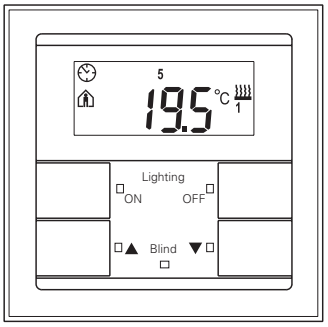
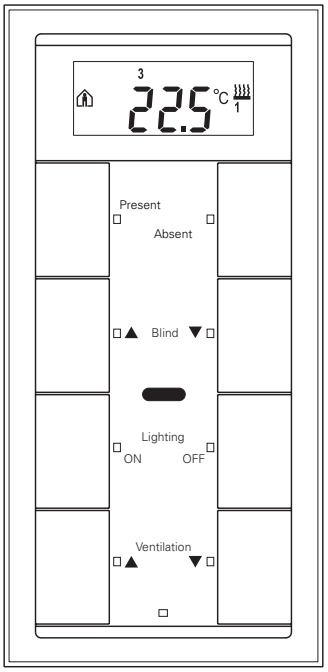
System M multi-function push-button, 2-gang, with room temperature control unit



Colour	Article no.
white	623244
polar white	623219
anthracite	623214
aluminium	623260
white, glossy	627344
polar white, glossy	627319
active white, glossy	627325

System M multi-function push-button, 4-gang, with room temperature control unit



Colour	Article no.
white	623644
polar white	623619
anthracite	623614
aluminium	623660
white, glossy	627444
polar white, glossy	627419
active white, glossy	627425

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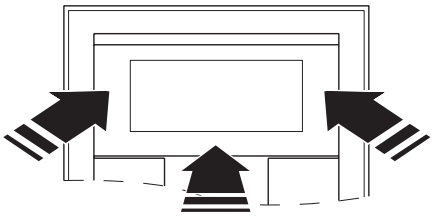
1. Function

The Merten multi-function push-button with the room temperature control unit (called **"push-button"** in the following) gives you four (2-gang push-button) or eight (4-gang push-button) operating surfaces. The push-buttons can be assigned different functions so that you can switch, dim, control the blinds or retrieve scenes, for example. Moreover, it has an integrated room temperature control unit with which you can implement different types of control.

The controller can be used for heating and cooling with infinitely variable KNX positioning drives, or to control switch actuators. It is fitted with a display whose cover is designed as a rocker. You can use this to make the most important settings.

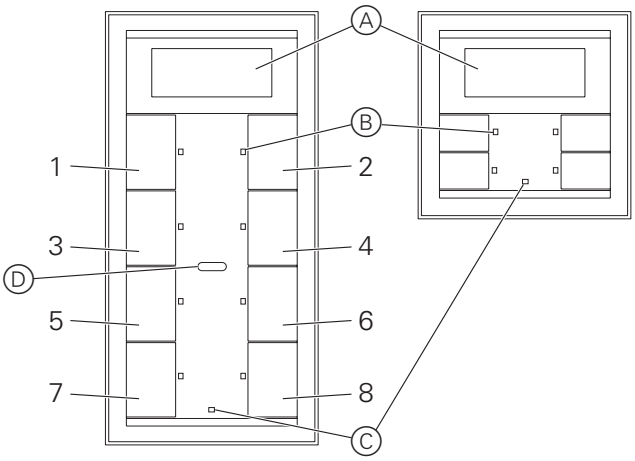


You can individually identify the keys using the labelling field in the middle. Each key has its own status LED.

The devices can signal danger and alarm situations with a bell symbol; the 4-gang push-button even has an integrated buzzer. In addition, the 4-gang push-button has an integrated IR receiver so that the push-button functions can also be triggered using Merten IR remote controls.

The push-button is connected to the KNX by attaching it onto the flush-mounted module for the multi-function push-button with the room temperature control unit (art. no. 623299, called **"flush-mounted module"** in the following), and is parameterised using the EIB tool software (ETS). The stored key functions, the behaviour of the status LEDs and the buzzer, for example, are configured in this way.

Operating and display elements:



Ⓐ Display

Ⓑ Status LED

Ⓒ Operational LED

Ⓓ IR receiver surface

1-8 Key numbering (only for 4-gang push-buttons). Pressing keys 1-8 on a Merten IR remote control triggers the function of the corresponding key on the 4-gang push-button.

2. Installation

What you need to know about the installation site

⚠ Risk of fatal injury from electric current!
All work carried out on the unit may only be performed by skilled electricians. Observe the country-specific regulations, as well as valid KNX guidelines!

In order for the integrated room temperature control unit to work best, you should keep in mind the following when selecting the right installation site:

– Mount the push-button inside the room and opposite the heat source, if possible.
– If possible, do not mount the push-button on external walls or in places where it is exposed to draught through windows and doors.
– Mount the push-button in the room in such a way that air can circulate around it easily, in other words, not between shelf units or behind curtains, for example.
– External sources of heat have a negative effect on the accuracy of the control unit. Ensure that external heat does not reach the device, e.g. due to direct sunlight or proximity of televisions, chimneys, heating pipes, dimmers, socket-outlets or other electrical loads which radiate heat.
– Mount the push-button at a height of 110-160 cm. This is where the temperature of the room air is best recorded, and the display can be easily read.

How to put the push-button into operation

① Press the programming button on the flush-mounted module.

The red programming LED lights up.

② Load down the physical address and application from the ETS into the flush-mounted module.

The red programming LED goes out.

ℹ Be sure to note the settings you have made in the ETS which are important for the user in the configuration table, since not all parameters that can be set are shown in the display of the push-button.

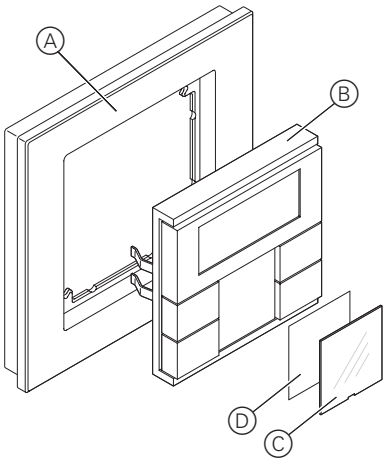
How to mount the push-button

The flush-mounted module must be installed and have a physical address.

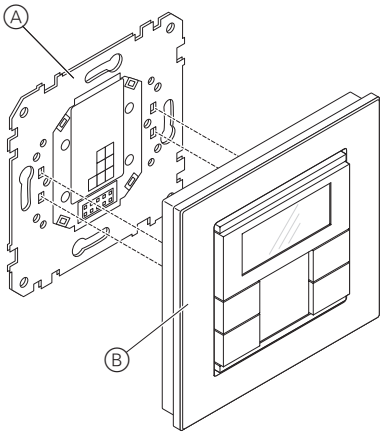
Push-button, 2-gang

You need a Merten System M frame to mount the 2-gang push-button.

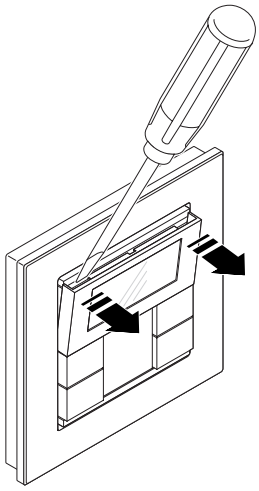
① Insert the push-button (B) into the frame (A).



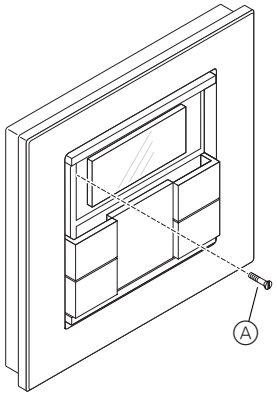
② Attach the push-button with the frame (B) onto the flush-mounted module (A). Ensure that the contact pins on the back are not bent, but fit cleanly into the pin strip of the flush-mounted module.



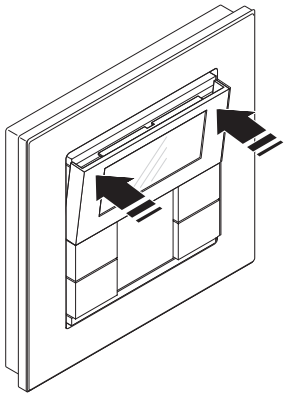
③ Lever the display cover carefully from the housing on the left and right of the upper side using a flat screwdriver.



④ To protect the device against dismounting, secure the push-button to the retaining ring of the flush-mounted module with the screw (A) provided.



⑤ Place the display cover in the housing bottom first, pressing it firmly left and right simultaneously.



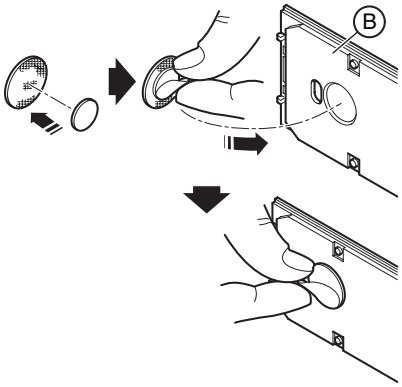
Now you can mark the labelling field (see below).

Note on dismounting:
In order to be able to remove the push-button from the flush-mounted module, you first have to remove the screw (dismounting safety feature).

4-gang push-button

To mount the 4-gang push-button, you need a Merten 2-gang frame without central bridge piece, M-PLAN (art. no. 5873 ..) design. Installation is not possible with any other frame.

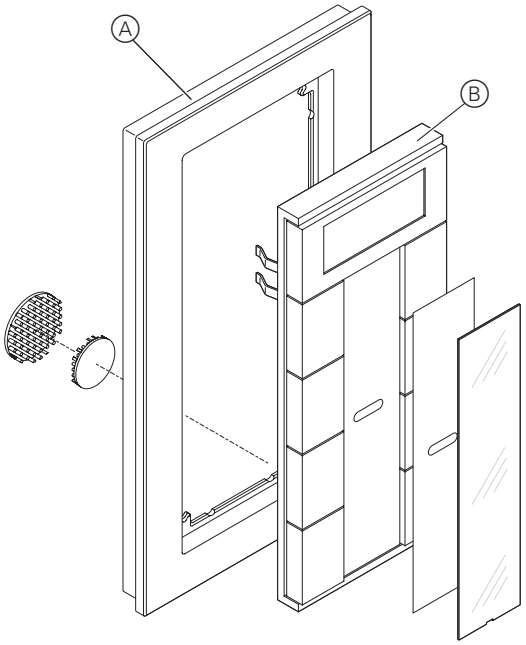
① Stick the two Velcro stickers together with the smaller in the centre of the larger.



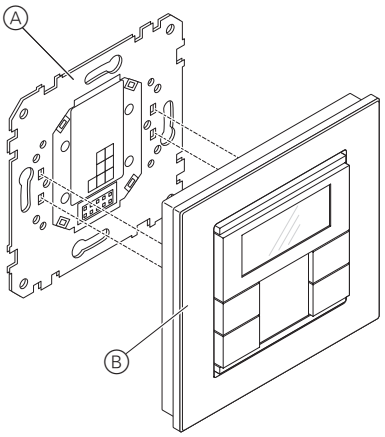
② Remove the adhesive surface of the smaller sticker and stick it in the recess on the back of the push-button housing.

③ Remove the adhesive surface of the larger sticker.

④ Insert the push-button (B) into the frame (A).

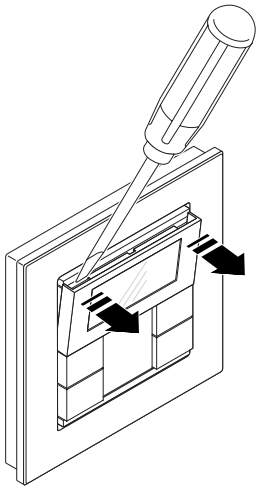


⑤ In the same way as the 2-gang push-button: Attach the push-button with the frame (B) onto the flush-mounted module (A). Ensure that the contact pins on the back are not bent, but fit cleanly into the pin strip of the flush-mounted module.

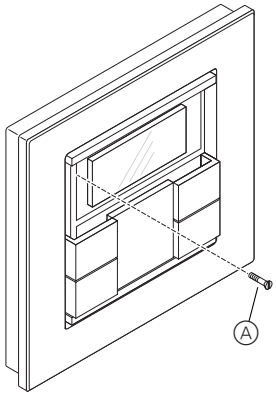


⑥ Press the lower part of the 4-gang push-button against the wall so that the velcro sticker on the back remains stuck to the wall.

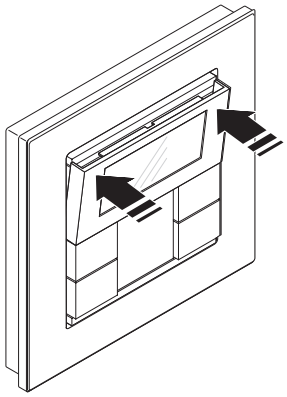
⑦ Lever the display cover carefully from the housing on the left and right of the upper side using a flat screwdriver.



⑧ To protect the device against dismounting, secure the push-button to the retaining ring of the flush-mounted module with the screw (A) provided.



⑨ Place the display cover in the housing bottom first, pressing it firmly left and right simultaneously.

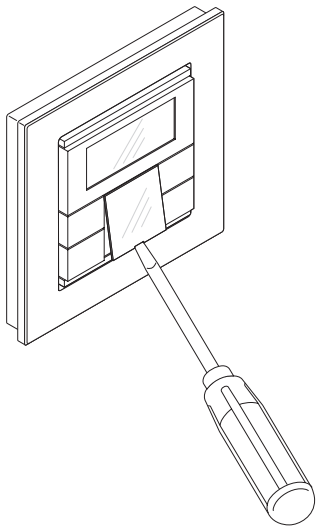


Now you can mark the labelling field (see below).

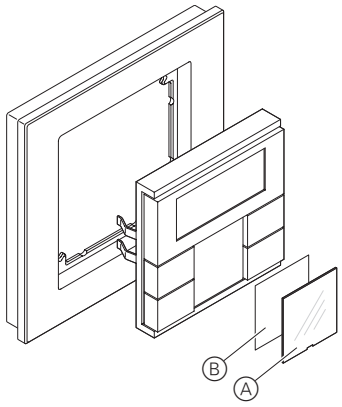
Note on dismounting:
In order to be able to remove the push-button from the flush-mounted module, you first have to remove the screw (dismounting safety feature).

How to mark the labelling field

① Open the cover of the labelling field by lifting with a flat screwdriver in the recess.

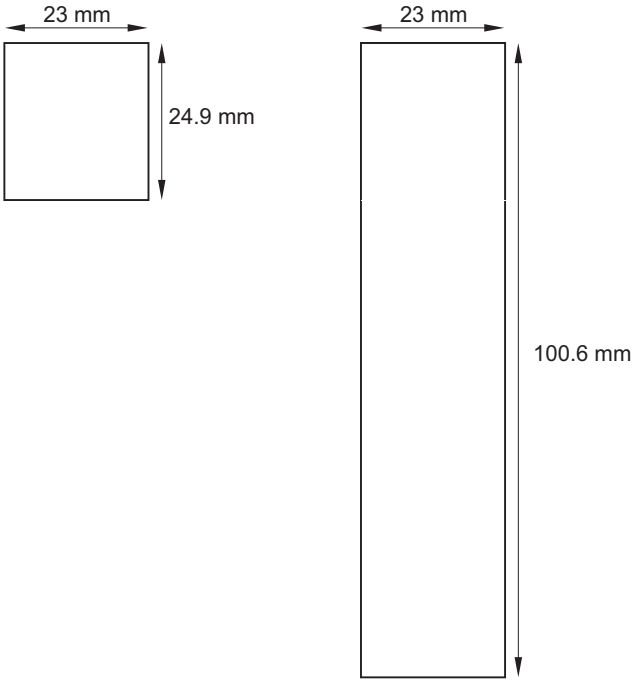


② Flip the cover (A) up and take out coloured foil strip (B).



To label foil strips, you need the Merten labelling software (art. no. 615022). You also need to download the format for the push-button from www.merten.com. With this software you can print foil strips in the format you wish.

You can also create and print corresponding foil strip templates with any layout program (for size defaults see the Figure below).



Use transparent foil strips with a maximum thickness of 0.15 mm. Consult the operating instructions of your printer to find out which type of foil strips you can print.

Only use the colour foil from Merten as a base. This ensures that the key LEDs located underneath the labelling field can shine through.

Only for 4-gang push-buttons:
Two coloured foil strip versions are provided: one with a recess in the middle for the IR receiver, and one without a recess. If you want to control the push-button from a Merten IR remote control, you have to use the coloured foil strip with recess.

If you want to close the labelling field:

① Insert the colour foil in the labelling field of the push-button. Lay the labelled transparent foil strip on top of it.

② Press the cover closed so that it clicks into the push-button.

3. Operation

What you need to know about the keypad

The keys opposite each other can be parameterised as either individual keys or a key pair. Each key has its own status LED, which depending on the preconfiguration, briefly lights up, for example, when the corresponding key is pressed.

The 4-gang push-button is equipped with an IR receiver, with which you can control the push-button with any Merten IR remote control. Pressing keys 1-8 on the remote control triggers the function of the corresponding key on the 4-gang push-button (for key assignment, see "Operating and display elements" above).

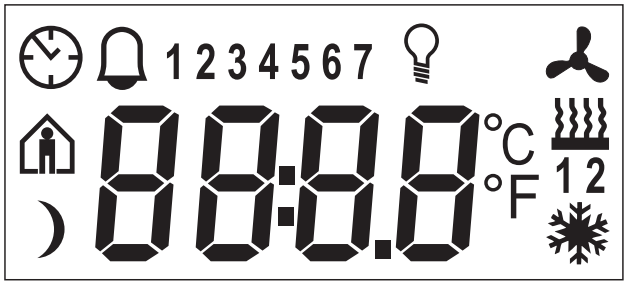
What you need to know about the room temperature control unit and display

With the integrated room temperature control unit you can control temperature in various different ways.

You can read and set important information on the display:

- Setpoint temperature
- Operating mode (comfort, standby, night, comfort extension)
- Workday/day off
- Display mode (setpoint temperature, current temperature, date etc.)
- Backlighting
- Setting time/switching time

Getting to know the display



You will see the following symbols on the display:

Comfort operation or workday. The heating is adjusted to the set comfort setpoint temperature.
The flashing symbol means that the comfort extension is active.

Standby operation or day off. The heating is adjusted to the set standby setpoint temperature.

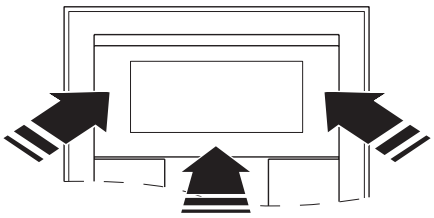
Night operation. The heating is adjusted to the set night setpoint temperature.

	Time control is active. Constant display: Time has been synchronised. Flashing display: Time has not been synchronised; the displayed time may not be accurate.
	Alarm, symbol flashing. With the 4-gang push-button an acoustic warning tone may also be emitted.
1 2 3 4 5 6 7	Weekday display / Ventilation level
	Menu command "Setting the backlighting" is activated.
	Ventilation
	Heating
	Cooling
1 2	Display under "heating" or "cooling" symbols. - For heating **or** cooling „1“: Setpoint temperature has not yet been reached. The controller is heating or cooling. „2“: Level 2 ist activated. Is only shown if two-stage heating/cooling is set. - For heating **and** cooling „1“: The controller is heating. „2“: The controller is cooling.
° C	Temperature display in degrees Celsius
° F	Temperature display in degrees Fahrenheit
88:88	Time display or value display

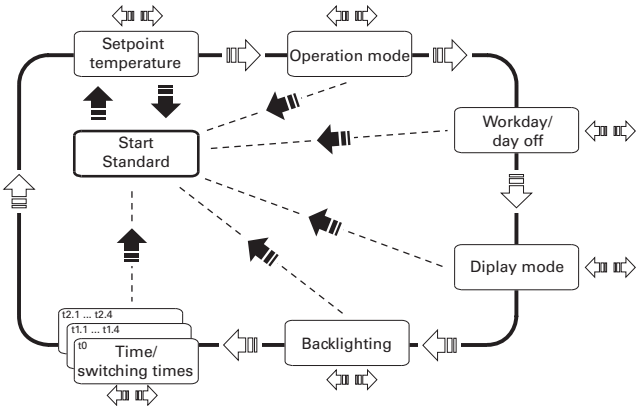
Using the control menu

There is a control menu to access the individual functions of the room temperature control unit.

A rocker with three pressure points is integrated in the cover of the display: left, centre and right. With these keys you can access the control menu, scroll backwards and forwards and change individual values.



The menu structure is shown schematically in the following diagram:

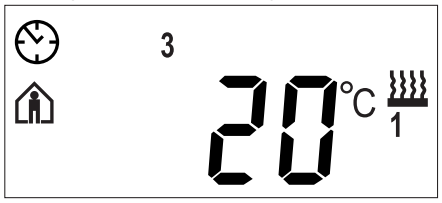


Push-button action	**Function triggered**
	This takes you to the control menu.
Centre – long push-button action	Within the menu: This saves a value and the standard display automatically reopens.
	Within the menu this opens the next menu command.
Centre – short push-button action	
	This changes the individual values in the control menu incrementally.
Left/right – short push-button action	
Left/right – long push-button action	This changes the individual values automatically (fast forward or back).

If you don't press any key within a period of approximately one minute, the room temperature control unit automatically returns to the standard display. The values before the retrieval of the menu are restored, and any changes made are **not stored**.

Standard display

Here you see an example of the standard display:



- "Comfort" operating mode
- Actual temperature **20°C**
- Heating is active in order to reach the comfort setpoint temperature
- Clock symbol is permanently displayed: time has been synchronised with the time switch (e.g., Merten's year time switch REG-K).
  Clock symbol flashes: Time has not (yet) been synchronised.
- Weekday display **3** = Wednesday

Note that the display of the weekday depends on the presettings (ETS -> card "Display" corresponds to parameter "Display '1'").

Setting the setpoint temperature

From the standard display:

1x centre key - long push-button action

The menu command "Set setpoint temperature" is shown with the value last set, for example 24°C.

You see the setpoint temperature of the currently active operating mode (comfort, standby or night, in each case either for heating or cooling). You can only change this setpoint temperature. To change the setpoint temperature of a different operating mode, you must first change the operating mode.

Depending on the preset option, this new setpoint temperature is only valid until the next change in the operating mode, or is permanently valid.

Depending on the setting, you can only change the values within the defined limits (offset), for example within a minimum of 16°C and a maximum of 26°C. You cannot set a value below or above these limit values.

If the appropriate setting has been made, the 4-gang push-button emits a warning tone as soon as you try to exceed these limit values.

① You can change the value in 0.5 degree increments by pressing the left or right key on the display.

② Store the required new setpoint temperature by a long push-button action on the centre key.

The new setpoint temperature is stored; the standard display reopens.

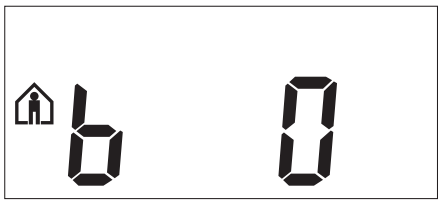
Setting the operating mode

From the standard display:

1x centre key - long push-button action

1x centre key - short push-button action

The "Set operating mode" menu command is shown with the last operating mode set and the corresponding symbol, for example, b 2, house with person = operating mode (b = base mode) "comfort".



① Change to the next operating mode by pressing the left or right key on the display.

② Store the required new operating mode with a long push-button action on the central key.

- b 0 = Night operation
  The heating is set to the night setpoint temperature (e.g. 15°C).
- b 1 = Standby operation
  Select this operating mode when you are not in the room over a longer period of time. The heating is set to the standby setpoint temperature (e.g. 18°C).
- b 2 = Comfort mode
  Select this operating mode if you are staying in the room. The heating is set to the comfort setpoint temperature (e.g. 21°C).
- b 3 = Comfort extension
  Select this operating mode if you want to suppress the night operation temporarily. The heating is set to the comfort setpoint temperature. (e.g. 21°C).

The new operating mode is stored; the standard display can be seen.

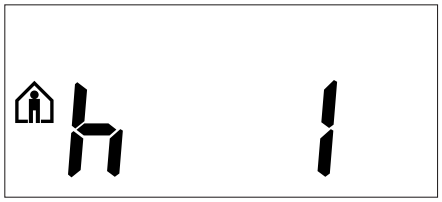
Setting workday/day off

From the standard display:

1x centre key - long push-button action

2x centre key - short push-button action

The "Set workday/day off" menu command is shown, for example, h 1 = Working day (h = here).



You can set the room temperature control unit with an external time switch in such a way that certain weekdays are considered as workdays (e.g. Mon-Fri), and others as days off. Depending on the setting, the heating can be reduced, for example, on non-working days during the day, in order to save energy. If you nevertheless want to heat the room on a day considered a day off or vice versa, you can make the appropriate setting here.

① Change between a day off and a workday by pressing the left or right button on the display.

② Store the required new setting by a long push-button action on the central key.

– h 0 = Day off
– h 1 = Workday

The new setting is stored; the standard display is shown.

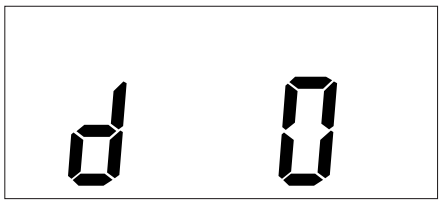
Setting the display mode

From the standard display:

1x centre key - long push-button action

3x centre key - short push-button action

The "Set display mode" menu command is shown with the display mode last set, for example, d 0 = actual temperature (d = display).



With this menu command you can specify which values you want to see in the standard display view.

① Change to the required display mode by pressing the left or right key on the display.

② Store the required new setting by a long push-button action on the central key.

– d 0 = Actual temperature (without decimal point)
– d 1 = Setpoint temperature (to 0.5 degree accuracy)
– d 2 = Temperatur from external temperature sensor
– d 3 = Date
– d 4 = Time
– d 5 = Ventilation level
– d 6 = Date and time alternately
– d 7 = Date, time and ventilation level alternately
– d 8 = Actual and setpoint temperature alternately
– d 9 = Actual/setpoint temperature and time (alternating)
– d10 = Actual/setpoint temperature and ventilation level alternately
– d11 = Temperatur from external temperature sensor and actual temperature
– d12 = Temperatur from external temperature sensor, actual temperature and time (alternating)
– d13 = Actual/setpoint temperature, date and time (alternating)
– d14 = Actual/setpoint temperature, ventilation level and time (alternating)
– d15 = Temperatur from external temperature sensor, actual temperature, ventilation level and time (alternating)

The new setting is stored; the standard display is shown.

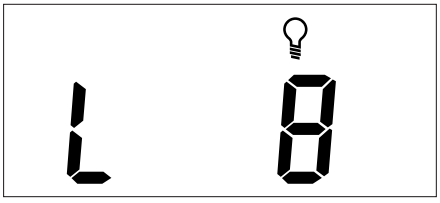
Setting background illumination

From the standard display:

1x centre key - long push-button action

4x centre key - short push-button action

The "Set backlighting" menu command is shown with the brightness level last set, for example, L 8 = brightness level 8 (l = luminosity).



① Change to the required brightness level 1 (dark) to 10 (light) by pressing the left or right key on the display.

② Store the required new setting by a long push-button action on the central key.

The new brightness level is stored; the standard display is shown.

Setting the internal time and switching times

From the standard display:

1x centre key - long push-button action

5x centre key - short push-button action

The clock symbol and "t 0" are displayed (t = time).

You can now scroll through with the left or right display key to adjust the time or switching times:

- **t 0** = time (either transmitted from the external time switch or from the internal clock)
- **t 1.1** to **t 1.4** = time channel 1, switching time 1-4
- **t 2.1** to **t 2.4** = time channel 2, switching time 1-4

If the time is updated by an external time switch, the updated time is displayed here. If you change this time manually, it will be overwritten again by the time switch during the next update.

The control menu allows you to adjust only the switching times which have been preprogrammed via the ETS. Switching times which are not defined in the ETS are shown when they are called up in the display with "**--:--** " and cannot be set using the keys on the display.

① Press the left or right key on the display to set the required time (t...).

② Press the centre key **for a long time**. The hour display for the selected time/switching time starts to flash.

③ Press the left or right key on the display to set the hours as required (short push-button action = step-by-step adjustment, long push-button action = continuous adjustment).

④ Press the centre key **briefly**. The minute digits now flash.

⑤ Press the left or right key on the display to set the minutes as required (short push-button action = step-by-step adjustment, long push-button action = continuous adjustment).

⑥ Press the centre key **briefly**. The set time (t...) appears again.

⑦ Store the required new setting by pressing the centre button for a **long period**.

The new time/switching time is saved; the standard display is shown.

We recommend that you synchronise the time via an external time switch to guarantee precision over a long period of time.

Selecting the setpoint temperature or operation mode directly

You can define in ETS whether you retrieve and adjust the setpoint temperature or operating mode directly by a right/left push-button action or whether none of these functions is activated.

If this function is activated:

① 1 x right/left key - short push-button action

The menu command "Set setpoint temperature" or "Set operating mode" is displayed with the last set value. Change the value by pressing the left or right key on the display. The value is adopted directly. It is not necessary to store it. After approximately five seconds the room temperature control unit returns automatically to the standard display.

Other displays

- ER...
  This signal is shown together with an error number when an error occurs, e.g. after an initialisation or power failure, or if the actual temperature is not correctly recorded, for example.
- A 1 ... A 5
  This signal is shown during the initialisation phase (for approx. 1 minute). No action is necessary.

4. Technical data

Initialisation:	Due to the limitation of the telegram rate, a telegram cannot be generated until at least 17 sec. after the initialisation.
Display elements:	Green LED to indicate that the device is ready, can be switched off via parameters. 4 status LEDs (art. no. 6232.., 6273..) 8 status LEDs (art. no. 6236.., 6274..) Display Piezo buzzer (art. no. 6236.., 6274..)
Operating elements:	4 keys (art. no. 6232.., 6273..) 8 keys (art. no. 6236.., 6274..) 3 keys to navigate menu IR receiver (art. no. 6236.., 6274..)
Power supply:	from flush-mounted module
Connection:	PEI, 10-pole pin strip
Ambient temperature:	
Operation	-5°C to +45°C
Storage	-25°C to +55°C
Transport	-25°C to +70°C
Max. humidity:	93 %
Measuring accuracy::	± 1 K, depending on installation site, offset can be parameterised
Type of controller:	2-step control continuous PI control switching PI control (PWM)
Controller mode:	Heating with one controller output Cooling with one controller output Heating and cooling with separate controller outputs 2-step heating with 2 controller outputs 2-step cooling with 2 controller outputs
Type of protection:	IP 20

5. Settings in the EIB tool software

Selection in the product database

Manufacturer:	Merten	
Product family:	1.5	Multifunction Push Button
Product type:	1.5.06	System M
Name of range:	Multifunction with RTCU and fan coil 1814/3.1	
Media type:	Twisted Pair	
Product name:	System M multi-function push-button 2-gang with RTCU	
Order number:	6232xx 6273xx	
Product name:	System M multi-function push-button 4-gang with RTCU	
Order number:	6236 xx 6274xx	

Manufacturer:	Merten	
Product family:	7.1	Heating/Single Room Thermostat
Product type:	7.1.17	System M thermostat
Name of range:	Multifunction with RTCU and fan coil 1814/3.1	
Media type:	Twisted Pair	
Product name:	System M multi-function push-button 2-gang with RTCU	
Order number:	6232xx 6273xx	
Product name:	System M multi-function push-button 4-gang with RTCU	
Order number:	6236xx 6274xx	

To guarantee the full functionality of the applications under ETS2, the ETS2 program from version 1.2 onwards and Service Release A or higher should be used. If you have any queries, please contact the Merten InfoLine.

6. Application overview

To operate the multi-function push-button with flush-mounted module (art. no. 623299) you can select the following applications:

Application	Vers.	Function
Multifunction with RTCU and fan coil 1814/3.1	1	Transmit 1/8 bit toggle commands via 1 or 2 objects
		Transmit 1/8 bit switching commands via 1 or 2 objects
		Transmit dimming commands with parameterisable dimming steps
		Transmit blind control commands or positioning values
		Transmit 1 bit, 2 bit (priority control) or 1 byte pulse edge commands via 2 objects
		Transmit 1 bit, 2 bit (priority control) or 1 byte pulse edge commands via 2 objects - extended functions
		Transmit 2 byte pulse edge commands via 1 object
		Transmit 2 byte pulse edge commands via 1 object - extended functions
		8 bit slide rule
		Transmit scene commands
		Transmit scene commands – extended
		Status response
		Operating display
		Acoustic key acknowledgement (with 4-gang push-button)
		IR range (with 4-gang push-button)
		Display/control menu
		Disable function
		Time control
		Behaviour on omission of synchronisation
		Scene function
		Heating; cooling; heating and cooling
		2-stage heating; 2-stage cooling
		PI control; 2-step control
		Continuous actuating signal (8 bit) or switching pulse-width-modulated actuating signal (1 bit)
		Comfort extension
		Detection of temperature drop
		Alarm function
		Preconfiguring the operating mode after a reset
		Fan speeds

6.0.1 Multi-function with RTCU 1814/3.1

General

Application 1814/3.1 has been developed for the multi-function push-button with RTCU. The multi-function push-button with RTCU is a convenient push-button with: time control, scene functions, temperature control, disable functions, and various display functions.

With this application, two objects are available per push-button.

The "push-button pair" concept is not applied here - in other words, you can parameterise the push-buttons independently of each other. Previously, for example, one switch object would appear in the ETS for one switching function per "push-button pair". In order to realise the same function with this software, you must connect two switch objects belonging to the two push-buttons in question in the ETS.

Group addresses are managed dynamically. Maximum no. of group addresses and associations: 150.

Device selection:

First you must adapt the application to the hardware used, since when the device selection is toggled, parameter settings and related group addresses are changed by the ETS. Select the "2-gang" or "4-gang" setting for multi-function push-buttons for System M or System Design. Select the "3-gang" setting for the Plantec multi-function push-button.

Parameter

General	
Parameter	**Setting**
Multi-function push-button with RTCU	2-gang
	3-gang
	4-gang
Operational LED (only visible for 2-gang or 4-gang setting)	**Switched on**
	Switched off
Acoustic push-button acknowledgement	**Switched on**
	Switched off
IR range	**1 - 8**, 11 - 18, 21 - 28, 31 - 38, 41 - 48

● Push-button info

The push-button info lets you see which designations are used in the ETS for the push-buttons on the multi-function push-button. The designations cannot be changed.

● Setting the display

Here you can make all the settings required for the multi-function push-button display. You can disable the control menu so that the display push-buttons cannot be used to make further changes to the settings.

You can specify the content of the display (actual value, setpoint, time, date, external temperature, and fan speed). You can display these values either individually or in alternation. You can also set the display rhythm for alternating displays. The display mode can also be set using the control menu on the push-button.

For the weekday display, you can set day "1". This means that the first weekday can be defined as: Friday, Saturday, Sunday or Monday. Each weekday is then shown in the display with a different number accordingly. You can also set the time format.

You can set the unit of temperature display (degrees/ Fahrenheit).

The first operating level is shown when the controller is switched on ("General controller" tab - "Controller"). Here, you can set the setpoint adjustment, operation mode adjustment or no adjustment by brief push-button action on the display push-button.

The background lighting on the display can either be switched off or on at all times, or can be switched on during operation. You can also set the persistence period and the brightness of the background lighting.

The parameters for the background lighting and display mode set here can be changed using the display push-buttons on the multi-function push-button (see operating instructions).

Parameter

Display	
Parameter	**Setting**
Enable control menu	**Yes**
	No
Display mode	**Actual temperature**
	Setpoint temperature
	External temperature
	Date
	Time
	Fan speed
	Date/time
	Date, time, fan speed
	Actual temperature, setpoint temperature
	Actual temperature, setpoint temperature, time
	Actual temperature, setpoint temperature, fan speed
	External temperature, actual temperature
	External temperature, actual temperature, time
	Actual temperature, setpoint temperature, date, time

Display	
Parameter	**Setting**
	Actual temperature, setpoint temperature, fan speed, time
	External temperature, actual temperature, fan speed, time
Display rhythm	3 - 10 sec., **5 sec.** preconfiguration
Time display	**00:00 ... 23:59**
	01:00 ... 12:59 (AM/PM)
Only when controller on: first control level	None
	Setpoint change
	Operation mode change
Unit of temperature display	**° C** / ° F
Display "1" corresponds to	Friday
	Saturday
	Sunday
	Monday
Background lighting	Always switched off
	Always switched on
	Switched on during operation + persistence
Persistence period in seconds (1-254)	1 - 254, **10** preconfiguration
Brightness of background lighting (1 = very dark/10 = very bright)	1 - 10, **5** preconfiguration

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Time control	Time object	3 byte	Low	WC	Receive
Time control	Date object	3 byte	Low	WC	Receive
Time control	Time request	1 bit	Low	CT	Transmit

● Transmit 1/8 bit toggle commands

You can simultaneously address two actuator groups with 1 or 8 bits.

With a 1 bit object type, the object value is first inverted with each push-button action, then transmitted to the bus, i. e. a "0" becomes a "1", and when the same push-button is pushed again, a "1" becomes a "0". The device is thus switched on and off alternately. This switching behaviour is called "toggling". An update or change to the 1 bit/1 byte object value is possible via the bus when another sensor switches the actuator (e .g. via a two-way circuit or a central command). To prevent "incorrect" toggling, you must load the status of the actuator ("1" or "0") in the push-button. To do this, connect the group address of the second sensor to the switch/value object of the multi-function push-button.

For 1 byte object types, you can set two values, which are transmitted alternately after each press.

Two objects can also be transmitted in any combination when the push-button is activated (1 bit / 1 byte).

Status indication

The status LED can

– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Flash,
– Display the status of the switch/value object. When a 1 byte object type is used, the LED lights up when value 1 is greater than zero,
– Display the status of the status feedback object.

Communication objects

You can select the following communication objects:

Per push-button:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Switch object A/B	1 bit	Low	WCT	Transmit/ receive
Push-button X	Value object A/B	1 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive

Parameter

Push-button X	
Parameter	**Setting**
Functional selection	Toggle
Number of objects	**One**
	Two
With two objects: Activation of status LED	Switched on
	Switched off
	From switch/value object A
	From switch/value object B
	From status feedback object
	For actuation = ON/release = OFF
	For prolonged actuation = ON/ release = OFF
	Flashes
	Flashes if switch/value object A not equal to 0
	Flashes if switch/value object B not equal to 0
	Flashes if switch/value object A equal to 0
	Flashes if switch/value object B equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF
Object A/B	**1 bit**
	1 byte in levels 0 % - 100 %
	1 byte infinitely 0 - 255
Value 1/2 (only for object "in levels 0 % - 100 %")	**100 %** for value 1, **0 %** for value 2
	Adjustable in steps of ten as well as 25% and 75% respectively
Value 1/2 (only for object "infinitely 0 - 255")	**255** for value 1, **0** for value 2
	Adjustable in steps of one respectively

● Transmitting 1/8 bit switching commands

You can simultaneously address two actuator groups with 1 or 8 bits.

Depending on the parameter settings, one of the following

– An ON or OFF telegram
– 1 byte values (0% - 100% in levels)
– 1 byte values (0 - 255) infinitely
– Two objects, (1 bit / 1 byte) in any combination

will be transmitted via the switch/value object whenever a push-button is pressed.

Status indication

The status LED can

– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Flash,
– Display the status of the switch/value object. When a 1 byte object type is used, the LED lights up when the value is greater than zero,
– Display the status of the status feedback object.

Communication objects

You can select the following communication objects:

Per push-button:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Switch object A/B	1 bit	Low	WCT	Transmit/ receive
Push-button X	Value object A/B	1 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive

Parameter

Push-button X	
Parameter	**Setting**
Functional selection	Switching
Number of objects	**One**
	Two
With two objects: Activation of status LED	Switched on
	Switched off
	From switch/value object A
	From switch/value object B
	From status feedback object
	Operation = ON/release = OFF
	Long operation = ON/release = OFF
	Flashes
	Flashes if switch/value object A not equal to 0
	Flashes if switch/value object B not equal to 0
	Flashes if switch/value object A equal to 0
	Flashes if switch/value object B equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF
Object A/B	**1 bit**
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0 - 255
Value (only for "1 bit" object)	**ON telegram**
	OFF telegram

Push-button X	
Parameter	**Setting**
Value (only for object "in steps 0 % - 100 %")	**100 %**
	Adjustable in steps of ten as well as 25% and 75%
Value (only for object "infinitely 0 - 255")	**255**
	Adjustable in single steps

● Dimming

You can use the dimming function for the following:

– Dim brighter **and** darker via **one push-button** (single-button dimming)
– Either dim brighter **or** darker. You need a second push-button to dim in the other direction (two-button dimming).

Common parameters for single-button and two-button dimming

You can use the corresponding push-button to switch the light on or off (brief press) or dim it (longer press, the exact period can be parameterised). During switching, an ON/OFF telegram is transmitted via the switch object. When dimming, dimming up or dimming down is carried out via the 4 bit dimming object; the parameters for the dimming steps can be set. You can also transmit the corresponding dimming step cyclically for a period of time which can be set as required.

Push-button X	
Parameter	**Setting**
Functional selection	Dimming
Detection of actuation time from 100 ms * factor (4-250)	4 - 250, **6** preconfiguration
Activation of status LED	Switched on
	Switched off
	From switch/value object A
	From status feedback object
	Operation = ON/release = OFF
	Long operation = ON/release = OFF
	Flashes
	Flashes if switch/value object A not equal to 0
	Flashes if switch/value object A equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF
Dimming direction	Brighter
	Darker
	Brighter and darker
Cyclical transmission of the dimming levels	Yes
	No

Push-button X	
Parameter	**Setting**
Only with cyclical transmission of the dimming levels: Base for cyclic interval	**0.1 second**
	1 second
	1 minute
	1 hour
	1 day
Only with cyclical transmission of the dimming steps: Factor for cyclic interval (3-255)	3 - 255, **8** preconfiguration

Additional parameters for single-button dimming

You can dim lighter or darker and also switch on or off using a single push-button.

The current switching or dimming direction is always dependent on the previous action, i. e. if switched off, pressing the push-button briefly will switch the light on and vice versa, and if the light has been dimmed up, prolonged actuation of the push-button will dim the light down again. On release after prolonged actuation, a stop telegram will be transmitted via the 4 bit dimming object, thus terminating the dimming procedure in the dimming actuator.

An update or change to the switch/object value is possible via the bus when another sensor switches or dims the actuator (e.g. via a two-way circuit or a central command). To prevent "incorrect" switching/dimming activity, you must load the state of the actuator into the push-button. To do this, connect the group address of the second sensor to the switch/dimming object of the multi-function push-button.

A single command is sufficient to cycle through the dimming range. This dimming procedure can be used for most applications. The other possible dimming levels (1/2 - 1/64 brighter or darker) dim brighter or darker by the selected level. For example, to dim from min. to max. brightness, you would need to press the push-button for a prolonged period four times in succession if the level set is 1/4.

Dimming	
Parameter	**Setting**
Dimming direction	Brighter and darker
Dimming levels (brighter)	**To max. brightness**
	1/2 brighter
	1/4 brighter
	1/8 brighter
	1/16 brighter
	1/32 brighter
	1/64 brighter
Dimming levels (darker)	**To min. brightness**
	1/2 darker
	1/4 darker
	1/8 darker
	1/16 darker
	1/32 darker
	1/64 darker

Additional parameters for two-button dimming

A single push-button is used to dim either brighter or darker and switch on or off. A second push-button for the opposite direction must be parameterised.

You can specify whether a stop telegram is to be transmitted when the push-button is released. When you have enabled the transmission of a stop telegram, a stop telegram will be transmitted via the 4 bit dimming object after prolonged actuation of the push-button, thus terminating the dimming procedure in the dimming actuator.

A single command is sufficient to cycle through the dimming range. This dimming procedure can be used for most applications. The other possible dimming steps (1/2 - 1/64 brighter or darker) dim brighter or darker by the selected step. For example, to dim from min. to max. brightness, you would need to push the push-button for a prolonged period four times in succession if the level set is 1/4.

Dimming	
Parameter	**Setting**
Dimming direction	Brighter
	Darker
For "brighter" dimming direction only: Dimming steps (brighter)	**To max. brightness**
	1/2 brighter
	1/4 brighter
	1/8 brighter
	1/16 brighter
	1/32 brighter
	1/64 brighter
For "darker" dimming direction only: Dimming steps (darker)	**To min. brightness**
	1/2 darker
	1/4 darker
	1/8 darker
	1/16 darker
	1/32 darker
	1/64 darker
Stop telegram after release	**Enabled**
	Disabled

Status indication

The status LED can

- Display the status of the switch/value object,
- Light up when pressed (for long period), and go out when released,
- Be on or off continuously,
- Flash,
- Display the status of the status feedback object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Switch object	1 bit	Low	WCT	Transmit/ receive
Push-button X	Dimming object	4 bit	Low	WCT	Transmit/ receive
push-button X	Status feedback object	1 bit	Low	WC	Receive

● Blind control

You can use the blind control function to do the following:

– Move the blind using an individual push-button and adjust the slats (single-button blind operation).
– Raise the blinds/adjust the slats using a single push-button and lower the blinds/adjust the slats using a second push-button (two-button blind operation).
– Move the blind to a pre-specified position.
– Move the blind back and forth between two previously specified positions.

Push-button X	
Parameter	**Setting**
Functional selection	Blind control
Activation of status LED	Switched on
	Switched off
	From status feedback object
	Operation = ON/release = OFF *(preconfiguration for direction of movement with positioning values)*
	Only with the direction of movement up, down, or up and down: **ON after movement telegram**
	Only for direction of movement with the following position values: Long operation = ON/release = OFF
	Flashes
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF

Blind function "up" or "down" with one push-button (two-button blind operation)

After the corresponding push-button is pressed for a short time, a stop/step telegram will be transmitted; after the push-button is activated for a prolonged period (the parameters for the exact period can be set), a movement telegram will be transmitted. With this function, you must parameterise a second push-button with the corresponding settings for blind movement in the opposite direction. Both push-buttons must be given the same group addresses.

Blind control	
Parameter	**Setting**
Detection of long activation time from 100 ms * Factor (4-250)	4 - 250, **6** preconfiguration
Direction of movement	Up
	Down

Blind function "up" or "down" with one push-button (single-button blind operation)

The current direction of movement of the blind, or the direction of the slat adjustment, always depends on the previous action, i. e. when the blind has just been moved downwards, it will move upwards the next time the push-button is activated for a long period (parameters for the period can be set).

After a stop/step telegram has been transmitted to adjust the slats, a stop/step telegram for the same direction of movement can be created by pressing the push-button again, as long as this subsequent push-button action is carried out within a time period, the parameters for which can be set. If this time period has elapsed, the direction of rotation of the slats will change when the push-button is pressed briefly.

The push-button can receive telegrams via the stop/step movement objects, and can create corresponding telegrams when the push-button is pressed, depending on the values received. An update or change to the switch/object value is possible via the bus when another sensor switches the actuator (e .g. via a two-way circuit or a central command). To prevent "incorrect" movement, you must load the status of the actuator into the push-button. To do this, connect the group address of the second sensor to the movement object of the multi-function push-button.

Blind control	
Parameter	**Setting**
Detection of long activation time from 100 ms * Factor (4-250)	4 - 250, **6** preconfiguration
Direction of movement	Up and down
Change in direction for slat adjustment from 100 ms * Factor (5-50)	5 - 50, **10** preconfiguration

Moving the blind to a pre-specified position

If the blind actuator is capable of approaching a specific position, you can define one or two positions using this function, which can be approached by the blind using 1 byte position values with a push-button action. The position values can be set in steps between 0% and 100%, or infinitely from 0-255.

When approaching a position, the set value for the blind position and the slat position is transmitted using a short (or long) push-button action.

To address two positions, enter the required blind position and slat position for both. Position value 1 is transmitted with a short push-button action, while position value 2 is transmitted with a long push-button action. No movement or stop/step objects exist with these set parameters.

Push-button X	
Parameter	**Setting**
Direction of movement	With position values
Selecting the positioning	One position (press briefly)
	Two positions (differentiation between short/long operation)
Position value 1 (short operation)	**In steps of 0% - 100%**
	Infinitely 0-255
Value for blind position	*For "in steps":* 0% - 100 % in steps of 10, **100%** preconfiguration
	For "infinitely": 0 - 255 in single steps, **255** preconfiguration
Value for slat position	For "in steps": 0 % - 100 % in steps of 10, **0 %** preconfiguration
	For "infinitely": 0 - 255 in single steps, **0** preconfiguration
Only for "two positions": Position value 2 (press for long period)	**In steps of 0% - 100%**
	Infinitely 0-255

Status indication

The status LED can

– Flash,
– Lights up when pressed, and goes out when released,
– Be on or off continuously,
– Light up when a movement telegram is transmitted,
– Display the status of the status feedback object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Stop/step object	1 bit	Low	WCT	Transmit/ receive
Push-button X	Movement object	1 bit	Low	WCT	Transmit/ receive
Push-button X	Blind position	1 byte	Low	CT	Transmit
Push-button X	Slat position	1 byte	Low	CT	Transmit
Push-button X	Status feedback object	1 bit	Low	WC	Receive

● Transmit 1 bit, 2 bit (priority control) or 1 byte edge commands

You can use these edge functions to parameterise different object actions. You can transmit one or two objects simultaneously, and select the size of the objects required (1 bit, 2 bit priority control or 1 byte in steps or infinitely) as needed. This enables you to parameterise a large number of application options.

You can specify which actions should be carried out when a push-button is pressed, and which should be carried out when a push-button is released. These actions could include:

– Transmit 1 or 0 (with 1 bit)
– Transmit value 1 or value 2 (with 2 bits or 1 byte): You can enter two values and set whether and how they are to be transmitted.
– Transmitting a value:
The object transmits the value which it has currently been given. You can therefore transfer a value e. g. with the transmitting group address which was previously received by another group address.
– Toggling:
The current object value is inverted and then transmitted. It is therefore alternately switched on and off (toggled). The value can be modified via the bus.
– No action

Push-button X	
Parameter	**Setting**
Functional selection	Edges 1 bit, 2 bit (priority), 1-byte values
Edge function	**Normal (pressed, released)**
	Extended (long and short activation)
Only for extended edge function: Detection of a long activation time from 100 ms * Factor (4-250)	4 - 250, **6** preconfiguration
Number of objects	**One**
	Two
Activation of status LED	Switched on
	Switched off
	From object A/B
	From status feedback object
	Operation = ON/release = OFF
	Long operation = ON/release = OFF
	Flashes
	Flashes when object A not equal to 0
	Flashes when object A equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF

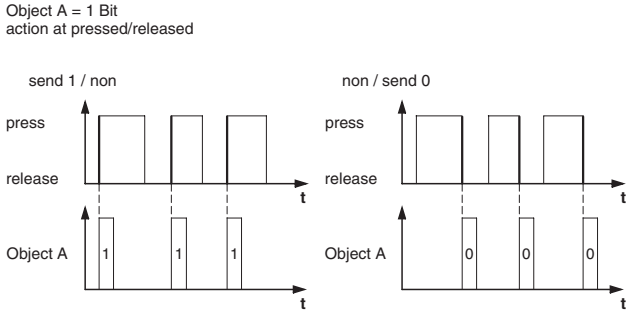
Normal edge function

With the standard edge function, you can transmit 1 bit, 2 bit priority control or 1 byte in steps or infinitely.

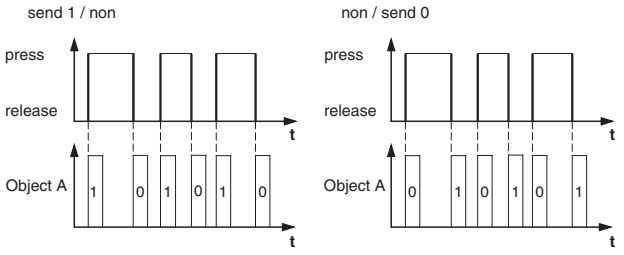
Push-button X - (object A&B)	
Parameter	**Setting**
Object A/B	**1 bit**
	2 bit (priority control)
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0 - 255
Action when activated	*Only for 1 bit:* **transmits 1**
	Only for 1 bit: transmits 0
	Only for 2 bit/1 byte: transmits value 1
	Only for 2 bit/1 byte: transmits value 2
	Toggles
	Transmits its value
	None
Action on release	*Only for 1 bit:* transmits 1
	Only for 1 bit: **transmits 0**
	Only for 2 bit/1 byte: transmits value 1
	Only for 2 bit/1 byte: transmits value 2
	Toggles
	Transmits its value
	None
Only for 2 bit (priority control): value 1/value 2	Switch on with priority control (11)
	Switch off with priority control (10)
	Remove priority control (00)
Only for 1 byte in steps 0 - 100%: value 1/value 2	0 - 100% in 10% steps **100%** preconfiguration value 1, **0%** preconfiguration value 2
Only for 1 byte infinitely 0-255: value 1/value 2	0-255 in single steps **255** preconfiguration value 1, **0** preconfiguration value 2

Principle of the edge function

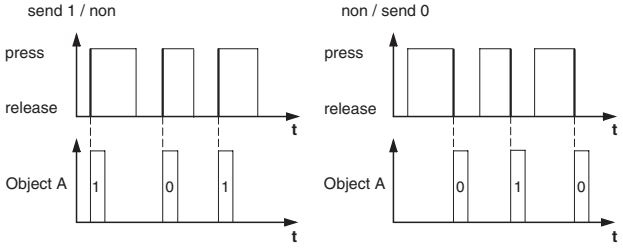
Using the following diagrams, you can see how the edge function behaves when edges rise or fall.



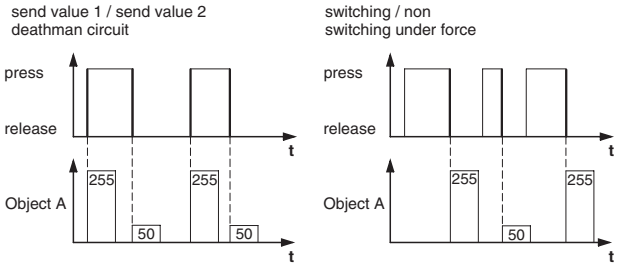
Object A = 1 Bit
action at pressed/released



Object A = 1 Bit
action at pressed/released

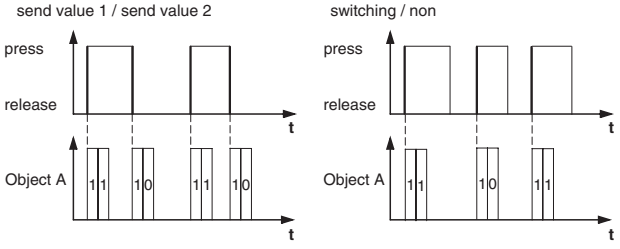


action at pressed/released



Example: Function "death man circuit" or "switching under force"

Object A = 2 Bit (guidance under force)
value 1 = 11 (switching on under force)
value 2 = 10 (switching off under force)
Action at pressed/released



Extended edge function

With the extended edge function, you have a wider range of functions available. For example, you can set different actions with a shorter or longer period of push-button pressure, which apply both when the push-button is pressed and when it is released. You can also set a cycle time which can be parameterised for each object.

When parameterising, bear in mind that you need to set all four types of push-button operation (brief/long, pressing and releasing the push-button) in order to ensure that the push-button functions as required.

Push-button X - (object A / object B)	
Parameter	**Setting**
Object A/B	**1 bit**
	2 bit (priority control)
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0 - 255

Push-button X - (object A / object B)	
Parameter	**Setting**
Direct action when activated Action on release before the long activation time has elapsed Action when the long activation time is reached Action on release after the long activation time has been completed	*Only for 1 bit:*transmits 1
	Only for 1 bit: transmits 1 immediately and then cyclically
	Only for 1 bit: transmits 1 only cyclically
	Only for 1 bit: sets object value to 1 (readable only)
	*Only for 1 bit:*transmits 0
	Only for 1 bit: transmits 0 immediately and then cyclically
	Only for 1 bit: transmits 0 only cyclically
	Only for 1 bit: sets object value to 0 (readable only)
	Only for 2 bit/1 byte: transmits value 1
	Only for 2 bit/1 byte: transmits value 1 immediately and then cyclically
	Only for 2 bit/1 byte: transmits value 1 only cyclically
	Only for 2 bit/1 byte: sets object value to value 1 (readable only)
	Only for 2 bit/1 byte: transmits value 2
	Only for 2 bit/1 byte: transmits value 2 immediately and then cyclically
	Only for 2 bit/1 byte: transmits value 2 only cyclically
	Only for 2 bit/1 byte: sets object value to value 2 (readable only)
	Toggles
	Toggles, transmits immediately, then cyclically
	Toggles, only transmits cyclically
	Toggles and is not transmitted
	Toggles cyclically, transmits immediately, then cyclically
	Toggles cyclically, only transmits cyclically
	Toggles cyclically and is not transmitted
	Only for 1 bit: transmits its value
	Only for 1 bit: transmits its value immediately and then cyclically
	Only for 1 bit: transmits 1 immediately and then transmits 0 after one cycle time
	Only for 2 bit/1 byte transmits value 1 and after a cyclic interval value 2
	Only for 1 byte increase the current object value by value 1 cyclically
	Only for 1 byte reduce the current object value by value 2 cyclically
	None (stops cyclical transmission)
	No change
	None (stop after current cycle time has elapsed)

Push-button X - (object A / object B)	
Parameter	**Setting**
Only for 2 bit (priority control): value 1/value 2	Switch on with priority control (11)
	Switch off with priority control (10)
	Remove priority control (00)
Only for 1 byte in steps 0 - 100%: value 1/value 2	0 - 100% in 10% steps **100%** preconfiguration value 1, **0%** preconfiguration value 2
Only for 1 byte infinitely 0-255: value 1/value 2	0-255 in single steps **255** preconfiguration value 1, **0** preconfiguration value 2
Base for cycle time	0.1 second
	1 second
	1 minute
	1 hour
	1 day
Factor for cyclic interval (3-255)	3-255, **10** preconfiguration

A description of the most important actions is given below:

– Transmits [value]:
transmits the current value and stops a cyclical transmission.

– Transmits [value] immediately and then cyclically:
If no cycle time is running, [value] is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, [value] is transmitted and a new cycle time is started.

– Transmits [value] only cyclically:
If no cycle time is running, [value] is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, [value] is transmitted after the current cycle time has elapsed, and a new cycle time is started.

– Sets object value to [value] (readable only)
[value] is written into the object and is not transmitted. An active cycle time is terminated.

– Toggles:
compares the current object value with [value]. If both are the same, value 1 or value 2 is transmitted. If both are different, [value] is transmitted.

– Toggles, transmits immediately, then cyclically:
The value is toggled (see "toggles") if no cycle time is running, transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the toggled value is transmitted and a new cycle time is started. Subsequently, the value which has already been toggled is always transmitted cyclically.

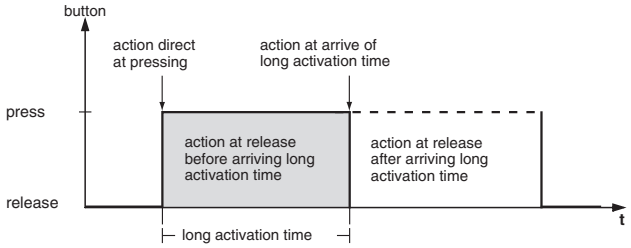
– Toggles, only transmits cyclically:
If no cycle time is running, the toggled value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the toggled value is transmitted after the current cycle time has elapsed, and a new cycle time is started. Subsequently, the value which has already been toggled is always transmitted cyclically.

– Toggles and is not transmitted:
  The toggled value is written into the object and is not transmitted. An active cycle time is terminated.
– Toggles cyclically, transmits immediately, then cyclically:
  The value is toggled (see "toggles") if no cycle time is running, transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the toggled value is transmitted and a new cycle time is started. Subsequently, it is always toggled cyclically and the new value is transmitted.
– Toggles cyclically, only transmits cyclically:
  If no cycle time is running, the toggled value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the toggled value is transmitted after the current cycle time has elapsed, and a new cycle time is started. Subsequently, it is always toggled cyclically and the new value is transmitted.
– Toggles cyclically and is not transmitted:
  The toggled value is written into the object and is **not** transmitted. Subsequently, it is always toggled cyclically and the new value is written into the object.
– Transmits its value:
  The current object value is transmitted. An active cycle time is terminated.
– Transmits its value immediately and then cyclically:
  If no cycle time is running, the current object value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the current object value is transmitted and a new cycle time is started. Subsequently, the current object value is always transmitted cyclically.
– Increases the current object value by [value] cyclically:
  If no cycle time is running, [value] is added to the current object value, the object value is transmitted, and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the current object value with [value] added is transmitted and a new cycle time is started.
– Reduces the current object value by [value] cyclically:
  If no cycle time is running, [value] is subtracted from the current object value, the object value is transmitted, and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the current object value with [value] subtracted is transmitted and a new cycle time is started.
– Transmits [value A] and after one cycle time [value B]:
  [value A] is transmitted immediately, and [value B] is transmitted after **one** cycle time, regardless of whether a cycle time is already running or not (staircase timer function).
– None (stops cyclical transmission):
  No action is carried out, and any active cycle time is stopped.
– No change:
  The current action remains unchanged (e. g. "transmits value 1 and after a cycle time, transmits value 2").
– None (stop after current cycle time has elapsed):
  No action is currently carried out, but any active cycle time is **not** stopped. It runs through until the end, and then transmits the corresponding value.

For read-only actions, the L flag must be manually set!

Examples of use for the edge function

The following activation sequence diagram shows the phases into which the edge function is divided:



Example: Staircase lighting function with cleaning light function

With a brief push-button action, the switch actuator switches on the light. A long push-button action extends the staircase lighting function (= cleaning light function) until a second, long push-button action switches off the actuator. The switch actuator requires a staircase lighting function and a disable function for this function.

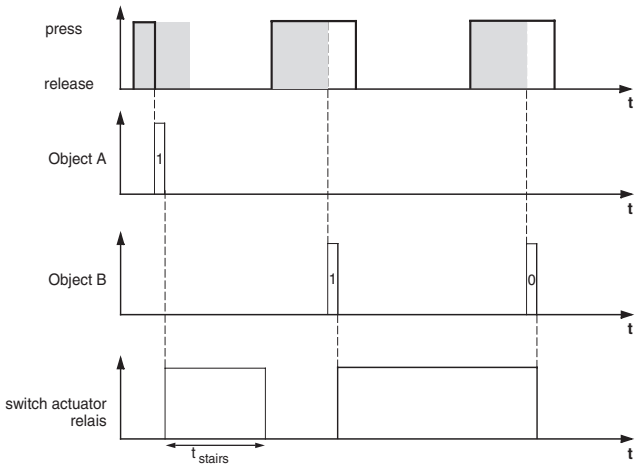
Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = transmits 1

Object B: Action on completion of the long activation time = toggles

To do this, connect object A with the switch object and object B with the disable object of the switch actuator.



Example: short and long staircase time

You can use this function to produce a brief and a long staircase time with the push-button. The switch actuator requires no staircase lighting function for this request.

With a brief push-button action, the switch actuator switches on the light, and after a parameterised cycle time (e. g. 3 minutes), it switches it back off again. With a long push-button action, the same function is carried out, but with a longer cycle time (e. g. 6 minutes).

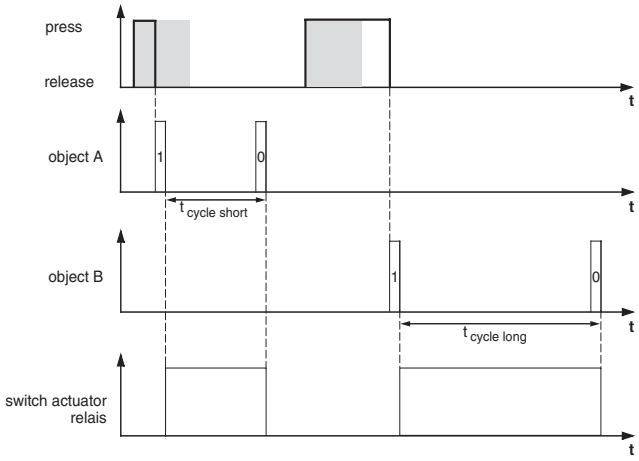
Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = transmits 1. After a cycle time has elapsed (here 3 minutes) = transmits 0

Object B: Action on release when the long activation time is completed = transmits 1. After a cycle time has elapsed (here 6 minutes) = transmits 0

To do this, connect object A and object B with the switch object of the switch actuator.



Example: Switch the light on/off permanently, or switch off after a cycle time has elapsed

With a brief push-button action, the switch actuator switches the light on or off permanently. With a long push-button action, the light switches on, and after a parameterised cycle time (e .g. 6 minutes), it switches back off again. Due to the cycle time in the push-button which can be parameterised, the switch actuator requires no staircase lighting function for this function.

Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = toggles

Object B: Action when the long activation time is completed = transmits 1. After a cycle time has elapsed (here 6 minutes) = transmits 0. Action on release when the long activation time is completed = no change.

To do this, connect object A and object B with the switch object of the switch actuator.

Example: electronic protection against theft

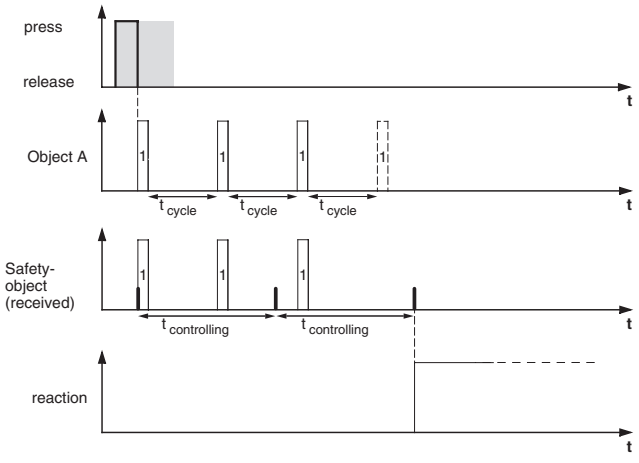
This example will show you how to program electronic theft protection for the push-button. It is activated by a brief push-button action and then transmits cyclically. As soon as the push-button is forcibly separated from the flush-mounted module, this can be shown on a display, or an alarm can be triggered.

Number of objects = 1 (object A)

Object A = 1 bit

Object A: Action on release before the long activation time has elapsed = transmits 1 immediately and then cyclically. Action when the long activation time is completed = no change. Action on release after the long activation time is completed = no change. Cycle time = e. g. 10 minutes.

To do this, connect object A with an object expecting cyclic telegrams (e. g. a safety object). The monitoring time set on the safety object must be longer than the cycle time of the push-button. If the safety object receives no telegrams from the push-button during this time, a reaction which can be parameterised is activated (e. g. the channel is switched on).



Example: Effect lighting

This example shows you how to program effect lighting, for example for a display window. A long push-button action switches between two different lighting scenes. A short push-button action stops the toggling and transmits a scene which switches off everything. The scene module of the multi-function push-button is used to retrieve the scene.

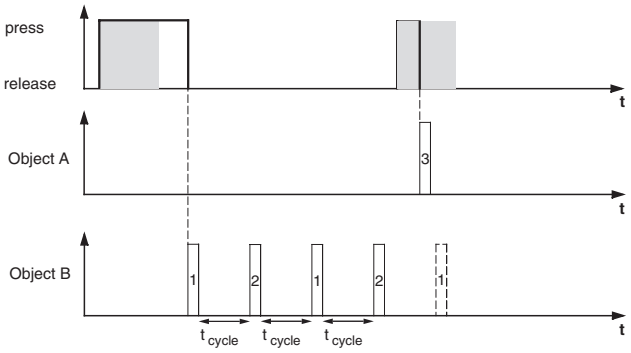
Number of objects = 2 (object A/B)

Object A/B = 1 byte infinite 0-255

Object A: Direct action when activated = none (stops cyclical transmission). Action on release before the long activation time has elapsed = transmits 1. Action when the long activation time is completed = none (stops cyclical transmission). Action on release after the long activation time is completed = none (stops cyclical transmission). Value 1 = 3.

Object B: Direct action when activated = none (stops cyclical transmission). Action on release before the long activation time has elapsed = none (stops cyclical transmission). Action when the long activation time is completed = none (stops cyclical transmission). Action on release after the long activation time has been completed = toggles cyclically, transmits immediately, then cyclically. Value 1 = 1, value 2 = 2nd cycle time = e. g. 1 minute.

To do this, connect object A and object B with the extension unit object of the scene function.



Status indication

The status LED can

– Flash,
– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Display the status of the status feedback object,
– Display the status of the switch/value object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Object A/B	1 bit	Low	WCT	Transmit/ receive
Push-button X	Object A/B	2 bit	Low	WCT	Transmit/ receive
Push-button X	Object A/B	1 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive

● Transmit 2 byte edge commands via an object

You can also use these edge functions to parameterise different object actions. However, in contrast to edge functions with 1 bit, 2 bits, 4 bits or 1 byte, you can only transmit one object .

You can transmit normal or extended edge commands. With normal edge commands, you can specify which actions should be carried out when a push-button is pressed, and which should be carried out when a push-button is released. With extended edge commands, you can also set the actions before and after the long activation time is completed.

You can transmit floating point numbers and whole numbers, without or without a sign.

Push-button X	
Parameter	**Setting**
Functional selection	Edges with 2 byte values
Edge function	**Normal (pressed, released)**
	Extended (long and short activation)
Only for extended edge function: Detection of a long activation time from 100 ms * Factor (4-250)	4 - 250, **6** preconfiguration
Activation of status LED	Switched on
	Switched off
	From status feedback object
	Operation = ON / release = OFF
	Long operation = ON/release = OFF
	Flashes
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF

Push-button X	
Parameter	**Setting**
Action when activated	**Transmits value 1**
	Only for extended edge function: transmits value 1 immediately and then cyclically
	Only for extended edge function: transmits value 1 only cyclically
	Only for extended edge function: sets object value to value 1 (readable only)
	Transmits value 2
	Only for extended edge function: transmits value 2 immediately and then cyclically
	Only for extended edge function: transmits value 2 only cyclically
	Only for extended edge function: sets object value to value 2 (readable only)
	Transmits its value
	Only for extended edge function: transmits value 1 and after a cyclic interval value 2
	Only for extended edge function: none (stops cyclical transmission)
	None
Action on release *Only for extended edge function:* Action on release before the long activation time has elapsed Action when the long activation time is reached Action on release after the long activation time has been completed	Transmits value 1
	Only for extended edge function: transmits value 1 immediately and then cyclically
	Only for extended edge function: transmits value 1 only cyclically
	Only for extended edge function: sets object value to value 1 (readable only)
	Transmits value 2
	Only for extended edge function: transmits value 2 immediately and then cyclically
	Only for extended edge function: transmits value 2 only cyclically
	Only for extended edge function: sets object value to value 2 (readable only)
	Transmits its value
	Only for extended edge function: transmits value 1 and after a cyclic interval value 2
	Only for extended edge function: **none (stops cyclical transmission)**
	None

Explanation of actions: See 1 bit edges.

Push-button X - values	
Parameter	**Setting**
Object type value	Floating point
	Whole number with sign (-32768 ... 32767)
	Whole number without sign (0 ... 65535)
Only with floating point: value 1/2 Basic value, adjustable value range in brackets	Different values between 0.01 and 327.68 in different step intervals **0.01 (0 to 20.47)** preconfiguration
Only for whole number with sign: value 1/2 (-32768 - 32767)	-32768 - 32767
Only for whole number without sign: value 1/2 (0 - 65535)	0 - 65535

Status indication

The status LED can

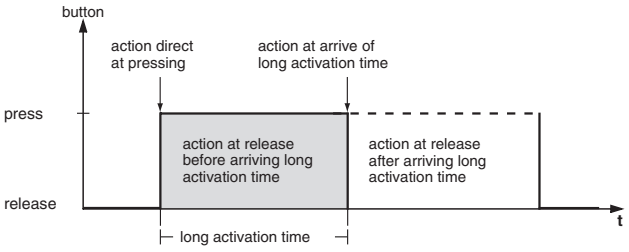
- Flash,
- Light up when pressed (for long period), and go out when released,
- Be on or off continuously,
- Display the status of the status feedback object.

For read-only actions, the L flag must be manually set!

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Object A	2 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive



● Setting the parameters for the 8 bit sliding controller

You can use the 8 bit sliding controller function to program a push-button as a sliding controller. You can parameterise all four actions when pressing/releasing with a shorter or longer operating time in each case. You can establish the function with or without limit values (start/end value).

Push-button X	
Parameter	**Setting**
Functional selection	8 bit sliding controller
Detection of long activation time from 100 ms * Factor (4-250)	4 - 250, **6** preconfiguration
Activation of status LED	Switched on
	Switched off
	From switch/value object A
	From status feedback object
	Operation = ON/release = OFF
	Long operation = ON / release = OFF
	Flashes
	Flashes if switch/value object A not equal to 0
	Flashes if switch/value object A equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	Operation = flash/release = OFF
	Long operation = flash/release = OFF

push-button 1 (2)	
Parameter	**Setting**
Sliding controller function	**With limit values**
	Without limit values
Direct action when activated Action on release before the long activation time has elapsed Action when the long activation time is reached Action on release after the long activation time has been completed	*Only for "with limit values"* Transmit value 1, then increase the cycle by the step interval
	Only for "with limit values" Transmit value 2, then reduce the cycle by the step interval
	Increase the current object value cyclically
	Increase the current object value once
	Reduce the current object value cyclically
	Reduce the current object value once
	Reverse the slide direction and transmit cyclically
	Only for "without limit values" Reverse the slide direction and cyclically increase/decrease
	Only for "with limit values" Stepwise to the limits and then back again
	Only for "with limit values" Stepwise increase within the limits
	Only for "with limit values" Stepwise decrease within the limits
	None (stops cyclical transmission)
	No change
Only for "with limit values": Value 1	0 - 255 in single steps
Step value	0 - 255 in single steps
Only for "with limit values": Value 2	0 - 255 in single steps
Base for cycle time	0.1 second
	1 second
	1 minute
	1 hour
	1 day
Factor for cyclic interval (3-255)	3 - 255 in single steps, **5** preconfiguration

A description of the actions is given below:

– Transmit value 1, then increase the cycle by the step interval:
  If no cycle time is running, value 1 is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, value 1 is transmitted and a new cycle time is started.
– Transmit value 2, then reduce the cycle by the step interval:
  If no cycle time is running, value 2 is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, value 2 is transmitted and a new cycle time is started.

– Increase the current object value cyclically:
  Increase the current object value cyclically by the parameterised step interval.
– Increase the current object value once:
  Increase the current object value once by the parameterised step interval. An active cycle time is terminated.
– Reduce the current object value cyclically:
  Reduce the current object value cyclically by the parameterised step interval.
– Reduce the current object value once:
  Reduce the current object value once by the parameterised step interval. An active cycle time is terminated.
– Reverse the slide direction and transmit cyclically:
  If no cycle time is running, the slide is pushed in the opposite direction (of this push-button) and a new cycle time is started. If a cycle time is already running, it is interrupted, the slide is immediately pushed in the opposite direction (of this push-button) and a new cycle time is started. Cyclic transmission is stopped when the maximum/ minimum value is reached.
– Reverse the slide direction and cyclically increase/ decrease:
  If no cycle time is running, the slide is pushed in the opposite direction (of this push-button) and a new cycle time is started. If a cycle time is already running, it is interrupted, the slide is immediately pushed in the opposite direction (of this push-button) and a new cycle time is started. Cyclic transmission is not stopped when the maximum/ minimum value is reached. When an incrementing value reaches the maximum value, the value is set to the minimum value and cyclic transmission continues. When an decrementing value reaches the minimum value, the value is set to the maximum value and cyclic transmission continues.
– Move step-by-step to the limit values, and then back again:
  The limit values are approached by one step interval at a time. When a limit is reached, the slide direction is reversed for the next action.
– Stepwise increment within the limits:
  The value is incremented, one step interval at a time, within the limits. The limits are not exceeded, the value is set 1 after the last possible step.
  Example: Value 1: "0", value 2: "255", step size: "100", the following values are transmitted:
  39%, 78%, 0%, 39%, 78%, 0%, etc.
– Reduce stepwise within the limits:
  The value is reduced, one step interval at a time, within the limits. The limits are not exceeded, the value is set 2 after the last possible step.
  Example: Value 1: "0", value 2: "255", step size: „100". The following values are transmitted:
  100%, 61%, 22%, 100%, 61%, 22%, etc.
– None (stops cyclical transmission):
  No action is carried out, and any active cycle time is stopped.
– No change:
  No action is carried out, and any active cycle time is continued.

You can only maintain the limit values and the toggling to a new slide direction with on-site operation!

Example: Implementing a "Step dimmer" with sliding controller function

It is possible to dim a dimmer actuator in several steps using a push-button on the multi-function push-button.

Example: push-button 1 of the multi-function push-button is used as an 8 bit sliding controller. The status LED can be controlled from the status feedback object.

① Set the 8 bit sliding controller in the "push-button 1" tab of the multi-function push-button.

② Make the following settings in the tab "Button 1(2)": Sliding controller function: "with limit values", direct action when activated: "Stepwise to the limits and then back again"; action on release or after the long activation time has been completed: "no change", value 1: "0", step size: "51"; value 2: „255". The cycle time is not required for this function.

③ Connect the push-button value object to the dimmer actuator value object.

④ Every new press of the push-button sends a new dimmer value in the steps: 20%, 40%, 60%, 80%, 100%, 80%, 60%, 40%, 20%, 0%, 20%, etc. This parameter setting implements a stepwise dimmer.

Status indication

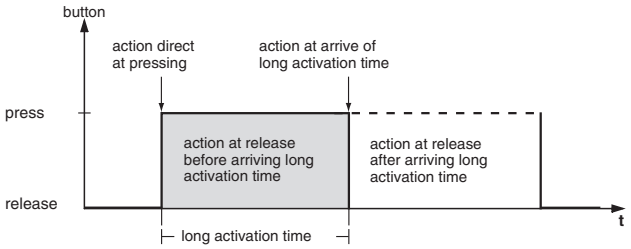
The status LED can

– Flash,
– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Display the status of the status feedback object,
– Display the status of the switch/value object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Value object	1 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive



● Scenes

Retrieving scenes by push-button does not access the internal scene module, but only accesses the bus externally via communication objects. If you therefore wish to retrieve scenes stored in the internal scene module using a push-button, you must connect the corresponding communication object with the extension unit object of the scene function.

There are two types of scene function:

– Normal
– Extended

With the standard scene function, a scene is retrieved by a brief push-button action and a long push-button action is used to save a scene. Simply set the time after which a push-button action is detected as a prolonged operation; how the status LED is to be triggered must also be set, as must the scene number.

Push-button X	
Parameter	**Setting**
Functional selection	Scene
Detection of long activation time from 100 ms * Factor (4-250)	4 - 250 in single steps, **30** preconfiguration
Scene function	**Normal (short = output/long = save)**
	Extended
Only for "extended" Number of objects	**One**
	Two
Activation of status LED	Switched on
	Switched off
	Only for "extended" from object A
	Only for "extended" from object B
	From status feedback object
	For actuation = ON/release = OFF
	For prolonged actuation = ON/ release = OFF
	Flashes
	Only for "extended" flashes when object A not equal to 0
	Only for "extended" Flashes when object B not equal to 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	For actuation = flash/release = OFF
	For prolonged actuation = flash/ release = OFF
Only with "normal scene function" Scene value (0-63)	0 - 63 in single steps

With the extended scene function, a wider range of functions are available. You can set actions for a shorter or longer activation time, for both pressing and releasing the push-buttons. You can also program a cycle time.

Depending on how many objects you have set in the scene function, you must make the settings in a tab ("key 1 - object A") or in an additional tab ("key 1 - object B):

push-button 1 - (object A/B)	
Parameter	**Setting**
Action when activated	Transmits value 1
	Transmits value 2
	Toggles
	Toggles cyclically, transmits immediately, then cyclically
	Transmits value 1 and after a cyclic interval value 2
	None (stops cyclical transmission)
	No change
Action on release before the long activation time has elapsed	**Transmits value 1**
	Transmits value 2
	Toggles
	Toggles cyclically, transmits immediately, then cyclically
	Transmits value 1 and after a cyclic interval value 2
	None (stops cyclical transmission)
	No change
Action when the long activation time is reached	Transmits value 1
	Transmits value 2
	Toggles
	Toggles cyclically, transmits immediately, then cyclically
	Transmits value 1 and after a cyclic interval value 2
	None (stops cyclical transmission)
	No change

push-button 1 - (object A/B)	
Parameter	**Setting**
Action on release after the long activation time has been completed	Transmits value 1
	Transmits value 2
	Toggles
	Toggles cyclically, transmits immediately, then cyclically
	Transmits value 1 and after a cyclic interval value 2
	None (stops cyclical transmission)
	No change
Value 1 Scene address (0-63) Value 2 Scene address (0-63)	0 - 63 in single steps
Scene value 1 should Scene value 2 should	Retrieve the scene (set by default to value 1)
	Store the scene (set by default to value 2)
Base for cycle time	0.1 second
	1 second
	1 minute
	1 hour
	1 day
Factor for cyclic interval (3-255)	3 - 255 in single steps, **10** preconfiguration

Status indication

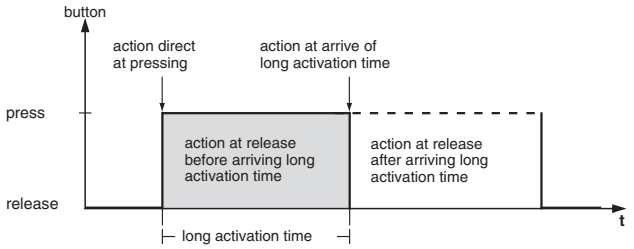
The status LED can

– Flash,
– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Display the status of the status feedback object,
– Display the status of the switch/value object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Object A	1 byte	Low	WCT	Transmit/ receive
Push-button X	Status feedback object	1 bit	Low	WC	Receive



● Parameterising scenes in the scene module

The multi-function push-button is fitted with its own scene module, which enables you to save up to eight scenes permanently. The saved scenes can be overwritten if you have parameterised a release for this purpose.

The entire scene function is controlled via the extension unit object (1 byte). You also have an object for programming release, as well as seven 1/8 bit objects and one object for values up to 16 bits, in order to transmit scene values to the bus.

You can set the time between the actuator read telegrams. This makes sense, e. g. when the anticipated response can last a long time (line coupler, area coupler).

If a read request is lost, or is not responded to, the scene from the current object value is saved (either through a read request, or written via an output). To check the correct saving procedure, you should retrieve the scene last saved on the push-button. If this remains unchanged, the individual saving procedure has been completed free of errors. If there is a difference, an incorrect response has been made to a read request.

If the multi-function push-button works through a scene, and a further scene is retrieved, the current process is interrupted and the scene last retrieved is worked through.

Scene module	
Parameter	**Setting**
Scene module	Switched on
	Switched off
Only when scene function on: Save scenes	**Enabled**
	If enable object is equal to "1"
	Disabled
Interval between two actuator read telegrams 100 ms * Factor (2-255)	2 - 255 in single steps, **10** preconfiguration

The following scene tabs only appear when the scene module is switched on.

In this tab, you can specify the data type of a maximum of five output objects. A special feature is the actuator group four, with which you can also transmit values that are larger than 8 bits.

When the alarm function is active, the fifth actuator group is no longer valid, since it is reserved for the alarm function.

Scene actuator groups	
Parameter	**Setting**
Actuator group 1-5	Switch object
	Value object (8 bit in steps)
	Value object (8 bit infinitely)
	Priority control object
	Only for actuator group 4: Value object (16 bit whole number without sign)
	Only for actuator group 4: Value object (16 bit whole number with sign)
	Only for actuator group 4: Value object (16 bit floating point value)

For each scene, you specify the code via which the scene on the scene-input object should be retrieved. You also specify the time between the individual scene telegrams.

Make sure that you always enter unique scene addresses for this device, i. e. no scene address should be allocated more than once.

Scene 1-5	
Parameter	**Setting**
Scene is retrieved with the following value (0-63)	0 - 63 in single steps
Interval between scene telegrams 100 ms * Factor (2-60)	2 - 60 in single steps

Finally, specify the actuator groups and their values for this scene. These only remain valid up to the first time the scene is saved.

The value range which can be set depends on the data type set for the "scene actuator groups".

Scene 1-5 values	
Parameter	**Setting**
Only for "Switch object" data type: value 1 to value 5	ON telegram
	OFF telegram
	Do not transmit a telegram
Only for data type "Value object (8 bit in steps)": value 1 to value 5	**Do not transmit a telegram**
	0 - 100% in 10% steps, additionally 25% and 75%
Only for data type "Value object (8 bit infinite)": value 1 to value 5	**Do not transmit a telegram**
	0 - 254 in single steps
Only for data type "Priority control object": value 1 to value 5	Switch on with priority control (11)
	Switch off with priority control (10)
	Remove priority control (00)
	Do not transmit a telegram
Only for 16 bit value object: Value 4	Transmit telegram
	Do not transmit a telegram
Only for Value object 16 bit whole number without sign: Value 4	0 - 65535
Only for Value object 16 bit whole number with sign: Value 4	-32768 - 32767
Only for 16 bit floating point value object: Value 4 Value 4 = base value * base value factor, value range in brackets	0.01 (0 to 20.47) 0.02 (0 to 40.94) 0.04 (0 to 81.88) 0.08 (0 to 163.76) 0.16 (0 to 327.52) 0.32 (0 to 655.04) 0.64 (0 to 1310.08) 1.28 (0 to 2620.16) 2.56 (0 to 5240.32) 5.12 (0 to 10480.64) 10.24 (0 to 20961.28) 20.48 (0 to 41922.56) 40.96 (0 to 83845.12) 81.92 (0 to 167690.24) 163.84 (0 to 335380.48) 327.68 (0 to 670760.96)
Only for 16 bit floating point value object: Value 4 Value 4 factor (0 - 2047)	0 to **1000** to 2047

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Scene function	Extension unit object - scene module	1 byte	Low	WC	Receive
Transmit value	Actuator group 1-5	1 byte	Low	WCT	Transmit/ receive
Transmit value	Only for actuator group 4	2 byte	Low	WCT	Transmit/ receive
Switching	Actuator group 1-5	1 bit	Low	WCT	Transmit/ receive
Priority control	Actuator group 1-5	2 bit	Low	WCT	Transmit/ receive
Save scenes	Enable object	1 bit	Low	WC	Receive

● Setpoint adjustment

A freely parameterisable push-buttonpair of the multi-function push-button can be used to implement setpoint adjustment for the integrated room temperature controller. Setpoint adjustment can also be performed over the bus, using two 1 bit objects. One object for increasinging the setpoint and one object for reducing the setpoint. With this application, the setpoint can be changed by a separate bus push-button.

Status indication

The status LED may do one of the following:

– Flash,
– Light up when pressed (for long period), and go out when released,
– Be on or off continuously,
– Display the status of the status feedback object,
– Display the status of the setpoint adjustment object.

Push-button X	
Parameter	**Setting**
Functional selection	Setpoint adjustment
Activation of status LED	Switched on
	Switched off
	From the setpoint adjustment object
	From status feedback object
	For actuation = ON/release = OFF
	Long operation = ON/release = OFF
	Flashes
	Flashes when the setpoint adjustment object is not equal to 0
	Flashes when the setpoint adjustment object equals 0
	Flashes if status feedback object equal to 1
	Flashes if status feedback object equal to 0
	For actuation = flash/release = OFF
	Long operation = flash/release = OFF
Setpoint adjustment	**Increase setpoint**
	Reduce setpoint
Setpoint adjustment step size	**0.5 K**
	1 K

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Push-button X	Increase setpoint	1 bit	Low	WCT	Transmit/ receive
Push-button X	Reduce setpoint	1 bit	Low	WCT	Transmit/ receive

● Activating the disable function

You can use the disable function to disable the multi-function push-button (not the display push-buttons) in three different ways:

1. Separately for each push-button
2. All push-buttons function as master push-buttons
3. Toggle between two local scenes

You can determine whether disable object = 0 or = 1 should be disabled. You can also parameterise disabling on the display push-buttons separately.

Disable function	
Parameter	**Setting**
Disable function	**Enabled**
	Disabled
Block	For object value "0"
	For object value "1"
Type of blocking	Separately for each push-button
	All push-buttons function as master push-buttons
	Toggle between two local scenes
Disable function for the display push-button	**Switched on**
	Switched off

Separately for each push-button

You can use this function to disable each of the four or eight multi-function push-buttons individually. When a push-button is disabled, it does not execute a function when pressed.

Disable function push-buttons	
Parameter	**Setting**
Push-button X - (integrate disable function)	**Disable**
	Do not disable

All push-buttons function as master push-buttons

You can use this function to specify one of the four, six (Plantec) or eight multi-function push-buttons as a master push-button. When any push-button (not display push-buttons) is pressed, the function which has been parameterised for the master push-button is carried out.

Disable function	
Parameter	**Setting**
Master push-button =	Push-button 1 to 4, or push-button 6, or up to push-button 8

Toggle between two local scenes

You can use this function to disable all multi-function push-buttons. Specify two local scenes. When any push-button is pressed, one or the other scene is retrieved in alternation.

The scene numbers entered must be known to the internal scene module of the multi-function push-button, and must be identical to the scene numbers in the module. The scene numbers entered with this function are not transmitted to the bus.

Disable function	
Parameter	**Setting**
Toggle between scene address	0 - 63
and scene address	0 - 63

Disable function for the display push-button

You can use this function to disable all display push-buttons.

Disable function	
Parameter	**Setting**
Disable function for the display push-button	**Switched on**
	Switched off

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Disable function	Disable object	1 bit	Low	WC	Receive

When a disable function is activated via the disable object, all current push-button functions (including cyclical actions) are suppressed.

● Activating the alarm function

The multi-function push-button can show you different alarm situations via the alarm function, using the bell symbol on the display, the flashing status LEDs and via alarm buzzer for the 3-gang and 4-gang push-buttons. When an alarm is issued, a "1" is transmitted to the bus via the alarm object, and a "0" is transmitted after the alarm. The alarm object can (e.g.) be set to "1" by another sensor and the push-button reacts as parameterised.

As soon as you switch on the alarm function, only four scene objects remain available, since the fifth scene object is then used for the alarm function.

You can parameterise the push-button in such a way that an alarm is triggered when the specified limits for the setpoint adjustment on the display are not reached/exceeded. You can also set the alarm to triggered when the actual temperature exceeds or fails to reach a preconfigured value.

You can specify whether an alarm should be displayed via a flashing display, or whether an acoustic signal should also be given with 3-gang and 4-gang push-buttons. For this purpose, you can set the duration of the alarm (1 to 254 seconds).

Alarm function	
Parameter	**Setting**
Alarm function	**Switched off**
	Switched on
Give signal when the upper/lower limit is reached for the setpoint adjustment	**Yes**
	No
Alarm signal acoustic No signal with 2-gang push-button!	Flashing display only
	Flashing display and acoustic
Only when alarm signal "flashing and acoustic": the acoustic alarm stops	**After an alarm duration which can be parameterised**
	When actual temp. is within the limits again
For "set alarm duration" only: Alarm duration Factor (1-254) x sec	1-254, **60** preconfiguration
Give signal when actual temp. is above	20.0 °C = 68.0 °F to 40.0 °C = 104.0 °F in 1 degree steps
	No, no signal
Give signal when actual temp. is below	0.0 °C = 32.0 °F to 19.0 °C = 66.2 °F in 1 degree steps
	No, no signal

With the setting "The acoustic alarm stops - after a set alarm duration", the acoustic signal only sounds for the parameterised duration. However, the visual display continues until the alarm ends. The alarm can also be acknowledged. To do this, press the display push-button. The visual display remains until the end of the alarm. It is also possible to acknowledge the alarm when it is triggered via the alarm object.

With the setting "The acoustic alarm stops - if actual temp. is within limits again", the alarm cannot be acknowledged. The acoustic and visual alarms remain until the actual temperature is back within the parameterised limits. It is not possible to acknowledge the alarm when it is triggered via the alarm object.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Alarm function	Alarm object	1 bit	Low	WCT	Transmit/ receive

● Activating the time control

Two time-switch channels are available, each with four programmable switch times, in order to trigger actions with minute-by-minute precision.

The push-button can be connected to an external clock via date and time objects, an object to request the time and an object to identify the working day/holiday, thus synchronising the internal clock.

After a reset, the time is set to 0:00, and the time display (time symbol in the display) flashes. When a synchronisation has been completed (time display is lit continuously), and it is determined that the difference between the internal and external clock is less than 1.5 hours, switching commands which are valid for this period are carried out. If no synchronisation is completed within 24 hours, switching commands can continue to be carried out or disabled, depending on the setting. In this case, the time display also flashes.

Using the multi-function push-button as a master clock

You can use the multi-function push-button as a master clock.

① Make the settings in the "General" tab, "Transmit time cyclically".

② For the Transmit time cyclically parameter, select either "Once per minute", "Once per hour", or "Once per day". Once you have selected a cycle, the T flag (transmission flag) of the "Time object-Time control" communication object is automatically set.

③ Now make the following settings for all multi-function push-buttons used as "Slave clocks": In the "General" tab, "Transmit time cyclically", make the setting: "Switched off".

④ Connect the "Time object - Time control" objects to each other.

All that remains is to set the master clock with which all the other multi-function push-buttons synchronise their time.
Caution: This only applies to transmitting the time. The date is not transmitted to the bus and cannot be set with the display push-buttons.

Time control	
Parameter	**Setting**
Time control	Switched on
	Switched off
Request time synchronisation via the bus	**Yes**
	No
Behaviour when synchronisation fails only displayed when "Request time synchronisation via the bus" is set to "Yes"	**Switching commands are still carried out**
	Switching commands are suppressed
Number of time switch channels	**2**
	1
Time channel 1/2, number of switching times	1 - **4**
Time channel 1/2 Actuator group	**Switch object**
	Value object (8 bit in steps)
	Value object (8 bit continuous)
	Priority object
	Value object (16-bit integer without sign)
	Value object (16-bit integer with sign)
	Value object (16-bit floating point value)

Time channel 1/2 - switch time 1-4	
Parameter	**Setting**
Hour (0-23)	0 - 23 in one-hour steps, **13** preconfiguration
Minute (0-59)	0 - 59 in one-minute steps, **0** preconfiguration
Value ("Switch object" actuator group)	**ON telegram**
	OFF telegram
Value ("Value object 8-bit in steps" actuator group)	0% - **100%**
Value ("Value object 8-bit continuous" actuator group)	0 - **255**
Value ("Priority object" actuator group)	**Switch on with priority (11)**
	Switch off with priority (10)
	Remove priority (00)
Value ("Value object 16-bit integer without sign" actuator group)	0 - **65535**
Value ("Value object 16-bit integer with sign" actuator group)	-32768 - **32767**
Value ("Value object 16-bit floating point" actuator group) Value = base value * factor Base value, value range in brackets	0.01 (0 to 20.47)
	0.02 (0 to 40.94)
	0.04 (0 to 81.88)

Time channel 1/2 - switch time 1-4	
Parameter	**Setting**
	0.08 (0 to 163.76)
	0.16 (0 to 327.52)
	0.32 (0 to 655.04)
	0.64 (0 to 1310.08)
	1.28 (0 to 2620.16)
	2.56 (0 to 5240.32)
	5.12 (0 to 10480.64)
	10.24 (0 to 20961.28)
	20.48 (0 to 41922.56)
	40.96 (0 to 83845.12)
	81.92 (0 to 167690.24)
	163.84 (0 to 335380.48)
	327.68 (0 to 670760.96)
Value factor (0 - 2047)	0 - **1000** - 2047
Select scene address internally	0 - 63
	No scene
Execute switch time	**On working day**
	On holiday
	Always

Request time synchronisation via the bus

After a download, after plugging into the BCU, or when the bus voltage is applied, the multi-function push-button can transmit a telegram to the bus to request the current time and date. This synchronises the time and date in the multi-function push-button.

① Connect the objects "Time object - Time control", "Date object - Time control", and the object "Request time - Time control" to the corresponding objects of a year time switch.

② In the "Time control" tab, set the "Request time synchronisation parameter via the bus" to "Yes". When this parameter is set to "Yes", then a further parameter is displayed: "Behaviour when synchronisation fails". Here you can select either "Time switch switching commands are still carried out" or "Time switch switching commands are suppressed" when time synchronisation does not occur.

The function "Request time synchronisation via the bus" only works in conjunction with an appropriate year time switch.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Time control	Time object	3 byte	Low	WC	Receive
Time control	Date object	3 byte	Low	WC	Receive
Time control	Time request	1 bit	Low	CT	Transmit
Time control	Working day/ holiday	1 bit	Low	WC	Receive
Time control	Switch object A/ B	1 bit	Low	WCT	Transmit/ receive
Time control	Value object A/B	1 byte/ 2 byte	Low	WCT	Transmit/ receive
Time control	Priority object A/ B	1 byte	Low	WCT	Transmit/ receive

When a change is made from a holiday to a working day or vice-versa via the control menu of the push-button, the push-button carries out all switch times which are programmed up to the current time, taking into account the new "working day/holiday" setting.

Communication object "Working day/ holiday"
The value 1 (1 bit) switches the clock to "Working day" mode. The value 0 (1 bit) switches the clock to "Holiday" mode.
Tip: This object should be controlled by an appropriate year time switch.
If the communication object "Working day/ holiday" does not have a group address then the default value "0" is used. This means that the clock is in the "Holiday" mode.
Only the switching times parameterised for "On holiday" or "Always" are then executed.

● Becoming familiar with and parameterising room temperature controller

To activate the room temperature controller, you must switch on the "Controller" parameter in the "General controller" tab. Up to seven additional tabs, with setting options, are then available. As for all parameters, the recommended settings are already specified here. However, you must check all parameters to make sure that they are set correctly and appropriately for the local conditions for your installation.

How the room temperature controller functions

There are many factors which can affect room temperature. The task of the controller is to detect the actual temperature constantly, and to ensure that the heating or cooling system receives new information accordingly. The heating or cooling system converts this information and adjusts the room temperature to the preconfigured setpoints.

The actual temperature is constantly measured by the temperature sensor integrated into the multi-function push-button. However, you can also measure the temperature via an external sensor and transfer it to the controller via the bus, which then takes it fully or partially into account when assessing the actual temperature.

The controller can control the connected heating/ cooling systems via corresponding switch telegrams or continuous control values. In this way, both PI controllers and 2-step controls can be parameterised.

Four operation modes (comfort, standby, night and frost/heat protection) for which setpoints can be set in each case are available for differentiated control with different requirements.

Additional functions of the room temperature control unit are comfort extension, shared/separate control value output, selection of the operation mode after reset, offset of the setpoint temperatures, 1 bit/1 byte status objects, taking into account a temperature which has been measured separately, temperature drop detection, and valve protection.

Setpoints and operation modes

Four operation modes are available to help you control the room temperature:

– Comfort mode
  Controls the room temperature when the room is being used.
– Standby operation
  Lowers temperature slightly when the room is not being used.
– Night operation
  Lowers temperature significantly, e. g. at night or during the weekend.
– Frost/heat protection
  Automatically switches on the heating or cooling when temperature threshold values are not reached or are exceeded.

The additional "comfort extension" operation mode acts in the same way as the comfort mode, but is exited automatically after a time period that can be set.

You can switch back and forth between these operation modes in different ways:

– Via the communication objects, by using the time control on the multi-function push-button, for example
– Via the control menu

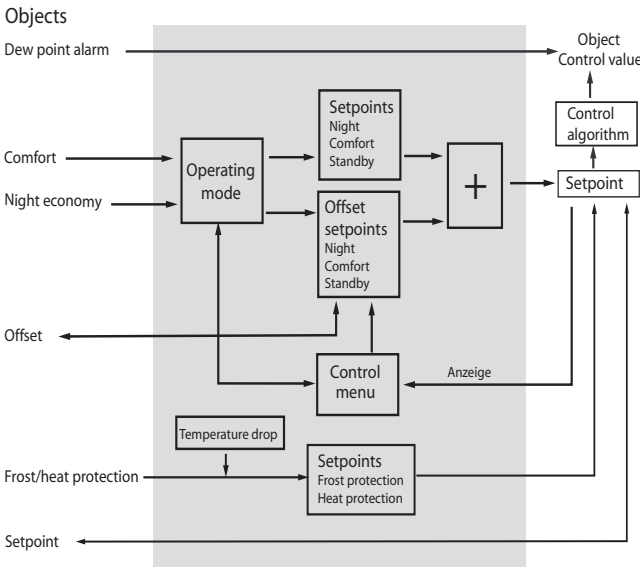
You can specify a setpoint for each operation mode. When changing the operation mode, the relevant setpoint for continued room temperature control is used. The setpoints for all operation modes, except for frost/heat protection, can be manually altered within adjustable limits using the control menu on the push-button, or can be adjusted via the "Setpoint adjustment - Controller" object. You can also set whether or not manual changes to the setpoints should remain valid after you have switched to another operation mode.

The active operating state of the controller is determined by the states of the communication objects: "Comfort", "Night economy", "Frost/heat protection" and "Dew point alarm".

When calculating the setpoints, the highest priority goes to the dew point alarm. If the alarm is triggered, heating continues to be possible, but cooling is deactivated ("0" on the controller output). The dew point alarm is terminated when its communication object is set to "0".

After a reset, the preconfigured operation mode is active. The corresponding setpoints then also apply. If the set setpoint is changed manually via the control menu and an attempt is made to exceed or not reach the set limits, an acoustic signal may sound with 3-gang and 4-gang push-buttons (can be set).

When the offset is received via the bus, the controller checks whether it lies within the parameterised limits, and if necessary, adjusts it to the corresponding limits.



Calculating the setpoint

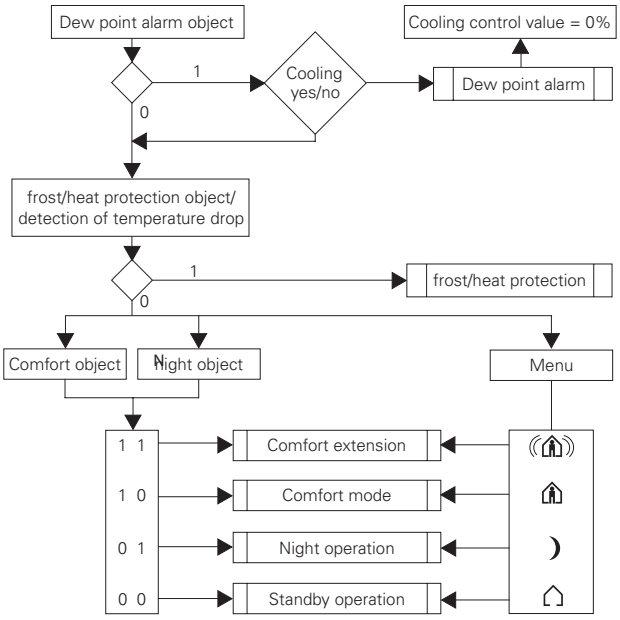
Toggling between operation modes via 1 bit

Activation via the bus:

Comfort bit	Night bit	Status byte	Description
0	0	Standby	Standby
0	1	Night	Night
1	0	Comfort	Comfort
1	1	Comfort	Comfort

Activation via the display:

Comfort bit	Night bit	Status byte	Description	Transmit bus
0	0	Standby	Standby	Yes
0	1	Night	Night	Yes
1	0	Comfort	Comfort	Yes
1	---	Comfort	Comfort extension	Only comfort



Toggling between operation modes via 1 bit

Comfort mode

The symbol in the display indicates that the controller is in the "Comfort" operation mode (room in use or person present). This operation mode is used to control the room temperature when the room is being used.

You can set the controller to switch on automatically in this state after a reset.

Comfort mode is active

– When (a presence detector for example) reports a presence via the "Comfort" object. An external push-button is also an option.
– When the "Comfort" operation mode is selected in the control menu.

When the comfort mode is terminated via the "Comfort" object (value = 0), the standby or night operation mode is activated. This setting can be useful as an office application for centralised resetting, for example.

Comfort extension (symbol flashes)

Comfort extension is indicated by the flashing symbol. The additional comfort extension operation mode is largely the same as the comfort mode. Comfort extension is exited automatically after a time period that can be set, however. It temporarily suppresses the night operation mode when the room is used for longer during the evening, for example.

The comfort extension is active:

– When the "Comfort extension" operation mode is selected in the control menu.

The parameterised time for the comfort extension runs to an end and can then be restarted by another activation of the comfort extension in the control menu. You can parameterise the controller so that it switches to standby mode, night mode, or a mode defined by the current object, once the comfort extension has finished. A precondition for this is that the parameter "Termination of comfort extension via (operation mode) object" is set to "Deactivated". When comfort extension is selected via the control menu, the symbol flashes.

It is terminated

– When the parameterised time has elapsed
– When the "Night operation", "Comfort" or "Standby" operation mode is selected in the control menu.

Comfort extension can be implemented via the bus. When the controller is in the "Night" operation mode, the "Edges extended" function can be used to transmit a "1" to the comfort object and, after a time T, a "0" is transmitted to the comfort object. The controller switches to comfort mode for the parameterised time, after which it switches back to night mode. Note that when "Comfort extension" is triggered by the "Edge function extended" then the comfort mode symbol in the display does not flash. The

comfort mode symbol only flashes when comfort extension is selected via the control menu.

"Termination of comfort extension via (operation mode) object"

Controller general	
Parameter	**Setting**
Termination of comfort extension via (operation mode) object	**Deactivated**
	Activated

Comfort extension when operation mode changes 1 bit

Termination of comfort extension via (operation mode) object - deactivated	Comfort bit	Night bit	Status byte	Description	A telegram is transmitted to the bus from the multi-function push-button
After time	0	0	Standby	Standby	No
sequence of	0	1	Night	Night	No
received	1	0	Comfort	Comfort	No
Operation mode	1	1	Comfort	Comfort	No (when comfort= 1 while the comfort extension was received
	1	1	Night	Night	Yes (comfort= 0 and night=1; when comfort= 1 not while the comfort extension was received
Setting: Standby	0	0	Standby	Standby	Yes (comfort= 0 and night=0)
Setting: Night	0	1	Night	Night	Yes (comfort= 0 and night=1)

Termination of comfort extension via (operation mode) object - activated	Comfort bit	Night bit	Status byte	Description	A telegram is transmitted from the multi-function push-button to the bus
After a time period:	Last operation mode	(bit state	as before the	comfort extension)	Yes
Received Operation mode	0	0	Standby	Standby	No
	0	1	Night	Night	No
	1	0	Comfort	Comfort	No
	1	1	Comfort	Comfort	No (when comfort= 1 while the comfort extension was received)
	1	1	Night	Night	Yes (comfort= 0 and night=1; when comfort= 1 not while the comfort extension was received)

Comfort extension when operation mode changes 1 bit

Termination of comfort extension via (operation mode) object - deactivated	Comfort bit	Operation mode changed byte	Status byte	Description	A telegram is transmitted from the multi-function push-button to the bus
After time	0	Standby (value 2)	Standby	Standby	No
sequence of	0	Night (value 3)	Night	Night	No
received	0	Comfort (value 1)	Comfort	Comfort	No
Operation mode	0	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection	No
	1	Standby (value 2)	Comfort	Comfort	No
	1	Night (value 3)	Comfort	Comfort	No
	1	Comfort (value 1)	Comfort	Comfort	No
	1	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection	No
Setting: Standby	0	Standby (value 2)	Standby	Standby	Yes (comfort= 0 and night=0)

Termination of comfort extension via (operation mode) object - deactivated	Comfort bit	Operation mode changed byte	Status byte	Description	A telegram is transmitted from the multi-function push-button to the bus
Setting: Night	0	Night (value 3)	Night	Night	Yes (comfort= 0 and night=1)

Termination of comfort extension via (operation mode) object - activated	Comfort bit	Operation mode changed byte	Status byte	Description	A telegram is transmitted from the multi-function push-button to the bus
After a time period:	Last operation mode	(bit state	as before the	comfort extension)	Yes
Received Operation mode	0	Standby (value 2)	Standby	Standby	No
	0	Night (value 3)	Night	Night	No
	0	Comfort (value 1)	Comfort	Comfort	No
	0	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection	No
	1	Standby (value 2)	Comfort	Comfort	No
	1	Night (value 3)	Comfort	Comfort	No
	1	Comfort (value 1)	Comfort	Comfort	No
	1	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection	No

Standby operation ⌂

The ⌂ symbol in the display indicates that the controller is in the "Standby" operation mode. This operation mode enables you to reduce or increase the room temperature to a parameterised level as soon as the room is no longer in use. A brief heating period or cooling period is triggered by the low difference in temperature to the comfort mode.

You can set the controller to switch on automatically in this state after a reset.

The standby mode is active

– When all operation mode objects equal "0", i. e. the "Dew point alarm", "Night economy", "Frost/heat protection" or "Comfort" operation modes are not active.
– When the "Standby" operation mode is selected in the control menu.

Night operation)

The) symbol in the display indicates that the controller is in the "night operation" mode. This operation mode enables you to reduce or increase the room temperature to a greater extent during the night or over the weekend. In this operation mode, you use a "1" telegram to switch via the "Night economy" object.

The night operation mode is active when the comfort object is set to "0" and

– The "Night economy" object is set to "1", or
– When the "Night operation" mode is selected in the control menu.

It is terminated

– When the "Night economy" object is set to "0", or
– When the "Comfort extension", "Comfort" or "Standby" operation mode is selected in the control menu.

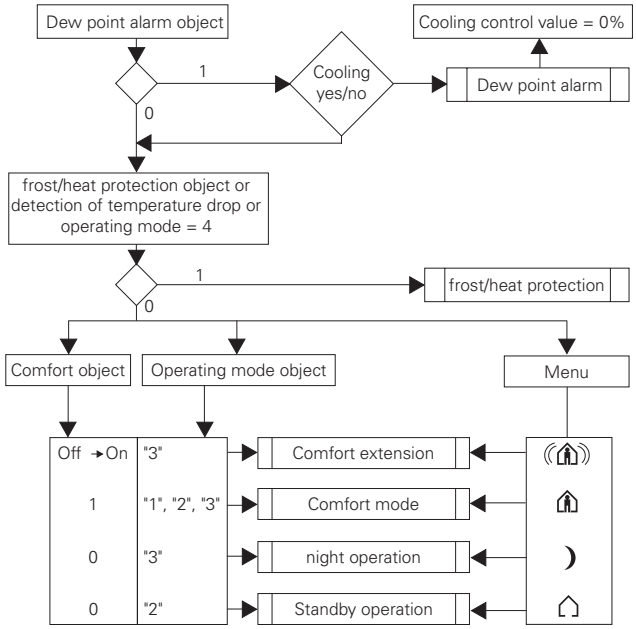
Frost/heat protection

The parameterised values for frost protection (e.g. +7°C) or heat protection (e. g. +35°C) are set as new setpoints with a "1" telegram to the "Frost/heat protection" object. This prevents the room from becoming overheated or the heating from freezing. A "0" telegram terminates "Frost/heat protection" and the previous operation mode is set again. The operation mode is defined by the information present in the comfort and night bits. If no change occurs then the previous operation mode is set. This does not apply when the "Dew point alarm" operation mode is also active.

Dew point alarm

The dew point operation mode is used to switch off the cooling in all circumstances. A "1" telegram via the "Dew point alarm" object switches off the cooling when there is condensation in the cooler. This operation mode has the highest priority. A "0" telegram terminates the "dew point alarm" and the new operation mode is set again. The operation mode is defined by the information present in the comfort and night bits. If no change occurs then the previous operation mode is set.

Toggling between operation modes via 1 byte



Toggling between operation modes via 1 byte

Operation mode object with 1 byte:
– "4" = Frost/heat protection
– "3" = Night economy
– "2" = Standby
– "1" = Comfort

Activation via the bus:

Comfort bit	Operation mode changed byte	Status byte	Description
0	Standby (value 2)	Standby	Standby
0	Night (value 3)	Night	Night
0	Comfort (value 1)	Comfort	Comfort
0	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection
1	Standby (value 2)	Comfort	Comfort
1	Night (value 3)	Comfort	Comfort
1	Comfort (value 1)	Comfort	Comfort
1	Frost/heat protection (value 4)	Frost/heat protection	Frost/heat protection

Activation via the display:

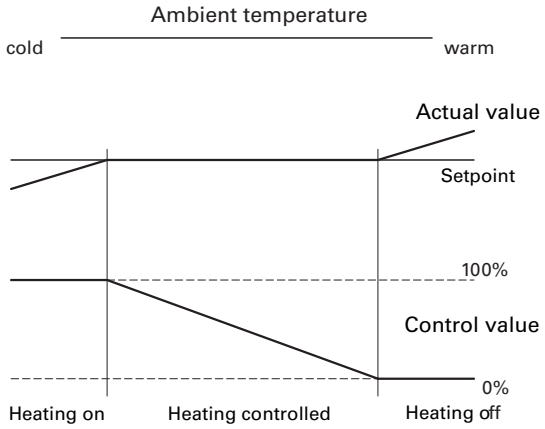
Comfort bit	Operation mode changed byte	Status byte	Description	Transmit bus
0	Standby	Standby	Standby	Yes
0	Night	Night	Night	Yes
0	Comfort	Comfort	Comfort	Yes
0	Comfort	Comfort	Comfort extension	Yes

Heating

In the heating control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature lies below the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0". The symbol for heating is shown in the display, and when a control deviation results (setpoint does not equal "0"), an additional "**1**".

Heating with constant control values (e. g. EMO valve drive):
– Radiator/convector hot water heating
– Underfloor hot water heating
– 2-circuit underfloor hot water heating
– Air convectors

Heating with switching control values (e. g. switch actuator):
– Electric convector
– Night storage heating
– Ceiling heating

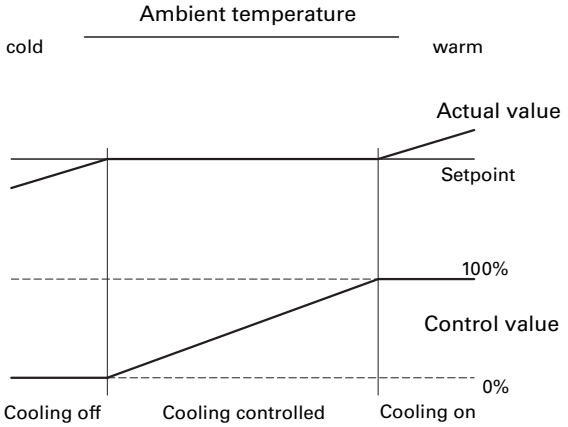


Cooling

In the cooling control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature is above the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0". The symbol for cooling is shown in the display, and when a control deviation results (setpoint does not equal "0"), an additional "**1**".

Cooling with constant control values (e. g. EMO valve drive):
– Cooling ceiling
– Air convectors

Cooling with switching control values (e. g. switch actuator):
– Cooling ceiling
– Air convectors



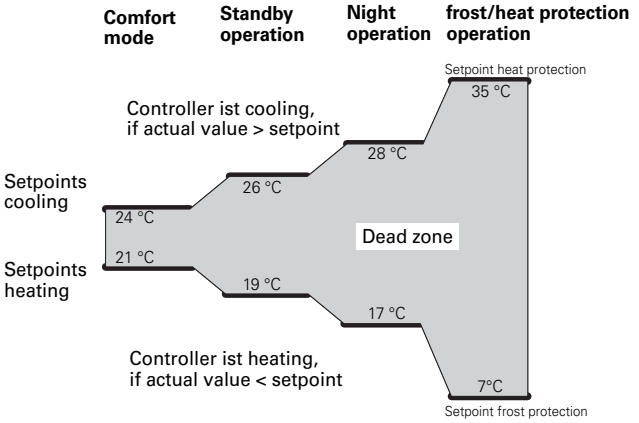
Heating and cooling

You can use the "Switch between heating and cooling" parameter to select whether the current control mode (heating or cooling) should be triggered automatically or via the "Heating/cooling" object. If you've selected the "Heating/cooling" object, the controller is forced into heating or cooling mode, and can only be adjusted to another control mode by an object change.

If you have set the parameter "Switch between heating and cooling"to "Externally (via Heating/ cooling object)" then after a download, or restoration of bus voltage, a read request is transmitted to the bus by the "Heating/cooling" object. If the object does not receive a status feedback within 2 seconds, the controller sets itself to heating mode and a "1" for heating is transmitted to the bus. If a status feedback is received within 2 seconds then this operation mode is switched off.

If you selected automatic mode, the controller decides which control mode is suitable based on the parameterised setpoints, the dead zone and the current actual temperature. The currently valid operation mode is shown in the display with the corresponding symbols (comfort, standby and night economy). An additional "1" is shown when the controller issues a control value which does not equal "0" at the heating output, and a "2" when the controller issues a control value which does not equal "0" at the cooling output. Heating is indicated by , and cooling by .

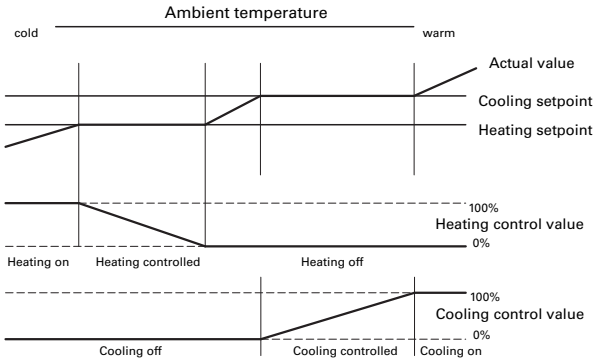
To save energy, you should plan a dead zone. This prevents the controller from switching constantly between heating and cooling. For example, if a heater is used for heating, it has sufficient thermal energy after the valve has been closed to continue to heat the room above the heating setpoint temperature. If you have configured the heating and cooling setpoint to be the same, and set the dead zone to "0", the air conditioning unit cools immediately since the setpoint for cooling has not been exceeded. The procedure repeats itself again and again.



If an error has occurred in planning (heating setpoint higher than cooling setpoint), this is shown in the display by the "Er 2" error message after a reset. The controller remains inactive until you rectify the error in the ETS and re-load the parameters.

Heating and cooling with constant control values (e. g. EMO valve drive):
– 2-pipe fan coil
– 4-pipe fan coil (with external switching between heating and cooling)
– 4-pipe fan coil (with automatic switching between heating and cooling)
– 1-circuit air conditioned ceiling
– Cooling ceiling with combined hot water heating
– Cooling ceiling with combined underfloor heating
– Variable air volume

Heating and cooling with switching control values (e. g. switch actuator):
– Cooling ceiling
– Air convectors



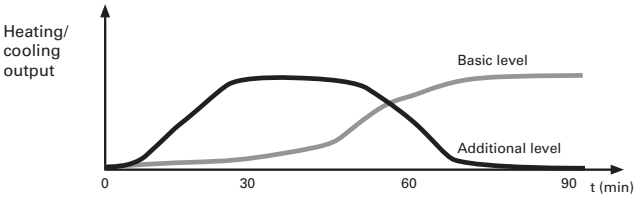
For heating and cooling, move the setpoints together

The difference between the two setpoints (heating and cooling) is interpreted as the dead zone for this operation mode.

Example: The upper and lower setpoint adjustment is 3K respectively. Actual value = 21 °C; Heating setpoint = 22 °C; Cooling setpoint = 24 °C, this results in a dead zone of 2K.
If you now adjust the setpoint temperature downwards using the display, then the following values are displayed: 22.0; 21.5; 20.5; 20.0; 19.5; 21.0. The jump from 19.5 to 21.0 can be explained by the fact that the cooling setpoint is relevant now because the actual temperature lies above the setpoint temperature. This is only carried out for the operation mode that is currently active. If you are currently in comfort mode, the comfort setpoints for heating and cooling can be adjusted together, but the values for standby or night operation cannot be.

Two-stage heating or cooling

In order to shorten the heat-up phase with slow heating systems (e. g. underfloor heating), a second, more responsive heating system which heats up faster during the long start-up period of the main system (basic level) is frequently used.



The same behaviour applies with cooling systems.

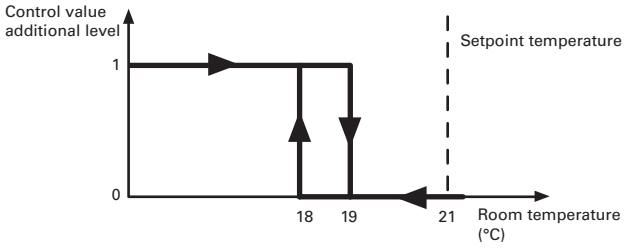
The additional level, which is controlled via 2-step control, remains switched on until a parameterised interval below the basic level is reached (e. g. 2 K), and then switches off. Only the basic level then remains switched on.

Example:

– Setpoint temperature: 21 °C
– Interval between basic level – additional level: 2 K
– Hysteresis of additional level: 1 K

The additional level remains switched on until "Setpoint temperature minus interval" (21 °C - 2 K = 19 °C) is reached. The additional level is then switched off.

It is only switched on again when the actual temperature is lower than the "setpoint temperature minus interval minus hysteresis" (21 °C - 2 K - 1 K = 18 °C).



The multi-function push-button displays the active basic level with a "1" and the active additional level with a "2".

Controller types

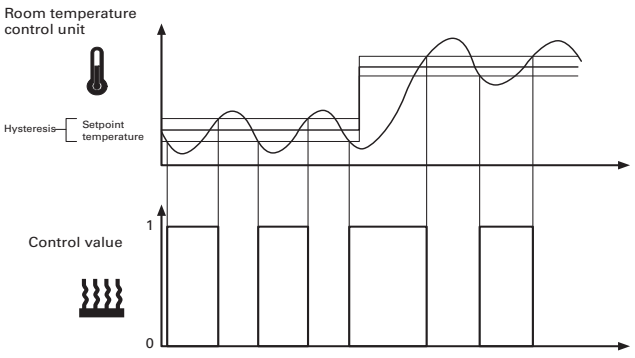
The room temperature control unit transmits control values to the bus via various communication objects, which you can use to control different controller types with switching commands or by specifying percentage values:

– Continuous 2-step control
– Switching 2-step control
– Continuous PI controller
– Switching PI controller

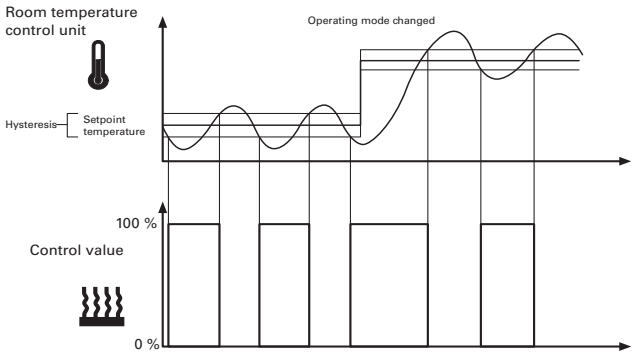
Continuous and switching 2-step control

2-step control is the simplest type of controller. The heating switches on as soon as the actual temperature falls below a specific value, and switches off as soon as a specific value has been exceeded. The two values (above and below the setpoint temperature) are called the hysteresis.

Switching 2-step control:



Continuous 2-step control:



The disadvantage of simple control, in contrast to its advantage, is that the room temperature is not constant, but changes continuously, reducing comfort particularly when heating and cooling systems are slow to react. To counteract this effect, the hysteresis can accordingly be set small. However, this leads to an increase in switching frequency, and therefore to increased wear of the drives.

The temperature overshoot above or below the hysteresis apparent in the diagram is caused when the heating/cooling system continues to emit heat or cold into the room after it has been switched off.

Setting rules for the 2-step control

"Hysteresis of the 2-step control" parameter:

– Small hysteresis:
  leads to small fluctuations, but frequent switching.
– Large hysteresis:
  leads to big fluctuations, but infrequent switching.

In general, due to the influences of the heating system and the room, the temperature fluctuations in the room are significantly higher than the hysteresis.

Continuous and switching PI controller

For PI controller, the control value is calculated from a proportional and an integral proportion. Parameters such as the temperature difference between the actual and setpoint, the proportional range and the readjustment time are material to the calculation. In this way, the controller can correct the room temperature quickly and accurately. The corresponding control value is transferred via a 1 bit/1 byte value to the bus.

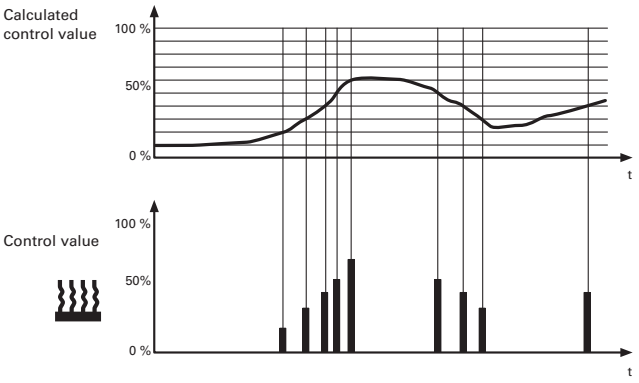
The standard control parameters for the most common system types are already installed in the controller:

– Hot water heating
– Underfloor heating
– Electric heating
– Air convector
– Split unit
– Cooling ceiling

You can also set the control parameters for the proportional range and the readjustment time manually, but you should know exactly which actuators are connected and the control conditions in the room.

Continuous PI controller

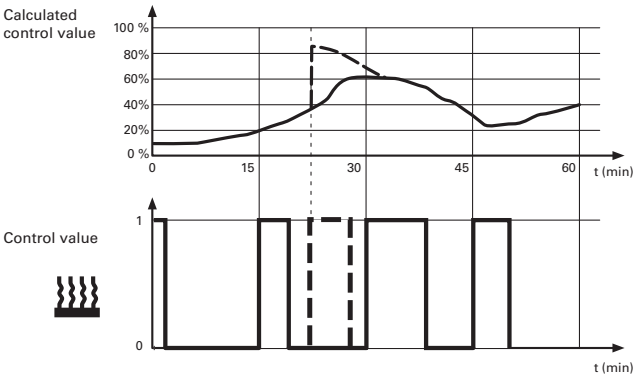
For the continuous PI controller, the corresponding 1 byte control value is transmitted 0-100% directly via the bus to the heating actuator (e. g. EMO valve drive), which converts the control value directly to a degree of opening. However, this is only transmitted when the newly calculated control value has changed by a specified percentage.



Switching PI controller (PWM)

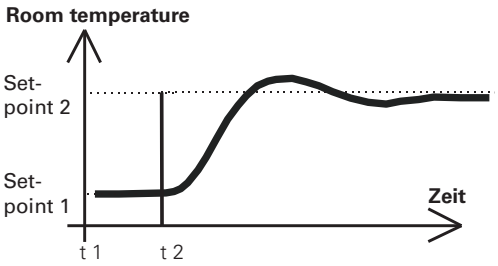
With the switching PI controller, also known as the PWM controller, the control values calculated by the controller (0-100%) are converted into a pulse-width modulation (PWM). Within a constant, defined cycle time, the control actuator is opened ("1") and then closed again ("0") for the calculated percentage period. For example, when a control value of 25% is calculated for a cycle time of 12 minutes, a "1" is transmitted at the beginning of the cycle time, and a "0" is transmitted after three minutes (= 25% of 12 minutes)

.



When the setpoint temperature changes, the controller re-calculates the required control value and transmits it still within the current cycle (broken line).

Setting rules for the PI controller



In general:

- Large system increases (e.g. high heating output, steep characteristic curves for valves) are controlled with large proportional ranges.
- Slow heating systems (e.g. underfloor heating) are controlled with high-level readjustment times.

If a satisfactory control result is not achieved by selecting an appropriate heating or cooling system, you can improve the adjustment "via control parameters":

- Low proportional range:
  large overshoot for setpoint changes (also continuous oscillation under certain circumstances), rapid adjustment to the setpoint.
- Large proportional range:
  no (or little) overshooting, but slow adjustment.
- Short readjustment time:
  rapid correction of control deviations (ambient conditions), risk of continuous oscillation.
- Long readjustment time:
  slow correction of control deviations.

The framework conditions for setting the cycle time are as follows:

– For small values, the switching frequency and the bus load are increased.
– For large values, temperature fluctuations are created in the room.
– A short cycle time for rapid heating systems (e.g. electric heating).
– A long cycle time for slow heating systems (e. g. underfloor hot water heating).

Examples

Hot water radiator heating with motorised valve drives:

Characteristics	Parameter	Setting
Heating only	Controller type	Heating
	Control value output	Continuous PI controller
	Adjust the controller to the heating system	Hot water heating (5 K/ 150 min)

Cooling ceiling with motorised valve drives:

Characteristics	Parameter	Setting
Cooling only	Controller type	Cooling
	Control value output	Continuous PI controller
	Adjust the controller to the cooling system	Adjustment via control parameter
	Cooling proportional range	Approx. 5 K (depending on the application)
	Cooling readjustment time	Approx. 240 min. (depending on the application)

Switching electric radiator heating:

Characteristics	Parameter	Setting
Heating only	Controller type	Heating
	Control value output	Switching PI controller
	Adjust the controller to the heating system	Electric heating (4 K/ 100 min)

Air conditioning with 4-duct (2-circuit) air convector system (e. g. switching valve drives):

Characteristics	Parameter	Setting
Heating or cooling as required, with automatic switching	Controller type	Heating and cooling
	Control value output - heating	e. g. switching PI controller
	Adjust the controller to the heating system	Air convector (4 K/ 90 min)
	Control value output - cooling	e. g. switching PI controller
	Adjust the controller to the cooling system	Air convector (4 K/ 90 min)
e. g. automatically switch between heating and cooling	Switch between heating and cooling	automatically via the controller

Temperature limitation using shading facility:

Characteristics	Parameter	Setting
Cooling only	Controller type	Cooling
	Control value output - heating	Switching 2-step control
	Hysteresis	Large (e. g. 2 K)

Setting the general controller parameters

Set the controller first. Then specify which control type you want to plan. You can set whether and how the comfort extension should function, and which operation mode the device should go to after a reset.

Define whether setpoint changes via the control menu should be saved, or whether each setpoint set should apply again when the operation mode is changed. Finally, specify the upper and lower setpoint adjustment.

Controller general	
Parameter	**Setting**
Control	**Switched off**
	Switched on
Controller type	**Heating**
	Cooling
	Heating and cooling
	2-level heating
	2-level cooling
Comfort extension	Switched off
	30 min - 4.0 hours in 0.5 hour steps, **1.0** preconfiguration, test mode 1 minute
Termination of comfort extension via (operation mode) object	**Deactivated**
	Activated
Only visible when "Termination of comfort extension" is set to "Deactivated": Operation mode after comfort extension	Standby
	Night operation
	Current object values
Operation mode after reset	Comfort operation
	Standby operation
	Night economy operation
Also retain setpoint adjustment after operation mode change	Yes
	No
Max upper setpoint offset	0 - 10 K in 1 Kelvin steps, **3 K** preconfiguration
Max lower setpoint offset	0 - 10 K in 1 Kelvin steps, **3 K** preconfiguration
Only when heating **and** *cooling:* Switch between heating and cooling	**Automatically (via the controller)**
	Externally (via heating/cooling object)

If you have parameterised the **"Heating and cooling"** controller type, either the controller automatically switches between heating and cooling or it is done by the "Heating/cooling" object accordingly.
As a standard, switching between heating and cooling is automatic. The controller is either in heating or cooling mode. The control value of the non-active mode is switched to 0% (off).

When switching externally, switch to the heating mode with a "1" telegram, and to cooling mode with a "0" telegram.

If the same transmitting group address is used for the heating and cooling setpoints, the "0" telegrams of the non-active controller type are automatically suppressed.

Setting the operation mode and status

Here you can set whether to toggle between operation modes via 1 bit or 1 byte. You can make the same setting for the size of the status object. This is useful when you require the status of the system to be displayed using visualisation software, for example.

Operation modes/status	
Parameter	**Setting**
Toggling between operation modes via	**1 bit**
	1 byte
Size of the status object	**1 bit**
	1 byte
Only when status object = 1 bit: Status selection	Bit 0: Comfort
	Bit 1: Standby
	Bit 2: Night operation
	Bit 3: Frost/heat protection
	Bit 4: Dew point alarm
	Bit 5: Heating (1)/cooling (0)
	Bit 6: Controller inactive
	Bit 7: Frost alarm (1)

Setting the setpoints

A setpoint which must be specified, used for temperature control when changing operation mode automatically or manually, is available for each operation mode. The setpoint can be changed manually via the control menu on the multi-function push-button within the offset limitation (see "General controller" tab).

There is no setpoint adjustment for frost or heat protection. As soon as the actual temperature has reached the respective value, the system immediately switches to protection and the corresponding setpoint is written to the corresponding communication object. As soon as this objects is written externally with a "0" again, the protection mode switches back off.

Setpoints	
Parameter	**Setting**
For both heating and cooling: Comfort setpoint	5.0 - 40 °C in 0.5 degree steps Heating preconfiguration: **21.0 °C** Cooling preconfiguration: **24 °C**

Setpoints	
Parameter	**Setting**
For both heating and cooling: Standby setpoint	5.0 - 40 °C in 0.5 degree steps Heating preconfiguration: **19.0 °C** Cooling preconfiguration: **26 °C**
For both heating and cooling: Night setpoint	5.0 - 40 °C in 0.5 degree steps Heating preconfiguration: **17.0 °C** Cooling preconfiguration: **28 °C**
Frost protection setpoint	0 - 15 °C in 1 degree steps Preconfiguration **7 °C**
Heat protection setpoint	18 - 40 °C in 1 degree steps Heating preconfiguration: **35 °C**

Setting the actual value

Here, you can set a correction value (compensation) for the temperature sensor installed in the room temperature control unit. This is useful when (it is mounted in an unsuitable place in the room or where the temperature is different to other places in the room (e. g. from a draught or heat sources nearby), for example. The following formula applies:

Actual temperature = measured temperature + compensation

You can set the temperature difference (the last difference transmitted compared to the current actual value) at which the actual temperature is transmitted, and at which interval it should automatically be transmitted (e. g. to visualisation software).

If you also use an external temperature sensor, you can set the percentage proportion at which the separately measured temperature should merge with the current actual value. The external value is received via the "Current actual value" object, read off by the room temperature control unit and calculated according to the set weighting. The actual value object is then immediately overwritten again with the calculated actual value.

Actual value	
Parameter	**Setting**
Compensation of the internal actual temperature Factor -128 ... 127) x 0.1 K	-128 - 127 in 1 Kelvin steps, **0** preconfiguration
Temperature difference for transmitting the actual temperature	Switched off, 0.1 -2.0 K in 0.1 Kelvin steps, **0.2 K** preconfiguration
Automatic transmission of actual temperature every	Switched off, 3 min, 5 - 60 mins. in 5 minute steps, **10 min** preconfiguration
Taking into account the separately measured temperature	0 - 100 % in 5-percent steps, **0 %** preconfiguration

Setting the temperature drop

When temperature drop detection is switched on, the room temperature control unit checks whether the temperature has fallen by the set temperature difference within three minutes. If this is the case, the system switches to frost protection mode for a period which can be set. After this time has elapsed, the controller switches the previously set operation mode back on.

You can set the sensor that takes the temperature to be measured (internal/external sensor, both or actual value). When using an external sensor, the actual temperature consists of the temperature measured on the room temperature control unit and the external temperature, depending on the parameterised weighting (see "Setting the actual value").

Temperature drop	
Parameter	**Setting**
Temperature drop detection	**Switched off**, -0.2 to -1.0 K in 0.1 Kelvin steps
Only when temperature drop is switched on: duration of the frost protection mode during temperature drop in mins. (10-60)	10 - 60 (min) in 1 minute steps, **20** (min) preconfiguration
Only when temperature drop is switched on: temperature measurement	From internal sensor
	From separate sensor
	From internal OR separate sensor
	From actual value

Setting the closed-loop control for heating

This tab only appears when you have set the "Heating", "Heating and cooling" or "2-step heating" control type in the "General controller" tab. Here, you can set which heating control type should be activated. For PI controllers, you can select between five standard system types, for which the recommended parameters have already been preconfigured. However, if you have sufficient specialised knowledge, you can also set the control parameters as required.

For 2-step controls, set the hysteresis here, and for "Heating and cooling", the dead zone.

Closed-loop control for heating/ Closed-loop control for heating (basic level)	
Parameter	**Setting**
Direction of the controller	**Normal**
	Inverted
Control value output	**PI controller (switching)**
	PI controller (continuous)
	2-step control (switching)
	2-step control (continuous)

Closed-loop control for heating/ Closed-loop control for heating (basic level)	
Parameter	**Setting**
Only for PI controller switching/ continuous: Adjust the controller to the heating system	Adjustment via control parameter
	Hot water heating (5 K/ 150 min)
	Underfloor heating (5 K/240 min)
	Electric heating (4 K/100 min)
	Air convector (4 K/90 min)
	Split unit (4 K/90 min)
Only with 2-step control switching/continuous: Hysteresis	0.3 K - 2.0 K in 0.1 Kelvin steps, **0.5 K** preconfiguration
Only for "Adjustment via control parameter": Proportional range for heating in 0.1 K (10-255)	10 - 255 in single steps, **40** preconfiguration
Only when "Adjustment via control parameter": Readjustment time for heating in min (1-255)	**Switched off**, 1 - 255 in single steps

The following settings for the additional heating level only appear when you have set the "2-step heating" control type in the "Controller general" tab. Here, specify the settings for the second heating level.

Control heating (additional level)	
Parameter	**Setting**
Direction of the controller	**Normal**
	Inverted
Control value output	**2-step control (switching)**
	2-step control (continuous)
Level interval Factor 10 ... 100) x 0.1 K	10 - 100 in single steps, **20** preconfiguration
Hysteresis	0.3 K - 2.0 K in 0.1 Kelvin steps, **0.5 K** preconfiguration

Setting the closed-loop control for cooling

This tab only appears when you have set the "cooling", "heating and cooling" or "2-step heating" control type in the "Controller general" tab. Here, you can set which cooling control type should be activated. For PI controllers, you can select between three standard system types, for which the recommended parameters have already been preconfigured. However, if you have sufficient specialised knowledge, you can also set the control parameters as required.

For 2-step control, set the hysteresis here.

Closed-loop control for cooling/ Closed-loop control for cooling (basic level)	
Parameter	**Setting**
Direction of the controller	**Normal**
	Inverted

Closed-loop control for cooling/ Closed-loop control for cooling (basic level)	
Parameter	**Setting**
Control value output	**PI controller (switching)**
	PI controller (continuous)
	2-step control (switching)
	2-step control (continuous)
Only for PI controller switching/ continuous: Adjust the controller to the cooling system	Adjustment via control parameter
	Air convector (4 K/90 min)
	Split unit (4 K/90 min)
	Cooling ceiling (5 K/240 min)
Only with 2-step control switching/continuous: Hysteresis	0.3 K - 2.0 K in 0.1 Kelvin steps, **0.5 K** preconfiguration
Only for "Adjustment via control parameter": Proportional range for cooling in 0.1 K (10-255)	10 - 255 in single steps, **40** preconfiguration
Only for "Adjustment via control parameter": Readjustment time for cooling in min (1-255)	**Switched off**, 1 - 255 in single steps

The following settings for the additional cooling level only appear when you have set the "2-step heating" control type in the "Controller general" tab. Here, specify the settings for the second cooling level

Closed-loop control for cooling (additional level)	
Parameter	**Setting**
Direction of the controller	**Normal**
	Inverted
Control value output	2-step control (switching)
	2-step control (continuous)
Level interval Factor 10 ... 100) x 0.1 K	10 - 100 in single steps, **20** preconfiguration
Hysteresis	0.3 K - 2.0 K in 0.1 Kelvin steps, **0.5 K** preconfiguration

Setting the control values

Please note that different parameters must be set for different controller types.

For "Cycle time of the switching control values", set the duration for the PWM controller. The calculated control value is always transmitted at the start of a cycle time.

If the valve drive has not received a value (e. g. during commissioning), the room could continuously heat up or cool down. To prevent this, set the cycle time for automatic control value transmission. The control value is transmitted again within the set time (as a precaution).

The following settings apply for the "Heating" controller type:

Control values	
Parameter	**Setting**
Cycle time for automatic transmission of the control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration

The following settings apply for the "Cooling" controller type:

Control values	
Parameter	**Setting**
Cycle time of the switching control value in min (2-60)	2 - 60 in single steps, **15** preconfiguration
Minimum control value (0% - 100%)	0 - 100 % in 1-percent steps, **0 %** preconfiguration
Maximum control value (0% - 100%)	0 - 100 % in 1-percent steps, **100 %** preconfiguration
Cycle time for automatic transmission of the control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration

The following settings apply for the "Heating and cooling" controller type.

Control values	
Parameter	**Setting**
For both heating and cooling: Cycle time of the switching control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration
For both heating and cooling: Minimum control value (0% - 100%)	0 - 100 % in 1-percent steps, **0 %** preconfiguration
For both heating and cooling: Maximum control value (0% - 100%)	0 - 100 % in 1-percent steps, **100 %** preconfiguration
For both heating and cooling: Cycle time for automatic transmission of the control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration
For both heating and cooling: Changes for automatic transmission of the control value	2% - **3%** - 100%

The following settings apply for the "2-step heating" and "2-step cooling" controller types:

Control values	
Parameter	**Setting**
Basic level: Cycle time of the switching control value in min (2-60)	2 - 60 in single steps, **15** preconfiguration
Minimum control value (0% - 100%)	0 - 100 % in 1-percent steps, **0 %** preconfiguration
Maximum control value (0% - 100%)	0 - 100 % in 1-percent steps, **100 %** preconfiguration
Cycle time for automatic transmission of the control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration
Additional level: Cycle time for automatic transmission of the control value in min (2-60)	2 - 60 in single steps, **30** preconfiguration

Setting the valve protection

The valve protection prevents the valves on the heaters becoming stuck due to deposits in the heating water when the heating is switched off for a longer period of time (e. g. over the summer). When the valve protection is switched on, the valves are opened for a preset duration (100% on the controller output) after a preset number of days, and are then closed again (0 % on the controller output). When the function is switched on, it is also active during normal controller operation.

Valve protection	
Parameter	**Setting**
Valve protection Note: Valve protection affects both controller outputs!	Switched on **Switched off**
Activate valve protection every ... days (1 - 30 x days)	1 - 30 in single steps, 15 preconfiguration
Approach end position for .... min each time (1 - 30 x min)	1 - 30 in single steps, 4 preconfiguration

Controller problems - what to do when

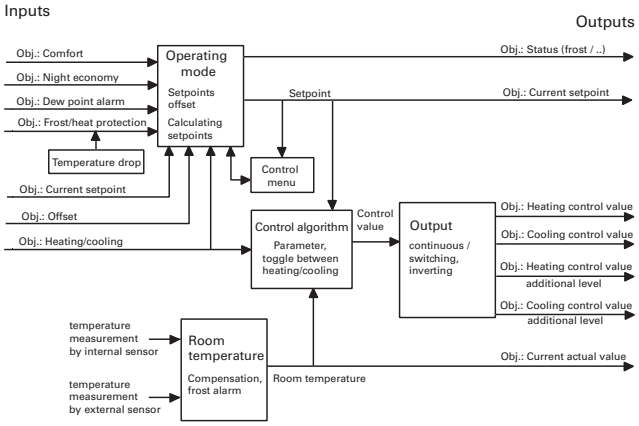
Problem	Possible solution
The controller switches constantly between heating and cooling.	Increase the "dead zone" parameter between heating and cooling.
The setpoint is only reached very slowly.	Increase the proportional range, either by selecting a system type with a larger proportional range in the system-specific selection "Adjustment of the controller to the heating/cooling system", or by directly increasing the proportional range via control parameters in the adjustment, or by reducing the integral time.
The room temperature exceeds the limits when changes are made to the setpoint.	Decrease the proportional range, either by selecting a system type with a smaller proportional range in the system-specific selection "Adjustment of the controller to the heating/cooling system", or by directly reducing the proportional range via control parameters in the adjustment, or by increasing the integral time.
	If no improvement occurs: Increase the readjustment time, either by setting a different system type or by setting the value directly.
It is always too hot or too cold in the room	Compensate for the room temperature measurement by changing the "Compensation of the internal actual temperature" parameters accordingly.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Controller	Setpoint adjustment	2 byte	Low	WCT	Transmit/ receive
Controller	Comfort	1 bit	Low	WC	Receive
Controller	Night economy	1 bit	Low	WC	Receive
Controller	Operation mode	1 byte	Low	WC	Receive
Controller	Frost/heat protection	1 bit	Low	WCT	Transmit/ receive
Controller	Current setpoint temperature	2 byte	Low	RWCT	Transmit/ receive/read out
Controller	Current actual temperature	2 byte	Low	RWCT	Transmit/ receive/read out
Controller	Heating/cooling	1 bit	Low	WCT	Transmit/ receive
Controller	Control output for heating	1 bit/1 byte	Low	LCT	Transmit/ read out
Controller	Heating setpoint (additional level)	1 bit/1 byte	Low	LCT	Transmit/ read out
Controller	Control output for cooling	1 bit/1 byte	Low	LCT	Transmit/ read out
Controller	Control output for cooling (additional level)	1 bit/1 byte	Low	LCT	Transmit/ read out
Controller	Status	1 bit/1 byte	Low	LCT	Transmit/ read out
Controller	Dew point alarm	1 bit	Low	RWCT	Transmitted/ receive/read out

The following diagrams are designed to show how the individual communication objects are involved in the control process.



● Display external temperature

You can cyclically read an external temperature value (2-byte value) via the bus and display it. The external temperature can be the outdoor temperature transmitted from a weather station, for example.

External temperature	
Parameter	**Setting**
Cyclic reading of the external temperature	Switched on **Switched off**
Base cycle time	**1 second** 1 minute 1 hour 1 day
Factor for cyclic interval (3 - 255)	**3** -255

The external temperature is only shown in the display, this temperature has no effect on the control behaviour of the multi-function push-button.

Communication object

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Display external temperature	External temperature	2 byte	Low	WCT	Transmit/ receive

● Fan speeds

This tab can be used with (e.g.) the Merten fan coil actuator (art. no. 645093). The sliding controller function in the multi-function push-button can be used to conveniently control the fan speeds with a single push-button. The multi-function push-button can display status feedback from the fan coil actuator on the display or on the feedback LEDs. The display can be used show whether the fans of the fan coil actuator are working in automatic or manual mode. The fan speed can also be shown in the display. The parameters can be used to set the percent values at which the individual speeds are displayed.

Fan speed	
Parameter	**Setting**
Number of fan speeds	1 - 7 **preconfiguration 3**
Value range for speed display: 1-100%	
Display of speed 1 to	1 - 100% **preconfiguration 34%**
Display of speed 2 to	1 - 100% **preconfiguration 67%**
Display of speed 3 to	1 - 100% **preconfiguration 100%**
Display automatic when	**Fan status automatic is "0"**
	Fan status automatic is "1"

Communication objects

You can select the following communication objects: (The display objects that the fan coil actuator transmits to the bus and the multi-function push-button shows on the display or LEDs.)

Function	Object name	Type	Prio	Flags	Behaviour
Display automatic	Fan status automatic	1 bit	Low	WC	Receive
Display fan speed	Fan 0 – 100%	1 byte	Low	WC	Receive

● Example of the multi-function push-button used with the Merten fan coil actuator (art. no. 645093)

The high level of operating convenience of the multi-function push-button with RTCU should be used for fan coil control.
From device version 3A, fan control is a functional element of the multi-function push-button with RTCU. The fan speed can be shown in the display of the multi-function push-button.

⚠ **Caution:** To avoid injury to persons and damage to the system: always adjust the parameters and settings to suit your system. This is just a planning example!

① Make the following settings at the multi-function push-button with 4-gang RTCU:

Setting the multi-function push-button with RTCU	
Tab	**Selection**
Display	Display mode "Actual temperature; Setpoint temperature; Fan speed"
Push-button 1	Setpoint adjustment "Reduce setpoint"
Push-button 2	Setpoint adjustment "Increase setpoint"
Push-button 3	"On telegram" switch
Push-button 3	"From status feedback object" status LED
Push-button 4	"On telegram" switch
Push-button 4	"From status feedback object" status LED
Push-button 5	"On telegram" switch
Push-button 5	"From status feedback object" status LED
Push-button 6	"On telegram" switch
Push-button 6	"From status feedback object" status LED
Push-button 7	"On telegram" switch
Push-button 7	"From status feedback object" status LED
Push-button 8	8 bit sliding controller
Push-button 8	"For actuation = ON/release = OFF" status LED
Push-button 8 (2)	"With limit values" sliding controller function
Push-button 8 (2)	"Stepwise to the limits and then back again" action when actuated
Push-button 8 (2)	Action on release ... "No change"
Push-button 8 (2)	Action when reached ... "No change"
Push-button 8 (2)	Action when released after being reached ... "No change"
Push-button 8 (2)	Value 1: "0"
Push-button 8 (2)	Step value: "85"
Push-button 8 (2)	Value 2: "255"
Controller	Switched on
Type of control	Heating and cooling
Closed-loop control for heating	"PI controller (continuous)" control value output
Closed-loop control for cooling	"PI controller (continuous)" control value output
External temperature	Switched on
External temperature	5 minute cycle time
Fan speeds	Number of fan speeds: "3"
Fan speeds	Display of speed 1 to : "34 %"
Fan speeds	Display of speed 2 to : "67%"

Setting the multi-function push-button with RTCU	
Tab	**Selection**
Fan speeds	Display of speed 3 to : "100%"
Fan speeds	Display automatic when "Fan status automatic 1"

Push-button assignments for multi-function push-button with RTCU:

Multi-function push-button with RTCU	
Push-button	**Assignment**
Push-button 1	"Reduce setpoint"
Push-button 2	"Increase setpoint"
Push-button 3	"Fan automatic ON"
Push-button 4	"Switch fan to speed 1"
Push-button 5	"Switch fan to speed 2"
Push-button 6	"Switch fan to speed 3"
Push-button 7	"Manually switch off fan"
Push-button 8	"Increase/reduce fan speeds stepwise"

② Perform the following settings for the fan coil actuator:

Fan coil actuator settings	
Tab	**Selection**
General	Heating "active"
General	Type of heating device "Fancoil"
General	Cooling "active"
General	Type of cooling device "Fancoil"
General	"Heating valve/cooling valve" valves
Actual temperature	Actual temperature monitoring time "16 minutes"
Fan	Number of fan speeds: "3"
Fan	Fan speed 1 threshold value: "10%"
Fan	Fan speed 2 threshold value: "40%"
Fan	Fan speed 3 threshold value: "70%"

③ Connect the group addresses:

Multi-function push-button with RTCU	
Group address	**Object**
1/1/1	No. 6 1 bit push-button 3 "Fan automatic on"
1/1/2	No. 8 1 bit push-button 3 "Automatic status feedback"
1/1/3	No. 9 1 bit push-button 4 "Fan speed 1"
1/1/4	No. 11 1 bit push-button 4 "Fan speed 1 status feedback"
1/1/5	No. 12 1 bit push-button 5 "Fan speed 2"

Multi-function push-button with RTCU	
Group address	**Object**
1/1/6	No. 14 1 bit push-button 5 "Fan speed 2 status feedback"
1/1/7	No. 15 1 bit push-button 6 "Fan speed 3"
1/1/8	No. 17 1 bit push-button 6 "Fan speed 3 status feedback"
1/1/9	No. 18 1 bit push-button 7 "Fan manually OFF"
1/1/10	No. 20 1 bit push-button 7 "Fan status feedback" ON/OFF
1/1/11	No. 21 1 byte push-button 8 "Fan speeds stepwise to the limits and then back again"
1/1/12 S 1/1/13 (from weather station)	No. 32 2 byte "External temperature"
1/1/2	No. 33 1 bit "Automatic display"
1/1/14	No. 34 1 byte "Fan speed display"
1/1/15	No. 42 1 byte "Heating control value"
1/1/16	No. 43 1 byte "Cooling control value"
1/1/17	No. 45 1 bit "Dew point alarm"

Fan coil actuator	
Group address	**Object**
1/1/12	No. 0 2 byte "Actual temperature input/output"
1/1/9	No. 9 1 bit "Fan manually OFF"
1/1/3	No. 10 1 bit "Fan manually to speed 1"
1/1/5	No. 11 1 bit "Fan manually to speed 2"
1/1/7	No. 12 1 bit "Fan manually to speed 3"
1/1/11	No. 15 1 byte "Fan manually 0-255"
1/1/1	No. 16 1 bit "Automatic mode manually ON"
1/1/2	No. 17 1 bit "Automatic status feedback"
1/1/4	No. 18 1 bit "Fan speed 1 status feedback"
1/1/6	No. 19 1 bit "Fan speed 2 status feedback"
1/1/8	No. 20 1 bit "Fan speed 3 status feedback"
1/1/15	No. 21 1 byte "Heating valve setpoint"
1/1/16	No. 22 1 byte "Cooling valve setpoint"
1/1/17	No. 24 1 bit "Dew point message" -"Dew point alarm"
1/1/10	No. 25 1 bit "Fan ON/OFF status feedback"
1/1/14	No. 26 1 byte "Fan 0-100% status feedback"

● Behaviour for application/recovery of bus voltage

Behaviour on application/recovery of the bus voltage

When the bus voltage is applied or recovered, the following status information may appear in the display:

– "A 1" to "A 6" shows the operational status during the initialisation phase of the push-button. After approximately 30 seconds, these displays are replaced by the standard display.
– "Er 1" is an error message and means that the actual temperature could not be detected.
– "Er 2" is also an error message. A contradiction has been detected in the heating parameters (setpoints or dead zone are inconsistent).
– "Er 3" means that the software in the multi-function push-button with RTCU is not compatible with the ETS application.

Depending on the setting

– The clock symbol may flash in the display when the time has not yet been automatically synchronised or manually set.
– The background lighting of the display may be switched on.
– The status LEDs may be switched on or may flash.
– The operating LEDs may be switched on, depending on the parameterisation. When parameters have been set incorrectly, the two lower status LEDs are switched on as an indication.
– A time synchronisation request telegram may be transmitted.
– Telegrams for the control function (actual value, control values etc.) may be transmitted.

Behaviour when bus voltage fails

The operation LEDs and any status LEDs which may be lit up are switched off together with the display including the background lighting.