2CKA001473B9482 | 24.01.2018

Product manual

ABB-tacteo ABB i-bus® KNX

TBR/U4.x.x-xx Control element 4gang with RTC incl. BAU

TR/U.x.x-xx Room temperature controller incl. BAU

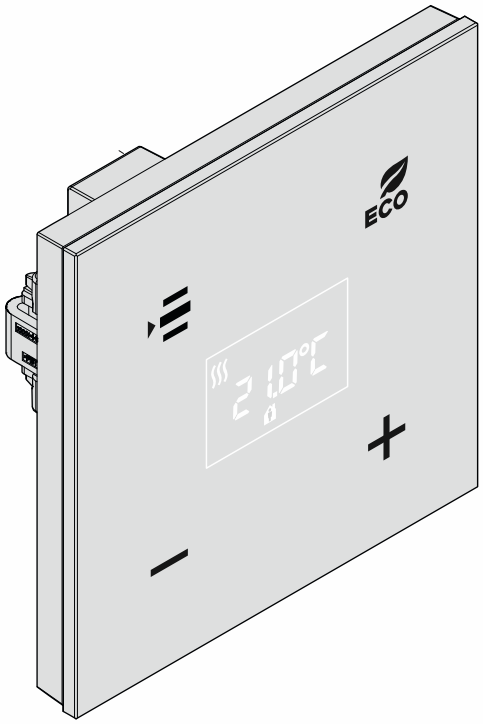


Table of contents

1 Notes on the instruction manual

Please read through this manual carefully and observe the information it contains. This will assist you in preventing injuries and damage to property, and ensure both reliable operation and a long service life for the device.

Please keep this manual in a safe place.

If you pass the device on, also pass on this manual along with it.

ABB accepts no liability for any failure to observe the instructions in this manual.

If you require additional information or have questions about the device, please contact ABB or visit our Internet site at:

www.BUSCH-JAEGER.com

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent hazards of this kind.

ABB accepts no liability for any failure to observe the safety instructions.

2.1 Information and symbols used

The following Instructions point to particular hazards involved in the use of the device or provide practical instructions:

Danger

Risk of death / serious damage to health

– The respective warning symbol in connection with the signal word "Danger" indicates an imminently threatening danger which leads to death or serious (irreversible) injuries.

Warning

Serious damage to health

– The respective warning symbol in connection with the signal word "Warning" indicates a threatening danger which can lead to death or serious (irreversible) injuries.

Caution

Damage to health

– The respective warning symbol in connection with the signal word "Caution" indicates a danger which can lead to minor (reversible) injuries.

Attention

Damage to property

– This symbol in connection with the signal word "Attention" indicates a situation which could cause damage to the product itself or to objects in its surroundings.

NOTE

This symbol in connection with the word "Note" indicates useful tips and recommendations for the efficient handling of the product.

This symbol alerts to electric voltage.

This icon warns against glass breakage.

2.2 Intended use

This device is a room temperature controller for decentralized flush-mounted installation.

The room temperature controller is suitable for the control of a ventilator convector with a fan-coil actuator or a conventional heating and cooling system.

The device is intended for the following:

- Operation according to the listed technical data
- Installation in dry interior rooms and suitable flush-mounted boxes
- Use with the connecting options available on the device

The intended use also includes adherence to all specifications in this manual.

Extensive functions are available for the room temperature controller. The scope of applications is contained in Chapter 11 “Description of application and parameters“ on page 41 (only in languages of the countries DE, EN, ES, FR, IT and NL).

The integrated bus coupler makes possible the connection of a KNX bus line.

The devices are available in a standard configuration or they can be individually designed via a web configurator. Only components that are specific to a selected country are displayed via the web configurator. Depending on the device type and configuration, different functions result.

- The standard devices are available in the e-catalogue under ABB-tacteo.
- The devices are configured via the web configuration tool under tacteo-configurator.my.busch-jaeger.de.
- Ordering is possible only from the web configurator in connection with the specified Design-ID or the generated Design-ID.

2.3 Improper use

Each use not listed in Chapter 2.2 “Intended use“ on page 11 is deemed improper use and can lead to personal injury and damage to property.

ABB is not liable for damages caused by use deemed contrary to the intended use of the device. The associated risk is borne exclusively by the user/operator.

The device is not intended for the following:

- Unauthorized structural changes
- Repairs
- Outdoor use
- The use in bathroom areas
- Insert with an additional bus coupler

2.4 Target group / Qualifications of personnel

Installation, commissioning and maintenance of the device must only be carried out by trained and properly qualified electrical installers.

The electrical installer must have read and understood the manual and follow the instructions provided.

The electrical installer must adhere to the valid national regulations in his/her country governing the installation, functional test, repair and maintenance of electrical products.

The electrical installer must be familiar with and correctly apply the "five safety rules" (DIN VDE 0105, EN 50110):

1. Disconnect
2. Secure against being re-connected
3. Ensure there is no voltage
4. Connect to earth and short-circuit
5. Cover or barricade adjacent live parts

No special qualifications are needed to operate the device.

2.5 Safety instructions

Danger - Electric voltage!

Electric voltage! Risk of death and fire due to electric voltage of 100 … 240 V.

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death.

- Work on the 100 … 240 V supply system may only be performed by authorised and qualified electricians.
- Disconnect the mains power supply before installation / disassembly.
- Never use the device with damaged connecting cables.
- Do not open covers firmly bolted to the housing of the device.
- Use the device only in a technically faultless state.
- Do not make changes to or perform repairs on the device, on its components or its accessories.
- Keep the device away from water and wet surroundings.

Danger - Electric voltage!

Install the device only if you have the necessary electrical engineering knowledge and experience.

- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:

- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect
  2. Secure against being re-connected
  3. Ensure there is no voltage
  4. Connect to earth and short-circuit
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the type of supply network (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

Caution - Glass breakage!

The breakage of a glass plate could lead to the risk of injury.

Thr glass plate consists of high-quality safety glass. Yet breakage cannot be excluded.

– Avoid force being applied to the glass plate.
– Never reach into a broken glass with you bare hands.

Caution! - Risk of damaging the device due to external factors!

Moisture and contamination can damage the device.

- Protect the device against humidity, dirt and damage during transport, storage and operation.

3 Information on protection of the environment

3.1 Environment

Consider the protection of the environment!

Used electric and electronic devices must not be disposed of with domestic waste.

– The device contains valuable raw materials which can be recycled. Therefore, dispose of the device at the appropriate collecting depot.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.

(EU Directive 2012/19/EU WEEE and 2011/65/EU RoHS)

(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006).

4 Setup and function

- The device is designed for decentralised flush-mounted installation.
- The device can be linked with an available actuator via KNX group addresses.
- The device (with bus coupler) can be assigned to an available switch actuator.
- The integrated bus coupler makes possible the connection to the KNX bus line.
- The device can, for example, send switching, dimming or blind control commands to KNX actuators. The device can also be used for storing and sending of light scenes.
- The device has an internal temperature sensor for measuring the actual temperature in the room. The measured value is made available to the KNX bus via communication object.
- The device must be parameterized for the use of the functions.
- The sensor is integrated in the flush-mounted insert and already pre-mounted.

Additional product features:

- LEDs as light for orientation / status indication

4.1 Configurable devices

The devices can be configured prior to delivery. The following sectors, for example, can be configured according to requirement.

- Button icons
- Colour of the buttons
- Additional text for the buttons
- Number of buttons (up to the maximum possible for the respective size of glass plate)
- Alignment of buttons (if the glass plates are not square)
- Alignment of the glass plates (if the glass plates are not square)

The function of the respective buttons is parameterised via the ETS4.

Alternative to the configurable models, the preconfigured versions are available.

The configuration is carried out with the tacteo configurator at tacteo-configurator.my.busch-jaeger.de

Note
Due to the options for configuration, your device no doubt differentiates itself from the examples shown here.
The type of operation, however, is carried out in the same way.

Note
Configured devices are excluded from replacement or a reimbursement.

4.2 Device overview

4.2.1 Overview

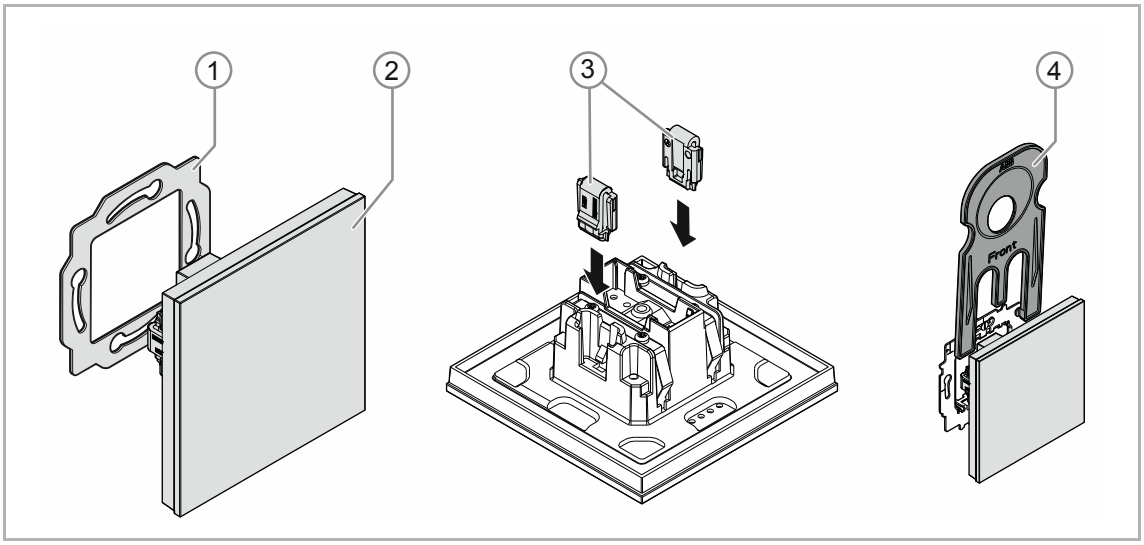


Fig. 1: Product overview

[1] Support ring [1]

[2] Flush-mounted insert with control element [2] (firmly installed unit)

[3] Clamps of removal protection [3] (optional)

[4] Removal tool [4] (optional)

4.2.2 Versions

The control element is available as pure RTC control element and in models 4gang plus RTC.

– Available are the configurable models and preconfigured standard versions.

– For the configurable models, the control elements can be designed personalized for the required functions via the ABB-tacteo configurator. The buttons can there be additionally fitted with text if required.

The functionality, method of operation and installation/dismantling is identical for all models.

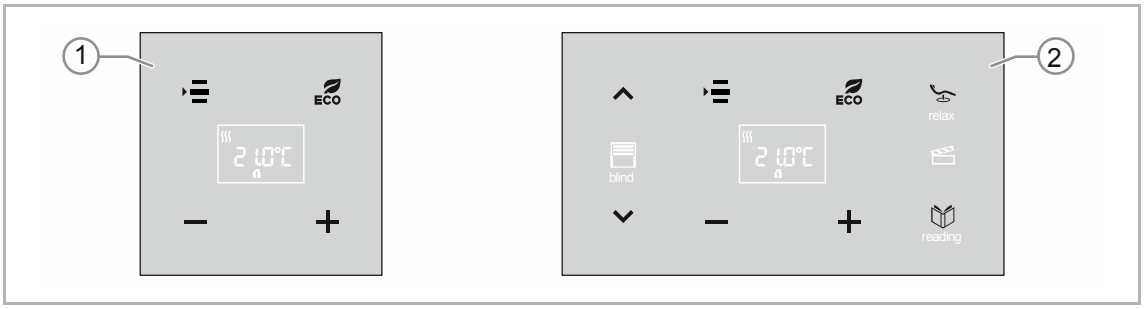


Fig. 2: Models of control elements (examples)

[1] Buttons for RTC

[2] Buttons for 4gang control elements plus RTC

4.2.3 Support rings

The support rings are partly diffenerent from country to country. The correct support ring is supplied according to country.

Country-specific support rings are for example:

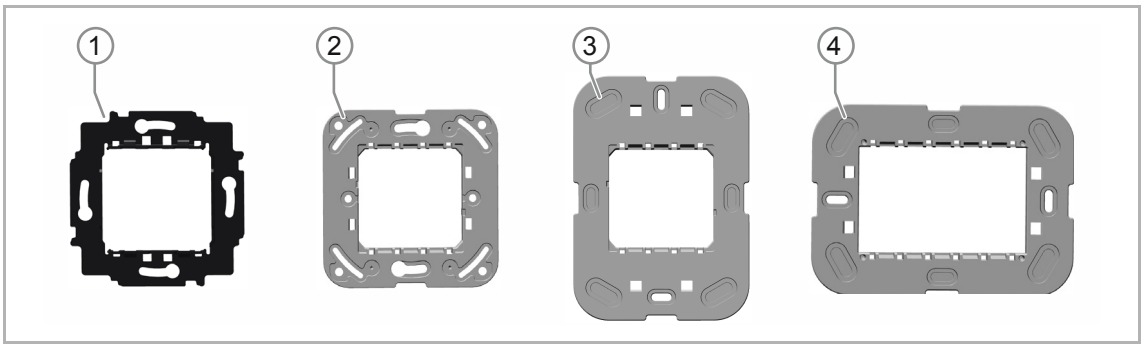


Fig. 3: Country-specific support rings

[1] VDE Germany

[2] Switzerland / British standard (BS)
(The support ring for Switzerland is supplied without earth terminal)

[3] NEMA

[4] Italy

4.3 Functions

The following table provides an overview of the possible functions and applications of the device:

Special features	Function
▪ Function illumination ▪ Freely programmable ▪ Day/Night switchover of display illumination	▪ Set / actual temperature ▪ Comfort/standby ▪ Eco mode ▪ Frost protection ▪ Heat protection ▪ Heating ▪ Cooling ▪ Fan control ▪ Logic functions

Table : Overview of functions

NOTE
The room temperature controller operates as PI controller and in time adjusts its control value also to the response of the room.

4.4 Scope of supply

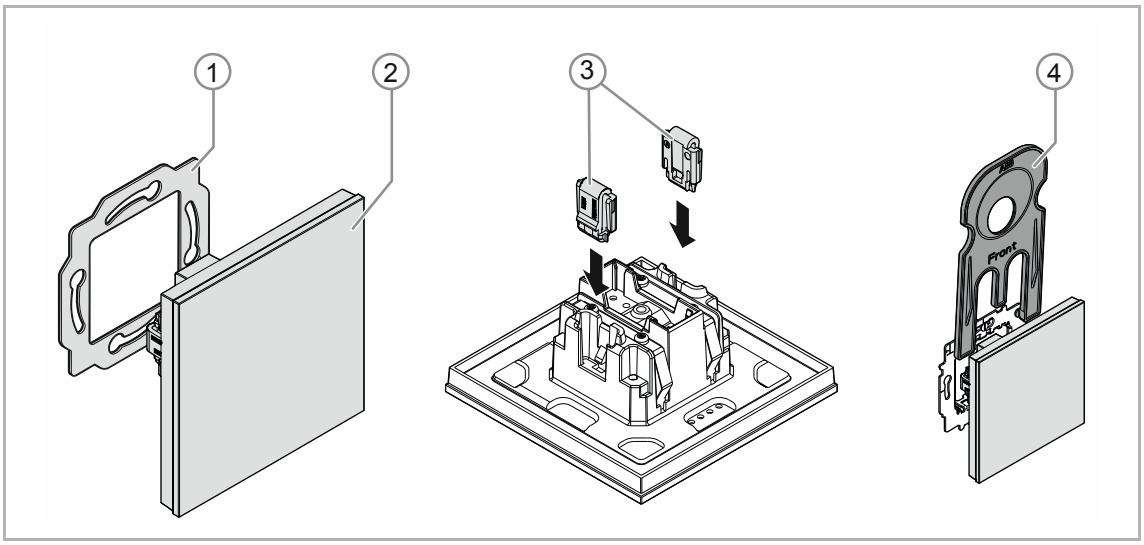


Fig. 4: Scope of delivery

Included in the scope of delivery are:

- Support ring [1]
- Flush-mounted insert with control element [2] (firmly installed unit)
- Clamps of removal protection [3] (optional)
- Removal tool [4] (optional)

Note

- Additional information about possible device versions is available in the electronic catalogue (www.busch-jaeger-catalogue.com).

4.5 Overview of types

Models of control elements preconfigured or freely configurable

Article no.	Product name
TR/U.x.x-xx	Room temperature controller incl. BAU ▪ Square ▪ Vertical ▪ Horizontal
TBR/U4.x.x-xx	Control element 4gang with RTC incl. BAU ▪ Vertical ▪ Horizontal

Table 1: Models of control elements preconfigured or freely configurable

5 Technical data

5.1 Technical data

Designation	Value
Power supply:	24 V DC (via bus line)
KNX connection ▪ Bus connecting terminal, screwless: ▪ Line type: ▪ Wire stripping:	 0.6 - 0.8 mm J-Y(St)Y, 2 x 2 x 0.8 mm 5 - 6 mm
Bus subscribers:	1 (≤12 mA)
Temperature range:	-5°C to +45°C
Storage temperature:	-20°C to +70°C
Protection type:	IP 20

Table 2: Technical data

5.2 Dimensional drawings

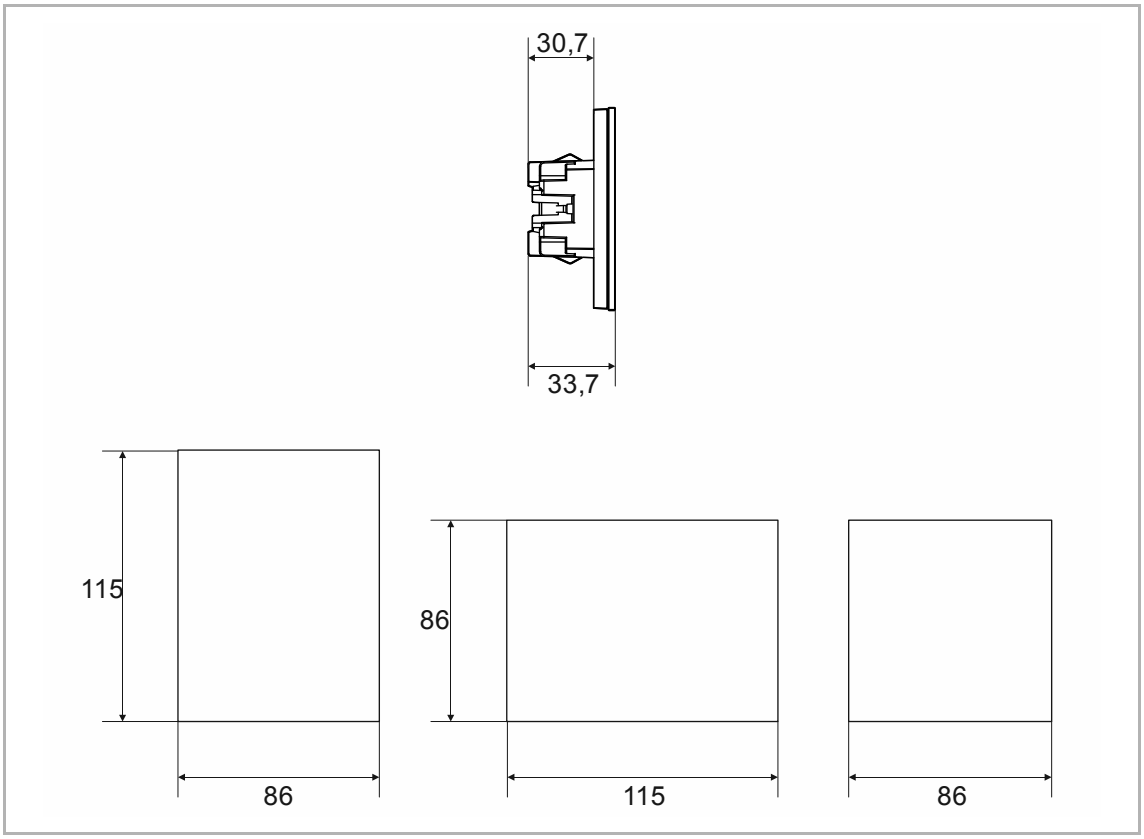


Fig. 5: Dimensions (all dimensions are in mm)

6 Connection, installation / mounting

Danger - Electric voltage!

Install the device only if you have the necessary electrical engineering knowledge and experience.

- Incorrect installation endangers your life and that of the users of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:

- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect
  2. Secure against being re-connected
  3. Ensure there is no voltage
  4. Connect to earth and short-circuit
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the type of supply network (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).
- Observe the correct polarity.

Caution - Glass breakage!

The breakage of a glass plate could lead to the risk of injury.

Thr glass plate consists of high-quality safety glass. Yet breakage cannot be excluded.

– Avoid force being applied to the glass plate.
– Never reach into a broken glass with you bare hands.

6.1 Installation site

For proper commissioning please observe the following points:

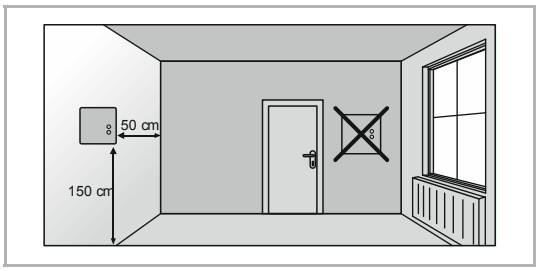


Fig. 6: Installation site - Distance

- The device should be installed at a height of approximately 150 cm from the floor and 50 cm from a door frame.

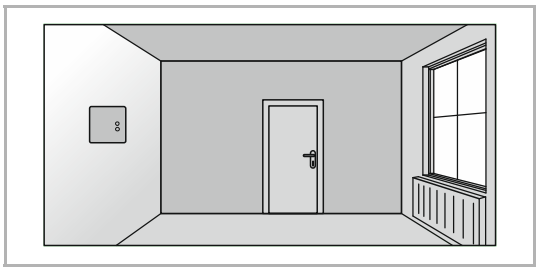


Fig. 7: Installation site – Position of radiator

- The device should be installed on a wall opposite a radiator.

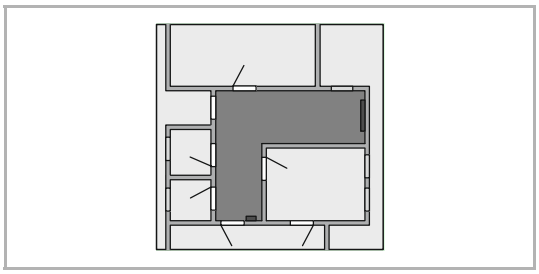


Fig. 8: Installation site - Room architecture

- The angles of the room architecture should not separate a radiator and the device from each other.

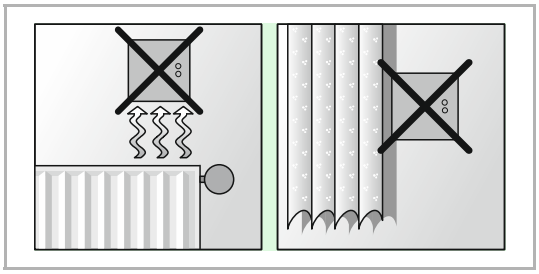


Fig. 9: Installation site – Position of RTC

- Installing a device close to a radiator or behind curtains is not practical.

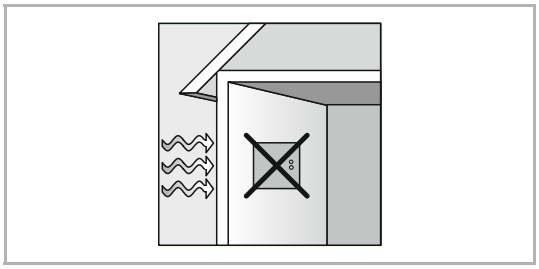


Fig. 10: Installation site - Exterior wall

- This also applies to installation on an exterior wall.
  - Low outside temperatures have an effect on temperature regulation.

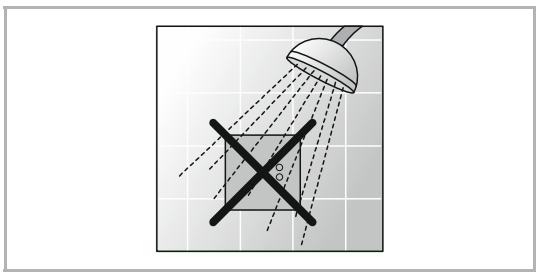


Fig. 11: Installation site – Wetting with fluids

- Wetting the room temperature controller with fluids is to be avoided.

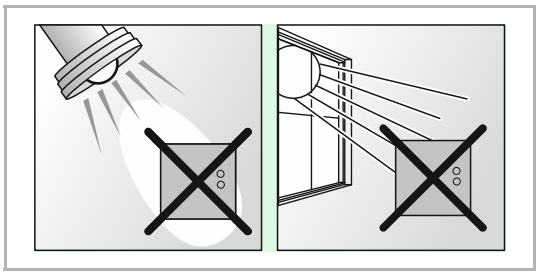


Fig. 12: Installation site – Direct sunlight

- Just as heat radiated from electric loads can impair the temperature regulation, so can direct sunlight on the device.

6.2 Mounting

Caution! The device can sustain damage when coming into contact with hard objects!

The plastic parts of the device are sensitive.

– Pull the attachment off only with your hands.
– Do not lever parts off with screwdrivers or similar hard objects.

In Germany the flush-mounted insert must only be installed in flush-mounted boxes according to DIN 49073-1, Part 1, or suitable surface-mounted housings.

Different installation standards apply in other countries. These are to be taken into account when used in connection with a different support ring and flush-mounted box.

To install the device, perform the following steps:

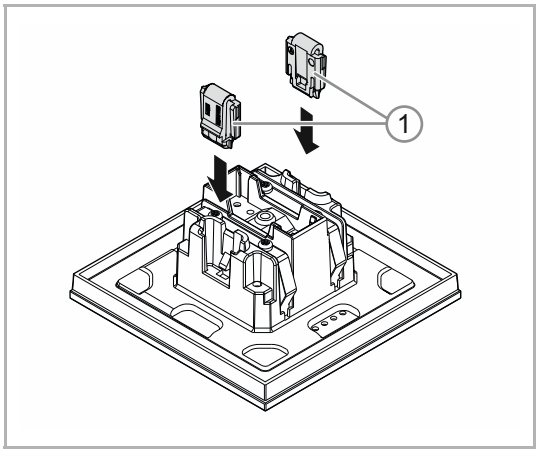


Fig. 13: Installation of the removal protection

Option

1. Installing the removal protection.
   – Push the removal protection into position by hand.

     (The removal protection is not a component part of the device and is to be ordered separately.)

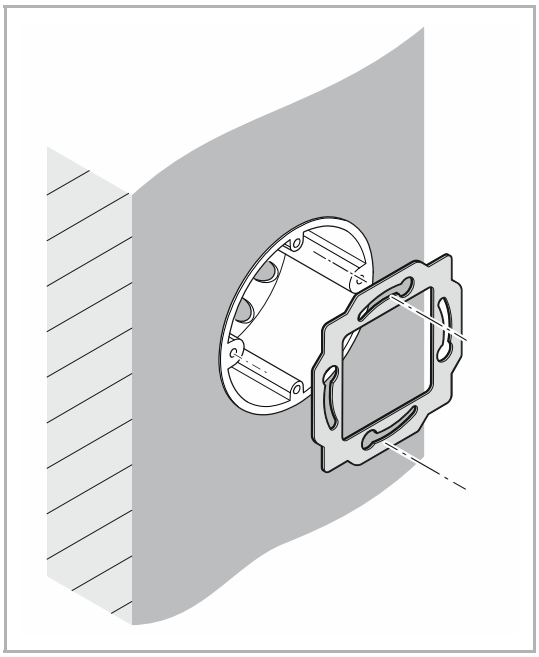


Fig. 14: Installation of the support ring

2. Installing the support ring.

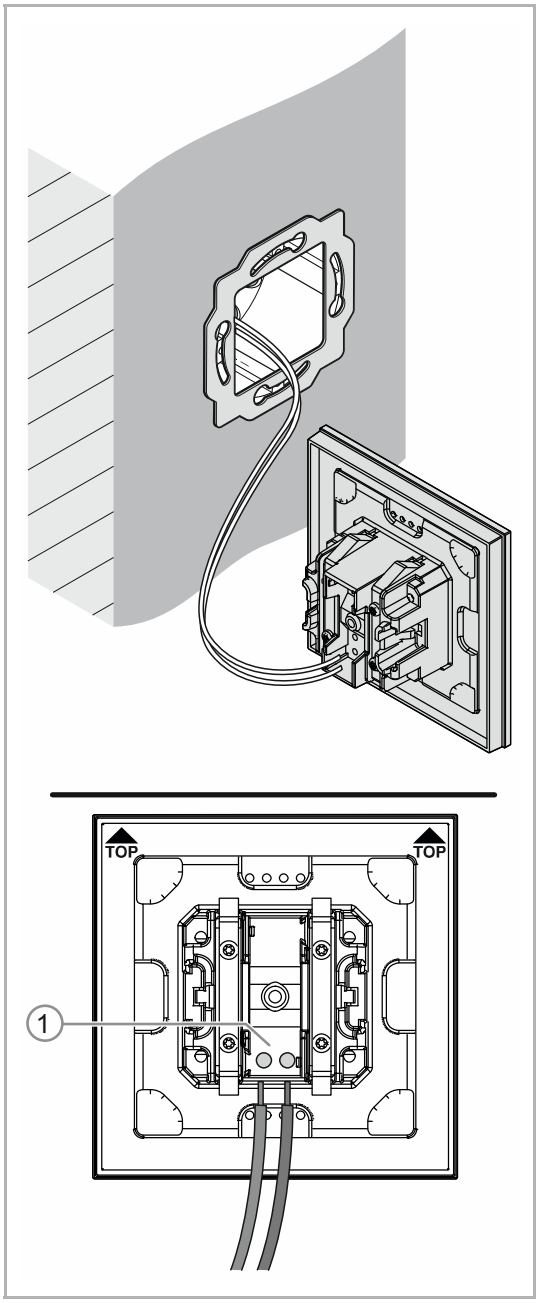


Fig. 15: Connection of the bus line

3. Pull the bus line out of the flush-mounted box and connect the line to the bus connection terminal [1], see chapter 6.3 “Electrical connection“ on page 26.
   – Check that the polarity is correct!

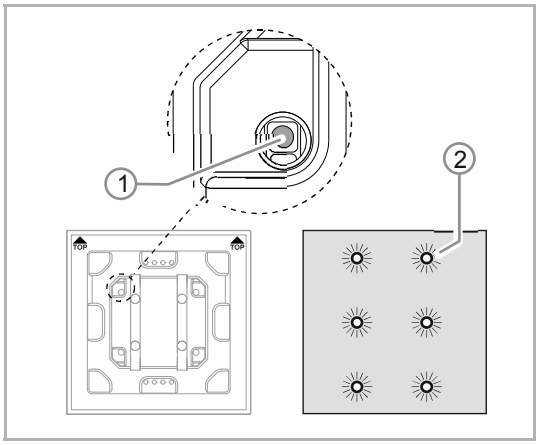


Fig. 16: Programming button

4. To commission the device, see chapter 7 “Commissioning“ on page 27.
   – Programming is carried out via the programming button [1] on the rear of the device.
     – Press the programming button [1].
     – All LEDs [2] light up red.

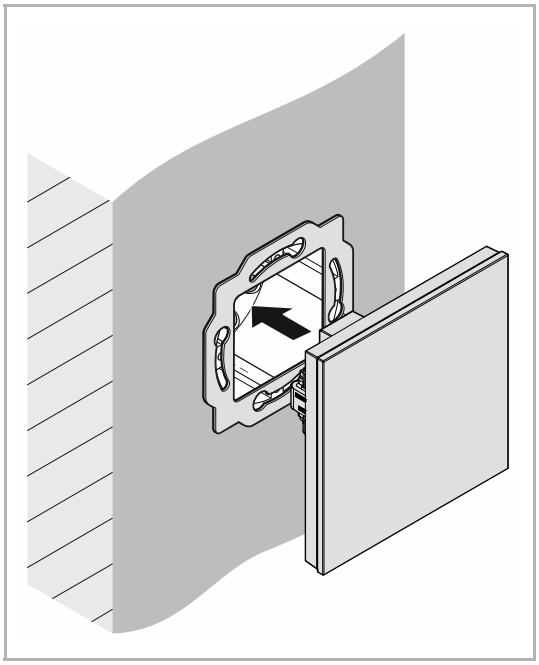


Fig. 17: Mounting devices

5. Installing the device.
   – Snap the device into the support ring by hand.

The device is now mounted.

6.3 Electrical connection

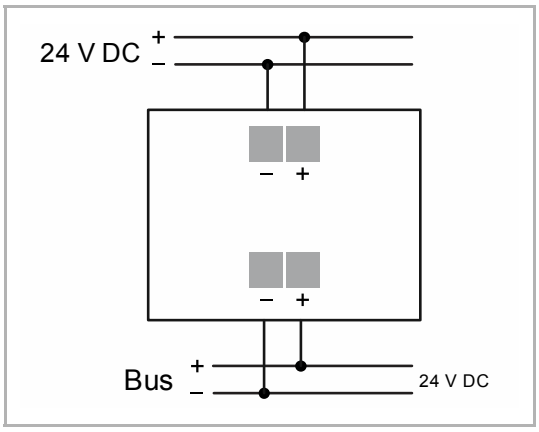


Fig. 18: Connection of bus coupler and display

Carry out the electrical connection according to the circuit diagram.

7 Commissioning

7.1 Software

To start the device a physical address must be assigned first. The physical address is assigned and the parameters are set with the Engineering Tool Software (ETS).

NOTE
The devices are products of the KNX system and meet KNX guidelines. Detailed expert knowledge by means of KNX training sessions for a better understanding is assumed.

7.1.1 Preparation

1. Connect a PC to the KNX bus line via the KNX interface (e.g. via the commissioning interface / commissioning adapter 6149/21-500).
   – The Engineering Tool Software must be installed on the PC (native application from ETS 4.0).
2. Switch on the bus voltage.

7.1.2 Assigning a physical address

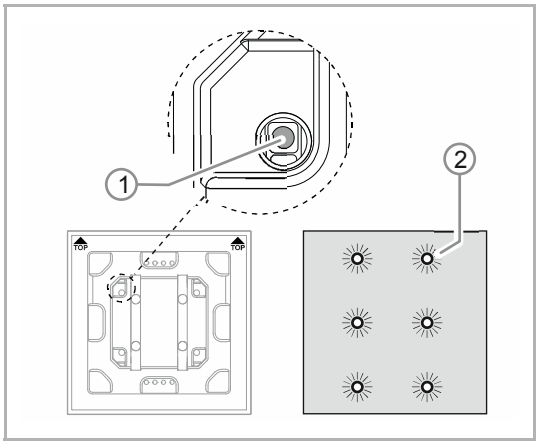


Fig. 19: Programming button

1. Press the programming button [1].
   – All LEDs [2] light up red.

7.1.3 Assigning the group address(es)

The group addresses are assigned in connection with the ETS.

7.1.4 Selecting the application program

Please contact our Internet support unit (www.BUSCH-JAEGER.com). The application is loaded into the device via the ETS.

7.1.5 Differentiating the application program

Various functions can be implemented via the ETS.

Detailed description of parameters, see chapter 11 “Description of application and parameters“ on page 41 (only in languages DE, EN, ES, FR, IT and NL).

8 Updating options

A firmware update is carried out via the KNX bus by means of the ETS app "KNX Bus Update".

NOTE
The description of the update process can be downloaded via the electronic catalogue (www.busch-jaeger-catalogue.com). It is stored on the device page under category "Software".

9 Operation

Caution - Glass breakage!

The breakage of a glass plate could lead to the risk of injury.

Thr glass plate consists of high-quality safety glass. Yet breakage cannot be excluded.

– Avoid force being applied to the glass plate.
– Never reach into a broken glass with you bare hands.

Note

The buttons of the device can be individually configured prior to delivery according to requirement or wishes. The buttons of your device are probably different from the examples listed here.

The type of operation, however, is carried out in the same way.

Operation is carried out by touching the individual operating fields.

The function is specified via the assigned application / function and their parameter settings. Extensive functions are available for the operating fields.

The range of applications is contained in see chapter 11 “Description of application and parameters“ on page 41 (only in languages DE, EN, ES, FR, IT, NL and RU).

Note

In the basic setting the display always indicates the setpoint temperature!

9.1 Control elements

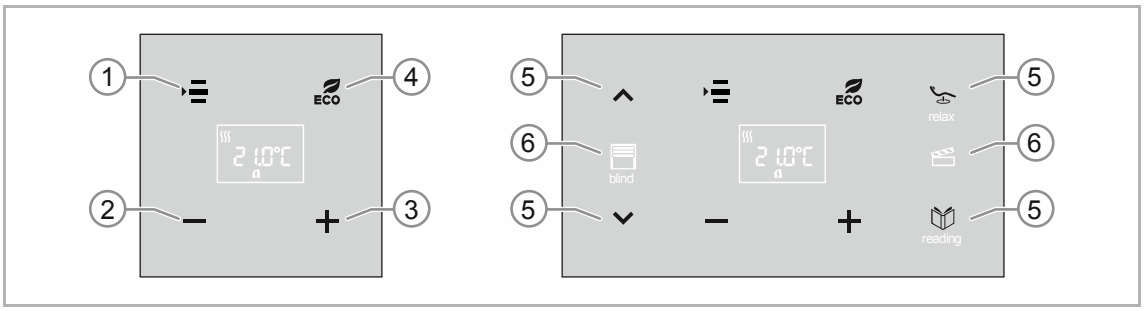


Fig. 20: Control elements

[1] Selection of one of the following functions in the sequence of the list.
Prerequisite: The parameters for the functions have been set beforehand.

- Setpoint adjustment
- Off/On (OFF; long press of the button)
- Fan speed levels
- Switchover heating/cooling

  Keep the button pressed until the display flashes. Press the button several times until the desired function is displayed.

[2] Reduce temperature, press the button

[3] Increase in temperature reduction; press the button

[4] ECO mode, press the button

[5] Additional functions (dependent on the configuration and parameter setting)

[6] Additional operating buttons (dependent on the configuration and parameter setting)

Note
The display of the room temperature controller always indicates the set-value temperature. This can be changed via the arrow buttons of the control element.

9.2 Colour concept

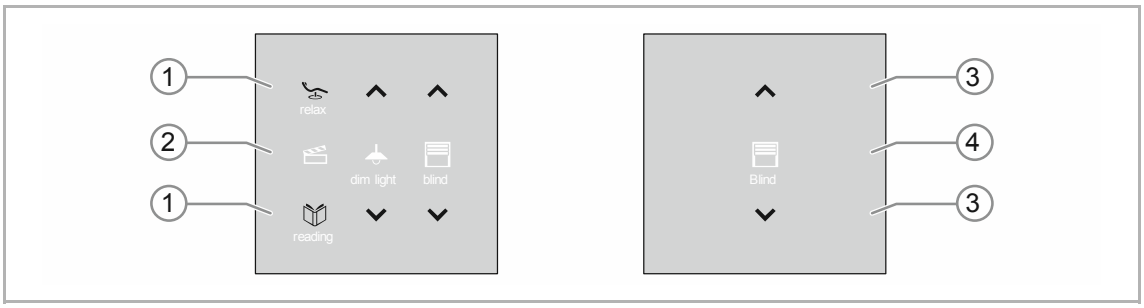


Fig. 21: Models of control elements (examples)

- The function icons [2] [4] have grey background.
  - The function icons describe the function.
- The control icons [1] [3] (on the buttons) have a coloured background.
  - The control icons "check" the function. The desired functions are carried out with the control icons.
  - The control icons can also be fitted with additional text.
- The text has a grey background.

9.3 Operating modes

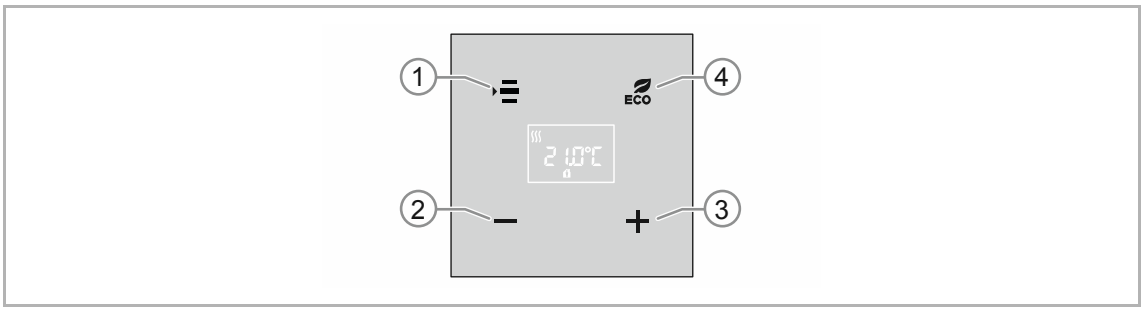


Fig. 22: RTC control elements

The device has the following operating modes:

Display	Operating mode
	Comfort operation – Application: You are in the room for a longer period of time; the comfort temperature is to be reached. – Behaviour of the RTC: The display indicates the set-value temperature that has been set. The controller aims at this temperature.
	ECO mode – Application: You are leaving the room for a few hours; the room temperature is to be reduced to save energy. However, the room should not cool down completely. – Behaviour of the RTC: The display indicates "ECO". The temperature is lowered by 2°C. The reduction can be adjusted in the user interface.
	Off mode – Application: The room is not being used for a longer period of time. – Behaviour of the RTC: The display indicates "OFF". The heating valves are closed (frost protection is active).
	Frost/heat protection – Application: The function switches on automatically when a window contact has been connected and the window is being opened. – Behaviour of the RTC: The display indicates the icon for frost/heat protection. The heating valves close. If the room temperature drops below 7°C, the heating is switched on again to prevent damage to the building.
 	Heating/cooling switchover – Application: The device is suitable for both heating and cooling mode. The switchover of the two operating modes takes place either via a binary input, which has been configured as heating/cooling reverser, or via a press of the button [1] and subsequent selection via the set value adjustment buttons (2/3). – Behaviour of the RTC: The device operates in heating mode. The display shows the icon for heating. The settings for heating mode are available. The heating unit, e.g. a heat pump, switches into cooling mode. All RTCs in the building receive information via the KNX bus and switch from heating mode into cooling mode. The display shows the icon for cooling. The settings for cooling mode are available.
 	Fan operation – Application: You want to change the automatically selected fan speed level and set the desired fan speed level manually on the device. The control of the temperature in the room continues to be active. – Behaviour of the RTC: The display indicates the set fan speed level and "Auto". The room is heated or cooled via a 3-stage fan coil. The fan sets the necessary fan speed level automatically in dependence of the control.

9.4 Displays / messages

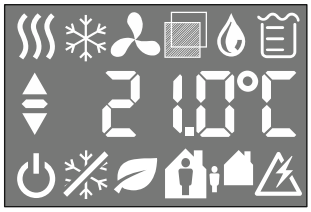


Fig. 23: Displays

Display	Function	Action of the device
21,0°C	Controller switched on / display of set-point temperature	
	Comfort mode	– Heating/cooling is at the normal level. – The display is only visible when the "Superimposed operating mode" is active. (Local operation is blocked)
	Standby mode	– The heating/cooling output is slightly lowered.
	Dew point mode	– The room temperature in not lowered any further.
	Frost protection mode	– The temperature is kept above a minimum value.
	Heat protection mode	– The temperature is kept below a maximum value.
	Condensate	– The condensate tank is full. The device operates in heat protection mode.
	OFF	– The control is deactivated. The device operates in frost protection mode.
	ECO mode	– The heating/cooling output is extremely lowered.
	Heating/cooling switchover	– Manual switchover.
1 3	Fan speed levels 1-3	– Manual ventilation control.
A(3)	Automatic fan speed levels	– Automatic ventilation control.
	Window contact	– The control is deactivated. The device operates in frost protection mode.

Table 3: Overview of displays

9.4.1 Switching On and Off

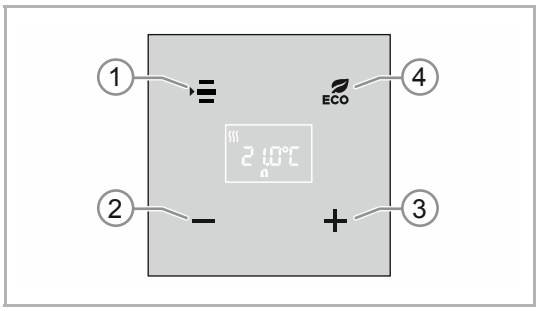


Fig. 24: RTC control elements

Switch-on

1. Press the button [1].
   - The functions which were active before deactivation are activated.
   - The set-point temperature is shown on the display.

Switch-off

1. Press the button [1] continuously until the display flashes.
2. Press the button [1] again several times until function "ON/OFF" is displayed.
3. Press the button [1] continuously until the device switches into the "Off" status.

Note
In the OFF mode all functions and all buttons of the device (except button [1]) are deactivated.

9.4.2 Adjust temperature

Display of the set-point temperature

The set-point temperature appears automatically on the display. The device must be switched on for this to happen.

Setting of the set-point temperature

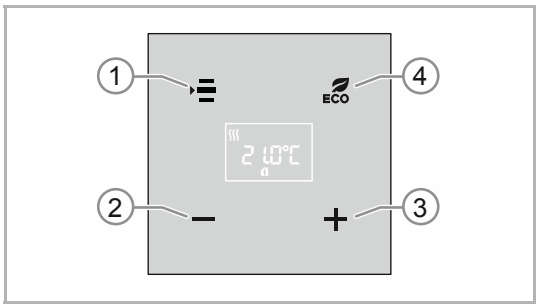


Fig. 25: RTC control elements

The desired temperature is set with the buttons [2] and [3]. The current set temperature is shown on the display.

- Press button [3] to raise the temperature.
- Press button [2] to lower the temperature.

After an adjustable time the device changes back into the mode that was active before the adjustment of the set-point temperature, e.g. into comfort operation. The stored set-point temperature is displayed.

Note
The jump-back time of the device to the primary functions of the control elements is specified via application "Control settings".

9.4.3 Adjusting the fan speed levels

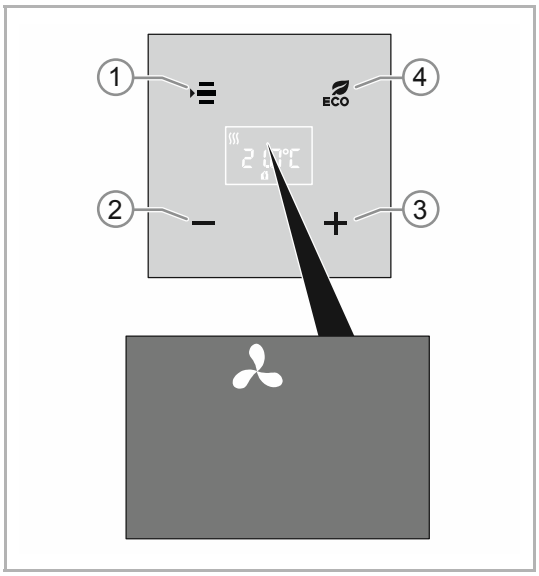


Fig. 26: Display of fan operation

1. Press the button [1] continuously until the display flashes
2. Press the "Menu" button [1].
   - Keep pressing it until the fan speed level icon is shown on the display.
3. Press the PLUS/MINUS button [2]/[3] to adjust the fan speed level.
   - The set fan speed level is adopted when a timeout happens after nothing has been pressed for a certain period of time, or if the "Menu" button [1] is pressed again.
   - The manually set fan speed level is shown in the setpoint (comfort mode) on the display in the centre at the top.

Note
The function of the fan speed levels is adjusted in application "RTC". This function is inactive if "Fan coil" has not been parameterized.

9.4.4 Eco mode

ECO mode can be used to automatically reduce the room temperature and for reducing the fan speed level. E.g. during absence.

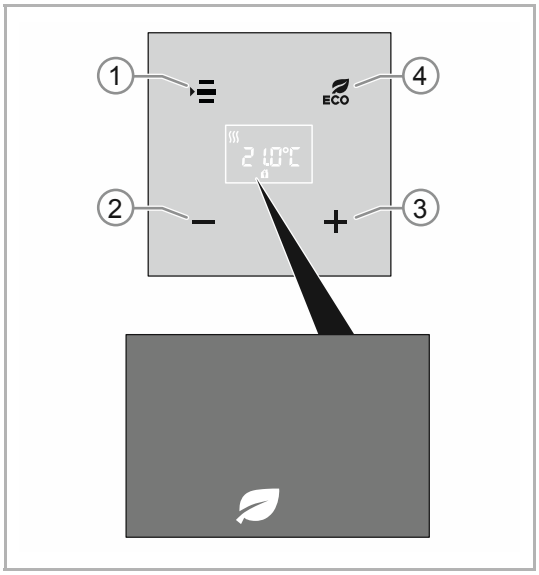


Fig. 27: Display of ECO mode

Activating ECO mode

1. Press the button [4].
   – The device switches to ECO mode.

Deactivating ECO mode

2. Press the button [4] again.
   – The device changes back into the mode that was active before the activation of ECO mode. E. g. into comfort operation.

ECO mode is also exited, for example, when the temperature is adjusted manually via buttons [2] and [3].

Note
The function of ECO mode is set via the "RTC" and "Control settings" applications.
The default setting cannot be changed via the setpoint adjustment (buttons [2] and [3]).

9.4.5 Changing the operating status (heating/cooling)

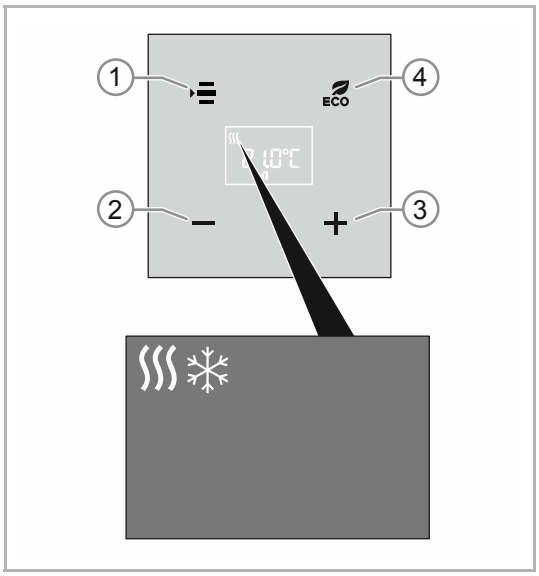


Fig. 28: Heating/cooling operating mode

1. Press the button [1] continuously until the display flashes
2. Press the "Menu" button [1].
   – Keep pressing it until the function "Operating mode" is shown on the display.
3. Select the desired operating mode with buttons [2] and [3].
   – After an adjustable time the device changes back into the mode that was active before the adjustment of the operating mode. E.g. into comfort operation.

When the "Heating" and/or "Cooling" control function is activated, the operating mode that is currently set is indicated on the display.

10 Maintenance

10.1 Maintenance-free device

The device is maintenance-free. In case of damage, e.g. during transport or storage), do not perform repairs. Once the device is opened, the warranty is void.

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

10.2 Cleaning

Caution - Glass breakage!

The breakage of a glass plate could lead to the risk of injury.

Thr glass plate consists of high-quality safety glass. Yet breakage cannot be excluded.

– Avoid force being applied to the glass plate.
– Never reach into a broken glass with you bare hands.

Clean dirty devices with a soft dry cloth.

– If this is insufficient, the cloth can be moistened slightly with a soap solution.

11 Description of application and parameters

11.1 Application program

Available devices (Control elements):

- TBR/U4.x.x-xx Control element 4gang with RTC incl. BAU
- TR/U.x.x-xx Room temperature controller incl. BAU

The following application programs are available:

Application program
Control element RTC/1

The application program for the control elements contains the following applications:

Parameter area	KNX application
Device settings:	Buzzer application
	Proximity application
	Enable application
	Object during operation
Primary function:	1-button switching
Function block RTC:	Operating function
	RTC function
	LED function
General functions:	Cyclic telegrams
	Priority
	Logic gate
	Gate
	Staircase lighting
	Delay
	Min/max value transducer
	Light scene actuator

Depending on the application selected, the Engineering Tool Software (ETS) shows different parameters and communication objects.

11.2 Overview of functions

Application	Parameters	Options
Device settings — Acoustic feedback signal — **Buzzer application**	Selected feedback signal noise is on	Clicking / beeping
	Acoustic feedback signal via object	Deactivated / activated
	Activation of the acoustic feedback signal with	On/off telegram
	Feedback signal after bus voltage recovery	Deactivated / activated
	Acoustic alarm via object	Deactivated / activated
	Alarm via the button	Deactivated / activated
	Cancelling the alarm automatically	Deactivated / activated
	Time for automatic ending of the alarm	00:00:10 - 18:00:00 (hh:mm:ss)
	Time for automatic ending via object	Deactivated / activated
	Time for automatic ending at overwrite download	Deactivated / activated
Device settings — Proximity — **Proximity application**	External proximity via object	Deactivated / activated
	Automatic switchover time	00:00:10 - 18:00:00 (hh:mm:ss)
	Brightness of the LED during blockage	Off / dark / bright
	LED colour in a blocked state	Yellow - white
	Internal proximity status via object	Deactivated / activated
Device settings — Device enabling — **Enable application**	Enable with	On/off telegram
	After bus voltage recovery the device is	Disabled / enabled
	Use of automatic enable/blockage	No / automatic enable / automatic blockage
	Automatic switchover time	00:00:10 - 18:00:00 (hh:mm:ss)
	Switchover time via object	Deactivated / activated
	Overwrite switchover time at download	Deactivated / activated
	Brightness of the LED during blockage	Off / dark / bright
	LED colour in a blocked state	Yellow - white
Device settings — In operation function — **In operation object**	Cycle time	00:00:55 - 01:30:00 (hh:mm:ss)
	Objects sends cyclic	On/off telegram
Primary function — **1-button switching**	Object type	1 bit / 1 byte 0 - 100% / 1 byte 0 - 255 / Light scene number 1 - 64 / RTC operating mode switchover (1 byte)
	Reaction on rising edge	Value 1 / value 2 / alternating value 1/ value 2 / deactivated
	Reaction on falling edge	Value 1 / value 2 / alternating value 1/ value 2 / deactivated
	Consider device enable	Deactivated / activated

	Value 1	*Setting dependent on object type*
	Value 2	*Setting dependent on object type*
Function block RTC — Control settings — **General**	Jump-back time to the primary function	5 s / 10 s / 20 s / 30 s / 1 min. / 2 min. / 4 min.
Function block RTC — Control settings — **Temperature display**	Temperature unit	°C / °F
	Setting the temperature unit via object	No / yes
	Display of the actual temperature	No / yes
	Waiting period for display of actual temperature	5 s / 10 s / 20 s / 30 s / 1 min. / 2 min. / 4 min.
Function block RTC — Control settings — **Brightness settings**	Day/Night mode	No / yes
	Brightness of display backlighting	Dark / bright
Function block RTC — Control settings — **Button configuration**	Button top left	Eco / ON/OFF / Menu / Fan
	Button top right	Eco / ON/OFF / menu / fan
Function block RTC — RTC — **General**	Device function	Single device / master device / slave device
	Overwrite local setting at download	Deactivated / activated
	Control function	Heating / heating with additional stage / cooling / cooling with additional stage / heating and cooling / heating and cooling with additional stages
	Operating mode after reset	Comfort / standby / Eco mode / frost/heat protection
	Send cyclic "In operation" (min)	5 - 3000
	Additional functions/objects	No / yes
	Delay time for read telegrams after reset (s)	1 - 255
Function block RTC — RTC — **Heating controller**	Control value type	2-point 1 bit, on/off / 2-point 1 byte, 0/100% / PI continuous, 0-100% / PI PWM, on/off / fan coil
	Heating type	Area (e.g. floor heating) 4°C 200 min. / convector (e.g. heater) 1.5°C 100 min. / free configuration / fan coil 4°C 90 min. / free configuration *Setting dependent on "Control value type"*
	P-component (x 0.1°C)	10 - 100
	I-component (min)	0 - 255
	Advanced settings	No / yes
Function block RTC — RTC — **Basic stage heating**	Status object heating	No / yes
	Mode of control value	Normal / inverse
	Hysteresis (x 0.1°C)	3 - 255
	Control value difference for sending of heating control value	2% / 5% / 10% / send cyclic only

	Cyclic sending of the control value (min)	1 - 60
	PWM cycle heating (min)	1 - 60
	Max. control value (0 to 255)	0 - 255
	Min. control value for basic load (0 to 255)	0 - 255
Function block RTC — RTC — **Control of additional heating stage**	Control value type	2-point 1 bit, on/off / 2-point 1 byte, 0/100% / PI continuous, 0-100% / PI PWM, on/off / fan coil
	Heating type	Area (e.g. floor heating) 4°C 200 min. / convector (e.g. heater) 1.5°C 100 min. / free configuration / fan coil 4°C 90 min. / free configuration *Setting dependent on "Control value type"*
	P-component (x 0.1°C)	10 - 100
	I-component (min)	0 - 255
	Temperature difference to basic stage (x 0.1°C)	0 - 255
	Advanced settings	No / yes
Function block RTC — RTC — **Additional heating stage**	Control direction of control value	Normal / inverse
	Hysteresis (x 0.1°C)	3 - 255
	Control value difference for sending of heating control value	2% / 5% / 10% / send cyclic only
	Cyclic sending of the control value (min)	1 - 60
	Max. control value (0 to 255)	0 - 255
	Min. control value for basic load (0 to 255)	0 - 255
Function block RTC — RTC — **Cooling controller**	Control value type	2-point 1 bit, on/off / 2-point 1 byte, 0/100% / PI continuous, 0-100% / PI PWM, on/off / fan coil
	Cooling type	Area (e.g. cooling ceiling) 5°C 240 min / free configuration / fan coil 4°C 90 min / free configuration *Setting dependent on "Control value type"*
	P-component (x 0.1°C)	10 - 100
	I-component (min)	0 - 255
	Advanced settings	No / yes
Function block RTC — RTC — **Basic stage cooling**	Status object cooling	No / yes
	Control direction of control value	Normal / inverse
	Hysteresis (x 0.1°C)	3 - 255
	Control value difference for sending of cooling control value	2% / 5% / 10% / send cyclic only
	Cyclic sending of the control value (min)	1 - 60
	PWM cycle cooling (min)	1 - 60
	Max. control value (0 to 255)	0 - 255

	Min. control value for basic load (0 to 255)	0 - 255
Function block RTC — RTC — **Control of additional cooling stage**	Control value type	2-point 1 bit, on/off / 2-point 1 byte, 0/100% / PI continuous, 0-100% / PI PWM, on/off / fan coil
	Cooling type	Area (e.g. cooling ceiling) 5°C 240 min / free configuration / fan coil 4°C 90 min / free configuration *Setting dependent on "Control value type"*
	P-component (x 0.1°C)	10 - 100
	I-component (min)	0 - 255
	Temperature difference to basic stage (x 0.1°C)	0 - 255
	Advanced settings	No / yes
Function block RTC — RTC — **Additional cooling stage**	Mode of control value	Normal / inverse
	Hysteresis (x 0.1°C)	3 - 255
	Control value difference for sending of cooling control value	2% / 5% / 10% / send cyclic only
	Cyclic sending of the control value (min)	1 - 60
	Max. control value (0 to 255)	0 - 255
	Min. control value for basic load (0 to 255)	0 - 255
Function block RTC — RTC — **Basic load settings**	Min. control value for basic load > 0	Always activate / activate via object
	Basic load active when controller is off	No / yes
Function block RTC — RTC — **Combined heating and cooling mode**	Heating/cooling switchover	Automatic / only for object / local/via extension unit and via object
	Operating mode after reset	Cooling / heating
	Heating and cooling control value output	Via 1 object / via 2 objects
	Additional heating and cooling stage control value output	Via 1 object / via 2 objects
Function block RTC — RTC — **Setpoint settings**	Set value for heating comfort = set value for cooling comfort	No / yes
	Hysteresis for switchover heating/cooling (x 0.1°C)	5 - 100
	Setpoint temperature for heating and cooling comfort (°C)	10 - 40
	Set-point temperature for heating comfort (°C)	10 - 40
	Reduction for standby heating (°C)	0 - 15
	Reduction for Eco heating (°C)	0 - 15
	Setpoint temperature for frost protection (°C)	5 - 15
	Setpoint temperature for cooling comfort (°C)	10 - 40
	Increase for cooling standby (°C)	0 - 15
	Increase for eco cooling (°C)	0 - 15

	Setpoint temperature heat protection (°C)	27 - 45
	Display indicates	Current setpoint / relative setpoint
	Send current setpoint	Cyclic and at change / only at change
	Cyclic sending of the current setpoint temperature (min)	5 - 240
	Basic set value is	Setpoint cooling comfort / setpoint heating comfort / mean value between heating comfort and cooling comfort
Function block RTC — RTC — **Setpoint adjustment**	Max. manual increase during heating mode (0 - 9°C)	0 - 9
	Max. manual reduction during heating mode (0 - 9°C)	0 - 9
	Max. manual increase during cooling mode (0 - 9°C)	0 - 9
	Max. manual reduction during cooling mode (0 - 9°C)	0 - 9
	Resetting of the manual adjustment for receipt of a basic set value	No / yes
	Resetting the manual adjustment for change of operating mode	No / yes
	Resetting the manual adjustment via object	No / yes
	Permanent storage of on-site operation	No / yes
Function block RTC — RTC — **Temperaturer reading**	Inputs of temperature reading	Internal measurement / external measurement / weighted measurement
	Inputs of weighted temperature reading	Internal and external measurement / 2x external measurement / internal and 2x external measurement
	Weighting of internal measurement (0 to 100%)	0 - 100
	Weighting of external measurement (0 to 100%)	0 - 100
	Weighting of external measurement 2 (0 to 100%)	0 - 100
	Cyclic sending of the actual temperature (min)	5 - 240
	Difference of value for sending the actual temperature (x 0.1°C)	1 - 100
	Adjustment value for internal temperature measurement (x 0.1°C)	1 - 100
	Monitoring time for temperature reading (0 = no monitoring) (min)	0 - 120
	Control value for fault (0 - 255)	0 - 255
Function block RTC — RTC — **Alarm function**	Condensate water alarm	No / yes
	Dew point alarm	No / yes
	Frost alarm temperature for HVAC and RHCC status (°C)	0 - 15
	Heat alarm temperature for RHCC status	25 - 70

	(°C)	
Function block RTC — RTC — **Fan coil settings - fan speed levels**	Number of fan speed levels	3 levels / 5 levels
	Format of the level output	0-5 / 0-255 / 1 bit m off n / 1 bit 1 off n
	Level output	At manual operation and automatic / only at manual operation
	Lowest manually adjustable fan speed level	Speed level 0 / speed level 1
	Level status evaluation	No / yes
Function block RTC — RTC — **Fan coil settings heating**	Fan speed level 1-5 up to control value (0 to 255) heating	0 - 255
	Fan speed level limit heating in eco mode	No / yes
	Max. fan speed level heating in eco mode	0 - 5
Function block RTC — RTC — **Fan coil settings cooling**	Fan speed level 1-5 up to control value (0 to 255) cooling	0 - 255
	Fan speed level limit cooling in eco mode	No / yes
	Max. fan speed level cooling in eco mode:	0 - 5
Function block RTC — RTC — **Summer compensation**	Summer compensation	No / yes
	(Lower) Starting temperature for summer compensation (°C)	-127 - 127
	Offset of the setpoint temperature for the entry into summer compensation (x 0.1°C)	-127 - 127
	(Upper) exit temperature for summer compensation (°C)	-127 - 127
	Offset of the setpoint temperature for the exit from summer compensation (x 0.1°C)	-127 - 127
Function block RTC — **LED function**	Operating mode	Status illumination / function illumination
	Object type for status object	1 bit / 1 byte 0-100%
	Brightness of the colours	Dark / bright
	Colour for Off	Off / yellow - white
	Colour for On	Off / yellow - white
	Colour for Zone 1 (corresponds to 0%)	Off / yellow - white
	Colour for Zone 2 (starting at 1%)	Off / yellow - white
	Threshold between Zone 2 and 3 (%)	1 - 98
	Colour for Zone 3	Off / yellow - white
	Threshold between Zone 3 and 4 (%)	2 - 99
	Colour for Zone 4 (up to 99%)	Off / yellow - white
	Colour for Zone 5 (corresponds to 100%)	Off / yellow - white
	Colour of function illumination	Off / yellow - white
	Day/Night mode	Deactivated / activated
	Light scene memory function	Deactivated / activated
	Alarm function	Deactivated / activated
General functions —	Channel name	*<Name>*

channel x — **Cyclic telegram**	Object type	1 bit switching / 1 bit alarm / 1 byte 0-100% / 1 byte 0-255 / 2 byte float / 2 byte signed / 2 byte unsigned / 4 byte float / 4 byte signed / 4 byte unsigned
	Cycle time	00:00:55 - 01:30:00 (hh:mm:ss)
	Enable object	Deactivated / activated
	Object value enable object	Normal / inverse
	Enable object after return of voltage	Disabled / enabled
	Cyclic sending	Always activated / activated at specified value / activated except specified value
	Value for cyclic sending	*Setting dependent on object type*
General functions — channel x — **Priority**	Channel name	*<Name>*
General functions — channel x — **Logic gate**	Channel name	*<Name>*
	Logical function	AND / OR / XOR / XNOR / NAND / NOR
	Number of input objects	1 - 10
	Object type input x	1 bit / 1 byte
	Initial value input x	Initialised with 0 / Initialised with 1
	Logic input x	Normal / inverse
	Object type output	1 bit / 1 byte
	Send output object	At each incoming telegram / at each change of output object
	Value of the output object for logic true	Output is set on 1 / defined via output default value true
	Output default value true	True = 0 / true = 1
	Output default value true	0 - 255
	Value of the output object for logic untrue	Output is set on 0 / defined via output default value untrue
	Output default value untrue	Untrue = 0 / untrue = 1
	Output default value untrue	0 - 255
General functions — channel x — **Gate**	Channel name	*<Name>*
	Object type	1 bit switching / 1 bit moving / 1 bit stop/adjusting / 2 bit priority / 4 bit relative dimming 1 byte 0-100% / 1 byte 0-255 / 2 byte float / 2 byte signed / 2 byte unsigned / 3 byte time / 3 byte date / 4 byte float / 4 byte signed / 4 byte unsigned / not allocated

	Filter function	Deactivated / on filter out / off filter out
	Data flow direction	Input in direction of output / output in direction of input / in both directions
	Enable object	Deactivated / activated
	Object value enable object	Normal / inverse
	Enable object after return of voltage	Disabled / enabled
	Save input signal	Deactivated / activated
General functions — channel x — **Staircase lighting**	Channel name	*<Name>*
	Object type/number	One 1-bit object for the input and output / two 1-bit objects for the input and output / two 1-byte objects for the input and output
	Switch-off delay	00:00:10 - 01:30:00 (hh:mm:ss)
	Retriggering	Deactivated / activated
	Switch-off pre-warning	Deactivated / activated
	Time for switch-off pre-warning (s)	1 - 5400
	Value for switch-off prewarning (%)	1 - 100 (%)
	Overwrite light-on and switch-off prewarning time during download	Deactivated / activated
General functions — channel x — **Delay**	Channel name	*<Name>*
	Object type	1 bit switching / 1 bit moving / 1 bit stop/adjusting / 1 byte 0-100% / 1 byte 0-255 / 2 byte float / 2 byte signed / 2 byte unsigned / 4 byte float / 4 byte signed / 4 byte unsigned
	Delay time	00:00:01.000-01:00:00.000 (hh:mm:ss.fff)
	Retriggering	Deactivated / activated
	Filter active	Deactivated / activated
	Filter function	Filter value is delayed, others are sent direct / filter value is delayed, others are suppressed / filter value is sent direct, others are delayed / filter value is suppressed, others are delayed
	Filter value	*Setting dependent on object type*
	Overwrite delay time during download	Deactivated / activated
General functions — channel x — **Min/max value transducer**	Channel name	*<Name>*
	Object type	1 byte 0-100% / 1 byte 0-255 / 2 byte float / 2 byte signed / 2 byte unsigned / 4 byte float / 4 byte signed / 4 byte

		unsigned
	Number of input objects	1 - 8
	Output sends	At each input assignment / when the output object is changed
	Output object	Assumes the largest input value / assumes the smallest input value / assumes the input average
General functions — channel x — **Light scene actuator**	Channel name	*<Name>*
	Number of scenes	1 - 8
	Number of actuator groups	1 - 8
	Duration of telegram delay	00.100 - 10.000 (ss.fff)
	Overwrite scenes at download	Deactivated / activated
	Object type actuator group x	Light scene number / 1 bit switching / 1 bit blind / 1 byte 0-100% / temperature
	Scene number	1 - 64
	Scene can be saved	Deactivated / activated
	Actuator group x	Deactivated / activated
	Number of light scene	1 - 64
	Value	Off / on
	Value	Up / down
	Value (%)	0 - 100
	Temperature	-33.5 - 93.5

Table 4: Overview of applications and functions

11.3 Application "Device settings"

11.3.1 Acoustic feedback signal - Application

Options:	Inactive
	Buzzer application

- Inactive:
  - The application is not active.
- Buzzer application:
  - The application is active.

The application is used to specify whether an acoustic signal sounds when a button is pressed. This signal can be adapted individually after the activation.

The following communication objects are available:

- "BUZ: object activation of acoustic feedback signal"
- "BUZ: triggering an alarm"
- "BUZ: time for automatic deactivation of the alarm"

The communication objects are enabled via the associated parameters.

Note
The following parameters can only be adjusted when the function "Acoustic feedback signal" is set on "Buzzer application".
The parameters for application "Acoustic feedback signal" can be called up via **general parameters**.

11.3.1.1 Selected feedback signal noise is on

Options:	Click
	Beeping

- Clicking:
  - "Clicking" sounds at the press of the buttons.
- Beeping:
  - "Beeping" sounds at the press of the buttons.

The parameter us used to specify the type of acoustic signal for the feedback signal noise.

11.3.1.2 Acoustic feedback signal via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 1-bit communication object "BUZ: object activation of acoustic feedback signal" can be enabled with this parameter. The further differentiation is carried out via the parameter that is available after enabling.

11.3.1.3 Activation of the acoustic feedback signal with

Options:	On telegram
	Off telegram

- ON telegram:
  - Activation via On telegram.
- Off telegram:
  - Activation via Off telegram.

The parameter is used to specify whether the acoustic feedback signal is activated via the input object at the receipt of an On or an Off telegram.

Note
The parameter can only be set when parameter "Acoustic feedback signal via object" or parameter "Acoustic alarm via object" is activated.

11.3.1.4 Feedback signal after bus voltage recovery

Options:	Deactivated
	Activated

- Deactivated:
  - Automatic deactivation after bus voltage recovery.
- Activated:
  - Automatic activation after bus voltage recovery.

If the "Acoustic feedback signal via object" is to start automatically after the bus voltage recovery, the parameter "Feedback signal after bus voltage recovery" must be set on "activated". If "deactivated has been selected, the "Acoustic feedback signal via object" does not start after bus voltage recovery.

Note
The parameter can only be set when parameter "Acoustic feedback signal via object" is activated.

11.3.1.5 Acoustic alarm via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 1-byte communication object "BUZ: trigger alarm" can be enabled with this parameter. The further differentiation is carried out via the parameter that is available after enabling.

The alarm function can, for example, display a wind alarm or an open door when the user wants to lower a blind or a roller blind.

11.3.1.6 Activation of the acoustic feedback signal with

Options:	On telegram
	Off telegram

- ON telegram:
  - Activation via On telegram.
- Off telegram:
  - Activation via Off telegram.

The parameter is used to specify whether the acoustic feedback signal is activated via the input object at the receipt of an On or an Off telegram.

Note
The parameter can only be set when parameter "Acoustic feedback signal via object" or parameter "Acoustic alarm via object" is activated.

11.3.1.7 Alarm via the button

Options:	Deactivated
	Activated

- Deactivated:
  - The pending alarm can not be deactivated with a press of the button.
- Activated:
  - The pending alarm can be deactivated with a press of the button.

Note
The parameter can only be set when parameter "Acoustic alarm via object" is activated.

11.3.1.8 Ending the alarm automatically

Options:	Deactivated
	Activated

- Deactivated:
  - The alarm is not switched off automatically.
- Activated:
  - The alarm is switched off automatically at an adjustable time.

By activating the parameter the alarm is automatically switched off after a parameterised time. The switch-off time is set via parameter "Time for automatic ending of the alarm".

The further differentiation is carried out via the parameter that is available after enabling.

Note
The parameter can only be set when parameter "Acoustic alarm via object" is activated.

11.3.1.9 Time for automatic ending of the alarm

Options:	Setting option from 00:00:10 to 18:00:00 (hh:mm:ss)

The set value defines the time for the automatic ending of the pending alarm.

The further differentiation is carried out via the parameter that is available after enabling.

Note
The parameter can only be set when parameters "Acoustic alarm via object" and "Ending the alarm automatically" are activated.

11.3.1.10 Time for automatic ending via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 2-byte communication object "BUZ: time for automatic activation of the alarm" can be enabled with this parameter. The further differentiation is carried out via the parameter that is available after enabling.

Note
The parameter can only be set when parameters "Acoustic alarm via object" and "Ending the alarm automatically" are activated.

11.3.1.11 Time for automatic ending at overwrite download

Options:	Deactivated
	Activated

- Deactivated:
  - Time for automatic ending is not overwritten during a download of the application.
- Activated:
  - Time for automatic ending is overwritten during a download of the application.

The parameter can be used to specify whether the data changed via communication object "BUZ: time for automatic deactivation of the alarm" are to be overwritten during the download or the times should be retained.

Note
The parameter can only be adjusted if the following parameters are activated:
- "Acoustic alarm via object"
- "Ending the alarm automatically"
- "Time for automatic ending via object"

11.3.2 Proximity - Application

Options:	Inactive
	Proximity application

- Inactive:
  - Application is not active.
- Proximity application:
  - Application is active.

The Application is used to specify whether it is recognized when the user approaches the device. The application can be used, for example, that the display and LEDs first switch on when the user is located in front of the device.

The following communication objects are available:

- "NARX: proximity"
- "NARX: internal proximity status"

The communication objects are enabled via the associated parameters.

Note
The following parameters can only be adjusted when the function "Proximity" is set on "Proximity application".
The parameters for application "Proximity" can be called up via **general parameters**.

11.3.2.1 External proximity via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 1-bit communication object "NARX: proximity" can be enabled with this parameter. If an On telegram is received via this object, the proximity function is active. If an Off telegram is received via this object, the proximity function is disabled.

11.3.2.2 Automatic switchover time

Options:	Setting option from 00:00:10 to 18:00:00 (hh:mm:ss)

The switching on or switchover always occurs immediately the user has approached the device. The switching off or switchover can be delayed via parameter "Automatic switchover time". In this way, for example, the display stays switched on for a while longer although the user has just moved away from the device.

Note
The parameter can only be set when parameter "External proximity via object" is deactivated.

11.3.2.3 Brightness of the LED during blockage

Options:	Off
	Dark
	Bright

- Off:
  - The LED does not light up at blockage.
- Dark:
  - The LED lights up dark at blockage.
- Bright:
  - The LED lights up bright at blockage.

The parameter is used to specify whether or in which brightness the LED lights up when the device is blocked.

11.3.2.4 LED colour in a blocked state

Options:	Yellow
	Orange
	Red
	Violet
	Blue
	Green
	White

- Yellow - white:
  - The LED lights up in the specified colour during blockage.

The parameter is used to specify the colour the LED lights up in when the device is blocked.

Note
The parameter is only adjustable if the "Brightness of LED during blockage" parameter is set on "dark" or "bright".

11.3.2.5 Internal proximity status via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 1-bit communication object "NARX: internal proximity status" can be enabled with this parameter. A telegram is ent on the bus via the enabled object when the user approaches the device.

11.3.3 Device enable - Application

Options:	Inactive
	Enable application

- Inactive:
  - Application is not active.
- Enable application:
  - Application is active.

If the application is activated the device can be blocked temporarily via the 1- bit communication object "EF: enable". No telegrams are sent on the bus via the communication object of the device during a blockage. It can be enabled via an On or an Off telegram.

The following communication objects are available:

- "EF: enable"
- "EF: automatic switchover time"

The communication objects are enabled via the associated parameters.

Note
The following parameters can only be adjusted when the function "Device enable" is set on "Enable application".
The parameters for application "Device enable" can be called up via **general parameters**.

11.3.3.1 Enable with

Options:	On telegram
	Off telegram

- ON telegram:
  - Devices are enabled via an On telegram.
- Off telegram:
  - Devices are enabled via an Off telegram.

The device is normally enabled with the receipt of an ON telegram via 1-bit communication object "EF: enabled" and blocked with an OFF telegram. The parameter can invert this behaviour.

11.3.3.2 After bus voltage recovery the device is

Options:	Blocked
	Enabled

- Blocked:
  - The enable object has value"1" after bus voltage recovery.
- Enabled:
  - The enable object has value "0" after bus voltage recovery.

The parameter serves to ensure that a defined behaviour is present on communication object "EF: enable" after a return of bus voltage.

11.3.3.3 Use of automatic enable/blockage

Options:	No
	Automatic enable
	Automatic blockage

- No:
  - No automatic enable or blockage of the device.
- Automatic enable:
  - Function "Automatic enable" is active.
- Automatic blockage:
  - Function "Automatic blockage" ia active.

The parameter can be used to automatically enable or automatically block the device.

11.3.3.4 Automatic switchover time

Options:	Setting option from 00:00:10 to 18:00:00 (hh:mm:ss)

The switching on or switchover always occurs immediately the user has approached the device.

The switching off or switchover can be delayed via the parameter. In this way, for example, the display stays switched on for a while longer although the user has just moved away from the device.

Note
This parameter can only be adjusted when the "Use of automatic enable/blockage" parameter is set on "Automatic enable" or "Automatic blockage".

11.3.3.5 Switchover time via object

Options:	Deactivated
	Activated

- Deactivated:
  - The communication object is not enabled.
- Activated:
  - The communication object is enabled.

A 2-byte communication object "EF: automatic switchover time" can be enabled with this parameter. The time can then be adjusted via the KNX bus.

Note
This parameter can only be adjusted when the "Use of automatic enable/blockage" parameter is set on "Automatic enable" or "Automatic blockage".

11.3.3.6 Overwrite switchover time at download

Options:	Deactivated
	Activated

- Deactivated:
  - The switchover time is not overwritten during a download of the application.
- Activated:
  - The switchover time is overwritten during a download of the application.

The parameter can be used to specify whether the data changed via communication object "EF: automatic switchover time" are to be overwritten during the download or the times should be retained.

Note
This parameter can only be adjusted when the "Use of automatic enable/blockage" parameter is set on "Automatic enable" or "Automatic blockage".

11.3.3.7 Brightness of the LED during blockage

Options:	Off
	Dark
	Bright

- Off:
  - The LED does not light up at blockage.
- Dark:
  - The LED lights up dark at blockage.
- Bright:
  - The LED lights up bright at blockage.

The parameter is used to specify whether or in which brightness the LED lights up when the device is blocked.

11.3.3.8 LED colour in a blocked state

Options:	Yellow
	Orange
	Red
	Violet
	Blue
	Green
	White

- Yellow - white:
  - The LED lights up in the specified colour during blockage.

The parameter is used to specify the colour the LED lights up in when the device is blocked.

Note
The parameter is only adjustable if the "Brightness of LED during blockage" parameter is set on "dark" or "bright".

11.3.4 During operation function - Application

Options:	Inactive
	Object during operation

- Inactive:
  - Application is not active.
- Object during operation:
  - Application is active.

The application makes monitoring of the device possible. A 1-bit telegram for further evaluation is made cyclically available to the KNX bus via communication object "HB: output". This, for example, allows monitoring of the device on a visualization. When the device is removed, it does not send a cyclic telegram and a fault message appears on the visualization.

The following communication object is available:

- "HB: output"

Note
The following parameters can only be adjusted when the function "Function during operation" is set on "Object during operation".
The parameters for application "Function during operation" can be called up via **general parameters**.

11.3.4.1 Cycle time

Options:	Setting option from 00:00:55 to 01:30:00 (hh:mm:ss)

The telegrams of the object during operation are sent cyclic on the bus.

The parameter specifies the time interval from which a new sending of the telegrams occurs.

11.3.4.2 Objects sends cyclic

Options:	On telegram
	Off telegram

- ON telegram:
  - Object during operation sends an On telegram.
- Off telegram:
  - Object during operation sends an Off telegram.

The parameter is used to specify whether an Off or an On telegram is sent cyclic on the KNX bus via communication object "HB: output" during the parameterized time.

11.4 Application "Primary function"

11.4.1 Primary function - Application

Options:	Inactive
	1-button switching

- Inactive:
  - Application is not active.
- 1-button switching:
  - Application is active.

The application is used to fix the primary function of the device. The primary function is the first function of the device that is carried out when the user presses button 1 or 2. The primary function should be a function that the user would use when entering the room for example (e.g. "switching the ceiling light").

When the application is active, a switching telegram is sent when the button is pressed or released.

The following communication object is available:

- "PF: switching"

Note
The following parameters can only be adjusted when the function "Primary function" is set on "1-button switching".
The parameters for "Primary function" can be called up via **general parameters**.

11.4.1.1 Object type

Options:	1 bit
	1 byte 0 - 100%
	1 byte 0 - 255
	Light scene number 1-64
	RTC operating mode switchover (1 byte)

- 1 bit:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/untrue.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. Any value 0 - 255.
- Light scene number 1 - 64:
  - Value is sent as scene number or scene control (1 - 64).
- RTC operating mode switchover (1 byte):
  - Value is sent as 1-byte value for the RTC operating mode switchover, e.g. auto, comfort, ECO), when the room temperature controller has been linked.

The "1-button value switching" application makes communication object "PF: switching" available for both input and output. The bit size of the communication object is fixed via the "Object type" parameter. For the most diverse applications, the size of the communication object can be adapted via "Object type".

11.4.1.2 Reaction on rising edge

Options:	Value 1
	Value 2
	Alternating value1/value2
	Deactivated

- Value 1:
  - Value 1 is sent at the press of the button (at rising edge).
- Value 2:
  - Value 2 is sent at the press of the button (at rising edge).
- Alternating value 1/value 2:
  - Value 1 and value 2 are sent alternately at the press of the button.
- Deactivated:
  - No telegram is sent at the press of the button.

Application "1-button value switching" can differentiate between the press and the releasing of the button. A press is defined as "Rising edge" and the releasing as "Falling edge".

The parameter is used to specify whether a telegram with value 1 or value 2 is sent on the bus at a rising edge via communication object "PF: switching". A further option can be specified as to whether the telegrams are sent alternately. This means that after value 1 has been sent, value 2 is sent at a renewed press of the button. After it is pressed again, value 1 is again sent out.

Note
Parameter "Value 1" and "Value 2" is used to specify the values that are to be sent.

11.4.1.3 Reaction on falling edge

Options:	Value 1
	Value 2
	Alternating value1/value2
	Deactivated

- Value 1:
  - Value 1 is sent when the button is released (at falling edge).
- Value 2:
  - Value 2 is sent when the button is released (at falling edge).
- Alternating value 1/value 2:
  - Value 1 and value 2 are sent alternately when the button is released.
- Deactivated:
  - No telegram is sent when the button is released.

Application "1-button value switching" can differentiate between the press and the releasing of a button. A press is defined as "Rising edge" and the releasing as "Falling edge".

The parameter is used to specify whether a telegram with value 1 or value 2 is sent on the bus at a falling edge via communication object "PF: switching". A further option can be specified as to whether the telegrams are sent alternately. This means that after value 1 has been sent, value 2 is sent at a renewed release of the button. After it is released again, value 1 is again sent out.

Note
Parameter "Value 1" and "Value 2" is used to specify the values that are to be sent.

11.4.1.4 Consider device enable

Options:	Deactivated
	Activated

- Deactivated:
  - Device enable is not taken into account for the primary function.
- Activated:
  - Device enable is taken into account for the primary function.

The primary function can be included in the device enable via the parameter. The parameter must be activated for this. Operating the device via the primary would then not be possible in a disabled state.

When the parameter is deactivated the device enable or blockage has an effect only on the individual buttons.

11.4.1.5 Value 1/Value 2

The possible options depend on parameter "Object type".

Options for selection "1 bit":

Options:	Off
	One

Options for selection "1 byte 0-100%":

Options:	Setting option from 0 to 100 (%)

Options for selection "1 byte 0-255":

Options:	Setting option from 0 to 255

Options for selection "Light scene number (1-64)":

Options:	Setting option from 1 to 64

Options for selection "RTC operating mode switchover (1 byte)":

Options:	Auto
	Comfort
	Standby
	ECO
	Frost/heat protection

The parameter is used to set value 1 that is sent at a press of the button.

Note
Parameter can only be set if the "Reaction at rising/falling edge" parameter is set on "Value 1" or "Alternating Value1/Value2".

11.4.1.6 Value 2

The possible options depend on parameter "Object type".

Options for selection "1 bit":

Options:	Off
	One

Options for selection "1 byte 0-100%":

Options:	Setting option from 0 to 100 (%)

Options for selection "1 byte 0-255":

Options:	Setting option from 0 to 255

Options for selection "Light scene number (1-64)":

Options:	Setting option from 1 to 64

Options for selection "RTC operating mode switchover (1 byte)":

Options:	Auto
	Comfort
	Standby
	ECO
	Frost/heat protection

The parameter is used to set value 2 that is sent at a press of the button.

Note
Parameter can only be set if the "Reaction at rising/falling edge" parameter is set on "Value 2" or "Alternating Value1/Value2".

11.5 Application "Function block RTC"

11.5.1 Control settings - General

11.5.1.1 Jump-back time to the primary function

Options:	5 s
	10 s
	20 s
	30 s
	1 min.
	2 min.
	4 min.

The parameter is used to specify the rest period after which the device changes into the primary function. This means that when the device is not operated during the set period, the primary functions for the device are activated.

11.5.2 Control settings — Temperature display

11.5.2.1 Temperature unit

Options:	°C
	°F

- °C:
  - Display of the actual temperature in degrees Celsius.
- °F:
  - Display of the actual temperature in degrees Fahrenheit.

The parameter is used to specify the unit of the temperature for the display.

11.5.2.2 Setting the temperature unit via object

Options:	No
	Yes

- No:
  - Communication object "HMI: units switchover" is not enabled.
- Yes:
  - Communication object "HMI: units switchover" is enabled.
  - If a telegram with value "1" is received via the object, the temperature is displayed in °C. If a telegram is received with value "0"; the temperature is displayed in °F.

The parameter is used to specify whether the 1-bit communication object "HMI: units switchover" is set.

11.5.2.3 Display of the actual temperature

Options:	No
	Yes

- No:
  - The actual temperature is not displayed after the waiting period.
- Yes:
  - The actual temperature is displayed after the waiting period.

The parameter is used to specify whether the actual temperature is shown in the display as priority. This means that when the device is not operated within the set waiting period, the current actual temperature is shown in the display.

11.5.2.4 Waiting period for display of actual temperature

Options:	5 s
	10 s
	20 s
	30 s
	1 min.
	2 min.
	4 min.

The parameter is used to specify after which rest period the actual temperature is shown in the display. This means that when the device is not operated within the set waiting period, the current room temperature is displayed.

Note
The parameter is only adjustable if the "Display of actual temperature" parameter is set on "Yes".

11.5.3 Control settings — Brightness setting

11.5.3.1 Day/Night mode

Options:	No
	Yes

- No:
  - Communication object "HMI: day/night mode" is not enabled.
- Yes:
  - Communication object "HMI: day/night mode" is enabled.
  - If a telegram with value "1" is received via the object, the display lights up brightly. If a telegram with value "0" is received, the display lights up dark.

The display of the device can light up with two different brightness levels. The parameter is used to specify whether the display can be switched over between bright and dark.

Note
Only the display illumination is switched via the object. The backlighting of the buttons is switched via object no. 64 "Day/night mode".

11.5.3.2 Brightness of display backlighting

Options:	Dark
	Bright

- Dark:
  - The display lights up with minimal brightness.
- Bright:
  - The display lights up with high brightness.

The parameter is used to specify whether the display lights up continuously dark or bright. No distinction is made between day or night.

Note
The parameter is only adjustable if the "Day/night mode" parameter is set on "No".
The operation only applies to the display. It does not apply to the backlighting of the buttons.

11.5.4 Control settings — Button configuration

11.5.4.1 Button top left

Options:	Eco
	ON/OFF
	Menu
	Fan

- Eco:
  - If selected, the ECO mode can be activated or deactivated with a press of the button.
- ON/OFF:
  - If selected, the temperature regulation can be switched on or off with a press of the button. Frost/heat protection remain active in a switched off state.
- Menu:
  - If selected, the following operating modes are available via the button:
    - Off mode
    - Heating/cooling switchover (if parameterised)
    - Fan operation (if parameterised).
  - Selection of stored operating modes is carried out with repeated presses of the button. The adjustment. e.g. changing the fan speed level, is carried out with the "+" and "-" buttons.
- Fan:
  - If selected, the fan speed level can be changed with repeated presses of the button.

The parameter is used to specify the function with which the top left button is occupied.

11.5.4.2 Button top right

Options:	Eco
	ON/OFF
	Menu
	Fan

- Eco:
  - If selected, the ECO mode can be activated or deactivated with a press of the button.
- ON/OFF:
  - If selected, the temperature regulation can be switched on or off with a press of the button. Frost/heat protection remaine active in a switched off state.
- Menu:
  - If selected, the following operating modes are available via the button:
    - Off mode
    - Heating/cooling switchover (if parameterised)
    - Fan operation (if parameterised).
  - Selection of stored operating modes is carried out with repeated presses of the button. The adjustment. e.g. changing the fan speed level, is carried out with the "+" and "-" buttons.
- Fan:
  - If selected, the fan speed level can be changed with repeated presses of the button.

The parameter is used to specify the function with which the top right button is occupied.

11.5.5 RTC - General

11.5.6 General — Device function

Options:	Single device
	Master device
	Slave device

- Single device
  - The device is used individually in a room for temperature control with fixed temperature values.
- Master device:
  - At least two room temperature controllers are located in one room. One device must be set up as a master device, while the others must be programmed as slave devices. The master device must be linked to the slave devices using the appropriately labelled communication objects. The master device regulates the temperature.
- Slave device:
  - The device only sends the measured temperature to the KNX bus.

11.5.7 General - Overwrite local setting at download

Options:	Deactivated
	Activated

- Deactivated:
  - Manual settings are not overwritten during a download.
- Activated:
  - All parameters are reset to the values that were fixed in the commissioning software.

The parameter is used to specify whether the settings that were made on the device by the user are overwritten during a download

11.5.8 General — Control function

Options:	Heating
	Heating with additional stage
	Cooling
	Cooling with additional stage
	Heating and cooling
	Heating and cooling with additional stage

– *Heating*: For operating a heat-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Heating type" can be programmed for optimal control.
– *Heating with additional stage*: In addition to the control function described under heating, the additional stage enables the activation of an additional heating circuit. This type of additional stage is used, for example, to quickly heat up a bathroom with floor heating via a heated towel rack.
– *Cooling*: For operating a cooling-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Cooling type" can be programmed for optimal control.
– *Cooling with additional stage*: In addition to the control function described under cooling, the additional stage enables the activation of an additional cooling device. This type of additional stage is used, for example, to quickly cool a room via an added cooling device.
– *Heating and cooling*: For operating a two-wire or four-wire system used to heat or cool a room. Switching between heating and cooling takes place using a central switch (two-wire system) or is carried out manually and / or automatically via the single room temperature controller (four-wire system).
– *Heating and cooling* with an additional stage: In addition to the heating and cooling functions, one additional stage each with an autonomous controller type can be programmed.

Note
This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

11.5.9 General - Operating mode after reset

Options:	Comfort
	Standby
	Eco mode
	Frost/heat protection

After a reset the device will run in the operating mode after a restart until a new operating mode is set as the result of device operation or by communication objects, as the case may be. This operating mode should be defined during the planning phase. An improperly defined operating mode can result in a loss of comfort or increased energy consumption.

– *Comfort*: If the room temperature is not automatically lowered and the room is therefore controlled independent of its use.
– *Standby*: If the room is controlled automatically, e.g. by a presence detector, as a function of its use.
– *Eco mode*: If the room is controlled automatically or manually as a function of its use.
– *Frost/heat protection*: If only the building protection function is necessary in the room after a reset.

Note
This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

11.5.10 General — Send cyclic "In operation" (min)

Options:	Setting option between 5 - 3000 minutes

– Communication object "In operation" serves for the information that the controller still operates. Value "1" is sent cyclic. The cycle for sending is set via this parameter. If there is no cyclic telegram, the function of the device is disturbed and the air-conditioning of the room can be maintained via forced control. For this, however, the system and/or actuator must have the "Forced control" function.

11.5.11 General - Additional functions/objects

Options:	No
	Yes

– This parameter enables additional functions and communication objects.

11.5.12 General — Delay time for read telegrams after reset [s]

Options:	Setting option from 1 - 255 seconds

– This parameter can be used to receive telegrams via the "Input" object. The received telegrams are sent with the set delay time to the "Output" object after a reset.

Note
This parameter is only available if the "Additional function" parameter is set to "Yes".

11.5.13 Heating control

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.14 Heating control — Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.5.15 Heating control — Heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. floor heating) 4°C 200 min
	▪ Convector (e.g. heater) 1.5°C 100 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user.

– If the required heating type is not available, individual parameters can be specified in free configuration.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.16 Heating control — P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Heating type" parameter must be set on "Free configuration".

11.5.17 Heating control — I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Heating type" parameter must be set on "Free configuration".

11.5.18 Heating control — Extended settings

Options:	No
	Yes

– This parameter enables additional functions and communication objects, e.g. "Basic stage heating".

11.5.19 Basic stage heating

Note
Only available when the "Extended settings" parameter under "Heating control" is set on "Yes".

11.5.20 Basic stage heating — Status object heating

Options:	No
	Yes

– This parameter enables the "Status heating" communication object.

11.5.21 Basic stage heating — Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.5.22 Basic stage heating — Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

11.5.23 Basic stage heating — Control value difference for sending of heating control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.24 Basic stage heating — Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.5.25 Basic stage heating — PWM cycle heating (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note
This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off“.

11.5.26 Basic stage heating — Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.27 Basic stage heating — Minimum control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.28 Control of additional heating stage

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating with additional stage" or "Heating and cooling with additional stages".

11.5.29 Control of additional heating stage — Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.5.30 Control of additional heating stage — Additional heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. floor heating) 4°C 200 min
	▪ Convector (e.g. heater) 1.5°C 100 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user.

– If the required heating type is not available, individual parameters can be specified in the free configuration.

Note

This parameter is only available when "Control value type" parameter for the additional stage is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.31 Control of additional heating stage — P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional range of a control. It fluctuates around the setpoint value and can be used to influence control speed of a controller. The smaller the setpoint, the faster the controller responds. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note

This parameter is only available when "Control value type" parameter for the additional stage is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". The "Additional heating type" parameter must be set on "Free configuration".

11.5.32 Control of additional heating stage — I-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note
This parameter is only available when "Control value type" parameter for the additional stage is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". The "Additional heating type" parameter must be set on "Free configuration".

11.5.33 Control of additional heating stage — Temperature difference to basic stage (x 0.1°C)

Options:	Setting option between 0 - 255

The setpoint temperature of the additional stage is defined as a function of the current setpoint temperature of the base stage and is expressed as a difference. The value represents the setpoint value starting at which the additional stage will operate.

11.5.34 Control of additional heating stage — Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional heating stage".

11.5.35 Additional heating stage

Note
Only available when the "Extended settings" parameter under "Control of additional heating stage" is set on "Yes".

11.5.36 Additional heating stage — Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.5.37 Additional heating stage — Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

11.5.38 Additional heating stage — Control value difference for sending of heating control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.39 Additional heating stage — Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.5.40 Additional heating stage — Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.41 Additional heating stage — Minimum control value for basic load (0 - 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.42 Cooling control

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.43 Cooling control — Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.5.44 Cooling control — Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. cooling ceiling) 5°C 240 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.

If the required cooling type is not available, individual parameters can be specified in free configuration.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.45 Cooling control — P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

11.5.46 Cooling control — I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

11.5.47 Cooling control — Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Basic stage cooling".

11.5.48 Basic stage cooling

Note
Only available when the "Extended settings" parameter under "Cooling control" is set on "Yes".

11.5.49 Basic stage cooling — Status object cooling

Options:	No
	Yes

This parameter enables the "Status cooling" communication object.

11.5.50 Basic stage cooling — Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.5.51 Basic stage heating - Control value difference for sending of heating control value

Options:	2%
	5%
	10%
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%,"PI PWM, On/Off“ or "Fan coil".

11.5.52 Basic stage cooling — Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

Basic stage cooling - Control value difference for sending of cooling control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.53 Basic stage cooling — Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

NOTE
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.5.54 Basic stage cooling - PWM cycle cooling (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an On-phase of five minutes and an Off-phase of 10 min. The time for a PWM cycle can be specified here.

NOTE
This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off“.

11.5.55 Basic stage cooling — Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.56 Basic stage cooling — Minimum control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.57 Control of additional cooling stage

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling with additional stage" or "Heating and cooling with additional stages".

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.5.58 Control of additional cooling stage — Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. cooling ceiling) 5°C 240 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.

If the required cooling type is not available, individual parameters can be specified in free configuration.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.59 Control of additional cooling stage — P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

11.5.60 Control of additional cooling stage — P-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and to ultimately reaching, the setpoint. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

11.5.61 Control of additional cooling stage - Temperature difference to basic stage (x 0.1°C)

Options:	Setting option between 0 - 255

The setpoint temperature of the additional stage is defined as a function of the current setpoint temperature of the base stage and is expressed as a difference. The value represents the setpoint value starting at which the additional stage will operate.

11.5.62 Control of additional cooling stage — Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional cooling stage".

11.5.63 Additional cooling stage

Note
Only available when the "Extended settings" parameter under "Control of additional cooling stage" is set on "Yes".

11.5.64 Additional cooling stage — Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.5.65 Additional cooling stage — Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

11.5.66 Additional cooling stage — Control value difference for sending of cooling control value

Options:	2%
	5%
	10%
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.67 Additional cooling stage — Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.5.68 Additional cooling stage — Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.69 Additional cooling stage — Minimum control value for basic load (0 - 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.70 Settings of basic load

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating with additional stage", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.71 Settings of basic load — Minimum control value for basic load > 0

Options:	Always active
	Activate via object

The function finds application when in the desired area, e.g. with floor heating, the floor is to have a basic warmth. The size of the minimum control value specifies the volume of heating medium that flows through the controlled area, even when the calculation of the control value of the controller would indicate a lower value.

– *Always active*: Here it is possible to define whether this basic load will be permanently active or whether it will be switched via the "Basic load" object.
– *Activate via object*: When this parameter is selected, the basic load function, which means the minimum control value with a value higher than zero, can be activated (1) or deactivated (2). If it is activated, then the heating medium will always be fed through the system with at least the minimum control value. If it is deactivated, the control value can be reduced to zero with the controller.

11.5.72 Basic load settings — Basic load active when controller is off

Options:	No
	Yes

– This parameter switches the basic load active when the controller is off.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

11.5.73 Combined heating and cooling modes

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating and cooling" or "Heating and cooling with additional stages".

11.5.74 Combined heating and cooling modes — Switchover of heating/cooling

Options:	Automatic
	Only via object
	On-site/via extension unit and via object

This function makes it possible to switch between the heating and cooling mode of the device.

– *Automatic*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The device switches automatically between heating and cooling and to the associated setpoint. "Switchover heating/cooling" is a transmitting object.
– *Only via object*: E.g. for two-conductor systems which are operated in heating mode in the winter and cooling mode in the summer. The switchover between heating and cooling and to the associated setpoint is carried out via the corresponding communication object. This function is used when a central switchover of the single room controllers is required. "Switchover heating/cooling" is a receiving object.
– *Local/ via extension unit and via object*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The switchover between heating and cooling and to the associated setpoint is carried out manually on the device by the user of the room or via the "Switchover heating/cooling" object via the bus. "Switchover heating/cooling" is a transmitting and receiving object.

11.5.75 Combined heating and cooling modes — Operating mode after reset

Options:	Cooling
	Heating

After a bus voltage failure, a system reset, or the attachment of a device to the bus coupler, the device starts in the parameterized "Operating mode after reset". The operating mode can be changed when the system is running using the options set under "Switchover heating/cooling".

11.5.76 Combined heating and cooling modes — Heating/cooling control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

11.5.77 Combined heating and cooling modes — Additional heating/cooling stage control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

Note
This parameter is only available when the "Control function" parameter is set on "Heating and cooling with additional stages".

11.5.78 Setpoint settings

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.5.79 Setpoint settings — Setpoint for heating comfort = setpoint for cooling comfort

Options:	No
	Yes

This parameter is used to configure the manner in which the setpoint adjustment functions.

– *Yes*: The device has the same setpoint for heating and cooling in the comfort mode. The system switches to heating when the temperature drops below the setpoint minus hysteresis. It switches to cooling when the temperature exceeds the setpoint plus hysteresis. The hysteresis is parameterizable.

– *No*: The function has two separate setpoints for heating and cooling in the comfort mode. The device will display the currently active setpoint value. Switching between heating and cooling occurs via the "Switchover heating/cooling" parameter setting.

Note
This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

11.5.80 Setpoint settings — Hysteresis for switchover heating/cooling (x 0.1°C)

Options:	Setting option between 5 - 100

This parameter specifies the one-sided hysteresis for switching between heating and cooling when "Setpoint heating comfort = Setpoint cooling comfort" is active. If the room temperature exceeds the setpoint temperature value plus hysteresis, the system switches to cooling. If the room temperature falls below the setpoint temperature value minus hysteresis, the system switches to heating.

Note
This parameter is only available when the "Setpoint heating comfort = Setpoint cooling comfort" parameter is set on "Yes".

11.5.81 Setpoint settings — Setpoint temperature for heating and cooling comfort (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for heating and cooling when people are present.

Note
This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

11.5.82 Setpoint settings — Setpoint temperature for heating comfort (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for heating when people are present.

Note
This parameter is only available when the "Control function" parameter is set on "Heating, "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stage" and parameter "Setpoint heating comfort = setpoint cooling comfort" is set on "No".

11.5.83 Setpoint settings — Reduction for standby heating (°C)

Options:	Setting option between 10 - 40

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note
This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.84 Setpoint settings — Reduction for ECO heating (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

11.5.85 Setpoint settings — Set-point temperature for frost protection (°C)

Options:	Setting option between 5 - 15

Function for protecting the building against the cold. On devices with a display, this mode is indicated by the frost protection icon. Manual operation is blocked.

Note
This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.86 Setpoint settings — Setpoint temperature for cooling comfort (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for cooling when people are present.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling" or "Cooling with additional stage".

11.5.87 Setpoint settings — Increase for standby cooling (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.88 Setpoint settings — Increase for ECO cooling (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.89 Setpoint settings — Set-point temperature for heat protection (°C)

Options:	Setting option between 27 - 45

Function for protecting the building against heat. On devices with a display, this mode is indicated by the heat protection icon. Manual operation is blocked.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.90 Setpoint settings — Display indicates

Options:	Current setpoint
	Relative setpoint

The display can indicate either the absolute or relative setpoint value.

– *Current setpoint*: On devices with a display, the setpoint is shown as an absolute temperature, e.g. 21.0°C.
– *Relative setpoint*: On devices with display, the setpoint is indicated as a relative value, e.g. -5°C .. + 5°C.

11.5.91 Setpoint settings — Send current setpoint

Options:	Cyclic and during change
	Only for change

The current setpoint value can be sent to the bus either cyclically and after a change, or only after a change.

11.5.92 Setpoint settings — Cyclic sending of the current set-point temperature (min)

Options:	Setting option between 5 - 240

This parameter is used to specify the amount of time that will elapse before the current setpoint value is automatically transmitted.

Note
This parameter is only available when the "Send current setpoint" is set on "Only during change".

11.5.93 Setpoint settings - Basic set value is

Options:	Set-point for cooling comfort
	Set-point for heating comfort
	Mean value between heating comfort and cooling comfort

- Setpoint for cooling comfort:
  - The device uses the temperature value that has been set via parameter "Setpoint temperature for cooling comfort" (°C).
- Set-point for heating comfort:
  - The device uses the temperature value that has been set via parameter "Setpoint temperature for heating comfort" (°C).
- Mean value between heating comfort and cooling comfort:
  - The device uses the mean value of the two specified setpoints.

The RTC requires a defines basic set value for its function. The parameter is used to specify the set value the device accesses.

Note
The parameter can only be set when the "Setpoint heating comfort = Setpoint cooling comfort" parameter is set on "No".

11.5.94 Setpoint adjustment

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.5.95 Setpoint adjustment — Maximum manual increase during heating mode (0 - 9°C)

Options:	Setting option between 0 - 9

This preset can be used to limit the manual increase during heating.

Note
This parameter is only available when parameter "Controller function" is set on "Heating" and parameter "Control value type" on "2-point 1 bit, On/Off" or "2-point 1 byte, 0/100%".

11.5.96 Setpoint adjustment — Maximum manual reduction during heating mode (0 - 9°C)

Options:	Setting option between 0 - 9

This preset can be used to limit the manual decrease during heating.

Note
This parameter is only available when parameter "Controller function" is set on "Heating" and parameter "Control value type" on "2-point 1 bit, On/Off" or "2-point 1 byte, 0/100%".

11.5.97 Setpoint adjustment — Maximum manual increase during cooling mode (0 - 9°C)

Options:	Setting option between 0 - 9

This preset can be used to limit the manual increase during cooling.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling," "Cooling with additional stage," "Heating and cooling" or "Heating and cooling with additional stages".

11.5.98 Setpoint adjustment — Maximum manual reduction during cooling mode (0 - 9°C)

Options:	Setting option between 0 - 9

This preset can be used to limit the manual decrease during cooling.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling," "Cooling with additional stage," "Heating and cooling" or "Heating and cooling with additional stages".

11.5.99 Setpoint adjustment — Resetting of the manual adjustment for receipt of a basic setpoint

Options:	No
	Yes

Activating this parameter will cause the manual adjustment to be deleted and the new setpoint value to be provided when a new value is received via the "Basic setpoint" object.

If the parameter is deactivated, the manual adjustment is added to the new base setpoint value. Example: Previous base setpoint value of 21°C + manual adjustment of 1.5°C = 22.5°C. The object receives a new basic setpoint of 18°C plus the previous manual adjustment of 1.5°C for a total of 19.5°C.

11.5.100 Setpoint adjustment — Resetting the manual adjustment for change of operating mode

Options:	No
	Yes

If the device switches to a new operating mode, the manual adjustment is deleted and the parameterized setpoint temperature for the operating mode plus any change by the base setpoint value object will be applied if this parameter is activated. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. Change to Eco with programmed temperature 17°C. The device regulates the temperature to 17°C, since the manual adjustment is deleted.

If the parameter is deactivated, the manual setpoint adjustment will be added to the temperature in the new operating mode. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. If the system switches to Eco with a parameterized temperature of 17°C, the device regulates the temperature to 18.5°C, since the manual adjustment is added.

11.5.101 Setpoint adjustment — Resetting the manual adjustment via object

Options:	No
	Yes

If this parameter is activated, a separate object can be used to delete the manual adjustment at any time. Example of application: Resetting the manual adjustment on all devices located in a building using a system clock.

11.5.102 Setpoint adjustment — Permanent storage of on-site operation

Options:	No
	Yes

If this parameter is activated, the manual settings for setpoint and, where applicable, fan speed level, as well as the value of the "Basic load" object, will be stored in the device and re-activated after a reset. The same applies to the operating mode.

If the device is re-programmed, the stored setpoint values will also be deleted.

11.5.103 Temperature reading — Inputs of temperature reading

Options:	Internal measurement
	External measurement
	Weighted measurement

The room temperature can be measured at the device or fed to the device by an object via the bus. In addition, weighted measuring is also available, in which the weighted average of up to three temperature values (1 x internal, 2 x external) is calculated and used as an input value for control.

11.5.104 Temperature reading — Inputs of weighted temperature reading

Options:	Internal and external measurement
	2 x external measurement
	Internal and 2x external measurement

Specifies the temperature reading inputs for the weighted measurement, in which the calculated weighted average of the inputs is used as an input value for control

Note
This parameter is only available when the "Inputs of temperature reading" parameter is set on "Weighted measurement".

11.5.105 Temperature reading — Weighting of internal measurement (0 to 100%)

Options:	Setting option between 0 - 100

Specifying the weighting of the internal measurement from 0 to 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "Internal and external measurement" or "Internal and 2x external measurement".

11.5.106 Temperature reading — Weighting of external measurement (0 to 100%)

Options:	Setting option between 0 - 100

Specifying the weighting of the external measurement from 0 to 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "Internal and external measurement", "2x external measurement" or "Internal and 2x external measurement".

11.5.107 Temperature reading — Weighting of external measurement 2 (0 to 100%)

Options:	Setting option between 0 - 100

Specifying the weighting of the external measurement 2 from 0 to 100%. The setting together with the weighting of the external measurement (0 - 100%) must result in 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "2x external measurement" or "Internal and 2x external measurement".

11.5.108 Temperature reading — Cyclic sending of the actual temperature (min)

Options:	Setting option between 5 - 240

The current actual temperature used by the device can be cyclically transmitted to the bus.

11.5.109 Temperature reading — Difference of value for sending the actual temperature (x 0.1°C)

Options:	Setting option between 1 - 100

If the change in temperature exceeds the parameterised difference between the measured actual temperature and the previous actual temperature that was sent, the changed value will be transmitted.

Note
This parameter is only available when the "Inputs of temperature reading" parameter is set on "Internal measurement" or "Weighted measurement".

11.5.110 Temperature reading — Adjustment value for internal temperature measurement (x 0.1°C)

Options:	Setting option between 1 - 100

Every installation location has different physical conditions (interior or exterior wall, lightweight or solid wall, etc.). In order to use the actual temperature at the installation location as a measured value for the device, a temperature measurement must be performed by an external equalised and / or calibrated thermometer at the installation location. The difference between the actual temperature displayed on the device and the actual temperature determined by the external measurement device must be entered in the parameter field as an "Adjustment value".

Note

- The calibration measurement should not be carried out immediately after the device has been installed. The device should first adjust to the ambient temperature before calibration is carried out. The calibration measurement should be repeated shortly before or after the room is occupied.
- This parameter is only available when the "Inputs of temperature reading" parameter is set on "Internal measurement" or "Weighted measurement".

11.5.111 Temperature reading — Monitoring time for temperature reading (0 = no monitoring) (min)

Options:	Setting option between 0 - 120

If no temperature is read within the parameterized time period, the device switches to error mode. It transmits a telegram to the bus via the "Actual temperature error" object and applies the operating mode and control value for error (0 - 255) settings.

11.5.112 Temperature reading — Control value for fault (0 - 255)

Options:	Setting option between 0 - 255

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently determine the control value. In case of an error, a PWM control (1 Bit) with a fixed cycle time of 15 minutes is used automatically instead of a parameterized 2-point control (1 Bit). In this case the set parameter value is taken into consideration for the control value during an error.

11.5.113 Alarm functions

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.5.114 Alarm functions — Condensate water alarm

Options:	No
	Yes

If a fan coil is used, condensation may form during operation as a result of excessive cooling and/or humidity. The associated condensate is typically collected in a container. To protect the container against overflowing, and thus prevent potential damage to devices and/or the building, the container alerts the "Condensation alarm" object (receiving only) that the maximum fill level has been exceeded. This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon on devices that have a display. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note
This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.115 Alarm functions — Dew point alarm

Options:	No
	Yes

When refrigerating machines are used, dew may appear on the refrigerant supply lines during operation as a result of excessive cooling and/or humidity. The dew indicator reports the dew formation via the "Dew point alarm" object (receiving only). This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon on devices that have a display. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note
This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.116 Alarm functions — Frost alarm temperature for HVAC and RHCC status (°C)

Options:	Setting option between 0 - 15

The RHCC status and HVAC objects have a frost alarm bit. It the input temperature of the controller drops below the temperature set in this parameter, then the frost alarm bit is set in the status objects. It is reset when the temperature is exceeded.

11.5.117 Alarm functions — Heat alarm temperature for RHCC status (°C)

Options:	Setting option between 25 - 70

The RHCC status object has a heat alarm bit. If the input temperature of the controller exceeds the temperature set in this parameter, then the heat alarm bit is set in the status object. It is reset when the temperature falls below the set temperature.

11.5.118 Fan coil settings - Fan speed levels

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil".

11.5.119 Fan coil settings - Fan speed levels — Number of fan speed levels

Options:	3 levels
	5 levels

This parameter is used to specify the number of fan speed levels the actuator will use to control the fan of the fan coil.

11.5.120 Fan coil settings - Fan speed levels — Format of the level output

Options:	0..5
	0..255
	1 bit m off n
	1 bit m 1 off n

– *0 to 5*: The level values (0..3 or 0..5) are output in the 1-byte format as the counter values 0..3 or 0..5.
– *0 to 255*: The level values (0..3 or 0..5) are output as percentage values. Example 5-stage fan: The level value 1 is output as 20%, and 5 is output as 100%.
– *1 Bit m from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For level 2, for example, the 1-bit fan speed level objects 1 and 2 are output as the value 1, while the other fan speed level objects use the value 0.
– *1 Bit 1 from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For the level 2, for example, only the 1-bit fan speed level object 2 is output as the value 1. The other fan speed level objects use the value 0.

11.5.121 Fan coil settings - Fan speed levels — Level output

Options:	For manual operation and automatic
	Only for manual operation

This parameter is used to specify when the output of the fan speed level values will occur: either only when the fan speed levels are manually adjusted or also in automatic mode. This setting depends on the options for the fan coil actuator. If the actuator itself controls the fan speed levels in automatic mode based on a derivative of the control value, than the "Only for manual operation" option must be selected. Otherwise, the other option should be selected.

11.5.122 Fan coil settings - Fan speed levels — Lowest manually adjustable level

Options:	Level 0
	Level 1

This parameter is used to preselect the lowest fan speed level that can be set by an operation performed at the device. When level 0 is selected, the heating/cooling system will not be in operation (fan speed level and valve control 0) as long as the current operating mode and operation type are maintained. To avoid damage to the building, level 0 is deactivated after 18 hours and the device is returned to automatic mode.

11.5.123 Fan coil settings - Fan speed levels — Level status evaluation

Options:	No
	Yes

The controller obtains the current fan speed level for controlling a fan coil actuator either by calculating it from the table of level values under "Fan coil settings for heating" or "Fan coil settings for cooling", or by receiving feedback from the fan coil actuator. If the "Yes" option is selected, the "Fan coil step status" object is activated for receiving the fan speed level from the fan coil actuator.

11.5.124 Fan coil settings heating

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". In addition, the "Control function" parameter must be set on either "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.125 Fan coil settings for heating — Speed level 1 to 5 up to control value (0 to 255) heating

Options:	Setting option between 0 - 255

In this parameter, the control values of the controller are assigned to fan speed levels. This assignment is used if the fan speed levels are transmitted together with the control values.

Note
- These level settings should be adjusted to match the settings in the fan coil actuator.
- Setting the "Control value type" to "Fan coil" in the control parameters is only useful for one of either the basic stage or the additional stage. Setting the basic and additional stage parameters to fan coil is not useful, since the control of only one fan coil actuator each for heating and cooling is supported.
- The "Fan speed level 4 - 5 up to control value (0 - 255) heating“ parameters are available only when the "Number of fan speed levels" is set on "5 levels".

11.5.126 Fan coil settings for heating — Fan speed level limit heating for eco mode

Options:	No
	Yes

This parameter limits the fan speed level when the system is switched to eco mode.

11.5.127 Fan coil settings for heating - Maximum speed level heating for eco mode

Options:	Setting option between 0 - 5

Specifies the maximum possible fan speed level when the system is switched to eco mode.

Note
The parameter is only adjustable if the "Fan speed level limit heating in Eco mode" parameter is set on "Yes".

11.5.128 Fan coil settings for cooling

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". In addition, the "Control function" parameter must be set on either "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.5.129 Fan coil settings for cooling — Speed level 1 to 5 up to control value (0 to 255) cooling

Options:	Setting option between 0 - 255

In this parameter, the control values of the controller are assigned to fan speed levels. This assignment is used if the fan speed levels are transmitted together with the control values.

Note
- These level settings should be adjusted to match the settings in the fan coil actuator.
- Setting the "Control value type" to "Fan coil" in the control parameters is only useful for one of either the basic stage or the additional stage. Setting the basic and additional stage parameters to fan coil is not useful, since the control of only one fan coil actuator each for heating and cooling is supported.
- The "Fan speed level 4 - 5 up to control value (0 - 255) cooling“ parameters are available only when the "Number of fan speed levels" is set on "5 levels".

11.5.130 Fan coil settings for cooling — Fan speed level limit cooling for eco mode

Options:	No
	Yes

This parameter limits the fan speed level when the system is switched to eco mode.

11.5.131 Fan coil settings for cooling - Maximum fan speed level cooling for eco mode

Options:	Setting option between 0 - 5

Specifies the maximum possible fan speed level when the system is switched to eco mode.

Note
The parameter is only adjustable if the "Fan speed level limit cooling in Eco mode" parameter is set on "Yes".

11.5.132 Summer compensation

Note
This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.5.133 Summer compensation — Summer compensation

Options:	No
	Yes

In order to save energy, and to ensure that the temperature difference occurring during entry and exit of a climate-controlled building stays within comfortable limits, the excessive reduction of room temperature should be prevented during high temperatures in the summer (Summer compensation according to DIN 1946). The room temperature is increased by adjusting the setpoint temperature for cooling.

Raising the room temperature does not, however, mean that you heat up the room. Rather, the adjustment is intended to allow the room temperature to increase to a certain setpoint without cooling. This, for example, prevents the air-conditioning system from further reducing the room temperature to 24°C with an external temperature of 35°C.

However, activation of the summer compensation requires an outside temperature sensor that transmits its measured value to the bus and can be evaluated by the room temperature controller.

The following parameters are available for summer compensation:

- "Lower outside temperature value for summer compensation",
- "Upper outside temperature value for summer compensation",
- “Lower setpoint offset for summer compensation",
- “Upper setpoint offset for summer compensation"

Above the "Upper outside temperature value", the minimum setpoint temperature for cooling is the outside temperature minus the "Upper setpoint offset". The outside temperature has no effect on the minimum setpoint temperature for cooling below the "Lower outside temperature value". Between the "Lower" and "Upper outside temperature value", the minimum setpoint temperature for cooling undergoes floating adjustment by the parameterized setpoint temperature equal to the outside temperature minus the "Lower offset" to a value equal to the outside temperature minus the "Upper setpoint offset" as a function of the outside temperature.

Typical values for summer compensation are:

- 21°C: Lower outside temperature value
- 32°C: Upper outside temperature value
- 0 K: Lower setpoint offset
- 6 K: Upper setpoint offset

This means that a continuous increase of the minimum setpoint value for cooling occurs to a value equal to the outside temperature minus a setpoint offset of 0 to 6 K if the outside temperature increases to 32°C from 21°C.

For example:

For an increasing outside temperature, the minimum setpoint value for cooling will be increased starting at an outside temperature of 21°C. The minimum setpoint temperature for cooling is 25.1°C at an outside temperature of 30°C; 25.5°C at an outside temperature of 31°C; 26°C at an outside temperature of 32°C; and 27°C at an outside temperature of 33°C.

11.5.134 Summer compensation -— (Lower) Starting temperature for summer compensation (°C)

Options:	Setting option between -127 - 127

The parameter defines the lower outside temperature value up to which temperature value the setpoint correction (summer compensation) is performed based on too high an outside temperature.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.5.135 Summer compensation — Offset of the set-point temperature for the entry into summer compensation (x 0.1°C)

Options:	Setting option between -127 - 127

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the lower temperature value is reached.

Typical values for summer compensation are:

- 20°C: Lower outside temperature value
- 32°C: Upper outside temperature value
- 0 K: Lower setpoint offset
- 4 K: Upper setpoint offset

That means that a flowing setpoint increase of 0 to 4 K occurs if the outside temperature increases from 20°C to 32°C.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.5.136 Summer compensation — (Upper) exit temperature for summer compensation (°C)

Options:	Setting option between -127 - 127

The parameter defines the upper outside temperature value up to which temperature value the setpoint correction (summer compensation) is performed based on too high an outside temperature.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.5.137 Summer compensation — Offset of the set-point temperature for the exit from summer compensation (x 0.1°C)

Options:	Setting option between -127 - 127

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the upper temperature value is reached.

Typical values for summer compensation are:

- 20°C: Lower outside temperature value
- 32°C: Upper outside temperature value
- 0 K: Lower setpoint offset
- 4 K: Upper setpoint offset

That means that a flowing setpoint increase of 0 to 4 K occurs if the outside temperature increases from 20°C to 32°C.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.5.138 Application - LED function

The application can be used to configure the button LEDs for the status or function display.

The following communication objects are available:

- "Status LED"
- "Day/night mode"
- "Alarm"
- "Scene storage"

The LEDs can light up in different colours and brightness levels. The LEDs can also flash for alarm display and/or scene storage display.

Note
The parameters for application "LED function" can be called via **general parameters** and **extended parameters**.

11.5.138.1 Operating mode

Options:	Status illumination
	Function illumination

- Status illumination:
  - The button LEDs display the device status with different colours.
- Function illumination:
  - The button LEDs display the device functions with different colours.

The parameter is used to specify whether the RTC button LEDs display the current device status or the selected device function with a colour.

If the operating mode "Status illumination" is selected, the LEDs have the 1-bit or 1-byte communication object "Status LED". If a telegram is received via the status object, the LEDs light up in the colour of the received value.

If operating mode "Function illumination" is selected, the colour for the configured button function can be firmly set via parameter "Colour of function illumination".

11.5.138.2 Object type for status object

Options:	1 bit
	1 byte 0 - 100%

- 1 bit:
  - The value is sent as 1-bit switching commands (On/Off) and the button LEDs light up in the colour for On or Off.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value (percent) and the button LEDs light up in the colour for the associated zone (1 - 5).

The parameter is used to set the size of communication objects for the colour of the LED.

For selection "1 bit", the 1-bit object "Status LED" is available. If an On telegram is received via the object, the RTC button LEDs light up in the colour that is stored in the "Colour for On" parameter. If an OFF telegram is received via the object, the LEDs light up in the colour that is stored in the "Colour for Off" parameter. The LEDs can also be switched off.

For selection "1 byte 0-100%", the 1-byte object "Status LED" is available. If a value telegram is received via the object, the RTC button LEDs light up in the colour that is set in the "Colour for zone" parameter. The LEDs can also be switched off for each zone.

The five adjustable zones have the following behaviour:

- Zone 1: 0%
- Zone 2: 1% ≤ value < S1
- Zone 3: S1 ≤ value < S2
- Zone 4: S2 ≤ value ≤ 99%
- Zone 5: 100%

The threshold value for S1 is set via the parameter "Threshold between Zone 2 and 3" (%).

The threshold value for S2 is set via the parameter "Threshold between Zone 3 and 4" (%).

Note
The parameter is only adjustable if the "Operating mode" parameter is set on "Status illumination".

11.5.138.3 Brightness of the colours

Options:	Dark
	Bright

- Dark:
  - The button LEDs light up with minimal brightness.
- Bright:
  - The button LEDs light up with high brightness.

The parameter is used to specify whether the RTC button LEDs light up continuously dark or bright. No distinction is made between day or night.

Note
The parameter is only adjustable if the "Day/night mode" parameter is set on "deactivated".

11.5.138.4 Colour for Off

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at switching signal "Off".

The parameter is used to specify the colour the RTC button LEDs light up in when the device receives an Off telegram via the 1-bit communication object "Status LED". The default setting is "green".

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 bit".

11.5.138.5 Colour for On

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at switching signal "On".

The parameter is used to specify the colour the RTC button LEDs light up in when the device receives an On telegram via the 1-bit communication object "Status LED". The default setting is "green".

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 bit".

11.5.138.6 Colour for Zone 1 (corresponds to 0%)

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at value telegrams for zone 1.

The parameter is used to specify the colour the RTC button LEDs light up in when a telegram with value "0%" is received via the 1-byte communication object "Status LED". The default setting is "green".

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.7 Colour for Zone 2 (starting at 1%)

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at value telegrams for zone 2.

The parameter is used to specify the colour the button LEDs light up in when a telegram with a value is received via the 1-byte communication object "Status LED", which meets the following conditions:

- Value is ≥ 1% and
- Value is < S1.

The default setting is "yellow".

The threshold value S1 is set via the parameter "Threshold between Zone 2 and 3" (%).

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.8 Threshold between Zone 2 and 3 (%)

Options:	Setting option from 1 to 98

The parameter is used to set the threshold value (S1) between Zone 2 and 3.

If the value received is < S1 and ≥ 1%, the button LEDs light up in the colour for zone 2.

If the value received is ≥ S1 and < S2, the button LEDs light up in the colour for zone 3.

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.9 Colour for Zone 3

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at value telegrams for zone 3.

The parameter is used to specify the colour the RTC button LEDs light up in when a telegram with a value is received via the 1-byte communication object "Status LED", which meets the following conditions:

- Value is ≥ S1 and
- Value is < S2.

The default setting is "white".

The thresholds S1 and S2 are specified via the parameters "Threshold between zone 2 and 3 (%)" and "Threshold between zone 3 and 4 (%)".

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.10 Threshold between Zone 3 and 4 (%)

Options:	Setting option from 2 to 99

The parameter is used to set the threshold value (S2) between Zone 3 and 4.

If the value received is ≥ S1 and < S2, the button LEDs light up in the colour for zone 3.

If the value received is ≥ S2 and ≤ 99%, the button LEDs light up in the colour for zone 4.

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.11 Colour for Zone 4 (up to 99%)

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at value telegrams for zone 4.

The parameter is used to specify the colour the RTC button LEDs light up in when a telegram with a value is received via the 1-byte communication object "Status LED", which meets the following conditions:

- Value is ≥ S2 and
- Value is ≤ 99%.

The default setting is "red-orange".

The threshold value S2 is set via the parameter "Threshold between Zone 3 and 4" (%).

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.12 Colour for Zone 5 (corresponds to 100%)

Options:	Off
	Yellow
	Red-orange
	Red
	Violet
	Blue
	Green
	White

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the fixed colour at value telegrams for zone 5.

The parameter is used to specify the colour the RTC button LEDs light up in when a telegram with value "100%" is received via the 1-byte communication object "Status LED". The default setting is "red".

Note
The parameter can only be set if the "Operating mode" parameter and is set on "Status illumination" and the "Object type for status object" parameter is set on "1 byte 0-100%".

11.5.138.13 Colour of function illumination

Options:	Off
	Yellow (light)
	Red/orange (heating)
	Red
	Violet (scene)
	Blue (blind)
	Green
	White (neutral)

- Off:
  - The button LEDs are switched off.
- Yellow - white:
  - The button LEDs light up in the selected colour.

The parameter is used to specify the colour the associated function icons (RTC buttons) of the device light up in.

The LEDs additionally serve for orientation, this means that the buttons can be recognized in the dark. Alternatively, the LEDs can also be switched off, such as when the device is in a sleeping area.

Note
The parameter is only adjustable if the "Operating mode" parameter is set on "Function illumination".

11.5.138.14 Day/Night mode

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Day/night mode" is not enabled.
- Activated:
  - Communication object "Day/night mode" is enabled.
  - If a telegram with value "1" is received via the object, the button LEDs display light up brightly. If a telegram with value "0" is received, the LEDs light up dark.

The LEDS of the RTC buttons can light up in two different brightness levels. The parameter is used to specify whether the LEDs can be switched over between bright and dark.

Note

The parameter is available via the following settings:

- The parameter is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 bit".
  and
- Parameter "Colour for Off" is set on a colour and not on "Off".
  or
- Parameter "Colour for On" is set on a colour and not on "Off".

The parameter is available also via the following settings:

- The parameter "Operating mode" is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 byte 0-100%.
  and
- At least one parameter "Colour for zone x" is set on a colour and not on "Off".

The parameter is available also via the following settings:

- The Operating mode" parameter is set on "Function illumination".
  and
- Parameter "Colour for function illumination" is set on a colour and not on "Off".

11.5.138.15 Light scene memory function

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Scene storage" is not enabled.
- Activated:
  - Communication object "Scene storage" is enabled.

The 1-byte communication object "Scene storage" can be enabled with this parameter. And it is specified whether the LED of the button flashes for three seconds and lights continuously when a telegram for scene storage is received via the enabled object.

The LED flashes in the colour that is set for the status or function illumination. If object "Day/night mode" is enabled, the LED flashes either bright or dark.

Note

The parameter is available via the following settings:

- The parameter "Operating mode" is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 bit".
  and
- Parameter "Colour for Off" is set on a colour and not on "Off".
  and
- Parameter "Colour for On" is set on a colour and not on "Off".

The parameter is available also via the following settings:

- The parameter is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 byte 0-100%.
  and
- All parameters "Colour for zone x" are set on a colour and not on "Off".

The parameter is available also via the following settings:

- The "Operating mode" parameter is set on "Function illumination".
  and
- Parameter "Colour for function illumination" is set on a colour and not on "Off".

11.5.138.16 Alarm function

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Alarm" is not enabled.
- Activated:
  - Communication object "Alarm" is enabled.

The 1-byte communication object "Alarm" can be enabled with this parameter. If an On telegram is received via the object, the LED of the button flashes. If an Off telegram is received via the object, the LED lights up continuously.

The LED flashes in the colour that is set for the status or function illumination. If object "Day/night mode" is enabled, the LED flashes either bright or dark.

The alarm function can, for example, display a wind alarm or an open door when the user wants to lower a Blind or a roller blind.

Note

The parameter is available via the following settings:

- The parameter is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 bit".
  and
- Parameter "Colour for Off" is set on a colour and not on "Off".
  and
- Parameter "Colour for On" is set on a colour and not on "Off".

The parameter is available also via the following settings:

- The parameter is set on "Status illumination".
  and
- Parameter "Object type for status object" is set on "1 byte 0-100%.
  and
- All parameters "Colour for zone x" are set on a colour and not on "Off".

The parameter is available also via the following settings:

- The "Operating mode" parameter is set on "Function illumination".
  and
- Parameter "Colour for function illumination" is set on a colour and not on "Off".

11.6 Application "General functions"

Up to five channels can be activated for the use of the applications described in this section.

11.6.1 Channel x - Application

Options:	Inactive
	Cyclic telegrams
	Priority
	Logic gate
	Gate
	Staircase lighting
	Delay
	Min/max value transducer
	Light scene actuator

- Inactive:
  - The application is not active. No parameters are available.
- Cyclic telegrams:
  - After the receipt of a telegram on object "GFx: input", a telegram with the same content is sent cyclic via object "GFx: output". Additional information, See “Application - Cyclic telegrams“ on page 141.
- Priority:
  - The telegrams received via communication object "GFx: switch input" are transferred to object "GFx: output" depending on the state of the "GFx: input priority" object. Additional information, See “Application - Priority“ on page 146.
- Logic gate:
  - The application is used to specify the logic gate the communication objects "GFx: input 1","GFx: input 2" and "GFx: output" are to be linked with. Additional information, See “Application - Logic gate“ on page 147.
- Gate:
  - The application can be used to filter certain signals and to block the flow of signals temporarily. Additional information, See “Application - Gate“ on page 153.
- Staircase lighting:
  - The application can be used to supply switching telegrams or value telegrams with a switch-off delay. Additional information, See “Application - Staircase lighting“ on page 159.
- Delay:
  - Telegrams can be received via the "GFx: input" object with the application. Additional information, See “Application - Delay“ on page 163.
- Min/max value transducer:
  - Up to eight input values can be compared with each other with the application. Additional information, See “Application - Min/max value transducer“ on page 169.

- Light scene actuator:
  - With the application it is possible to call up scenes that are stored in the device via the receipt of a scene number on the 1-byte communication object "GFx: scene call-up". Additional information, See “Application - Light scene actuator“ on page 172.

Note
The following parameters can only be adjusted when the corresponding application (see above) is selected.

11.6.2 Application - Cyclic telegrams

The application can be used to send telegrams cyclic on the bus under fixed conditions.

The following communication objects are available:

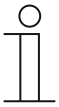
- "GFx: input“
- "GFx: output"
- "GFx: enable" (1-bit object)

The objects "GFx: input" and "GFx: output" can take on different sizes (1 bit - 4 byte, depending on the object type selected). The bit sizes of objects "GFx: input" and "GFx: output" can be collectively adjusted for the different applications.

After the receipt of a telegram on object "GFx: input", a telegram with the same content is sent cyclic via the application on the bus via object "GFx: output". The object types for "GFx: input" and "GFx: output" can be collectively parameterised for the different applications. The times for cyclic sending via "GFx: output" object are adjustable.

An additional "GFx: enable" object provides the option of temporarily blocking the function.

Note
The parameters for application "Cyclic telegrams" can be called up via **general parameters** and **extended parameters**.



Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.2.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.2.2 Object type

Options:	1-bit switching
	1-bit alarm
	1 byte 0 - 100%
	1 byte 0 - 255
	2-byte float
	2-byte signed
	2-byte unsigned
	4-byte float
	4-byte signed
	4-byte unsigned

- 1-bit switching:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/untrue.
- 1-bit alarm:
  - The value is sent as 1-bit switching commands (0 or 1), alarm functions On/Off.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. Any value 0 - 255.
- 2-byte float:
  - The value is sent as floating point value (-671088.6 - 670760.9), e.g. temperature or moisture value.
- 2-byte signed:
  - The value is sent as 2-byte value with a sign, (-32768 - +32767), e.g. time difference or percentage difference.
- 2-byte unsigned:
  - The value is sent as 2-byte value without a sign (0 - 65535), e.g. time or brightness value.
- 4-byte float:
  - The value is sent as 4-byte floating point value, physical values, e.g. luminosity, electric power, pressure.
- 4-byte signed:
  - The value is sent as 4-byte value with a sign (-2147483648 - 2147483647), e.g. counting impulse, time difference.
- 4-byte unsigned:
  - The value is sent as 4-byte value without a sign (0 - 4294967295), e.g. counting impulse.

The set option fixes the bit size of the input and output object.

11.6.2.3 Cycle time

Options:	Setting option from 00:00:55 to 01:30:00 (hh:mm:ss)

The telegrams of the object during operation are sent cyclic on the bus.

The parameter specifies the time interval from which a new sending of the telegrams occurs.

11.6.2.4 Enable object

Options:	Deactivated
	Activated

- Deactivated:
  - Object "GFx: enable" is not enabled.
- Activated:
  - Object "GFx: enable" is enabled. The function "Cyclic telegram" can be temporarily blocked via the object.

The 1-bit communication object "GFx: enable" can be enabled with this parameter.

Note

If the "Enable object" parameter is activated, the following parameters can be set:

- "Object value enable object"
- "Enable object after return of voltage"

11.6.2.5 Object value enable object

Options:	Normal
	Inverse

- Normal:
  - If an Off telegram is received via the object "GFx: enable", the function "Cyclic telegram" is blocked. An On telegram deactivates the blockage.
- Inverse:
  - If an On telegram is received via the object "GFx: enable", the function "Cyclic telegram" is blocked. An Off telegram deactivates the blockage.

The parameter is used to specify whether function "Cyclic telegram" is blocked temporarily at the receipt of an On or Off telegram.

Note

This parameter can only be set if the "Enable object" parameter is set on "activated".

11.6.2.6 Enable object after return of voltage

Options:	Blocked
	Enabled

- Blocked:
  - Object "GFx: enable" is not activated at bus voltage recovery. The blocking function is deactivated.
- Enabled:
  - If object "GFx: enable" was activated prior to bus voltage recovery, it will also be activated after bus voltage recovery.

The parameter serves to ensure that a defined value is present on communication object "GFx: enable" after a return of bus voltage.

Note
This parameter can only be set if the "Enable object" parameter is set on "activated".

11.6.2.7 Cyclic sending

Options:	Always activated
	Activated at a specified value
	Activated except at a specified value

- Always activated:
  - Telegrams that are received on object "GFx: input" are transferred directly to object "GFx: output" and there sent cyclic.
- Activated at a specified value:
  - This value is sent cyclic via object "GFx: output" only at the receipt of a specific, set value. If a different value is received on "GFx: input", no telegram is sent via object "GFx: output".
- Activated except at a specified value:
  - This deviating value is sent cyclic via object "GFx: output" only at the receipt of a value that deviates from the set value.

11.6.2.8 Value for cyclic sending

The possible options and setting limits depend on parameter "Object type".

Options for selection "1 bit switching" and "1-bit alarm":

Options:	Off
	One

Options for selection "1 byte 0-100%":

Options:	Setting option from 0 to 100 (%)

Options for selection "1 byte 0-255":

Options:	Setting option from 0 to 255

Options for selection "2-byte float":

Options:	Setting option from -671088.64 to 670760.96

Options for selection "2-byte signed":

Options:	Setting option from -32768 to +32767

Options for selection "2-byte unsigned":

Options:	Setting option from 0 to 65535

Options for selection "2-byte temperature":

Options:	Setting option from -273 to 500

Options for selection "4-byte float":

Options:	Setting option from -4000000 to 4000000

Options for selection "4-byte signed":

Options:	Setting option from -2147483648 to 2147483647

Options for selection "4-byte unsigned":

Options:	Setting option from 0 to 4294967295

The parameter is used to fix the value that must be received on object "GFx: input" to ensure that the same value is sent cyclic via object "GFx: output". The bit size depends on parameter "Object type".

Note
The parameter can only be set if the "Cyclic sending" parameter is set on "activated at a specified value" or on "activated except at a specified value.

11.6.3 Application - Priority

The application can be used to activate a forced guidance (priority) for switching outputs.

The following communication objects are available:

- "GFx: switch input" (1-bit object)
- "GFx: priority input" (2-bit object)
- "GFx: output" (1-bit object)

The telegrams received on "GFx: switch input" are transferred to object "GFx: output" depending on the state of the "GFx: priority input" object.

The 2-bit object "GFx: priority input" can receive and differentiate between four different values (0, 1, 2 and 3). Here, the "GFx: output" object is positively driven. Three different states are differentiated:

- "GFx: priority input" has the value "3". The value that is present on "GFx: switch input" has no meaning. The "GFx: output" object is switched on positively driven and has the value "1".
- "GFx: priority input" has the value "2". The value that is present on "GFx: switch input" has no meaning. The "GFx: output" object is switched off positively driven and has the value "0".
- "GFx: priority input" has the value "1" or "0". The "GFx: output" object is not positively driven. The "GFx: switch input" is linked to the status bit of the priority object OR and transferred to the "GFx: output" object.

During a positive drive, changes of the "GFx: switch input" object are saved, even if the current state on the "GFx: output" object does not immediately change through this. If the positive drive is terminated, the "GFx: output" object sends a telegram corresponding to the current value of the "GFx: switch input" object.

Note
The parameters for application "Priority" can be called up via **general parameters**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.3.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.4 Application - Logic gate

Up to ten input values can be linked with each other via the application.

The following communication objects are available:

- "GFx: output"
- "GFx: input x“

All input objects and the output object can take on size 1 bit or 1 byte independent from each other.

The application is used to specify the logic gate the enabled input objects are linked with. At the receipt of new telegrams at the inputs, they are switched according to the selected function. The inputs can also be individually inverted.

The result determined from the inputs is sent via the output object. The default value that is to be sent at a positive result can be adjusted.

Note
The parameters for application "Logic gate" can be called via **general parameters, parameter input x** and **output parameters**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.4.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.4.2 Logical function

Options:	AND
	OR
	XOR
	XNOR
	NAND
	NOR

- AND - NOR:
  - Logic gates, with which communication objects can be linked.

The parameter is used to specify the logic gate the communication objects are to be linked with.

11.6.4.3 Number of input objects

Options:	Setting option from 1 to 10

The parameter is used to set the number of input objects that are to be linked in the logic function.

Note
If the parameter is set on "1", the "logic function" parameter is specified on "NOT".

11.6.4.4 Object type input x

Options:	1 bit
	1 byte

- 1 bit:
  - The input object can take on value "0" or "1".
- 1 byte:
  - The input object can take on value 0 to 255.

The parameter is used to specify the bit size for the input object.

11.6.4.5 Initial value input x

Options:	Initialised with 0
	Initialised with 1

- Initialised with 0:
  - After initial commissioning and after the return of voltage the input has the logical value "0".
- Initialised with 1:
  - After initial commissioning and after the return of voltage the input has the logical value "1".

The parameter is used to specify the value the input is to have after initial commissioning and after the return of voltage. Thus, no undefined states can arise.

11.6.4.6 Logic input x

Options:	Normal
	Inverse

- Normal:
  - The input signal of the channel is not inverted.
- Inverse:
  - The input signal of the channel is inverted.

The parameter is used to invert the input signal of the channel.

Note
For a 1-byte size input object, the "inverse" setting means that only upon receipt of the value "0" will a logical "1" be present on the input. All other values (1 to 255) cause a logical "0" on the input.

11.6.4.7 Object type output

Options:	1 bit
	1 byte

- 1 bit:
  - Object "GFx: output“ consists of a 1-bit value (0/1).
- 1 byte:
  - Object "GFx: output“ consists of a 1-byte value (0 - 255).

Each logic function has an output object. The result determined from the inputs is sent on the bus via the output object.

The parameter is used to specify the bit size for the output object.

11.6.4.8 Send output object

Options:	With each input telegram
	With a change of the output object

- With each input telegram:
  - When a telegram is received via the input object, the communication object always sends the value of the output object on the bus. This also happens if the value of the output object has not changed.
- With a change of the output object:
  - The communication object only sends a telegram when the value of the output object has changed.

The parameter is used to specify whether a telegram is sent via communication object "GFx: output" at each receipt of a telegram or only at a change of the output object.

11.6.4.9 Value of the output object for logic true

Options:	Output is set to 1
	Defined via output default value true

- Output is set on 1:
  - As soon as the logic function is fulfilled, a logical "1" is present on the output. This equally applies when the "Object type output" parameter is set on "1byte".
- Defined via output default value true:
  - The value that is present on the output when the logic has been met, can be set via parameter "Output default value true".

The parameter is used to specify the value of the output object in the logic status "True".

11.6.4.10 Output default value true

Options:	True = 0
	True = 1

- True = 0:
  - When a logic has been met, value "0" is present at communication object "GFx: output".
- True = 1:
  - When a logic has been met, value "1" is present at communication object "GFx: output".

The parameter is used to specify the value that is sent via the 1-bit communication object "GFx: output" when a condition (true) has been met.

Note
The parameter can only be set if the "Object type output" parameter is set on "1 bit" and parameter "Value of the output object for logic true" is set on "Defined via output default value true".

11.6.4.11 Output default value true

Options:	Setting option from 0 to 255

The parameter is used to set the value that is sent via the 1-byte communication object "GFx: output" when a condition (true) has been met.

Note
The parameter can only be set if the "Object type output" parameter is set on "1 byte" and parameter "Value of the output object for logic true" is set on "Defined via output default value true".

11.6.4.12 Value of the output object for logic untrue

Options:	Output is set to 0
	Defined via output default value untrue

- Output is set on 0:
  - As soon as the logic function is fulfilled, a logical "0" is present on the output. This equally applies when the "Object type output" parameter is set on "1 byte".
- Defined via output default value untrue:
  - The value that is present on the output when the logic has been met, can be set via parameter "Output default value untrue".

The parameter is used to specify the value that is sent via object "GFx: output" when a condition (untrue) has not been met.

11.6.4.13 Output default value untrue

Options:	Untrue = 0
	Untrue = 1

- Untrue = 0
  - When a logic has not been met, value "0" is present at communication object "GFx: output".
- Untrue = 1
  - When a logic has not been met, value "1" is present at communication object "GFx: output".

The parameter is used to specify the value that is sent via the 1-bit communication object "GFx: output" when a condition (untrue) has been not been met.

Note
The parameter can only be set if the "Object type output" parameter is set on "1 bit" and parameter "Value of the output object for logic untrue" is set on "Defined via output default value untrue".

11.6.4.14 Output default value untrue

Options:	Setting option from 0 to 255

The parameter is used to set the value that is sent via the 1-byte communication object "GFx: output" when a condition (untrue) has been not been met.

Note
The parameter can only be set if the "Object type output" parameter is set on "1 byte" and parameter "Value of the output object for logic untrue" is set on "Defined via output default value untrue".

11.6.5 Application - Gate

The application allows specific signals to be filtered and the signal flow to be temporarily blocked.

The following communication objects are available:

- "GFx: input“
- "GFx: output"
- "GFx: control input" (1-bit object)

The objects "GFx: input" and "GFx: output" can take on different sizes (1 bit - 4 byte, depending on the object type selected).

The bit sizes of objects "GFx: input" and "GFx: output" can be collectively adjusted for the different applications.

The bit size can be freely assigned with the "Not assigned" setting of the "Object type" parameter. This means that the first internal or external group address or action that is assigned and already connected to an other communication object will specify the size.

The control can occur from "Input to output" or also from "Output to input," provided the control input allows this. Enabling via the control input can take place via an On telegram or an Off telegram.

If, for example, the "Control input" setting is set on "ON telegram," only telegrams from the input are transmitted to the output. The condition is that the control input has received an On telegram.

It is also possible to block signals via the "Filter function" setting. Either "nothing is filtered out" or the signal "on is filtered out" or the signal "off is filtered out". This function is always necessary, for example, when only the On telegram is needed for a sensor and the device does not offer any filter function in its application program.

Note
The parameters for application "Gate" can be called up via **general parameters** and **extended parameters**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.5.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.5.2 Object type

Options:	1-bit switching
	1-bit travel
	1-bit stop/adjust
	2-bit priority
	4-bit relative dimming
	1 byte 0 - 100%
	1 byte 0 - 255
	2-byte float
	2-byte signed
	2-byte unsigned
	3-byte time of day
	3-byte date
	4-byte float
	4-byte signed
	4-byte unsigned
	Not allocated

- 1-bit switching:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/untrue.
- 1-bit travel:
  - The value is sent as 1-bit switching commands, e.g. travel up or down.
- 1-bit stop/adjust:
  - The value is sent as 1-bit switching commands, e.g. travel stop, adjust slats.
- 2-bit priority:
  - The value is sent as 2-bit switching commands with priority.
- 4-bit relative dimming:
  - The value is sent as 4-bit brightness step.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. Any value 0 - 255.
- 2-byte float:
  - The value is sent as floating point value (-671088.6 - 670760.9), e.g. temperature or moisture value.
- 2-byte signed:
  - The value is sent as 2-byte value with a sign, (-32768 - +32767), e.g. time difference or percentage difference.
- 2-byte unsigned:
  - The value is sent as 2-byte value without a sign (0 - 65535), e.g. time or brightness value.

- 3-byte time of day:
  - The value is sent as 3-byte daytime value.
- 3-byte date:
  - The value is sent as 3-byte date value.
- 4-byte float:
  - The value is sent as 4-byte floating point value, physical values, e.g. luminosity, electric power, pressure.
- 4-byte signed:
  - The value is sent as 4-byte value with a sign (-2147483648 - 2147483647), e.g. counting impulse, time difference.
- 4-byte unsigned:
  - The value is sent as 4-byte value without a sign (0 - 4294967295), e.g. counting impulse.
- Not allocated:
  - The bit size can be freely allocated. This means that the first internal or external group address or action that is assigned and already connected to an other communication object will specify the size.

The set option fixes the bit size of the input and output object.

11.6.5.3 Filter function

Options:	Deactivated
	On filter out
	Off filter out

- Deactivated:
  - No telegrams are filtered out.
- On filter out:
  - On telegrams are filtered out.
- Off filter out:
  - Off telegrams are filtered out.

The parameter can be used to filter On or Off telegrams (1 bit) out. The function is used, for example, when only the On telegram is needed and the sensor does not offer any filter function in its application program.

Note
The parameter can only be set if the "Object type" parameter is set on "1-bit switching".

11.6.5.4 Data flow direction

Options:	Input towards the output
	Output towards the input
	In both directions

- Input towards the output:
  - Telegrams are transferred from object "GFx: input" to object "GFx: output".
- Output towards the input:
  - Telegrams are transferred from object "GFx: output" to object "GFx: input".
- In both directions:
  - Telegrams are transferred in both directions.

The parameter is used to specify the direction in which the signal is to be transferred.

11.6.5.5 Enable object

Options:	Deactivated
	Activated

- Deactivated:
  - Object "GFx: control input" is not enabled.
- Activated:
  - Object "GFx: control input" is enabled. The function can be temporarily blocked via object "Sx: control input".

The 1-bit communication object "GFx: control input" can be enabled with this parameter.

Note
If the "Enable object" parameter is activated, the following parameters can be set:
- "Object value enable object"
- "Enable object after return of voltage"
- "Save input signal"

11.6.5.6 Object value enable object

Options:	Normal
	Inverse

- Normal:
  - If an Off telegram is received via the object "GFx: control input", the function "Gate" is blocked. An On telegram deactivates the blockage.
- Inverse:
  - If an On telegram is received via the object "GFx: control input", the function "Gate" is blocked. An Off telegram deactivates the blockage.

The parameter is used to specify whether function "Gate" is blocked temporarily at the receipt of an On or Off telegram.

Note
This parameter can only be set if the "Enable object" parameter is set on "activated".

11.6.5.7 Enable object after return of voltage

Options:	Blocked
	Enabled

- Blocked:
  - The enable object is not activated after bus voltage recovery. The blocking function is deactivated.
- Enabled:
  - If the enable object was activated prior to bus voltage recovery, it will also be activated after bus voltage recovery.

The parameter serves to ensure that a defined value is present on communication object "GFx: control input" after a return of bus voltage.

Note
This parameter can only be set if the "Enable object" parameter is set on "activated".

11.6.5.8 Save input signal

Options:	Deactivated
	Activated

- Deactivated:
  - Input telegrams are not saved during the blocking phase.
- Activated:
  - Input telegrams are saved during the blocking phase.

The parameter is used to specify whether input signals are saved during the blocking phase. The further behaviour depends on the setting of the "Data flow direction" parameter.

For example:

Data flow direction: Input towards the output.

If the setting "activated" has been selected, the output sends its value after the blocking phase if a telegram has been received on the input during the blocking phase.

Note
This parameter can only be set if the "Enable object" parameter is set on "activated".

11.6.6 Application - Staircase lighting

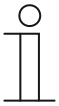
With the application, switching telegrams and value telegrams can be provided with a switch-off delay.

The application has the following communication objects:

- "GFx: input“
- "GFx: input" (1-bit object)
- "GFx: switch-off delay" (2-byte object)
- "GFx: switch-off prewarning time" (2-byte object)
- "GFx: output"

The objects "GFx: input" and "GFx: output" can take on size 1 bit or 1 byte, depending on the object type selected.

Note
The parameters for application "staircase lighting" can be called up via **general parameters** and **extended parameters**.



Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.6.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.6.2 Object type/number

Options:	A 1-bit object for input and output
	Two 1-bit objects for input and output
	Two 1-byte objects for input and output

- A 1-bit object for input and output:
  - When an On telegram is received via the "GFx: input_output" object, an adjustable switch-off delay is started. After expiration of the switch-off delay, the "GFx: input_output" object sends an Off telegram (1 bit).
- Two 1-bit objects for input and output:
  - When a switching telegram (On or Off) is received via the "GFx: input" object, an adjustable switch-off delay is started. At the same time, a telegram with the same value of the telegram received on the input (On or Off) is sent via object "GFx: output". After expiration of the switch-off delay, the "GFx: output" object sends an Off telegram (1 bit).
- Two 1-byte objects for input and output:
  - When a value telegram is received via the "GFx: input" object, an adjustable switch-off delay is started. At the same time, a telegram with the same value of the telegram (1 byte) received on the input is sent via object "GFx: output". After expiration of the switch-off delay, the "GFx: output" object sends a telegram with value "0" (1 byte).

The parameter is used to fix the size and number of the communication objects for the "Staircase lighting" application.

The switch-off delay of the staircase lighting is set via the "Switch-off delay" parameter.

11.6.6.3 Switch-off delay

Options:	Setting option from 00:00:10 to 01:30:00 (hh:mm:ss)

The parameter is used to set the switch-off delay of the staircase lighting. The switch-off delay can be set in steps of one second.

The start of the switch-off delay is dependent on the setting of the "Object type/number" parameter. The parameter "Object type/number" also specifies whether an Off telegram (1 bit) or a telegram with value "0" (1 byte) is sent after the expiry of the switch-off delay.

11.6.6.4 Retriggering

Options:	Deactivated
	Activated

- Deactivated:
  - The set switch-off delay always runs to its end, so that a telegram is always sent via object "GFx: output" after the delay time has expired.
- Activated:
  - The switch-off delay is always restarted when a telegram is received via the "GFx: input" object.

The parameter is used to specify whether the switch-off delay is restarted when a further telegram is received via object "GFx: input". This behaviour is called retriggering.

For example, a retriggering makes sense for a switch-off delay for movement detectors. This always resets the switch-off delay as long as movement is detected.

If telegrams with different values are received during the retriggering phase, only the last value received is always sent via the "GFx: output" object after expiration of the delay time.

11.6.6.5 Switch-off pre-warning

Options:	Deactivated
	Activated

- Deactivated:
  - The staircase lighting goes out without flickering at the end of the switch-off delay.
- Activated:
  - The staircase flickers before the expiry of the switch-off delay.

Before the staircase lighting switches itself off, the end of the illumination period is signalled by means of brief flickering or dimming darker. The user can then keep the light on in time.

The parameter is used to specify whether an additional value is sent via the output object just before the switch-off delay expires.

11.6.6.6 Time for switch-off pre-warning (s)

Options:	Setting option from 1 to 5400

The parameter is used to specify when the staircase lighting by means of flickering or dimming darker is to warn of the end of the switch-off delay. The warning is carried out according to the set time before the expiry of the switch-off delay.

Note
This parameter can only be set if the "switch-off prewarning" parameter is set on "activated".

11.6.6.7 Value for switch-off prewarning (%)

Options:	Setting option from 1 to 100 (%)

The parameter is used to set the value that is sent via object "GFx: output". The value is sent at the time set via parameter "Time for switch-off prewarning".

The set percentage value is sent once and then replaced by the original output value after approximately one second.

Note
This parameter can only be set if the "Object type/number" parameter is set on "Two 1-byte objects for input and output" and parameter "Switch-off prewarning" is set on "activated".

11.6.6.8 Overwrite switch-off delay and switch-off prewarning time during download

Options:	Deactivated
	Activated

- Deactivated:
  - The switch-off delay and switch-off prewarning time will not be overwritten when the device is reprogrammed.
- Activated:
  - The switch-off delay and switch-off prewarning time will be overwritten when the device is reprogrammed.

Telegrams with new times can be received via communication objects "GFx: switch-off delay" and "GFx: switch-off prewarning". The received 2-byte values are written to the memory of the device and are retained even after a power failure.

The parameter is used to specify whether the received storage values are to be retained for a reprogramming of the device or replaced by the values specified in the parameterising software.

11.6.7 Application - Delay

The application can be used to receive telegrams via the "Input" object. The telegrams received are sent out via the "Output" object with a set delay time.

The application has the following communication objects:

- "GFx: input“
- "GFx: output"
- "GFx: delay time" ((2 byte object)

The objects "GFx: input" and "GFx: output" can take on different sizes (1 bit - 4 byte, depending on the object type selected).

The bit sizes of objects "GFx: input" and "GFx: output" can be collectively adjusted for the different applications.

Note
The parameters for application "Delay" can be called up via **general parameters** and **extended parameters**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.7.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.7.2 Object type

Options:	1-bit switching
	1-bit travel
	1-bit stop/adjust
	1 byte 0 - 100%
	1 byte 0 - 255
	2-byte float
	2-byte signed
	2-byte unsigned
	4-byte float
	4-byte signed
	4-byte unsigned

- 1-bit switching:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/untrue.
- 1-bit travel:
  - The value is sent as 1-bit switching commands, e.g. travel up or down.
- 1-bit stop/adjust:
  - The value is sent as 1-bit switching commands, e.g. travel stop, adjust slats.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. Any value 0 - 255.
- 2-byte float:
  - The value is sent as floating point value (-671088.6 - 670760.9), e.g. temperature or moisture value.
- 2-byte signed:
  - The value is sent as 2-byte value with a sign, (-32768 - +32767), e.g. time difference or percentage difference.
- 2-byte unsigned:
  - The value is sent as 2-byte value without a sign (0 - 65535), e.g. time or brightness value.
- 4-byte float:
  - The value is sent as 4-byte floating point value (-4000000 to 4000000), physical values, e.g. luminosity, electric power, pressure.
- 4-byte signed:
  - The value is sent as 4-byte value with a sign (-2147483648 - 2147483647), e.g. counting impulse, time difference.
- 4-byte unsigned:
  - The value is sent as 4-byte value without a sign (0 - 4294967295), e.g. counting impulse.

The set option fixes the bit size of the input and output object.

11.6.7.3 Delay time

Options:	Setting option from 00:00:01.000 to 01:00:00:000 (hh:mm:ss)

The parameter is used to set the delay with which the telegrams received via object "GFx: input" are sent via object "GFx: output".

The delay time can be set in steps of one millisecond.

11.6.7.4 Retriggering

Options:	Deactivated
	Activated

- Deactivated:
  - The set switch-off delay always runs to its end, so that a telegram is always sent via object "GFx: output" after the delay time has expired.
- Activated:
  - The switch-off delay is always restarted when a telegram is received via the "GFx: input" object.

The parameter is used to specify whether the switch-off delay is restarted when a further telegram is received via object "GFx: input". This behaviour is called retriggering.

For example, a retriggering makes sense for a switch-off delay for movement detectors. This always resets the switch-off delay as long as movement is detected.

If telegrams with different values are received during the retriggering phase, only the last value received is always sent via the "GFx: output" object after expiration of the delay time.

11.6.7.5 Filter active

Options:	Deactivated
	Activated

- Deactivated:
  - Filter is not active.
- Activated:
  - Filter is active. Filter function and filter value can be set.

The parameter is used to specify whether a filter is used for the delay of telegrams.

11.6.7.6 Filter function

Options:	Filter value is delayed, other values are sent directly
	Filter value is delayed, other values are suppressed
	Filter value is sent directly, other values are delayed
	Filter value is suppressed, other values are delayed

- Filter value is delayed, other values are sent directly.
  - Only the filter value is sent delayed All other values are sent directly.
- Filter value is delayed, other values are suppressed.
  - Only the filter value is sent delayed. All other values are blocked.
- Filter value is sent direct, others are sent delayed.
  - Only the filter value is sent direct. All other values are sent delayed.
- Filter value is suppressed, other are delayed.
  - Only the filter value is blocked. All other values are sent delayed.

The parameter can be used to specify a condition for the sending of filter values compared to all other values.

Note
The parameter is only adjustable if the "Filter active" parameter is set to "Activated".

11.6.7.7 Filter value

The possible options and setting limits depend on parameter "Object type".

Options for selection "1 bit switching":

Options:	Off
	One

Options for selection "1 bit moving" and "1-bit stop/adjust":

Options:	Up
	Down

Options for selection "1 byte 0-100%":

Options:	Setting option from 0 to 100 (%)

Options for selection "1 byte 0-255":

Options:	Setting option from 0 to 255

Options for selection "2-byte float":

Options:	Setting option from -671088.64 to 670760.96

Options for selection "2-byte signed":

Options:	Setting option from -32768 to +32767

Options for selection "2-byte unsigned":

Options:	Setting option from 0 to 65535

Options for selection "4-byte float":

Options:	Setting option from -4000000 to 4000000

Options for selection "4-byte signed":

Options:	Setting option from -2147483648 to 2147483647

Options for selection "4-byte unsigned":

Options:	Setting option from 0 to 4294967295

The value that is to be specifically observed is specified via the parameter. The bit size depends on parameter "Object type".

The connected "Filter function" parameter fixes a condition for the sending of the filter value.

Note
The parameter is only adjustable if the "Filter active" parameter is set to "Activated".

11.6.7.8 Overwrite delay time during download

Options:	Deactivated
	Activated

- Deactivated:
  - The delay time will not be overwritten when the device is reprogrammed.
- Activated:
  - The delay time will be overwritten when the device is reprogrammed.

A telegram with a new delay time (s) can be received via the 2-byte communication object "GFx: delay time". The received 2-byte value is written to the memory of the device and is retained even after a power failure.

The parameter is used to specify whether the received storage value is to be retained for a reprogramming of the device or replaced by the values specified in the parameterising software.

11.6.8 Application - Min/max value transducer

Up to eight input values can be compared with each other via the application.

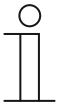
The following communication objects are available:

- "GFx: output"
- "GFx: input x“

The objects "GFx: input x" and "GFx: output" can take on different sizes (1 byte - 4 byte, depending on the object type selected).

The bit sizes of objects "GFx: input x" and "GFx: output" can be collectively adjusted for the different applications.

The application can send either the largest input value, the smallest input value or the average of all input values via the output object. The values are sent either at each input assignment or when the output object is changed.



Note
The parameters for application "Min/max value transducer" can be called up via **general parameters**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.8.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.8.2 Object type

Options:	1 byte 0 - 100%
	1 byte 0 - 255
	2-byte float
	2-byte signed
	2-byte unsigned
	4-byte float
	4-byte signed
	4-byte unsigned

- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. Any value 0 - 255.
- 2-byte float:
  - The value is sent as floating point value (-671088.6 - 670760.9), e.g. temperature or moisture value.
- 2-byte signed:
  - The value is sent as 2-byte value with a sign, (-32768 - +32767), e.g. time difference or percentage difference.
- 2-byte unsigned:
  - The value is sent as 2-byte value without a sign (0 - 65535), e.g. time or brightness value.
- 4-byte float:
  - The value is sent as 4-byte floating point value, physical values, e.g. luminosity, electric power, pressure.
- 4-byte signed:
  - The value is sent as 4-byte value with a sign (-2147483648 - 2147483647), e.g. counting impulse, time difference.
- 4-byte unsigned:
  - The value is sent as 4-byte value without a sign (0 - 4294967295), e.g. counting impulse.

The set option fixes the bit size of the input and output object.

11.6.8.3 Number of input objects

Options:	Setting option from 1 to 8

The parameter is used to set the number of input telegrams to be compared with each other.

11.6.8.4 Output sends

Options:	For every assignment of the inputs
	With a change of the output object

- For every assignment of the inputs:
  - When a telegram is received on one of the input objects, a telegram is always sent via the output object.
- With a change of the output object:
  - An output telegram is only sent when the value of the output object changes.

The parameter is used to specify the conditions under which a telegram is sent.

For the setting "For every assignment of inputs" an output telegram is sent at every receipt of a telegram on one of the inputs. In this case, also an output telegram is sent if the value of the output does not change.

11.6.8.5 Output object

Options:	Adopts the largest value of the inputs
	Adopts the smallest value of the inputs
	Adopts the average value of the inputs

- Adopts the largest value of the inputs:
  - The largest value of all input telegrams is sent via the output object.
- Adopts the smallest value of the inputs:
  - The smallest value of all input telegrams is sent via the output object.
- Adopts the average value of the inputs:
  - The average value of the input telegrams is sent via the output object.

The "Min/max value transducer" application compares the values that are present on the input objects.

The parameter is used to specify whether the largest, smallest or average of all input values is sent. If the average value is sent, the application calculates the arithmetic mean of the inputs. Decimal points are rounded up or down.

For example:

- Object type: "2-byte signed“, 2 input objects
- Input 1: value "4"
- Input 2: value "5"

(Input 1 + input 2) / 2 = arithmetic mean; (4 + 5) / 2 = 4.5

Sent average value: 5

11.6.9 Application - Light scene actuator

The application is used to create up to eight scenes and eight actuator groups.

The following communication objects are available:

- "GFx: scene call-up"
- "GFx: actuator group x"

The input object "Scene call-up" has the size 1 byte. The output objects can take on different sizes (1 bit - 4 byte, depending on the object type selected).

The application is used to call up scenes stored in the device. This takes place via the receipt of the scene number on object "Scene call-up".

For triggering different actuators, the size of objects "GFx: actuator group x" can be set via parameter "Object type actuator group".

The user has the option of saving the scenes. A corresponding save telegram must be received for this.

Note
The parameters for the "Light scene actuator" application can be called up via **general parameters, configuration of actuator objects** and **configuration of scene x**.

Note
The number of the object (GF1 - GFx) depends on the channel used.

11.6.9.1 Channel name

Entry:	<Name>

The parameter can be used to name the selected channel. The preset name "Channel" can be replaced with any arbitrary name. The length of the name is limited to 30 characters.

11.6.9.2 Number of scenes

Options:	Setting option from 1 to 8

The parameter is used to configure up to eight scenes for the light scene actuator.

11.6.9.3 Number of actuator groups

Options:	Setting option from 1 to 8

The parameter is used to configure up to eight actuator groups for the light scene actuator.

At a call up of a scene, telegrams are sent consecutively via communication object "GFx: actuator group x". If, for example, four lamp groups, a blind and an absolute temperature value are to be sent at the call-up of a scene, the parameter must be set on "6" actuator groups.

The bit size of communication objects "GFx: actuator group x" is set via parameter "Object type actuator group x".

11.6.9.4 Duration of telegram delay

Options:	Setting option from 00.100 to 10.000 (ss.fff)

At the call up of a scene, telegrams are sent consecutively via communication objects "GFx: actuator group x". The sequence is strictly specified. First the telegram of actuator group A is sent out, then the telegram of actuator group B, etc.

The parameter is used to set the delay time between the individual telegrams.

11.6.9.5 Overwrite scenes at download

Options:	Deactivated
	Activated

- Deactivated:
  - The scene values saved by the user remain in the device.
- Activated:
  - When reprogramming the device, the values saved by the user are overwritten with the preset values in the parameterisation software.

A scene storage can be triggered with a long press of the button on the device. The communication objects "GFx: actuator groups x" send read requests to the connected actuators. If the L-flag is set for the objects of the connected actuators, the actuators send an answer telegram to the device with their current values.

If the parameter is activated, the current scene values are saved and at the same time overwrite the previous values.

11.6.9.6 Object type actuator group x

Options:	Number of light scene
	1-bit switching
	1-bit blind
	1 byte 0 - 100%
	Temperature

- 1-bit switching:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/untrue.
- 1-bit blind:
  - The value is sent as 1-bit switching commands, e.g. travel up or down.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). (0 = 0%, 255 = 100%)
- Temperature:
  - The value is sent as 2-byte floating point value (-671088.6 - 670760.9).

The parameter is used to set the bit size of communication object "GFx: actuator group x" for different applications.

11.6.9.7 Scene number

Options:	Setting option from 1 to 64

The parameter is used to specify which light scene is to be started.

11.6.9.8 Scene can be saved

Options:	Deactivated
	Activated

- Deactivated:
  - Stored scene values that are sent at a scene call-up via different actuator objects, can not be changed and overwritten by the user.
- Activated:
  - Current scene values of actuator objects can be overwritten and stored in the device by the user.

The parameter is used to specify whether the user can trigger a scene storage. The communication objects "GFx: actuator groups x" in this case send read requests to the connected actuators. Provided that the L-flag is set for the communication objects of the connected actuators, these will send their current values to the device via an answer telegram. The values are stored in the memory and overwrite the previous values. These are also not lost in the event of a power failure.

11.6.9.9 Actuator group x

Options:	Deactivated
	Activated

- Deactivated:
  - The value of actuator group x is not sent at the call-up of the scene.
- Activated:
  - The value of actuator group x is sent at the call-up of the scene.

The parameter is used to specify whether a telegram of actuator group x is sent at the call-up of the light scene.

The possible options and setting limits depend on parameter "Object type actuator group x".

11.6.9.10 Number of light scene

Options:	Setting option from 1 to 64

Setting option, if parameter "Object type actuator group x" is set on "Light scene number".

11.6.9.11 Value

Options:	Off
	One

Adjustable options, when parameter "Object type actuator group x" is set on "1-bit switching".

11.6.9.12 Value

Options:	Up
	Down

Adjustable options, when parameter "Object type actuator group x" is set on "1-bit blind".

11.6.9.13 Value (%)

Options:	Setting option from 0 to 100 (%)

Setting option, if parameter "Object type actuator group x" is set on "1 byte 0-100%".

11.6.9.14 Temperature

Options:	Setting option from -33.5 to 93.5

Setting option, if parameter "Object type actuator group x" is set on "Temperature".

12 Notes

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