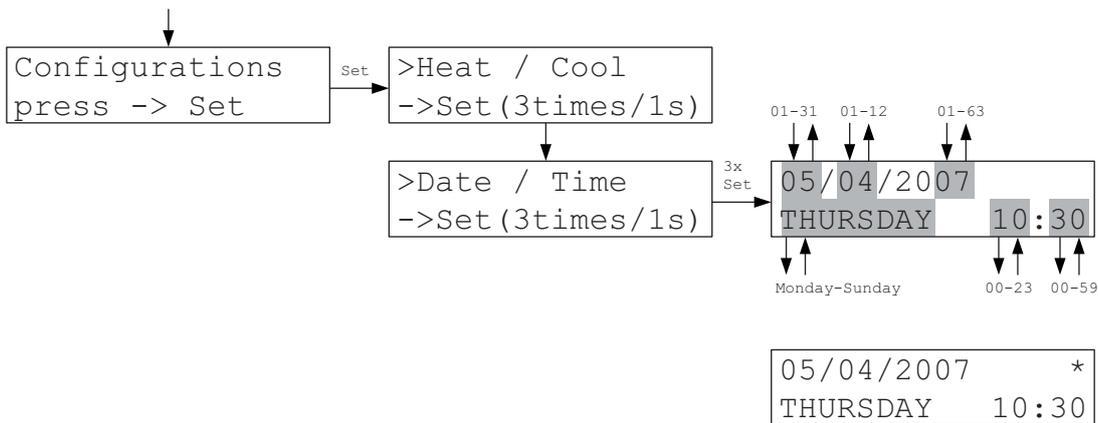


In the Settings menu a number of setting options have been summarised for defaults; they normally need to be entered only once. The menu points should be activated only with caution since an unintentional change may possibly interfere with the function of the THZ control. To protect against unintentional operation the Set button must therefore be pressed 2x within 1 second.



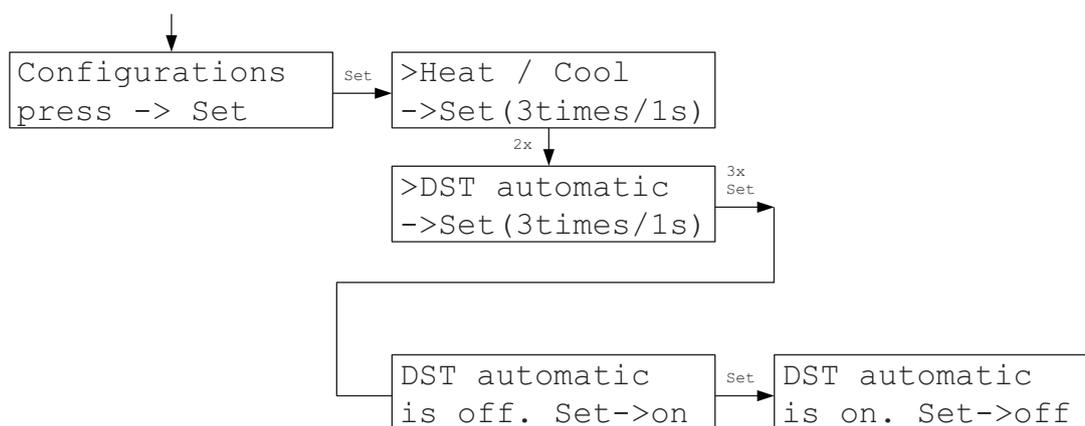
Switching between heating and cooling operation is possible in the Heat/Cool menu. Press the Set button in each case. However, switching must have been permitted first in the Start up - Heat/Cool menu. If not permitted, the message Switching blocked appears.

The system performs a complete restart after each switching to load the correct parameters.



At date / clock the date can also be entered in addition to the weekday and the time. An asterisk (*) in the upper right corner indicates that the Automatic DST function is active (see Auto-DST settings).

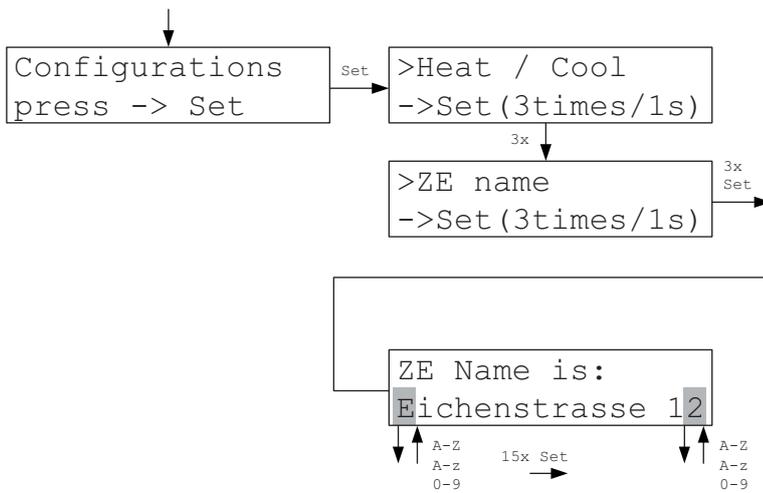
If a radio clock FU is included in the system, the Automatic DST function must be inactive since the radio clock changes on its own.



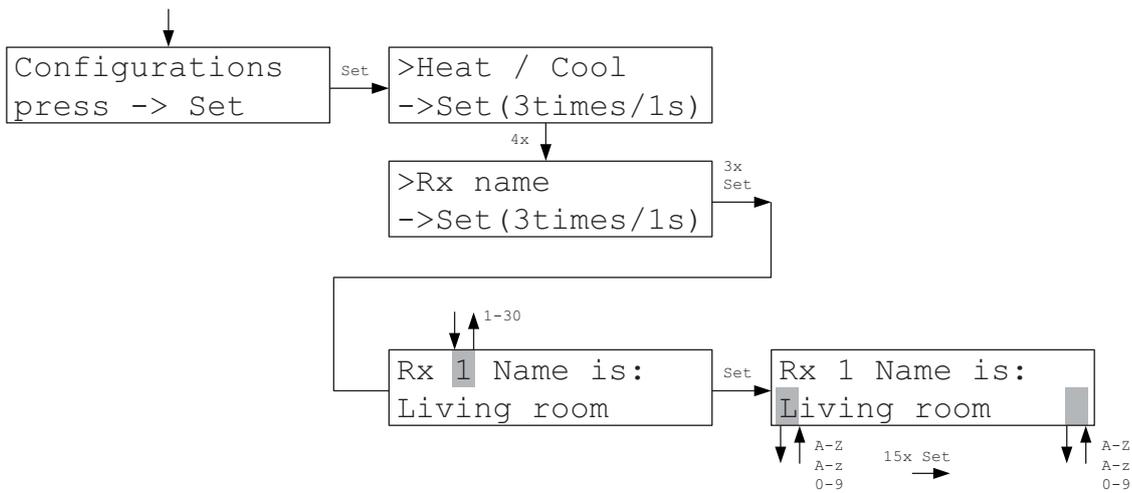
If the DST automatic function is active, the clock changes automatically in each case to European daylight saving time: 1 hour ahead on the last Sunday in March (at 2:00 o'clock CET) and 1 hour back again on the last Sunday in October (at 3:00 o'clock CET)

This is indicated by an asterisk (*) on the upper left in the Settings – Date/Time menu.

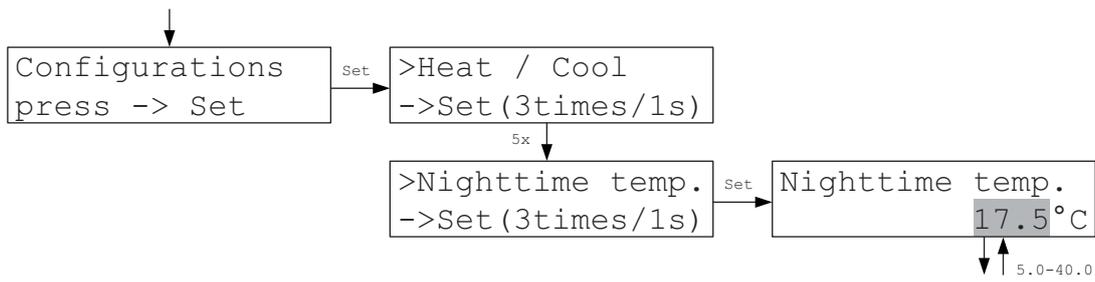
If a radio clock FU is included in the system, the Automatic DST function must be inactive since the radio clock changes on its own.



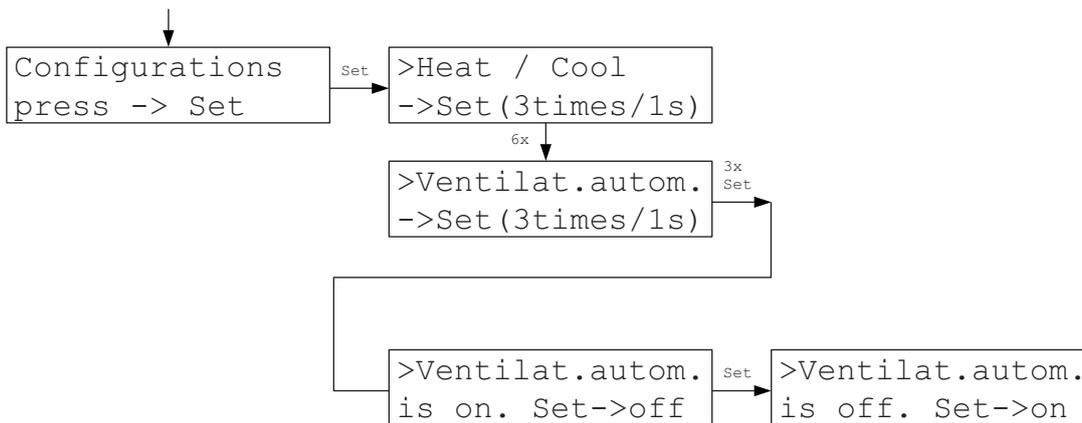
A name can be assigned here to the central unit. The name facilitates identification if the central unit is controlled with the PC program PC-i. Otherwise, it does not appear anywhere else in the ZE menu.



The Rx name menu allows assigning names to the local units. If the set temperatures of the local units are not changed directly on the local unit but in the central unit (see Local units menu item), identification via a name is much easier than via the unit number. For example, if local unit 3 is installed in the living room, living room can be entered as name. The names of the children can be used, for example, for children's rooms.



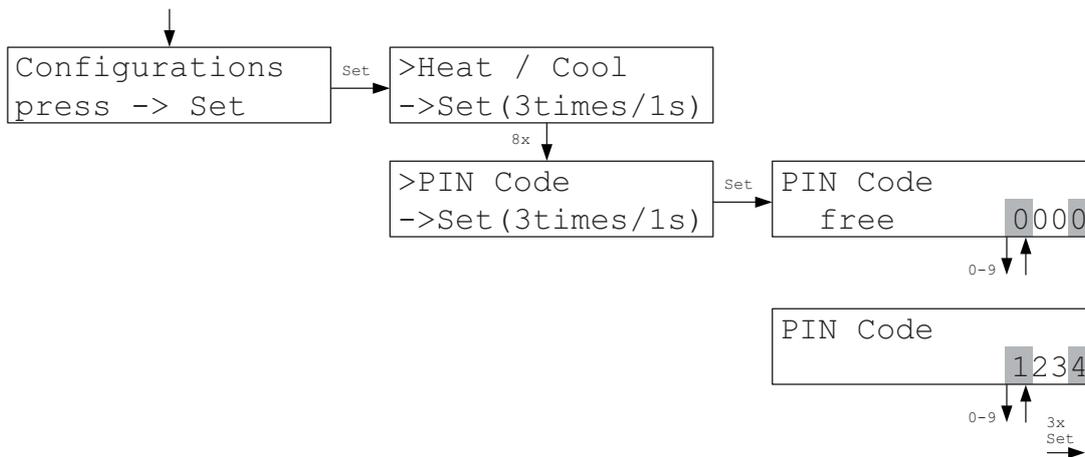
The temperature used by the local devices as set temperature in the Night mode can be set here. It is uniform for all local units.



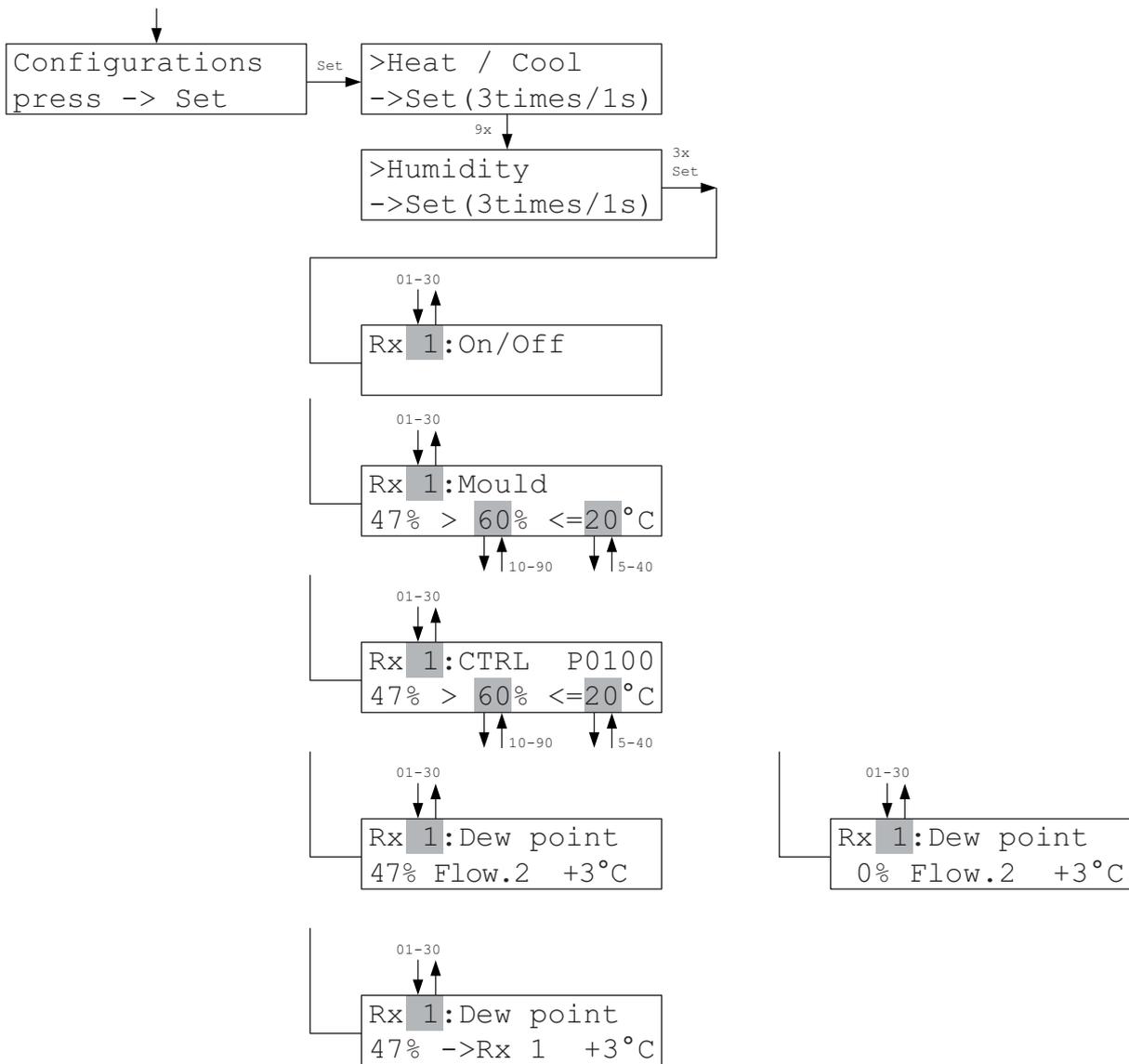
In the Ventil.autom. menu the characteristics of the THZ control with the ventilation of rooms can be changed. The THZ control detects through characteristic features where a window or door was just opened for ventilation. In this case, the heating circuit is deactivated to avoid energy-wasting heating while the window is open. The heating circuit is activated again after closing the window or door. This function can be disabled here if not wanted. The function is enabled in the factory settings.



In the Colour menu one of 256 different colours can be set for the display of the ZE central unit (die colours for the displays of the RG / RF local units are set in the units directly).



In The PIN code menu an access code can be defined for the control of the ZE central unit (e.g. via the PC program PCi).



Limit values for the activated humidity regulation can be changed in the Humidity menu. The values that can be changed depend on the type of humidity regulation set in the Start up-Humidity menu. The measured value of humidity Rx is always displayed in the 2nd line at the left.

AUS - Humidity regulation is deactivated.

Mould - When the limit value of humidity (%) is exceeded heating switches on until the limit value of the temperature (°C) is reached. The room is maintained at this value until the humidity has fallen again below the limit value of humidity. The set value of the temperature originally set is then used again for the control. The limit values for humidity and temperature can be changed. (To prevent mould, a limit value of the humidity of 60% is often recommended.)

CTRL - The room is regulated to constant humidity, the temperature may therefore fluctuate. The setpoint of humidity can be adjusted. A limit value that must not be exceeded is entered for the temperature even if the humidity can then no longer be maintained. The regulating parameter, set in the Start up-Humidity menu and determining the regulating dynamics, is displayed at the upper right.

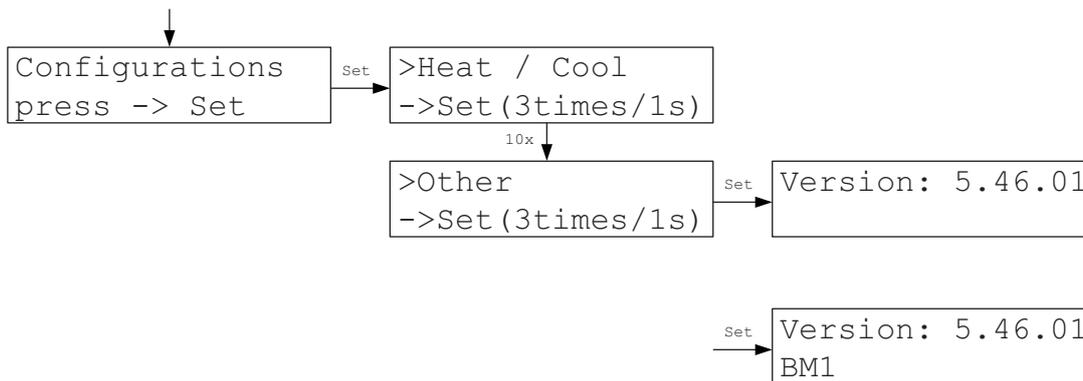
Dew point Flow 1 - The local unit works as dew point sensor for Flow 1. The safety distance to the dew point set in the Start up-Humidity menu is specified at the lower right. The temperature of the coolant is measured with the external sensor of the local unit. The coolant temperature is raised if the safety distance to the dew point is fallen below.

Dew point Flow 2 - Same as dew point Flow 1.

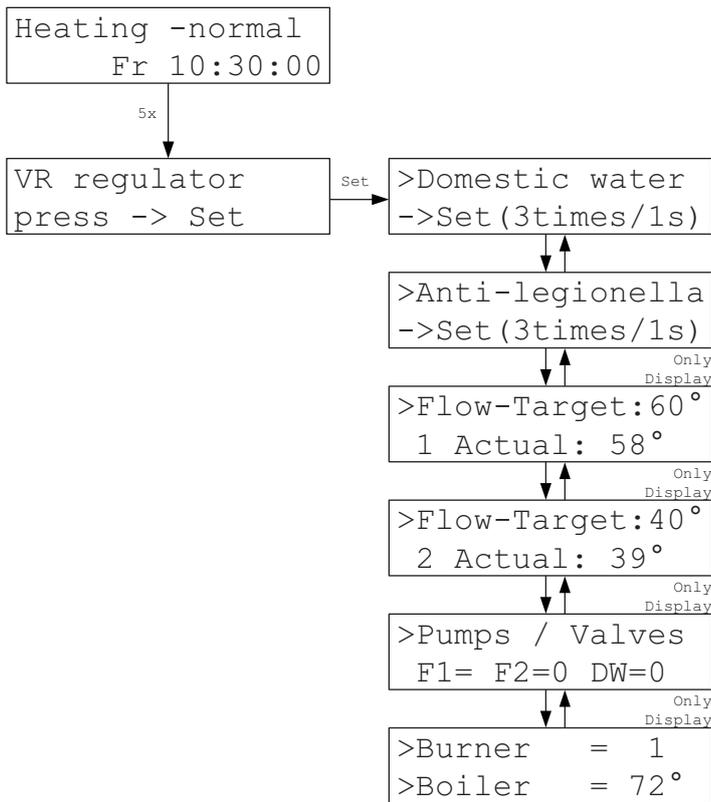
Dew point Rx - The local unit works as dew point sensor for the own room or another local unit. The temperature of the coolant is measured with the external sensor of the local unit. Heating is switched off in the allocated room if the safety distance to the dew point is fallen below.

Attention:

No dew point monitoring is possible in the Temper function!



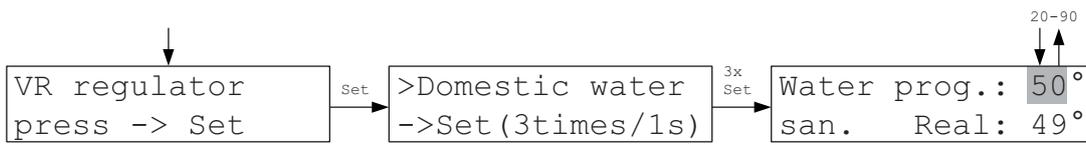
The Other menu shows the version number of the operating software. A possible software version is displayed in the 2nd line.



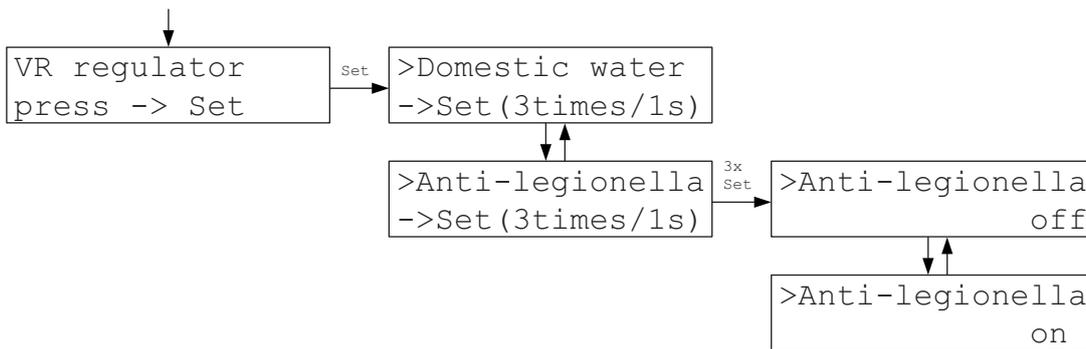
The domestic water temperature can be changed in the VR regulator menu. A setting is also possible whether the domestic water shall be heated over 60 °C once a week to protect against legionella. In addition, the operating data of the VR regulator is displayed.

Attention:

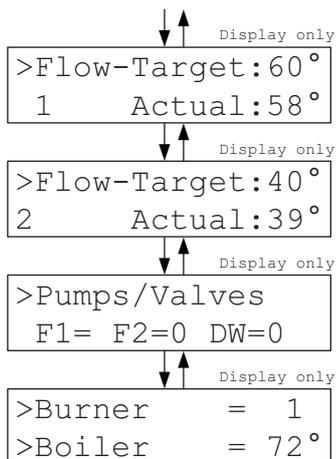
The data refers to an optionally connected VR regulator. The data is insignificant if no VR is connected.



The domestic water temperature can be changed here.



If the anti-legionella function is enabled, the domestic water is heated each Monday from 1:00 h at night to over 60 °C. Heating shuts off as soon as 60 °C has been exceeded of 4 hours have elapsed. (That is, heating stops at the latest at 5:00 h in the morning, even if the 60 °C was not reached, e.g. because of a fault in the boiler.).



Flow temperatures 1 and 2 are displayed in the first two display menus.

The next menu shows the status of the connected pumps / valves:

V1=0 Flow 1 Pump off / Valve closed

V1=1 Flow 1 Pump on / Valve open

V2=0 Flow 2 Pump off / Valve closed

V2=1 Flow 2 Pump on / Valve open

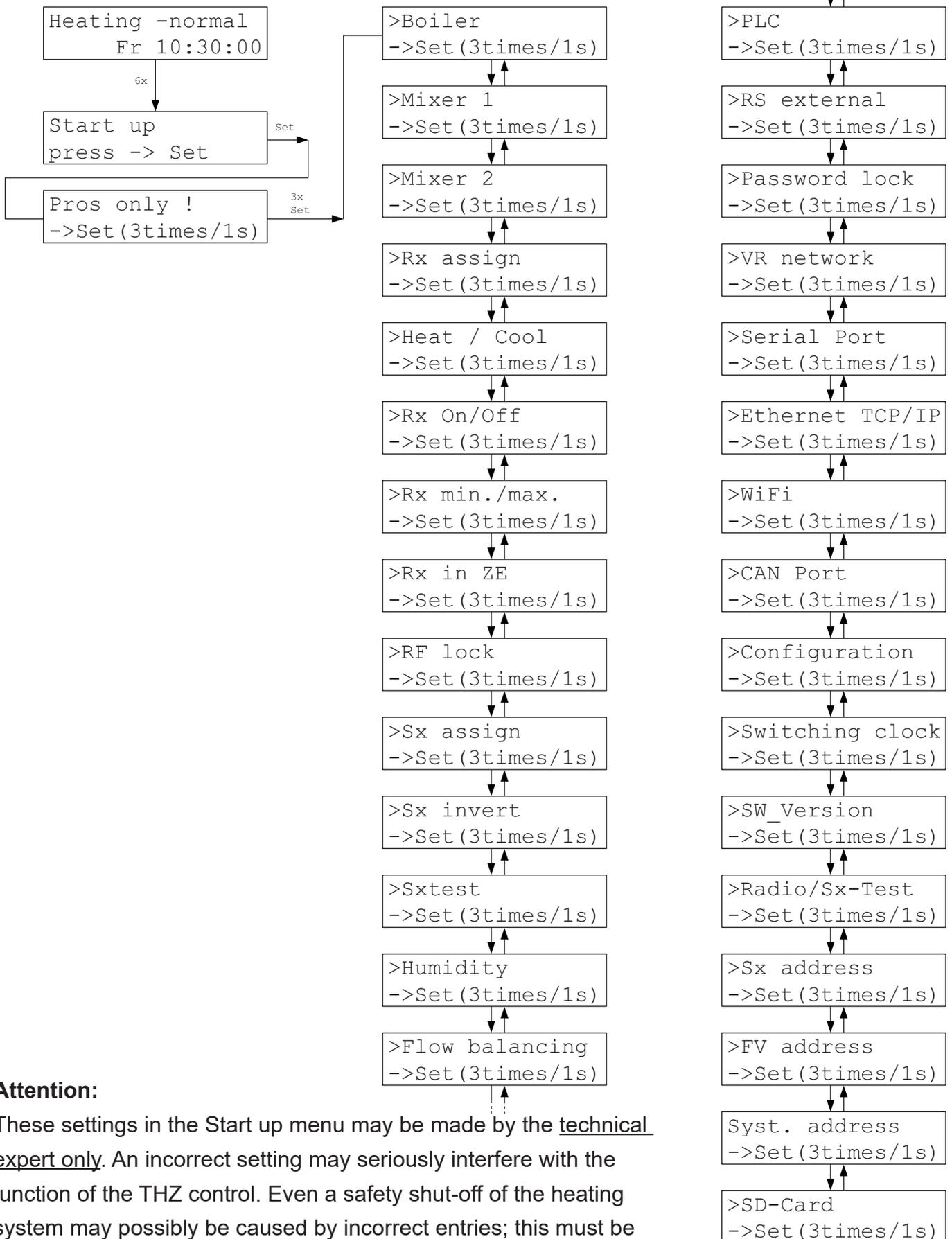
BW=0 Domestic water pump off / Valve closed

BW=1 Domestic water pump on / Valve open

The last menu indicates the burner condition and the current boiler temperature:

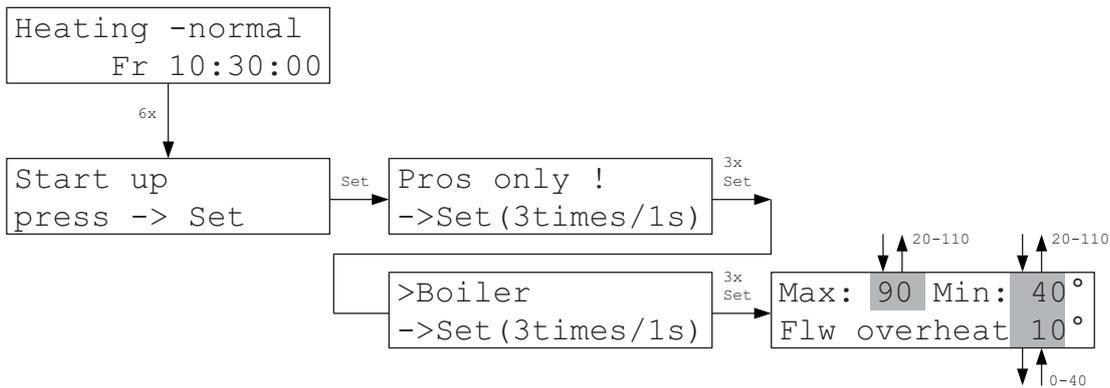
Burner = 0 - Burner is off

Burner = 1 - Burner is on



Attention:

These settings in the Start up menu may be made by the technical expert only. An incorrect setting may seriously interfere with the function of the THZ control. Even a safety shut-off of the heating system may possibly be caused by incorrect entries; this must be reset manually!

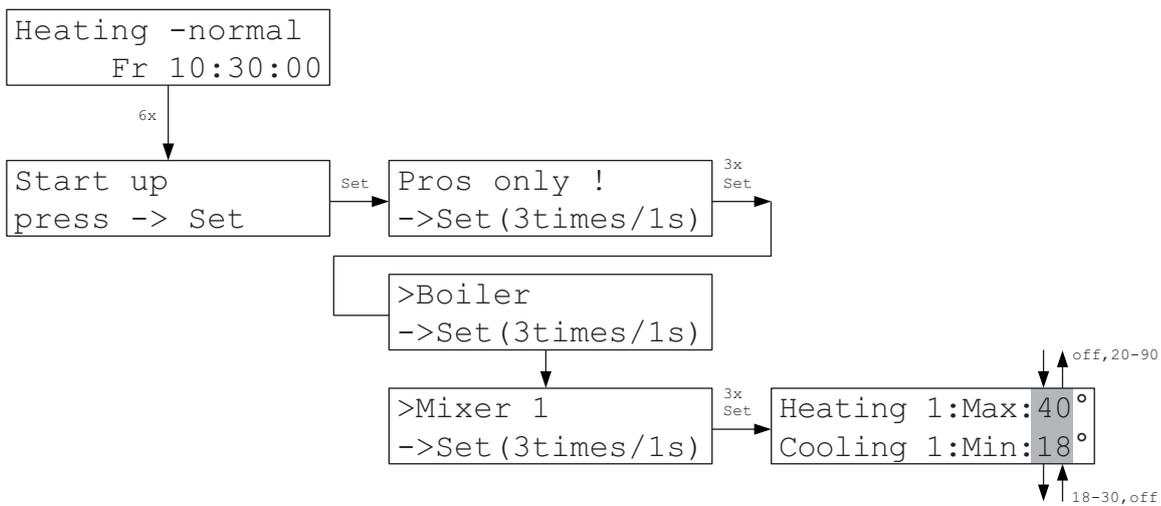


The minimum and maximum boiler temperature can be set in the Boiler menu. The default settings at delivery are min. 40 °C and max. 90 °C.

In addition, entering the temperature difference between flow and boiler, at which the boiler is switched off if exceeded, is possible. The default is 10 °C.

Attention:

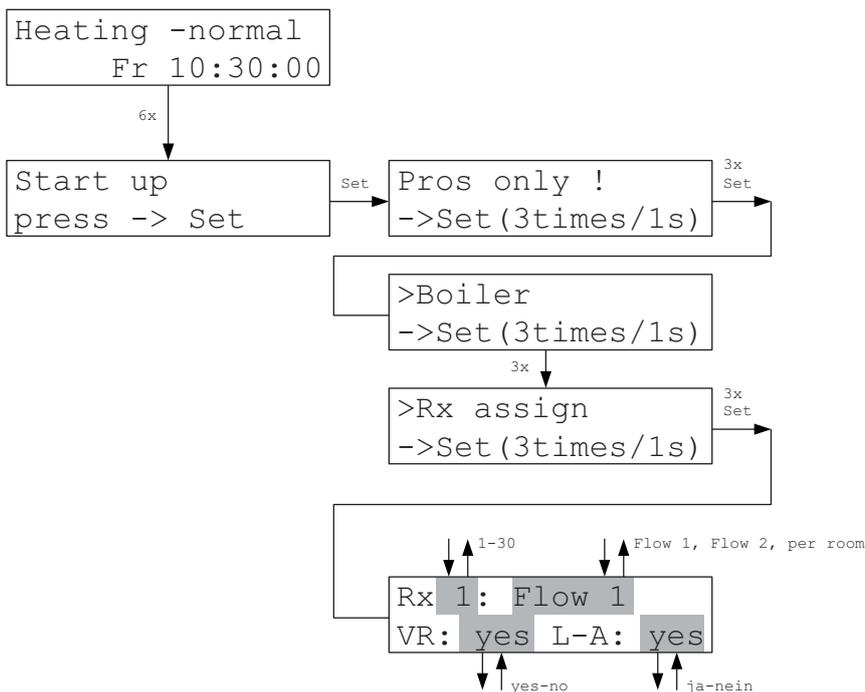
To ensure that excessive temperatures in the boiler and flow, especially for underfloor heating, are reliably ruled out, additional independent temperature limiters must be in place.



In the Mixer 1 menu the separate input of a max. temperature for the Heating mode and a min. temperature for the Cooling mode is possible.

The mixer is switched off when during heating the max. temperature is set below 20 °C. This is also displayed like this. When cooling, a min. temperature of over 30 °C switches off the mixer. This is also displayed. Deactivation always applies only to the mode (heating or cooling) for which it was done.

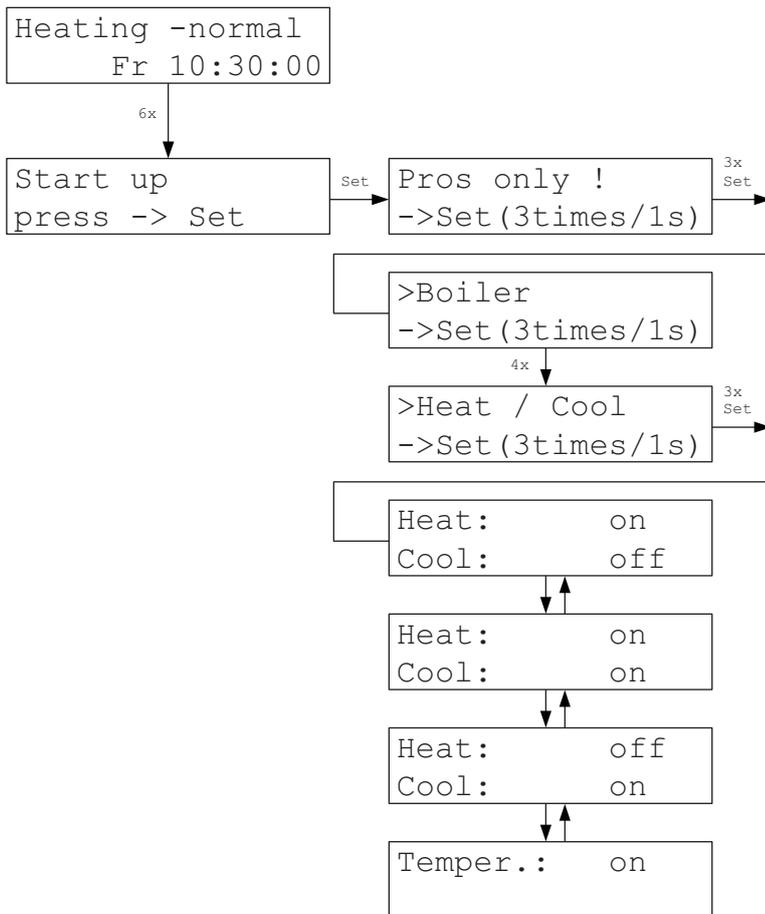
The Mixer 2 menu works in the same way as the Mixer 1 menu.



The Rx menu allows defining whether the local unit belongs to a flow (mixer circuit) and whether it is included in the calculation of the flow temperature (VR: yes) or not (VR: no). If the Rx does not belong to any flow (setting „per room“) the heating power for this local device is determined separately. This is only sensible if the room is heated electrically and switched by STE switching steps that can process this information. The electrical radiators are not fully switched off during the switching pauses but supplied with low output that is derived from the calculated output by using an internal table. The default is Flow 1 and yes = included.

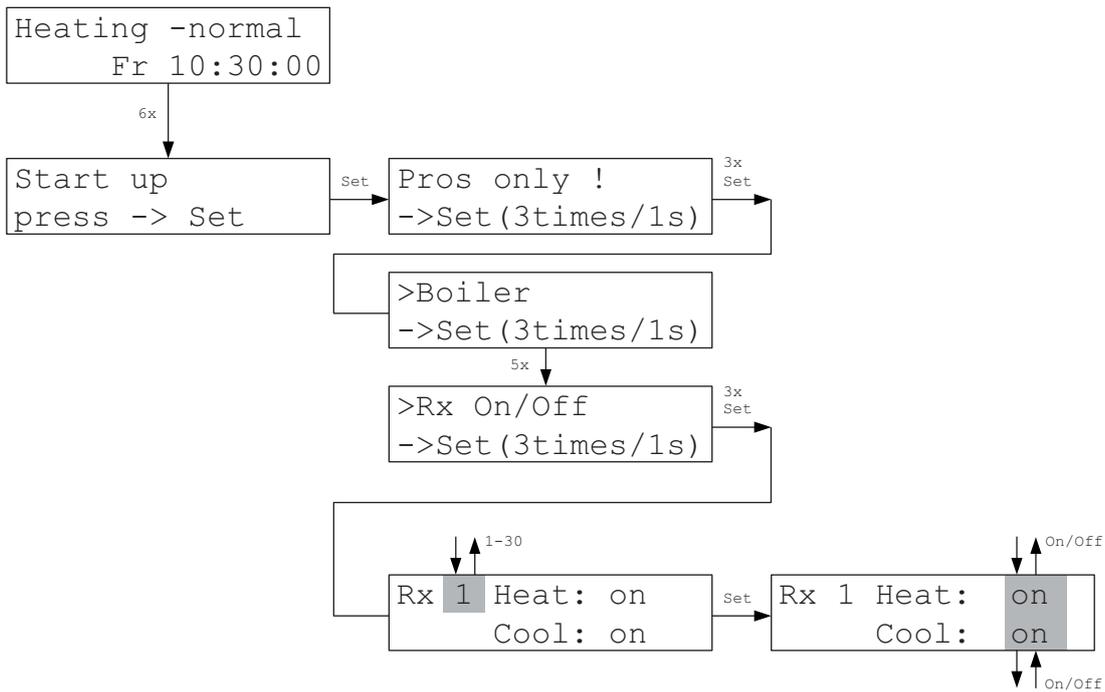
It is sometime recommended to remove rooms that are often ventilated or for long periods, e.g. bathrooms, from the flow temperature calculation. If, for example, venting through tilted windows, as is often the case in bathrooms, is frequently done, the output of the radiator is usually not sufficient to reach the set temperature set. Logically, THZ control increases the flow temperature even to the maximum to compensate for the above. However, this is usually not desired. It may therefore be better not to include such rooms in the calculation.

Finally, it can be specified whether the local unit shall be included in the Ventilat.autom. (L-A yes) or not (L-A: no). It may be beneficial especially in entrance areas not to include the local unit in Ventilat.autom. to achieve uniform heating even when doors are frequently opened.



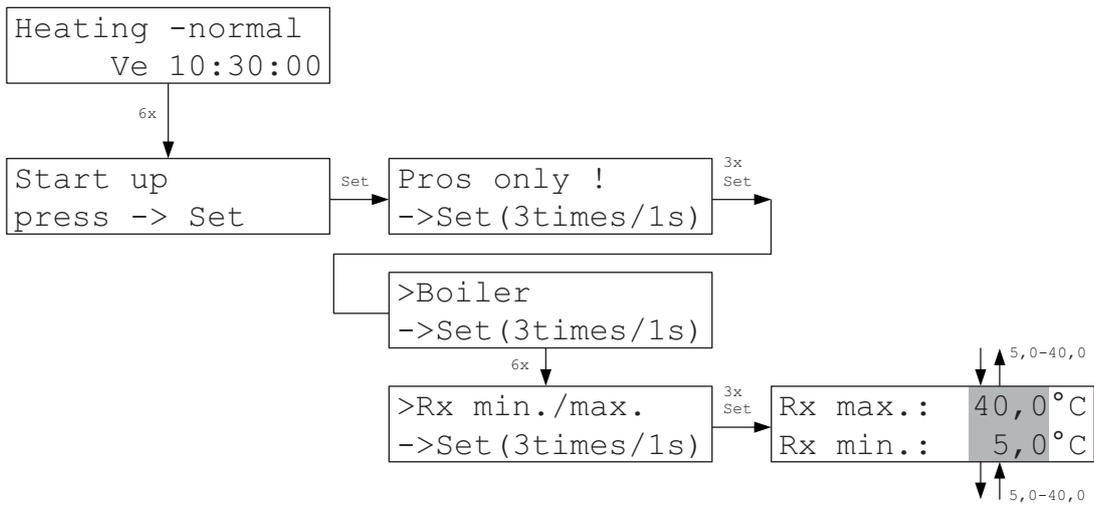
The Heat / Cool menu allows setting for which functions the system is approved. The options are „Heating only“, „Heating and Cooling“, „Cooling only“ or „Temper.“. Switching the function in the Settings menu is only possible with the setting „Heat and Cool“. „Heat only“ is preset.

If a system that was previously set to only one function (e.g. Heat only) is changed to a different function (e.g. Cool only) the system is restarted to load the correct parameters.

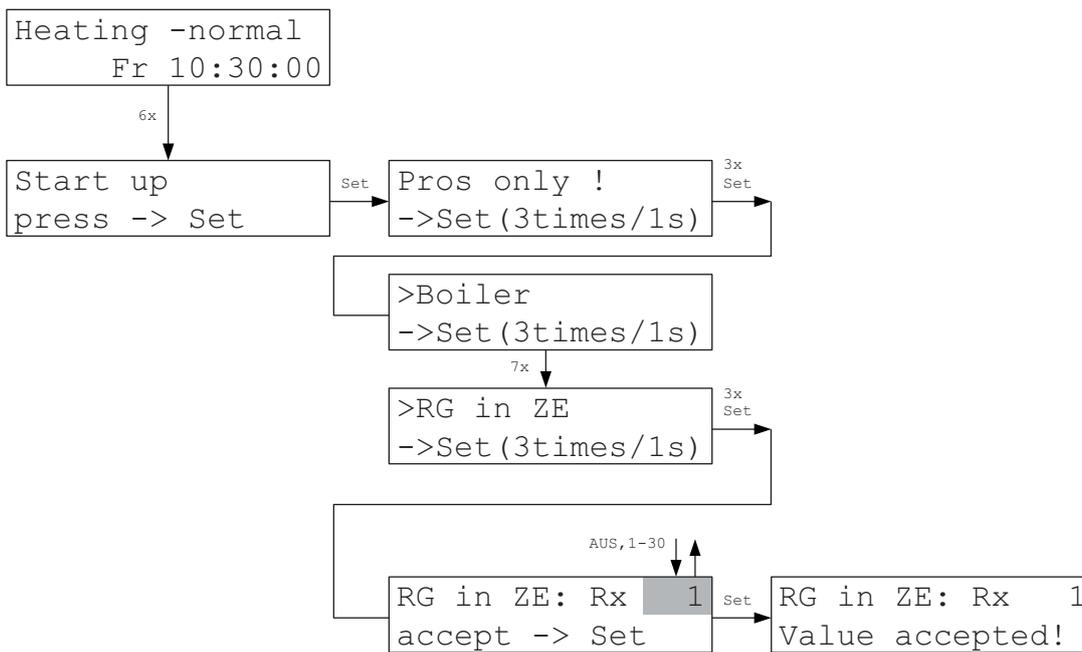


In the Rx On / Off menu the user can specify for each local unit and each function (heating or cooling) whether the local unit shall be active (switched on) in the respective function or not. For example, certain rooms can be deactivated in the cooling function. Upon delivery, all Rx are active (On) in both functions (heating and cooling).

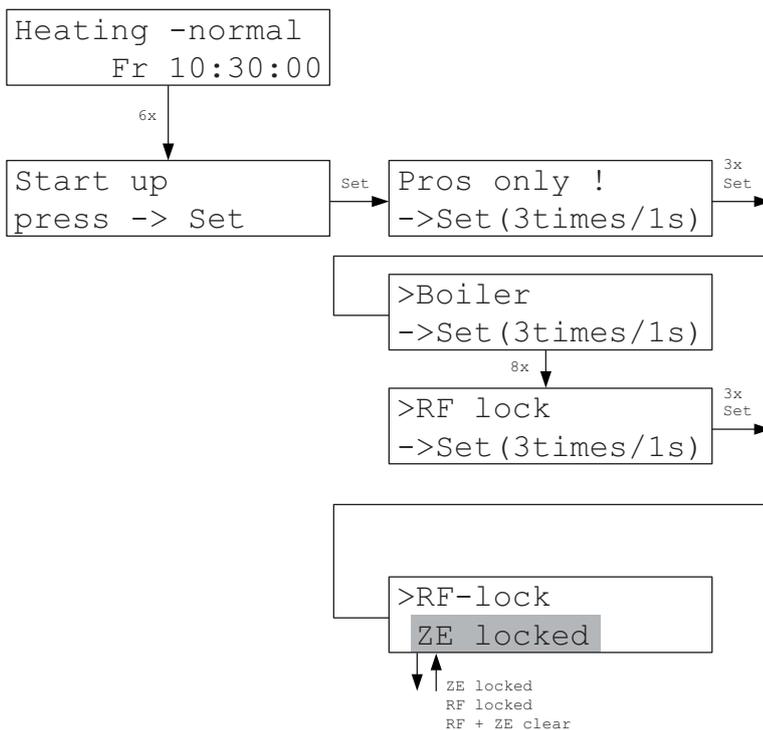
The settings for heating also apply to the function for tempering.



In the Rx min. / max. menu the setpoint for the temperature can be limited to a minimum and maximum value. The limit applies uniformly to all local units in the entire system. For RG local units and RF wireless units a set temperature outside the limit can be set at the unit, however, the limit will still be considered in the ZE central unit. With RG and RF local units a set temperature that was set outside the limit is also automatically reset in the display to the permissible value (within max. 1 minute).



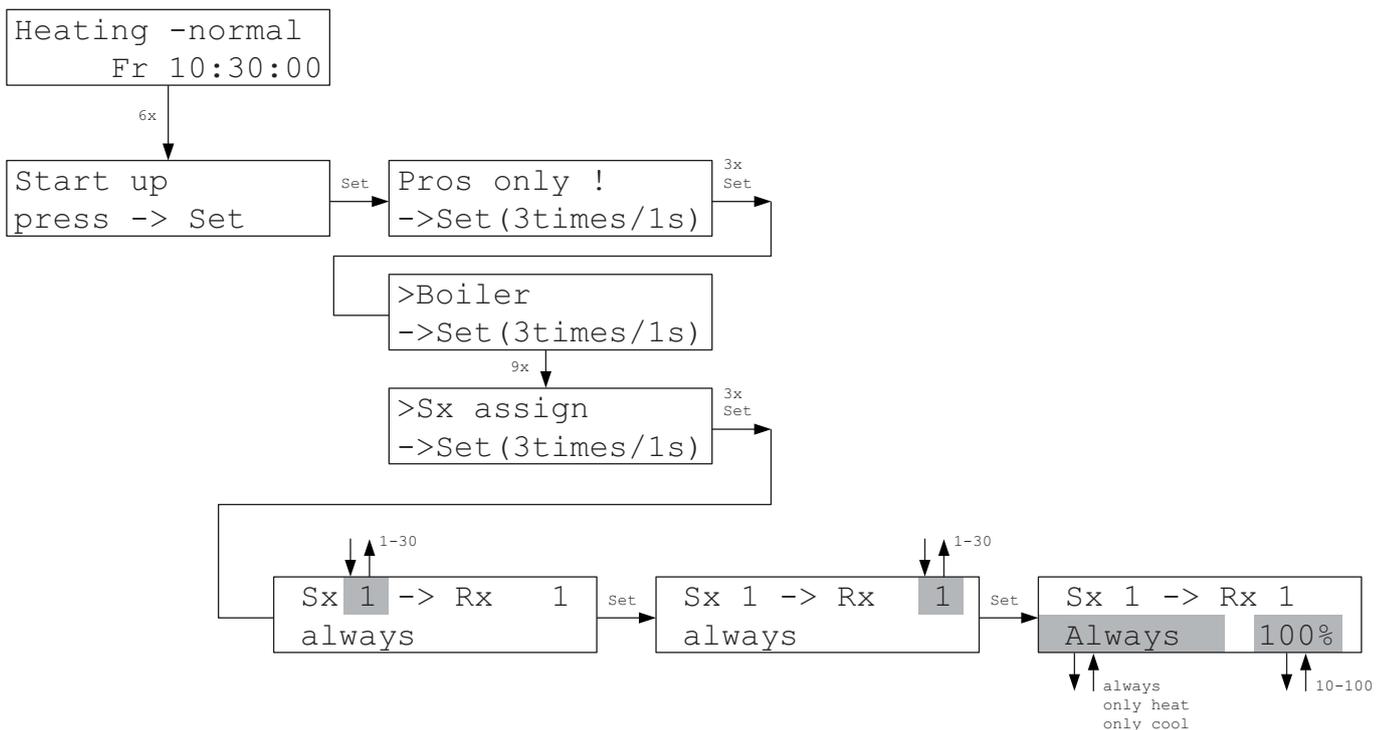
In the RG in ZE menu the internal temperature sensor of the ZE central unit can be configured as RG local unit. The ZE central unit can thus be used at the same time as room sensor. To activate the internal sensor, the address (1 - 30) at which it shall appear in the system must be set here. It then behaves as if a local unit with the corresponding address would be available in the system. The OFF setting deactivates the internal temperature sensor. The setting is accepted by pressing the Set button. Of course, it needs to be ensured that no other local unit with the same address exists in the system!



The user can define in the RF lock menu where the set temperature of the RF room units existing in the system can be entered: either only in the RF local unit (ZE locked) or only in the ZE central unit (RF locked), or both in the RF and the ZE (RF + ZE clear).

For RF2 and smaller the input at both locations (RF + ZF clear) is not possible since the ZE can only communicate with the RF in one direction and thus mutual coordination as to which setpoint was changed last and is therefore valid is not possible. In the local units menu the settings for the RF are blocked therefore at 'ZE locked'.

Bidirectional communication is set up from RF3 so that this restriction does not apply.

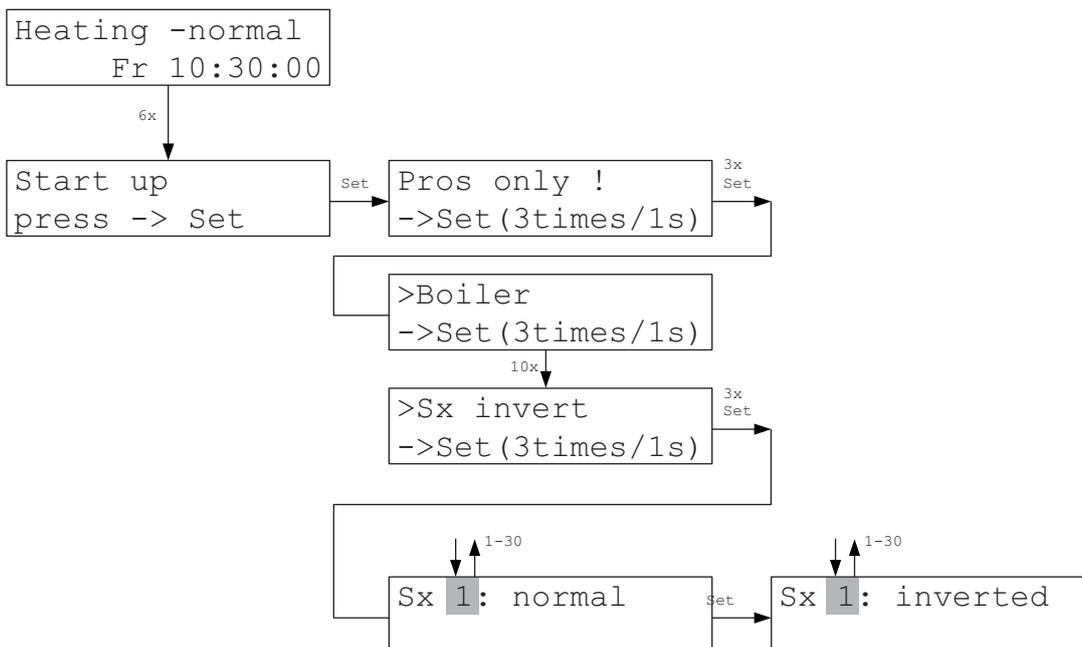


The system is preset so that one switching step / one valve drive with the same unit number is assigned to each local unit. The assignment can be changed via the Sx assign menu. This may especially be necessary when more than one switching step must be assigned to only one local unit because, e.g. two or more heating circuits shall be controlled jointly by one local unit and the valves of the heating circuits cannot be selected via the same control circuit.

In this manner, e.g. local unit 1 can be assigned to switching step 1 (this is the default setting) and at the same time local unit 1 can also be assigned to switching step 4. Both, switching step 1 and switching step 4 (that is, valves 1 and 4) are then controlled by local unit 1.

Furthermore, the function for which the relay / valve drive is used can be set: heat only, cool only, or always (= heat and cool). This then allows assigning different relays for heating and cooling to one Rx as required for the Temper function. The default is ‚always‘.

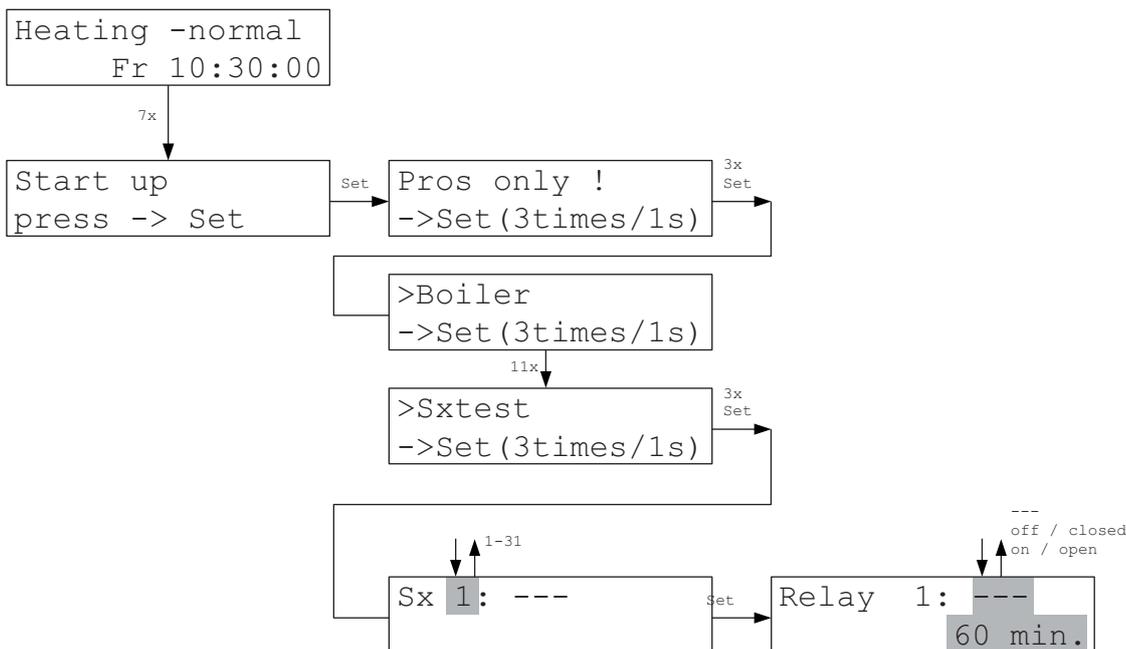
Finally, valve opening can be limited. Of course, this only applies to the valves that can be controlled proportionally (e.g. SF, SK, STE). The valve opening calculated by the regulator is then multiplied with the percentage value set. If the regulator specifies, e.g. 50% and the valve opening is limited to 80% the valve is set to 40% in the result. The setting applies to heating and cooling. The default is 100%.



In the Sx invert menu the switching direction of the relays can be changed in the switching steps / valve drives. The relays of the switching steps are preset to pick up and close the switching contact when the associated switching step receives the activation command from the central unit (active NO). The connected control element must then activate the heating circuit, i.e. one valve must open, one current switch must close. In case a control element just works in the opposite direction, the polarity of the relay of each switching step can be reversed. A relay with changed polarity opens the working contact at an activation command and closes it in the other case.

In this manner, the polarity can be entered individually for each switching relay.

This applies accordingly to valve drives (e.g. SK, SF). In the ,normal' position an activation command of the central unit causes the valve to open. In the ,inverted' position an activation command closes the valve.

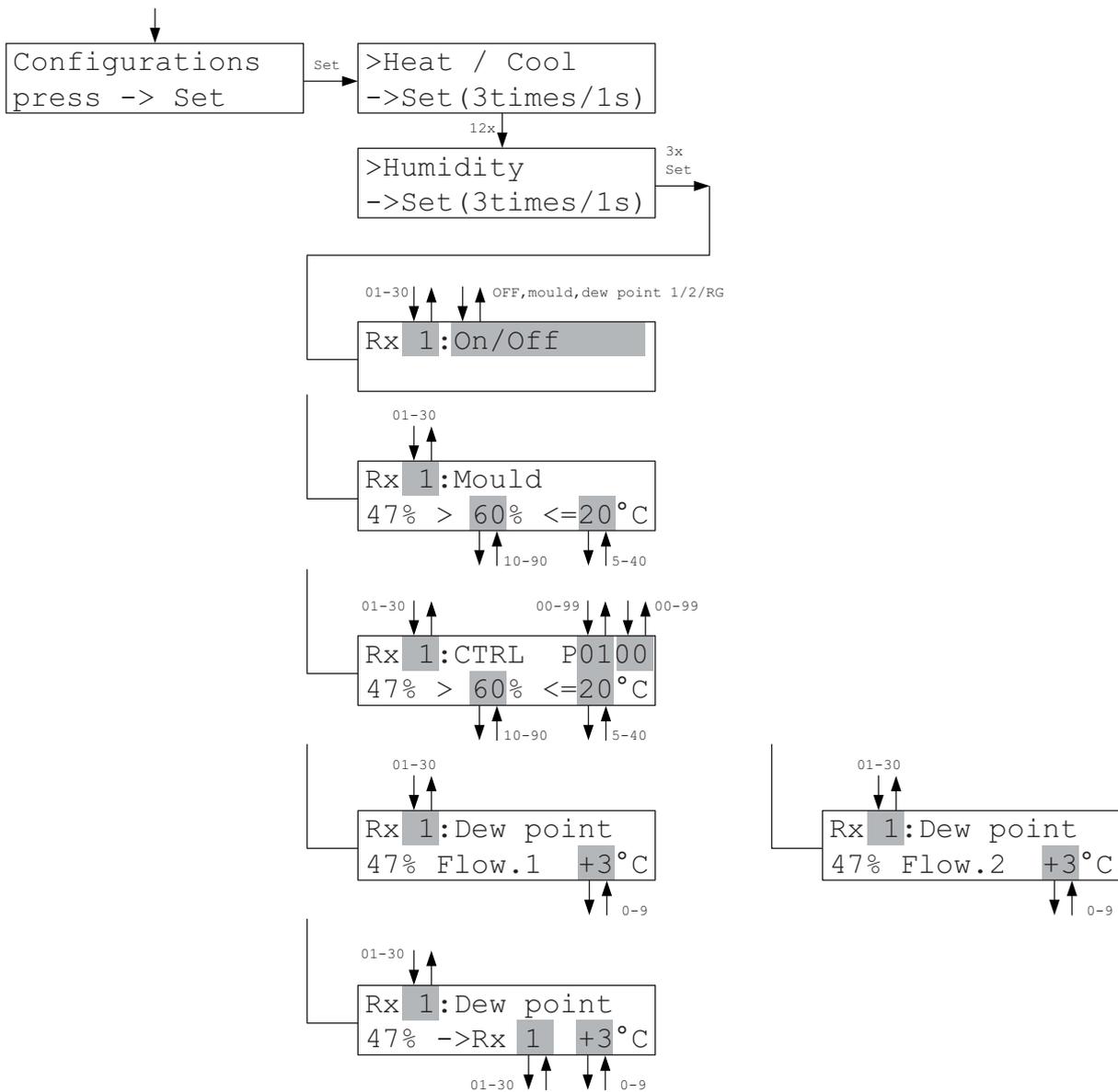


In the Sx test menu each relay in a switching step ST / each valve drive can be activated and deactivated individually. This is used to check whether the relays and valve drives are connected correctly and the correct addresses were set.

The settings mean:

- the relay is switched automatically by the ZE program (default setting).
- off / closed the relay is switched off for 60 minutes, one valve drive (e.g. SK /SF) is closed.
- on / open the relay is switched on for 60 minutes, one valve drive (e.g. SK /SF) is open.

After 60 minutes at the latest the relays / valve drives return by themselves to the default state. The minute counter is reduced by 1 each minute allowing to see at any time how long the test condition will still last. Of course, the setting can also be changed again manually during the running 60 minutes.



In the Humidity menu the type of humidity control can be selected for each local unit. In addition, limit values can be entered for the respective humidity control activated. The measured value of humidity is always displayed in the 2nd line at the left.

Attention:

The selected local unit must be equipped with a humidity sensor, otherwise humidity cannot function, of course! If humidity control is selected although the local unit does not have a humidity sensor an error message appears in the Settings-Humidity menu.

OFF - Humidity regulation is deactivated.

Mould - When the limit value of humidity (%) is exceeded heating switches on until the limit value of the temperature (°C) is reached. The room is maintained at this value until the humidity has fallen again below the limit value of humidity. The set value of the temperature originally set is then used again for the control. The limit values for humidity and temperature can be changed. To prevent mould, a limit value of the humidity of 60% is generally recommended.

CTRL - The room is regulated to constant humidity, the temperature may therefore fluctuate. The setpoint of humidity can be adjusted. A limit value that must not be exceeded is entered for the temperature even if the humidity can then no longer be maintained. The regulating parameter that determines the control dynamics is set at the upper right.

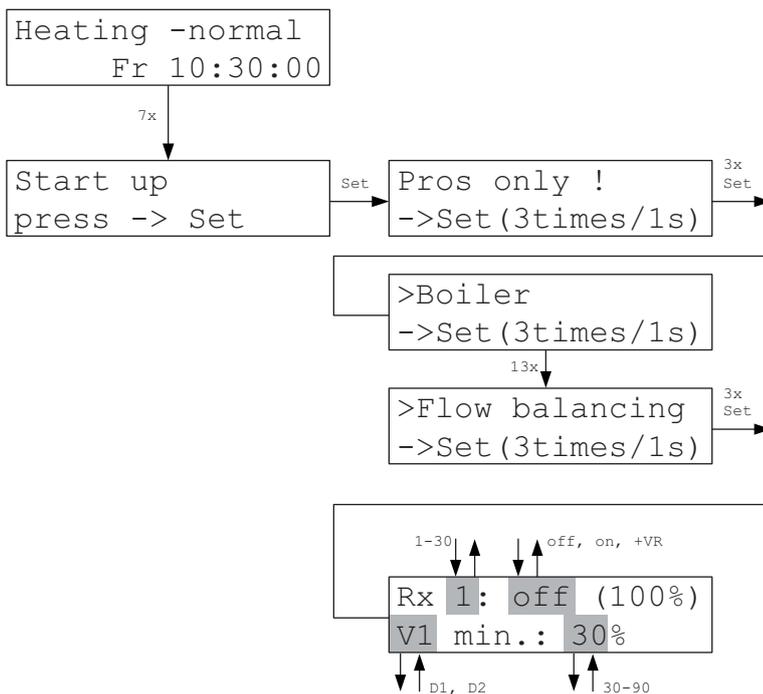
Dew point Flow 1 - The local unit works as dew point sensor for Flow 1. The safety distance to the dew point can be set at the lower right. The temperature of the coolant is measured with the external sensor of the local unit. The coolant temperature is raised if the safety distance to the dew point is fallen below. (The Rx requires only 1 address for this purpose.)

Dew point Flow 2 - Same as dew point Flow 1.

Dew point Rx - The local unit works as dew point sensor for the own room or another local unit. The temperature of the coolant is measured with the external sensor of the local unit. The local unit to which the dew point sensor is assigned can be set. The same applies to the safety distance to the dew point. Heating is switched off in the allocated room if the safety distance to the dew point is fallen below.

Attention:

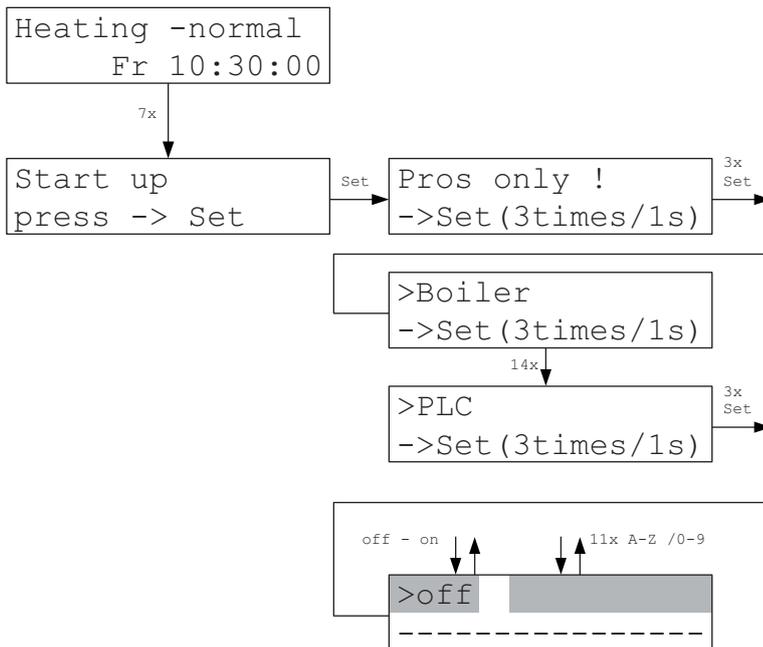
No dew point monitoring is possible in the Temper function!



If proportional servomotors SK or SF (from SF2) are installed automatic and dynamic balancing can be performed. The ZE central unit then determines constantly which heating power the coldest room needs, sets its valve opening to 100% and reduces the valve openings of all other rooms until the corresponding conditions are produced in these rooms. The valve opening of the coldest room is only reduced if it is strongly oversupplied. Otherwise, reduction of the heating power of the coldest room shall take place by a reduction of the flow temperature.

The menu Flow balancing allows determining for which rooms flow balancing shall be performed. The default setting is ,off'. In this case, the valve opening is fixed at 100%. In the ,On' setting the correct valve opening of all servomotors assigned to the Rx is determined by the ZE and automatically allowed for. For information, it is shown at the end of the line as percentage in parentheses. A coldest room is not determined, each room is reduced individually as much as possible. In the ,+VR' setting, by contrast, balancing relates to a coldest room. However, its heat supply should then be adjusted via regulation per flow temperature.

In the bottom line, a minimum valve opening can be specified separately for flow 1 and flow 2. The valve opening of all servomotors assigned to the flow then cannot fall below this minimum value. The default setting is 30%.

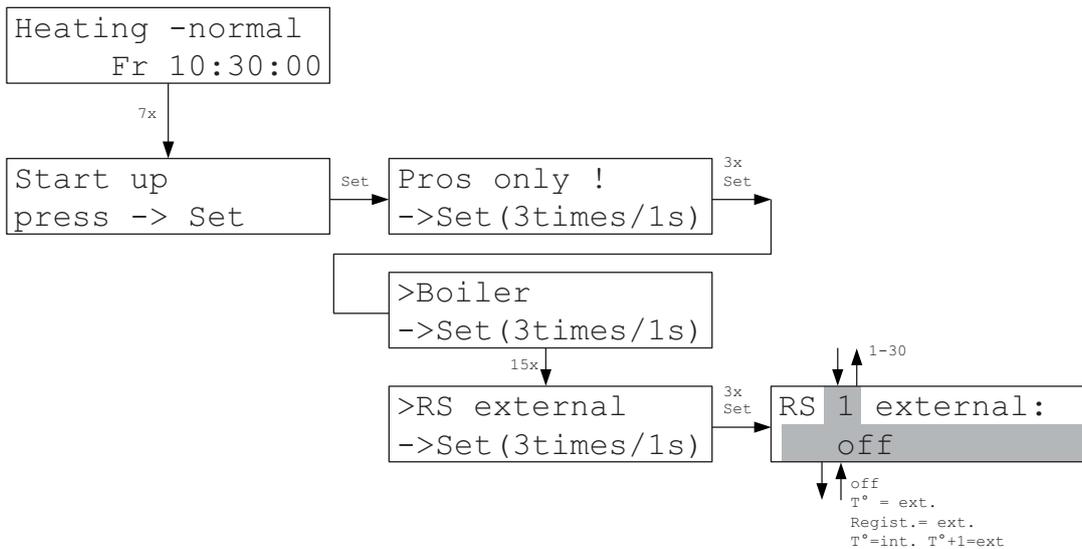


In the PLC menu a loaded PLC program can be activated (Programmable Logic Controller). If the program is enabled, it is carried out once each minute.

If the PLC program permits, parameters can be subsequently entered for the PLC program. However, it may take up to 1 minute after initial activation until the corresponding input prompt appears.

The name of the program loaded is displayed in the 2nd line. If no program is loaded ----- appears there. Enabling does not have any function then.

A PLC program provides full access to all registers of the ZE and all devices connected to the THZ bus. Many different customer-specific switching and control tasks can therefore be realised using a PLC program (e.g. fan control, alarm functions, etc.).



In the RS external menu the user can set for RS local units how sensors connected to the external terminal shall be treated. For RG local units the corresponding settings must be made in the menu of the RG local units.

The settings mean:

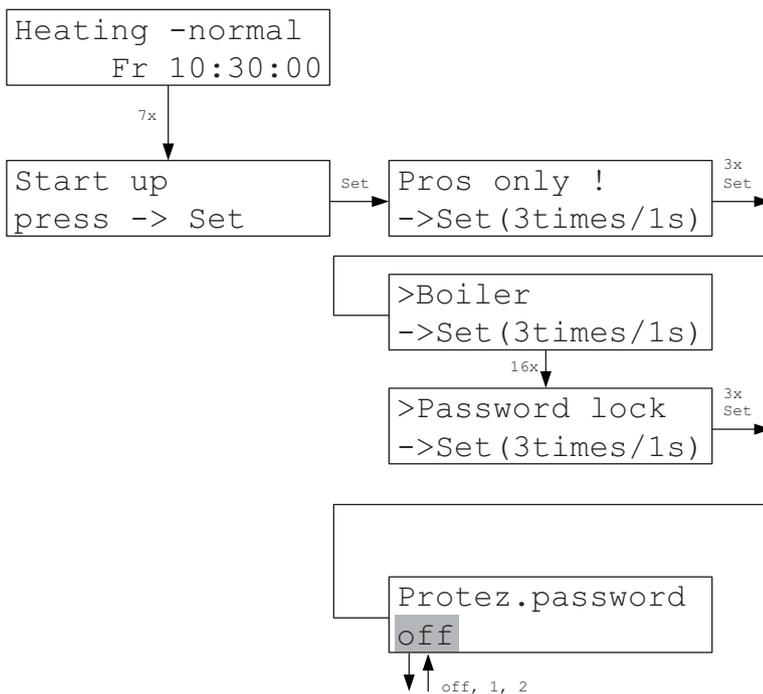
Off the external terminal is disabled. (Only the internal sensor is used.)

T° = ext. The external sensor value is used as real temperature value in the THZ routines. (That is, the external sensor replaced the internal sensor.)

Regist.= ext. The external value is stored in the associated ZE register. (Both, internal and external sensors are used.)

T°=int T°+1=ext The internal sensor is used for the address set. The external sensor is used for the address following the set address. Of course, this address must not have been used by another unit. (With one RS local unit 2 rooms can then be controlled, one with the internal sensor and the other with the external sensor.)

Attention: The RS local unit must support this function, of course. In particular, an external terminal must be available. This is the case from hardware version RS3_V1 and from software version RS3-V3.03.



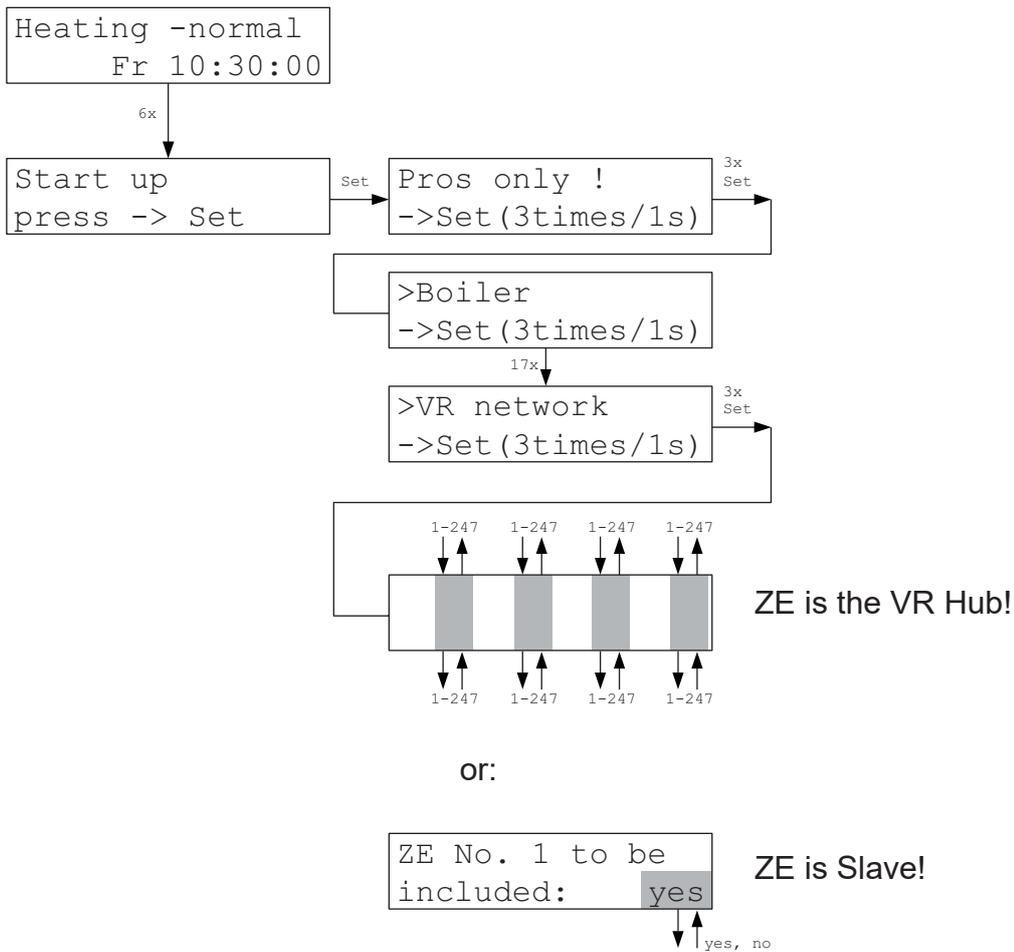
In the password lock menu the menu can be locked partially or completely. Locked parts can only be accessed after entering a password. The status menus always remain accessible.

off = no menu is locked.

1 = only the start up menu is locked. Password: 1475

2 = all menus are locked (with exception of the status menus). Password: 2908

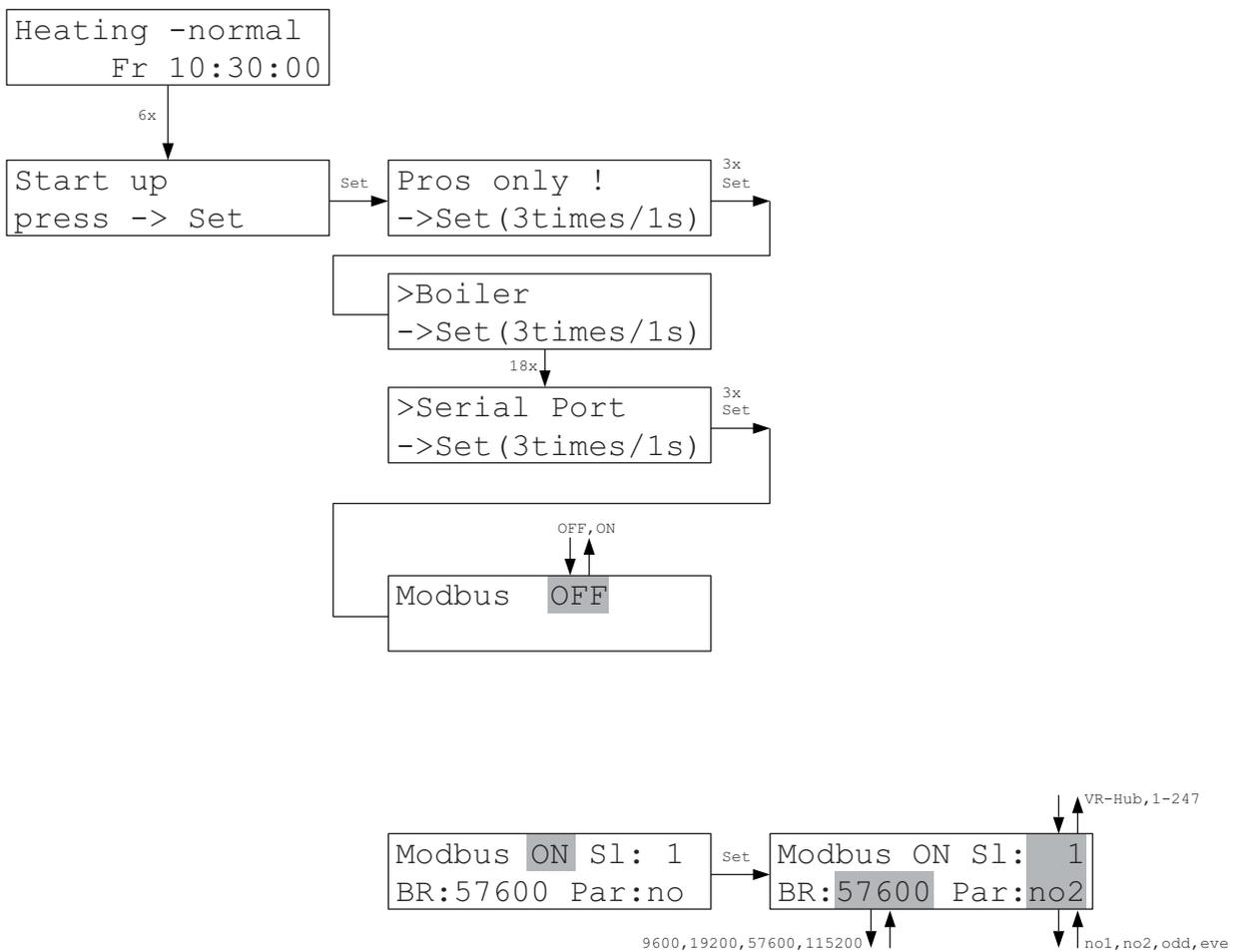
The lock is activated automatically if no menu actions take place for approx. 15 minutes or after a reset by the ZE central unit.



In the VR network menu information can be provided for the ZE that shall be included in the network for the calculation of the heating power.

If the own ZE is the VR Hub (=Modbus Master) the addresses of the Slave ZE which the Master ZE shall query can be entered. Currently up to ZE can be queried.

If the own ZE is Modbus Slave the user can enter whether it shall be included in the heating power calculations or the Master ZE (yes), or no (no).

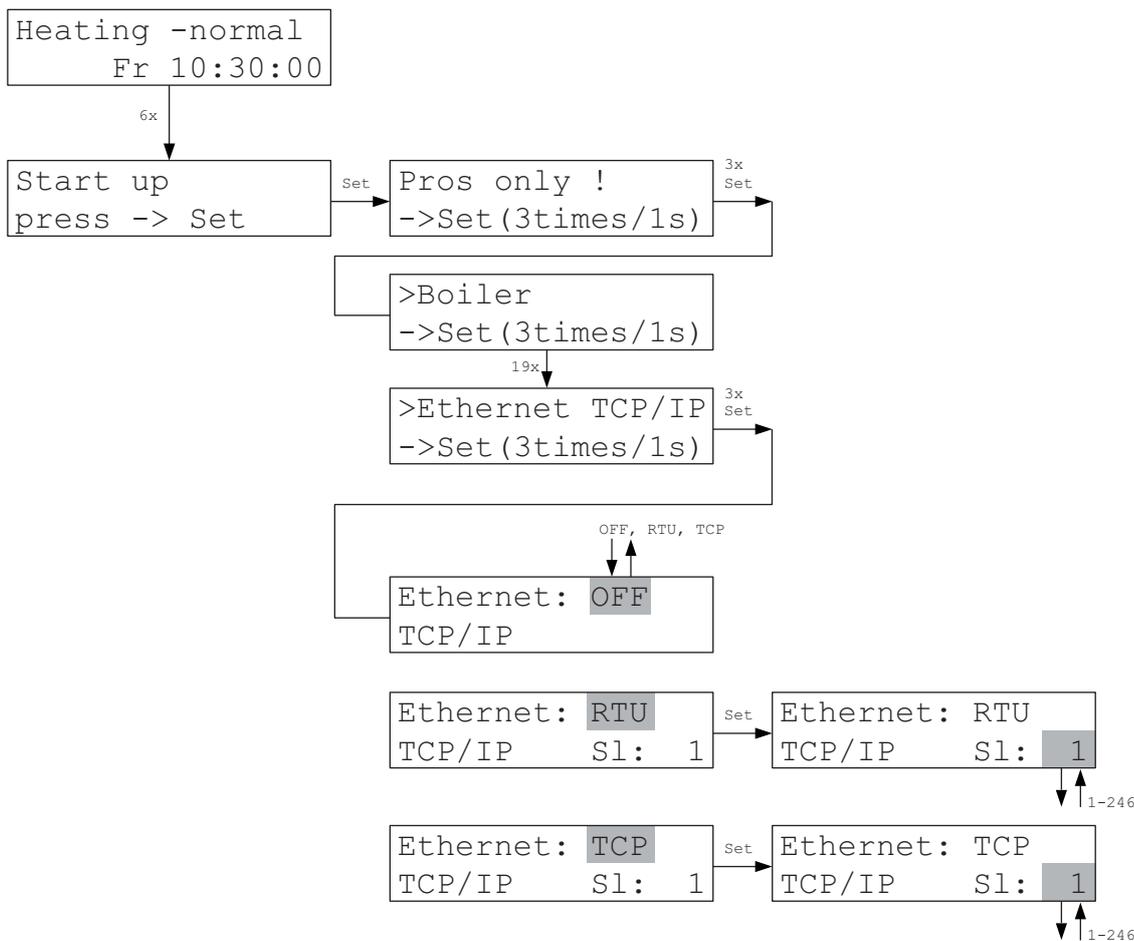


In the Serial Port menu the characteristics of the serial interface can be set.

- Modbus OFF: the interface is disabled.

- Modbus ON: the interface is configured as MODBUS over Serial Line, according to the MODBUS over Serial Line Specification and Implementation Guide V1.02 - Dec 20, 2006 (www.modbus.org). The parameters are: RS 485, Modbus RTU, 1 Start Bit, 8 Data Bits, 1 or no Parity Bit, 1 or 2 Stop Bits). Address (Sl:), Baudrate (BR:) and Parity (Par:) can be set. For Parity = none 1 or 2 Stop Bits can be set (no1 or no2 - 2 Stop Bits conform to the standard but only 1 Stop Bit is often used - this is a frequent source of error).

Attention: If the Modbus address is set to VR Hub the ZE works as as Modbus Master. It will then regularly query the heating power of the connected Slave ZE and calculates the minimum heating power required for the connected VR network.

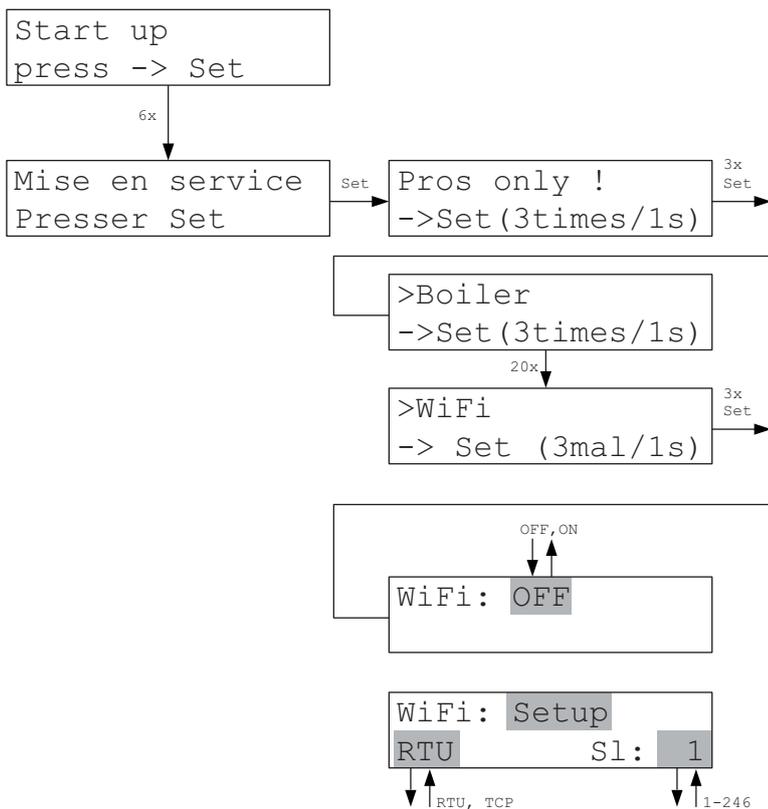


In the Ethernet TCP/IP menu the characteristics of the Ethernet interface can be set.

- Ethernet: - OFF: the interface is disabled.
- Ethernet: RTU: the interface is configured as MODBUS RTU over TCP/IP. In this operating mode the Modbus RTU messages are sent unchanged as TCP/IP packages. (The operating mode is not standardised by the Modbus organisation but is very popular.)
- Ethernet: TCP: the interface is configured as Modbus TCP/IP, according to the specification MODBUS MESSAGING ON TCP/IP IMPLEMENTATION GUIDE V1.0b - October 24, 2006 (www.modbus.org).
- Sl: the Modbus-Slave address of the ZE.

The ZE can be addressed via the LAN Module (XPORT) and a fixed IP address. More information is available in the operating instructions of the XPORT module.

Attention: the LAN module is optional and not installed as standard feature!



In the WiFi menu the characteristics of the WiFi interface can be set.

- WiFi: - OFF: the interface is disabled.

- WiFi: Setup: the interface works as Access Point with the network name „THZ-Setup“ and the password „Heizung177“. A Smartphone can then be connected first with this network. Next, the interface can be configured with the App THZ-Control. The setup mode is automatically terminated after 15 minutes if not switching to a different mode first during configuration.

- RTU: the interface is configured as MODBUS RTU over TCP/IP. In this operating mode the Modbus RTU messages are sent unchanged as TCP/IP packages. (The operating mode is not standardised by the Modbus organisation but is very popular.)

- TCP: the interface is configured as Modbus TCP/IP, according to the specification MODBUS MESSAGING ON TCP/IP IMPLEMENTATION GUIDE V1.0b - October 24, 2006 (www.modbus.org).

- Sl: the Modbus-Slave address of the ZE.

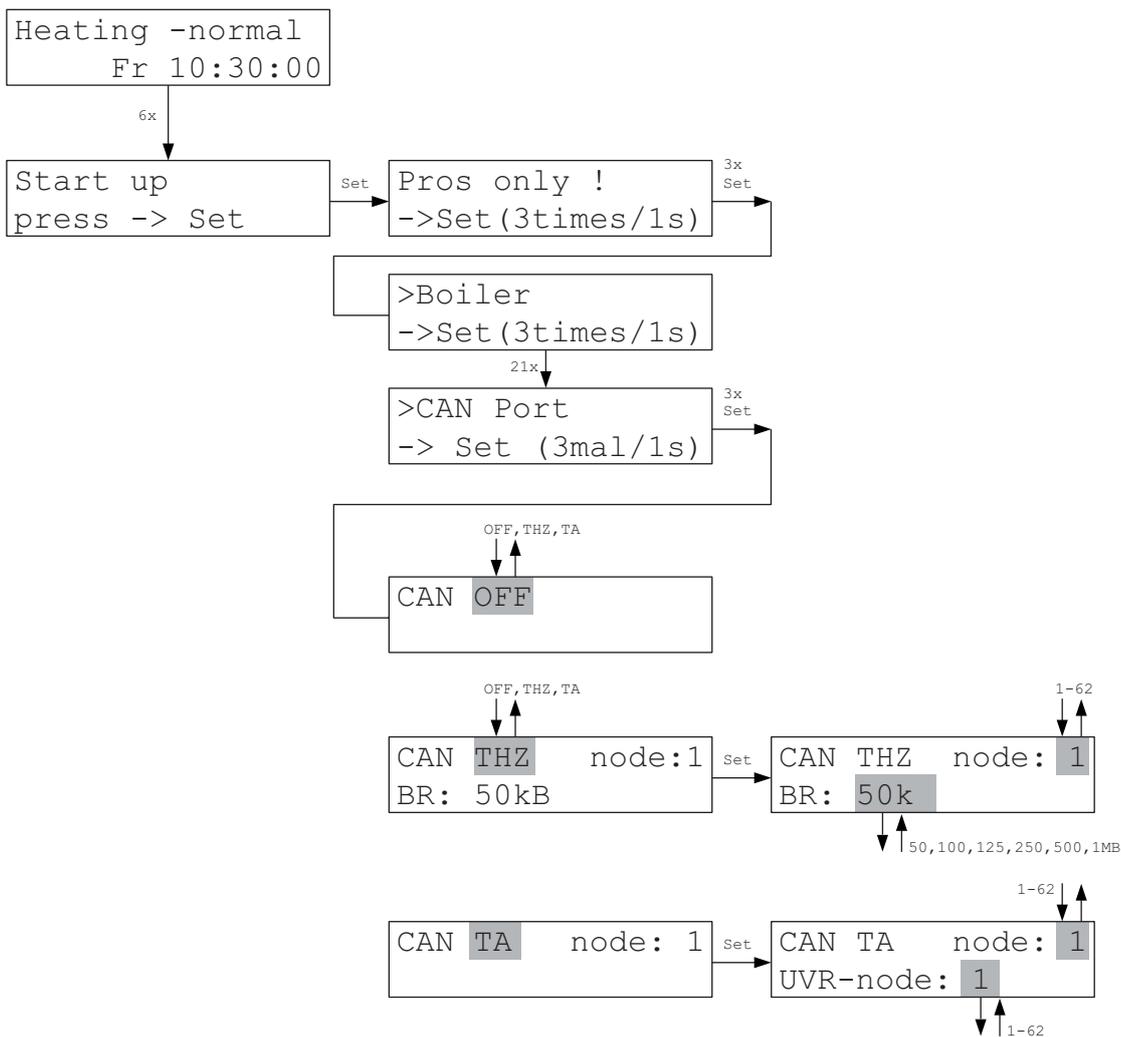
The following operating modes (modes) are possible with the WiFi interface:

OFF The interface is disabled.

Setup The interface works as Access Point (for the own network).
IP address = 192.168.0.1
Port: 10001
Network name = THZ-Setup
Password (WPA2) = Heizung177
The setup mode can only be selected manually in the menu of the ZE.
It is automatically terminated after 15 minutes.

Access Point The interface works as Access Point (for the own network).
IP address = 192.168.0.1
Port: 10001
Network name = <configurable, max. 32 characters>
Password (WPA2) = <configurable, max. 63 characters>
Channel = <configurable, 1-13>

Server The interface works as server (in an external network).
IP address = <configurable, default setting is 192.168.0.177>
Port: <configurable, default is 10001>
Network name = <configurable, max. 32 characters> = the name of the external network
Password (WPA2) = <configurable, max. 63 characters> = the password for the external network

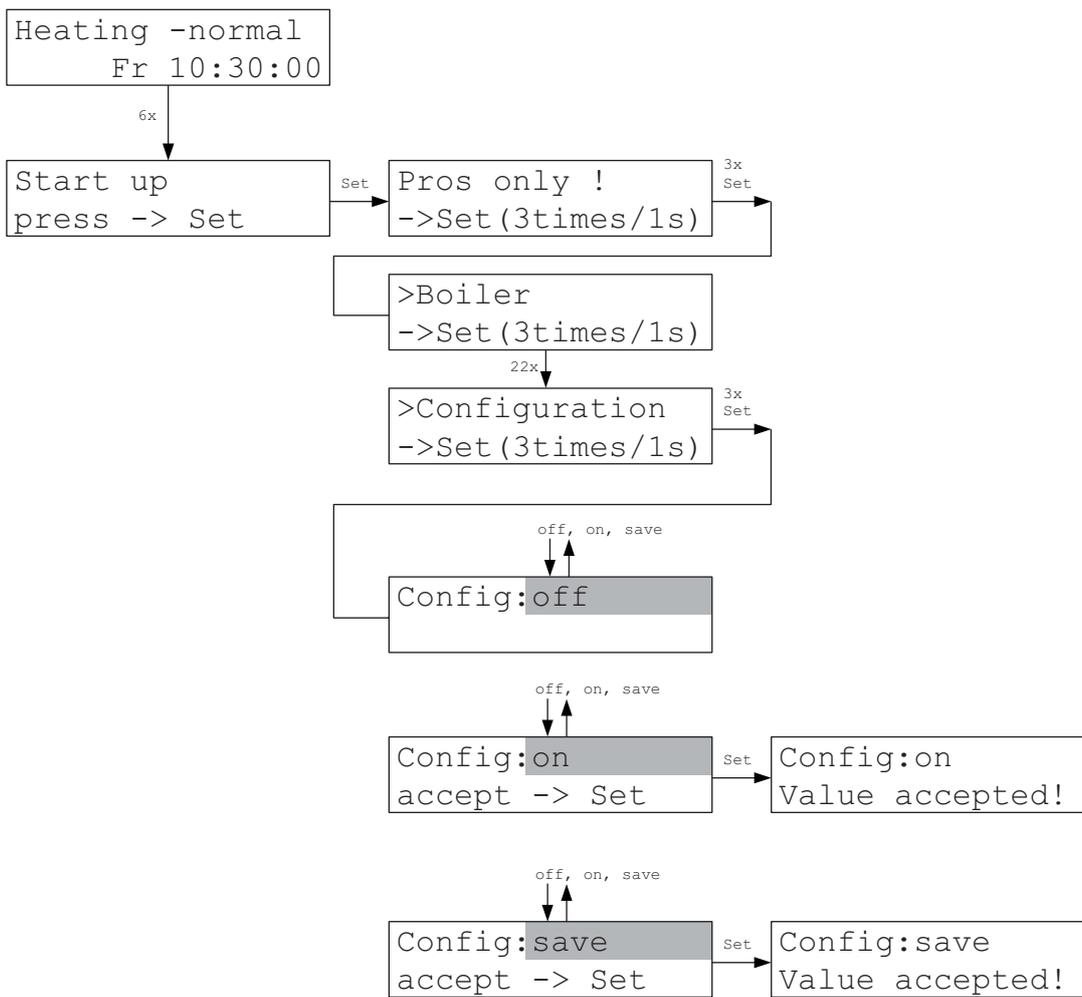


In the CAN Port menu the characteristics of the CAN interface can be set.

- CAN OFF: the interface is disabled.

- CAN THZ: the interface is configured for THZ data. The network nodes of the ZE and the baudrate can be configured.

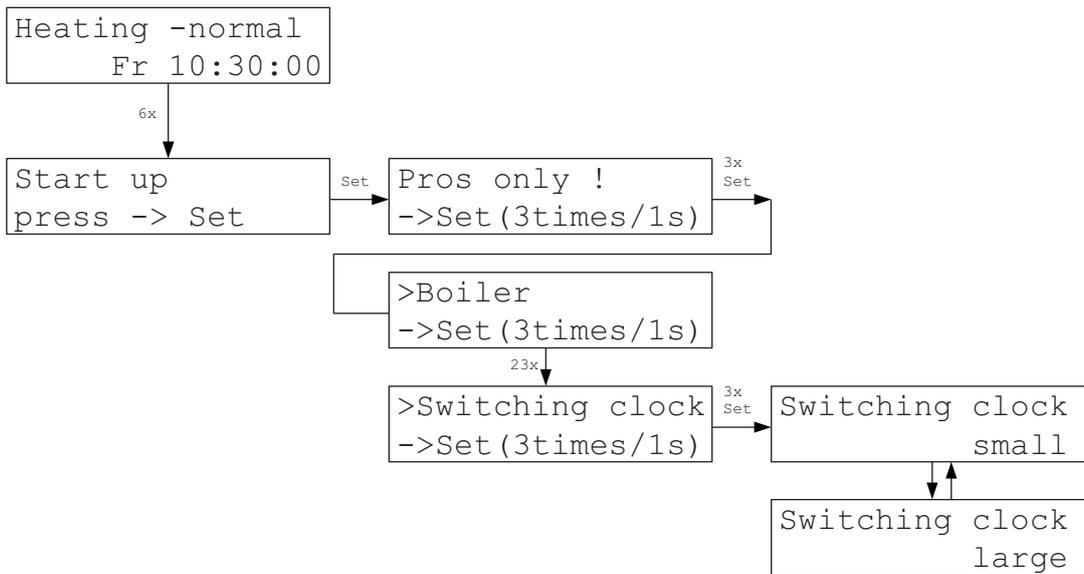
- CAN TA: the interface is configured for communication with an UVR1611 of Technische Alternative, Wien company. The baudrate is fixed at 50 kB. The network node of the ZE can be configured.. The ZE then appears under this number in the UVR1611. Furthermore, the network node on which the UVR1611 is configured can be specified.



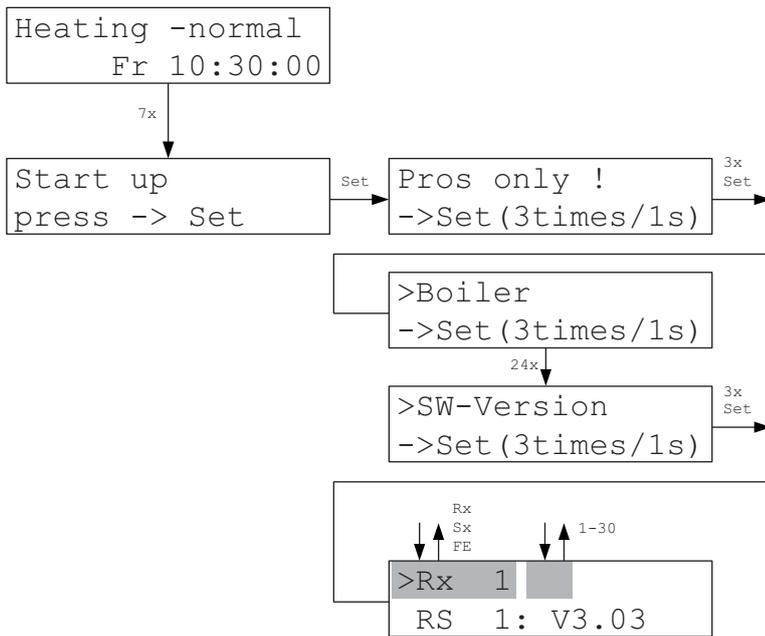
In the Configuration menu the peripheral devices currently available in the system can be recorded. Only these devices will then be accepted by the ZE in the future and included in fault monitoring. This approach allows preventing that devices are added or removed uncontrolled and unnoticed.

Especially in systems with wireless devices it may happen, in addition, that because of radio interference devices are erroneously detected once and then remain as ghost devices in the system. This is also prevented.

The current configuration must first be saved for activation. The function can now be enabled or disabled.

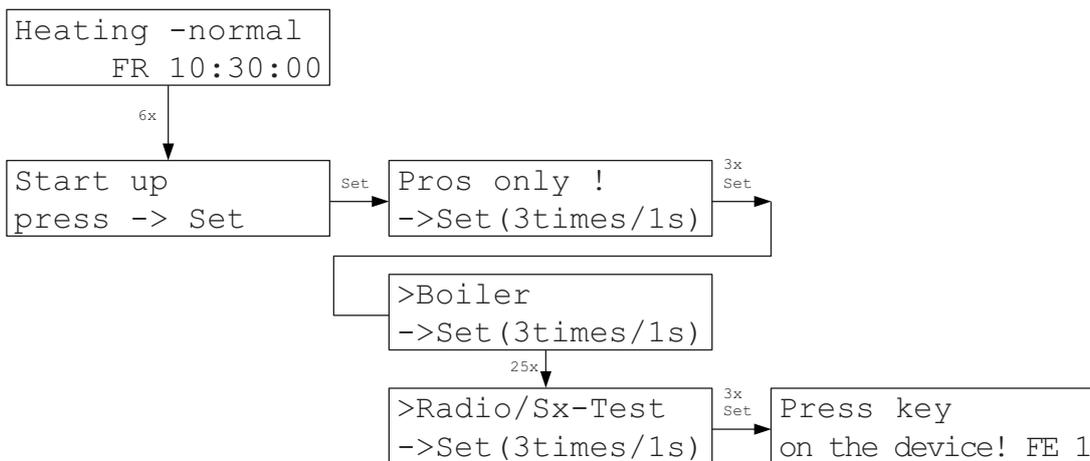


The Switching clock menu allows selecting which of the two switching clock systems shall be activated. For more information on the switching clocks, refer to the menu Switching clock (small) and Switching clock (large).



In the SW version menu the software version of the devices connected to the bus can be queried if the devices support this function.

The query is currently not yet supported by all devices.



Press key on the device and wait ...

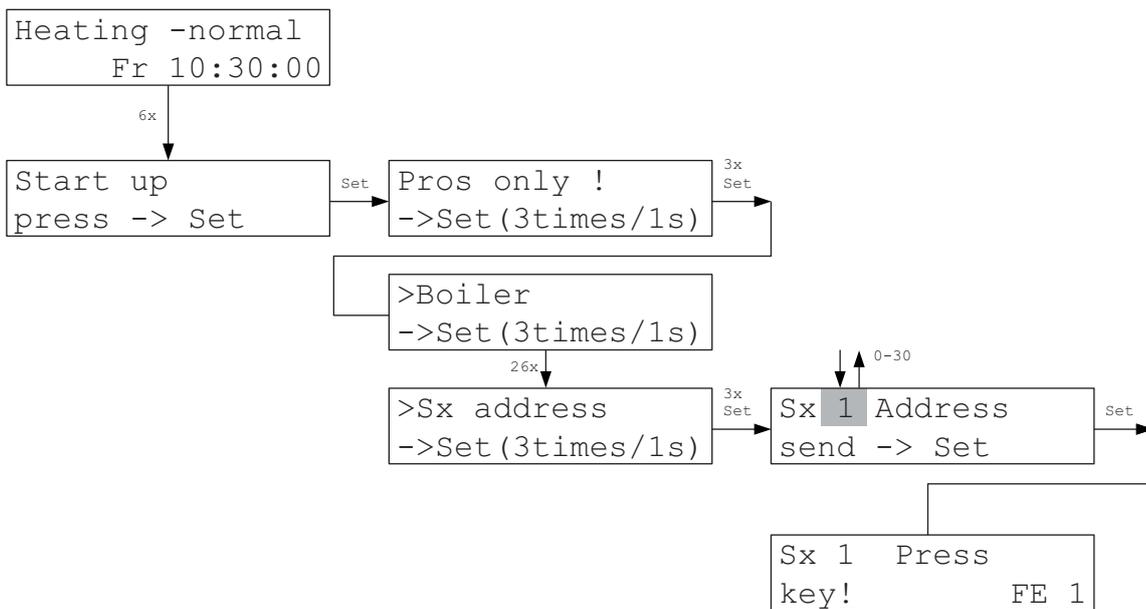
```
-SF 01 -0001- OK
(Press Set)
```

or:

```
-SF 01 ?0002?
Error !!! ->Set
```

In the Radio/Sx test menu the function of radio switching steps SF and radio amplifiers FV as well as valve drives SK and switching steps STE can be tested. After pressing the key on the device the set device number, and for radio devices also the system address, are read and displayed or an error message is shown.

The error message shows the type and number of the device, for radio devices also the system address programmed in the device.



Press key on the device and wait ...

```
-SF 01 -0001- OK
(Press Set)
```

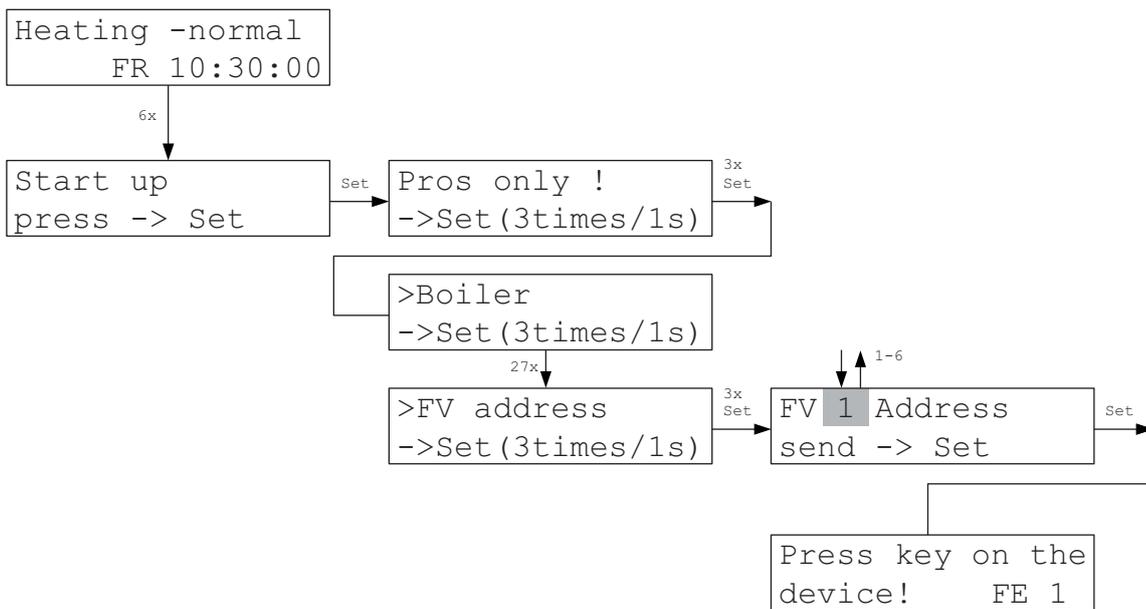
or:

```
-SF 01 ?0002?
Error !!! ->Set
```

In the Sx Address menu the device address of switching steps and valve drives can be programmed. After pressing the key on the device the programmed device number, and for radio devices also the system address, are read and displayed or an error message is shown.

The error message shows the type and number of the device, for radio devices also the system address programmed in the device.

The device address 0 deletes a previously set address and deactivates the device.



Press key on the device and wait ...

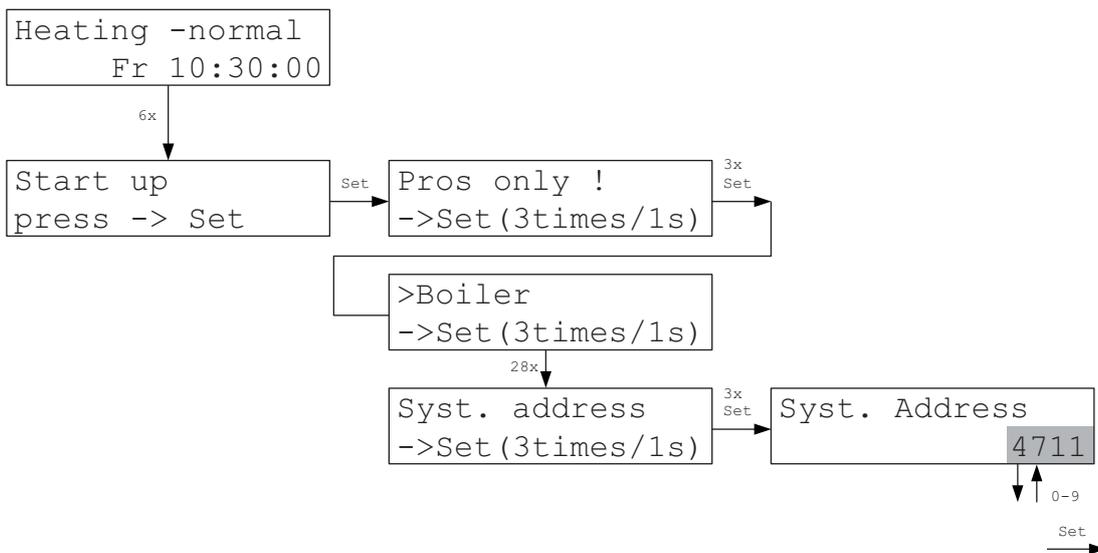
```
-FV 01 -0001- OK
(Press Set)
```

or:

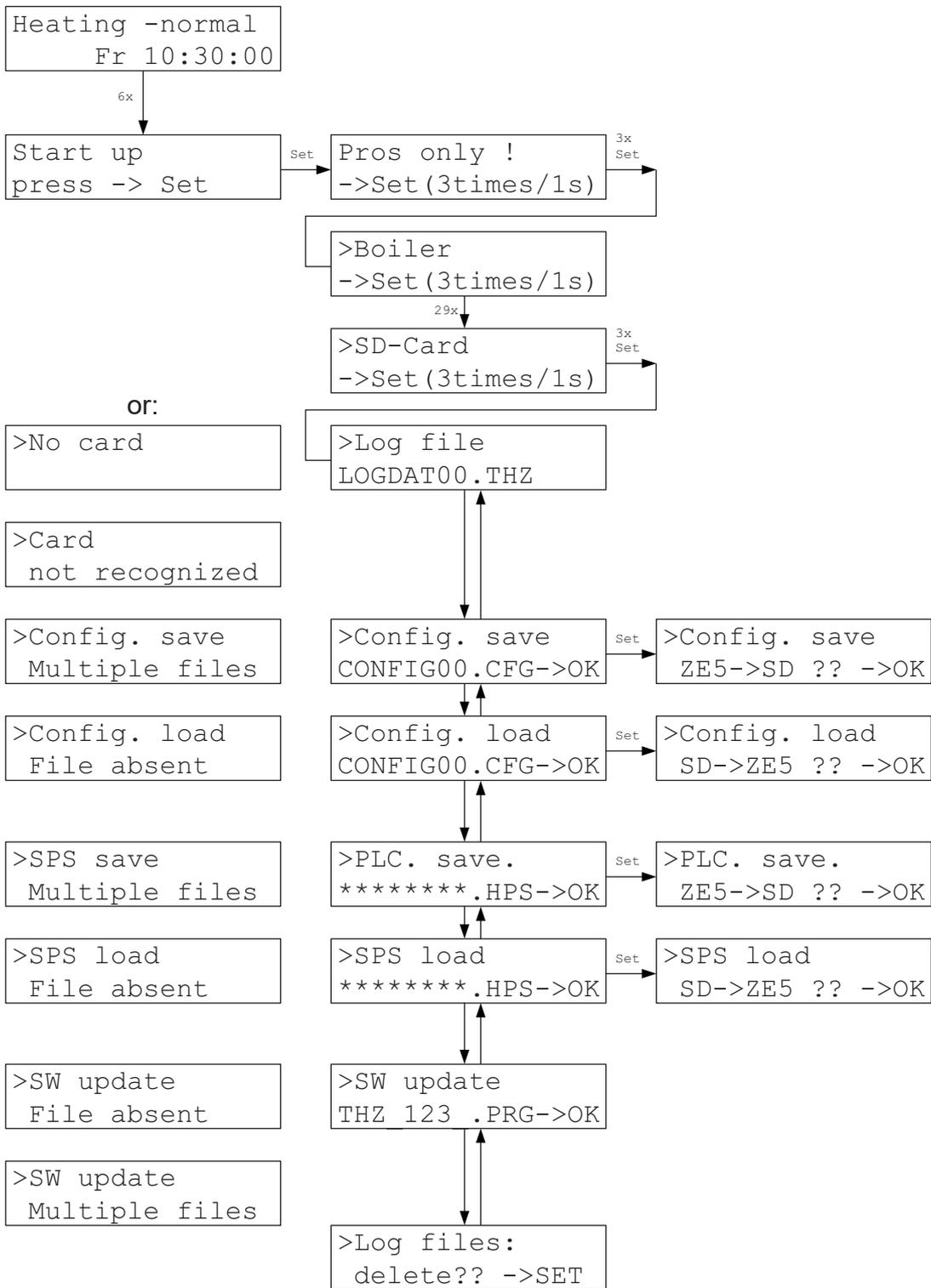
```
-FV 01 ?0002?
Error !!! ->Set
```

In the FV Address menu the device address of FV radio amplifiers can be programmed. After pressing the key on the FV radio amplifier the programmed device number and the system address are read and displayed or an error message is shown.

The error message shows the type and number of the device as well as the system address programmed in the device.



In the System Address menu the user can set which system address the radio devices (RF local units, SF radio switching steps and FV radio amplifiers) shall use. The default is a random number; it must normally not be changed. Only when operating several ZE central units (and thus several systems) in close proximity to each other, it must be ensured that a different system address is assigned to each system. Addresses from 1 - 9999 are possible.



The SC Card menu first shows which log file is currently being used. If no file exists, a new file called LOGDAT00.THZ is created. A new file is created as soon as the current log file has exceeded the size of 50 MB. The numeric index is thereby counted up by 1 (for example LOGDAT01.THZ). The last possible index is 99. A LOGDAT99.THZ file continues to be written to without size limit.

Under Config. save, all settings of the ZE can be saved to the card. If exactly one THZ configuration file exists in the master directory, it is being saved to; existing data is overwritten. The name must follow the Format 8.3 with the extension CFG. Otherwise, any names can be chosen. If no file exists, a new file with the default name CONFIG00.CFG is created. An error message is shown if several files exist.

Settings stored on the card can be uploaded to the ZE under Config. load. Exactly one THZ configuration file must exist in the master directory of the card. An error message is shown if none or several files exist.

The currently loaded PLC program can be saved at PLC save.

If exactly one PLC file exists in the master directory, it is being saved to; existing data is overwritten. The name must follow the Format 8.3 with the extension HPS. Otherwise, any names can be chosen. If no file exists, a new file SPSDAT00.HPS is created. An error message is shown if several files exist.

A PLC program stored on the card can be uploaded to the ZE under PLC load. Exactly one PLC file with the extension HPS must exist in the master directory of the card. An error message is shown if none or several files exist.

An update of the ZE software can be performed at SW update. Exactly one THZ software file must exist in the master directory of the card for this purpose. An error message is shown if none or several files exist.

A software file always starts with THZ_ and ends with .PRG. The software is indicated with 4 digits in the file name, 3 digits for the software version and 1 digit for the software variant. For example 500_ for the version 5.00 Standard (= without variant), or 517B for the version 5.17 variant B. The correct file names are then, e.g. THZ_500_.PRG or THZ_517B.PRG.

Attention: Loading of the software must never be interrupted (e.g. by removing the card or interrupting the power supply). If this still happens, the ZE must be reprogrammed at the factory!

Under Log files all log files on the card can finally be deleted together.

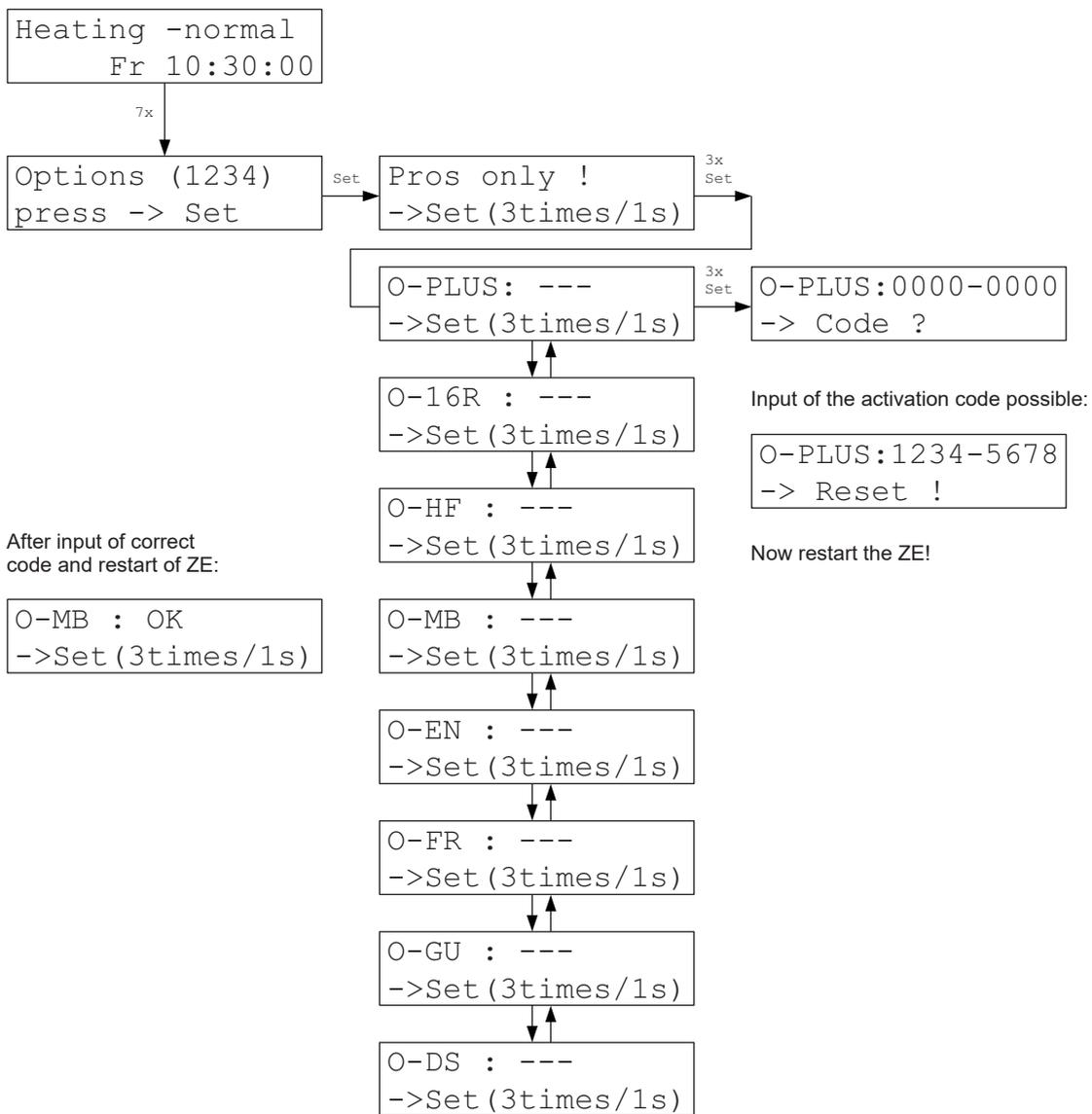
Attention: If errors occur during loading or saving, the ZE jumps to the menu Status 4: SD Card and displays the error number and error area. The last action should then be repeated. (The respective menu must first be located again for this purpose!) If an error occurs again, note the error number and try a different card. Please format the card first! If this does not solve the problem, please forward the error number to THZ and explain the circumstances.

For example:

```
>error 1001-172  
File system
```

or for example:

```
>error 3201-242  
CFG file
```

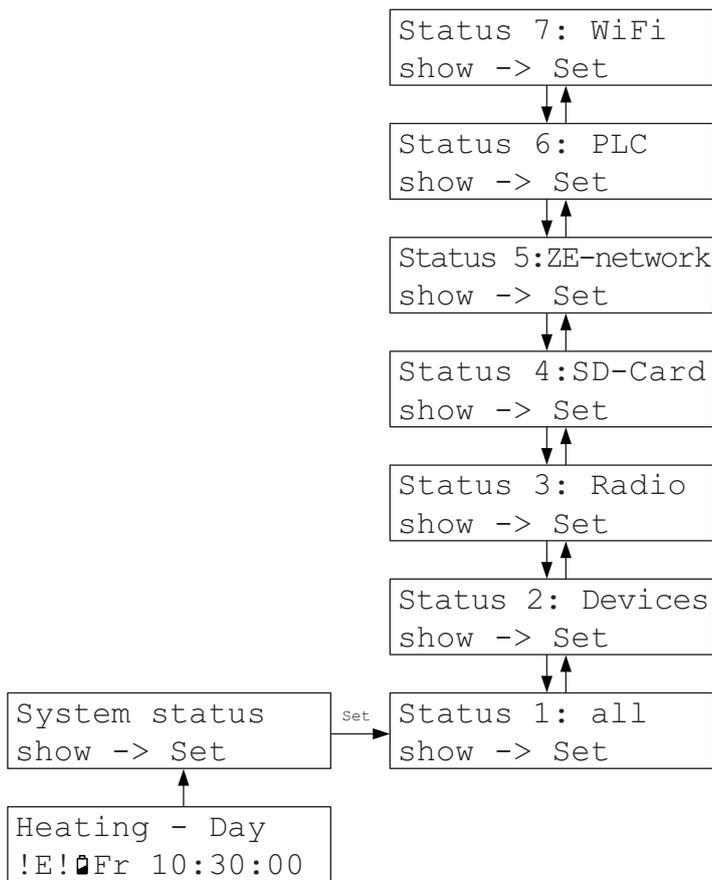


A number of optional functions can be activated in the Options menu:

- O-PLUS ZE-Plus: 30 rooms can be regulated + Options O-MB, O-EN, O-GU and O-DS activated.
- O-16R 16 rooms: 16 rooms can be regulated.
- O-HF Mobile phone option: Remote control of the operating mode via mobile phone.
- O-MB Modbus: Modbus interface can be used.
- O-EN Ethernet: Ethernet interface can be used (TCP/IP).
- O-FR Humidity regulation: Humidity regulation can be used.
- O-GU Large switching clock: Large switching clock can be used.
- O-DS O-DS - Data backup: Backup of all settings of SD Card (always enabled).

To activate an option an 8-digit numeric code must be entered. It is unique for each ZE and is provided by Thermozyklus. If options shall be retrofitted, this can be done by specifying the 4-digit code appearing at the upper right in the Options menu. From this, Thermozyklus can generate the required code numbers for each ZE.

The ZE must be restarted after the code numbers for all options to be activated have been entered. The corresponding functions are then activated. This is indicated for each option by OK.



All connected devices are displayed in the System Status menu in several overviews.

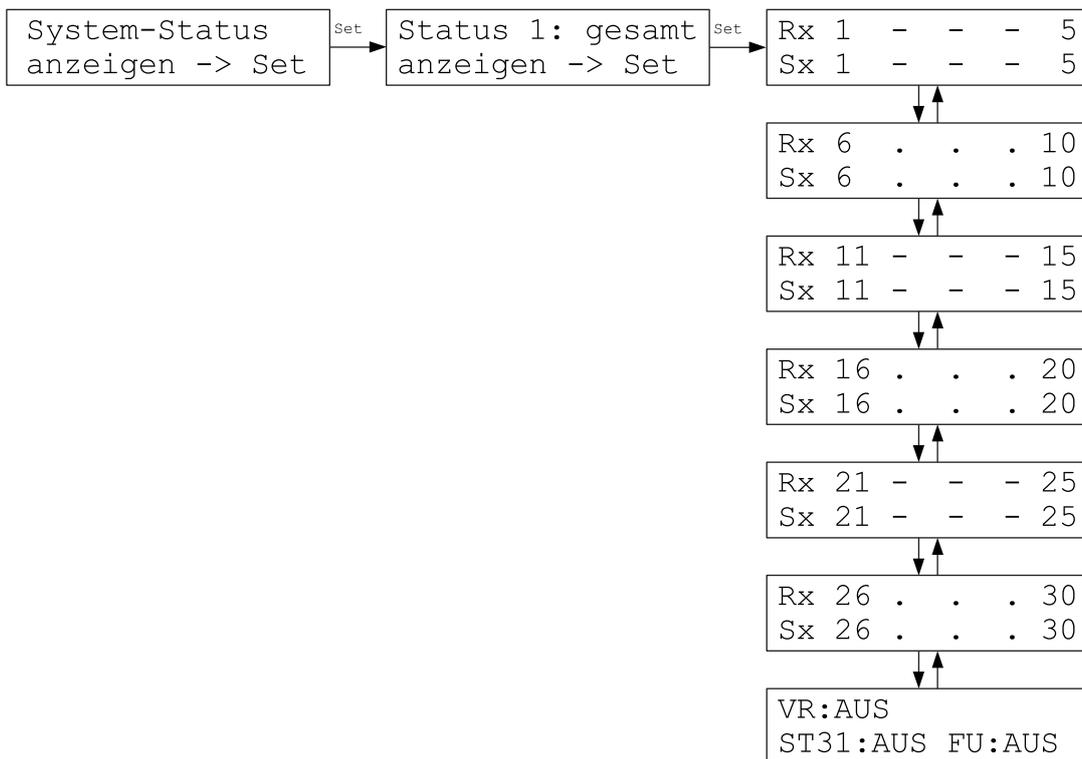
- If devices have failed, this is indicated by !E for ERROR in the lower left on the main display.
- If 🔋 is displayed, batteries of radio units are weak and should soon be replaced (within a few weeks).
- The status menu 1 - 3 can be accessed for more detailed information.

Information on a plugged in MMC or SD Card is displayed in status menu 4.

Information on linking of several ZE is displayed in status menu 5. If the ZE is the master (=VR Hub) the addresses of the connected slave ZE are displayed. If the ZE is the slave, the status of the connection to the master ZE is displayed, whether it is intact.

In status menu 6 information on a possibly loaded PLC program is displayed.

In status menu 7 information on a possibly loaded active WiFi network is displayed.

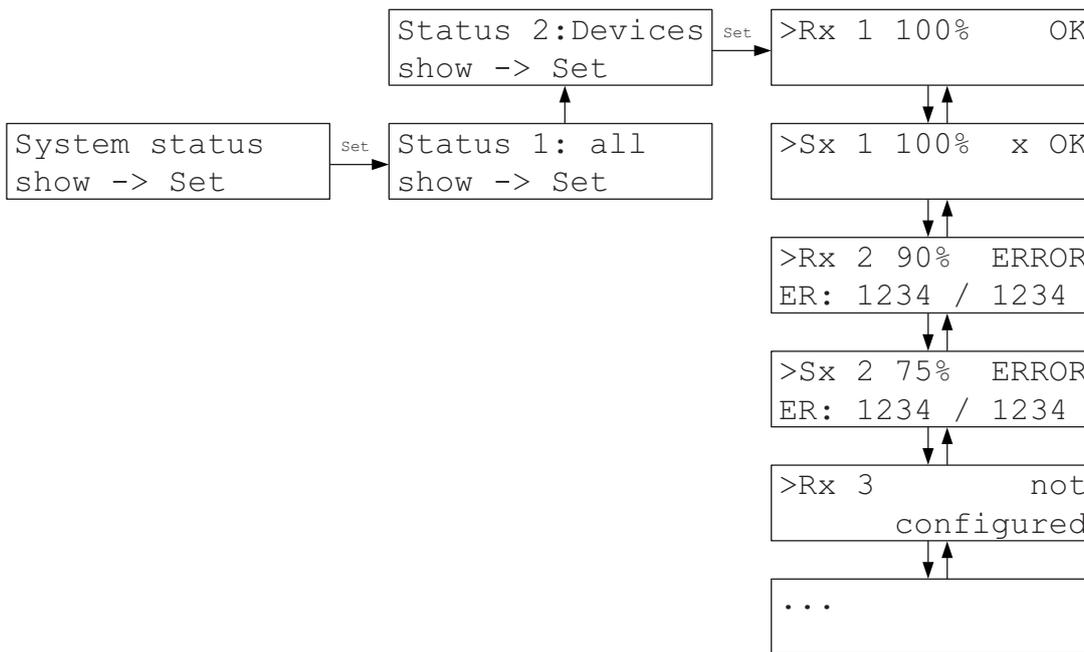


All connected devices (bus and radio) are display in an overview in the status 1 menu: Missing or faulty devices are indicated by a question mark -? that flashes alternating with the number of the device. Status menus 2 and 3 will then normally contain more details about the type of fault.

An exclamation mark with battery symbol (!) flashing in alternating fashion with the number indicates radio devices with weak batteries that should soon be replaced (within a few weeks).

The status of an FU radio clock indicated as follows means:

- OFF - FU not connected or not recognised
- OK - FU connected and recognised on the bus
- CON - FU has current reception from time sender



In Status 2: Devices, more detailed information on the connected local units and switching steps are displayed (both bus devices and radio devices):

In the 1st line

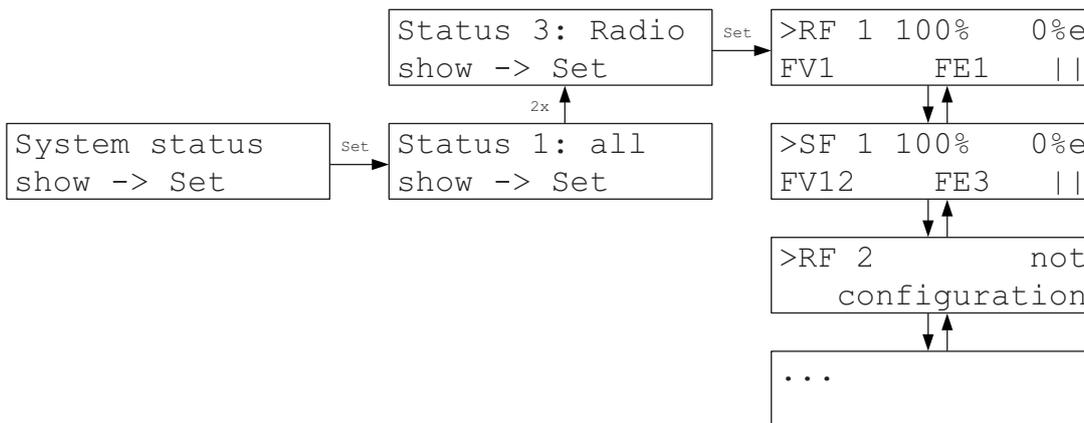
- the name and number of the device (Rx and Sx each in pairs),
- the average availability over a longer period in %,
- for Sx the switching state open (o) or closed (x),
- the status „OK“ (device currently available) or „ERROR“ (device not available),
- for valve drives SK and SF also → and / or ■:
 - → (arrow to the right): transmission of the switching state has failed,
 - ■ (black rectangle): the valve is blocked.

In the 2nd line

- for how many minutes the device was not available the last time,
- after how many minutes the device became available again.

The data therefore permits a diagnosis that assesses vulnerable connections, especially also to radio devices, also statistically. Isolated errors have no significance at this.

Devices that were not saved as available in the Start up-Configuration menu are displayed as not configured.



In Status 3: Radio, special information on the connected radio devices is displayed:

In the 1st line

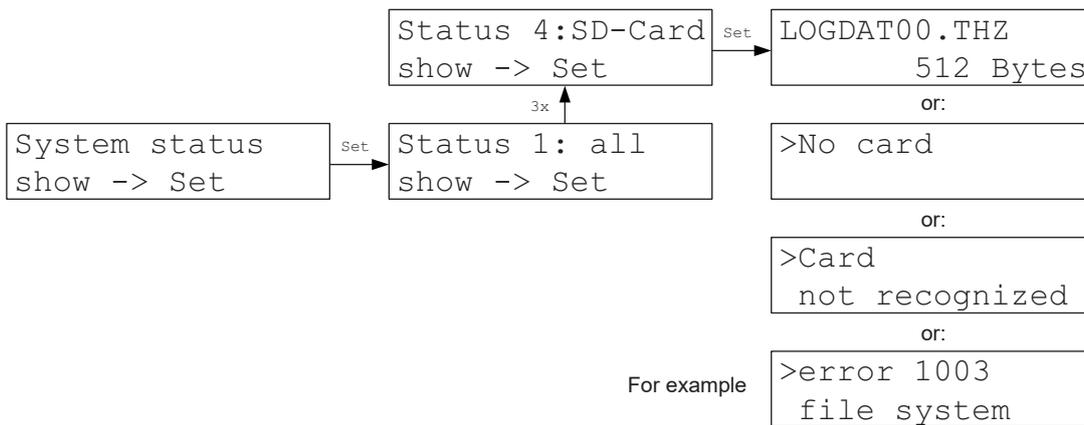
- the name and number of the device (RF and SF each in pairs),
- the average availability over a longer period in % (same as status 2),
- the average failure rate of a longer period in %e (number of the failed radio connections in relationship to the succeeded connections - 10%e means that on average one of 10 connections has failed).

In the 2nd line

- the route via which the device is received (via FV 1-6 and FE 1-4),
- for radio switching steps SF also → and / or ■:
 - → (arrow to the right): transmission of the switching state has failed,
 - ■ (black rectangle): the valve is blocked.
- the reception field strength with one (| = low) or two (|| = high) antenna symbols.

The data therefore allows for a diagnosis of connections prone to interferences. Isolated error or an error rate < 10%e is thereby not significant.

Devices that were not saved as available in the Start up-Configuration menu are displayed as not configured.



In Status 4: SD Card, information about the log file of a plugged in MMC or SD Card is displayed.

When a card is plugged in, the ZE first looks in the master directory of the card whether a log file already exists. (Log files serve to record operating data of the ZE and can be recognised by the extension .THZ or .thz.)

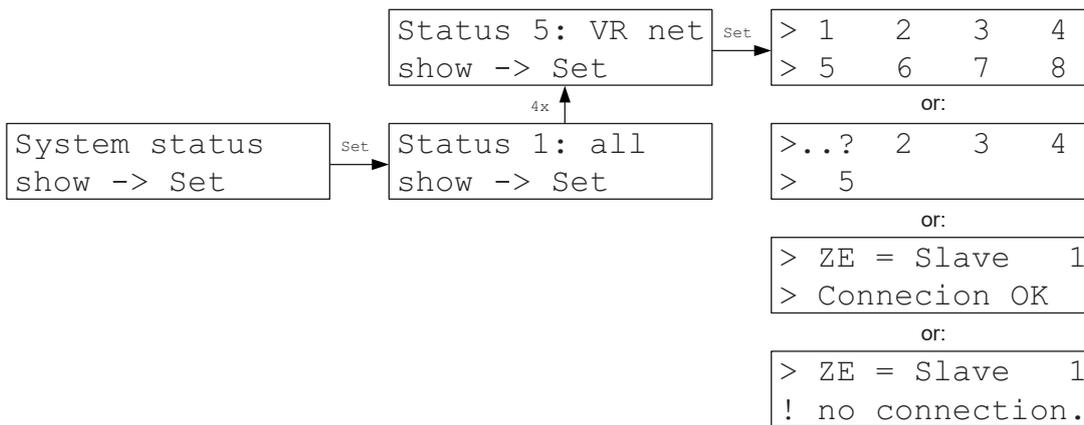
If a log file is available, the ZE appends the further log data to the end of the log file. If no log file is available, the ZE creates a new log file with the default name LOGDAT00.THZ in the master directory of the card. Immediately after this, the ZE tries to write 512 bytes of test data to the card. This verifies whether the card can be correctly written to. An error message appears if this is not the case.

A new file is created as soon as the current log file has exceeded the size of 50 MB. The numeric index is thereby counted up by 1 (for example LOGDAT01.THZ). The last possible index is 99. A LOGDAT99.THZ file continues to be written to without size limit.

Other files and folders existing on the card are not affected by this.

Attention:

An error message possibly appears if the card is fault or is not recognised for other reasons. Please remove the card then and insert it again. Please use a different card if the same error message is displayed.

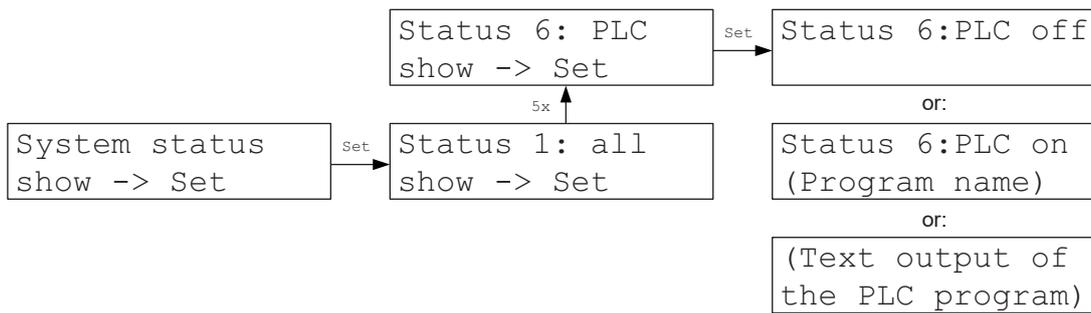


In the menu Status 5: VR Network, the MODBUS connections to other ZEs are displayed.

If the ZE is the Modbus Master (=VR Hub) the addresses of up to 8 slave ZE are displayed.

If a connection is disturbed, ..? flashes alternating with the address.

If the ZE is the Modbus Slave its own address is displayed together with the information whether the connection to the Modbus Master is OK.

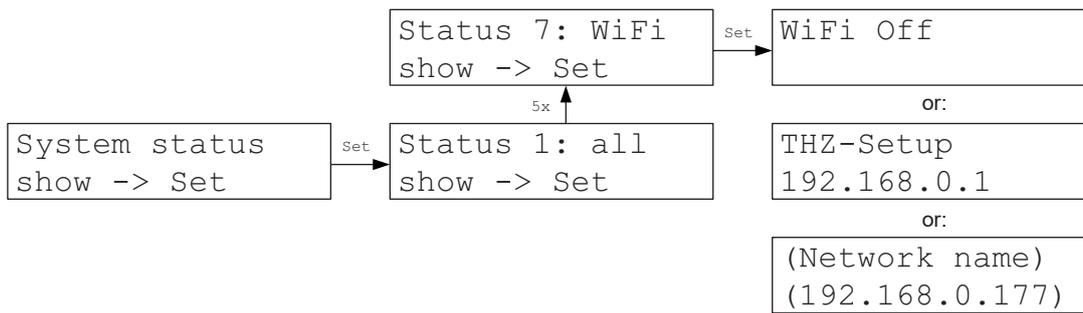


In the menu Status 6: PLC, indicates whether a PLC program exists and is active.

The 1st line displays whether the program is enabled or disabled.

The 2nd line displays the name of the program if a program is loaded. If no program is loaded blanks or ----- appear there.

Alternatively, text output of the running PLC program may also appear in both lines.



In the menu Status 7: WiFi, information on the WiFi network of the ZE is displayed.

The 1st line shows ...

- WiFi OFF: The WiFi function is disabled.

- (Network name): The name of the network to which the ZE is connected.

- THZ Setup: the interface works as Access Point with the network name „THZ-Setup“
and the password „Heizung177“ for 15 minutes

In the 2nd line the internal IP address used by the ZE is displayed.