

# HERZ clever&smart Control Box Heating

Heating circuit controller for surface heating systems

3 F810 11

Installation and operating instruction



Read carefully before installation, commissioning and operation

# CONTENT

<b>Safety Instructions</b> .....	<b>3</b>
EU-Conformity .....	3
General Instructions .....	3
Explanation of Symbols .....	3
Changes to the Unit .....	4
Warranty and Liability .....	4
Disposal and Pollutants .....	4
<b>Description HERZ clever&amp;smart Control Box Heating</b> .....	<b>4</b>
Description .....	4
Technical Data .....	5
Scope of Supply .....	6
<b>Installation</b> .....	<b>6</b>
Wall Installation .....	6
Electrical Connection .....	7
Electrical Terminals .....	8
LED status .....	9
Wiring structures .....	10
CAN bus .....	10
1-Wire-Bus .....	10
Connection examples HERZ clever&smart Room Controller .....	11
Connection example single-family house with >8 zones .....	12
Connection example apartment building .....	13
Connection Examples 1-Wire Sensors .....	14
Connection example HERZ clever&smart LEDcontroller .....	15
1-Wire ID overview .....	16
<b>Setup Wizard</b> .....	<b>17</b>
<b>Operation</b> .....	<b>18</b>
Room Overview .....	18
Operating Mode .....	19
Menu .....	19
Set Operation Hours .....	20
Set Operation Hours .....	20
Expert Menu .....	21
Settings .....	22
Devices .....	23
Rooms .....	24
Temperature .....	25
Functions Control Box .....	26
Zones .....	32
Example zone setting .....	33
WiFi .....	34
Access Point .....	36
WiFi Sensor .....	36
Integrating devices without WiFi .....	37
Service Values .....	38
Connecting HERZ clever&smart App to the HERZ clever&smart Room Controller WiFi .....	38
<b>Tips</b> .....	<b>39</b>
<b>Support</b> .....	<b>39</b>

## Safety Instructions

### EU-Conformity

By affixing the CE mark to the unit the manufacturer declares that the HERZ clever&smart Control Box Heating conforms to the following relevant safety regulations

- EU low voltage directive 2014/35/EU
- EU electromagnetic compatibility directive 2014/30/EU
- EU RoHS Directive 2011/65/EU
- EU WEEE Directive 2012/19/EU (Reg.nr. DE 23479719)

conforms. Conformity has been verified and the corresponding documentation and the EU declaration of conformity are kept on file by the manufacturer.

### General Instructions

#### Please read carefully!

These installation and operating instructions contain basic instructions and important information regarding safety, installation, commissioning, maintenance and the optimal use of the unit. Therefore these instructions must be read and understood completely by the installation technician/specialist and by the system user before installation, commissioning and operation of the unit.

This unit is a universal heating and individual room controller for surface heating systems and similar applications. Install the unit only in dry areas and under the ambient conditions described in "Specifications".

The valid accident prevention regulations, VDE regulations, the regulations of the local power utility, the applicable DIN-EN standards and the installation and operating instruction of the additional system components must also be observed.

Under no circumstances does the unit replace any safety devices to be provided by the customer!

Installation, electrical connection, commissioning and maintenance of the device may only be carried out by an appropriately trained specialist. Users: Make sure that the specialist gives you detailed information on the function and operation of the unit. Always keep these instructions in the vicinity of the unit.

The manufacturer does not take over any liability for damage caused through improper usage or non-compliance of this manual!

### Explanation of Symbols



Danger

Failure to observe these instructions may result in life-threatening effects due to electrical voltage.



Danger

Failure to observe these instructions can result in serious damage to health such as scalding or life-threatening injuries.



Caution

Failure to observe these instructions can result in destruction of the unit or the system, or environmental damage.



Caution

Information which is especially important for the function and optimal use of the unit and the system.

## Changes to the Unit

- Changes, additions to or conversion of the unit are not permitted without written permission from the manufacturer.
- It is likewise forbidden to install additional components that have not been tested together with the unit.
- If it becomes clear that safe operation of the unit is no longer possible, for example because of damage to the housing, turn the Unit off immediately.
- Any parts of the unit or accessories that are not in perfect condition must be exchanged immediately.
- Use only original spare parts and accessories from the manufacturer.
- Markings made on the unit at the factory must not be altered, removed or made illegible.
- Only the settings described in these instructions may be set using the Unit.



Changes to the unit can compromise the safety and function of the unit or the entire system.

## Warranty and Liability

The unit has been manufactured and tested with regard to high quality and safety requirements. The unit is subject to the statutory guarantee period of two years from the date of sale. The warranty and liability shall not include, however, any injury to persons or material damage that is attributable to one or more of the following causes:

- Failure to observe these installation and operating instructions.
- Improper installation, commissioning, maintenance and operation.
- Improperly executed repairs.
- Unauthorised structural changes to the unit.
- Use of the device for other than its intended purpose.
- Operation above or below the limit values listed in the 'Specifications' section.
- Force majeure.

## Disposal and Pollutants

The unit conforms to the European RoHS 2011/65/EU for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



Under no circumstances may the device be disposed of with the normal household waste. Dispose of the unit only at appropriate collection points or ship it back to the seller or manufacturer.

# Description HERZ clever&smart Control Box Heating

## Description

The HERZ clever&smart Control Box Heating is a universal heating and individual room controller for surface heating systems. In combination with HERZ clever&smart Room Controller, HERZ clever&smart Room Sensor or HERZ clever&smart LEDcontroller, this enables efficient use and function control of your surface heating with intuitive operation. The inputs and outputs can be freely assigned via HERZ clever&smart Room Controller so that a wide variety of heating systems can be implemented.

Important characteristics of the HERZ clever&smart Control Box Heating:

- Control of 8 heating zones with 1 - 4 thermostatic radiator valves each
- Room temperature detection in conjunction with HERZ clever&smart Room Controller, HERZ clever&smart LEDcontroller or HERZ clever&smart Room Sensor
- Optionally weather compensated via outdoor temperature sensor
- Optional control of the heating circuit pump and the mixer (PWM or 0-10 V) possible
- 2 separate CAN bus interfaces for building network and private floor or apartment network
- Connectable with other HERZ products via CAN-Bus
- Control of mixers, valves and energy generators via 0-10 V / PWM
- 2 additional floating changeover contacts (terminals J and K) for flexible assignment
- Innovative strain relief and coloured terminal strip
- Up to 20 1-Wire temperature sensors can be connected (incl. a maximum of 8 LEDcontrollers)

## Technical Data

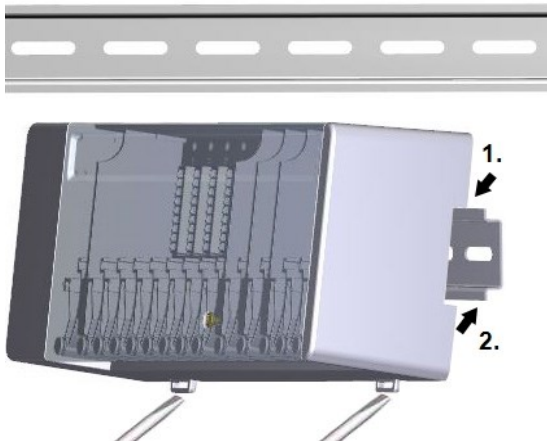
Model	<b>HERZ clever&amp;smart Control Box Heating</b>	Heating circuit controller for surface heating systems
Temperature controller class (ErP)	8	
Energy efficiency (ErP)	5 %	
Standby loss	0,5 W	
Request type invertible heat pump	"On /off" and/or "modulating"	
<b>Electrical specifications:</b>		
Power Supply	230 VAC (+/- 5 %), 50-60 Hz	
Power consumption / standby	0.5 - 2.5 W/ 0,5 W	
Internal fuse 1	1	(Pos A, left) 2 A slow blow 250 V Fuse protection for terminal area A and electronics
Internal fuse 2	1	(Pos B, right) 4 A slow blow 250 V Fuse protection for terminal area B - I
Protection Class	IP 20	
Protection class / overvoltage category	II / II	
<b>Inputs</b>	Quantity	Measuring range / design
1-Wire temperature sensor powered, 3-wire system	< 20 pieces (incl. max. 8 LEDcontrollers)	- 55 °C ... 125 °C (3 pole version)
PWM inputs	2 (N2, N5)	
<b>Outputs</b>		
Switching relay outputs	11	
Relay heat pump	1	230 VAC, 4 A, (AC1 920 VA, AC3 185W)
Relay actuator	8	230 VAC, 4 A, (AC1 920 VA, AC3 185W)
Relay additional function	2	Potential-free max. 4 A
PWM outputs	3 (N1, N4, N8)	for 10 kΩ working resistance 1 kHz, level 10 V
of which 0-10 V / PWM switchable	2 (N1, N4)	
+ Voltage outputs 24VDC	3	Total max. 12 W for external devices e.g. HERZ clever&smart Room Controller or mixer motor
<b>Interface</b>		
Fieldbus	2 x	CAN bus (separate building CAN bus and private CAN bus)
<b>Max. Cable Length</b>		
1-Wire Sensors	Cable length of the total system 100 m, use suitable twisted pair cable (LIYCY 2 x 2 x 0.75 mm <sup>2</sup> ) When using HERZ clever&smart LEDcontroller, ensure sufficient conductor cross-section to avoid impermissible voltage drop, see "Connection example HERZ clever&smart LEDcontroller" on page 15.	
CAN	< 3 m; for ≥ 3 m, use a shielded twisted pair cable (2 x 2 x 0.22 mm <sup>2</sup> ). Isolate shielding and connect it to the protective conductor of <b>only one</b> of the devices. Max. cable length of the complete system 200 m.	
0-10 V / PWM	< 3 m	
24 VDC	< 30 m	
mechanical relay	< 30 m	
<b>Permissible Ambient Conditions</b>		
during operation	0 °C - 40 °C, max. 85 % rel. humidity at 25 °C	
for transport/storage	0 °C - 60 °C, no moisture condensation permitted	
<b>Other Specifications and Dimensions</b>		
Housing Design	multi-part ABS	
Installation Methods	DIN rail mounting or wall mounting on DIN rail	
Overall dimensions	95 mm x 303 mm x 57 mm	
Light diode	14 x LED green	
Real Time Clock	RTC with 24 hour power reserve	
Operation	via HERZ clever&smart Room Controller	

## ☑ Scope of Supply

- Heating circuit controller for surface heating systems HERZ clever&smart Control Box Heating
- 2 spare fuses, 1x 2 AT, 1x 4 AT
- Additional separation wall for use of non-230 VAC actuators
- DIN rail H= 35 mm L= 280 mm 2 screws 3.5 x 35 mm and 2 dowels S6
- HERZ clever&smart Control Box Heating installation and operating instructions

## Installation

### ☑ Wall Installation



Fix the DIN rail horizontally to the wall using screws.

#### Installation

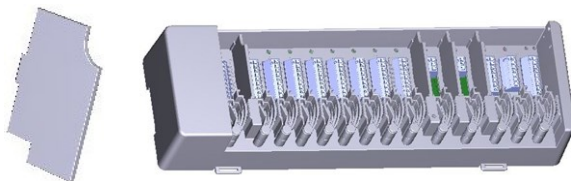
1. Place the HERZ clever&smart Control Box Heating on the upper edge of the DIN rail with the locking catch on top.

2 Engage the device by pressing it down. Ensure that the locking catches engage completely and that the device is firmly seated on the rail.

#### Disassembly

Remove the HERZ clever&smart Control Box Heating from the DIN rail by insert-ing two screwdrivers into the eyelets and pulling them downwards.

### Separation walls and cover



The separation walls and the cover can be removed for easier connection of the cables. They must then be reinstalled in order to safely separate areas carrying mains voltage from areas carrying low voltages.

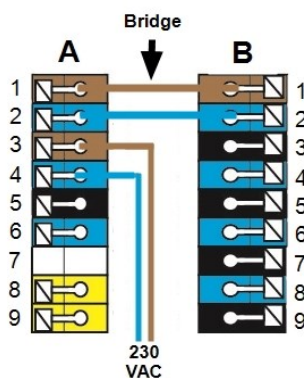
Open the cover (90° degree) and then pull it out of the side of the attachment.



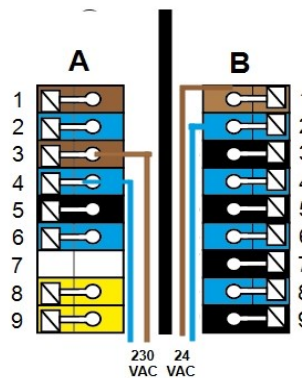
If the terminal blocks (B-I) are to be supplied with a voltage other than the mains voltage, proceed as follows:

- Remove existing bridges A1 - B1 and A2 - B2
- It is absolutely necessary to insert a separating wall between A - B.
- Connect the power supply to B1 (L) and B2 (N).
- Observe max. switching power of relay and fuse (4 AT)

#### Heating zones with 230 VAC actuators (bridge)



#### Heating zones with e.g. 24 VAC actuators (separation wall)





## Electrical Connection



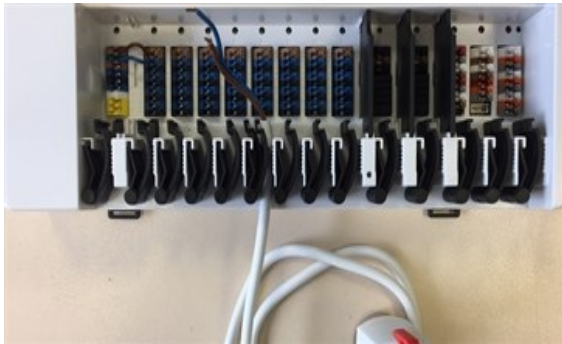
Low-voltage cables, such as temperature sensor cables, must be laid separately from mains voltage cables.



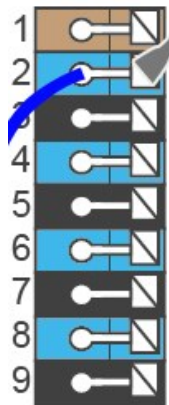
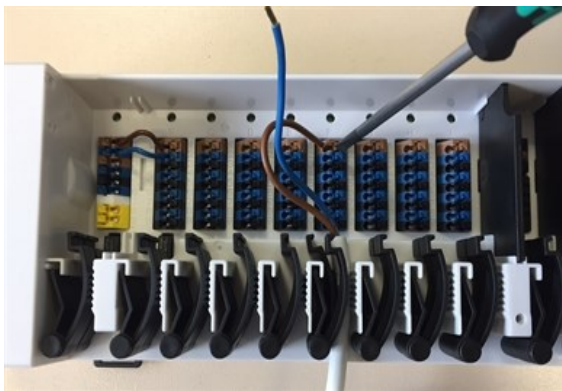
Before working on the unit, switch off the power supply and secure it against being switched on again! Check that there is no power flowing! Electrical connections may only be made by a specialist and in compliance with the applicable regulations. The unit may not be put into operation if there is visible damage to the housing, e.g. cracks.



An all-pole disconnecting device, e.g. heating emergency switch, must be provided on site in the power supply of the controller.



The strain reliefs are suitable for flexible cables with a cable sheath diameter of 5 mm to 8 mm, primarily using the lower strain relief (as shown). The cables must be checked for firm placement. Solid, thicker and thinner cables must always be laid firmly and must be fixed on the installation side.



Massive wires or cables with special wire end sleeves can simply be pressed into the terminals. For other wires, the trowel must first be **completely pressed on** with a screwdriver as shown.

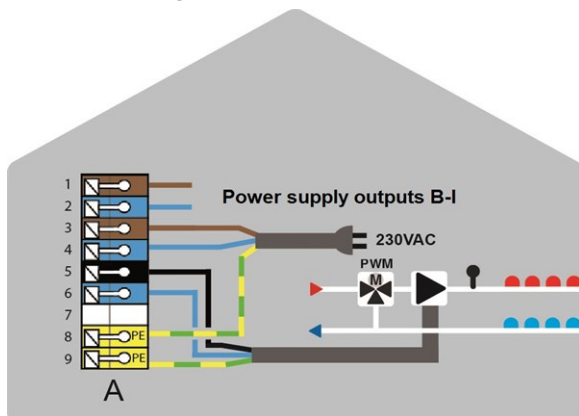


Wire ferrules made of brass can be difficult to clamp due to their asymmetric crimping shape. In this case, remove the wire ferrule. The plug-in terminals are also suitable for flexible cables.

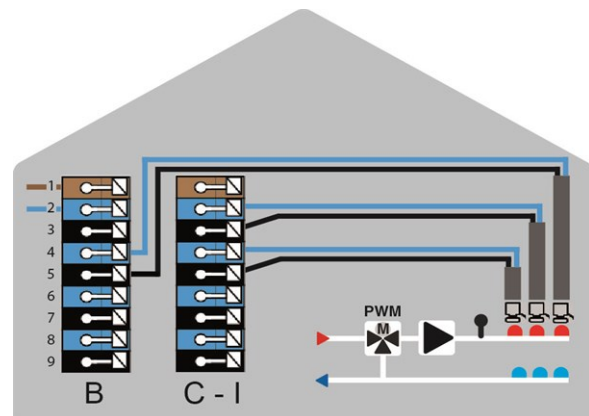
**Electrical Terminals**

1 L'	L'	L'	L'	L'	L'	L'	L'	L'	NC	NC	24 VDC	CAN high	0-10V/ PWM
2 N'	N'	N'	N'	N'	N'	N'	N'	N'	C	C	GND	CAN low	PWM In
3 L	L'	L'	L'	L'	L'	L'	L'	L'	NO	NO	CAN high	CAN high	GND
4 N	N'	N'	N'	N'	N'	N'	N'	N'			CAN low	CAN low	0-10V/ PWM
5 L	L'	L'	L'	L'	L'	L'	L'	L'			24 VDC	VDD	PWM In
6 N	N'	N'	N'	N'	N'	N'	N'	N'			GND	DQ	GND
7 ---	L'	L'	L'	L'	L'	L'	L'	L'			CAN high	GND	24 VDC
8 PE	N'	N'	N'	N'	N'	N'	N'	N'			CAN low		PWM
9 PE	L'	L'	L'	L'	L'	L'	L'	L'					GND

**Example Wiring of Terminal Blocks**

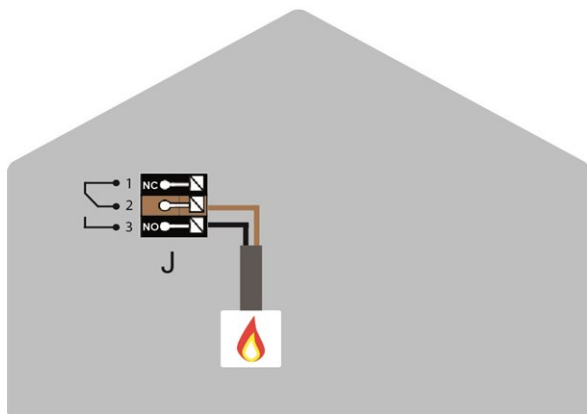


Mains connection heating circuit pump

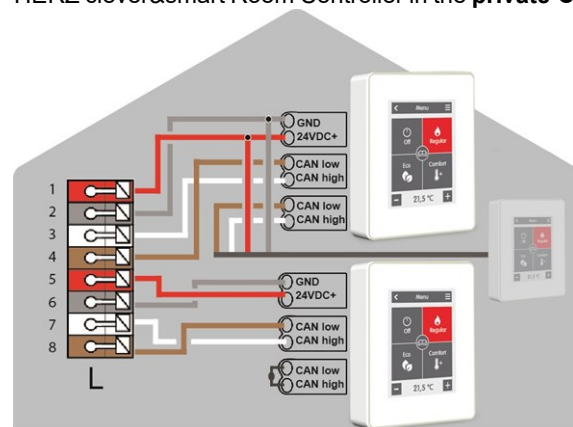


Actuators for the heating zones

HERZ clever&smart Room Controller in the **private CAN bus**



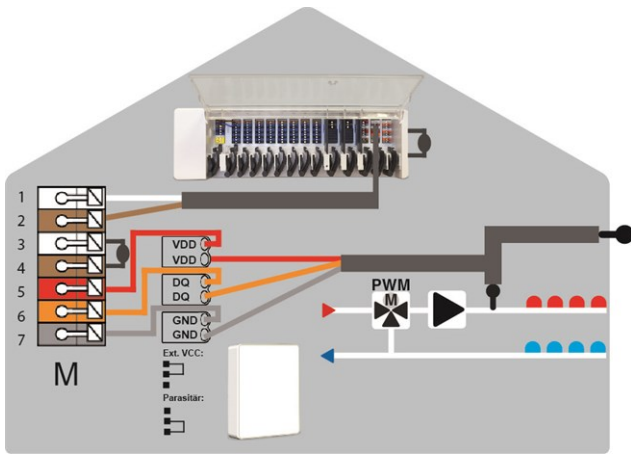
Potential-free switching contacts for additional functions



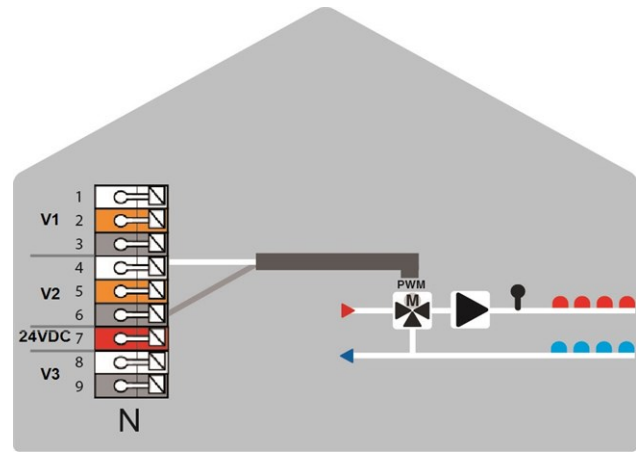
**Private CAN bus**

For linking devices within a housing unit, such as a single-family house or a flat. Shares all information with all devices in the same network, including room names, setpoint temperatures, absences, etc.





**Building CAN bus and 1-Wire sensors**



**0-10 V / PWM outputs for additional functions**

**Building CAN bus**

For linking devices across several units, such as flats, offices or hotel rooms. Only shares information relevant for optimising the overall system:

- Outdoor temperature
- Energy demand
- Flow temperature
- Season (heating / cooling)




 **LED status**

LED A	Lights up if mains voltage is present and relay A is switched
LED B - K	Lights up if relay B - K is switched.
LED L	Flashes if the private CAN bus is active. Flashes at 1 Hz (60 x / minute) if there is an error in the private CAN bus.
LED M	Lights up when the building CAN bus and the 1-wire bus are active. Flashes at 1 Hz (60 x / minute) if there is an error in the building CAN bus. Flashes at 3 Hz (180 x / minute) if there is an error in the 1-wire connection. <b>EXCEPTION:</b> If the building CAN bus remains unused, a flashing (1 Hz (60 x / minute)) of LED M is normal and does <b>NOT</b> mean that there is an error.
LED N	Lights up if outputs V1, V2 or V3 are active.

 **Wiring structures**




**CAN bus**



Description	Implementation	Admissibility
Line		Yes, optimal installation with maximum range.
Tree		No
Star		No

**1-Wire-Bus**



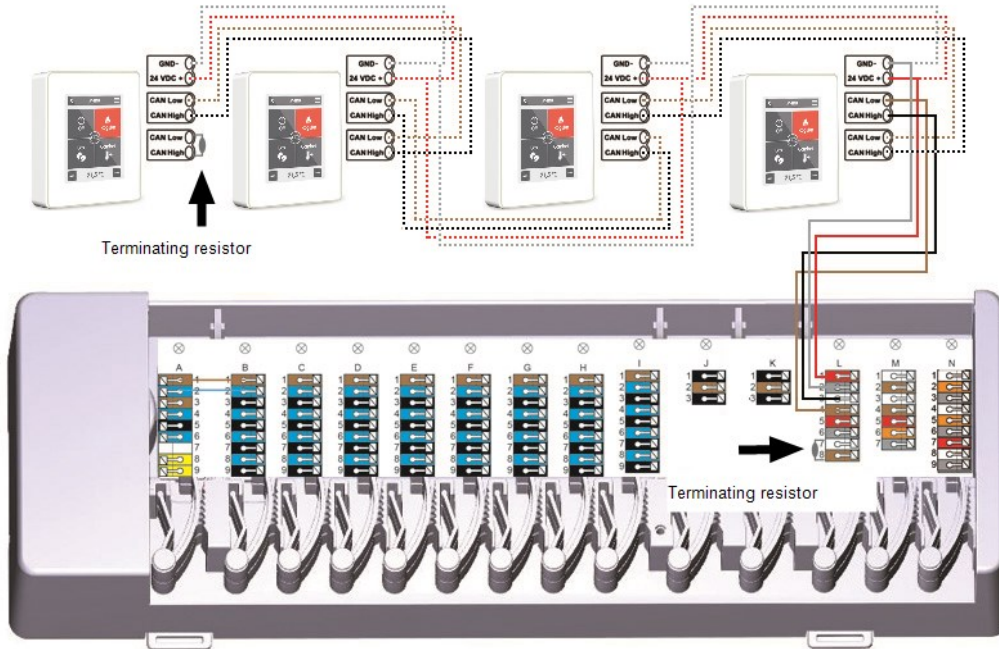
Description	Implementation	Admissibility
Line		Yes, optimal installation with maximum range.
Tree		Possible without guarantee for <b>small systems</b> with short line lengths and few network participants. Keep stub lines short.
Star		Not recommended

**Connection examples HERZ clever&smart Room Controller**



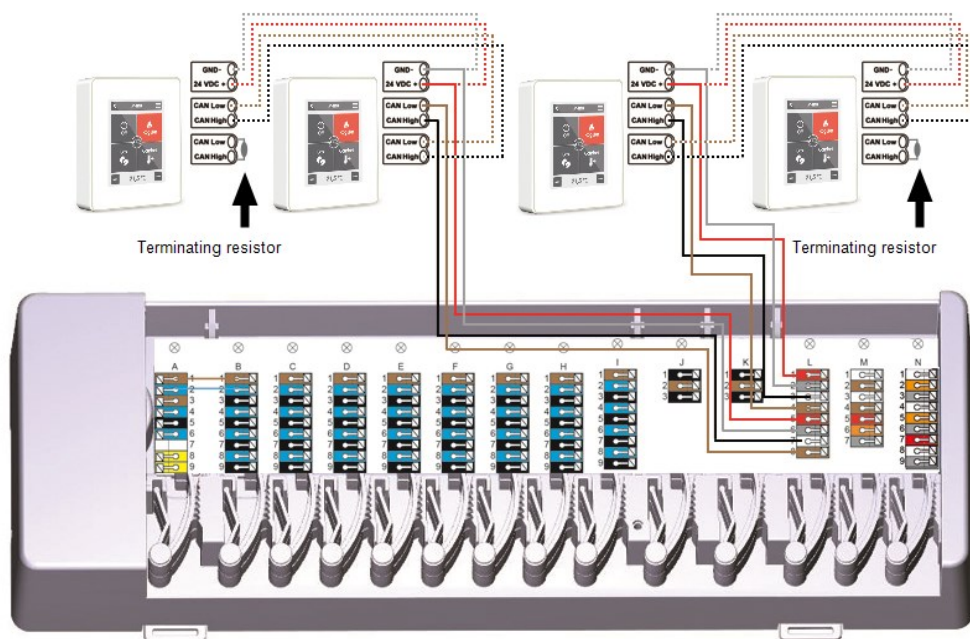
Do not combine devices designed for heating only (HERZ clever&smart Room Controller/HERZ clever&smart Control Box Heating) with devices designed for heating and cooling (HERZ clever&smart Room Controller Clima/HERZ clever&smart Control Box Clima).

**Example 1: Line structure with HERZ clever&smart Control Box Heating as end point**



A 120 Ohm terminating resistor must be set between the CAN Low and CAN High connections on the first and last device in the CAN network.

**Example 2: Line structure with HERZ clever&smart Control Box Heating in the middle**

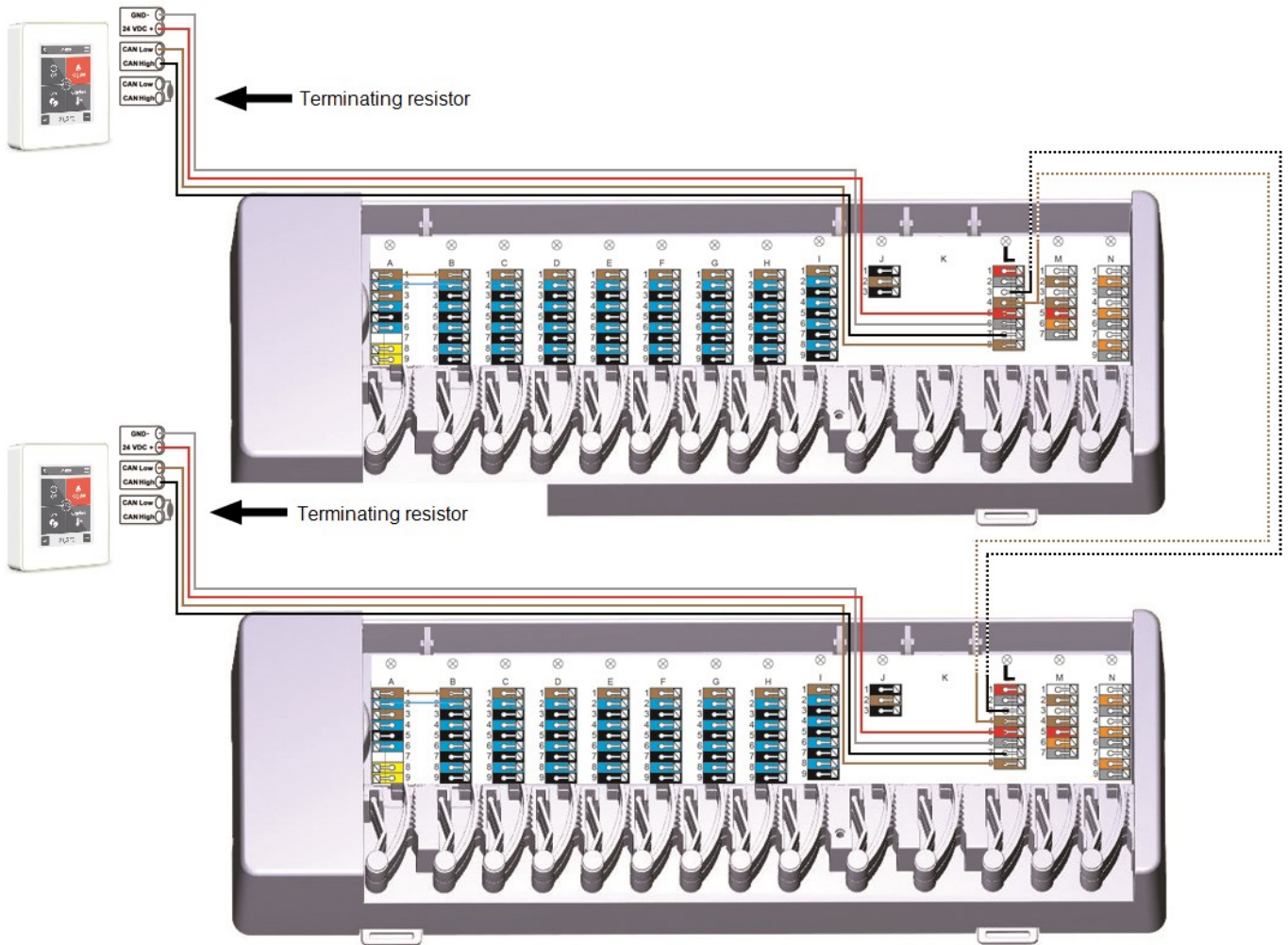


A 120 Ohm terminating resistor must be set between the CAN Low and CAN High connections on the first and last device in the CAN network.

**Connection example single-family house with >8 zones**

**Example:**

Line structure with several HERZ clever&smart Control Box Heating via the private CAN bus (e.g. within a residential unit).



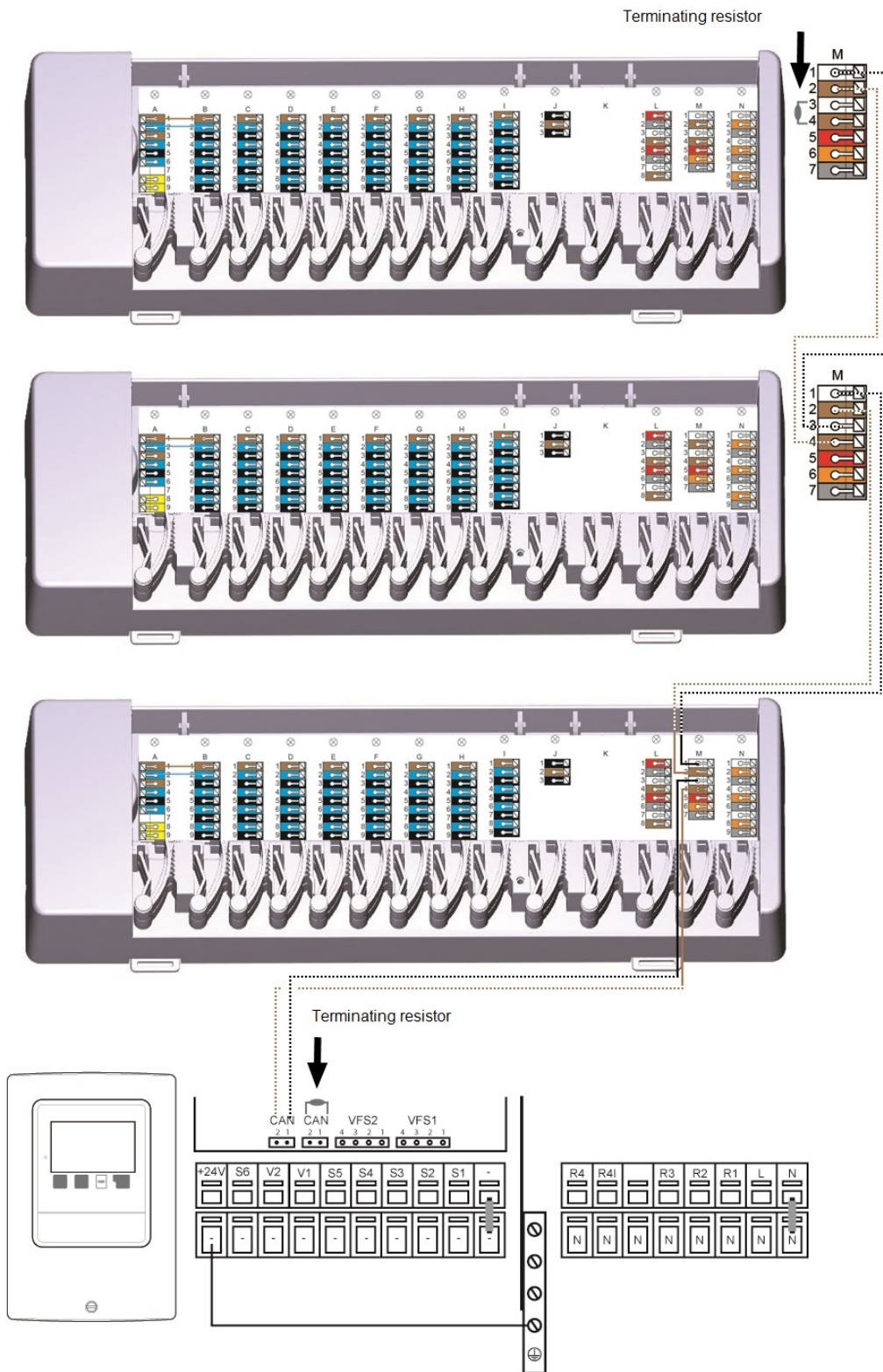
A 120 Ohm terminating resistor must be set between the CAN Low and CAN High connections on the first and last device in the CAN network.



**Connection example apartment building**

**Example:**

Line structure with several HERZ clever&smart Control Box Heating via the building CAN bus (e.g. across several residential or commercial units).



Use **building CAN bus** on **terminal block M** so that no private data such as room temperatures or holiday mode are shared across flats.



A 120 Ohm terminating resistor must be set between the CAN Low and CAN High connections on the first and last device in the CAN network.

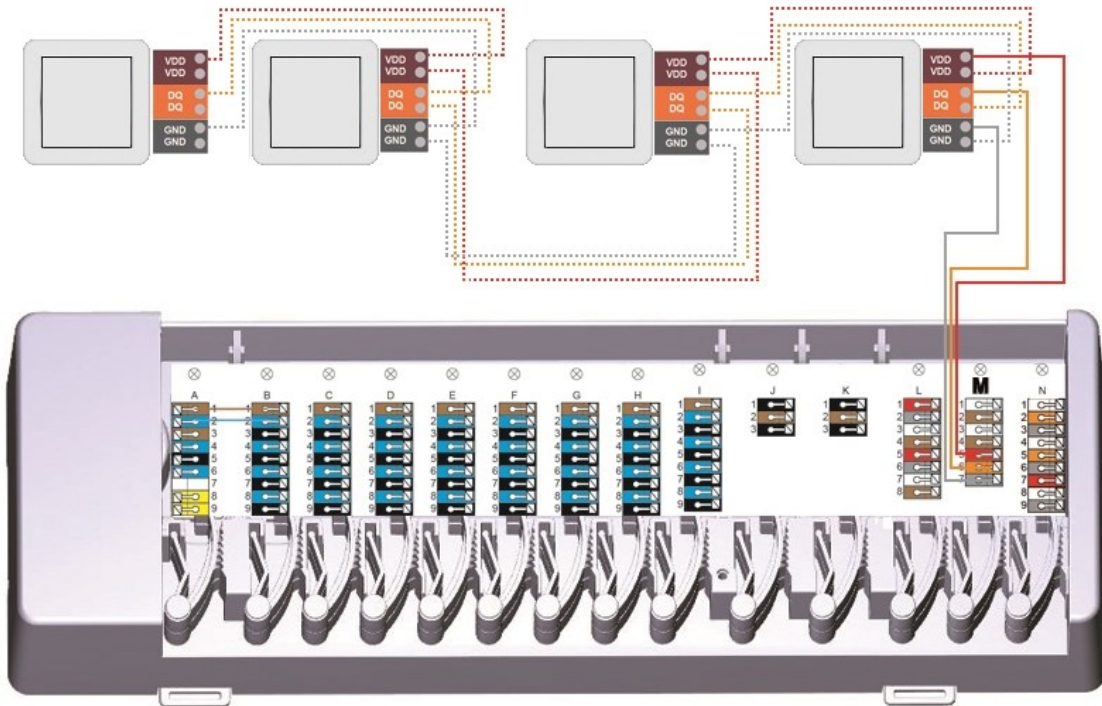
**Connection Examples 1-Wire Sensors**



When connecting the 1-Wire sensors, please record the 16-digit 1-Wire ID and the location of the sensor for later commissioning of the system! The 1-Wire ID can be found in the device housing and in the device menu under: Devices -> HERZ clever&smart Control Box Heating -> Resources -> 1-Wire Sensor.

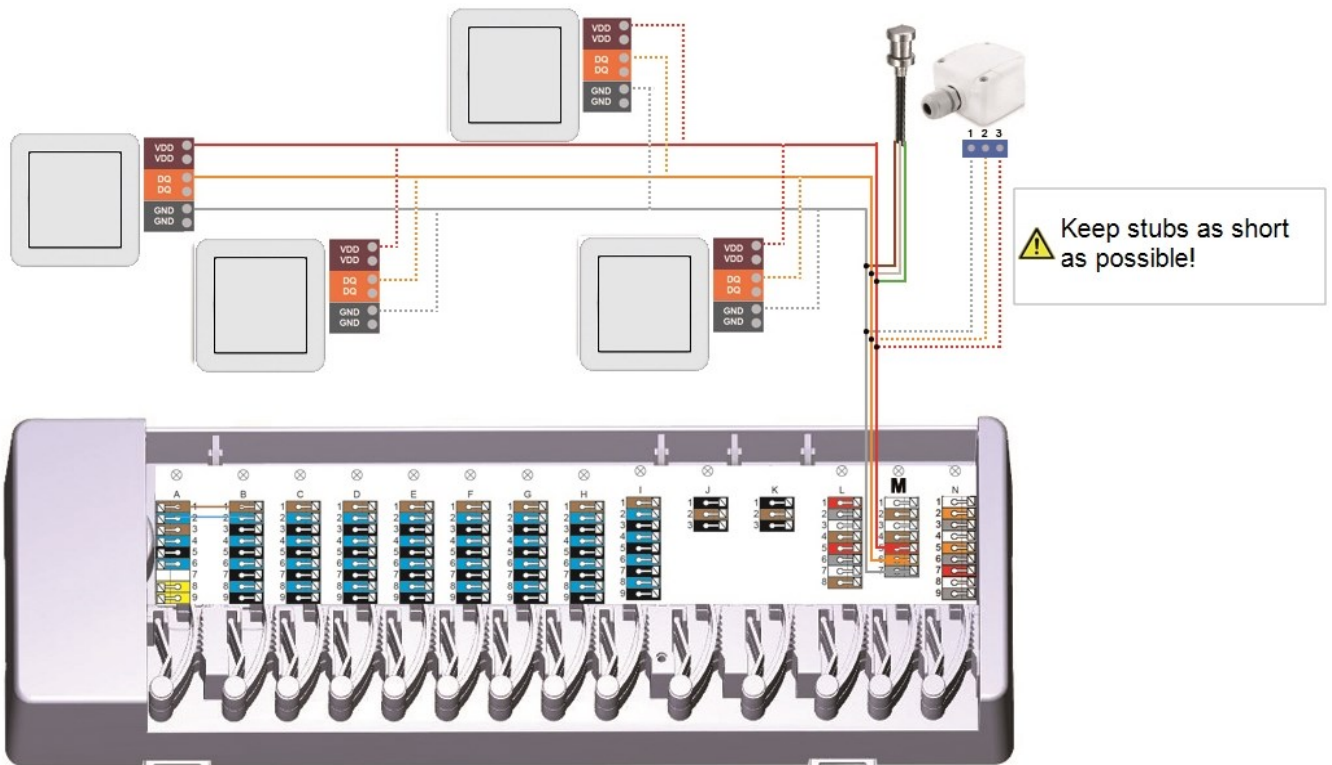
**Example 1:**

**Line.** The installation leads from one sensor to the next. A twisted pair cable is to be used for the connection line



**Example 2:**

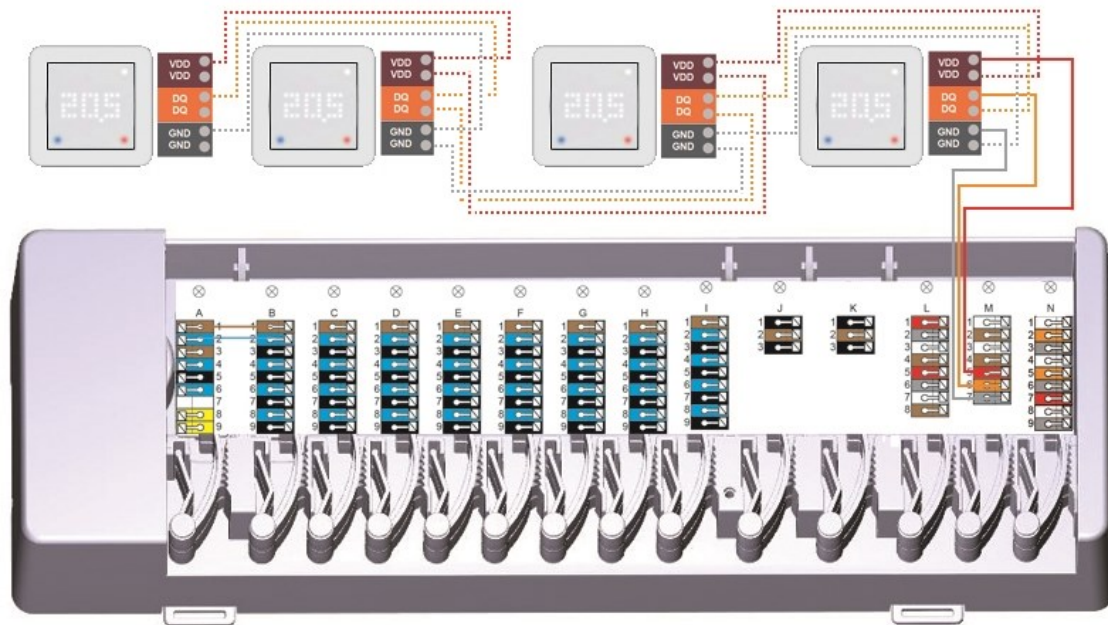
**Tree structure.** A twisted pair cable is to be used for the connection line





## Connection example HERZ clever&smart LEDcontroller

Example line: The installation leads from one sensor to the next. A twisted pair cable must be used for the connecting cable.



The 1-Wire system must be realised with 3 wires (5 VDC, DQ, GND). The total cable length can thus be up to 100 m. Use a suitable twisted pair cable and ensure sufficient conductor cross-section, e.g. LIYCY 2 x 2 x 0.75 mm<sup>2</sup>, to avoid impermissible voltage drop at the HERZ clever&smart LEDcontroller below  $U_{\min} = 4.5$  VDC.

**1-Wire ID overview**

HERZ clever&smart Room Sensor can be assigned to rooms in two ways:

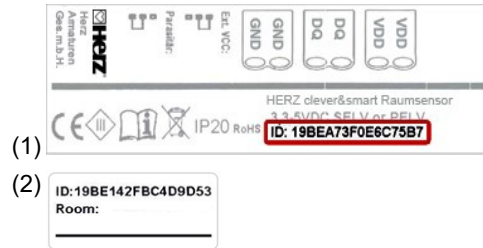
1. by means of the "Touch-To-Assign" function (T2A)



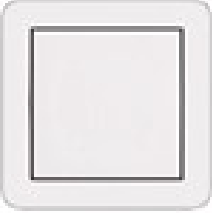





A detailed description of this assignment procedure is enclosed with the respective unit.

2. By assigning the HERZ clever&smart Room Sensor via the 1-wire ID (16-digit hexadecimal number)

If this method is selected, it is helpful to note the 1-wire ID of the HERZ clever&smart Room Sensors in connection with the room in which the respective sensor was installed for later assignment within the scope of the system configuration.

The 1-Wire ID can be found inside the sensor on the type plate (1) and on the supplied sticker (2). We recommend placing the sticker in the following table.



HERZ clever&smart LEDcontroller		
HERZ clever&smart Room Sensor		
HERZ clever&smart Contact Sensor HERZ clever&smart Immersion Sensor		
HERZ clever&smart Outdoor Sensor		

	Location	1-Wire ID		Location	1-Wire ID
Example	Bathroom	1053f67c0308009e	11		
1			12		
2			13		
3			14		
4			15		
5			16		

6		17	
7		18	
8		19	
9		20	
10		21	

## Setup Wizard

The setup wizard in the HERZ clever&smart Room Controller starts automatically when the device is commissioned for the first time and guides you through the necessary basic settings in the correct sequence. Press the arrow keys in the upper right/left corner to return to the next or previous setting.



Commissioning must also be completed on all other HERZ clever&smart Room Controller in the network.



The HERZ clever&smart Control Box Heating is usually configured using a HERZ clever&smart Room Controller. If the "configurator" of the HERZ clever&smart Control Box Heating is a HERZ clever&smart Room Controller WiFi with an existing internet connection, a configuration can also be continued or changed using the HERZ clever&smart App.



The setup wizard is restarted via the "Factory settings" menu item.

## Operation

To parameterise the HERZ clever&smart Control Box Heating, you need at least one HERZ clever&smart Room Controller. This is connected to the HERZ clever&smart Control Box Heating via the private CAN bus as described above (see "Electrical Connection" on page 7).

### Room Overview

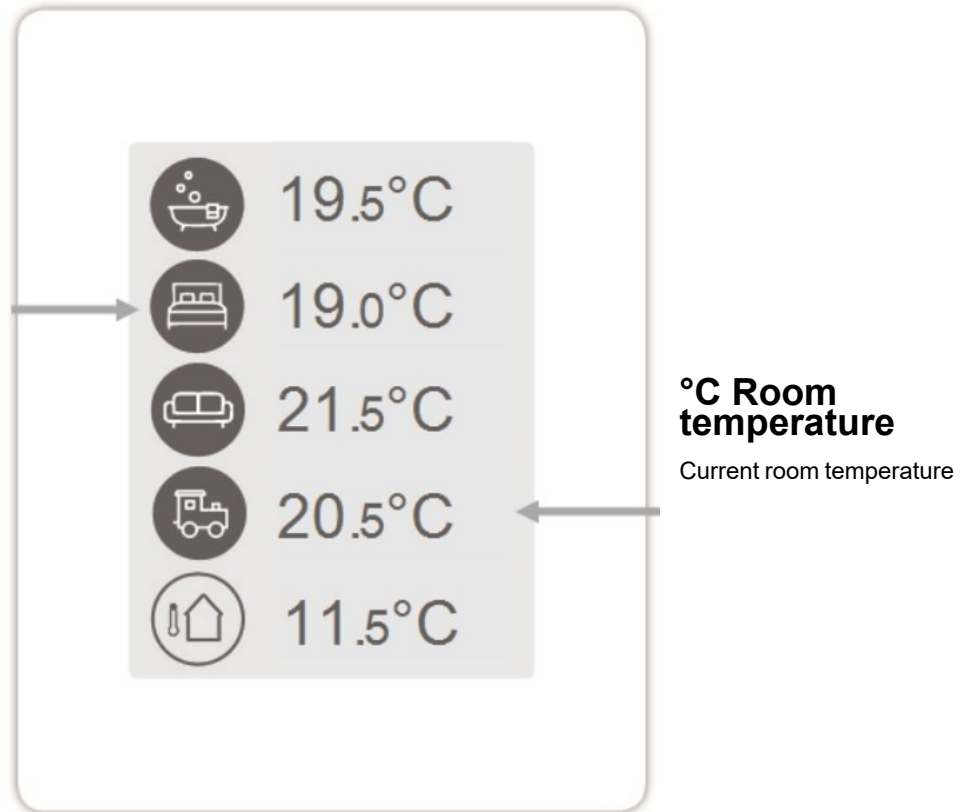
After activating the start screen, displays the room temperature of the configured rooms and, if a 1-wire outdoor temperature sensor is connected, also its temperature.

#### Room icon

By selecting a room icon, you are forwarded to the room temperature settings.

#### Multiroom selection

By dragging your finger vertically across several rooms, you can change the operating mode in all rooms at the same time.



 **Operating Mode**

Overview > Operating Mode

**Back/ Forward**

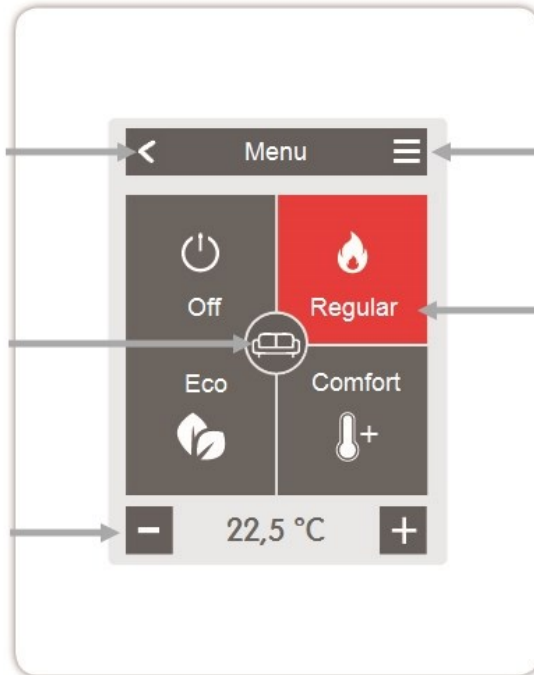
Navigation back to overview

**Room**

Display of the selected room

**Reference temperature**

Setting the setpoint temperature for the active operating mode in the displayed room



**Menu**

Navigation to the main menu

**Operating Modes**

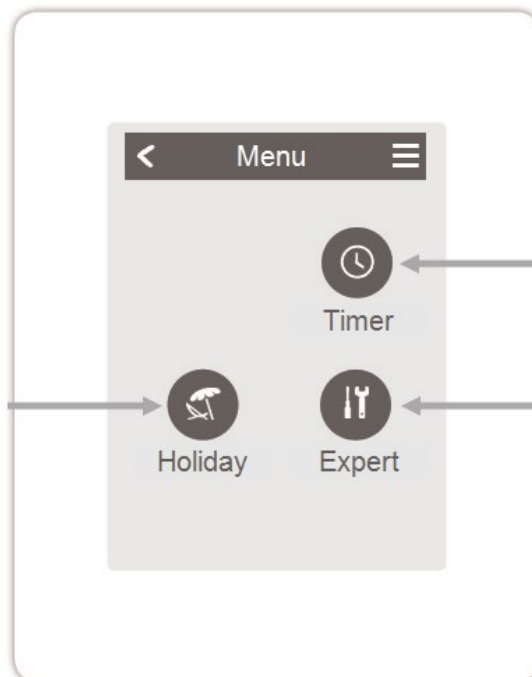
The operating mode shown in colour is currently active and can be changed by selecting another mode. Manually selected modes remain active until the next change of mode by the timer program. A background frost protection function remains active in the "off" mode.

 **Menu**

Overview > Operating Mode > Menu

**Holiday**

Set time period and temperature for a longer absence



**Timer**

Setting of individual heating or cooling times for each day of the week with copy function for subsequent days

**Expert**

Further settings for the specialist

**Set Operation Hours**

Overview > Operating Mode > Menu > Timer

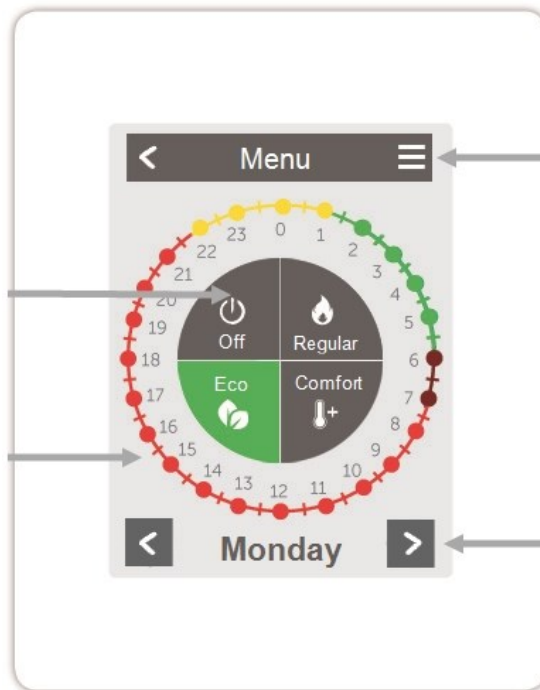
Setting of individual heating and cooling times for the selected room.

**Operating Modes**

Selection of the operating mode to select individual heating sections.

**Clock**

Time table of the selection in periods of 30 minutes increments. Touch individual segments, or drag your finger over complete time intervals to colour them according to the selected operation mode.



**Menu**

Opens the copy function. This function allows you to copy the heating times for the next day, on Monday-Friday or Monday-Sunday.

**Back / Next**

Weekday Selection of the day of the week to be set

**Set Operation Hours**

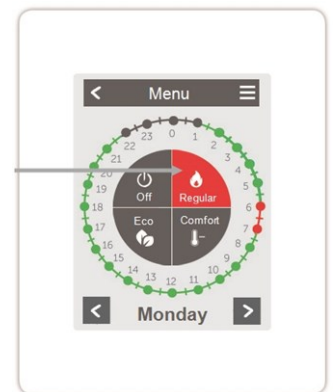
**Step 1**

Use the arrow keys to select the desired day.



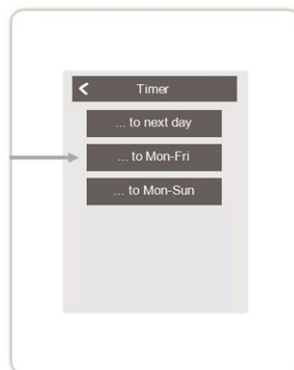
**Step 2**

Select the desired mode (Normal, Comfort, Eco or Off) and then move your index finger over the desired time period. The selected period changes colour to the colour of the selected operating mode after selection. Set the times of the other operating modes in the same way.



**Step 3**

After completing the setting of the individual heating or cooling times, you have the option of copying the times via the main menu to the following day on Monday - Friday or to Monday - Sunday or to set them individually for each day of the week.



In the interests of efficient and energy-saving single room control, the operating times should be set specifically for each room.



When setting the operating times, please consider that surface heating systems are inherently inert.



## Expert Menu

Overview > Operating Mode > Menu > Expert

### Select Language

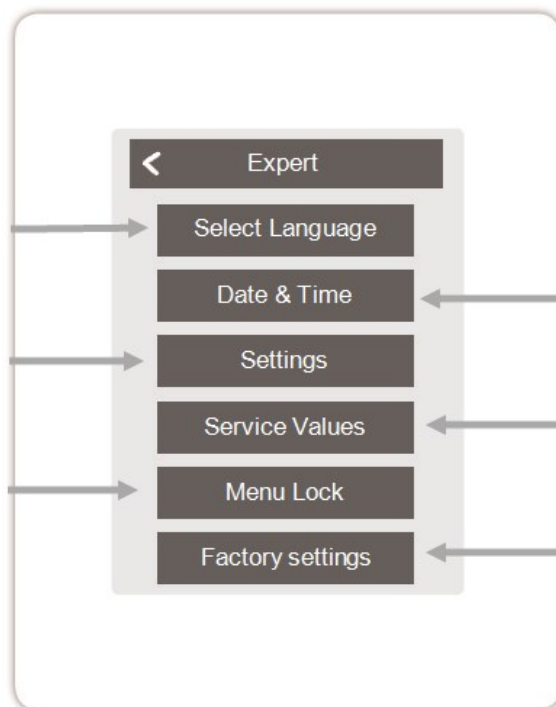
Set the device language

### Settings

Parameterisation of the heating system

### Menu Lock

Secure the controller against unintentional changing and compromise of basic functions.



### Date & Time

Setting the time and date and automatic summertime/wintertime changeover

### Service Values

Information about the system

### Factory settings

The factory settings are restored in the device.

**!** The menu structure described here is based on the status at the time of production and may vary due to subsequent software changes.

**Settings**

Overview > Operating Mode > Menu > Expert > **Settings**

**Devices**

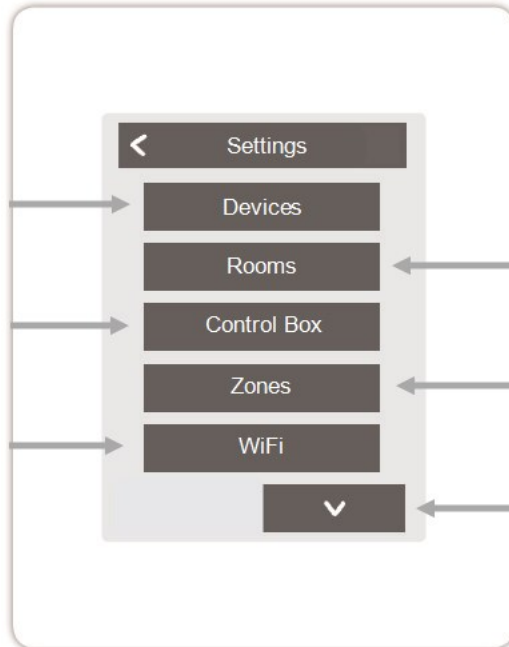
Add, manage and remove connected devices

**Control Box**

Additional functions of the free switching outputs on the HERZ clever&smart Control Box Heating. This menu is only visible if this HERZ clever&smart Room Controller was set as the "Configurator" ("Expert > Settings > Devices > Control box > Configurator") of the HERZ clever&smart Control Box Heating during commissioning.

**WiFi**

Set and manage WiFi functions



**Rooms**

Add, manage and remove rooms and assign them to connected devices

**Zones**

Assigning rooms to heating zones

**Display Brightness**

Setting the screen brightness

**Interface Mode**

Switch between full and restricted menu. Only the reference temperature can be set in the mode "Hide menu". To return to "full" mode, press and hold the upper right corner of the display for 5 seconds and then change the mode to "full" in this menu.

**Room Sync.**

If room synchronisation is activated, you will see all rooms set up in the system and the corresponding sensor information on the HERZ clever&smart Room Controller. This also allows the setting of other rooms. If you only want to see and set the room to which this HERZ clever&smart Room Controller is assigned, deactivate room synchronisation.

**Devices**

Overview > Operating mode > Menu > Expert > Settings > **Devices**



Do not combine devices designed for heating only (HERZ clever&smart Room Controller/HERZ clever&smart Control Box Heating) with devices designed for heating **and** cooling (HERZ clever&smart Room Controller Clima/HERZ clever&smart Control Box Clima).



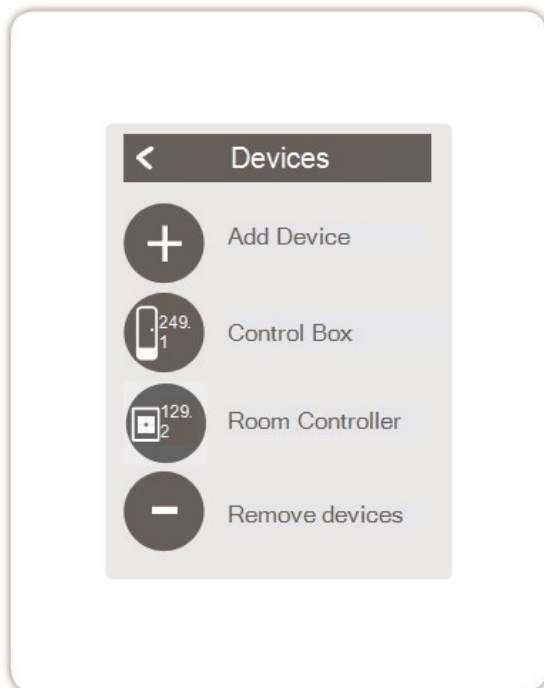
**Add Device**

Starts the search for new available devices in the network



**Device icon**

Shows the type of connected device and its CAN ID



**Description**

Shows the detected type of the unit



**Remove devices**

Devices are removed from the network

Overview > Operating mode > Menu > Expert > Settings > Devices > **Control Box**

**Resources**

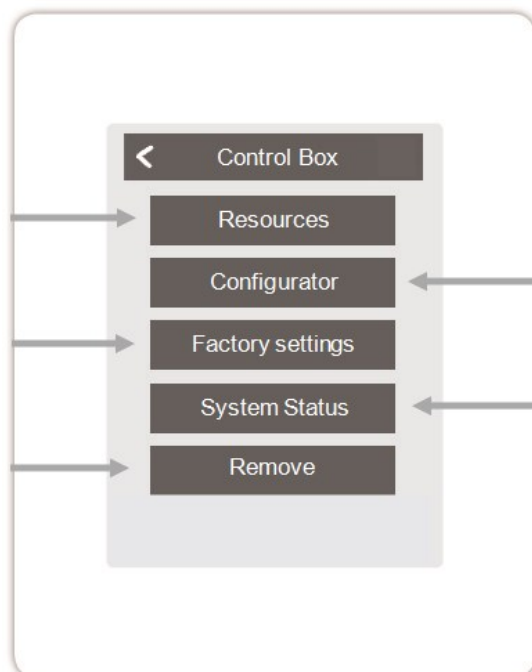
Displays which outputs and connected sensors are available.

**Factory settings**

Loading the factory settings of the HERZ clever&smart Control Box Heating

**Remove**

Device removed from the list



**Configurator**

Use this HERZ clever&smart Room Controller to configure the HERZ clever&smart Control Box Heating. Tip: If available in the system, use the HERZ clever&smart Room Controller WiFi as a configurator to set up a router connection.

**System Status**

Update option of the HERZ clever&smart Control Box Heating software

**Rooms**

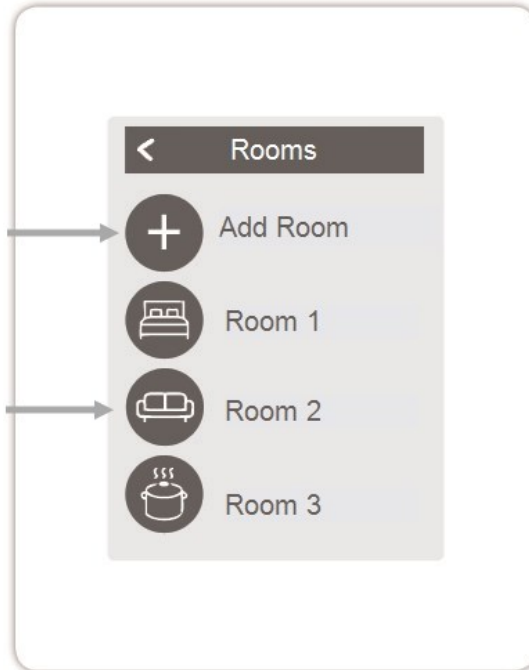
Overview > Operating mode > Menu > Expert > Settings > Rooms

**Add Room**

Adding rooms

**Room 2**

Setting of location, sensors of the respective room



Overview > Operating mode > Menu > Expert > Settings > Room 2

**Location**

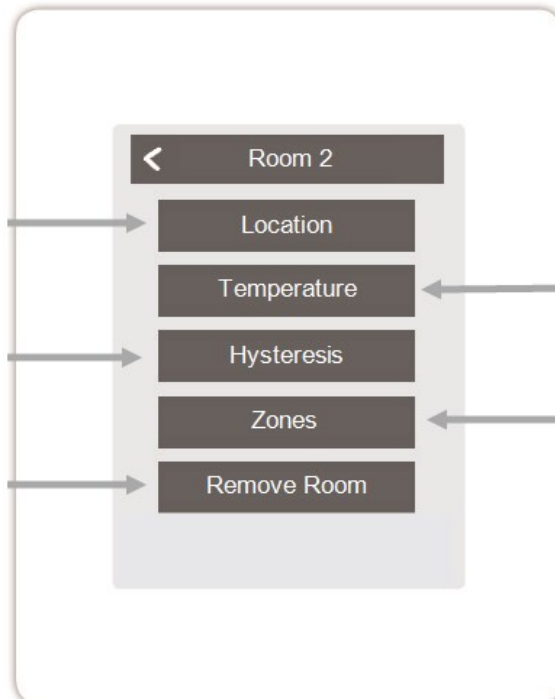
Selection of the space icon

**Hysteresis**

Switch-off hysteresis for the room setpoint temperature

**Remove Room**

Removing the selected room



**Temperature**

Selection of temperature sensors in the selected room

**Zones**

Selecting the zones to be controlled

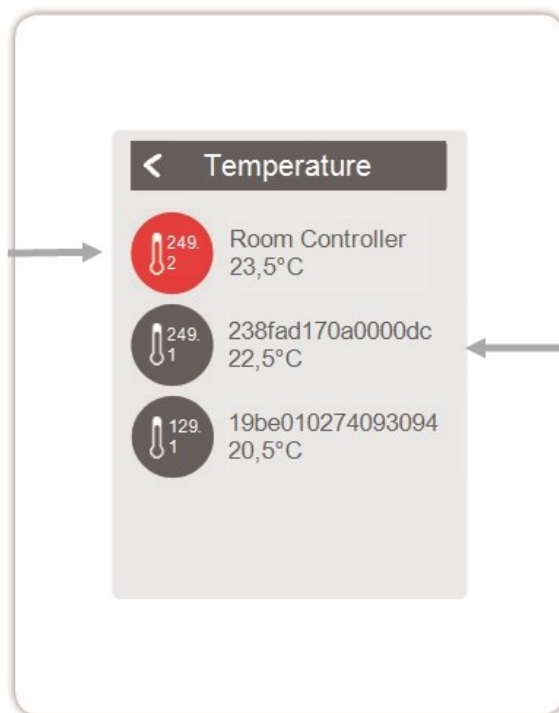
## Temperature

Overview > Operating mode > Menu > Expert > Settings > Rooms > Room 1 > Temperature



### Icon

Already selected sensor



### Sensor icon with CAN ID of the Control Box + serial number

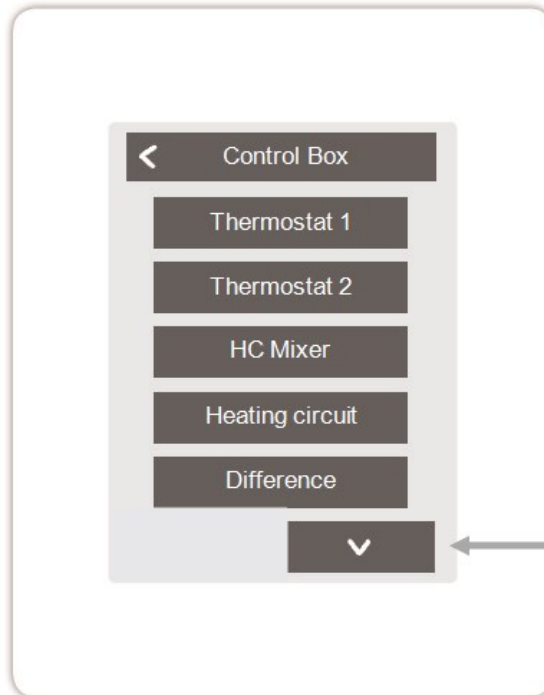
When using 1-Wire sensors, these are displayed via the CAN ID of the HERZ clever&smart Control Box Heating + a resource number.

With 1-Wire sensors, the temperature and the 1-Wire ID are displayed alternately. The 1-Wire ID is used for the room or function assignment of the sensors.

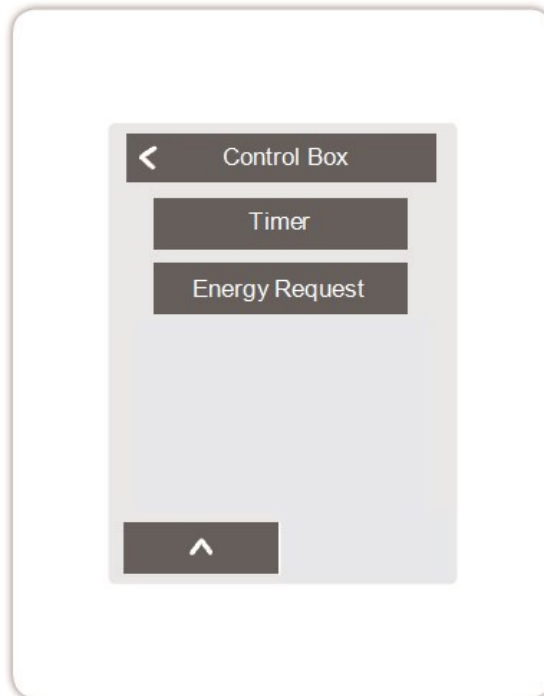
## Functions Control Box

Overview > Operating mode > Menu > Expert > Settings > Control Box

Activate and set additional functions on free outputs of the HERZ clever&smart Control Box Heating.



Further functions on the next page.





Overview > Operating mode > Menu > Expert > Settings > Control Box > Thermostat 2

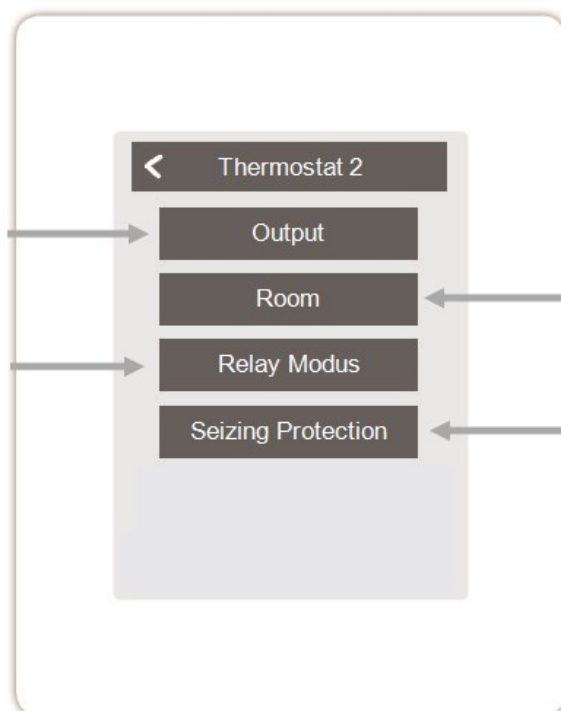
Switches the defined output to the set room / rooms depending on time and temperature.

## Output

Assign the output to be switched by the function. **The other menu options become visible after assigning the output.**

## Relay Modus

Switching mode output:  
regular / inverted




## Room

Selection of the rooms on whose settings and states the function is to be based

## Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.

 In heating mode, the thermostat function switches on in at least one of the selected rooms when the room temperature falls below the target room temperature. The automatic summer switch-off of the zones via the outdoor temperature is not considered here.

Overview > Operating mode > Menu > Expert > Settings > Control Box > HC mixer

The heating circuit mixer function controls the flow temperature via a 0-10 V / PWM mixer depending on the outdoor temperature. When using a 3-point mixer, the potential-free relay contacts of terminals J and K can be used. For this purpose, the foot contacts (J2, K2) of the relays must be supplied with 230 V or 24 V, depending on the mixer type.

## Output

Assign the output to be switched by the function. **The other menu options become visible after assigning the output.**

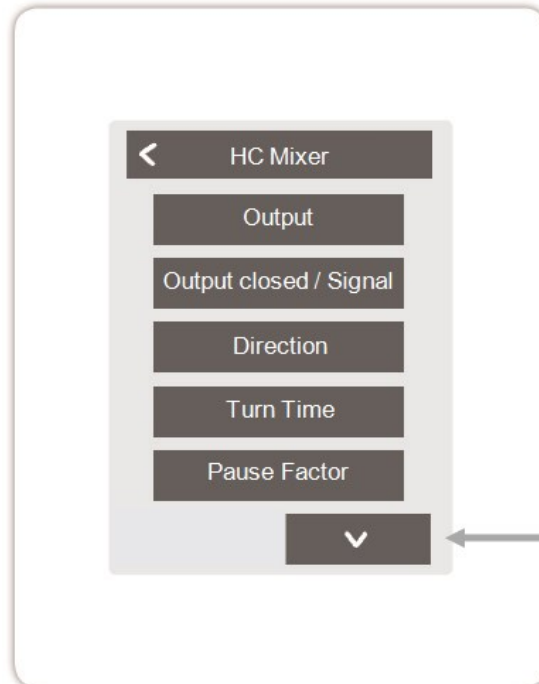
**Only outputs N1, N4 and N8 may be used.**

## Direction

Set the direction of rotation of the mixer

## Pause Factor

Multiplier for the pause time between strokes. The off factor 1.0 is the pause time calculated by the programme, at 0.5 the pause time is halved - the valve regulates twice as fast.



## Output closed / Signal type

Select switching output  
Relay or signal output  
Relay, 0-10 V or PWM.

## Turn Time

Set the duration of a stroke or the duration of a mixer cycle.

## Increase

Set the influence of temperature changes. Setting a higher value leads to earlier counter-control of the mixer.

## Mixer run time

Setting of the running time required by the mixer for a full ride.

## Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.

The heating circuit function starts the heating pump at the defined output as soon as at least one zone is active.

## Output

Assign the output to be switched by the function. **The other menu options become visible after assigning the output.**

**By default, the output at terminal block A of the HERZ clever&smart Control Box is defined here.**

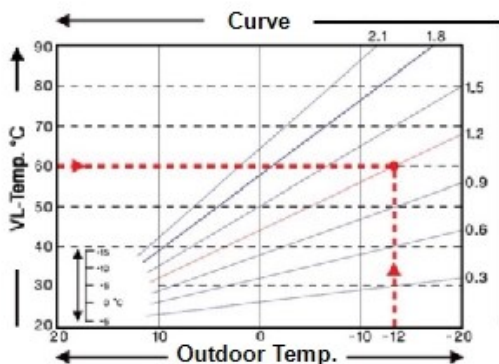
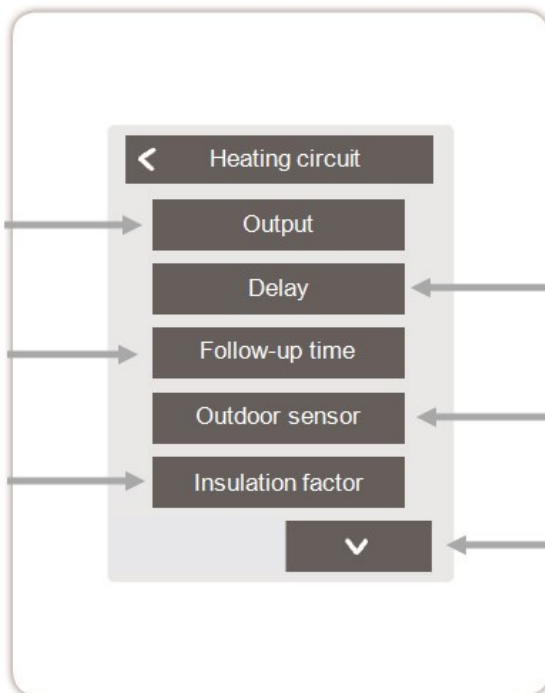
## Follow-up time

When all zones are switched off, the pump continues to run in order to bring the residual heat into the heating system.

## Insulation factor

Appears when 'Sensor Outside' is defined. Delays the influence of the outdoor temperature on the calculation of the set flow temperature.

1 = poor insulation  
5 = good insulation



## Delay

Delays switching on the heating circuit pump so that it does not press against closed valves.

## Outdoor sensor

Assignment of the outdoor sensor for weather-compensated control of the heating circuit.

## Curve

Appears when 'Sensor Outdoor' is defined. The characteristic curve is used to control the heat dissipation of the heating circuit relative to the outdoor temperature. The characteristic curve can also be changed via the parallel shift.

## Parallel characteristic translation

Appears when 'Sensor Outdoor' is defined. A fixed correction value is added to or subtracted from the current setpoint flow calculated by the characteristic curve.

## Room influence

Influence of the setpoint temperature deviation on the setpoint flow temperature

## Flow

Assignment of the heating circuit flow sensor

## Min. Flow

Appears when a sensor has been defined for "Flow". Setting the minimum flow temperature.

## Max. Flow

Appears when a sensor has been defined for "Flow". Setting the maximum flow temperature.

## Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.

Overview > Operating mode > Menu > Expert > Settings > Control Box > **Difference**

The difference function switches the defined output as soon as there is a preset temperature difference between the source and target sensor.

## Output

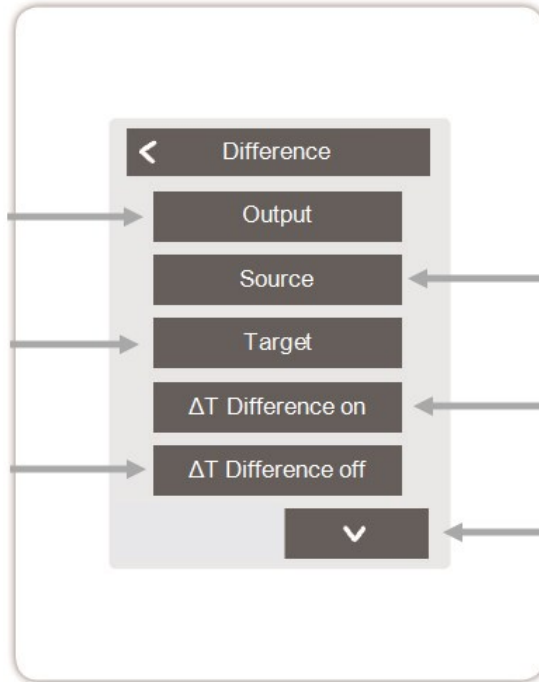
Assign the output to be switched by the function. **The other menu options become visible after assigning the output.**

## Target

Assignment of the temperature sensor in the energy consumer

## $\Delta T$ Difference off

Set the temperature difference for switching off



## Source

Assignment of the temperature sensor in the energy source

## $\Delta T$ Difference on

Determination of the temperature difference as switch-on criterion

## Tmin Source

Set the minimum temperature in the energy source

## Tmax Drain

Setting the maximum temperature in the energy consumer

## Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.

Overview > Operating mode > Menu > Expert > Settings > Control Box > Timer 2

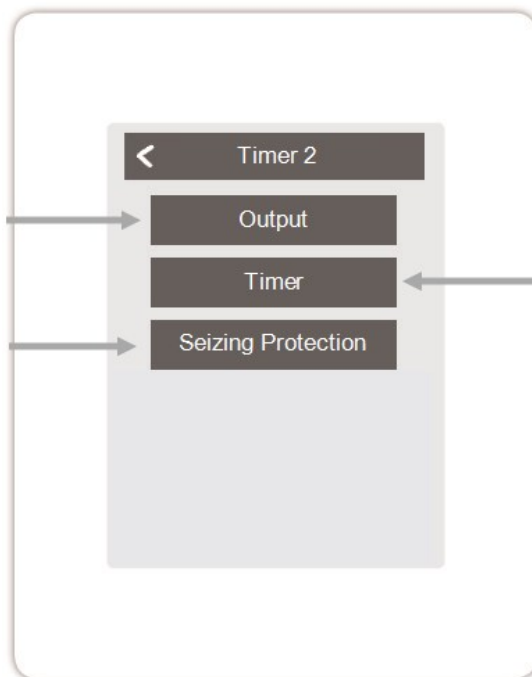
The function Timer 1-2 switches the defined output depending on the set times.

### Output

Assign the output to be switched by the function. **The other menu options become visible after assigning the output.**

### Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.



### Timer

Set the times at which the outputs are to be switched.

Overview > Operating mode > Menu > Expert > Settings > Control Box > Energy request

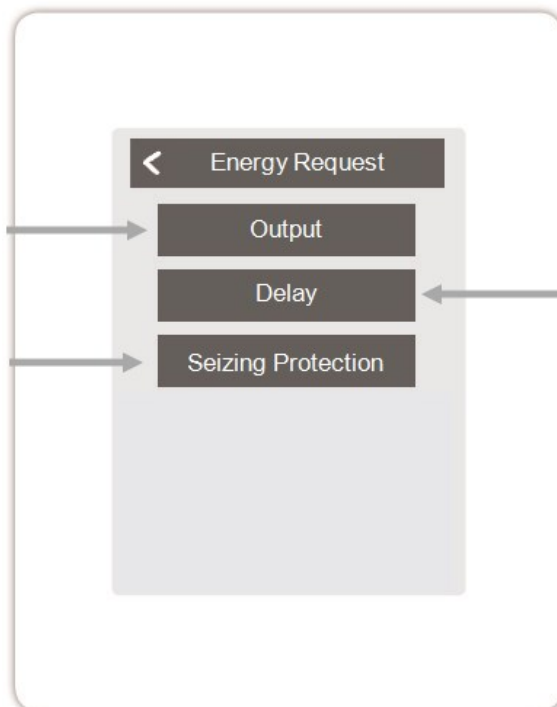
The function energy request switches the defined output when the rooms require energy depending on the set delay.

### Output

Selection of the output on the HERZ clever&smart Control Box Heating that is switched when a zone requires energy. By default, the output on terminal J is assigned with the energy requirement. **The other menu options become visible after assigning the output.**

### Seizing Protection

If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.



### Delay

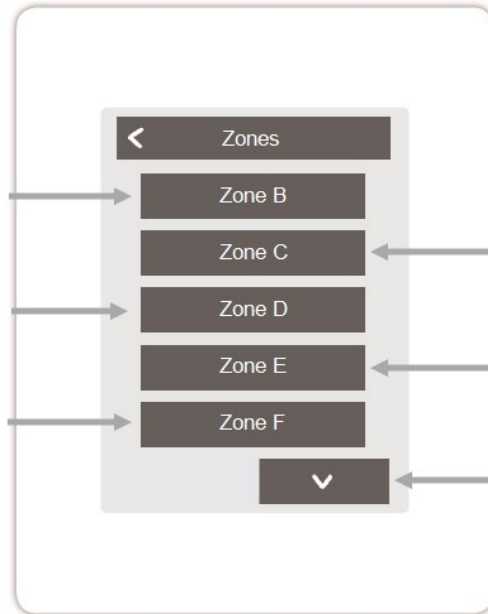
Set the delay of the energy demand in minutes

**Zones**

view > Operating mode > Menu > Expert > Settings > **Zones**

**Zones**

Selection of zones to be set or managed.



Overview > Operating Mode > Main Menu > Expert > Settings > Zones > **Zone B**

**Room**

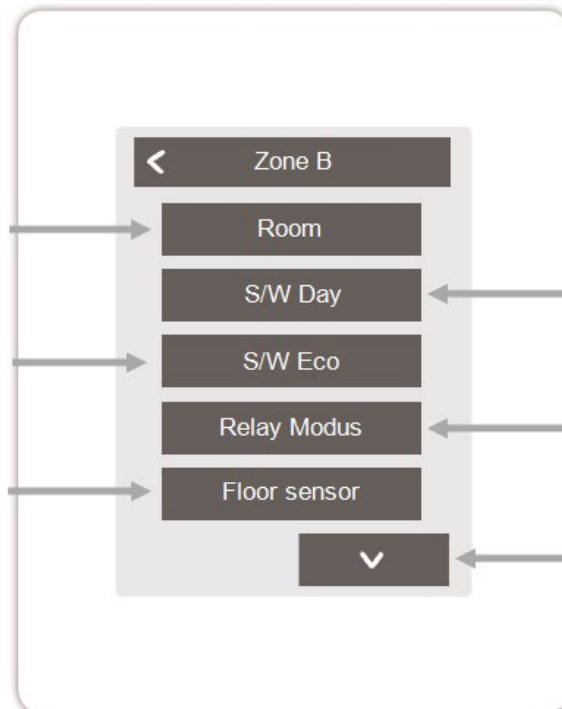
Assignment of the rooms in which the zone is located. Rooms must first be created in the menu under: Expert > Rooms.

**S/W Eco**

Setting the temperature limit for summer switch-off in "Eco" operating mode in heating mode. If the outdoor temperature exceeds this value, this zone is no longer heated.

**Floor sensor**

Assignment of the floor sensor



**S/W Day**

Setting the temperature limit for summer switch-off in "Normal" operating mode in heating mode. If the outdoor temperature exceeds this value, this zone is no longer heated.

**Relay Modus**

Set the switching direction for the zone valves. In Normal mode the relay is used as a normally open contact (for actuators NC), in Inverted mode as a normally closed contact (for actuators NO).

**Tmax floor**

Setting the maximum temperature of the floor sensor

**Seizing Protection**

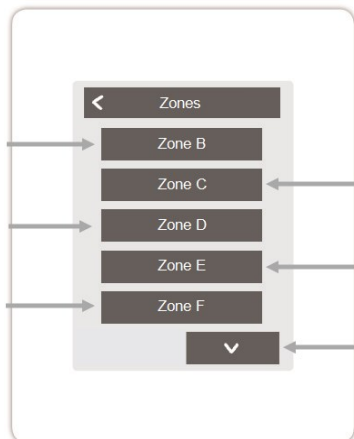
If the seizing protection is activated (daily, weekly, off), the Control Box switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the connected actuator from seizing in case of longer inactivity.



 **Example zone setting**

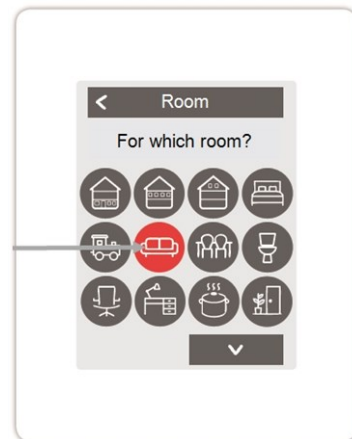
**Step 1**

Select the respective zone.



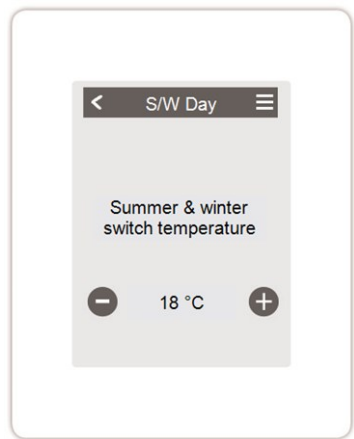
**Step 2**

Select the room corresponding to the zone.



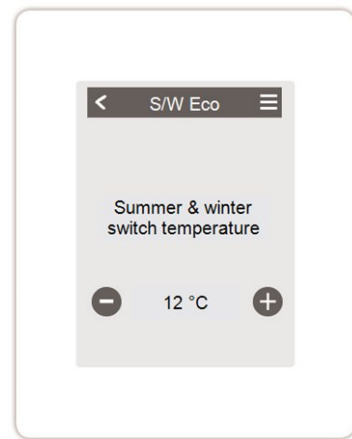
**Step 3**

Set the desired outdoor switch-off temperature for the Normal (S/W Day) mode.



**Step 4**

Set the desired outdoor switch-off temperature for Eco (S/W Eco) mode.



**WiFi**

Overview > Operating mode > Menu > Expert > Settings > WiFi



This menu is only available when a HERZ clever&smart Room Controller WiFi is connected.

**Activate WiFi**

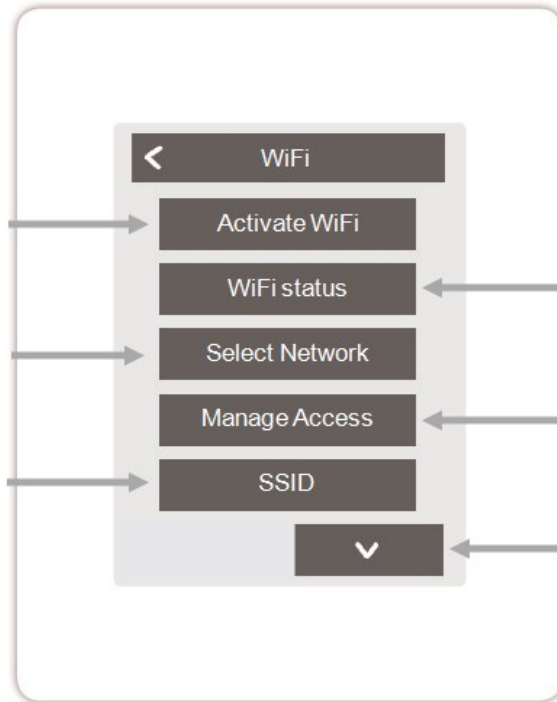
Activate WiFi function

**Select Network**

Scan for available networks and select the network

**SSID**

Manually entering the WLAN name



**WiFi status**

Information about the WiFi status and the device address (which is needed to connect to the HERZ clever&smart App).

**Manage Access**

Allow up to 5 users to access the unit via HERZ clever&smart App by entering their e-mail addresses.

**Further menu items**

**WiFi password**

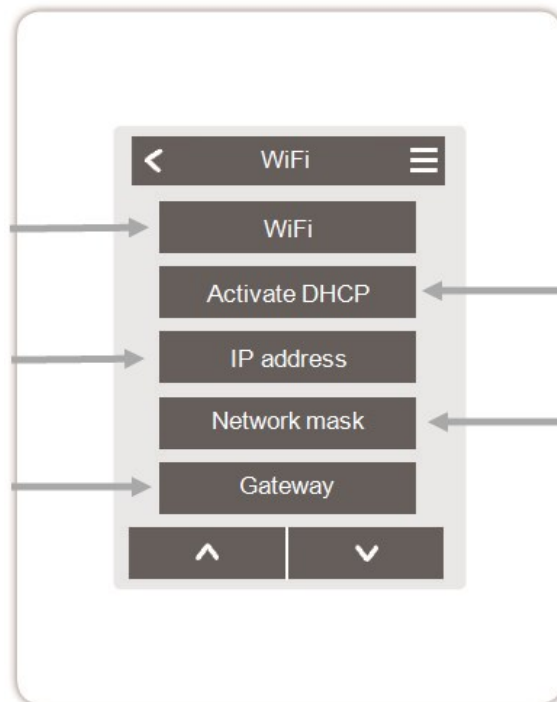
Entering the WiFi password

**IP address**

Entering the HERZ clever&smart Room Controller IP address

**Gateway**

Enter the gateway address



**Activate DHCP**

If auto-configuration is enabled, the device searches the network for a DHCP server that assigns it an IP address, subnet mask, gateway IP and DNS server IP. If you deactivate the auto configuration (DHCP), you will have to make the required network settings manually! See the following points:

**Network mask**

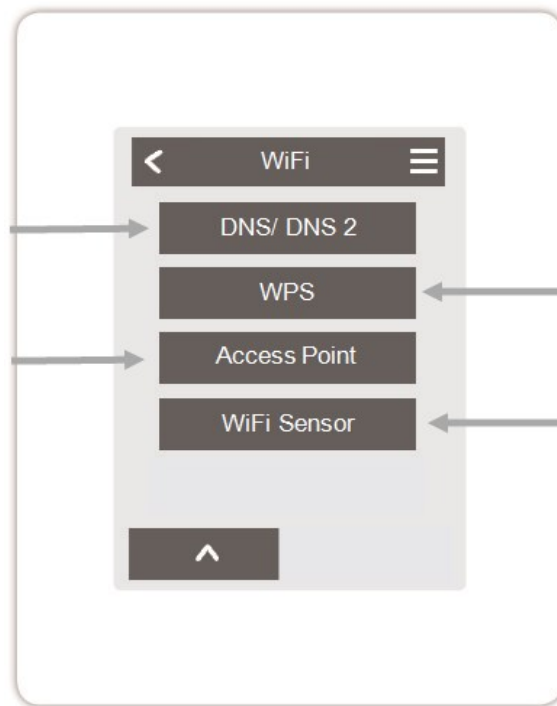
Entering the network mask

## DNS/ DNS 2

Entering the DNS address

## Access Point

Settings for routing and the WPS Repeater



## WPS

Connecting the HERZ clever&smart Control Box Heating to a WPS-enabled router

## WiFi Sensor

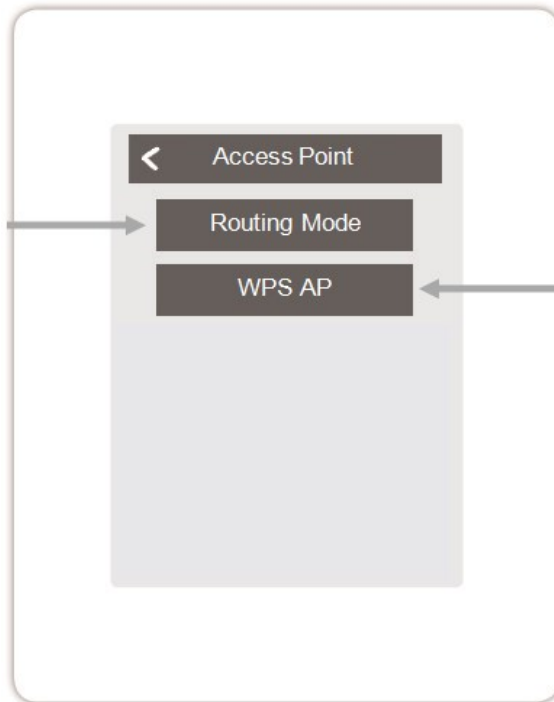
Settings for the LED display and the transmission interval

**Access Point**

Overview > Operating Mode > Menu > Expert > Settings > WiFi > **Access Point**

**Routing Mode**

The automatic routing independently selects between a direct connection of WiFi devices with the access point of the HERZ clever&smart room controller and indirect connection via the WLAN router. As not all routers support this function, the setting "No" is recommended in case of problems in WiFi communication. In this case, all communication runs via the WLAN router. If there is no router, communication takes place via the access point of the HERZ clever&smart room controller.



**WPS AP**

Add a WPS-enabled repeater to increase the range.

**WiFi Sensor**

Overview > Operating Mode > Menu > Expert > Settings > WiFi > **WiFi Sensor**

**LED-Mode**

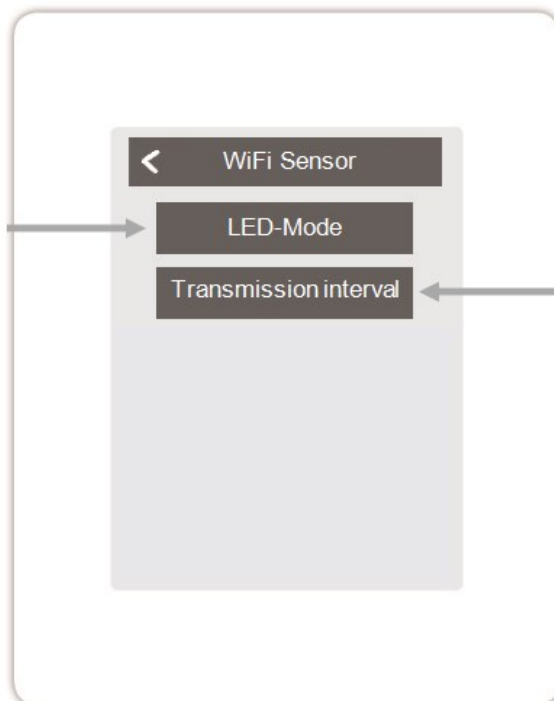
LED behaviour settings:

**normal:**

Sending the sensor values successfully  
=> LED lights up green  
Sending the sensor value failed  
=> LED flashes red

**silent:**

In the "silent" mode, the LED only flashes red if the transmission of the sensor values has failed three times in succession.




**Transmission interval**

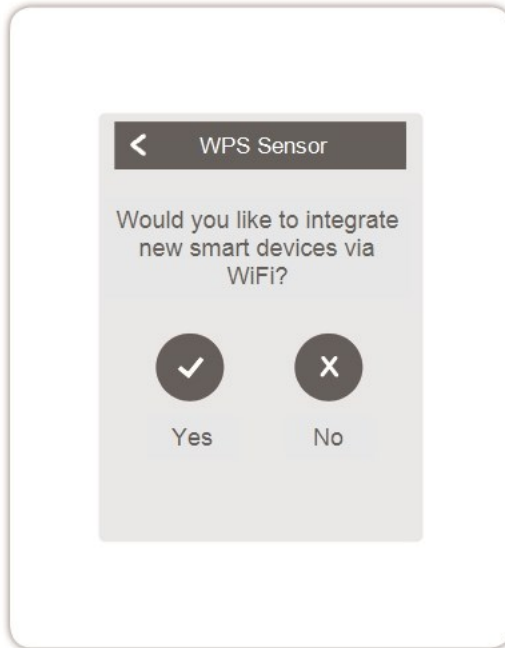
Setting the time between two Transmissions in minutes.



A transmission interval that is set too short can lead to problems with the WLAN connection with some routers.

 **Integrating devices without WiFi**

 If no WLAN is available, devices can be added to the network via the menu 'Expert -> Settings -> Devices -> Add device'.



**Service Values**

Overview > Operating mode > Menu > Expert > Service values

**Message Log**

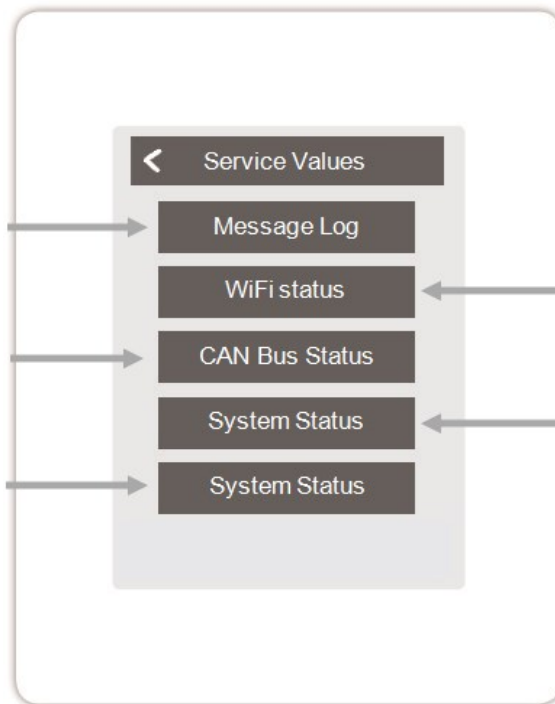
Display of the error memory

**CAN Bus Status**

CAN bus status display

**System Status**

Enables an update of all Room Controller and Control Boxes networked in the private CAN network.



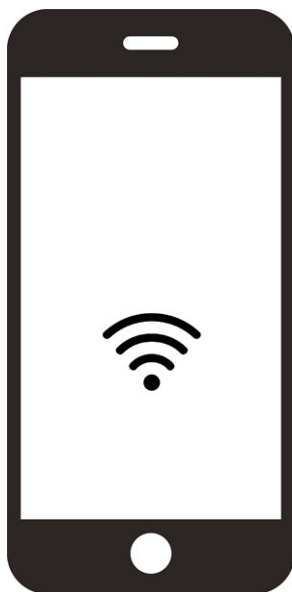
**WiFi status**









Display of the WiFi status

**System Status**

Display of the system status

**Connecting HERZ clever&smart App to the HERZ clever&smart Room Controller WiFi**



1.  Download HERZ clever&smart App app to your mobile device. Currently available on Google Play (Android) and Apple App Store (iOS).
2.  Start app and create account.
3.  Click activation link in your e-mail inbox.
4.  Connect HERZ clever&smart Room Controller with the WLAN network:  
Expert → Settings → WiFi → Choose Network
5.  Add selected e-mail address to the access list in HERZ clever&smart Room Controller:  
Expert → Settings → WiFi → "Manage Access"
6.  Log in to app with e-mail and password
- 7.a  If your HERZ clever&smart Room Controller WiFi is located in the same WiFi network as your mobile device, you can activate it by clicking the "Done! Search HERZ clever&smart Room Controller on WiFi to connect to each other.
- 7.b  If the devices are not in the same WiFi network, click the "Enter device address manually" button. The device address is displayed automatically during commissioning or you can find it in the menu under : Expert → Settings → WiFi → WiFi status

## Tips

<b>Interface Mode</b> see "Settings" on page 22	Menu > Expert > Settings > Interface mode Provides the option to restrict the menu against unintentional use, for example, by hotel guests or children.
<b>Download firmware updates via WiFi (only with HERZ clever&amp;smart Room Controller WiFi)</b> see "Devices" on page 23	Offers the possibility to update HERZ clever&smart Room Controller and HERZ clever&smart Control Box Heating in the network to the latest version. HERZ clever&smart Control Box Heating: Menu > Expert > Settings > Devices > HERZ clever&smart Control Box Heating > Firmware HERZ clever&smart Room Controller: Menu > Expert > Service values > System update, start update on each HERZ clever&smart Room Controller. It is recommended to check for the availability of system update from HERZ clever&smart Room Controller and HERZ clever&smart Control Box Heating during installation.
<b>Insulation factor</b> see "Functions Control Box" on page 26	Menu > Expert > Settings > Control Box > Heating circuit > Insulation factor Provides the option to adapt the flow temperature calculation performed by the controller to the insulation of your building.
<b>Additional functions</b>	<ul style="list-style-type: none"> <li>• Menu &gt; Expert &gt; Settings &gt; Control Box</li> <li>• Overview of all available additional functions (on the HERZ clever&amp;smart Room Controller configuring the HERZ clever&amp;smart Control Box Heating, all HERZ clever&amp;smart Control Box Heating functions are displayed. At all other HERZ clever&amp;smart Room Controller, only local functions of the HERZ clever&amp;smart Room Controller are displayed).</li> <li>• Setting options for the selected function see "Functions Control Box" on page 26.</li> <li>• Select function and free switching output to activate function.</li> </ul>
<b>HERZ clever&amp;smart App (only with HERZ clever&amp;smart Room Controller WiFi)</b> see "Connecting HERZ clever&smart App to the HERZ clever&smart Room Controller WiFi" on page 38	Offers the possibility to operate the HERZ clever&smart Room Controller via app.

## Support

Event	Support
<b>Devices or sensors are missing from the device or sensor lists although they are connected.</b>	Has a search for connected devices been carried out under Settings > Devices > Add Device? Has the electrical connection been implemented as described in the operating instructions? Is the bus connection properly installed? see "Wiring structures" on page 10
<b>A specific sensor is not found, fluctuating sensor values</b>	Check wiring, check correct connection. Measure the voltage at the sensor (supply voltage 5 V DC), install the 1-Wire repeater / extender if necessary, carry out the system update.
<b>No sensor is found</b>	Check wiring, disconnect 1-Wire sensors, start with the last sensor in the series. Pay attention to when a sensor is displayed. Measure the voltage at the last sensor (supply voltage 5 V DC), install 1-Wire repeater / extender if necessary, carry out system update.
<b>Two smart devices cannot be connected</b>	Is the routing mode activated? Settings > WiFi > Access Point -> Activate / deactivate Routing Mode



**Final Declaration**

Although these instructions have been created with the greatest possible care, the possibility of incorrect or incomplete information cannot be excluded. Subject as a basic principle to errors and technical changes.

Herz Armaturen Ges.m.b.H.  
Richard-Strauss-Straße 22  
1230 Vienna, Austria  
+43 (0) 1 616 26 31 - 0  
office@herz.eu  
www.herz-armaturen.at

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