

## ClimaECO sensors

### Busch-Installationsbus® KNX

SBS/Ux.0.11-xx Room temperature controller with xgang operating function

SBR/Ux.0.11-xx Room temperature controller with xgang operating function

SBC/Ux.0.11-xx Room temperature controller with CO2/moisture sensor and 6gang operating function

SB/Ux.0.11-xx Control element xgang



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## 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.

Busch-Jaeger 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 Busch-Jaeger or visit our Internet site at:

[www.BUSCH-JAEGER.de](http://www.BUSCH-JAEGER.de)

## 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.

Busch-Jaeger 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.

## 2.2 Intended use

The devices with CO<sub>2</sub>/moisture sensor serve for determining CO<sub>2</sub> relative humidity and temperature (also devices without RTC). The devices also serve for controlling the room temperature (only devices with RTC).

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

Extensive functions are available for the control elements (also devices without RTC). The range of applications is listed in Chapter 11 “Description of application and parameters“ on page 63 (in languages of the countries DE, EN, ES, FR, IT, NL, PL and RU).

## 2.3 Improper use

Each use not listed in Chapter 2.2 “Intended use“ on page 19 is deemed improper use and can lead to personal injury and damage to property.

Busch-Jaeger 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
- The use in bathroom areas
- Outdoor use
- The control of the device serves for monitoring and regulating the quality of the air. It must not be used for safety-related tasks.

**2.4 Target group / Qualifications of personnel**

**2.4.1 Operation**

No special qualifications are needed to operate the device.

**2.4.2 Installation, commissioning and maintenance**

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

## 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! - 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 surface-mounted and 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.
- Depending on the model, the device has an internal temperature sensor / CO<sub>2</sub> sensor / moisture meter for measuring the values 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.
- Depending on the model, the sensors are integrated in the device.

#### 4.1 Device versions

The ClimaECO sensors are available in the following models:

- 10gang with display, with/without CO2 and moisture sensor
- 6gang with display, with/without CO2 and moisture sensor
- Control element 12gang
- Control element 8gang

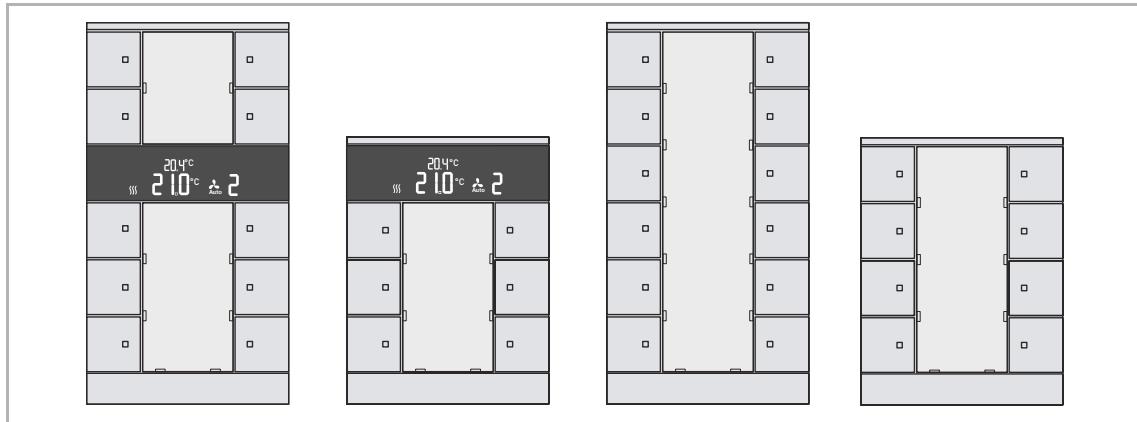


Fig. 1: Models of control elements (examples)

Room temperature controller 10gang, with display

Room temperature controller 6gang, with display

Control element 12gang

Control element 8gang

### 4.2 Device overview

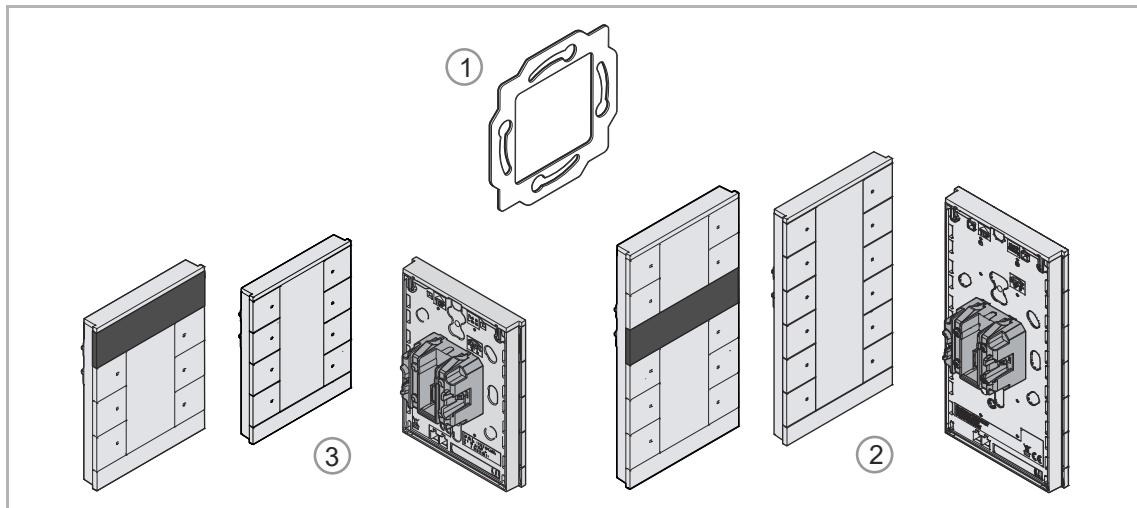


Fig. 2: Overview of devices

- [1] Support ring
- [2] Control element 12gang/RTC with control element 10gang (firmly installed unit), with/without CO2 and humidity sensor
- [3] Control element 8gang/RTC with control element 6gang (firmly installed unit), with/without CO2 and humidity sensor

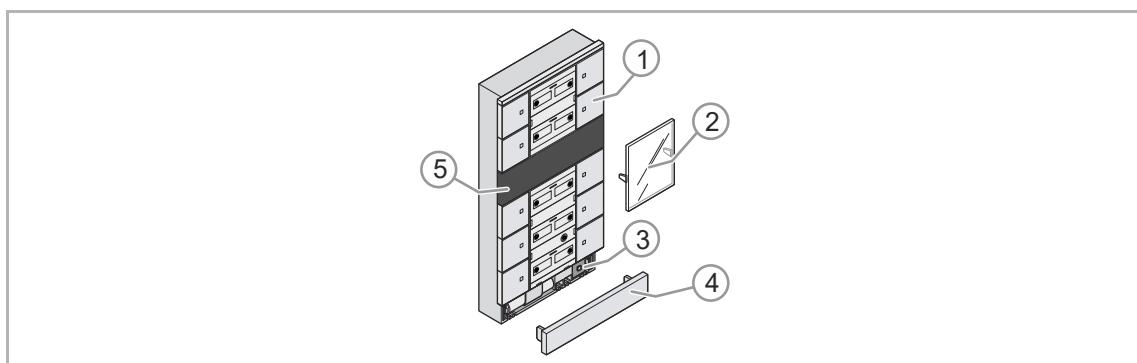


Abb. 3: Overview of function elements

- [1] Control buttons
- [2] Cover/labelling field
- [3] Programming button
- [4] End strip
- [5] Display

## Display (only RTC devices)

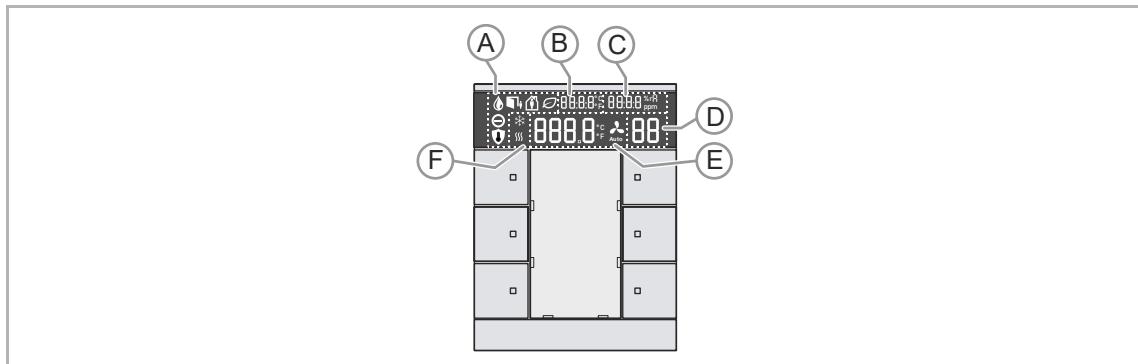


Fig. 4: Overview of display

[A]		Icons of the room temperature control Building protection Local operation is blocked Dew point alarm Standby mode ECO mode
[B]		Actual temperature
[C]		Relative humidity / CO2
[D]		Fan status / fan speed level / fan speed
[E]		Temperature setpoint
[F]		Heating or cooling status

Table 1: Display icons

## Removal protection (optional)

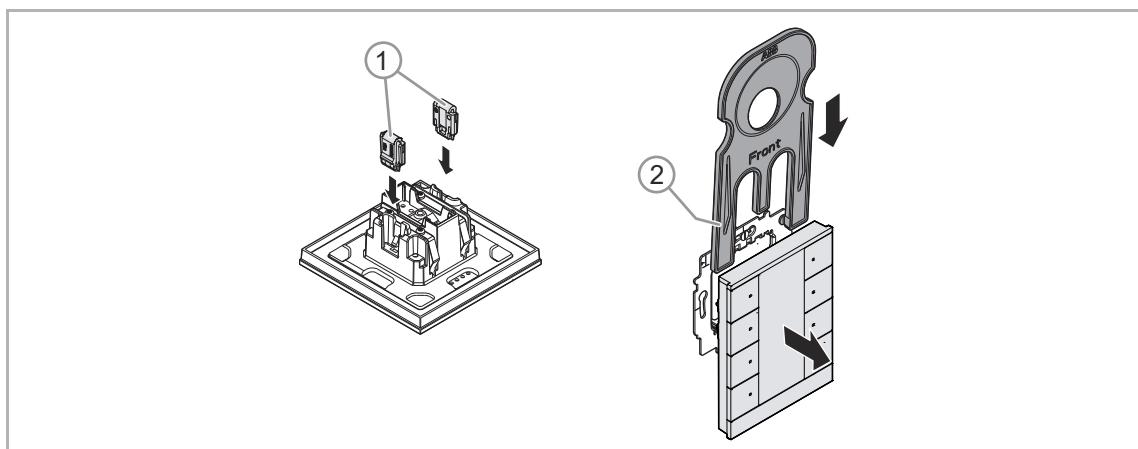


Fig. 5: Removal protection

- [1] Clamps of removal protection {1}
- [2] Removal tool [2]

### 4.3 Control elements

The control element is available in models 6-, 8-, 10- and 12gang.

- Various functions can be implemented via the ETS commissioning software. The functions depend on the parameters selected via the respective software application.

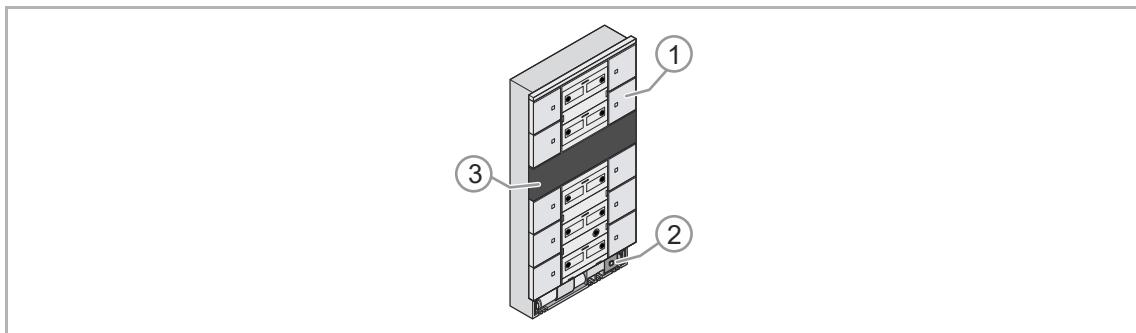


Fig. 6: Models of control elements (examples)

- [1] Buttons
- [2] Programming button
- [3] Display

#### 4.4 Functions

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

Special features	Function (only with devices with display and integrated room temperature controller)
<ul style="list-style-type: none"> <li>– Freely configurable multifunction control element</li> <li>– Labelling field</li> <li>– Support of the KNX functions with innovative colour concept</li> <li>– Integrated temperature sensor (only with devices with display and integrated room temperature controller)</li> <li>– For the activation of heating, ventilation and fan coil actuators (only for devices with display and integrated room temperature controller)</li> <li>– Master/slave mode</li> <li>– The fans speed level can be switched manually or in automatic mode (only for devices with display and integrated room temperature controller)</li> <li>– Contribution to room heating energy efficiency: 1.0%</li> </ul>	<ul style="list-style-type: none"> <li>– Room temperature controller</li> <li>– Push-button function (switching/dimming/blind/value transmission/light scenes/fan function)</li> <li>– With actual value temperature display (only for devices with display)</li> <li>– With SET value temperature display (only for devices with display)</li> <li>– Integrated KNX bus coupler.</li> <li>– Display of operating mode, temperature, fan speed level, moisture value (only for devices with display (only Room temperature controller with CO2/moisture sensor and 6gang operating function), CO2 value (only Room temperature controller with CO2/moisture sensor and 6gang operating function), time or date via LCD.</li> <li>– CO2-/moisture sensor (only Room temperature controller with CO2/moisture sensor and 6gang operating function)</li> </ul>

Table 2: Overview of functions

#### 4.4.1 Support rings

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

Country-specific support rings are for example:

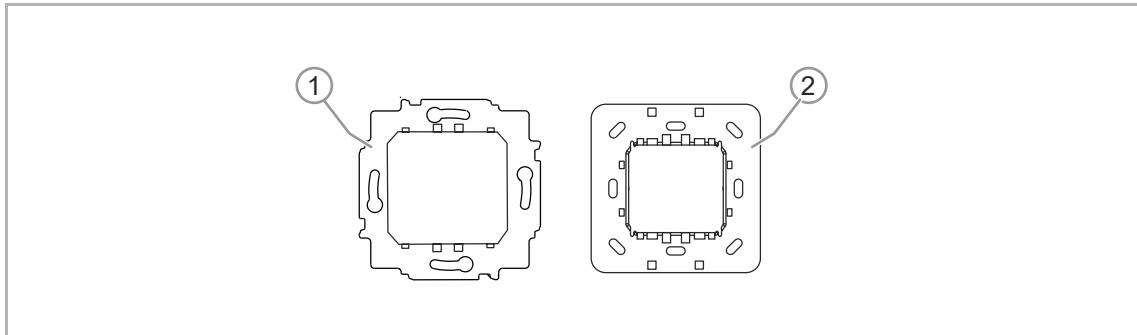


Fig. 7: Country-specific support rings

- [1] VDE Germany
- [2] Switzerland / British standard (BS)
  - (The support ring for Switzerland is supplied without earth terminal)
  - (The support ring is enclosed with the ABB version)

#### 4.5 Scope of supply

Included in the scope of delivery are:

- Support ring  
(ABB version: 2 support rings, 2 screws)
- Flush-mounted insert with control element (firmly installed unit)



##### Notice

ABB version:

The scope of delivery also includes two M4 screws, which serve for fixing the Chinese support ring.



##### Notice

- Surface-mounted housings/frames are not included in the scope of delivery and must be purchased separately!
- Removal protection and removal tool are not included in the scope of delivery and must be purchased separately!



##### Notice

- For information about the versions of the device, see chapter “Device versions“ on page 25.
- For information about the removal protection, see chapter “Removal protection (optional)“ on page 38.

## 5 Technical data

### 5.1 Technical data

Designation	Value
Power supply:	24 V DC (via the bus line);
Bus subscribers ClimaECO sensors:	
– Without CO <sub>2</sub> sensor:	1 (12 mA)
– With CO <sub>2</sub> sensor:	2 (24 mA)
Connection	
– Bus connection terminal:	0.4 - 0.8 mm
– Cable type:	J-Y(St)Y, 2 x 2 x 0.8 mm
– Wire stripping:	6 - 7 mm
Power consumption	
– Devices without CO <sub>2</sub> :	24V / 12 mA (FanIn1)
– Devices with CO <sub>2</sub> :	24V / 24 mA (FanIn2)
Parameter setting:	Parameters are set using the ETS Tool Software.
Ambient temperature:	-5°C - +45°C
Storage temperature:	-20°C - +70°C
Measuring ranges:	
– Carbon dioxide	390 ppm to 10000 ppm
– Relative humidity	0 % - 100 %
– Temperature	0°C - 35°C

Table 3: Technical data

## 5.2 Dimensional drawings

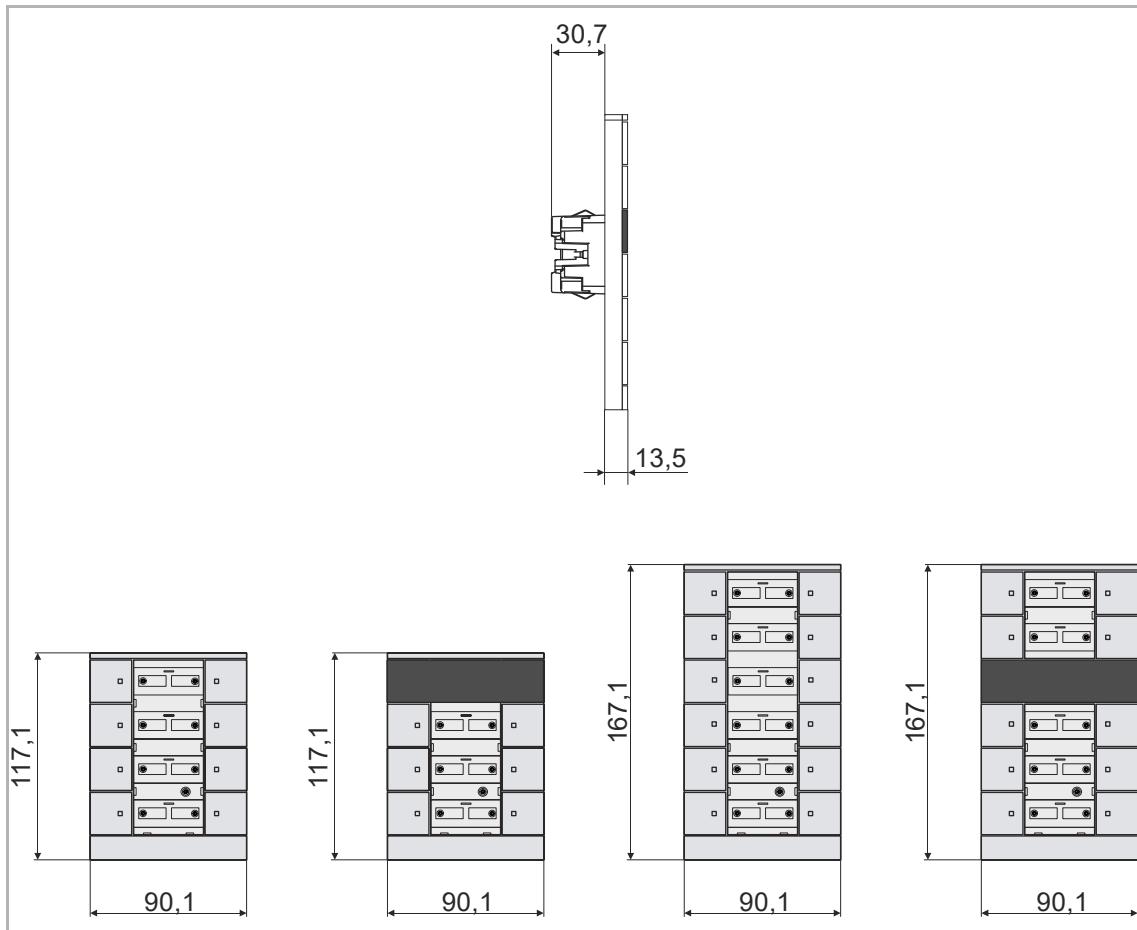


Fig. 8: Dimensions (all dimensions are in mm)

## 5.3 Factory settings

## 6 Connection, installation / mounting



### **Danger - Electric voltage!**

Risk of death due to electrical voltage of 100 ... 240 V during short-circuit in the low-voltage conduit.

- Low-voltage and 100 ... 240 V conduits must not be installed together in a flush-mounted box!

### 6.1 Requirements for the electrician



### **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.

## 6.2 Installation site

For proper commissioning please observe the following points:

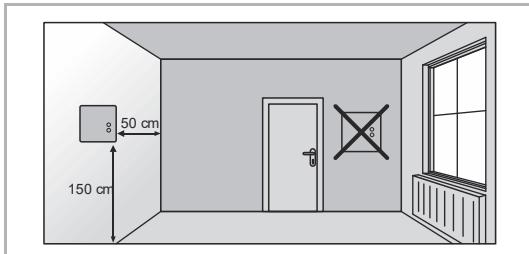


Fig. 9: Installation site - Distance

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

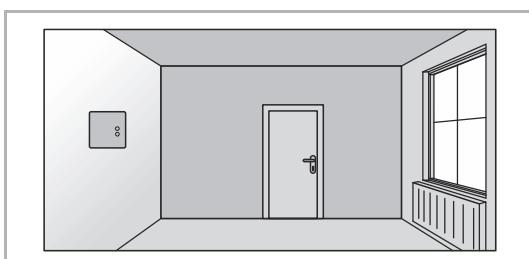


Fig. 10: Installation site – Position of radiator

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

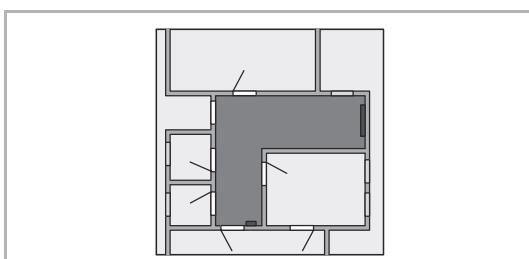


Fig. 11: Installation site - Room architecture

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

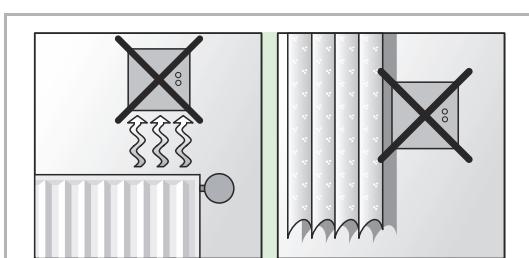


Fig. 12: Installation site – Position of RTC

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

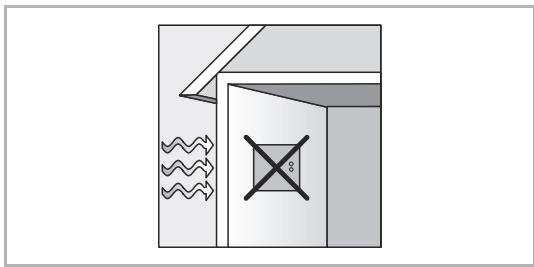


Fig. 13: Installation site - Exterior wall

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

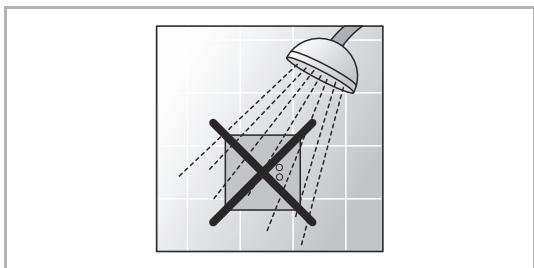


Fig. 14: Installation site – Wetting with fluids

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

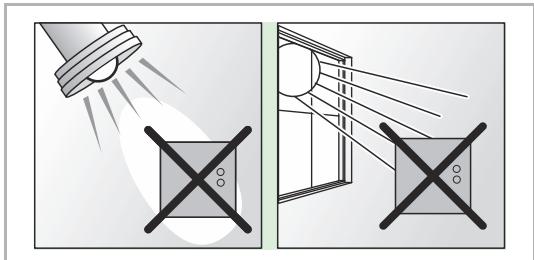


Fig. 15: Installation site – Direct sunlight

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

### 6.3 Mounting / dismantling



#### **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.



#### **Attention! - Risk of damaging the device**

Risk of malfunction due to construction dust

- On devices with CO2 sensor the installation area must be carefully cleaned from construction dust and other contamination before installing the sensor, to guarantee faultless function.



#### **Attention! - Risk of damaging the device**

Risk of malfunction!

To guarantee faultless function:

- The installation must not block the ventilation slots.
- An adequate distance to heat source must be ensured.

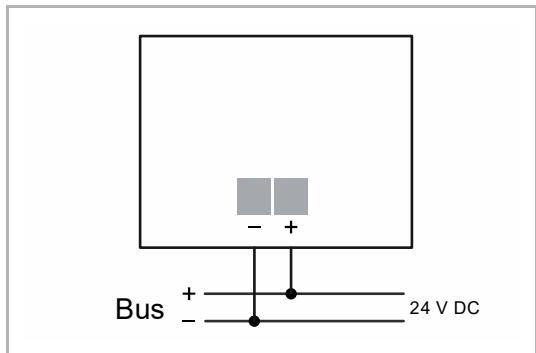


#### **Attention!**

Risk of faulty measurements!

- Install devices with CO2 sensors only in wind-proof flush-mounted boxes to prevent faulty measurements.

#### 6.4 Electrical connection



Carry out the electrical connection according to the circuit diagram.

Fig. 16: Connection of bus coupler

## 6.5 Mounting

### 6.5.1 Flush-mounted installation

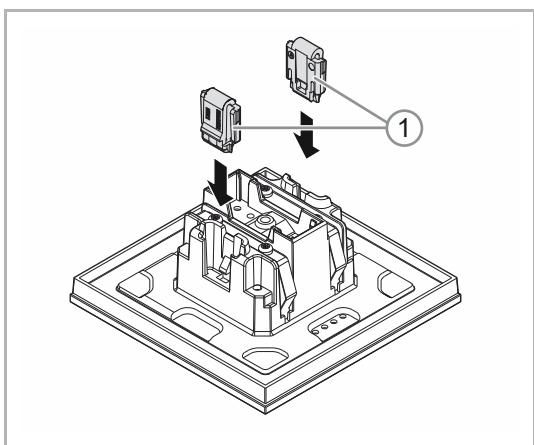
#### 6.5.1.1 Removal protection (optional)



##### Notice

- After mounting with removal protection, dismantling, see chapter “Dismantling with the removal protection tool” on page 42, is then only possible with the removal tool!
- The removal protection is not a component part of the device and is to be ordered separately.

Carry out the following step for the optimum installation of the removal protection:



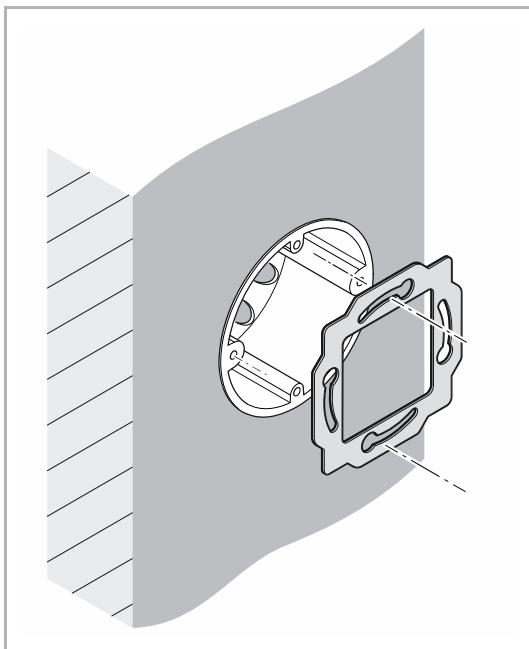
##### Option

1. Installing the removal protection [1].
  - Push the removal protection into position by hand.

Fig. 17: Installation of the removal protection

### 6.5.1.2 Mounting/installation in flush-mounted installation box

To install the device, perform the following steps:



1. Installing the support ring.

Fig. 18: Installation of the support ring



#### Notice

ABB version:

The scope of delivery also includes two M4 screws, which serve for fixing the Chinese support ring.

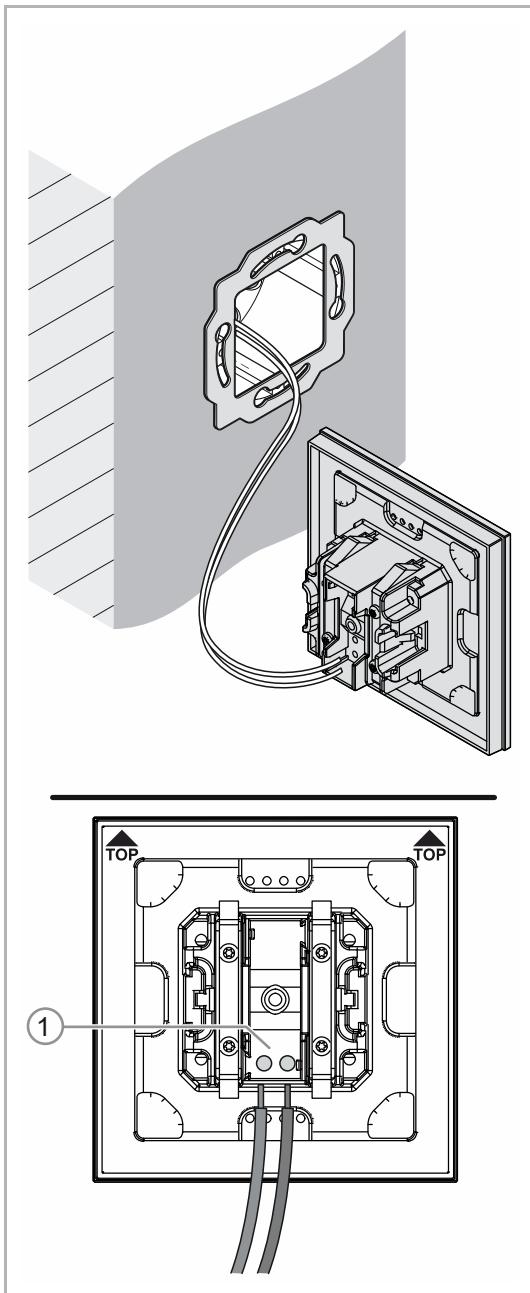


Fig. 19: Connection of the bus line

2. Pull the bus line out of the flush-mounted box and connect the line to the bus connection terminal [1], see chapter "Electrical connection" on page 37.
  - Check that the polarity is correct!

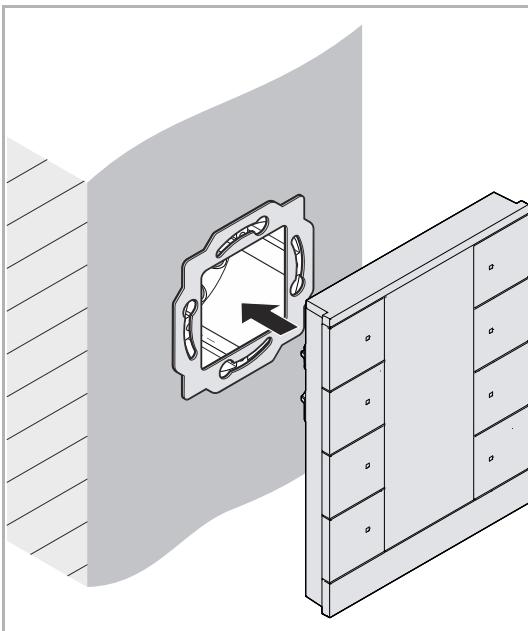


Fig. 20: Mounting devices

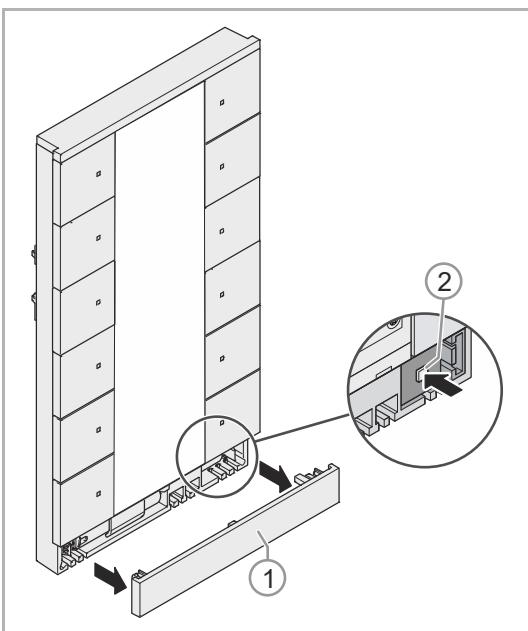


Fig. 21: Programming button

### 3. Installing the device.

- Snap the device into the support ring by hand.

### 4. To commission the device, see chapter "Commissioning" on page 49.

- Programming is carried out via the programming button [2] on the front of the device.
- Pull off the bottom end strip [1]
- Press the programming button [2]
  - All LEDs light up red as long as the device is in programming mode.
  - On devices with display, "Prog" appears additionally in the display in red.
  - Reinsert the end strip [1] after programming has been completed.

The device is now mounted.

## 6.5.2 Dismantling

### 6.5.2.1 Dismantling with the removal protection tool



#### Notice

After mounting with removal protection, see chapter "Removal protection (optional)" on page 38, dismantling is then only possible with the removal tool!

If installed, carry out the following step to dismantle the removal protection:

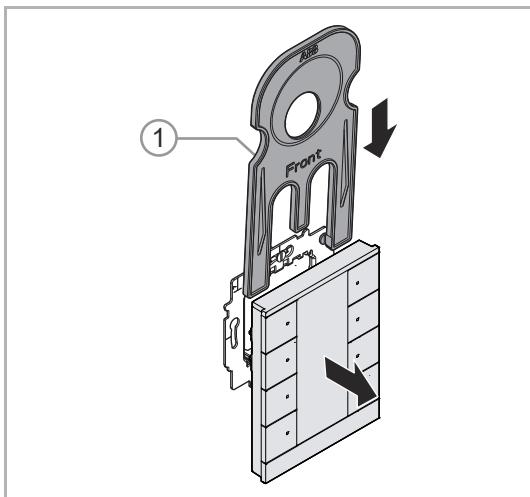


Fig. 22: Dismantling the removal tool

1. Dismantling the device with the removal protection tool [1].
  - Guide the removal protection tool down behind the the device.
  - Remove the device.

## 6.5.3 Surface-mounted installation

### 6.5.3.1 Mounting with surface-mounted mounting frame



#### Notice

Surface-mounted housings/frames are not included in the scope of delivery and must be purchased separately!

#### Preparatory work:

For the installation on a surface-mounted frame, the fastening screw must be made accessible on the operating section on the front of the device.

- Pull off the bottom end strip.
- Remove the cover of the labelling field.

For additional information, please see chapter "Labelling inlay"

#### Unscrew the flush-mounted insert of the device

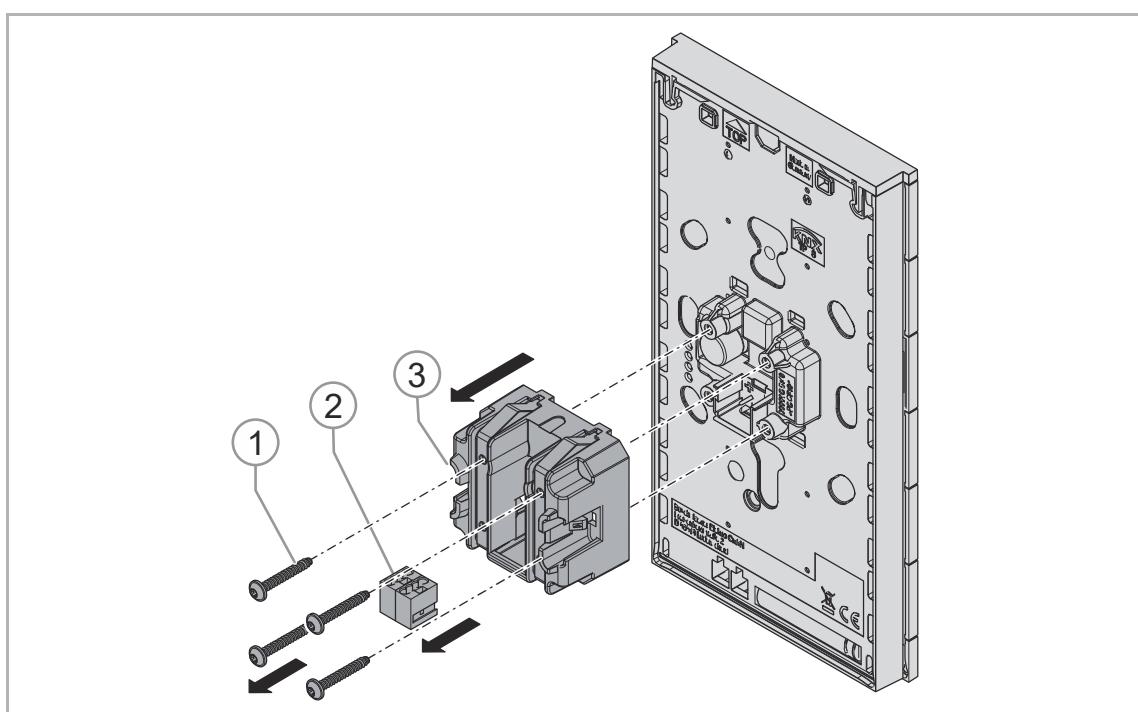


Fig. 23: Preparing the operating section

1. Pull off the KNX terminal [2]
2. Screw out the screws (Torx T8 [1]
3. Remove the flush-mounted insert [3]

### Bus cable guide of surface-mounted frame

For an alternative cable guide, via the top or bottom side of the frame, a 6 mm borehole can be provided.



#### Notice

A centring mark is available on the top and bottom side of the frame for an alternative cable guide.

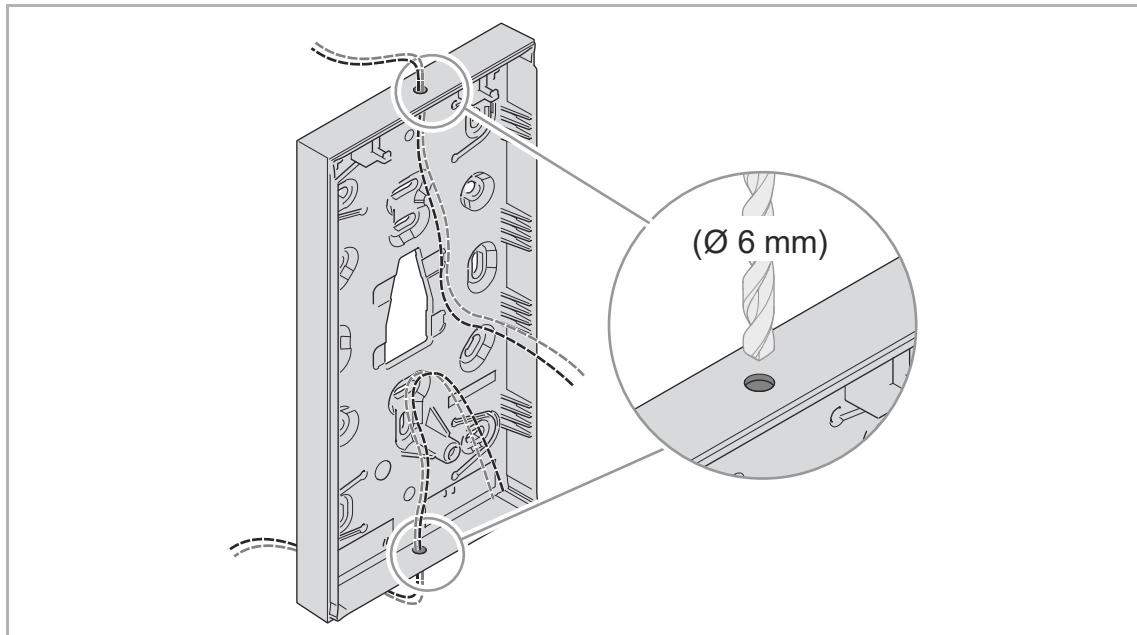


Fig. 24: Alternative bus cable guide

## Installing the surface-mounted frame



### Notice

The surface-mounted frame can also be screwed to the wall via the flush-mounted box via the different housing recesses.

- Do not use countersunk head screws for mounting!



### Attention!

Risk of faulty measurements!

- Install devices with CO<sub>2</sub> sensors only in wind-proof flush-mounted boxes to prevent faulty measurements.

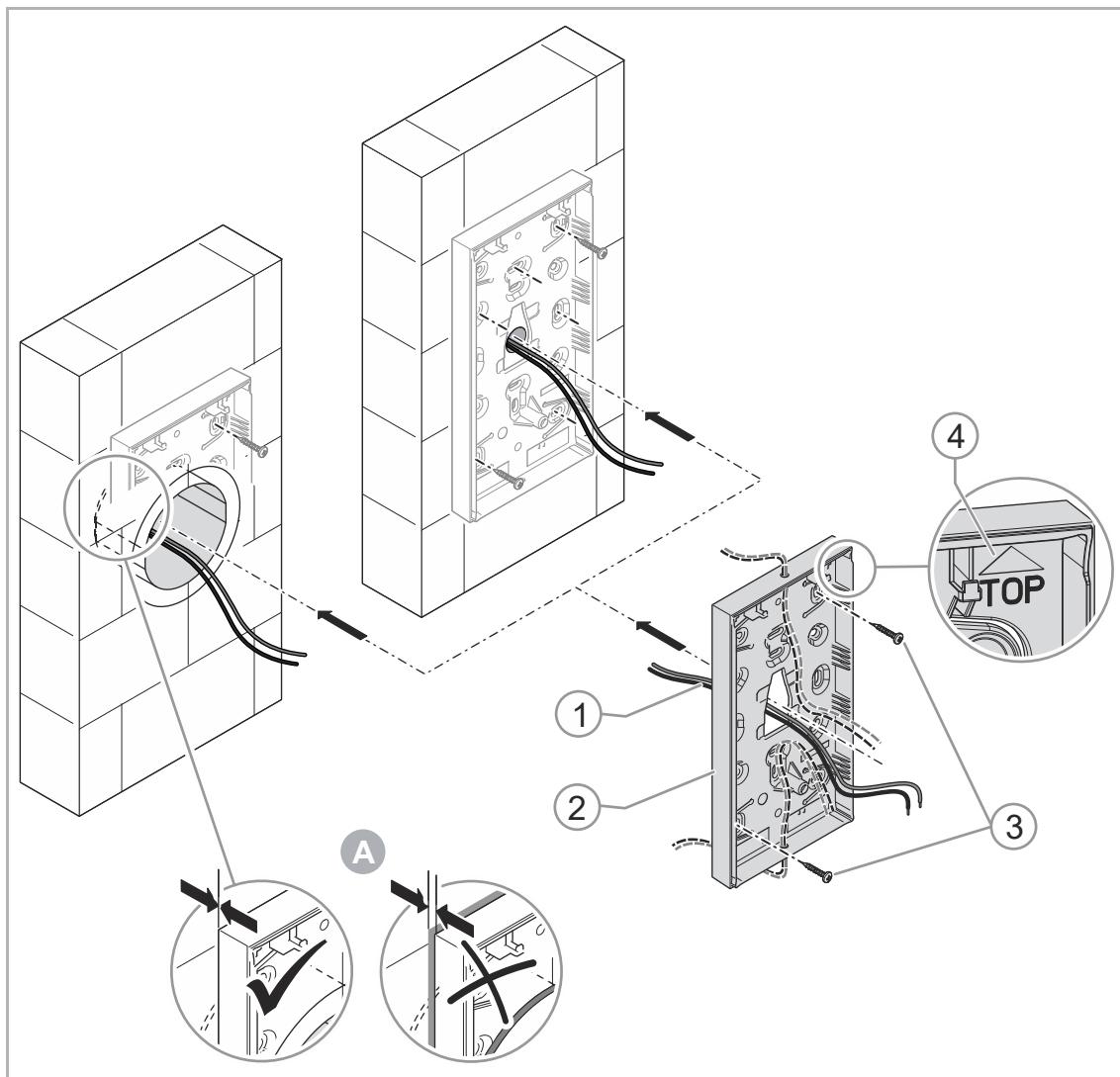


Fig. 25: Installing the surface-mounted frame

4. Guide the bus cable [1] through the opening provided from back.



### Notice

- Alternatively, the bus cable can be routed through a borehole on the top or bottom side of the frame.

5. Fix the surface-mounted frame [2] to the wall with the suitable screws [3] and with the housing recesses suitable for the installation situation.



### Notice

- The mark [4] on the surface-mounted frame "Top" must always point upwards.
- Do not use countersunk head screws for mounting the surface-mounted frame.
- [A] A flush-mounted box must not project from the wall, otherwise the device cannot be mounted flush on the wall.

Mounting control elements

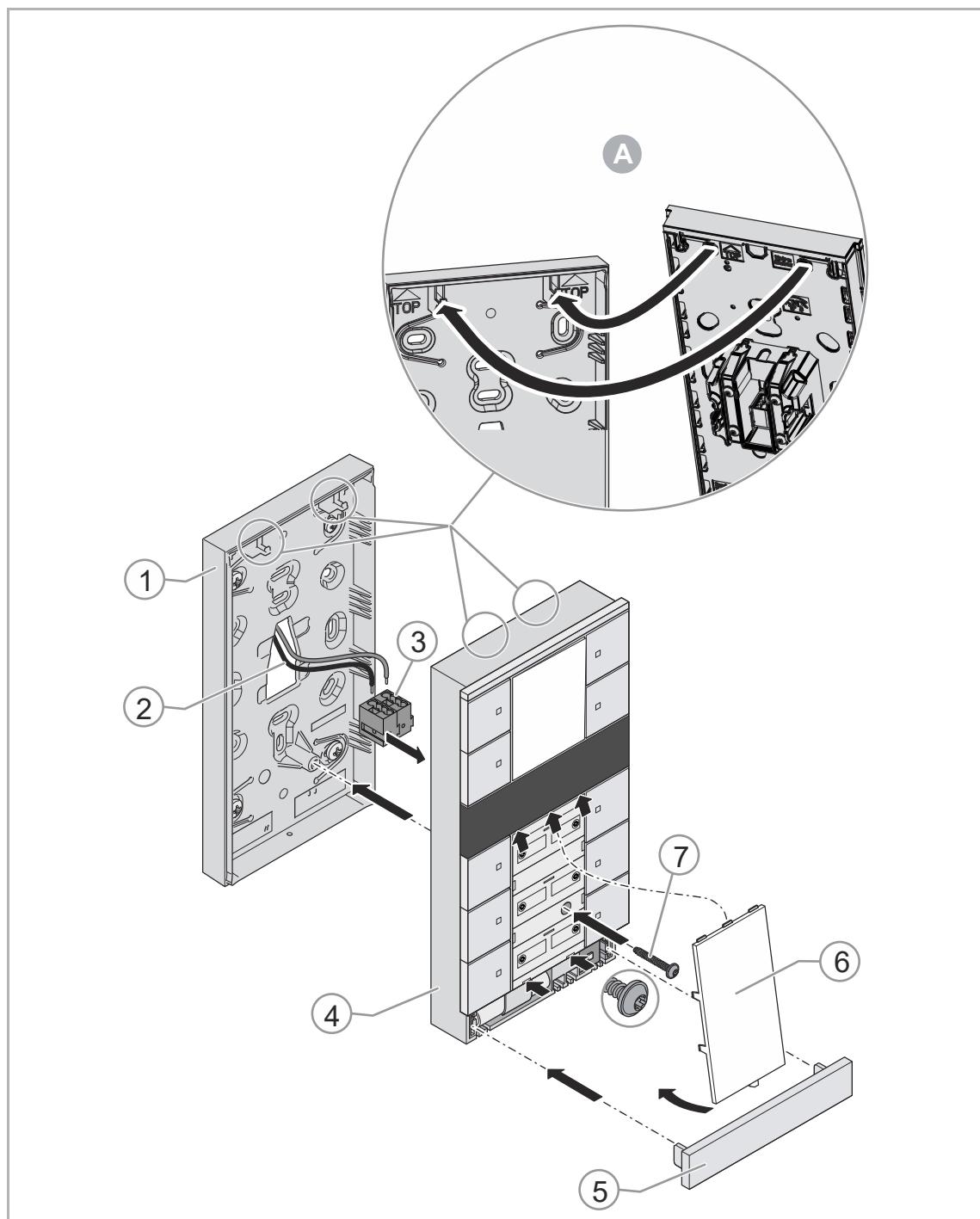


Fig. 26: Mounting control elements

6. Connect the bus cable [2] with the bus terminal [3] and plug it onto the control element [4].
7. Hang the control element [4] into the surface-mounted frame [1] from the top. Both openings for hanging must be placed onto the two hooks [A].
8. Screw the control element [4] with the enclosed screw [7] (Torx 10) onto the surface-mounted frame [1].
9. Insert the labelling inlay [6].
10. Position and snap in the end strip [5].

### 6.5.4 Labelling inlay

Depending on the device model, carry out the following steps to change the labelling inlay.

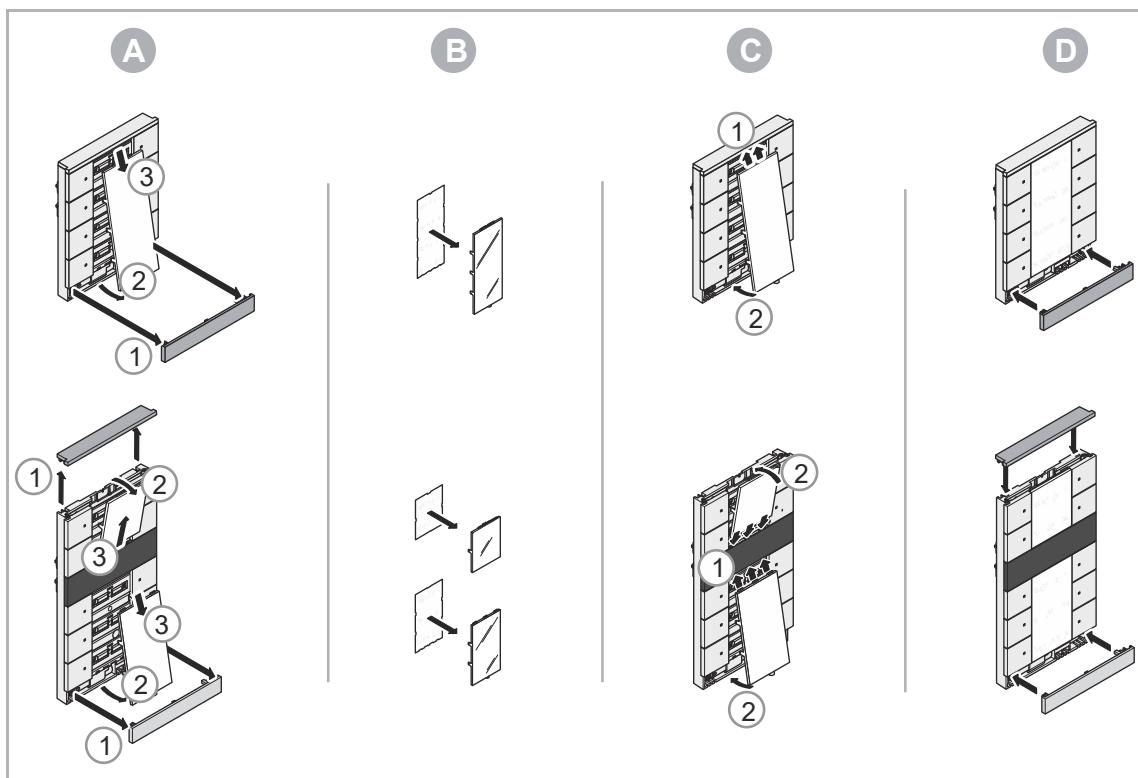


Fig. 27: Labelling inlay

## 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).
  - 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

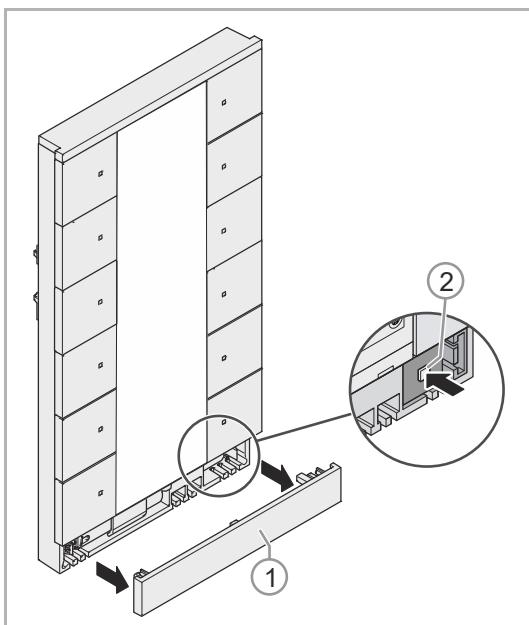


Fig. 28: Programming button

1. Remove the end strip [1].
2. Press the programming button [2].
  - All LEDs light up red.
  - On devices with display, "Prog" appears additionally in 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.de](http://www.BUSCH-JAEGER.de)). 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 “Description of application and parameters“ on page 63 (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](http://www.busch-jaeger-catalogue.com)). It is stored on the device page under category "Software".

## 9 Operation



### Notice

- All devices with room temperature controllers are correspondingly preconfigured in the RTC section and directly access the functions of the internal RTC.
- The push-buttons of the device can be individually configured by the installer according to requirement or wishes.
- The push-buttons of your device may therefore be different from the examples listed here. The type of operation, however, is carried out in the same way.

Operation is carried out by pressing the individual push-buttons.

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

For the full range of applications, see chapter “Description of application and parameters” on page 63.



### Notice

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

## 9.1 Control elements



### Notice

- All devices with room temperature controllers are correspondingly preconfigured in the RTC section and directly access the functions of the internal RTC.
- Depending on the model, push-buttons are also located above the device, and can be freely configured.
- The operation of the individual room temperature controller functions is implemented via one of the available rockers. For this the corresponding function is to be selected via the ETS application.

The room temperature controller is operated via push-buttons [1 - 6] beneath the display. The functions can vary depending on the application.

The following illustration shows the complete structure.

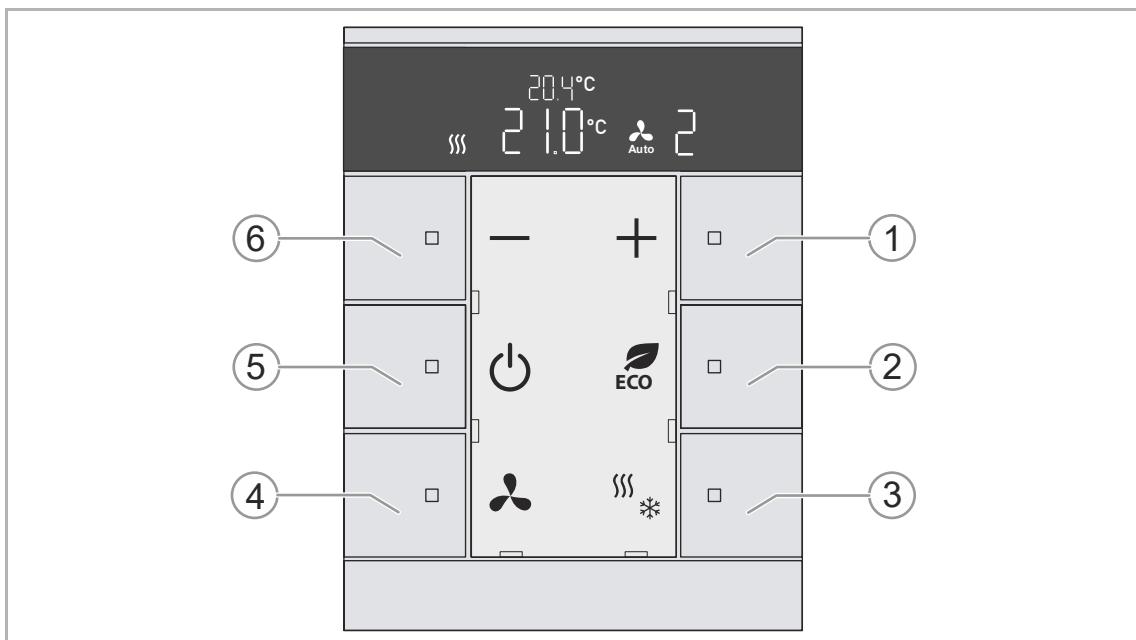


Fig. 29: Example of control elements

- [1] Setpoint adjustment (increasing the temperature)
- [2] ECO mode
- [3] Heating/cooling switchover
- [4] Fan speed levels
- [5] Switching the device on/off
- [6] Setpoint adjustment (reducing the temperature)

## 9.2 Colour concept

The KNX functions are supported by an LED colour concept.

Colour	Meaning
Yellow	Lights
Blue	Blind control
Orange	Room temperature control
Magenta	Light scenes
White	Neutral / no assignment of functions
Red/green	Standard illumination

Table 4: LED colour concept



### Notice

The operating buttons serve as status and function illumination.

### 9.3 Operating modes

The devices with RTC have the following operating modes:

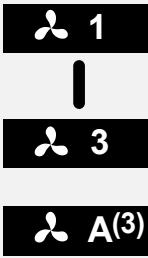
Display	Operating mode
	<p><b>Comfort operation</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– You are in the room for a longer period of time; the comfort temperature is to be reached.</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– The display indicates the set-value temperature that has been set. The controller aims at this temperature.</li> </ul>
	<p><b>ECO mode</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– 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.</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– The display shows the icon for "ECO". The temperature is reduced by the pre-programmed value. The fan speed levels can be limited according to the parameter setting.</li> </ul>
	<p><b>Off mode</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– The room is not being used for a longer period of time.</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– The display shows "OFF". The heating valves are closed (frost protection is active).</li> </ul>
	<p><b>Frost/heat protection</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– The function switches on automatically when a window contact has been connected and the window is being opened.</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– 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.</li> </ul>
	<p><b>Heating/cooling switchover</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– 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 [3] and subsequent selection via the set value adjustment buttons [1/6].</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– The device operates in heating mode. The display shows the icon for heating. The settings for heating mode are available.</li> </ul> <p>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.</p>
	<p><b>Fan operation</b></p> <p>Application:</p> <ul style="list-style-type: none"> <li>– 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.</li> </ul> <p>Behaviour of the RTC:</p> <ul style="list-style-type: none"> <li>– 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.</li> </ul>

Table 5: Operating modes

## 9.4 Display overview

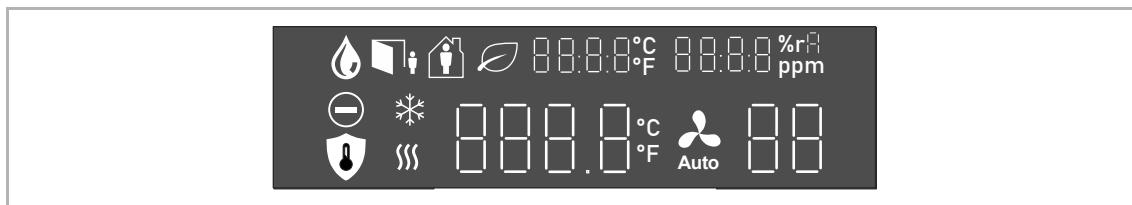


Fig. 30: Display

Display	Function	Action of the device
 21.0 °C	Controller switched on / display of set-point temperature	
 21.0 °C	Display of the actual temperature	
	Comfort mode	Heating/cooling is at the normal level. – The icon is active only when "Override comfort operating mode" has been activated via the corresponding communication object.
	Standby mode	The heating/cooling output is slightly lowered. – The icon is active only when standby mode has been activated via object "Operating mode" or "Override operating mode" has been activated.
	Dew point mode	The room temperature is not lowered any further.
	Frost protection mode	The temperature is kept above a minimum value.
	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.
 	Fan speed levels 1-3 (5)	Manual ventilation control.
	Automatic fan speed levels	Automatic ventilation control.
965 ppm	Display CO2 value	Further actions are carried out depending on the parameter settings.
52% rf	Display of humidity value	
	Local operation is blocked	In OFF mode, frost/heat protection mode, dew point mode and condensate mode, local operation is blocked. The disabled function is also indicated by the corresponding disabled icon on the display. The operating mode must first be deactivated.
	Time or date via LCD	

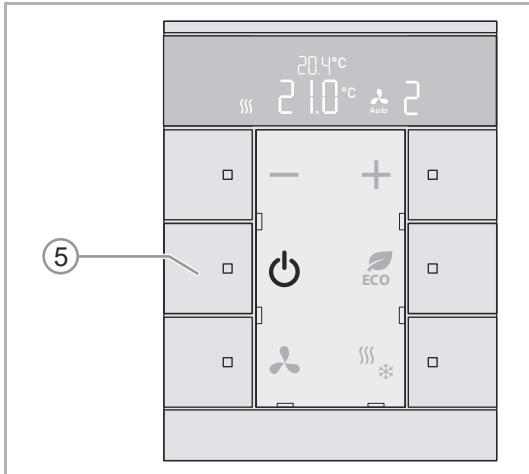
Fig. 6: Display icons

## 9.4.1 Switching On and Off



### Notice

- The device operates in frost/heat protection mode when switched off.
- The following illustration shows an example of a configuration.
- The function can be individually parameterized on one of the buttons.



1. Switch the device on or off with a press of the push-button [5].
- The device switches to the setpoint display when switched on.
- The device switches into frost/heat protection mode when switched off.

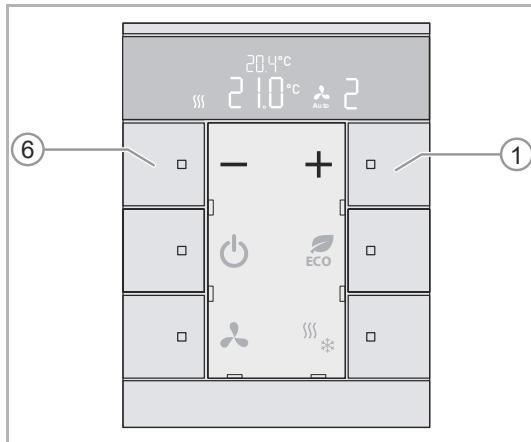
Fig. 31: Switching On and Off

#### 9.4.2 Adjust temperature



##### Notice

- The set-point temperature appears automatically on the display. The device must be switched on for this to happen.
- The following illustration shows an example of a configuration.
- The function can be individually parameterized on one of the button pairs.



The setpoint temperature is adjusted with the buttons [1] and [6].

The current setpoint temperature is shown in the display.

- Press button [1] to increase the setpoint temperature.
- Press button [6] to reduce the setpoint temperature.

The new setpoint temperature is displayed.

Fig. 32: Setting the temperature

### 9.4.3 Adjusting the fan speed levels



#### Notice

- The following illustration shows an example of a configuration.
- The function can be individually parameterized on one of the buttons.

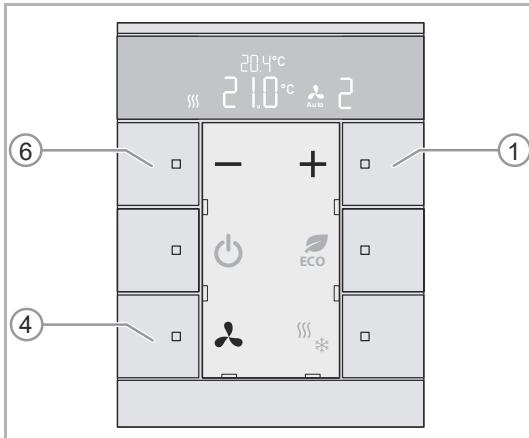


Fig. 33: Selecting the fan speed level operating mode

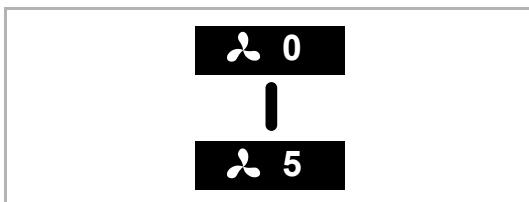


Fig. 34: Fan speed levels" function



Fig. 35: Fan speed level "AUTO"

1. Press button [4] to set the desired fan speed level.

#### "Fan speed levels" function

2. Use button [1] or [6] to switch between the fan settings.

5 speed levels are available to select for the manual fan setting.

- The set fan speed level is adopted when a timeout happens after nothing has been pressed for a certain period of time, or if button [4] is pressed again.
- The manually set fan speed level is shown in the setpoint on the display at the bottom right.
- The fan speed level that is set is stored automatically.

If "AUTO" is selected, the device control system will take on the task of determining the fan speed level.



#### Notice

The function of the fan speed levels can be parameterized.  
This function is inactive if parameter "Fan coil" has not been parameterized.  
Chapter 11.4.2 "Fan coil settings" on page 141

#### 9.4.4 Eco mode

ECO mode is used to reduce the room temperature automatically and to reduce the fan speed level, if this option has been parameterized. As a result, less energy is consumed when the occupants are absent, for example.



##### Notice

- The following illustration shows an example of a configuration.
- The function can be individually parameterized on one of the buttons.

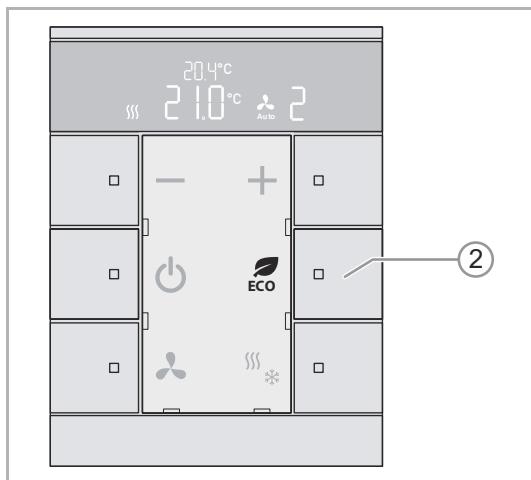


Fig. 36: ECO mode button

Activating ECO mode:

1. Press button [2].
- The device switches to ECO mode.

Deactivating ECO mode:

2. Press button [2] again.
- The device switches back to standard operation



##### Notice

The function of ECO mode is parameterized via the ETS.  
The default setting cannot be changed via the setpoint adjustment, buttons [1] and [6].

#### 9.4.5 Changing the operating status (heating/cooling)



##### Notice

- The following illustration shows an example of a configuration.
- The function can be individually parameterized on one of the buttons.

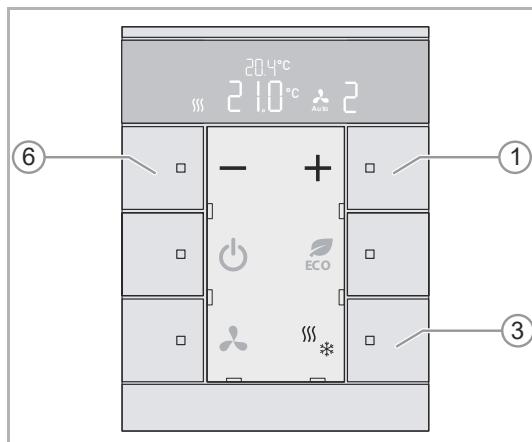


Fig. 37: Operation cooling / heating

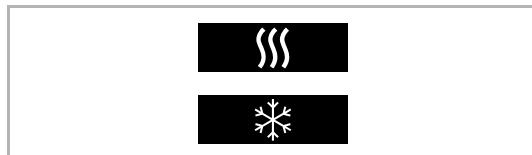


Fig. 38: Heating / cooling icon

1. Press button [3] to set the desired operating status.

2. Press the button [1] or [6] to adjust the operating status.
  - The selected operating mode is adopted when a timeout happens after nothing has been pressed for a certain period of time, or if button [3] is pressed again.
  - The set operating status appears on the display to the left of the setpoint.
  - When the "Heating" and/or "Cooling" control function is activated, the operating status that is currently set is indicated on the display.

## 10 Maintenance

### 10.1 Cleaning



#### **Caution! - Risk of damaging the device!**

- When spraying on cleaning agents, these can enter the device through crevices.
  - Do not spray cleaning agents directly onto the device.
- Aggressive cleaning agents can damage the surface of the device.
  - Never use caustic agents, abrasive agents or solvents.

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 "Device settings"

#### 11.1.1 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**.

#### 11.1.1.1 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.

#### 11.1.1.2 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.

#### 11.1.1.3 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" is active.

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

#### 11.1.1.4 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".

**11.1.1.5      Use object for switchover time**

Options:	No
	Yes

- No:
  - The communication object is not enabled.
- Yes:
  - 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.

**Notice**

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

**11.1.1.6 Overwrite switchover time at download**

Options:	No
	Yes

- No:
  - The switchover time is not overwritten during a download of the application.
- Yes:
  - 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.

**Notice**

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

**11.1.1.7 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.

#### 11.1.1.8 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".

#### 11.1.2 LED - Additional function — Application

Options:	Inactive
	LED additional function

- Inactive:
  - Application is not active.
- LED additional function:
  - Application is active.



##### Notice

The following parameters can only be adjusted when the function "Device enable" is set on "LED-additional function". The parameters for application "LED additional function" can be called up via general parameters.

## 11.1.2.1 Day/Night mode

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "LED: day/night mode" is not enabled.
- Activated:
  - Communication object "LED: day/night mode" is enabled.

If a telegram with value "1" (day) is received via the object, the LED lights up brightly. If a telegram with value "0" (night) is received, the LED lights up dark.

The LED of the button can light up with two different brightness levels. The parameter is used to specify whether the LED can be switched over between bright and dark. Additional function: If the "Operating mode" parameter is set on "Status illumination", the "LED: day/night mode" communication object can also be used for the status display.

Example: The button is assigned with the application "1-button switching" and connected with a switching actuator that switches a lamp group. The LED of the button is set on "Status illumination" and a colour is set. If the object "LED: day/night mode" is now connected with the status response object of the switching actuator via a group address or action and the light is switched on, the LED lights up bright. If the light is switched off, the LED lights up dark.

**Notice**

The parameter is available via the following settings:

- 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" or
- Parameter "Colour for On" is set on a colour and not on "Off".

The parameter is available also via the following settings:

- 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".

11.1.2.2 **Alarm function**

Options:	Deactivated
	Activated
Options:	Yellow
	Orange
	Red
	Violet
	Blue
	Green
	White

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

The LED will flash if an ON telegram is received on the 1-bit communication object "Alarm". If the object receives an OFF telegram, the LED will no longer flash.

The LED always flashes in the same colour and brightness that was specified via parameter "LED brightness during alarm" and "LED colour during alarm".

The alarm function could be used to display a wind alarm to the user, for example, so that the user knows that no blind operation is possible at that time. An additional application would be the signalling of an open door when the user would like to lower a roller shutter.

**Notice**

If the LED is currently serving as an orientation light, it will not blink. This also applies if during the flashing it is switched to orientation illumination, the LED then stops flashing immediately.

#### 11.1.2.3 LED brightness during alarm

Options:	Dark
	Bright

- Dark:
  - The LED lights up dark.
- Bright:
  - The LED lights up bright.

The parameter is used to specify the brightness the LED lights up in during an alarm



#### Notice

This parameter can only be set if the "Alarm function" parameter is set on "activated".

#### 11.1.2.4 LED colour during alarm

Options:	Yellow
	Orange
	Red
	Violet
	Blue
	Green
	White

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

The parameter is used to specify the colour the LED lights up in during an alarm



##### Notice

This parameter can only be set if the "Alarm function" parameter is set on "activated".

#### 11.1.3 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: in operation". 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: In operation"



##### Notice

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**.

**11.1.3.1 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.

**11.1.3.2 Objects sends cyclic**

Options:	Off telegram
	On telegram

- Off telegram:
  - Object during operation sends an Off telegram.
- ON telegram:
  - Object during operation sends an On 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: In operation" during the parameterized time.

**11.1.4 Display settings - General****11.1.4.1 Display actual temperature value**

Options:	No
	Yes

- No
  - The actual temperature is not shown on the display
- Yes
  - The actual temperature is shown on the display

The device shows the temperature value in the middle of the top line.

**11.1.4.2      Actual temperature value above**

Options:	Internal measurement
	Communication object

- Internal measurement
  - Actual temperature value is measured on the device
- Communication object
  - Actual temperature value via the bus

The parameter can be used to select whether the actual temperature is measured directly on the device or fed to the device via communication object "DS: Temperature value" via the bus.

**Notice**

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

**11.1.4.3      Temperature unit**

Options:	Celsius
	Fahrenheit

- Celsius
  - Temperature unit Celsius (°C)
- Fahrenheit
  - Temperature unit Fahrenheit (°F)

The parameter is used to choose temperature unit Celsius (°C) or Fahrenheit (°F).

**Notice**

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

#### 11.1.4.4 Adjusting the temperature unit via object

Options:	No
	Yes

- No
- Yes

The parameter is used to define whether the temperature unit adjustment is transmitted via an object.

**Notice**

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

#### 11.1.4.5 Display CO<sub>2</sub> value

Options:	No
	Yes

- No
  - No display of the CO<sub>2</sub> value
- Yes
  - Display of the CO<sub>2</sub> value

The parameter is used to select whether the CO<sub>2</sub> value is shown on the display.

**Notice**

With devices without CO<sub>2</sub> module the CO<sub>2</sub> value is sent automatically to the device via a communication object.

11.1.4.6 CO<sub>2</sub> value via

Options:	Internal measurement
	Communication object

- Internal measurement
  - CO<sub>2</sub> value is measured on the device.
- Communication object
  - CO<sub>2</sub> value is fed via the bus.

The parameter can be used to select whether the CO<sub>2</sub> value is measured directly on the device or fed to the device via a communication object via the bus.

**Notice**

- The parameter is only adjustable if the "Display CO<sub>2</sub> value" parameter is set on "Yes".
- With devices without CO<sub>2</sub> module it is specified that the CO<sub>2</sub> value is sent automatically to the device via a communication object.
- The above selection is cancelled.

## 11.1.4.7 Communication object data type

Options:	2 byte value (DPT 9.007)
	1 byte value (DPT 5.001)

- 2-byte value (DPT 9.007)
  - For EIS 5 (9.007), when the display of the value for relative humidity takes place via the communication object.
- 1-byte value (DPT 5.001)
  - For DPT scaling (5.001), when the display of the value for relative humidity takes place via the communication object.

**Notice**

The parameter can only be set when parameter "Display relative humidity" is set on "Yes". In addition, parameter "Relative humidity value above" must be set on "Communication object".

**11.1.4.8      Display relative humidity**

Options:	No
	Yes

- No
  - No display of relative humidity.
- Yes
  - Display of relative humidity.

The parameter is used to select whether the relative humidity is shown on the display.

**Notice**

With devices without humidity module the relative humidity value is sent automatically to the device via a communication object.

**11.1.4.9      Relative humidity value above**

Options:	Internal measurement
	Communication object

- Internal measurement
  - The relative humidity value is measured on the device.
- Communication object
  - The relative humidity value is fed via the bus.

The parameter can be used to select whether the relative humidity value is measured directly on the device or fed to the device via a communication object via the bus.

**Notice**

- The parameter can only be set when parameter "Display relative humidity" is set on "Yes".
- With devices without humidity module it is automatically specified that the relative humidity value is sent to the device via a communication object.
- The above selection is cancelled.

**11.1.4.10     Show date**

Options:	No
	Yes

**11.1.4.11 Display time**

Options:	No
	Yes

**11.1.4.12 Display change interval**

Options:	Setting option from 5 to 60 (s)
----------	---------------------------------

- 5 to 60 seconds
  - After non-actuation of the control element the current actual temperature again appears in the display after the set waiting period.

**11.1.4.13 Display backlighting white**

Options:	Always on
	Via communication object day/night
	For RTC operation
	Via communication object day/night and RTC operation

- Always on:
  - The display backlighting lights up permanently white during operation.
- Via communication object day/night:
  - The communication object "DS: Display day/night" is enabled. When a telegram with value "1" is received, the display lights up white, according to the setting of parameter "Display backlighting day". When a telegram with value "0" is received, the display lights up white, according to the setting of parameter "Display backlighting night".
- For RTC operation:
  - The display backlighting lights up white as soon as the RTC is operated. After non-actuation of the control element the backlighting of the display goes out again after a waiting period of approx. 5 seconds.
- Via communication object day/night and RTC operation:
  - The communication object "DS: Display day/night" is enabled. When a telegram with value "1" is received via the object, the display lights up white, according to the setting of parameter "Display backlighting day". When a telegram with value "0" is received, the display lights up white, according to the setting of parameter "Display backlighting night". The display backlighting additionally lights up 100% white as soon as the RTC is operated. After non-actuation of the control element the backlighting of the display that was active prior to the actuation is displayed again after a waiting period of 5 seconds.

## 11.1.4.14 Display backlighting day

Options:	Off
	50%
	100%

- Off:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display does not light up.
- 50 %:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display lights up 50% white.
- 100 %:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display lights up 100% white.

**Notice**

The parameter is adjustable only when parameter "Display backlighting white" is set on "via communication object day/night" or "via communication object day/night and RTC operation".

## 11.1.4.15 Display backlighting night

Options:	Off
	50%
	100%

- Off:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display does not light up.
- 50 %:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display lights up 50% white.
- 100 %:
  - If a telegram with value "1" is received via the object "DS: Display day/night", the display lights up 100% white.

**Notice**

The parameter is adjustable only when parameter "Display backlighting white" is set on "via communication object day/night" or "via communication object day/night and RTC operation".

**11.1.4.16      Display backlighting red**

Options:	No
	CO <sub>2</sub> value
	Humidity value
	CO <sub>2</sub> and humidity value
	Via communication object

- No:
  - The device displays white only.
- CO<sub>2</sub> value:
  - When exceeding the set CO<sub>2</sub> value, the device changes into red display backlighting, if parameterized.
- Humidity value:
  - When exceeding the highest set step of the humidity value, the device changes into red display backlighting, if parameterized.
- CO<sub>2</sub> and humidity value:
  - When exceeding the highest set step of the CO<sub>2</sub> and humidity value, the device changes into red display backlighting, if parameterized.
- Via communication object:
  - If a telegram with value "1" is received via object "DS: Display backlighting red", the display changes into red display backlighting, if parameterized.

## 11.2 Application "Primary function"

### 11.2.1 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**.

### 11.2.1.1 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".

## 11.2.1.2 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.

## 11.2.1.3 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.

## 11.2.1.4 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.

**11.2.1.5 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".

### 11.2.1.6      **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".

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- 11.3 Application "Function block RTC"
- 11.4 Application "RTC"

#### 11.4.1 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 setpoint values.
- Master device:
  - At least two room temperature controllers "Master/Slave" are located within one room temperature control. 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 associated slave devices using the appropriately labelled communication objects. Only the master device regulates the temperature.
- Slave device:
  - The slave device serves exclusively for operating the room temperature controller and the display of the actual temperature.

### 11.4.2 General - Control function

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

- *Heating*: For operating a heat-based single-room control. The control is based on the adjustable setpoint temperature value. The "Controller type" and "Heating type" can be programmed for optimizing the control.
- *Heating with additional stage*: In addition to the control function described under heating, the additional stage makes available a control circuit with parallel identification for the activation of an additional heating circuit. An independent controller type can be selected in addition. This type of additional stage is used, for example, to quickly heat up a bathroom with floor heating via an additional heating fan.
- *Cooling*: For operating a cooling-based 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 optimizing the control.
- *Cooling with additional stage*: In addition to the control function described under cooling, the additional stage makes available a control circuit with parallel identification for the activation of an additional cooling circuit. An independent controller type can be selected in addition. 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 can take 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.



#### Notice

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

### 11.4.3 General - Operating mode after reset

Options:	Comfort
	Standby
	Eco mode
	Frost/heat protection

In operating mode after reset sets operating mode, which is valid until it is overwritten. 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. The setpoint is set to a value that makes the temperature of the room comfortable during "normal use, e.g. presence".
- *Standby*: If the room is controlled automatically, e.g. by a presence detector, as a function of its use. The setpoint is lowered (e.g. during temporary absence) to save energy costs.
- *Eco mode*: If the room is controlled automatically or manually as a function of its use. The setpoint is further lowered (e.g. during extended absence/weekend) to save energy costs.
- *Frost/heat protection*: If only the building protection function is necessary in the room after a reset. The setpoint is lowered/raised to a low/high value, which means that heating and cooling only takes place when the building protection function is guaranteed.



#### Notice

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

The parameter is used to set the cycle time in minutes for sending value "1", which is sent via communication object "RTC: In operation".

Sending of the value serves to inform that the controller operates without a fault. 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. However, for this the system and/or actuator must have "Forced operation" function.

**11.4.4 General - Additional functions/objects**

Options:	No
	Yes

- This parameter enables the additional function "Delay time for reading telegrams after reset" and communication objects "Current HVAC operating mode".

### 11.4.5 General — Delay time for read telegrams after reset

Options:

Setting option from 1 to 255

The parameter is used to set the delay time in seconds with which the received telegrams are transmitted after a reset.



#### Notice

This parameter can only be set when parameter "Additional functions/objects" is set on "Yes".

#### 11.4.6 General — Object "Effective operating mode" active

Options:	No
	Yes

- No
  - If not activated, no operating mode is sent via communication object "Current HVAC operating mode".
- Yes
  - If activated, the RTC sends the operating mode via communication object "Current HVAC operating mode" which belongs to the currently set setpoint temperature.



**Notice**

The operating function is only available if the "Device function" is set on "Slave device".

RTC operating mode	Current HVAC operating mode
Error	Building protection
Comfort override operating mode	Comfort
Standby override operating mode	Standby
Economy override operating mode	Economy
Building protection override operating mode	Building protection
Condensate water alarm	Building protection
Dew point alarm	Building protection
Window open	Building protection
Control OFF	Building protection
Presence	Comfort
Comfort	Comfort
Standby	Standby
Economy	Economy
Building protection	Building protection

Table 7: Operating mode

### 11.4.7 RTC — Heating control



#### Notice

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".

### 11.4.8 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 activation of the heating control valve is selected via 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 as soon as a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands. Observe switching cycles for switch actuators!
- 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% or 100%).
- PI continuous, 0-100%:
  - The continuous control has a continuously changing control value as output, which results from the difference between setpoint value and actual value. This change can take on values between 0 and 100%. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value can only be transmitted if it has changed by a predefined percentage in relation to the previously sent value. The control value can also be transmitted cyclically.
- PI PWM, On/Off:
  - This is also a PI controller. The output is a 1-bit command. For this, the calculated control value is converted into a pulse-interval signal.
- Fan coil:
  - The fan coil controller functions similar to the PI continuous controller. In addition, it allows the separate control of the fan in the fan coil unit (e.g. fan speed levels 1..3).



#### Notice

The "Fan coil" controller type can be set in all 4 controller functions (heating/cooling, basic/additional stage). That is why it is recommended not to use the "Fan coil" controller type in the basic and additional stage of the heating/cooling operating mode.

#### 11.4.9 Heating control - Heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: <ul style="list-style-type: none"> <li>▪ Area (e.g. floor heating) 4°C 200 min</li> <li>▪ Convector (e.g. heater) 1.5°C 100 min</li> <li>▪ Free configuration</li> </ul> Fan coil: <ul style="list-style-type: none"> <li>▪ Fan coil 4°C 90 min</li> <li>▪ Free configuration</li> </ul>
----------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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 via the free configuration.



##### Notice

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".

#### 11.4.10 Heating control - P-component (x 0.1°C)

Options:	Setting option from 10 to 100
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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 PI 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.



##### Notice

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".

#### 11.4.11 Heating control - I-component (min.)

Options:

Setting option from 0 to 255

The I-component refers to the readjust 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 readjust time has to have different values. In general, the more inactive the overall system, the greater the readjust time.



##### Notice - Readjust time

- If the I-component "Readjust time" selected too small (fast), the system tends to overshoot at the start.
- If the I-component "Readjust time" is selected too large, the system responds constantly too slow.



##### Notice

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".

#### 11.4.12 Heating control - Extended settings

Options:

No

Yes

- No:
  - No additional parameters are enabled.
- Yes:
  - Additional parameters are enabled.

This parameter enables the following additional functions and communication objects in dependence of parameter "Control value type":

- "Basic stage heating"
- "Settings of basic load"

#### 11.4.13 Basic stage heating

**Notice**

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

#### 11.4.14 Basic stage heating — Status object heating

Options:	No
	Yes

- No
  - The parameter enables the "Status heating" communication object.
- Yes
  - The parameter enables the "Status heating" communication object.

An On telegram is sent on the bus via the 1-bit communication object as soon as the RTC is in active heating mode.

If the controller is in cooling mode or in the inactive zone between heating and cooling, the RTC sends an OFF telegram via the "RTC: Heating status" object.

#### 11.4.15 Basic stage heating - Mode of the control value

Options:	Normal
	Inverse

- Normal:
  - The mode of the control value can be used to adapt the control value to de-energised opened (normal) valves.
  - Normal: Means "Valve closed" de-energised closed.
- Inverse:
  - The mode of the control value can be used to adapt the control value to de-energised closed (inverse) valves.
  - Inverse: Means "Valve open" de-energised opened.

The mode of the control value can be used to adapt electro-thermal drives.

#### 11.4.16 Basic stage heating - Hysteresis (x 0.1°C)

Options:	Setting option from 3 to 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 switch-on point" and the upper point is at "Setpoint value plus switch-off point".

**Notice**

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%".

#### 11.4.17 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 new calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value. This value difference can be entered here.

**Notice**

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".

#### 11.4.18 Basic stage heating — Cyclic sending of the control value

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

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

**Notice**

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

#### 11.4.19 Basic stage heating - PWM cycle heating (min)

Options:

Setting option from 1 to 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 switch-on phase and a switch-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.

**Notice**

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

#### 11.4.20 Basic stage heating - Maximum control value (0 - 255)

Options:

Setting option from 0 to 255

The maximum control value of the PI controller defines the maximum value put out by the controller. The maximum value will not be exceeded, even if the controller calculates a higher control value.

**Notice**

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".

#### 11.4.21 Basic stage heating - Minimum control value for basic load (0 to 255)

Options:

Setting option from 0 to 255

The minimum control value of the PI controller defines the minimum value issued by the controller. If a minimum value that is greater than zero is selected, the controller will not issue a lower value, even if it calculates a control 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.

**Notice**

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".

#### 11.4.22 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".

#### 11.4.23 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).

#### 11.4.24 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".

#### 11.4.25 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".

**11.4.26 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".

**11.4.27 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.

**11.4.28 Control of additional heating stage — Extended settings**

Options:

No

Yes

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

#### 11.4.29 Additional heating stage



##### Note

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

#### 11.4.30 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.

- *Normal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

#### 11.4.31 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%".

#### 11.4.32 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".

#### 11.4.33 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".

#### 11.4.34 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".

#### 11.4.35 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".

#### 11.4.36 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".

#### 11.4.37 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).

#### 11.4.38 Cooling control — Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: <ul style="list-style-type: none"><li>▪ Area (e.g. cooling ceiling) 5°C 240 min</li><li>▪ Free configuration</li></ul>
	Fan coil: <ul style="list-style-type: none"><li>▪ Fan coil 4°C 90 min</li><li>▪ Free configuration</li></ul>

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".

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

Options:	Setting option between 10 - 100
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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".

#### 11.4.40 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".

#### 11.4.41 Cooling control — Extended settings

Options:

No

Yes

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

#### 11.4.42 Basic stage cooling


**Note**

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

#### 11.4.43 Basic stage cooling — Status object cooling

Options:	No
	Yes

This parameter enables the "Status cooling" communication object.

#### 11.4.44 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.

- *Normal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

#### 11.4.45 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".

#### 11.4.46 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".

#### 11.4.47 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".

**11.4.48 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".

#### 11.4.49 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".

#### 11.4.50 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".

#### 11.4.51 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).

#### 11.4.52 Control of additional cooling stage — Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: <ul style="list-style-type: none"><li>▪ Area (e.g. cooling ceiling) 5°C 240 min</li><li>▪ Free configuration</li></ul>
	Fan coil: <ul style="list-style-type: none"><li>▪ Fan coil 4°C 90 min</li><li>▪ Free configuration</li></ul>

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".

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

Options:	Setting option between 10 - 100
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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".

**11.4.54 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".

**11.4.55 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.

**11.4.56 Control of additional cooling stage — Extended settings**

Options:

No

Yes

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

#### 11.4.57 Additional cooling stage



##### Note

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

#### 11.4.58 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.

- *Normal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

#### 11.4.59 Additional cooling stage — Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255
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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%".

#### 11.4.60 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".

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

Options:	Setting option between 1 - 60 minutes
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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".

#### 11.4.62 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".

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

Options:	Setting option between 0 - 255
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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".

#### 11.4.64 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".

#### 11.4.65 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.

#### 11.4.66 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".

#### 11.4.67 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".

#### 11.4.68 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.

#### 11.4.69 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".

**11.4.70 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.

**11.4.71 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".

#### 11.4.72 Setpoint settings

**Note**

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

#### 11.4.73 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".

#### 11.4.1 Setpoint settings — Standby and Eco are absolute values

Options:	No
	Yes

This parameter is used to set the indication of the display for standby and Eco mode.

- Yes:
  - The setpoints for standby and Eco mode are entered as absolute values.
- No:
  - The setpoints for standby and Eco mode are entered as temperature difference to the setpoint of comfort mode. At an adjustment of the comfort setpoint temperature during operation of the device the setpoints for standby and Eco mode are shifted at the same temperature difference from comfort mode.

#### 11.4.2 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".

#### 11.4.3 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".

#### 11.4.4 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".

#### 11.4.5 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".

#### 11.4.6 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.

#### 11.4.7 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".

#### 11.4.8 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".

#### 11.4.9 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".

#### 11.4.10 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".

#### 11.4.11 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".

#### 11.4.1 Setpoint settings - Setpoint adjustment via communication object (DPT 9.001)

Options:	No
	For comfort, Eco, standby
	For comfort, Eco, standby, building protection

The communication objects that allow the adjustment of the parameterised setpoints via the bus are enabled via the associated parameters.



##### Notice

If the received temperature values are not possible (heating setpoint via cooling setpoint or on the other side the comfort or building protection values), they are then ignored. To display this event a telegram with value "1" is sent via communication object "Setpoint error".

#### 11.4.1 Setpoint settings - Hide temperature unit

Options:	No
	Yes

This parameter makes it possible to hide the temperature unit as well as the absolute and the relative setpoint. This standardises the function between master/individual device and slave devices.

#### 11.4.2 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.

#### 11.4.3 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.

#### 11.4.4 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".

#### 11.4.5 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".

#### 11.4.6 Setpoint adjustment

**Note**

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

#### 11.4.7 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%".

#### 11.4.8 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%".

#### 11.4.9 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".

**11.4.10 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".

**11.4.1 Setpoint adjustment - Step size of manual setpoint adjustment**

Options:

0.1 K

0.2 K

0.5 K

1.0 K

The default can be used to set the step size of the setpoint adjustment per press of the button on the device. The default setting is 0.5 K.

#### 11.4.1 Setpoint adjustment - Setpoint adjustment via communication object

Options:	1-byte counter value
	Absolute temperature value
	Relative temperature value

The default is used to set the datapoint type with which a setpoint adjustment via the bus on the device can be carried out. Available for selection are

- the 1-byte counter value in format DPT 6.010, which multiplied with the step size results in the setpoint adjustment and
- the absolute (DPT 9.001) und
- relative (DPT 9.002) setpoint temperature.

#### 11.4.2 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.

#### 11.4.3 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.

**11.4.4 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.

**11.4.5 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.

**11.4.6 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.

#### 11.4.7 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".

#### 11.4.8 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".

#### 11.4.9 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".

**11.4.10 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".

**11.4.11 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.

**11.4.12 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".

#### 11.4.13 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".

#### 11.4.14 Temperature reading — Monitoring of temperature reading

Options:	No
	Yes

This parameter can be used to activate monitoring of temperature reading.

#### 11.4.15 Temperature reading — Monitoring time for temperature reading

Options:	Setting option between 00:05:00 – 18:12:15 (hh:mm:ss)
----------	-------------------------------------------------------

If no temperature is read within the parameterised time period, the device switches to error mode. It sends a telegram to the bus via the "Actual temperature error" object and sets the operating mode and control value for error. Rather small monitoring times are prevented via the specified setting option.



##### Notice

The parameter is only adjustable if the "Monitoring of temperature reading" parameter is set on "Yes".

#### 11.4.16 Temperature reading — Operating mode for fault

Options:	Cooling
	Heating

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently specify the heating/cooling operating type. As a result, the operating type best suited to protecting the building will be selected.

**Note**

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

#### 11.4.17 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.

#### 11.4.18 Alarm functions

**Note**

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

#### 11.4.19 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".

#### 11.4.20 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".

**11.4.21 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. If 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.

**11.4.22 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.

#### 11.4.1 Temperature limiter

Temperature limiting, for example, serves to protect wooden floors from heating up too much by the floor heating. For this the thermal limiter receives an external temperature value from the floor sensor. If the measured value exceeds the set threshold value, the control value is reset to zero. The control value is activated again when the value drops below the threshold value.

##### 11.4.1 Temperature limiter - Temperature limit of heating

Options:	No
	Yes

The parameter is used to activate or deactivate the temperature limit for the basic heating stage.



##### Notice

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

##### 11.4.1 Temperature limiter - Temperature limit of heating - Limit temperature

Options:	Setting option between 20 - 100°C
----------	-----------------------------------

The parameter is used to set the limit temperature for the basic heating stage. The temperature limit becomes active when the input temperatures are above the limit temperature.

##### 11.4.1 Temperature limiter - Temperature limit of heating - Hysteresis

Options:	Setting option between 0.5 - 5 K
----------	----------------------------------

The parameter is used to set the hysteresis for the temperature limit of the basic heating stage. At an active limit the temperature limit is deactivated again when the input temperatures are below the limit temperature minus hysteresis.

**11.4.1 Temperature limiter - Temperature limit of heating - Integral component of the PI controller**

Options:	Keep
	Reset

The parameter is used to define the processing of the I-component of a PI controller for temperature limiting.

If the I-component is retained, this value is the starting point for continuing the PI controller after the termination of the temperature limit. This option is suitable for slow control systems.

If the I-component is reset, the PI controller starts after the termination of the temperature limit with an I-component of zero. This option is suitable for fast control systems.

If no PI controller is used, this parameter is without function.

#### 11.4.1 Temperature limiter - Temperature limit of additional heating stage

Options:	No
	Yes

The parameter is used to activate or deactivate the temperature limit for the basic heating stage.



##### Notice

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

#### 11.4.1 Temperature limiter - Temperature limit of additional heating stage - Limit temperature

Options:	Setting option between 20 - 100°C
----------	-----------------------------------

The parameter is used to set the limit temperature for the basic additional heating stage. The temperature limit becomes active when the input temperatures are above the limit temperature.

#### 11.4.1 Temperature limiter - Temperature limit of additional heating stage - Hysteresis

Options:	Setting option between 0.5 - 5 K
----------	----------------------------------

The parameter is used to set the hysteresis for the temperature limit of the additional heating stage. At an active limit the temperature limit is deactivated again when the input temperatures are below the limit temperature minus hysteresis.

#### 11.4.1 Temperature limiter - Temperature limit of additional heating stage - Integral component of the PI controller

Options:	Keep
	Reset

The parameter is used to define the processing of the I-component of a PI controller for temperature limiting.

If the I-component is retained, this value is the starting point for continuing the PI controller after the termination of the temperature limit. This option is suitable for slow control systems.

If the I-component is reset, the PI controller starts after the termination of the temperature limit with an I-component of zero. This option is suitable for fast control systems.

If no PI controller is used, this parameter is without function.

#### 11.4.1 Temperature limiter - Temperature limit of cooling

Options:	No
	Yes

The parameter is used to activate or deactivate the temperature limit for the basic cooling stage.

**Notice**

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".

#### 11.4.1 Temperature limiter - Temperature limit of cooling - Limit temperature

Options:	Setting option between 20 - 100°C
----------	-----------------------------------

The parameter is used to set the limit temperature for the basic cooling stage. The temperature limit becomes active when the input temperatures are above the limit temperature.

#### 11.4.1 Temperature limiter - Temperature limit of cooling - Hysteresis

Options:	Setting option between 0.5 - 5 K
----------	----------------------------------

The parameter is used to set the hysteresis for the temperature limit of the basic cooling stage. At an active limit the temperature limit is deactivated again when the input temperatures are above the limit temperature plus hysteresis.

#### 11.4.1 Temperature limiter - Temperature limit of cooling - Integral component of the PI controller

Options:	Keep
	Reset

The parameter is used to define the processing of the I-component of a PI controller for temperature limiting.

If the I-component is retained, this value is the starting point for continuing the PI controller after the termination of the temperature limit. This option is suitable for slow control systems.

If the I-component is reset, the PI controller starts after the termination of the temperature limit with an I-component of zero. This option is suitable for fast control systems.

If no PI controller is used, this parameter is without function.

#### 11.4.1 Temperature limiter - Temperature limit of additional cooling stage

Options:

No

Yes

The parameter is used to activate or deactivate the temperature limit for the additional cooling stage.

**Notice**

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

#### 11.4.1 Temperature limiter - Temperature limit of additional cooling stage - Limit temperature

Options:

Setting option between 20 - 100°C

The parameter is used to set the limit temperature for the basic additional cooling stage. The temperature limit becomes active when the input temperatures are above the limit temperature.

#### 11.4.1 Temperature limiter - Temperature limit of additional cooling stage - Hysteresis

Options:

Setting option between 0.5 - 5 K

The parameter is used to set the hysteresis for the temperature limit of the additional cooling stage. At an active limit the temperature limit is deactivated again when the input temperatures are above the setpoint temperature plus hysteresis.

#### 11.4.1 Temperature limiter - Temperature limit of additional cooling stage - Integral component of the PI controller

Options:

Keep

Reset

The parameter is used to define the processing of the I-component of a PI controller for temperature limiting.

If the I-component is retained, this value is the starting point for continuing the PI controller after the termination of the temperature limit. This option is suitable for slow control systems.

If the I-component is reset, the PI controller starts after the termination of the temperature limit with an I-component of zero. This option is suitable for fast control systems.

If no PI controller is used, this parameter is without function.

#### 11.4.2 Fan coil settings

**Notice**

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".

#### 11.4.1 Fan coil settings - Number of fan devices

Options:	Heating/cooling via one system
	Heating/cooling via two systems

If fan coil devices have been set for heating and cooling, this parameter is used to set whether heating or cooling operation is carried out via the same device with fan control, or via two separate devices with separate fan activation.

#### 11.4.1 Fan coil settings – Fan speed level data formats for Master-Slave

Options:	Counter values (e.g. 0 - 5)
	Percentage values

Here, for master-slave operation of operating units, it is set whether the setting of the manual fan speed level between master and slave device is carried out as counter value or percentage value. Master and slave devices must be set the same for the correct function.

#### 11.4.2 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".

#### 11.4.3 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.

#### 11.4.4 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.

#### 11.4.5 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.

#### 11.4.6 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.

#### 11.4.7 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.

#### 11.4.8 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".

#### 11.4.1 Fan coil settings heating - Fan speed level values

Options:	According to standard values table
	Specify individually

For the calculation of the fan speed level from the control value or for the output of a percentage value for a specific fan speed level, the fan speed level value table is used. The standard value table is the table from the KNX specification. For a deviation the values can be specified individually.

#### 11.4.2 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".

#### 11.4.3 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.

**11.4.4 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".

### 11.4.5 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".

### 11.4.1 Fan coil settings cooling - Fan speed level values

Options:	According to standard values table
	Specify individually

For the calculation of the fan speed level from the control value or for the output of a percentage value for a specific fan speed level, the fan speed level value table is used. The standard value table is the table from the KNX specification. For a deviation the values can be specified individually.

### 11.4.2 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".

### 11.4.3 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.

**11.4.4 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".

#### 11.4.5 Summer compensation

**Note**

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

#### 11.4.6 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.

#### 11.4.7 Summer compensation - (Lower) Starting temperature for summer compensation (x 0.1°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.



##### Notice

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

#### 11.4.8 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".

**11.4.9 Summer compensation - (Upper) Exit temperature for summer compensation (x 0.1°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.

**Notice**

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

**11.4.10 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 Application "CO2 sensor"

### 11.5.1 CO2 sensor — CO2 sensor

Options:	<b>Inactive</b>
	Active

The parameter activates the CO<sub>2</sub> sensor. The corresponding communication objects are displayed in ETS.

### 11.5.2 CO2 sensor - Height of mounting location above normal height zero

Options:	Input option between 1000 m - +10,000 m
----------	-----------------------------------------

The parameter is used to make an adaptation of the CO<sub>2</sub> measurement to the height of the installation location.

### 11.5.3 CO2 sensor — Measured value correction

Options:	500 ppm
	450 ppm
	400 ppm
	350 ppm
	300 ppm
	250 ppm
	200 ppm
	150 ppm
	100 ppm
	50 ppm
	<b>0 ppm</b>
	-50 ppm
	-100 ppm
	-150 ppm
	-200 ppm
	-250 ppm
	-300 ppm
	-350 ppm
	-400 ppm
	-450 ppm
	-500 ppm

The measured CO<sub>2</sub> value can be corrected using the parameter. The corrected value is displayed on the device and sent to the KNX bus.

### 11.5.4 CO2 sensor — CO2 error

Options:	Message
	Do not send message

If an error is detected on the sensor, it can be sent to the KNX.

#### 11.5.5 CO2 sensor — Send CO2 value in case of change

Options:	Inactive
	In case of a change of 10 ppm
	In case of a change of 20 ppm
	In case of a change of 50 ppm
	In case of a change of 100 ppm
	In case of a change of 150 ppm
	In case of a change of 200 ppm
	In case of a change of 250 ppm
	In case of a change of 300 ppm
	In case of a change of 350 ppm
	In case of a change of 400 ppm
	In case of a change of 450 ppm
	In case of a change of 500 ppm

The parameter is used to determine when a change should be actively sent to the KNX bus. The telegram load can be reduced by the setting.

#### 11.5.6 CO2 sensor — Send the CO2 value cyclic

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If you wish to send the CO2 value cyclically through the corresponding KNX communication object, a corresponding time must be selected here.

#### 11.5.7 CO2 sensor — External measured value

Options:	Active
	Inactive

An additional external measured value can be used in the measurement.

### 11.5.8 CO2 sensor — Weighting of external measured value

Options:	Include in calculation at 10%
	Include in calculation at 20%
	Include in calculation at 30%
	Include in calculation at 40%
	Include in calculation at 50%
	Include in calculation at 60%
	Include in calculation at 70%
	Include in calculation at 80%
	Include in calculation at 90%
	Only use external measured value

The share of the weighting of the measured value integrated through a KNX communication object is defined using this parameter.

**Notice**

The parameter is available only when parameter "External measured value" is set on "Active".

### 11.5.9 CO2 controller — CO2 controller type

Options:	Inactive
	Single-stage
	Two-stage
	Three-stage
	PI

The control type for actuating the external fan is defined using this parameter.

### 11.5.10 CO2 controller — Permit change of the basic set value via bus

Options:	No
	Yes

The basic set value defined for the first threshold can be optimised via the KNX bus, e.g., through a visualisation.

### 11.5.11 CO2 controller — Control value output format

Options:	Switch command
	Priority
	Percent
	Byte
	Scene

The output value when the respective threshold is exceeded or undershot is defined using this parameter.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "Single stage", "Two-stage" or "Three-stage".

**Notice**

For selection of parameter setting "PI" only the selection between "Percent" or "Byte" is available.

**11.5.12 CO2 controller — Send control value at switchover**

Options:	Inactive
	Active

At each change in status between ON and OFF, the corresponding control value is sent. The parameter must be activated for this.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command", "Priority" or "Scene".

### 11.5.13 CO2 controller — Send control value at change

Options:	Inactive
	In case of a change of 1%
	In case of a change of 2%
	In case of a change of 3%
	In case of a change of 4%
	In case of a change of 5%
	In case of a change of 6%
	In case of a change of 7%
	In case of a change of 8%
	In case of a change of 9%
	In case of a change of 10%
	In case of a change of 11%
	In case of a change of 12%
	In case of a change of 13%
	In case of a change of 14%
	In case of a change of 15%
	In case of a change of 16%
	In case of a change of 17%
	In case of a change of 18%
	In case of a change of 19%
	In case of a change of 20%
	In case of a change of 21%
	In case of a change of 22%
	In case of a change of 23%
	In case of a change of 24%
	In case of a change of 25%

The control value is sent after a defined percentage change. If this is not desired, the parameter must be set to "inactive".

**Notice**

The parameter is available only when parameter "Control value output format" is set on "PI".

**11.5.14 CO2 controller — Send control value cyclic**

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If you wish to send the control value cyclically through the corresponding KNX communication object, the corresponding time must be selected.

**11.5.15 CO2 controller — Hysteresis (symmetrical)**

Options:	50 ppm
	100 ppm
	150 ppm
	200 ppm
	250 ppm
	300 ppm

The basic set value has a hysteresis. If the parameterised hysteresis value is exceeded/undershot, the corresponding value is sent.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "Single stage", "Two-stage", "Three-stage" or "PI".

### 11.5.16 Settings— Switch command below threshold 1

Options:	Off
	On

The parameter defines which state should be sent after threshold value 1 is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

### 11.5.17 Settings— Priority below threshold 1

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after threshold value 1 is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

### 11.5.18 Settings — Value below threshold 1 (-100) for output format percent

Options:	0-100
----------	-------

If the parameterised value of the threshold is undershot, a defined parameterised value is sent on the KNX bus to reset the event that occurred beforehand. E.g., a fan is activated when the threshold is undershot to supply the room with fresh air. When the change of air has occurred and the CO2 concentration has again dropped below the threshold value, the fan is switched off.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

**11.5.19 Settings — Value below threshold 1 (-255) for output format byte**

Options:

0-255

If the parameterised value of the threshold is undershot, a defined parameterised value is sent on the KNX bus to reset the event that occurred beforehand. E.g. a fan is activated when the threshold is undershot to supply the room with fresh air. When the change of air has occurred and the CO2 concentration has again dropped below the threshold value, the fan is switched off.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Byte".

**11.5.20 Settings — Value below threshold 1 (-64) for output format scene**

Options:

1-64

If the parameterised value of the threshold is undershot, a defined parameterised value is sent on the KNX bus to reset the event that occurred beforehand. For example, a fan is activated when the threshold is undershot to supply the room with fresh air. When the change of air has occurred and the CO2 concentration has again dropped below the threshold value, the fan is switched off.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Scene".

**11.5.21 CO2 — CO2 threshold 1**

Options:	400 ppm
	450 ppm
	500 ppm
	550 ppm
	600 ppm
	650 ppm
	700 ppm
	750 ppm
	800 ppm
	850 ppm
	900 ppm
	950 ppm
	1000 ppm
	1050 ppm
	1100 ppm
	1150 ppm
	1200 ppm
	1250 ppm
	1300 ppm
	1350 ppm
	1400 ppm
	1450 ppm
	1500 ppm
	1550 ppm
	1600 ppm
	1650 ppm
	1700 ppm
	1750 ppm
	1800 ppm
	1850 ppm
	1900 ppm
	1950 ppm
	2000 ppm

The first basic value from which a reaction should be triggered, e.g., "Fan speed level 1" is defined through threshold 1.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "Single stage", "Two-stage" or "Three-stage".

### 11.5.22 Settings — Value for output format switching command

Options:	Off
	On

The parameter defines whether a value should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

### 11.5.23 Settings — Value for output format priority

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

### 11.5.24 Settings — Value for output format switching command

Options:	0-100
----------	-------

The parameter defines which value should be sent after the threshold value is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

#### 11.5.25 Settings — Value for output format byte

Options: 0-255

The parameter defines which value should be sent after the threshold value is undershot.



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Byte".

#### 11.5.26 Settings — Value for output format scene

Options: 0-64

The parameter defines which value should be sent after the threshold value is undershot.



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Scene".

**11.5.27 CO2 — CO2 threshold 2**

Options:	Same as threshold 1
	Threshold 1+50 ppm
	Threshold 1+100 ppm
	Threshold 1+150 ppm
	Threshold 1+200 ppm
	Threshold 1+250 ppm
	Threshold 1+300 ppm
	Threshold 1+350 ppm
	Threshold 1+400 ppm
	Threshold 1+450 ppm
	Threshold 1+500 ppm
	Threshold 1+550 ppm
	Threshold 1+600 ppm
	Threshold 1+650 ppm
	Threshold 1+700 ppm
	Threshold 1+750 ppm
	Threshold 1+800 ppm
	Threshold 1+850 ppm
	Threshold 1+900 ppm
	Threshold 1+950 ppm
	Threshold 1+1000 ppm

The parameterised value of threshold 2 from which a reaction should be triggered, e.g., "Fan speed level 2", is added to threshold 1 (basic value).

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "Two-stage" or "Three-stage".

#### 11.5.28 Settings — Value for output format switching command

Options:	Off
	On

The parameter defines whether a value should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

#### 11.5.29 Settings — Value for output format priority

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

#### 11.5.30 Settings — Value for output format switching command

Options:	0-100
----------	-------

The parameter defines which value should be sent after the threshold value is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

### 11.5.31 Settings — Value for output format byte

Options:

0-255

The parameter defines which value should be sent after the threshold value is undershot.



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Byte".

### 11.5.32 Settings — Value for output format scene

Options:

0-64

The parameter defines which value should be sent after the threshold value is undershot.



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Scene".

## 11.5.33 CO2 — CO2 threshold 3

Options:	Same as threshold 2
	Threshold 2+50 ppm
	Threshold 2+100 ppm
	Threshold 2+150 ppm
	Threshold 2+200 ppm
	Threshold 2+250 ppm
	Threshold 2+300 ppm
	Threshold 2+350 ppm
	Threshold 2+400 ppm
	Threshold 2+450 ppm
	Threshold 2+500 ppm
	Threshold 2+550 ppm
	Threshold 2+600 ppm
	Threshold 2+650 ppm
	Threshold 2+700 ppm
	Threshold 2+750 ppm
	Threshold 2+800 ppm
	Threshold 2+850 ppm
	Threshold 2+900 ppm
	Threshold 2+950 ppm
	Threshold 2+1000 ppm

The parameterised value of threshold 3 from which a reaction should be triggered, e.g., "Fan speed level 3", is added to threshold 1 (basic value) and threshold 2.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "Three-stage".

## 11.5.34 Settings — Value for output format switching command

Options:	Off
	On

The parameter defines whether a value should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

### 11.5.35 Settings — Value for output format priority

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after the threshold value is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

### 11.5.36 Settings — Value for output format switching command

Options:	0-100
----------	-------

The parameter defines which value should be sent after the threshold value is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

### 11.5.37 Settings — Value for output format byte

Options:	0-255
----------	-------

The parameter defines which value should be sent after the threshold value is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Byte".

#### 11.5.38 Settings — Value for output format scene

Options:	0-64
----------	------

The parameter defines which value should be sent after the threshold value is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Scene".

#### 11.5.39 Settings - blocking object

Options:	Inactive
	Active

The complete function of the CO2 sensor can be switched active or inactive using this parameter and the corresponding communication object.

#### 11.5.40 Behaviour at removing the blockage

Options:	Do not send any message
	Send current value

If the sensor is enabled again after the receipt of an OFF telegram, the following parameters can be selected:

- Do not send:
  - The sensor only sends its value when it has changed.
- Send current value:
  - The sensor sends its current value also when it has not changed.

**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

#### 11.5.41 Behaviour at setting the blockage

Options:	Send nothing
	Send value

If the sensor is blocked after the receipt of an ON telegram, the following parameters can be selected:

- Do not send:
  - The sensor sends no value during blockage.
- Send current value:
  - The sensor sends its current value during blockage also when it has not changed.

**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

#### 11.5.42 Settings — Value for blockage

Options:	0...64
----------	--------

Fixes the status for activating the blockage.

**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

#### 11.5.43 PI controller - Blocking object

Options:	Inactive
	Active

The complete function of the CO2 sensor can be blocked using this parameter and with a 1 via the corresponding communication object. Deactivation takes place by setting a value of 0.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "PI".

#### 11.5.44 PI controller — Readjust time (15...240 min)

Options:

15-240

In case of a PI controller for the control of a fan, for example, the I-component of the controller can be influenced by the set values.



#### Notice

The parameter is available only when parameter "CO2 controller type" is set on "PI".

#### 11.5.45 PI controller - Minimum control value

Options:	0%
	5%
	10%
	15%
	20%
	25%
	30%
	35%
	40%
	45%
	50%
	55%
	60%
	65%
	70%
	75%
	80%
	85%
	90%
	95%

The parameter can be used to influence the control value for controlling the fan or ventilation valve, for example.

In the process, the ventilation valve can be prevented from closing with a value greater than 0%.



#### Notice

The parameter is available only when parameter "CO2 controller type" is set on "PI".

**11.5.46 PI controller - Maximum control value**

Options:	5%
	10%
	15%
	20%
	25%
	30%
	35%
	40%
	45%
	50%
	55%
	60%
	65%
	70%
	75%
	80%
	85%
	90%
	95%
	100%

The parameter can be used to influence the control value for controlling the fan or ventilation valve, for example.

The maximum limit can be used to influence the ventilation valve directly, for example, so that a complete opening of the ventilation valve can be limited.

**Notice**

The parameter is available only when parameter "CO2 controller type" is set on "PI".

#### 11.5.47 PI controller — Control value at measurement failure

Options	End priority
	OFF with priority
	ON with priority

If the internal or external measurement malfunctions or fails, a defined switch command can be sent through this parameter.



##### Notice

The parameter is available only when parameter "CO2 controller type" is set on "PI".

#### 11.5.48 PI controller - Blocking object

Options:	Inactive
	Active

The complete function of the CO2 sensor can be blocked using this parameter and with a 1 via the corresponding communication object. Deactivation takes place by setting a value of 0.



##### Notice

The parameter is available only when parameter "CO2 controller type" is set on "PI".

#### 11.5.49 Behaviour at removing the blockage

Options:	Do not send any message
	Send current value

If the sensor is enabled again after the receipt of an OFF telegram, the following parameters can be selected:

- Do not send:
  - The sensor only sends its value when it has changed.
- Send current value:
  - The sensor sends its current value also when it has not changed.



##### Notice

The parameter is available only when parameter "Blocking object" is set on "Active".

### 11.5.50 Behaviour at setting the blockage

Options:	Send nothing
	Send value

If the sensor is blocked after the receipt of an ON telegram, the following parameters can be selected:

- Do not send:
  - The sensor sends no value during blockage.
- Send current value:
  - The sensor sends its current value during blockage also when it has not changed.

**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

### 11.5.51 PI controller - Value at blockage

Options:	0...100 %
----------	-----------

Fixes the status for activating the blockage.

**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

## 11.6 "Relative humidity" application

### 11.6.1 Relative humidity - Relative humidity sensor

Options:	Inactive
	Active

The parameter activates the relative humidity sensor. The corresponding communication objects are displayed in ETS.

### 11.6.2 Relative humidity — Correction of measured value

Options:	-5%
	-4%
	-3%
	-2%
	-1%
	0%
	1%
	2%
	3%
	4%
	5%

The measured humidity value can be corrected using the parameter. The corrected value is displayed on the device and sent to the KNX bus.

### 11.6.3 Relative humidity — Moisture sensor error

Options:	Message
	Do not send message

If an error is detected on the sensor, it can be sent to the KNX.

**11.6.4 Relative humidity - Send relative humidity at change**

Options:	Inactive
	In case of a change of 1%RH
	In case of a change of 2%RH
	In case of a change of 3%RH
	In case of a change of 4%RH
	In case of a change of 5%RH
	In case of a change of 6%RH
	In case of a change of 7%RH
	In case of a change of 8%RH
	In case of a change of 9%RH
	In case of a change of 10%RH
	In case of a change of 11%RH
	In case of a change of 12%RH
	In case of a change of 13%RH
	In case of a change of 14%RH
	In case of a change of 15%RH
	In case of a change of 16%RH
	In case of a change of 17%RH
	In case of a change of 18%RH
	In case of a change of 19%RH
	In case of a change of 20%RH
	In case of a change of 21%RH
	In case of a change of 22%RH
	In case of a change of 23%RH
	In case of a change of 24%RH
	In case of a change of 25%RH

The parameter is used to determine when a change should be actively sent to the KNX bus. The telegram load can be reduced by the setting.

### 11.6.5 Relative humidity - Send relative humidity cyclic

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If you wish to send the humidity cyclically through the corresponding KNX communication object, the corresponding time must be selected.

### 11.6.6 Relative humidity - External measured value

Options:	Inactive
	Active

An additional external measured value can be used in the measurement, as well.

### 11.6.7 Relative humidity - Component

Options:	Include in calculation at 10%
	Include in calculation at 20%
	Include in calculation at 30%
	Include in calculation at 40%
	Include in calculation at 50%
	Include in calculation at 60%
	Include in calculation at 70%
	Include in calculation at 80%
	Include in calculation at 90%
	Only use external measured value

The share of the weighting of and external measured value integrated through a KNX communication object is defined using this parameter.

**Notice**

The parameter is available only when parameter "External measured value" is set on "Active".

### 11.6.8 Relative humidity controller - Controller type

Options:	Inactive
	Single-stage
	Two-stage
	Three-stage
	PI

The control type for actuating the external fan is defined using this parameter.

### 11.6.9 Relative humidity — Permit change of the basic set value via bus

Options:	No
	Yes

The basic set value defined for the first threshold can be optimised via the KNX bus, e.g., through a visualisation.

### 11.6.10 Relative humidity — Control value output format

Options:	Switch command
	Priority
	Percent
	Byte
	Scene

The output value when the respective threshold is exceeded or undershot is defined using this parameter.

**Notice**

The parameter is available only when parameter "Controller type" is set on "Single stage", "Two-stage" or "Three-stage".

**Notice**

For selection of parameter setting "PI" only the selection between "Percent" or "Byte" is available.

### 11.6.11 Relative humidity controller — Send control value at switchover

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command", "Priority" or "Scene".

Options:	Inactive
	Active

At each change in status between inactive/active, the corresponding control value is sent. The parameter must be activated for this.

**11.6.12 Relative humidity controller — Send control value at change****Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

Options:	Inactive
	In case of a change of 1%
	In case of a change of 2%
	In case of a change of 3%
	In case of a change of 4%
	In case of a change of 5%
	In case of a change of 6%
	In case of a change of 7%
	In case of a change of 8%
	In case of a change of 9%
	In case of a change of 10%
	In case of a change of 11%
	In case of a change of 12%
	In case of a change of 13%
	In case of a change of 14%
	In case of a change of 15%
	In case of a change of 16%
	In case of a change of 17%
	In case of a change of 18%
	In case of a change of 19%
	In case of a change of 20%
	In case of a change of 21%
	In case of a change of 22%
	In case of a change of 23%
	In case of a change of 24%
	In case of a change of 25%

The control value is sent after a defined percentage change. If this is not desired, the parameter must be accordingly set to "inactive".

#### 11.6.13 Relative humidity controller — Send control value at change of byte



##### Notice

The parameter is available only when parameter "Control value output format" is set on "Byte".

Options:	Inactive
	In case of a change of 1
	In case of a change of 2
	In case of a change of 5
	In case of a change of 10
	In case of a change of 15
	In case of a change of 20
	In case of a change of 25
	In case of a change of 30
	In case of a change of 35
	In case of a change of 40
	In case of a change of 45
	In case of a change of 50

The control value is sent after a defined value change. If this is not desired, the parameter must be accordingly set to "inactive".

#### 11.6.14 Relative humidity controller — Send control value cyclic

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If you wish to send the control value cyclically through the corresponding KNX communication object, the corresponding time must be selected.

#### 11.6.15 Relative humidity controller - Hysteresis (symmetrical)

Options:	1%
	2%
	3%
	4%
	5%
	6%
	7%
	8%
	9%
	10%

The basic set value has a hysteresis. If the parameterised hysteresis value is exceeded/undershot, the corresponding value is sent.



##### Notice

The parameter is available only when parameter "CO2 controller type" is set on "Single stage", "Two-stage", "Three-stage" or "PI".

#### 11.6.16 Step controller — Switch command below threshold 1

Options:	Off
	On

The parameter defines which state should be sent after threshold value 1 is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

#### 11.6.17 Step controller — Priority below threshold 1

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after threshold value 1 is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

#### 11.6.18 Step controller — Percent below threshold 1

Options:	0 ... 100 %
----------	-------------

The parameter defines which state should be sent after threshold value 1 is undershot.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

#### 11.6.19 Step controller — Value below threshold 1 (byte)

Options: 0 ... 255

The parameter defines which state should be sent after threshold value 1 is undershot.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Byte".

#### 11.6.20 Step controller — Value below threshold 1 (scene)

Options: 0 ... 64

The parameter defines which state should be sent after threshold value 1 is undershot.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Scene".

#### 11.6.21 Step controller — RH threshold 1

Options:	20%
	21%
	22%
	23%
	24%
	25%
	26%
	27%
	28%
	29%
	30%
	31%
	32%
	33%
	34%
	35%
	36%
	37%
	38%
	39%
	40%
	41%
	42%
	43%
	44%
	45%
	46%
	47%
	48%
	49%
	50%

The first basic value from which a reaction should be triggered, e.g., "Fan speed level 1" is defined via threshold 1.

#### 11.6.22 Step controller — Switch command above threshold 1

Options:	Off
	On

The parameter defines which state should be sent after threshold value 1 is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

#### 11.6.23 Step controller — Priority above threshold 1

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after threshold value 1 is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

#### 11.6.24 Step controller — Percent above threshold 1

Options:	0 ... 100 %
----------	-------------

The parameter defines which state should be sent after threshold value 1 is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".

#### 11.6.25 Step controller — Value above threshold 1 (byte)

Options:	0 ... 255
----------	-----------

The parameter defines which state should be sent after threshold value 1 is exceeded.

#### 11.6.26 Step controller — Value above threshold 1 (scene)

Options:

0 ... 64

The parameter defines which state should be sent after threshold value 1 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Scene".

#### 11.6.27 Step controller — RH threshold 2

Options:	Same as threshold 1
	Threshold 1+1%
	Threshold 1+2%
	Threshold 1+3%
	Threshold 1+4%
	Threshold 1+5%
	Threshold 1+6%
	Threshold 1+7%
	Threshold 1+8%
	Threshold 1+9%
	Threshold 1+10%
	Threshold 1+11%
	Threshold 1+12%
	Threshold 1+13%
	Threshold 1+14%
	Threshold 1+15%
	Threshold 1+16%
	Threshold 1+17%
	Threshold 1+18%
	Threshold 1+19%
	Threshold 1+20%
	Threshold 1+21%
	Threshold 1+22%
	Threshold 1+23%
	Threshold 1+24%
	Threshold 1+25%
	Threshold 1+26%
	Threshold 1+27%
	Threshold 1+28%
	Threshold 1+29%
	Threshold 1+30%

The parameterised value of threshold 2 from which a reaction should be triggered, e.g., "Fan speed level 2", is added to threshold 1 (basic value).

**11.6.28 Step controller — Switch command above threshold 2**

Options:	Off
	On

The parameter defines which state should be sent after threshold value 2 is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

**Notice**

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

**11.6.29 Step controller— Priority above threshold 2**

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after threshold value 2 is exceeded.

**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

**Notice**

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

#### 11.6.30 Step controller — Percent above threshold 2

Options:

0 ... 100 %

The parameter defines which state should be sent after threshold value 2 is exceeded.



##### Notice

The parameter is available only when parameter "Control value output format" is set on "Percent".



##### Notice

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

#### 11.6.31 Step controller — Value above threshold 2 (byte)

Options:

0 ... 255

The parameter defines which state should be sent after threshold value 2 is exceeded.



##### Notice

The parameter is available only when parameter "Control value output format" is set on "Byte".



##### Notice

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

#### 11.6.32 Step controller — Value v of threshold 2 (scene)

Options:

0 ... 64

The parameter defines which state should be sent after threshold value 2 is exceeded.



##### Notice

The parameter is available only when parameter "Control value output format" is set on "Scene".



##### Notice

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

#### 11.6.33 Step controller — RH threshold 3

Options:	Same as threshold 2
	Threshold 2+1%
	Threshold 2+2%
	Threshold 2+3%
	Threshold 2+4%
	Threshold 2+5%
	Threshold 2+6%
	Threshold 2+7%
	Threshold 2+8%
	Threshold 2+9%
	Threshold 2+10%
	Threshold 2+11%
	Threshold 2+12%
	Threshold 2+13%
	Threshold 2+14%
	Threshold 2+15%
	Threshold 2+16%
	Threshold 2+17%
	Threshold 2+18%
	Threshold 2+19%
	Threshold 2+20%
	Threshold 2+21%
	Threshold 2+22%
	Threshold 2+23%
	Threshold 2+24%
	Threshold 2+25%
	Threshold 2+26%
	Threshold 2+27%
	Threshold 2+28%
	Threshold 2+29%
	Threshold 2+30%

The parameterised value of threshold 3 from which a reaction should be triggered, e.g., "Fan speed level 3", is added to threshold 1 (basic value) and threshold 2.

#### 11.6.34 Step controller — Switch command above threshold 3

Options:	Off
	On

The parameter defines which state should be sent after threshold value 3 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".



**Notice**

The parameter is available only when parameter "Controller type" is set on "Two-stage" or "Three-stage".

#### 11.6.35 Step controller — Switching command at measurement failure

Options:	Off
	On

If the internal or external measurement malfunctions or fails, a defined switching command can be sent through this parameter.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Switching command".

#### 11.6.36 Step controller — Priority above threshold 3

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent after threshold value 3 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".



**Notice**

The parameter is available only when parameter "Controller type" is set on "Three-stage".

#### 11.6.37 Step controller — Priority at measurement failure

Options:	End priority
	OFF with priority
	ON with priority

If the internal or external measurement malfunctions or fails, a defined switching command can be sent through this parameter.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Priority".

#### 11.6.38 Step controller — Percent above threshold 3

Options:

0 ... 100 %

The parameter defines which state should be sent after threshold value 3 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Percent".



**Notice**

The parameter is available only when parameter "Controller type" is set on "Three-stage".

#### 11.6.39 Step controller - Percentage at measurement value failure

Options:	0%
	5%
	10%
	15%
	20%
	25%
	30%
	35%
	40%
	45%
	50%
	55%
	60%
	65%
	70%
	75%
	80%
	85%
	90%
	95%
	100%

The parameterised value of threshold 3 from which a reaction should be triggered, e.g., "Fan speed level 3", is added to threshold 1 (basic value).



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Percent".

#### 11.6.40 Step controller — Value above threshold 3 (byte)

Options: 0 ... 255

The parameter defines which state should be sent after threshold value 3 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Byte".



**Notice**

The parameter is available only when parameter "Controller type" is set on "Three-stage".

#### 11.6.41 Step controller - Value at measurement value failure (byte)

Options: 0-255

If the internal or external measurement malfunctions or fails, a defined value can be sent through this parameter.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Byte".

#### 11.6.42 Step controller — Value above threshold 3 (scene)

Options: 0 ... 64

The parameter defines which state should be sent after threshold value 3 is exceeded.



**Notice**

The parameter is available only when parameter "Control value output format" is set on "Scene".



**Notice**

The parameter is available only when parameter "Controller type" is set on "Three-stage".

#### 11.6.43 Step controller - Value at measurement value failure (scene)

Options:

0-64

If the internal or external measurement malfunctions or fails, a defined value can be sent via this parameter.



#### Notice

The parameter is available only when parameter "Control value output format" is set on "Scene".

#### 11.6.44 PI controller — Setpoint (10...95%RH)

Options:

10-95

The parameter defines which value should be sent after the threshold value is undershot or when the value is below this threshold value.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

#### 11.6.45 PI controller - Proportional range (10...40%RH)

Options:

10-40

The parameter defines which value should be sent after the threshold value is exceeded or when the value is above this threshold value.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

#### 11.6.46 PI controller — Readjust time (15...240 min)

Options:

15-240

The first basic value from which a reaction should be triggered, e.g., "Fan speed level 1" is defined via threshold 3.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

#### 11.6.47 PI controller - Minimum control value

Options:

0 ... 240

The parameter defines which value should be sent after the threshold value is undershot or when the value is below this threshold value.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

### 11.6.48 PI controller - Maximum control value

Options:

10 - 255

The parameter defines which value should be sent after the threshold value is exceeded or when the value is above the threshold value.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

### 11.6.49 PI controller - Value at measured value failure

Options:

0 - 255

If the internal or external measurement malfunctions or fails, a defined value can be sent through this parameter.



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

### 11.6.50 PI controller - Blocking object

Options:

Inactive

Active

The complete function of the sensor can be blocked using this parameter and the corresponding communication object. Deactivation takes place by selecting "Inactive".



#### Notice

The parameter is available only when parameter "Controller type" is set on "PI".

### 11.6.51 Behaviour at removing the blockage

Options:	Do not send any message
	Send current value

If the sensor is enabled again after the receipt of an OFF telegram, the following parameters can be selected:

- Do not send:
  - The sensor only sends its value when it has changed.
- Send current value:
  - The sensor sends its current value also when it has not changed.



**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

#### 11.6.52 Behaviour at setting the blockage

Options:	Send nothing
	Send value

If the sensor is blocked after the receipt of an ON telegram, the following parameters can be selected:

- Do not send:
  - The sensor sends no value during blockage.
- Send current value:
  - The sensor sends its current value during blockage also when it has not changed.



**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

#### 11.6.53 PI controller - Value at blockage

Options:	0 - 255
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Fixes the status for activating the blockage.



**Notice**

The parameter is available only when parameter "Blocking object" is set on "Active".

**11.6.54 Dew point temperature — Dew point sensor**

Options:	Inactive
	Active

The parameter activates the dew point sensor. The corresponding communication objects are displayed in ETS.

**11.6.55 Dew point — Dew point temperature**

Options:	Inactive
	In case of a change of 0.1°C
	In case of a change of 0.2°C
	In case of a change of 0.5°C
	In case of a change of 1.0°C
	In case of a change of 1.5°C
	In case of a change of 2.0°C
	In case of a change of 2.5°C
	In case of a change of 3.0°C
	In case of a change of 3.5°C
	In case of a change of 4.0°C
	In case of a change of 4.5°C
	In case of a change of 5.0°C
	In case of a change of 6.0°C
	In case of a change of 7.0°C
	In case of a change of 8.0°C
	In case of a change of 9.0°C
	In case of a change of 10°C

The parameter is used to determine when a change should be actively sent to the KNX bus. The telegram load can be reduced by the setting.

**11.6.56 Dew point — Cyclically send dew point temperature**

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If you wish to send the dew point temperature cyclically through the corresponding KNX communication object, the corresponding time must be selected.

**11.6.57 Dew point alarm — Dew point alarm**

Options:	Inactive
	Active

If an alarm is sent when the parameterised dew point is exceeded, the parameter must be set to "active". A corresponding communication object is displayed in ETS in parallel.

**11.6.58 Dew point alarm — Dew point alarm advance**

Options:	0
	1°C
	2°C
	3°C
	4°C
	5°C

If the alarm is triggered before the dew point is reached, the advance can be set using this parameter. In this way, for example, a fan can be activated before the dew point alarm is reached so that the alarm case is delayed or does not even occur.

**11.6.59 Dew point alarm — Dew point alarm hysteresis (symmetrical)**

Options:	0
	1°C
	2°C
	3°C
	4°C
	5°C

The basic set value has a hysteresis. If the parameterised hysteresis value is exceeded/undershot, the corresponding value is sent.

**11.6.60 Dew point alarm — Send dew point alarm at status change**

Options:	Inactive
	Active

If a changed value/status is present, it can be activated and sent to the KNX bus via the corresponding communication object.

**11.6.61 Dew point alarm — Send dew point alarm cyclic**

Options:	Inactive
	Every minute
	Every 2 minutes
	Every 3 minutes
	Every 4 minutes
	Every 5 minutes
	Every 10 minutes
	Every 15 minutes
	Every 20 minutes
	Every 45 minutes
	Every hour
	Every 2 hours
	Every 3 hours
	Every 4 hours
	Every 5 hours
	Every 6 hours
	Every 12 hours
	Once a day

If the current alarm should be sent cyclically through the corresponding KNX communication object, the corresponding time must be selected here.

**11.6.62 Dew point alarm — Telegram type for dew point alarm**

Options:	Switch command
	Priority
	Percent
	Byte
	Scene

This parameter defines the output value when the dew point alarm is present.

**11.6.63 Dew point alarm — Switch command for dew point alarm**

Options:	Off
	On

The parameter defines which state should be sent in case of a dew point alarm.

**11.6.64 Dew point alarm — Switch command at the end of the dew point alarm**

Options:	Off
	On

On

If the dew point alarm is no longer present at the object, this parameter can be used to define which status should be sent.

#### 11.6.65 Dew point alarm — Priority for dew point alarm

Options:	End priority
	OFF with priority
	ON with priority

The parameter defines which state should be sent in case of a dew point alarm.

#### 11.6.66 Dew point alarm — Priority at the end of the dew point alarm

Options:	End priority
	OFF with priority
	ON with priority

If the dew point alarm is no longer present at the object, this parameter can be used to define which status should be sent.

#### 11.6.67 Dew point alarm — Percent for dew point alarm

Options:	0-100%
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This parameter defines which value between 0 and 100% is sent in case of a dew point alarm.

#### 11.6.68 Dew point alarm — Percent at the end of the dew point alarm

Options:	0-100%
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If the dew point alarm is no longer present at the object, this parameter can be used to define which value between 0 and 100% should be sent.

#### 11.6.69 Dew point alarm — Value for dew point alarm (0 - 255)

Options:	0-255
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This parameter defines which value between 0 and 255 is sent in case of a dew point alarm.

#### 11.6.70 Dew point alarm — Value at the end of the dew point alarm (0 - 255)

Options:	0-255
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If the dew point alarm is no longer present at the object, this parameter can be used to define which value between 0 and 255 should be sent.

**11.6.71 Dew point alarm — Scene for dew point alarm (1 - 64)**

Options: 1-64

This parameter defines which scene between 1 and 64 is sent in case of a dew point alarm.

**11.6.72 Dew point alarm — Scene at the end of the dew point alarm (1 - 64)**

Options: 1 - 64

If the dew point alarm is no longer present at the object, this parameter can be used to define which scene between 1 and 64 should be sent.

#### 11.7 Application "Function block x"

Depending on the device type, from one to five function blocks with buttons and LED applications for up to 10 buttons are available:

- Function block 1: Settings for buttons 1 and 2.
- Function block 2: Settings for buttons 3 and 4.
- Function block 3: Settings for buttons 5 and 6.
- Function block 4: Settings for buttons 7 and 8.
- Function block 5: Settings for buttons 9 and 10.

### 11.7.1 Function block x - Application

#### Button applications:

Options:	2-button switching
	1-button switching
	2-button dimming
	1-button dimming
	2-button blind
	1-button blind
	2-button value transmitter
	1-button value transmitter
	1-button value transmitter, 2 objects
	2-button value dimming sensor
	1-button light scene extension unit with memory function
	2-button step switch
	1-button step switch
	1-button multiple operation
	1-button short-long operation
	1-button operating mode, "Adjust RTC"
	2-button RTC function internal
	1-button RTC function internal
	Inactive



#### Note

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

- 2-button switching:
  - The application makes it possible to switch a light via a button pair. Additional information, .
- 1-button switching:
  - The application makes it possible to switch a light via a button. Additional information, .
- 2-button dimming:
  - The application makes it possible to dim and switch a light via a button pair. Additional information, .
- 1-button dimming:
  - The application makes it possible to dim and switch a light via a button. Additional information, .
- 2-button blind:
  - The application makes it possible to control blinds and roller blinds via a button pair. Additional information, .
- 1-button blind:

- The application makes it possible to control blinds and roller blinds via a button. The length of press of the button can be set for different movement commands. Additional information, .
- 2-button value transmitter:
  - The application makes it possible to send two preset values with the same bit size with a button pair via a joint communication object. Additional information, .
- 1-button value transmitter:
  - At a press and release of the button the application makes it possible to send different, preset values via a joint communication object. Additional information, .
- 1-button value transmitter, 2 objects:
  - At a press and release of the button the application makes it possible to send different, preset values via separate communication objects. Additional information, .
- 2-button value dimming sensor:
  - The application makes it possible to dim the light brighter and darker via a button pair. The dimming values are sent via a joint communication object. Additional information, .
- 1-button light scene extension unit with memory function:
  - The application can be used to call up and save one of 64 possible light scenes with a press of the button. Additional information, .
- 2-button step switch:
  - Up to five switching levels can be activated for a button pair via the application. One button is used to switch the steps up and the other button to switch them down. Additional information, .
- 1-button step switch:
  - Up to five switching levels can be activated for a button via the application. The switching levels of the first button can be combined with the switching levels of the second button of a function block. Additional information, .
- 1-button multiple operation:
  - The application is used to create from one up to five button operations. Different bit values can be sent for each single and multiple press of the button. Additional information, .
- 1-button short-long operation:
  - The application can be used to set the value for long and short operations. Additional information, .
- 1-button operating mode, "Adjust RTC".
  - The operating mode of linked room temperature controllers can be switched over via the application with a press of the button. Additional information, .
- 2-button RTC function internal:
  - The application is active. Additional information, .
- 1-button RTC function internal:
  - The application is active. Additional information, .
- Inactive:
  - No applications are enabled.

### 11.7.2 Application - 2-button switching

The application makes it possible to switch a light via a button pair.

The following communication object is available:

- "Sx: switching"

At the press of one of the two buttons a switching command is sent via the same communication object. The application distinguishes whether the first or second button is pressed.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.



#### Note

The parameters for application "2-button switching" can be called up via **general parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.2.1 Working mode of the buttons for switching

Options:	1st button on / 2nd button off
	1st button off / 2nd button on
	Alternating on/off

- 1st Button on / 2nd button off:
  - When the first button is pressed the "On" command is sent and the "Off" command when the second button is pressed.
- 1st Button off / 2nd button on:
  - When the first button is pressed the "Off" command is sent and the "On" command when the second button is pressed.
- Alternating on/off:
  - "On" and "Off" are sent alternately at the press of the first or second button.

The parameter is used to specify, for example, whether a light is switched on or off with the first and second button.

A further option can be specified as to whether the switching commands are sent alternately, independent from the button pressed. This means that after "On" is sent, "Off" is sent at a renewed press of one of the two buttons. After one of the two buttons is pressed again, "On" is sent again.

This also applies for values that are received via the associated 1-bit communication object "Sx: switching". This means that when an Off command is received after an On command was sent via object "Sx: switching", an On command is sent after the button is pressed again. It must be ensured here that the S-flag (writing) of the communication object is activated.

### 11.7.3 Application - 1-button switching

The application makes it possible to switch a light via a button.

The following communication object is available:

- "Sx: switching"

The application can differentiate between the press and the releasing of a button. When actuated and released a switching telegram is sent out each time.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.



#### Note

The parameters for application "1-button switching" can be called up via **general parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.3.1 Reaction on rising edge

Options:	Deactivated
	Off
	On
	Alternating on/off

- Deactivated:
  - No telegram is sent at the press of the button.
- Off:
  - The "Off" telegram is sent at the press of the button (at rising edge).
- On:
  - The "On" telegram is sent at the press of the button (at rising edge).
- Alternating on/off:
  - "On" and "Off" are sent alternately 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 an On or Off telegram is sent on the bus at a rising edge via the 1-bit communication object "Sx: switching". A further option can be specified as to whether the switching telegrams are sent alternately. This means that after "On" is sent, "Off" is sent at a renewed press of the button. After it is pressed again, "On" is sent.

## 11.7.3.2 Reaction on falling edge

Options:	Deactivated
	Off
	On
	Alternating on/off

- Deactivated:
  - No telegram is sent when the button is released.
- Off:
  - The "Off" telegram is sent when the button is released (at falling edge).
- On:
  - The "On" telegram is sent when the button is released (at falling edge).
- Alternating on/off:
  - "On" and "Off" are sent alternately when the button is released.

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 an On or Off telegram is sent on the bus at a falling edge via the 1-bit communication object "Sx: switching". A further option can be specified as to whether the switching telegrams are sent alternately. This means that after value "On" has been sent, "Off" is sent at a renewed release of the button. After it is released again, "On" is again sent out.

- Deactivated:
  - No telegram is sent when the button is released.
- Off:
  - The "Off" telegram is sent when the button is released (at falling edge).
- On:
  - The "On" telegram is sent when the button is released (at falling edge).
- Alternating on/off:
  - "On" and "Off" are sent alternately when the button is released.

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 an On or Off telegram is sent on the bus at a falling edge via the 1-bit communication object "Sx: switching". A further option can be specified as to whether the switching telegrams are sent alternately. This means that after value "On" has been sent, "Off" is sent at a renewed release of the button. After it is released again, "On" is again sent out.

#### 11.7.4 Application - 2-button dimming

The application makes it possible to dim and switch a light via a button pair.

The following communication objects are available:

- "Sx: switching"
- "Sx: relative dimming"

The button pair has a joint switching and dimming object. The application is used to specify which of the two buttons triggers a switching telegram or a dimming telegram. The first button, for example, can be used to dim a lamp and the second button to switch it on or off.

It can also be specified whether the light is dimmed with a short or long press of the button.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.

**Note**

The parameters for application "2-button dimming" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

##### 11.7.4.1 Duration of long operation

Options:

Setting option from 00.300 to 03.000 (ss.fff)

The application can differentiate between a short and a long press of the button and thus trigger a dimming or switching signal.

The parameter is used to specify the time from which a long press of the button is recognised and the object values are reset. A typical value for a long press of the button is 0.4 seconds.

**11.7.4.2 Manner of dimming**

Options:	Start-stop dimming
	Step-wise dimming

- Start-stop dimming:
  - At the press of a button the command "dim brighter" or "dim darker" is sent. When the button is released, the command "Stop dimming" is sent.
- Step-wise dimming:
  - A defined value, e.g. "Dim brighter by 6.25%" is always sent out for triggering of a dimming command.

The parameter is used to specify the way a light is dimmed with a press of a button.

For "Start-Stop dimming" two 3-bit telegrams for dimming are sent. At a press of the button the first telegram with the command "Dim 100% brighter" or "Dim 100% darker" is sent to the linked dimming actuator. When the button is released, the second telegram with the command "Stop dimming" is sent. Hence, a connected dimming actuator can be halted at any time during the dimming phase.

For step-wise dimming, a defined value, e.g. "Dim brighter by 6.25%", is sent to the linked dimming actuator after triggering a dimming command. This type of dimming is especially suitable for systems in which dimming sensors and dimming actuators are installed in different lines. In this case couplers could cause a delay in telegrams, which could lead to different brightness values.

**11.7.4.3 Step size for step-wise dimming (%)**

Options:	1.56
	3.13
	6.25
	12.5
	25
	50

The parameter is used to specify how many percent per step the light is dimmed. The value sent, always relates to the current brightness value.

Example (setting 12.5%):

The light is dimmed to a brightness value of 70%. With a press of the button the command "Dim brighter by 12.5%" is sent. After receiving the dimming command, the dimming actuator increases the brightness value to 82.5%.

**Note**

If step-wise dimming is used to evenly dim multiple dimming actuators in different lines, a low step size should be selected, e.g. 3.13%. At the same time the cyclical sending of the dimming telegrams should be activated. This ensures that dimming telegrams are sent continuously as long as the button is pressed.

**Note**

The parameter is only adjustable if the "Dimming mode" parameter is set on "Step-wise dimming".

#### 11.7.4.4 Dimming function

Options:	Short operation dimming, long operation switching
	Short operation switching, long operation dimming

- Short operation dimming, long operation switching:
  - The "dimming" telegram is sent at a short press of the button. The "switching" telegram is sent at a long press of the button.
- Short operation switching, long operation dimming:
  - The "switching" telegram is sent at a short press of the button. The "dimming" telegram is sent at a long press of the button.

The application can differentiate between a short and a long press of the button.

The parameter is used to specify whether a switching telegram or a dimming telegram is sent on the bus at a short or long press of the button.

The time for a long press of the button is set via parameter "Time for long operation".



##### Note

The parameter is only adjustable if the "Dimming mode" parameter is set on "Step-wise dimming".

#### 11.7.4.5 Working mode of the buttons for switching

Options:	1st button on / 2nd button off
	1st button off / 2nd button on
	Alternating on/off

- 1st Button on / 2nd button off:
  - When the first button is pressed the "On" command is sent and the "Off" command when the second button is pressed.
- 1st Button off / 2nd button on:
  - When the first button is pressed the "Off" command is sent and the "On" command when the second button is pressed.
- Alternating on/off:
  - "On" and "Off" are sent alternately at the press of the first or second button.

The parameter is used to specify, for example, whether a light is switched on or off with the first and second button.

A further option can be specified as to whether the switching commands are sent alternately, independent from the button pressed. This means that after "On" is sent, "Off" is sent at a renewed press of one the two buttons. After one of the two buttons is pressed again, "On" is sent again.

This also applies for values that are received via the associated 1-bit communication object "Sx: switching". This means that when an Off command is received after an On command was sent via object "Sx: switching", an On command is sent after the button is pressed again. It must be ensured here that the S-flag (writing) of the communication object is activated.

#### 11.7.4.6 Working mode of the buttons for dimming

Options:	1st button brighter / 2nd button darker
	1st button darker / 2nd button brighter

- First button brighter / 2nd button darker:
  - When the first button is pressed the "dim brighter" command is sent and the "dim darker" command when the second button is pressed.
- First button darker / 2nd button brighter:
  - When the first button is pressed the "dim darker" command is sent and the "dim brighter" command when the second button is pressed.

The parameter is used to specify whether the light is dimmed brighter or darker with the first and second button.

At the press of a button a telegram is sent to the dimming actuator via the 3-bit communication object "Sx: relative dimming".

#### 11.7.4.7 Dimming stop telegram

Options:	Dimming stop is not sent
	Dimming stop is sent

- Dimming stop is not sent:
  - When the button is released, no "Stop dimming" command is sent.
- Dimming stop is sent:
  - When the button is released, the command "Stop dimming" is sent.

The parameter is used to specify whether the "Stop dimming" command is sent when the button is released after a long press. Hence, a connected dimming actuator can be halted at any time during the dimming phase.



##### Note

This parameter is only adjustable if parameter "Manner of dimming" is set on "Step-wise dimming" and parameter "Dimming function" is set on "Short operation switching, long operation dimming".

#### 11.7.4.8 Cyclic sending of the dimming telegrams

Options:	Deactivated
	Activated

- Deactivated:
  - No dimming telegrams are sent cyclic as long as the button is pressed.
- Activated:
  - Telegrams are sent cyclic as long as the button is pressed.

The parameter is used to specify whether dimming telegrams are sent cyclic on the bus via 3-bit communication object "S1: relative dimming" as long as the button is pressed.

After releasing the button, the cyclic sending of the dimming telegrams is stopped. The cycle time is specified via the "Duration of the telegram repetition" parameter.



##### Note

This parameter is only adjustable if parameter "Manner of dimming" is set on "Step-wise dimming" and parameter "Dimming function" is set on "Short operation switching, long operation dimming".

#### 11.7.4.9 Duration of telegram repetition

Options:

Setting option from 00.100 to 05.000 (ss.fff)

Telegrams are sent cyclic to the dimming actuator via communication object "Sx: relative dimming" as long as the button is pressed.

The parameter is used to set time intervals between the telegrams. The default setting is 1 second.



#### Note

The parameter is available only via the following settings:

- Parameter "Manner of dimming" is set on "Step-wise dimming".  
and
- Parameter "Dimming function" is set on "Short operation switching, long operation dimming".  
and
- Parameter "Cyclic sending of dimming telegrams" is set on "activated".

### 11.7.5 Application - 1-button dimming

The application makes it possible to dim and switch a light via a button.

The following communication objects are available:

- "Sx: switching"
- "Sx: relative dimming"

The button has a switching object and a dimming object. A distinction is made between a short press of the button (switching) and a long press (dimming).

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons.

**Note**

The parameters for application "1-button dimming" can be called up via **general parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.5.1 Duration of long operation

Options:

Setting option from 00.300 to 03.000 (ss.fff)

The application can differentiate between a short and a long press of the button. With a short press of the button, the next level forward is switched to. With a long press of the button, the first level is activated. Thus with a long press of the button a jump back from every level to the first level is possible, without having to run through the remaining levels.

The parameter is used to specify the time from which a long press of the button is recognised and the object values are reset. A typical value for a long press of the button is 0.4 seconds.

### 11.7.5.2 Working mode of the buttons for switching

Options:	Deactivated
	Off
	On
	Alternating on/off

- Deactivated:
  - No command is sent at the press of the button.
- Off:
  - The "Off" command is sent at the press of the button.
- On:
  - The "On" command is sent at the press of the button.
- Alternating on/off:
  - "On" and "Off" are sent alternately at the press of the button.

The parameter is used to specify whether an On or an Off command is sent on the bus via 1-bit communication object "Sx: switching" when the button is pressed.

A further option can be specified as to whether the switching commands are sent alternately. This means that after "On" is sent, "Off" is sent at a renewed press of the button. After it is pressed again, "On" is sent.

### 11.7.5.3 Working mode of the buttons for dimming

Options:	Darker
	Brighter
	Alternating brighter/darker

- Darker:
  - The "Dim darker" command is sent at a long press of the button.
- Brighter:
  - The "Dim brighter" command is sent at a long press of the button.
- Alternating brighter/darker:
  - "Dim darker" and "Dim brighter" are sent alternately at a long press of the button.

The parameter is used to specify whether a telegram with the "Dim brighter" or "Dim darker" command is sent on the bus via the 3-bit communication object "Sx: relative dimming" at a long press of the button.

A further option can be specified as to whether the dimming telegrams are sent alternately at each long press of the button. This means that after "Dim brighter" is sent, "Dim darker" is sent at a renewed press of the button. After it is pressed again, "Dim brighter" is sent.

### 11.7.6 Application - 2-button blind

The application makes it possible to control blinds and roller blinds via a button pair.

The following communication objects are available:

- "Sx: moving" (1-bit object)
- "Sx: adjusting" (1-bit object)
- "Sx: position" (1-byte object)
- "Sx: slats" (1-byte object)

The application is used to specify whether the first or second button triggers the "Up" or "Down" movement command. Also Up and Down positions as well as slat position can be preset.

Movement and slat adjustment commands are sent to linked blind actuators with long and short button operations. A long press of the button triggers a move command. A short press of the button triggers a command to adjust the slats.

The sensor stores the last command carried out with the button that is occupied with the application. This means, for example, if a blind was lowered and halted at half height via a short press of the button, then a renewed long press of the button will raise the blind.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.

**Note**

The parameters for application "2-button blind" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

### 11.7.6.1 Duration of long operation

Options:	Setting option from 00.300 to 03.000 (ss.fff)
----------	-----------------------------------------------

The application can differentiate between a short and a long press of the button. At a short press of the button a telegram with the command "Move/position blind" is sent on the bus. At a long press of the button a telegram with the command "Adjust/position slats" is sent.

The parameter is used to specify the time after which a long button press is recognised. A telegram is sent on the bus via communication object "Sx: adjust" or "Sx: slat position" only after this time has expired. A typical value for a long press of the button is 0.4 seconds.



#### Note

The command "Adjust/position blind" is sent immediately after the press of the button. The command is also sent if the button is pressed long and a "Adjust/position slats" command is sent due to the long operation. This causes a short jerking of the blind since the first slats adjustment command is always interpreted by a blind actuator as a stop command.

### 11.7.6.2 Object type

Options:	1 bit
	1 byte 0 - 100%

- 1 bit:
  - The value is sent as 1-bit switching commands (up/down or adjustment).
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (position in percent).

The parameter is used to set the size of communication objects for the control of blinds. For selection "1 bit", objects "Sx: moving" and "Sx: adjusting" are available. For selection "1 byte 0-100%", objects "Sx: position" and "Lx: slat position" are available.

If option "1 byte 0-100%" is selected, communication objects can be connected with 1-byte position objects of the blind actuators. Also desired positions of the blind can be preset under **Extended parameters**.

Example: Button 1 always moves the blind down to 50%, with the slats closed at 50%. Button 1 always moves the blind down to 80%, with the slats closed at 100%.

### 11.7.6.3 Working mode of the buttons

Options:	1st button Up / 2nd button Down
	1st button Down / 2nd button Up

- 1st button Up / 2nd button Down:
  - When the first button is pressed the "Up" command is sent and the "Down" command when the second button is pressed.
- 1st button Down / 2nd button Up:
  - When the first button is pressed the "Down" command is sent and the "Up" command when the second button is pressed.

The parameter is used to specify whether the first or second button triggers the "Up" or "Down" movement command.

### 11.7.6.4 Value for position down (%)

Options:	Setting option from 0 to 100 (%)
----------	----------------------------------

The parameter is used to set the position to which a linked blind is to be lowered. The associated 1-byte communication object "Sx: position" must hereby be connected with a 1-byte position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0% = blind completely raised.
- 100% = blind completely lowered.



#### Note

The parameter is only adjustable if the "object type" parameter is set to "1 byte 0 - 100%".

### 11.7.6.5 Value for position up (%)

Options:	Setting option from 0 to 100 (%)
----------	----------------------------------

The parameter is used to set the position to which a linked blind is to be raised. The associated 1-byte communication object "Sx: position" must hereby be connected with a 1-byte position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0% = blind completely raised.
- 100% = blind completely lowered.



#### Note

The parameter is only adjustable if the "object type" parameter is set to "1 byte 0 - 100%".

#### 11.7.6.6 Value for slats position down (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which the slats of the linked blind are to open. The associated 1-byte "Sx: slat position" communication object must hereby be connected with the 1-byte slat position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0 % = slats completely open.
- 100 % = slats completely closed.

**Note**

The parameter is only adjustable if the "object type" parameter is set to "1 byte 0 - 100%".

#### 11.7.6.7 Value for slats position down (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which the slats of the linked blind are to close. The associated 1-byte "Sx: slat position" communication object must hereby be connected with the 1-byte slat position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0 % = slats completely open.
- 100 % = slats completely closed.

**Note**

The parameter is only adjustable if the "object type" parameter is set to "1 byte 0 - 100%".

### 11.7.7 Application - 1-button blind

The application makes it possible to control blinds and roller blinds via a button.

The following communication objects are available:

- "Sx: moving" (for blinds/roller blinds, 1 Bit)
- "Sx: adjusting" (for blinds, 1-bit)
- "Sx: position" (for blinds, 1-byte)
- "Sx: slats" (for blinds, 1-byte)
- "Sx: stop" (for roller blinds, 1 bit)

The application can be used to set the length of the button actuations for the operating functions of blinds and roller blinds.

**Blinds:** Movement and slat adjustment commands are sent to linked blind actuators with long and short button operations. A long press of the button triggers a move command. A short press of the button triggers a command to adjust the slats.

**Roller blinds:** Movement and stop commands are sent to linked roller blind actuators with long and short button operations. A long press of the button triggers a move command. A short press of the button triggers a stop command.

**Blinds and roller blinds:** The sensor stores the last command carried out with the button that is occupied with the application. This means, for example, if a blind was lowered and halted at half height via a short press of the button, then a renewed long press of the button will raise the blind.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons.



#### Note

The parameters for application "1-button blind" can be called up via **general parameters** and **extended parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.7.1 Duration of long operation

Options:

Setting option from 00.300 to 03.000 (ss.fff)

The application can differentiate between a short and a long press of the button. At a short press of the button a telegram with the command "Move blind/roller blind" is sent on the bus. At a long press of the button a telegram with the command "Adjust slats" or "Stop roller blind" is sent.

The parameter is used to specify the time after which a long button press is recognised. A telegram is sent on the bus via communication object "Sx: adjust" or "Sx: stop" only after this time has expired. A typical value for a long press of the button is 0.4 seconds.



#### Note

The command "Move blind" is sent immediately after the press of the button. The command is also sent if the button is pressed long and a "Adjust slats" command is sent due to the long operation. This causes a short jerking of the blind since the first slats adjustment command is always interpreted by a blind actuator as a stop command.

#### 11.7.7.2 Cycle time of the telegram repetition

Options:

Setting option from 00.100 to 05.000 (ss.fff)

Telegrams are sent cyclic to the blind actuator via communication object "Sx: adjust" as long as the button is pressed.

The parameter is used to set time intervals between the telegrams. The default setting is 1 second.

This function serves to more accurately position larger slats that require a longer time for a complete slat rotation. This means that the button can remain pressed and be specifically released when the slats have reached the desired position.



#### Note

The parameter can only be set if the "Object type" parameter is set on "1 bit" and the "Blind/roller blind function switchover" parameter is set on "Blind".

## 11.7.7.3

## Object type

Options:	1 bit
	1 byte 0 - 100%

- 1 bit:
  - The value is sent as 1-bit switching commands (up/down or adjustment).
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (position in percent).

The parameter is used to set the size of communication objects for the control of blinds. For selection "1 bit", objects "Sx: moving" and "Sx: adjusting" are available. For selection "1 byte 0-100%", objects "Sx: position" and "Lx: slat position" are available.

If option "1 byte 0-100%" is selected, communication objects can be connected with 1-byte position objects of the blind actuators. Also desired positions of the blind can be preset under **Extended parameters**.

Example: Button 1 always moves the blind down to 50%, with the slats closed at 50%. Button 1 always moves the blind down to 80%, with the slats closed at 100%.

**Note**

The parameter can only be set if the "Blind/roller blind function switchover" parameter is set on "Blind".

## 11.7.7.4

## Function switchover blinds/roller blinds

Options:	Blind
	Roller blind

- Blind:
  - The application is fixed on blind control.
- Roller blind:
  - The application is fixed on roller blind control.

The parameter is used to specify whether the sensor or the selected button can be used for a blind or a roller blind control.

**Note**

If the "Blind" function is selected and parameter "Object type" is fixed on "1 byte 0-100%", the following parameters are available.

#### 11.7.7.5 Value for position down (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which a linked blind is to be lowered. The associated 1-byte communication object "Sx: position" must hereby be connected with a 1-byte position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0% = blind completely raised.
- 100% = blind completely lowered.



#### Note

The parameter can only be set if the "Blind/roller blind switchover function" parameter is set on "Blind" and the "Object type" parameter is set on "1-byte 0-100%.

#### 11.7.7.6 Value for position up (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which a linked blind is to be raised. The associated 1-byte communication object "Sx: position" must hereby be connected with a 1-byte position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0% = blind completely raised.
- 100% = blind completely lowered.



#### Note

The parameter can only be set if the "Blind/roller blind switchover function" parameter is set on "Blind" and the "Object type" parameter is set on "1-byte 0-100%.

#### 11.7.7.7 Value for slats position down (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which the slats of the linked blind are to open. The associated 1-byte "Sx: slat position" communication object must hereby be connected with the 1-byte slat position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0 % = slats completely open.
- 100 % = slats completely closed.



#### Note

The parameter can only be set if the "Blind/roller blind switchover function" parameter is set on "Blind" and the "Object type" parameter is set on "1-byte 0-100%.

#### 11.7.7.8 Value for slats position down (%)

Options:

Setting option from 0 to 100 (%)

The parameter is used to set the position to which the slats of the linked blind are to close. The associated 1-byte "Sx: slat position" communication object must hereby be connected with the 1-byte slat position object of the blind actuator.

Percentage values can be set in steps of 1%. Meaning of the percentage values:

- 0 % = slats completely open.
- 100 % = slats completely closed.



#### Note

The parameter can only be set if the "Blind/roller blind switchover function" parameter is set on "Blind" and the "Object type" parameter is set on "1-byte 0-100%.

### 11.7.8 Application - 2-button value transmitter

The application makes it possible to send preset values with a button pair via a joint communication object.

The following communication object is available:

- "Sx: switching value"

A telegram with value 1 is sent with the press of the first button. A telegram with value 2 is sent with the second button. Both values have the same bit size and are sent on the bus via the "Sx: switching value" communication object. The bit size is specified via the "Object type" parameter.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.



#### Note

The parameters for application "2-button value transmitter" can be called up via **general parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

## 11.7.8.1

## Object type

Options:	1 bit
	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:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/false.
- 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:
  - 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 communication object "Sx: switching value" (input/output) for a button pair.

## 11.7.8.2

## Working mode of the buttons

Options:	1st button value 1 / 2nd button value 2
	1st button value 2 / 2nd button value 1
	Alternating value1/value2

- 1st button value 1 / 2nd button value 2:
  - When the first button is pressed the value 1 is sent and value 2 when the second button is pressed.
- 1st button value 2 / 2nd button value 1:
  - When the first button is pressed the value 2 is sent and value 1 when the second button is pressed.
- Alternating value 1/value 2:
  - "Value 1" and "Value 2" are sent alternately at the press of the first or second button.

The parameter is used to specify the value that is sent on the bus via communication object "Sx: switching" at a press of the first or second button.

A further option can be specified as to whether the values are sent alternately, independent from the button pressed. This means that after value 1 is sent, value 2 is sent at a renewed press of one the two buttons. After one of the two buttons is pressed again, value 1 is sent again.

This also applies for values that are received via the associated communication object "Sx: switching value". This means that when value 2 is received via object "Sx: switching value" after value 1 is sent, value 1 is sent again after the button is pressed. It must be ensured here that the S-flag (writing) of the communication object is activated.

### 11.7.8.3 Value 1/Value 2

The possible options and setting limits 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 "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 parameter is used to set value 1 or value 2 that is sent at a press of one of the two buttons of the function block.

#### 11.7.9 Application - 1-button value transmitter

At a press and release of the button the application makes it possible to send different, preset values via a joint communication object.

The following communication object is available:

- "Sx: switching"

The application can differentiate between the press and the releasing of a button (rising/falling edge). All telegrams have the same bit size.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.



#### Note

The parameters for application "1-button value transmitter" can be called up via **general parameters** and **extended parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

## 11.7.9.1

## Object type

Options:	1 bit
	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:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/false.
- 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:
  - 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 communication object "Sx: switching" (input/output).

**11.7.9.2 Reaction on rising edge**

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent at the press of the button.
- 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.

Application "1-button value transmitter" can differentiate between the press and the releasing of the button. A press is defined as "Rising edge" and the releasing as "Falling edge". Only one communication object is available for both edges.

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 "Sx: 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.

## 11.7.9.3

## Reaction on falling edge

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent when the button is released.
- 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.

Application "1-button value transmitter" can differentiate between the press and the releasing of a button. A press is defined as "Rising edge" and the releasing as "Falling edge". Only one communication object is available for both edges.

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 "Sx: 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.

#### 11.7.9.4 Value 1/Value 2

The possible options and setting limits 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 (%)
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##### 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 parameter is used to set value 1 or value 2 that is sent at a rising or falling edge.

#### 11.7.10 Application - 1-button value transmitter, 2 objects

At a press and release of the button the application makes it possible to send different, preset values via separate communication objects.

The following communication objects are available:

- "Sx: switching (rising edge)"
- "Sx: switching (falling edge)"

The application can differentiate between the press and the releasing of a button (rising/falling edge). The telegrams for the rising and falling edge can have different bit sizes. This, for example, allows a switching function and a floating point value to be sent.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.



#### Note

The parameters for application "1-button value transmitter, 2 objects" can be called up via **general parameters** and **extended parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

## 11.7.10.1 Object type for rising/falling edge

Options:	1 bit
	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:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/false.
- 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:
  - 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 communication objects "Sx: switching (rising edge)" and "Sx: switching (falling edge)" of a button independent from each other.

**11.7.10.2 Reaction on rising edge**

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent at the press of the button.
- 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.

Application "1-button value transmitter, 2 objects" 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 application makes two separate communication objects available for the rising and falling edge of a button.

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 "Sx: switching (rising edge)". 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 for rising edge" and "Value 2 for rising edge" is used to specify the values that are to be sent.

**11.7.10.3 Reaction on falling edge**

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent when the button is released.
- 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.

Application "1-button value transmitter, 2 objects" 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 application makes two separate communication objects available for the rising and falling edge of a button.

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 "Sx: switching (falling edge)". 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 for falling edge" and "Value 2 for falling edge" is used to specify the values that are to be sent.

#### 11.7.10.4 Value 1/value 2 for rising edge

The possible options and setting limits 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 (%)
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##### 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 parameter is used to set value 1 or value 2 that is sent at a rising edge.



##### Note

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

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

### 11.7.10.5 Value 1/value 2 for falling edge

The possible options and setting limits 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 "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
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#### 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 parameter is used to set value 1 or value 2 that is sent at a falling edge.



#### Note

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

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

### 11.7.11 Application - 2-button value dimming sensor

The application makes it possible to dim the light brighter and darker via a button pair.

The following communication object is available:

- "Sx: value":

The parameter is used to specify whether the light is dimmed brighter or darker with the first and second button.

At the press of a button a value telegram is sent to the linked dimming actuator via the 1-bit communication object "Sx: value". The bit size is specified jointly for both buttons via the "Object type" parameter.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.

**Note**

The parameters for application "2-button value dimming sensor" can be called up via **general parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.11.1 Object type

Options:	1 byte 0 - 100%
	1 byte 0 - 255

- 1 byte 0 - 100%:
  - The value is sent as 1-byte value without a sign (percentage value). The current dimming value is raised or lowered by a fixed percentage value at each press of the button.
- 1 byte 0 - 255:
  - The value is sent as 1-byte value without a sign. The current dimming value is raised or lowered by a fixed absolute value at each press of the button.

The set option fixes the bit size of communication object "Sx: value" (input/output) for a button pair.

The size of the percentage or absolute value is fixed via parameter "Step size".

### 11.7.11.2 Step size (%)

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

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

Options:	Setting option from 1 to 50 (%)
----------	---------------------------------

#### Options for selection "1 byte 0-255":

Options:	Setting option from 1 to 128
----------	------------------------------

The parameter is used to specify the value the light is dimmed per step. The value sent, always relates to the current brightness value.

Selection of object type "1 byte 0-100%". The current value is raised or lowered by the set percentage value with a press of a button.

Example: The current value of the dimming actuator is 40%.

If the parameter is set on step size "10", the current value is raised from 40% to 50% or lowered to 30% with a press of the button.

Selection of object type "1 byte 0-255": The current value is raised or lowered by the set absolute value with a press of a button.

Example: The current value of the dimming actuator is 100.

If the parameter is set on step size "20", the current value is raised from 100 to 120 or lowered to 80 with a press of the button.

### 11.7.11.3 Working mode of the buttons

Options:	1st button brighter / 2nd button darker
	1st button darker / 2nd button brighter

- First button brighter / 2nd button darker:
  - When the first button is pressed the "dim brighter" command is sent and the "dim darker" command when the second button is pressed.
- First button darker / 2nd button brighter:
  - When the first button is pressed the "dim darker" command is sent and the "dim brighter" command when the second button is pressed.

The parameter is used to specify whether the light is dimmed brighter or darker with the first and second button.

At the press of a button the value set via the "Step size" parameter is sent to the dimming actuator via the 1-bit communication object "Sx: value".

### 11.7.12 Application - 1-button light scene extension unit with memory function

The application can be used to call up and save one of 64 possible light scenes with a press of the button.

The following communication object is available:

- "Sx: light scene number"

The fixed light scene is called up with a press of the button. A save command for the light scene can be sent with a long press of the same button.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.



#### Note

The parameters for application "1-button light scene extension unit with memory function" can be called up via **general parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.12.1 Duration of long operation

Options:

Setting option from 00.300 to 10.000 (ss.fff)

The application can differentiate between a normal and a long press of the button. At a normal press of the button a 1-byte value is sent on the bus via communication object "Sx: light scene number". At a long press of the button a memory bit is sent in addition to the light scene number.

The parameter is used to specify the time after which a long button press is recognised. A typical value for a long press of the button is 5 seconds.

### 11.7.12.2 Light scene memory function

Options:	Deactivated
	Activated

- Deactivated:
  - A save command is not sent with the light scene call-up.
- Activated:
  - A save command is sent with the light scene call-up with a long press of the button.

A memory bit can be sent in addition to the light scene number via the parameter.

A memory bit is set within the 1-byte value of the light scene number. If a light scene module (e.g. Busch-ComfortTouch®) receives this 1-byte value, the module can identify the associated light scene and trigger a storage process. Read requests are sent to all connected actuators that answer with their current object values. The answers are saved by the light scene module and are sent out at every new receipt of the light scene number.

### 11.7.12.3 Number of light scene

Options:	Setting option from 1 to 64
----------	-----------------------------

The parameter is used to specify the light scene number which is sent via the 1-byte communication object "Sx: light scene number" at the press of the button.

The button serves exclusively as light scene extension unit, i.e. only the light scene number is called up via the button. The individual values for the dimming actuators or blind actuators to be adjusted are either stored in the actuator itself or in connected light scene modules (e.g. Busch-ComfortTouch®). A light scene module receives the light scene number and subsequently sends the stored light scene values consecutively to the connected actuators.

### 11.7.13 Application - 2-button step switch

Up to five switching levels can be activated for a button pair via the application. One button is used to switch the steps up and the other button to switch them down.

The following communication object is available:

- "Sx: switching level x"

The application makes step-type switching of the room lighting possible. A different switching process is triggered with each new press of the programmed button.

The application differentiates whether the first or second button of a function block is pressed. Depending on the setting, one lower or one higher level can be switched to.

Example (1st button up, 2nd button down):

[1st button – 1st press – 1st step] = switches lamp 1 on.

[1st button – 2nd press – 2nd step] = switches lamp 1 off and lamp 2 on.

[1st button – 3rd press – 3rd step] = switches lamp 2 off and lamp 3 on.

[2nd button – 1st press – 2nd step] = switches lamp 3 off and lamp 2 on.

[2nd button – 2nd press – 1st step] = switches lamp 2 off and lamp 1 on.

The application makes a joint set of parameters and communication objects available in function block x for both buttons.

**Note**

The parameters for application "2-button step switch" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.13.1 Number of objects

Options:

Setting option from 1 to 5

The parameter is used to set the number of communication objects or switching step of a button.

For every level, its own 1-bit communication object "Sx: switching step x" is available.

#### 11.7.13.2 Evaluation period

Options:	Setting option from 01.000 to 05.000 (ss.fff)
----------	-----------------------------------------------

Room lighting can be switched step-wise via a button.

To be able send a switching telegram after each actuation, the device requires a defined time period (evaluation period) to decide whether the telegram is to be sent.

For example:

The button is pressed three times. If no further actuation is made within the set evaluation period, the value for step 3 is sent.

#### 11.7.13.3 Working mode of the buttons

Options:	1st button down / 2nd button up
	1st button up / 2nd button down

- 1st button down / 2nd button up:
  - When the first button is pressed the "Step down" command is sent and the "Step up" command when the second button is pressed.
- 1st button up / 2nd button down:
  - When the first button is pressed the "Step up" command is sent and the "Step down" command when the second button is pressed.

The parameter is used to specify whether the first or second button triggers the switching command "Step up" or "Step down".

#### 11.7.13.4 Sending of objects

Options:	For operation
	For change of value

- For operation:
  - Telegram are sent at each press of the button.
- For change of value
  - Telegrams are only sent at a change of the object value.

The parameter is used to specify whether the object values for every button operation are sent out on the bus or only if the object values have changed since they were sent last.

### 11.7.13.5 Object values

Options:	Normal
	Inverse

- Normal:
  - Values of the individual switching levels are not sent inverted.
- Inverse:
  - Values of the individual switching levels are sent inverted.

The parameter is used to specify whether values of the 1-bit communication objects "Sx: switching step x" are sent normal or inverted.

Example (five objects, x of n):

The object value "10000" is sent inverted as object value "01111".

### 11.7.13.6 Bit pattern of the object values

Options:	x of n
	1 of n

The levels can be switched in two different bit patterns:

#### Object values for the bit pattern "x off n"

	1 object	2 objects	3 objects	4 objects	5 objects
<b>Level 0</b>	0	00	000	0000	00000
<b>Level 1</b>	1	10	100	1000	10000
<b>Level 2</b>		11	110	1100	11000
<b>Level 3</b>			111	1110	11100
<b>Level 4</b>				1111	11110
<b>Level 5</b>					11111

#### Object values for the bit pattern "1 off n"

	1 object	2 objects	3 objects	4 objects	5 objects
<b>Level 0</b>	0	00	000	0000	00000
<b>Level 1</b>	1	10	100	1000	10000
<b>Level 2</b>		01	010	0100	01000
<b>Level 3</b>			001	0010	00100
<b>Level 4</b>				0001	00010
<b>Level 5</b>					00001

### 11.7.14 Application - 1-button step switch

Up to five switching levels can be activated for a button via the application. The switching levels of the first button can be combined with the switching levels of the second button of a function block.

The following communication object is available:

- "Sx: switching level x"

The application makes step-type switching of the room lighting possible. A different switching process is triggered with each new press of the programmed button.

The application differentiates whether the first or second button of a function block is pressed. Depending on the setting, one lower or one higher level can be switched to.

Example (1st button up, 2nd button down):

[1st button – 1st press – 1st step] = switches lamp 1 on.

[1st button – 2nd press – 2nd step] = switches lamp 1 off and lamp 2 on.

[1st button – 3rd press – 3rd step] = switches lamp 2 off and lamp 3 on.

[2nd button – 1st press – 2nd step] = switches lamp 3 off and lamp 2 on.

[2nd button – 2nd press – 1st step] = switches lamp 2 off and lamp 1 on.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.

**Note**

The parameters for application "1-button step switch" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.14.1 Number of objects

Options:	Setting option from 1 to 5
----------	----------------------------

The parameter is used to set the number of communication objects or switching step of a button.

For every level, its own 1-bit communication object "Sx: switching step x" is available.

**11.7.14.2 Evaluation period**

Options:	Setting option from 02.000 to 05.000 (ss.fff)
----------	-----------------------------------------------

Room lighting can be switched step-wise via a button.

To be able send a switching telegram after each actuation, the device requires a defined time period (evaluation period) to decide whether the telegram is to be sent.

For example:

The button is pressed three times. If no further actuation is made within the set evaluation period, the value for step 3 is sent.

**11.7.14.3 Duration of long operation**

Options:	Setting option from 00.300 to 02.5000 (ss.fff)
----------	------------------------------------------------

The application can differentiate between a short and a long press of the button. With a short press of the button, the next level forward is switched to. With a long press of the button, the first level is activated. Thus with a long press of the button a jump back from every level to the first level is possible, without having to run through the remaining levels.

The parameter is used to specify the time from which a long press of the button is recognised and the object values are reset. A typical value for a long press of the button is 0.4 seconds.

**11.7.14.4 Sending of objects**

Options:	For operation
	For change of value

- For operation:
  - Telegram are sent at each press of the button.
- For change of value
  - Telegrams are only sent at a change of the object value.

The parameter is used to specify whether the object values for every button operation are sent out on the bus or only if the object values have changed since they were sent last.

**11.7.14.5      Object values**

Options:	Normal
	Inverse

- Normal:
  - Values of the individual switching levels are not sent inverted.
- Inverse:
  - Values of the individual switching levels are sent inverted.

The parameter is used to specify whether values of the 1-bit communication objects "Sx: switching step x" are sent normal or inverted.

Example (five objects, x of n):

The object value "10000" is sent inverted as object value "01111".

## 11.7.14.6 Bit pattern of the object values

Options:	x of n
	1 of n

The levels can be switched in two different bit patterns:

**Object values for the bit pattern "x off n"**

	1 object	2 objects	3 objects	4 objects	5 objects
<b>Level 0</b>	0	00	000	0000	00000
<b>Level 1</b>	1	10	100	1000	10000
<b>Level 2</b>		11	110	1100	11000
<b>Level 3</b>			111	1110	11100
<b>Level 4</b>				1111	11110
<b>Level 5</b>					11111

**Object values for the bit pattern "1 off n"**

	1 object	2 objects	3 objects	4 objects	5 objects
<b>Level 0</b>	0	00	000	0000	00000
<b>Level 1</b>	1	10	100	1000	10000
<b>Level 2</b>		01	010	0100	01000
<b>Level 3</b>			001	0010	00100
<b>Level 4</b>				0001	00010
<b>Level 5</b>					00001

### 11.7.15 Application - 1-button multiple operation

The application is used to create from one up to five button operations. Different bit values can be sent for each single and multiple press of the button.

For every multiple operation an own communication object is available.

- "Sx: switching 1 actuation"
- "Sx: switching x actuations"

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.

**Note**

The parameters for application "1-button multiple actuation" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.15.1 Number of objects or operations

Options:

Setting option from 1 to 5

The parameter is used to set the number of communication objects or multiple operations available for one button.

One object: single operation

Two objects: single and double operation

Three objects: single, double and triple operation

Four objects: single, double, triple and quadruple operation

Five objects: single, double, triple, quadruple quintuple operation

#### 11.7.15.2 Evaluation period

Options:

Setting option from 01.000 to 05.000 (ss.fff)

The parameter is used to set the period for the multiple actuation of the button. This enables the user to switch several lamps at the same time. After the evaluation period has expired, all telegrams are sent parallel via the activated communication objects.

For the device to recognize a multiple operation, the button operation must be carried out within a defined time period (evaluation period). The time is started after the first actuation and continues for the set evaluation period. A typical value for the evaluation period is 3 seconds.

Example (five objects):

The five objects "Sx: switching x actuation(s)" are connected with five actuator channels. If all five channels are to be switched at the same time, the button must be pressed five times within the evaluation period.

## 11.7.15.3 Object type for object x

Options:	1 bit
	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:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/false.
- 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 communication objects "Sx: switching 1 operation" and "Sx: switching x operations" of a button or multiple operations independent from each other.

For every application or multiple operation a different bit size and thus a different function can be selected.



#### Note

The number of the adjustable parameters "Object type for object x" is dependent on the setting of parameter "Number of objects or operations".

**11.7.15.4 Function for object type 1-bit for object x**

Options:	Send value
	Alternating on/off

- Send value:
  - The value that is fixed via parameter "Value for object x" is sent when the button is pressed. This means that an On or Off telegram is sent.
- Alternating on/off:
  - "On" and "Off" are sent alternately at the press of the button.

The parameter is used to specify whether an On or an Off telegram is sent via 1-bit communication object "Sx: switching x actuation(s)" when the button is pressed.

A further option can be specified as to whether the switching telegrams are sent alternately. This means that after "On" is sent, "Off" is sent at a renewed press of the button. After it is pressed again, "On" is sent.

**Note**

The parameter can only be set if the "Object type for object x" parameter is set on "1 bit".

### 11.7.15.5 Value for object x

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

#### 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 "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 parameter is used to set the value that is sent at a multiple operation of the button. For the single to five button actuations an own value can be set for each, depending on the number of disabled communication objects.



#### Note

The parameter can only be set if the "Object type for object x" parameter is set on "1 bit" and parameter "Function for object type 1-bit for object x" is set on "Send value".

#### 11.7.16 Application - 1-button short-long operation

The application can be used to set the value for long and short operations.

The following communication objects are available:

- "Sx: reaction on short operation"
- "Sx: reaction on long operation"

The two objects can take on different sizes (1 bit - 4 byte, depending on the object type selected).

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.



#### Note

The parameters for application "1-button short-long operation" can be called up via **general parameters** and **extended parameters**.



#### Note

The number (S1 - Sx) of the object depends on the function block and the button number.

## 11.7.16.1 Object type

Options:	1 bit
	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:
  - The value is sent as 1-bit switching commands (0 or 1), e.g. On/Off, enabled/blocked, true/false.
- 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 jointly fixes the bit size of communication objects "Sx: reaction on short operation" and "Sx: reaction on long operation".

**11.7.16.2 Reaction on short operation**

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent at a short press of the button.
- Value 1:
  - Value 1 is sent at a short press of the button.
- Value 2:
  - Value 2 is sent at a short press of the button.
- Alternating value 1/value 2:
  - Value 1 and value 2 are sent alternately at a short press of the button.

The parameter is used to specify whether value 1 or value 2 is sent on the bus at a short press of the button. 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 x for short operation" is used to specify the values that are to be sent.

### 11.7.16.3 Reaction on long operation

Options:	No reaction
	Value 1
	Value 2
	Alternating value1/value2

- No reaction:
  - No telegram is sent at a long press of the button.
- Value 1:
  - Value 1 is sent at a long press of the button.
- Value 2:
  - Value 2 is sent at a long press of the button.
- Alternating value 1/value 2:
  - Value 1 and value 2 are sent alternately at a long press of the button.

The parameter is used to specify whether value 1 or value 2 is sent on the bus at a long press of the button. 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 x for long operation" is used to specify the values that are to be sent.

### 11.7.16.4 Duration of long operation

Options:	Setting option from 00.300 to 03.000 (ss.fff)
----------	-----------------------------------------------

The application can differentiate between a short and a long press of the button. At a short press of the button a value is sent on the bus via communication object "Sx: value switching at short operation". At a long press of the button a value is sent on the bus via communication object "Sx: value switching at long operation".

The parameter is used to specify the time after which a long button press is recognised. A typical value for a long press of the button is 0.4 seconds.

**11.7.16.5 Value 1/value 2 for short operation**

The possible options and setting limits 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 "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 parameter is used to set value 1 or value 2 that is sent at a short press of the button.

**Note**

Parameter "Value 1 for short operation" can only be set when parameter "Reaction at short operation" is set on "Value 1" or on "Alternating Value1/Value2".

Parameter "Value 2 for short operation" can only be set when parameter "Reaction at short operation" is set on "Value 2" or on "Alternating Value1/Value2".

**11.7.16.6 Value 1/value 2 for long operation**

The possible options and setting limits 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 "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 parameter is used to set value 1 or value 2 that is sent at a long press of the button.

**Note**

Parameter "Value 1 for long operation" can only be set when parameter "Reaction at long operation" is set on "Value 1" or on "Alternating Value1/Value2".

Parameter "Value 2 for long operation" can only be set when parameter "Reaction at long operation" is set on "Value 2" or on "Alternating Value1/Value2".

### 11.7.17 Application - 1-button operating mode "Adjust RTC"

The operating mode of linked room temperature controllers can be switched over via the application with a press of the button.

The following communication objects are available:

- "Sx: enable"
- "Sx: comfort operating mode"
- "Sx: Eco operating mode"
- "Sx: frost operating mode"

Object type "1-bit" serves for activating room temperature controllers that have the 1-bit objects for the switchover of the operating modes.

Object type "1 byte" serves for activating room temperature controllers that have a 1-byte object for the switchover of the KNX operating modes.

The following operating modes and object values can be set via the application:

- Auto (value "0")
- Comfort (value "1")
- Standby (value "2")
- Eco (value "3")
- Frost protection, heat protection (value "4")

The function can be temporarily blocked via 1-bit object "Sx: enable".

In each case, the application makes a separate set of parameters and communication objects available in function block x for both buttons. The second button of each function block can be occupied with an additional button function.

**Note**

The parameters for application "1-button operating mode "Adjust RTC"" can be called up via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

**11.7.17.1 Object type for output**

Options:	1 bit
	1 byte

- 1 bit:
  - Object type for the control of RTC with 1-bit communication objects for operating mode switchover.
- 1 byte:
  - Object type for the control of RTC with 1-byte communication objects for KNX operating mode switchover.

The parameter is used to fix the size of object "Sx: operating mode...".

For setting "1 byte" the following values are sent dependent on the setting of the "Operating mode" parameter.

0 = auto

1 = comfort

2 = standby

3 = night

4 = frost/heat protection

### 11.7.17.2 Operating mode

The possible options depend on parameter "Object type for output".

#### Options for object type "1 bit":

Options:	Comfort
	Standby
	ECO
	Frost/heat protection

- Comfort:
  - Switching signal "On" is sent via the 1-bit object and a linked RTC switches over into comfort mode.
- Standby:
  - Switching signal "On" is sent via the 1-bit object and a linked RTC switches over into standby mode.
- ECO:
  - Switching signal "On" is sent via the 1-bit object and a linked RTC switches over into ECO mode.
- Frost/heat protection:
  - Switching signal "On" is sent via the 1-bit object and a linked RTC switches over into frost/heat protection mode.

The parameter is used to specify the operating mode which is sent via communication object "Sx: operating mode" at the press of the button.

**Options for object type "1 byte":**

Options:	Auto
	Comfort
	Standby
	ECO
	Frost/heat protection

- Auto:
  - Value "0" is sent via the 1-byte object. At each press of the button a linked RTC switches over between operating modes "Comfort", "Standby" and "ECO". When forced guidance is activated, selection "Auto" is used to switch over to the standard operating mode object.
- Comfort:
  - Value "1" is sent via the 1-byte object and a linked RTC switches over into comfort mode.
- Standby:
  - Value "2" is sent via the 1-byte object and a linked RTC switches over into standby mode.
- ECO:
  - Value "3" is sent via the 1-byte object and a linked RTC switches over into ECO mode.
- Frost/heat protection:
  - Value "4" is sent via the 1-byte object and a linked RTC switches over into frost/heat protection mode.

The parameter is used to specify the operating mode which is sent via communication object "Sx: operating mode" at the press of the button.

11.7.17.3 **Enable object**

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Sx: enable" is not enabled. Local switchover of operating modes via the device button is always possible and cannot be blocked temporarily.
- Activated:
  - Communication object "Sx: enable" is enabled. Local switchover of operating modes via the device button can be blocked temporarily.
  - If an On telegram (value "1") is received via the enabled object, local switchover of operating modes is possible.
  - If an Off telegram (value "0") is received via the enabled object, local switchover of operating modes is blocked. This means that no telegram is sent via output object "Sx: operating mode ...".

**Note**

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

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

11.7.17.4 **Object value enable object**

Options:	Normal
	Inverse

- Normal:
  - If an On telegram (value "1") is received via communication object "Sx: enable", local switchover of operating modes is possible. An Off telegram (value "0") deactivates the function and no telegrams are sent on object "Sx: operating mode...".
- Inverse:
  - If an Off telegram (value "0") is received via communication object "Sx: enable", local switchover of operating modes is possible. An On telegram (value "1") deactivates the function and no telegrams are sent on object "Sx: operating modes ...".

The parameter is used to specify whether application "Set 1-button operating mode "RTC"" 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".

## 11.7.17.5 Enable object after return of voltage

Options:	Blocked
	Enabled

- Blocked:
  - Object "Sx: enable" is not activated at bus voltage recovery. The blocking function is deactivated.
- Enabled:
  - If object "Sx: 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 "GF1: enable" after a return of bus voltage.

**Note**

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

## 11.7.17.6 Send comfort object

Options:	Deactivated
	Activated

- Deactivated:
  - No telegram is sent via object "Sx: comfort operating mode" at the press of the operating mode switchover button.
- Activated:
  - A telegram is sent via object "Sx: comfort operating mode" at the press of the operating mode switchover button.
  - The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via object "Sx: comfort operating mode" at each press of the button.

The parameter is used to specify whether a telegram is sent on the bus via the 1-bit communication object "Sx: comfort operating mode" when the operating mode switchover button is pressed. This may be necessary for switching the linked room temperature controller (RTC) into a defined operating mode.

**Note**

The parameter can only be set if the "Object type for output" parameter is set on "1 bit" and the "Operating mode" parameter is set on "Comfort", "Standby" or "ECO".

## 11.7.17.7 Send Eco object

Options:	Deactivated
	Activated

- Deactivated:
  - No telegram is sent via object "Sx: Eco operating mode" at the press of the operating mode switchover button.
- Activated:
  - A telegram is sent via object "Sx: Eco operating mode" at the press of the operating mode switchover button.
  - The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via object "Sx: comfort operating mode" at each press of the button.

The parameter is used to specify whether a telegram is sent on the bus via the 1-bit communication object "Sx: Eco operating mode" when the operating mode switchover button is pressed. This may be necessary for switching the linked room temperature controller (RTC) into a defined operating mode.

**Note**

The parameter can only be set if the "Object type for output" parameter is set on "1 bit" and the "Operating mode" parameter is set on "Standby" or "ECO".

## 11.7.17.8 Send frost object

Options:	Deactivated
	Activated

- Deactivated:
  - No telegram is sent via object "Sx: frost operating mode" at the press of the operating mode switchover button.
- Activated:
  - A telegram is sent via object "Sx: frost operating mode" at the press of the operating mode switchover button.
  - The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via object "Sx: frost operating mode" at each press of the button.

The parameter is used to specify whether a telegram is sent on the bus via the 1-bit communication object "Sx: frost operating mode" when the operating mode switchover button is pressed. This may be necessary for switching the linked room temperature controller (RTC) into a defined operating mode.

**Note**

The parameter can only be set if the "Object type for output" parameter is set on "1 bit" and the "Operating mode" parameter is set on "Comfort", "Standby" or "ECO".

### 11.7.18 Application - 2-button RTC function internal

The operating mode of linked room temperature controllers can be switched over via the application with a press of the button.

- 2-button RTC function internal

The 2-button function is a rocker switch function.

**Notice**

The parameters for application "2-button RTC function internal" can be called up via **general parameters**.

#### 11.7.18.1 Rocker switch function

Options:	Setpoint adjustment
	Fan speed level adjustment

This parameter is used to assign the "2-button RTC function internal" the setpoint adjustment or the fan speed level adjustment.

#### 11.7.18.2 Rocker configuration

Options:	Left "-", right "+"
	Left "+", right "-"

The 2-button function is a rocker switch function. This parameter is used to specify how the buttons of the rocker are configured for the assigned rocker switch function.

### 11.7.19 Application - 1-button RTC function internal

The operating mode of linked room temperature controllers can be switched over via the application with a press of the button.

- 1-button RTC function internal



#### Notice

The parameters for application "1-button RTC function internal" can be called up via **general parameters**.

#### 11.7.19.1 Button function

Options:	On/Off
	Comfort/Eco
	Heating/cooling
	Fan speed / level

The RTC settings occur on the same level as the normal button functions. The parameters available for selection directly access the function of the internal RTC.

### 11.7.20 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:

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

The LED of button x can light up with two different colours and brightness levels. The LED can also flash for alarm display and/or scene storage display.

In each case, the application makes a separate set of parameters and communication objects available in function block x for both LEDs. The second button of each function block can be occupied with an additional button function.

**Note**

The parameters for application "LED function" can be called up in each function block via **general parameters** and **extended parameters**.

**Note**

The number (S1 - Sx) of the object depends on the function block and the button number.

#### 11.7.20.1 Operating mode

Options:	Status illumination
	Function illumination

- Status illumination:
  - The LED displays the device status with different colours.
- Function illumination:
  - The LED displays the device functions with different colours.

The parameter is used to specify whether the LED displays the current device status or the selected device function with a colour.

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

If operating mode "Function illumination" is selected, the colour for the configured button function (e.g. light, blind or scene) can be firmly set via parameter "Colour of function illumination".

## 11.7.20.2 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 LED lights up in the colour for On or Off.
- 1 byte 0 - 100%:
  - The value is sent as 1-byte value (percent) and the LED lights 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 "Sx: status LED" is available. If an On telegram is received via the object, the LED lights up in the colour that is stored in the "Colour for On" parameter. If an OFF telegram is received via the object, the LED lights up in the colour that is stored in the "Colour for Off" parameter. The LED can also be switched off.

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

The five adjustable zones have the following behaviour:

- Zone 1: 0%
- Zone 2:  $1\% \leq \text{value} < S1$
- Zone 3:  $S1 \leq \text{value} < S2$
- Zone 4:  $S2 \leq \text{value} \leq 99\%$
- 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".

## 11.7.20.3 Brightness of the colours

Options:	Dark
	Bright

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

The parameter is used to specify whether the LED 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 "deactivated".

## 11.7.20.4 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 button LED lights up in when the device receives an Off telegram via the 1-bit communication object "Lx: 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".

## 11.7.20.5

## Colour for On

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at switching signal "On".

The parameter is used to specify the colour the button LED lights up in when the device receives an On telegram via the 1-bit communication object "Lx: 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 bit".

11.7.20.6 Colour for Zone 1 (corresponds to 0%)

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at value telegrams for zone 1.

The parameter is used to specify the colour the LED lights up in when a telegram with value "0%" is received via the 1-byte communication object "Lx: 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%".

## 11.7.20.7 Colour for Zone 2 (starting at 1%)

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at value telegrams for zone 2.

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

- Value is  $\geq 1\%$  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%".

## 11.7.20.8 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  $\geq 1\%$ , the LED lights up in the colour for zone 2.

If the value received is  $\geq S1$  and  $< S2$ , the LED lights 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%".

#### 11.7.20.9 Colour for Zone 3

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at value telegrams for zone 3.

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

- Value is  $\geq S1$  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%".

#### 11.7.20.10 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  $\geq S1$  and  $< S2$ , the LED lights up in the colour for zone 3.

If the value received is  $\geq S2$  and  $\leq 99\%$ , the LED lights 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%".

11.7.20.11 Colour for Zone 4 (up to 99%)

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at value telegrams for zone 4.

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

- Value is  $\geq S2$  and
- Value is  $\leq 99\%$ .

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%".

## 11.7.20.12 Colour for Zone 5 (corresponds to 100%)

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the fixed colour at value telegrams for zone 5.

The parameter is used to specify the colour the LED lights up in when a telegram with value "100%" is received via the 1-byte communication object "Lx: 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%".

**11.7.20.13 Colour of function illumination**

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

- Off:
  - The LED is switched off.
- Yellow - white:
  - The LED lights up in the selected colour.

The parameter is used to specify the colour the associated function icon of the device lights up in.

The LED additionally serves for orientation, this means that the buttons can be recognized in the dark. Alternatively, the LED 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".

## 11.7.20.14 Day/Night mode

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Lx: day/night mode" is not enabled.
- Activated:
  - Communication object "Lx: day/night mode" is enabled.
  - If a telegram with value "1" is received via the object, the LED lights up brightly. If a telegram with value "0" is received, the LED lights up dark.

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

Additional function: If the "Operating mode" parameter is set on "Status illumination", the "Lx: day/night mode" communication object can also be used for the status display.

Example: The button is assigned with the application "1-button switching" and connected with a switching actuator that switches a lamp group. The LED of the button is set on "Status illumination" and a colour. If the "Lx: day/night mode" object is additionally connected with the status response object of the switching actuator via a group address or action and the light is switched on, the LED lights up bright. When the light is switched off, the LED lights up 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 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".

## 11.7.20.15 Light scene memory function

Options:	Deactivated
	Activated

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

The 1-byte communication object "Lx: 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 "Lx: Day/night mode" is enabled, the LED flashes either bright or 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" 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".

## 11.7.20.16 Alarm function

Options:	Deactivated
	Activated

- Deactivated:
  - Communication object "Lx: alarm" is not enabled.
- Activated:
  - Communication object "Lx: alarm" is enabled.

The 1-byte communication object "Lx: 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 "Lx: 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".

## 11.8 Application "Temperature"

Temperature - Application

Options:	Inactive
	Temperature sensor

- Inactive:
  - Application is not active.
- Temperature sensor:
  - Application is active.

The application enables the temperature sensor of the device and fixes the conditions for sending the measured value.

The following communication objects are available:

- "TS: actual temperature"
- "TS: actual temperature adjustment"

The temperature sensor can be used for a room temperature controller (RTC). Here the temperature sensor is the slave device and the RTC the master device. Slave devices must be linked with the master device via the appropriately labelled communication objects. The slave device operates the RTC functions of the master device.



### Note

The following parameters can only be adjusted when the function "Temperature" is set on "Temperature sensor".

The parameters for "Temperature" can be called up via **general parameters**.

### 11.8.1.1 Send measured values

Options:	Only cyclical
	Cyclic and during change

- Only cyclical:
  - The actual temperature (room temperature) is sent at fixed time intervals. The interval is set via parameter "Cycle time for sending the actual temperature".
- Cyclic and at a value change:
  - The actual temperature is sent at fixed intervals and at each change of the room temperature.

#### 11.8.1.2 Cycle time for sending of the actual temperature

Options:

Setting option from 00:00:25 to 01:30:00 (hh:mm:ss)

The actual temperature (room temperature) is sent on the bus cyclically.

The parameter is used to fix the time interval with which the measured room temperature is sent to the linked RTC.

#### 11.8.1.3 Temperature difference for sending within the cycle time \*0.1 K

Options:

Setting option from 1 to 255

If the temperature increases rapidly within the set cycle time or falls, an additional sending of the actual temperature can make sense.

The parameter can be used to set the change value from which the actual temperature is sent during the cycle time (setting value  $\times 0.1$  Kelvin =  $\Delta T$ ).

**Note**

The cycle time for sending the actual temperature starts anew after the actual temperature has been sent due to an exceeding of the set temperature difference.

**Note**

The parameter is only adjustable if the "Send measured value" parameter is set on "Cyclic and at value change".

#### 11.8.1.4 Offset of the temperature sensor (x 0.1°C)

Options:

Setting option from -127 to 127

If the measured temperature is distorted by external influences or the device is mounted at a location where it is always constantly being measured too much or too little, a compensation value for the temperature measurement can be set.

The parameter is used to set the compensation value. The mounting location of the temperature sensor and the suitable selection of the parameter settings are decisive for a good temperature reading.

**11.8.1.5 Overwriting internal object**

Options:	No
	Yes

- No:
  - The offset adjusted via parameter "Offset of the temperature sensor (x 0.1°C)" is not overwritten.
- Yes:
  - The set offset is overwritten with communication object "TS: actual temperature for temperature compensation".

With selection "Yes" an actual temperature value can be sent to the device, without opening the ETS application, which overwrites the parameterised offset.

## 11.9 Application "General functions"

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

### 11.9.1 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, .
- 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, .
- 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, .
- Gate:
  - The application can be used to filter certain signals and to block the flow of signals temporarily. Additional information, .
- Staircase lighting:
  - The application can be used to supply switching telegrams or value telegrams with a switch-off delay. Additional information, .
- Delay:
  - Telegrams can be received via the "GFx: input" object with the application. Additional information, .

- Min/max value transducer:
  - Up to eight input values can be compared with each other with the application.  
Additional information, .
- 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, .



### Note

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

### 11.9.2 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.

#### 11.9.2.1 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.

### 11.9.2.2 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.

**11.9.2.3 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.

**11.9.2.4 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"

**11.9.2.5 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".

### 11.9.2.6 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".

### 11.9.2.7 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.

**11.9.2.8 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".

### 11.9.3 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.

#### 11.9.3.1 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.

#### 11.9.4 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.

##### 11.9.4.1 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.

#### 11.9.4.2 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.

#### 11.9.4.3 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".

#### 11.9.4.4 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.

#### 11.9.4.5 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.

#### 11.9.4.6 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.

#### 11.9.4.7 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.

#### 11.9.4.8 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.

#### 11.9.4.9 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".

#### 11.9.4.10 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".

#### 11.9.4.11 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".

#### 11.9.4.12 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.

#### 11.9.4.13 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".

#### 11.9.4.14 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".

### 11.9.5 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.

### 11.9.1

#### 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.

## 11.9.5.2

## 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.

#### 11.9.5.3 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".

**11.9.5.4 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.

**11.9.5.5 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"

**11.9.5.6 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".

**11.9.5.7 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".

**11.9.5.8      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".

### 11.9.6 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.

#### 11.9.6.1 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.

## 11.9.6.2

## 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.

## 11.9.6.3

## 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.

**11.9.6.4****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.

**11.9.6.5****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.

### 11.9.6.6 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".

### 11.9.6.7 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".

### 11.9.6.8 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.

### 11.9.7 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.

#### 11.9.7.1 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.

## 11.9.7.2

## 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.

### 11.9.7.3 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.

### 11.9.7.4 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.

### 11.9.7.5 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.

## 11.9.7.6

## 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".

## 11.9.7.7

## 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 (%)
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**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".

**11.9.7.8      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.

### 11.9.8 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.

#### 11.9.8.1 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.

## 11.9.8.2

## 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.

## 11.9.8.3

## 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.

### 11.9.8.4 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.

### 11.9.8.5 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"

$(\text{Input 1} + \text{input 2}) / 2 = \text{arithmetic mean}; (4 + 5) / 2 = 4.5$

Sent average value: 5

### 11.9.9 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.

#### 11.9.9.1 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.

#### 11.9.9.2 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.

#### 11.9.9.3 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".

#### 11.9.9.4 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.

#### 11.9.9.5 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.

**11.9.9.6****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.

**11.9.9.7****Scene number**

Options:	Setting option from 1 to 64
----------	-----------------------------

The parameter is used to specify which light scene is to be started.

**11.9.9.8      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.

**11.9.9.9      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".

**11.9.9.10      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".

#### 11.9.9.11      Value

Options:	Off
	One

Adjustable options, when parameter "Object type actuator group x" is set on "1-bit switching".

#### 11.9.9.12      Value

Options:	Up
	Down

Adjustable options, when parameter "Object type actuator group x" is set on "1-bit blind".

#### 11.9.9.13      Value (%)

Options:	Setting option from 0 to 100 (%)
----------	----------------------------------

Setting option, if parameter "Object type actuator group x" is set on "1 byte 0-100%".

#### 11.9.9.14      Temperature

Options:	Setting option from -33.5 to 93.5
----------	-----------------------------------

Setting option, if parameter "Object type actuator group x" is set on "Temperature".

## 12 Communication objects

### 12.1 Communication objects

#### 12.1.1 DS - Temperature value

Name	Object function	Data type
DS: Temperature value	Input	9.001 Temperature value

The temperature value of an external temperature sensor is received via the 2-byte communication object. The parameter "Actual temperature value above" must be set on "Communication object".

#### 12.1.2 DS - Time

Name	Object function	Data type
DS: Time	Input	10.001 Daytime

The time for showing in the display is received via the 3-byte communication object.

#### 12.1.3 DS - Date

Name	Object function	Data type
DS: Date	Input	11.001 Date

The date for showing in the display is received via the 3-byte communication object.

#### 12.1.4 DS - CO2 value

Name	Object function	Data type
DS: CO2 value	Input	7.* 2-byte floating point value

The CO2 value for showing in the display is received via the 2-byte communication object. The parameter "CO2 value above" must be set on "Communication object".

#### 12.1.5 DS - Relative humidity

Name	Object function	Length	Data type
DS: Relative humidity	Input	2 bytes 1 byte	9.007 Moisture (%) 5.001 Percent (0..100%)

Depending on the parameter setting, the humidity value for showing in the display is received via the 1-byte or the 2-byte communication object.

The parameter "Relative humidity value above" must be set on "Communication object".

### 12.1.6 DS - Display day/night

Name	Object function	Data type
DS: Display day/night	Input	1.001 Switching

The strength of the backlighting of the display is switched via the 1-bit communication object according to the specifications from parameter "Display backlighting day/night". When a telegram with value "1" is received via the object, the display lights up according to the setting of parameter "Display backlighting day". When a telegram with value "0" is received, the display lights up according to the setting of parameter "Display backlighting night".

The parameter "Display backlighting white" must be set on "Via communication object day/night".

### 12.1.7 DS -Display backlighting red

Name	Object function	Data type
DS: Display backlighting	Input	1.001 Switching

If a telegram with value "1" is received via the 1-bit communication object, the device changes into red display backlighting, if parameterized.

The parameter "Display backlighting red" must be set on "Via communication object".

### 12.1.8 DS - Units switchover

Name	Object function	Data type
DS : Units switchover	Input	1.001 Switching

This 1-bit communication object can be used to switch the temperature display between degrees Celsius (°C) and degrees Fahrenheit (°F). If a telegram with value "1" is received via the object, the temperature is displayed in °F. If a telegram is received with value "0"; the temperature is displayed in °C.

### 12.1.9 LED - Alarm

Name	Object function	Data type
LED: Alarm	Input	1.005 Alarm

An alarm signal is received via the 1-bit communication object. If an On telegram is received via the object, the LEDs of the buttons on which the parameter "Consider alarm function" has been set on "Yes", flash. If an Off telegram is received via the object, the LEDs light up continuously.

### 12.1.10 LED - Day/Night mode

Name	Object function	Data type
LED: Day/Night mode	Input	1.001 Switching

The 1-bit communication object is used to switch the illumination of the buttons bright or dark for which the parameter "Consider day/night function" has been set on "Yes". If a telegram with value "1" is received, the LEDs of the buttons light up bright (day mode). If a telegram with value "0" is received, the LEDs light up dark (night mode).



#### Notice

The illumination of the buttons is switched via the object. The illumination of the display is switched via object no. 6 "DS: Display day/night".

### 12.1.11 EF - Enable

Name	Object function	Data type
EF: Enable	Input	1.001 Switching

Via the 1-bit communication object the functions of the buttons can be blocked or enabled.

### 12.1.12 EF - Automatic switchover time

Name	Object function	Data type
EF: - Automatic switchover time	Input	7.005 Time (s)

The 2-byte communication object is used to receive a telegram with the set switchover time. Depending on the respective setting, the device is automatically blocked or enabled after the switchover time has expired.

### 12.1.13 HB - In operation

Name	Object function	Data type
HB: In operation	Output	1.001 Switching

The device sends a telegram to the bus via the 1-bit communication object to signal its readiness for operation. This signal can be used for monitoring

#### 12.1.14 PF - Switching

Name	Object function	Data type
PF: Switching	Output	1.001 Switching 5.001 Percentage value 18.001 Light scene 20.102 HVAC mode

At an active primary function the device sends the set value via the communication object after the actuation of any button.

### 12.1.15 RTC — Status control value of basic heating stage

Name	Object function	Data type
RTC: Status control value of basic heating stage	Output	1.001 Switching 5.001 Percent (0..100%)

- The 1-bit communication object is used to operate a switching actuating drive, e.g. a thermoelectric actuating drive, that is controlled by a switching/heating actuator.
- The 1-byte communication object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

### 12.1.16 RTC — Status control value of additional heating stage

Name	Object function	Data type
RTC: Status control value of additional heating stage	Output	1.001 Switching 5.001 Percent (0..100%)

- The 1-bit communication object is used to operate a switching actuating drive, e.g. a thermoelectric actuating drive, that is controlled by a switching/heating actuator.
- The 1-byte communication object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.



#### Notice

The additional stage can also be used as a parallel second heating stage. To do this, the parameter for the temperature difference to the basic stage must be set on 0°C.

### 12.1.17 RTC — Status control value of basic cooling stage

Name	Object function	Data type
RTC: Status control value of basic cooling stage	Output	1.001 Switching 5.001 Percent (0..100%)

- The 1-bit communication object is used to operate a switching actuating drive, e.g. a cooling ceiling, that is controlled by a switching/heating actuator.
- The 1-byte communication object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

### 12.1.18 RTC — Status control value of additional cooling stage

Name	Object function	Data type
RTC: Status control value of additional cooling stage	Output	1.001 Switching 5.001 Percent (0..100%)

- The 1-bit communication object is used to operate a switching actuating drive, e.g. a cooling ceiling, that is controlled by a switching/heating actuator.
- The 1-byte communication object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.



#### Notice

The additional stage can also be used as a parallel second cooling stage. To do this, the parameter for the temperature difference to the basic stage must be set on 0°C.

### 12.1.19 RTC - Control On/Off

Name	Object function	Data type
RTC: Control On/Off	Output	1.001 Switching
RTC: Control On/Off (master)	Output	1.001 Switching
RTC: Control On/Off (slave)	Output	1.001 Switching

If a telegram with value "0" is received, the controller switches to Off mode and regulates the temperature to the setpoint value for frost/heat protection. When the controller is switched on again, the remaining operating mode communication objects are queried in order to determine the new operating mode. If the control of the temperature is switched on or off, the new status is signalled to the bus via this object.



#### Notice

When the master/slave operation is activated, the object "RTC: Control On/Off (master)" of the master device must be connected with object "RTC: Control On/Off (slave)" of the slave device.

### 12.1.20 RTC - Actual temperature

Name	Object function	Data type
RTC: Actual temperature	Output	9.001 Temperature value
RTC: Actual temperature weighted	Output	9.001 Temperature value

- RTC: Actual temperature
  - The communication object outputs the measured (room) temperature, adjusted by the calibration value.
- RTC: Actual temperature weighted
  - The communication object outputs the temperature value which is calculated from the recording and weighting of the internal temperature with up to two external temperatures.

### 12.1.21 RTC - External actual temperature

Name	Object function	Data type
RTC: External actual temperature	Input	9.001 Temperature value

The temperature value of an external temperature sensor is received via the 2-byte communication object.



#### Notice

An external temperature measurement for room temperature control may be practical for larger rooms and/or floor heating.

### 12.1.22 RTC - External actual temperature 2

Name	Object function	Data type
RTC: External actual temperature 2	Input	9.001 Temperature value

The temperature value of a second external temperature sensor is received via the 2-byte communication object.



#### Notice

An external temperature measurement for room temperature control may be practical for larger rooms and/or floor heating.

### 12.1.23 RTC - Fault of actual temperature

Name	Object function	Data type
RTC: Fault of actual temperature	Output	1.001 Switching
RTC: Fault of actual temperature (Master)	Output	1.001 Switching
RTC: Fault of actual temperature (Slave)	Output	1.001 Switching

If one of the parameterised input temperatures is unavailable to the controller for a period longer than the monitoring time, the controller enters the error mode. The device sends a telegram on the bus with value "1".



#### Notice

When the master/slave operation is activated, the object "RTC: Fault of actual temperature (master)" of the master device must be connected with object "RTC: Fault of actual temperature (slave)" of the slave device to display the faulty operation.

#### 12.1.24 RTC - Current setpoint

Name	Object function	Data type
RTC: Current setpoint	Output	9.001 Temperature value

The communication object outputs the current setpoint temperature. The value results from the set setpoint temperature of the current operating mode, the manual setpoint temperature adjustment and a change in the basic setpoint temperature via the "RTC: Basic set value".

#### 12.1.25 RTC - Normal operating mode

Name	Object function	Data type
RTC: Normal operating mode	On	20.102 HVAC mode
RTC: Normal operating mode (master)	On	20.102 HVAC mode
RTC: Normal operating mode (Slave)	On	20.102 HVAC mode

The value for the switchover of the operating mode is received via the 1-byte communication object. Meaning of values:

- "1": Comfort
- "2": Standby
- "3": Economy
- "4": Building protection

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller is defined by the following communication objects (listed in decreasing order of priority):

- "RTC: Override operating mode"
- "RTC: Condensate water alarm"
- "RTC: Dew point alarm"
- "RTC: Window contact"
- "RTC: Control On/Off"
- "RTC: Presence detector"
- "RTC: Normal operating mode"



##### Notice

When the master/slave operation is activated, the object "RTC: Normal operating mode (master)" of the master device must be connected with object "RTC: Normal operating mode (slave)" of the slave device.

### 12.1.26 RTC - Superimposed operating mode

Name	Object function	Data type
RTC: Override operating mode	Input	20.102 HVAC mode
RTC: Override operating mode (Master/Slave)	Input	20.102 HVAC mode

The value for the switchover of the operating mode is received via the 1-byte communication object. Meaning of values:

- "0": Override operating mode inactive
- "1": Comfort
- "2": Standby
- "3": Economy
- "4": Building protection

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller is defined by the following communication objects: (listed in decreasing order of priority).

- "RTC: Override operating mode"
- "RTC: Condensate water alarm"
- "RTC: Dew point alarm"
- "RTC: Window contact"
- "RTC: Control On/Off"
- "RTC: Presence detector"
- "RTC: Normal operating mode"



#### Notice

When the master/slave operation is activated, the object "RTC: Override operating mode (master/slave)" of the master and slave device must be connected with the group address of the sending device.

### 12.1.27 RTC - Window contact

Name	Object function	Data type
RTC: Window contact	Input	1.001 Switching
RTC: Window contact (Master/Slave)	Input	1.001 Switching

The signal of a window contact is received via the 1-bit communication object. At an open window a telegram with value 1 is sent to the RTC.

If no other communication object with a higher priority is active, the RTC is set on the setpoint value for frost/heat protection by the message "Window open".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller is defined by the following communication objects: (listed in decreasing order of priority).

- "RTC: Override operating mode"
- "RTC: Condensate water alarm"
- "RTC: Dew point alarm"
- "RTC: Window contact"
- "RTC: Control On/Off"
- "RTC: Presence detector"
- "RTC: Normal operating mode"



#### Notice

When the master/slave operation is activated, the object "RTC: Window contact (master/slave)" of the master and slave device must be connected with the group address of the sending device.

### 12.1.28 RTC - Presence detector

Name	Object function	Data type
RTC: Presence detector	Input	1.001 Switching
RTC: Presence detector (Master/Slave)	Input	1.001 Switching

The signal of a movement detector is received via the 1-bit communication object. If a person is present in the room, a telegram with value "1" is sent to the RTC.

If no other communication object with a higher priority is active, the RTC is set on the comfort setpoint value by the message "Person present in the room".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller is defined by the following communication objects: (listed in decreasing order of priority).

- "RTC: Override operating mode"
- "RTC: Condensate water alarm"
- "RTC: Dew point alarm"
- "RTC: Window contact"
- "RTC: Control On/Off"
- "RTC: Presence detector"
- "RTC: Normal operating mode"



#### Notice

When the master/slave operation is activated, the object "RTC: Presence detector (master/slave) of the master and slave device must be connected with the group address of the sending device.

### 12.1.29 RTC - Heating status

Name	Object function	Data type
RTC: Heating status	Output	1.001 Switching

An On telegram is sent on the bus via the 1-bit communication object as soon as the RTC is in active heating mode.

If the controller is in cooling mode or in the inactive zone between heating and cooling, the RTC sends an OFF telegram via the "RTC: Heating status" object.

### 12.1.30 RTC - Cooling status

Name	Object function	Data type
RTC: Cooling status	Output	1.001 Switching

An On telegram is sent on the bus via the 1-bit communication object as soon as the RTC is in active cooling mode.

If the controller is in heating mode or in the inactive zone between heating and cooling, the RTC sends an OFF telegram via the "RTC: Cooling status" object.

### 12.1.31 RTC - Basic load

Name	Object function	Data type
RTC: Basic load	Input	1.001 Switching

A parameterized basic load can be activated via the 1-bit communication object. I.e. a minimum control value that is larger than zero is activated by sending value "1".

The basic load is deactivated by sending value "0". When the setpoint temperature is reached the control value can be reduced up to zero without taking the parameterized minimum value into account.



#### Notice

Deactivating the base load for a floor heating system is always useful in the summer, since it saves heating energy.

### 12.1.32 RTC - Heating/cooling switchover

Name	Object function	Data type
RTC: Heating/cooling switchover	1. Output 2. Input 3. Input/output	1.001 Switching

1. Automatic:

- When the switchover between heating and cooling is carried out automatically by the RTC, the current status is sent to the bus via the communication object. Here the status "Heating" has value "1" and status "cooling" has value "0".

2. Only via object:

- The switchover between heating and cooling is carried out in the RTC only via the communication object. Here the heating mode is activated with the receipt of value "1" and the cooling mode with value "0".

3. On-site/via extension unit and via object:

- Switching between heating and cooling on the room temperature controller occurs in the RTC by user interaction or via the communication object. The current status is sent to the bus or received via the object. Here the status "Heating" has value "1" and status "cooling" has value "0".

### 12.1.33 RTC - Fan manual (heating)

Name	Object function	Data type
RTC: Fan manual	Output	1.001 Switching
RTC: Fan manual (master)	Output	1.001 Switching
RTC: Fan manual (slave)	Output	1.001 Switching

Using the 1-bit communication object, a fan coil actuator can be placed in manual fan mode or returned to automatic fan mode. In the automatic fan mode of the fan coil actuator, the fan's rotational speed is defined in the fan coil actuator using the control value. In manual fan operation, the user of the RTC can set the fan's rotational speed as needed. This setting will remain active until it is reset. The fan speed level 0 is an exception: to avoid damage to the building, automatic mode is activated again 18 hours after fan speed level 0 is selected.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator heating.



#### Notice

When the master/slave operation is activated, the object "RTC: Fan manual (master)" of the master device must be connected with object "RTC: Fan manual (slave)" of the slave device.

### 12.1.34 RTC - Fan speed level (heating)

Name	Object function	Data type
RTC: Fan speed level	Output	5.001 Percent (0..100%) 6.010 Counter value
RTC: Fan speed level (master)	Output	5.001 Percent (0..100%) 6.010 Counter value
RTC: Fan speed level (slave)	Output	5.001 Percent (0..100%) 6.010 Counter value

The fan speed level in the fan coil actuator is selected via the 8-bit communication object.

The fan speed levels are sent to the bus as percentage values. Example 5-stage fan: The level value 1 is output as 20%, and 5 is output as 100%. The setting of the levels can also be made optionally as counter values, in this example 0..5.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator heating.



#### Notice

When the master/slave operation is activated, the object "RTC fan speed level (master)" of the master device must be connected with object "RTC: Fan speed level (slave)" of the slave device.

### 12.1.35 RTC - Fan speed level status (heating)

Name	Object function	Data type
RTC: Fan speed level status (heating)	Input	5.001 Percent (0..100%) 6.010 Counter value

The RTC receives the currently set fan speed level of the fan coil actuator via the 8-bit communication object.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator heating.

### 12.1.36 RTC - Fan speed level 1 - 5 (heating)

Name	Object function	Data type
RTC: Fan speed level x	Output	1.001 Switching

The controller sends a switching signal to the bus via the 1-bit communication object. When fan speed level x is activated, value "1" is sent. Value "0" is sent when the fan speed level (1 - 5) is deactivated.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator heating.

### 12.1.37 RTC - Basic setpoint

Name	Object function	Data type
RTC: Basic setpoint	Input	9.001 Temperature value

This 2-byte communication object can be used to change the parameterised basic setpoint value of the RTC. The parameter "Basic setpoint" is used to specify the set value the device accesses. The following can be selected:

- "Setpoint for heating comfort"
- "Setpoint for cooling comfort"
- "Mean value between heating comfort and cooling comfort"

### 12.1.38 RTC - Resetting manual setpoints

Name	Object function	Data type
RTC: Resetting manual setpoints	Input	1.001 Switching

This 1-bit communication object is used to reset the manual setpoint adjustment that was set on the device.

### 12.1.39 RTC - Dew point alarm

Name	Object function	Data type
RTC: Dew point alarm	Input	1.001 Switching

A dew point detector signals the occurrence of dew formation, e.g. on the cooling medium feed lines of a cooling machine. The 1-bit communication object is used to set the controller into the dew point protection mode. This causes the current setpoint to be set on the heat protection setpoint in order to prevent the formation of water.



#### Notice

This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value "0". When an alarm is active, manual operation of the controller is blocked. The information is displayed by a corresponding icon on the control unit.

### 12.1.40 RTC - Condensate water alarm

Name	Object function	Data type
RTC: Condensate water alarm	Input	1.001 Switching
RTC: Condensate water alarm (master/slave)	Input	1.001 Switching

The 1-bit communication object is used to set the controller into the condensation protection mode. This causes the current setpoint to be set on a value that cannot be reached, which prevents the condensate collection container from overflowing.

This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value "0". When an alarm is active, manual operation of the controller is blocked. The information is displayed by a corresponding icon on the device.



#### Notice

When the master/slave operation is activated, the object "RTC: Condensate water alarm (master/slave)" of the master and slave device must be connected with the alarm transmitter.

### 12.1.41 RTC - Outside temperature for summer compensation

Name	Object function	Data type
RTC: Outside temperature for summer compensation	Input	9.001 Temperature value

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 reduction of room temperature by cooling devices should be limited as a function dependent on the outside temperature (summer compensation). This, for example, prevents the air-conditioning system from running continuously when the outside temperature is 35°C in order to reduce the room temperature to 22°C.

An open air temperature sensor is required for this application. For this the current outside temperature must be made available to the controller via the 2-byte communication object.

### 12.1.42 RTC - Summer compensation active

Name	Object function	Data type
RTC: Summer compensation active	Output	1.001 Switching

The controller uses this 1-bit communication object to send a switching signal to the bus. If summer compensation is active, value "1" is sent. If summer compensation is not active, value "0" is sent.

If summer compensation is active, the set setpoint temperature for cooling operation is raised in dependence of the outside temperature. A decrease of the cooling mode setpoint temperature below the value calculated by the summer compensation function is not possible. An increase of the setpoint temperature for the cooling mode is always possible.

#### 12.1.43 RTC - Temperature calibration

Name	Object function	Data type
RTC: Temperature calibration	Input	9.001 Temperature value 9.002 Differential temperature value

The temperature measured locally in the device can be calibrated via the 2-byte temperature value. It can be set whether the calibration is performed as new temperature value or as differential value to the currently measured temperature.

#### 12.1.44 RTC - On/off request

Name	Object function	Data type
RTC: On/off request (master)	Input	1.001 Switching
RTC: On/off request (slave)	Output	1.001 Switching

The 1-bit switching object is used to transmit the switch-on/off request of the button operation of a slave device to the master device. The confirmation is made via object "Control On/Off".



##### Notice

When the master/slave operation is activated, the object "RTC: On/Off request (master)" of the master device for synchronisation must be connected with object "RTC: On/Off request (slave)" of the slave device.

#### 12.1.45 RTC - Setpoint display

Name	Object function	Data type
RTC: Set value display (master)	Output	9.001 Temperature value 9.002 Differential temperature value
RTC: Set-point display (slave)	Input	9.001 Temperature value 9.002 Differential temperature value

The actual value for showing in the display is sent or received via the 2-byte communication object. Depending on the parameter setting, this is an absolute temperature value or a differential value (e.g. - 5 K - + 5 K).



##### Notice

When the master/slave operation is activated, the object "RTC: Setpoint display (master)" of the master device for synchronisation must be connected with object "RTC: Setpoint display (slave)" of the slave device.

#### 12.1.46 RTC - Request setpoint (master)

Name	Object function	Data type
RTC: Request set value (master)	Input	9.001 Temperature value 9.002 Differential temperature value 6.010 Counter value
RTC: Request set value (slave)	Output	9.001 Temperature value 9.002 Differential temperature value 6.010 Counter value

The communication object is used to transmit the setpoint request of the button operation of a slave device to the master device. The format can be an absolute or relative temperature value or a counter value which is multiplied with an adjustable step size (standard value 0.5 K). The confirmation is made via object "Confirm setpoint".



##### Notice

When the master/slave operation is activated, the object "RTC: Request setpoint (master)" of the master device for synchronisation must be connected with object "RTC: Request setpoint (slave)" of the slave device.

### 12.1.47 RTC - Confirm setpoint

Name	Object function	Data type
RTC: Confirm set value (master)	Output	9.001 Temperature value 9.002 Differential temperature value 6.010 Counter value
RTC: Confirm set value (slave)	Input	9.001 Temperature value 9.002 Differential temperature value 6.010 Counter value

The communication object is used to transmit the setpoint confirmation of the master device to a slave device. The format can be an absolute or relative temperature value or a counter value which is multiplied with an adjustable step size (standard value 0.5 K). This value the slave device adopts as starting point for a further setpoint adjustment.



#### Notice

When the master/slave operation is activated, the object "RTC: Confirm setpoint (master)" of the master device for synchronisation must be connected with object "RTC: Confirm setpoint (slave)" of the slave device.

### 12.1.48 RTC - Heating/cooling request

Name	Object function	Data type
RTC: Heating/cooling request (Master)	Input	1.100 Heating / Cooling
RTC: Heating/cooling request (Slave)	Output	1.100 Heating / Cooling

The communication object is used to transmit the heating/cooling switchover request of the button operation of a slave device to the master device. The confirmation is made via object "Heating/cooling switchover".



#### Notice

When the master/slave operation is activated, the object "RTC: Heating/cooling request (master)" of the master device for synchronisation must be connected with object "RTC: Heating/cooling request (slave)" of the slave device.

### 12.1.49 RTC - Request manual fan speed level

Name	Object function	Data type
RTC: Request manual fan speed level (Master)	Input	1.001 Switching
RTC: Request manual fan speed level (Slave)	Output	1.001 Switching

The communication object is used to transmit the request of the manual or automatic fan speed level control of a slave device to the master device. This means that value 0 "Automatic fan speed level control", the value 1 "Manual fan speed level control"



#### Notice

When the master/slave operation is activated, the object "RTC: Request manual fan speed level (master)" of the master device for synchronisation must be connected with object "RTC: Request manual fan speed level (slave)" of the slave device.

### 12.1.50 RTC - Request fan speed level

Name	Object function	Data type
RTC: Request fan speed level (Master)	Input	5.001 Percentage value 6.010 Counter value
RTC: Request fan speed level (Slave)	Output	5.001 Percentage value 6.010 Counter value

The communication object is used to transmit the request of a fan speed level via the button operation of a slave device to the master device. The values can be transmitted as percentage values or counter values.



#### Notice

When the master/slave operation is activated, the object "RTC: Request fan speed level (master)" of the master device for synchronisation must be connected with object "RTC: Request fan speed level (slave)" of the slave device.

### 12.1.51 RTC - Confirm fan speed level

Name	Object function	Data type
RTC: Confirm fan speed level (Master)	Output	5.001 Percentage value 6.010 Counter value
RTC: Confirm fan speed level (Slave)	Input	5.001 Percentage value 6.010 Counter value

The communication object is used to transmit the fan speed level confirmation of the master device to a slave device. The values can be transmitted as percentage values or counter values.



#### Notice

When the master/slave operation is activated, the object "RTC: Confirm fan speed level (master)" of the master device for synchronisation must be connected with object "RTC: Confirm fan speed level (slave)" of the slave device.

### 12.1.52 RTC - Controller status RHCC

Name	Object function	Data type
RTC: Controller status RHCC	Output	9.* 2-byte floating point value

The status of the RHCC (Room Heating Cooling Controller) is sent to the bus via the communication object.

- Operating mode heating/cooling
- Operation active/passive
- Frost alarm
  - If the input temperature of the controller drops below the set temperature, then the frost alarm bit is set. The bit is reset when the temperature is exceeded.
- Heat alarm
  - If the input temperature of the controller exceeds the temperature set in the parameter, then the heat alarm bit is set. If the temperature drops below its setting, the bit is reset.
- Error
  - If the actual temperature cannot be received, the error bit is set.

### 12.1.53 RTC - Controller status HVAC

Name	Object function	Data type
RTC: Controller status HVAC	Output	5.xxx HVAC status
RTC: Controller status HVAC (master)	Output	5.xxx HVAC status
RTC: Controller status HVAC (slave)	Input	5.xxx HVAC status

The status of the HVAC (Heating, Ventilation, and Air Conditioning) is sent to the bus via the communication object.

- Operating mode heating/cooling
- Operation active/passive
- Frost alarm
  - If the input temperature of the controller drops below the temperature in the parameter, the frost alarm bit is set. The bit is reset when the temperature is exceeded.
- Dew point alarm
  - When value 1 is received via object "Dew point alarm", the dew point alarm bit is set.



#### Notice

When the master/slave operation is activated, the object "RTC: Controller status (master)" of the master device for synchronisation must be connected with object "RTC: Controller status (slave)" of the slave device.

#### 12.1.54 RTC - Setpoint for heating comfort

Name	Object function	Data type
RTC: Setpoint for heating comfort	Input	9.001 Temperature value

The RTC receives a setpoint heating comfort as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

#### 12.1.55 RTC - Setpoint for heating standby

Name	Object function	Data type
RTC: Setpoint for heating standby	Input	9.001 Temperature value

The RTC receives a setpoint heating standby as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

#### 12.1.56 RTC - Cooling setpoint economy

Name	Object function	Data type
RTC: Cooling setpoint economy	Input	9.001 Temperature value

The RTC receives a setpoint cooling economy as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

#### 12.1.57 RTC - Heating setpoint for building protection

Name	Object function	Data type
RTC: Heating setpoint for building protection	Input	9.001 Temperature value

The RTC receives a setpoint heating building protection as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

### 12.1.58 RTC - Setpoint for cooling comfort

Name	Object function	Data type
RTC: Setpoint for cooling comfort	Input	9.001 Temperature value

The RTC receives a setpoint cooling comfort as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

### 12.1.59 RTC - Setpoint for cooling standby

Name	Object function	Data type
RTC: Setpoint for cooling standby	Input	9.001 Temperature value

The RTC receives a setpoint cooling standby as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

### 12.1.60 RTC - Cooling setpoint economy

Name	Object function	Data type
RTC: Cooling setpoint economy	Input	9.001 Temperature value

The RTC receives a setpoint cooling economy as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

### 12.1.61 RTC - Cooling setpoint for building protection

Name	Object function	Data type
RTC: Cooling setpoint for building protection	Input	9.001 Temperature value

The RTC receives a setpoint cooling building protection as absolute temperature value via the communication object, which replaces the parameterized value. When option "Save local operation continuously" has been activated, the setting is retained also after a restart of the device. If the option has not been set, the value parameterized with the ETS becomes active again after a restart of the device.

### 12.1.62 RTC — Setpoint error

Name	Object function	Data type
RTC: Setpoint error	Output	1.001 Switching

The RTC sends value 1 via the communication object when a setpoint telegram has been received, the value of which is invalid. If a telegram with a valid value is received, it takes on value 0. The telegram is sent when its value changes.

Invalid temperature values are those that require a higher energy level than comfort mode or in validate the temperature range for heating and cooling. Example: For a temperature value of 21°C for heating comfort, values for heating standby higher than 21°C are not permitted. Or. For a temperature value of 21°C for heating comfort, values for cooling comfort smaller than 22°C (21°C + 1 K safety distance between heating and cooling) are not permitted.

### 12.1.63 RTC: Limit temperature basic heating stage

Name	Object function	Data type
RTC: Limit temperature basic heating stage	Input	9.001 Temperature value

The communication object receives the measured temperature value for the limit temperature of the basic heating stage. If, for example, the basic heating stage controls the floor heating, then the floor temperature is received via this communication object. If the temperature received exceeds the limit value, the control value is set on zero.

### 12.1.64 RTC - Limit temperature additional heating stage

Name	Object function	Data type
RTC: Limit temperature additional heating stage	Input	9.001 Temperature value

The communication object receives the measured temperature value for the limit temperature of the additional heating stage. If, for example, the basic heating stage controls the floor heating, then the floor temperature is received via this communication object. If the temperature received exceeds the limit value, the control value is set on zero.

### 12.1.65 RTC - Limit temperature basic cooling stage

Name	Object function	Data type
RTC: Limit temperature basic cooling stage	Input	9.001 Temperature value

The communication object receives the measured temperature value for the limit temperature of the basic cooling stage. The function is analogue to the heating limit temperature.

### 12.1.66 RTC - Limit temperature additional cooling stage

Name	Object function	Data type
RTC: Limit temperature additional cooling stage	Input	9.001 Temperature value

The communication object receives the measured temperature value for the limit temperature of the additional cooling stage. The function is analogue to the heating limit temperature.

### 12.1.67 RTC — Confirm fan (cooling) manually

Name	Object function	Data type
RTC; Confirm fan (cooling) manually	Output	1.001 Switching

The communication object signals the status of the second fan output (cooling) manually/automatic to the bus. Manual mode is signalled with value 1, automatic mode with value 0.

### 12.1.68 RTC - Fan speed level (cooling)

Name	Object function	Data type
RTC: Fan speed level (cooling)	Output	5.001 Percentage value 6.010 Counter value

The fan speed level to be set is sent to the second fan coil actuator (cooling) via the communication object. The parameter can be used to set whether the fan speed level is sent only in manual or also in automatic mode. A counter value or a percentage value can be set as data format.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator cooling.

### 12.1.69 RTC - Fan speed level status (cooling)

Name	Object function	Data type
RTC: Fan speed level status (cooling)	Input	5.001 Percentage value 6.010 Counter value

The communication object receives the current fan speed level of the second fan coil actuator (cooling). This the RTC uses for the display of the fan speed level and as starting point for its adjustment. The speed level in the RTC is determined as standard from the current control value or the manual adjustment.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator cooling.

### 12.1.70 RTC - Fan speed level x (cooling)

Name	Object function	Data type
RTC: Fan speed level x (cooling)	Output	1.001 Switching

These, up to five communication objects send the current fan speed level of the second fan coil actuator (cooling) via 1-bit switching commands to the actuator.

If a fan coil regulator is set for both operating modes of heating and cooling and an own generating device is set for both operating modes, this communication object then operates jointly with fan coil regulator cooling.

### 12.1.71 RTC - Current HVAC operating mode

Name	Object function	Data type
RTC: Current HVAC operating mode	Output	20.102 HVAC mode

The RTC uses this communication object to send the operating mode that belongs to the currently set setpoint temperature.

RTC operating mode	Current HVAC operating mode
Error	Building protection
Comfort override operating mode	Comfort
Standby override operating mode	Standby
Economy: Override operating mode	Economy
Building protection override operating mode	Building protection
Condensate water alarm	Building protection
Dew point alarm	Building protection
Window open	Building protection
Control OFF	Building protection
Presence	Comfort
Comfort	Comfort
Standby	Standby
Economy	Economy
Building protection	Building protection

Table 8: Operating mode

### 12.1.72 CO2 — CO2 value

Name	Object function	Data type
CO2: CO2 value	Output	9.* 2-byte floating point value

The CO2 value measured by the device is available via the communication object.

### 12.1.73 CO2 - External CO2 value

Name	Object function	Data type
CO2: External CO2 value	Input	9.* 2-byte floating point value

If another CO2 value is to be included in the measurement, this input can be linked with the other output of a corresponding device.

### 12.1.74 CO2 – Request CO2 value

Name	Object function	Data type
CO2: Request CO2 value	Input	1.017 Trigger

If the external value is not to be sent cyclically or if the device is being reset, the external value is requested via this object.

### 12.1.75 CO2 – Sensor error

Name	Object function	Data type
CO2: Sensor error	Output	1.001 Switching

If a sensor defect occurs or no current value is available to the KNX bus, a telegram with the value "1" is sent to the KNX bus.

A telegram with the value "0" resets the error.

### 12.1.76 CO2 – Control value

Name	Object function	Data type
CO2: Control value	Output	5.001 Percent (0..100%)

The CO2 controller sends its control value to an actuator via the control value communication object when the controller type is set on PI controller.

### 12.1.77 CO2 - threshold 1

Name	Object function	Data type
CO2: Threshold 1	Output	5.001 Percent (0..100%)

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.78 CO2 - Threshold 2

Name	Object function	Data type
CO2: Threshold 2	Output	5.001 Percent (0..100%)

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.79 CO2 - Threshold 3

Name	Object function	Data type
CO2: Threshold 3	Output	5.001 Percent (0..100%)

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.80 CO2 - CO2 setpoint

Name	Object function	Data type
CO2: CO2 setpoint	Output	9.* 2-byte floating point value

Another basic set value can be specified for the device via the object.

Once a new value has been received, this acts as the new reference point and therefore has a direct impact on the measuring results of the device.

### 12.1.81 CO2 - Block output

Name	Object function	Data type
CO2: Block output	Input	1.001 Switching

When the value "1" is received, all the KNX communication of the CO2 sensor is blocked and is no longer part of KNX bus communication. Unblocking happens when the value "0" is received.

### 12.1.82 RH - Relative humidity value

Name	Object function	Data type
RH: Relative humidity value	Output	9.* 2-byte floating point value

The humidity value measured by the device is available via the communication object.

### 12.1.83 RH - Relative external humidity value

Name	Object function	Data type
RH: Relative external humidity value	Input	9.* 2-byte floating point value

If another humidity value is to be included in the measurement, this input can be linked with the other output of a corresponding device.

### 12.1.84 RH – Request humidity value

Name	Object function	Data type
RH: Request humidity value	Input	1.017 Trigger

If the external value is not to be sent cyclically or if the device is being reset, the external value is requested via this object.

### 12.1.85 RH – Sensor error

Name	Object function	Data type
RH: Sensor error	Output	1.001 Switching

If a sensor defect occurs or no current value is available to the KNX bus, a telegram with the value "1" is sent to the KNX bus.

A telegram with the value "0" resets the error.

### 12.1.86 RH - Control value

Name	Object function	Data type
RH: Control value	Output	5.001 Percent (0..100%)

The humidity controller sends its control value to an actuator via the control value communication object when the controller type is set on PI controller.

### 12.1.87 RH - Threshold 1

Name	Object function	Data type
RH: Threshold 1	Output	1.001 Switching

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.88 RH - Threshold 2

Name	Object function	Data type
RH: Threshold 2	Output	1.001 Switching

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.89 RH - Threshold 3

Name	Object function	Data type
RH: Threshold 3	Output	1.001 Switching

The value sent via the object is parameterized in the application. This parameterized value is sent to the KNX bus after the threshold is exceeded.

### 12.1.90 RH - Relative humidity setpoint

Name	Object function	Data type
RH: Relative humidity setpoint	Output	9.* 2-byte floating point value

Another basic set value can be specified for the device via the object.

Once a new value has been received, this acts as the new reference point and therefore has a direct impact on the measuring results of the device.

### 12.1.91 RH - Block output

Name	Object function	Data type
RH: Block output	Input	1.001 Switching

When the value "1" is received, all the KNX communication of the humidity sensor is blocked and is no longer part of KNX bus communication.

Unblocking happens when the value "0" is received.

**Notice**

The communication objects regarding the function blocks appear for each function block in the same sequence depending on the parameterization.

- Only one sequence is explicitly presented in the following.
- The individual function blocks are differentiated by the numbering of the blocks (e.g. S1, L1, etc.).
- The same applies to the numbering of the step switches.

#### 12.1.92 1-button dimming - Switching

Name	Object function	Data type
SX: Switching	Input / output	1.001 Switching

A switching telegram is received or sent via the 1-bit communication object.

#### 12.1.93 1-button dimming - Relative dimming

Name	Object function	Data type
SX: Relative dimming	Output	3.007 Dimmer step

A dimming telegram is sent on the bus via the 3-bit communication object.

#### 12.1.94 1-button blind - Moving/Position

Name	Object function	Data type
xx Sx: Moving	Input / output	1.008 Up/Down
Sx: Position	Input / output	5.001 Percent (0..100%)

The 1-bit communication object "Sx: Moving" can be linked with switching objects of blind or roller blind actuators.

The 1-byte communication object "Sx: Position" can be linked with position objects of blind actuators.

### 12.1.95 2-button blind — Adjustment/slats position/stop

Name	Object function	Data type
Sx: Adjust	Input / output	1.007 Step
Sx: Slats position	Input / output	5.001 Percent (0..100%)
Sx: Stop	Input / output	1.007 Step

The 1-bit communication object "Sx: Adjust" can be linked with switching objects of blind or roller blind actuators.

The 1-byte communication object "Sx: Slats position" can be linked with position objects of blind actuators.

The 1-bit communication object "Sx: Stop" can be linked with switching objects of blind or roller blind actuators.

### 12.1.96 1-button short-long operation - Reaction at short operation

Name	Object function	Data type
Sx: Reaction at short operation	Input / output	1.001 Switching
Sx: Reaction at short operation Operation	Input / output	5.001 Percent (0..100%)

A telegram is sent or received via the communication object with brief press of the button.

Which telegrams is sent depends on the setting of the parameters. The bit size of the object is specified via the "Object type" parameter.

### 12.1.97 1-button short-long operation - Reaction at long operation

Name	Object function	Data type
Sx: Reaction at long operation Operation	Input / output	1.001 Switching
Sx: Reaction at long operation	Input / output	5.001 Percent (0..100%)

A telegram is sent or received via the communication object with long press of the button.

Which telegrams is sent depends on the setting of the parameters. The bit size of the object is specified via the "Object type" parameter.

### 12.1.98 1-button value transmitter - Switching

Name	Object function	Data type
SX: Switching	Input / output	1.001 Switching
SX: Switching	Input / output	5.001 Percent (0..100%)
SX: Switching	Input / output	5.010 Counting pulses (0..255)
SX: Switching	Input / output	9.* 2-byte Floating point value
SX: Switching	Input / output	8.001 Pulse difference
SX: Switching	Input / output	7.001 Pulses
SX: Switching	Input / output	14.* 4-byte Floating point value
SX: Switching	Input / output	13.001 Counting pulse (signed)
SX: Switching	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram is received or sent via the communication object. The bit size of the object is specified via the "Object type" parameter.

### 12.1.99 1-button value transmitter, 2 objects - Switching (rising edge)

Name	Object function	Data type
Sx: Switching (rising edge)	Input / output	1.001 Switching
Sx: Switching (rising edge)	Input / output	5.001 Percent (0..100%)
Sx: Switching (rising edge)	Input / output	5.010 counting pulses (0..255)
Sx: Switching (rising edge)	Input / output	9.* 2-byte Floating point value
Sx: Switching (rising edge)	Input / output	8.001 Pulse difference
Sx: Switching (rising edge)	Input / output	7.001 Pulses
Sx: Switching (rising edge)	Input / output	14.* 4-byte Floating point value
Sx: Switching (rising edge)	Input / output	13.001 Counting pulse (signed)
Sx: Switching (rising edge)	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram is received or sent via the communication object. The bit size of the object is specified via the "Object type for rising edge" parameter.

### 12.1.100 1-button value transmitter, 2 objects - Switching (falling edge)

Name	Object function	Data type
Sx: Switching (falling edge)	Input / output	1.001 Switching
Sx: Switching (falling edge)	Input / output	5.001 Percent (0..100%)
Sx: Switching (falling edge)	Input / output	5.010 Counting pulses (0..255)
Sx: Switching (falling edge)	Input / output	9.* 2-byte Floating point value
Sx: Switching (falling edge)	Input / output	8.001 Pulse difference
Sx: Switching (falling edge)	Input / output	7.001 Pulses
Sx: Switching (falling edge)	Input / output	14.* 4-byte Floating point value
Sx: Switching (falling edge)	Input / output	13.001 Counting pulse (signed)
Sx: Switching (falling edge)	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram is received or sent via the communication object. The bit size of the object is specified via the "Object type for falling edge" parameter.

### 12.1.101 1-button step switch - Switching step x

Name	Object function	Data type
Sx: Switching step x	Input / output	1.001 Switching

A switching telegram is received or sent via the 1-bit communication object.

**12.1.102 1-button multiple operation - Switching 1 actuation**

Name	Object function	Data type
Sx: Switching 1 actuation	Input / output	1.001 Switching
Sx: Switching 1 actuation	Input / output	5.001 Percent (0..100%)
Sx: Switching 1 actuation	Input / output	5.010 Counting pulses (0..255)
Sx: Switching 1 actuation	Input / output	9.* 2-byte Floating point value
Sx: Switching 1 actuation	Input / output	8.001 Pulse difference
Sx: Switching 1 actuation	Input / output	7.001 Pulses
Sx: Switching 1 actuation	Input / output	14.* 4-byte Floating point value
Sx: Switching 1 actuation	Input / output	13.001 Counting pulse (signed)
Sx: Switching 1 actuation	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram is received or sent via the communication object. The bit size of the object is specified via the "Object type for object 0" parameter.

**12.1.103 1-button multiple operation - Switching x actuations**

Name	Object function	Data type
Sx: Switching x actuations	Input / output	1.001 Switching
Sx: Switching x actuations	Input / output	5.001 Percent (0..100%)
Sx: Switching x actuations	Input / output	5.010 Counting pulses (0..255)
Sx: Switching x actuations	Input / output	9.* 2-byte Floating point value
Sx: Switching x actuations	Input / output	8.001 Pulse difference
Sx: Switching x actuations	Input / output	7.001 Pulses
Sx: Switching x actuations	Input / output	14.* 4-byte Floating point value
Sx: Switching x actuations	Input / output	13.001 Counting pulse (signed)
Sx: Switching x actuations	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram is received or sent via the communication object. The bit size of the object is specified via the "Object type for object x" parameter.

**12.1.104 1-button light scene extension unit with memory function - Light scene number**

Name	Object function	Data type
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Sx: Light scene number:	Output	18.001 Scenes Control
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At a normal press of the button the light scene number is sent on the bus via the 1-byte communication object.

At a long press of the button a memory bit is sent in addition to the light scene number.

#### 12.1.105 1-button operating mode "Adjust RTC" — Enable

Name	Object function	Data type
Sx: Enable	Input	1.001 Switching

The RTC function can be temporarily blocked or enabled via the 1-bit communication object.

#### 12.1.106 1-button operating mode "Adjust RTC" — Operating mode

Name	Object function	Data type
Sx: Operating mode	Output	20.102 HVAC mode

The value for the switchover of operating mode is sent via the 1-byte communication object.  
Meaning of values:

- "0": Auto
- "1": Comfort
- "2": Standby
- "3": Night
- "4": Frost/heat protection

#### 12.1.107 1-button operating mode "Adjust RTC" — Operating mode comfort

Name	Object function	Data type
Sx: Operating mode comfort	Output	1.001 Switching

The comfort operating mode is sent to the bus via the 1-bit communication object. The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via the object at each press of the button.

**12.1.108 1-button operating mode "Adjust RTC" — Operating mode Eco**

Name	Object function	Data type
Sx: Operating mode Eco	Output	1.001 Switching

The ECO operating mode is sent to the bus via the 1-bit communication object. The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via the object at each press of the button.

**12.1.109 1-button operating mode, "Adjust RTC" — Frost operating mode**

Name	Object function	Data type
Sx: Frost operating mode	Output	1.001 Switching

The frost operating mode is sent to the bus via the 1-bit communication object. The telegram that is sent, always has the inverted value of the value sent last. This means that "0" or "1" is sent (toggle mode) alternately via the object at each press of the button.

### 12.1.110 2-button switching - Switching

Name	Object function	Data type
SX: Switching	Input / output	1.001 Switching

A switching telegram for a button pair is received or sent via the 1-bit communication object.

Once an Off telegram has been received via the object after an On telegram was sent, an On telegram is sent again after a renewed press of the button. It must be ensured here that the S-flag (writing) of the communication object is activated.

### 12.1.111 2-button dimming - Switching

Name	Object function	Data type
SX: Switching	Input / output	1.001 Switching

A switching telegram for a button pair is received or sent via the 1-bit communication object.

### 12.1.112 2-button dimming - Relative dimming

Name	Object function	Data type
SX: Relative dimming	Output	3.007 Dimmer step

A dimming telegram for a button pair is sent on the bus via the 3-bit communication object.

### 12.1.113 2-button blind - Moving/Position

Name	Object function	Data type
Sx: Moving	Output	1.008 Up/Down
Sx: Position	Output	5.001 Percent (0..100%)

The 1-bit communication object "Sx: Moving" can be linked with switching objects of blind or roller blind actuators.

The 1-byte communication object "Sx: Position" can be linked with position objects of blind actuators.

### 12.1.114 2-button blind — Adjustment/slats position

Name	Object function	Data type
Sx: Adjust	Output	1.007 Step
Sx: Slats position	Output	5.001 percent (0..100%)

The 1-bit communication object "Sx: Adjust" can be linked with switching objects of blind or roller blind actuators.

The 1-byte communication object "Sx: Slats position" can be linked with position objects of blind actuators.

### 12.1.115 2-button value transmitter - Switching

Name	Object function	Data type
Sx: Value switching	Input / output	1.001 Switching
Sx: Value switching	Input / output	5.001 Percent (0..100%)
Sx: Value switching	Input / output	5.010 counting pulses (0..255)
Sx: Value switching	Input / output	9.* 2-byte Floating point value
Sx: Value switching	Input / output	8.001 Pulse difference
Sx: Value switching	Input / output	7.001 Pulses
Sx: Value switching	Input / output	14.* 4-byte Floating point value
Sx: Value switching	Input / output	13.001 Counting pulse (signed)
Sx: Value switching	Input / output	12.001 Counting pulse (unsigned)

A switching or value telegram for a button pair is received or sent via the communication object. The bit size of the object is specified via the "Object type" parameter.

### 12.1.116 2-button value dimming sensor - Value

Name	Object function	Data type
Sx: Value	Input / output	5.001 Percent (0..100%)
Sx: Value	Input / output	5.010 counting pulses (0..255)

A value telegram for a button pair is received or sent via the communication object. The bit size of the object is specified via the "Object type" parameter.

**12.1.117 2-button step switch - Switching step x**

Name	Object function	Data type
Sx: Switching step x	Input / output	1.001 Switching

A switching telegram for a button pair is received or sent via the 1-bit communication object.

### 12.1.118 LED function - Status LED

Name	Object function	Data type
Sx: Status LED	Input	1.001 Switching
Lx: Status LED	Input	5.001 Percent (0..100%)

The 1-bit communication object is used to receive switching telegrams. If an On telegram is received via the object, the LED lights up in the colour for On. If an Off telegram is received via the object, the LED lights up in the colour for Off.

The 1-byte communication object is used to receive value telegrams for the button LED. The parameter specifies the colour in which the LED lights up for the values received.

The bit size of the object is specified via the "Object type for status object" parameter.

### 12.1.119 LED function - Scene storage

Name	Object function	Data type
Lx: Scene storage	Input	18.001 Scenes Control

A value telegram for storing scenes is received via the 1-byte communication object. The LED of the button flashes for three seconds and lights continuously when a telegram is received via the object.

If object "Lx: Day/night mode" is enabled, the LED flashes either bright or dark.

**12.1.120 Temperature sensor - Actual temperature**

Name	Object function	Data type
TS: Actual temperature	Output	9.001 Temperature (°C)

The actual temperature of the internal temperature sensor can be sent on the bus via the 2-byte communication object.

**12.1.121 Temperature sensor - Actual temperature for temperature adjustment**

Name	Object function	Data type
TS: Actual temperature for temperature adjustment	Input	9.* 2-byte Floating point value

The actual temperature of an external temperature sensor that overwrites the parameterised offset can be received via the 2-byte communication object.

**Notice**

The communication objects regarding the channels (general functions) appear in the same sequence depending on the parameterization.

- Only one sequence is explicitly presented in the following.
- The individual channels are differentiated with channel numbering (e.g. GF1, etc.).
- The same applies to the numbering of the inputs.

### 12.1.122 Cyclic telegrams — Enable

Name	Object function	Data type
GFx: Enable	Input	1.001 Switching

The function "Cyclic telegram" can be temporarily blocked or enabled via the 1-bit communication object.

### 12.1.123 Priority - Switching input

Name	Object function	Data type
GFx: Switching input	Input	1.001 Switching

The switching telegrams received via the 1-bit communication object are transmitted to object "GFx: Output" depending on the state of the "GFx: Priority input" object.

### 12.1.124 Priority - Input priority

Name	Object function	Data type
GFx: Input priority	Input	2.001 Switching priority

The values 0, 1, 2 and 3 can be received via the 2-bit communication object. Each value triggers a specific forced operation of object "GFx: Output".

### 12.1.125 Priority - Output

Name	Object function	Data type
GFx: Output	Output	1.001 Switching

The telegrams received via communication object "GFx: Switching input" are transferred to object "GFx: Output" depending on the state of the "GFx: Input priority" object.

### 12.1.126 Logic gate - Output

Name	Object function	Data type
GFx: Output	Output	1.001 Switching
GFx: Output	Output	5.001 Percent (0..100%)

The result determined from the inputs is sent via the communication object. The value that is to be sent for a logic function that was fulfilled or not fulfilled is adjustable. The bit size of the object is specified via the "Object type output" parameter.

### 12.1.127 Logic gate - Input

Name	Object function	Data type
GFx: Input x	Input	1.001 Switching
GFx: Input x	Input	5.001 Percent (0..100%)

The values received via the communication objects are linked via the logic gate. The bit size of the object is specified via the "Object type input x" parameter.

### 12.1.128 Gate - Input

Name	Object function	Data type
GFx: Input	Input	1.001 Switching
GFx: Input	Input	1.008 Up/Down
GFx: Input	Input	2.001 Switching priority
GFx: Input	Input	3.007 Dimmer step
GFx: Input	Input	5.001 Percent (0..100%)
GFx: Input	Input	5.010 Counting pulses (0..255)
GFx: Input	Input	9.* 2-byte Floating point value
GFx: Input	Input	8.001 Pulse difference
GFx: Input	Input	7.001 Pulses
GFx: Input	Input	10.001 Daytime
GFx: Input	Input	11.001 Date
GFx: Input	Input	14.* 4-byte Floating point value
GFx: Input	Input	13.001 Counting pulse (signed)
GFx: Input	Input	12.001 Counting pulse (unsigned)

The communication object is used to receive telegrams for controlling gates and for display. The object can take on different sizes. The bit size is specified via the "Object type" parameter.

### 12.1.129 Gate - Output

Name	Object function	Data type
GFx: Output	Output	1.001 Switching
GFx: Output	Output	1.008 Up/Down
GFx: Output	Output	2.001 Switching priority
GFx: Output	Output	3.007 Dimming step
GFx: Output	Output	5.001 Percent (0..100%)
GFx: Output	Output	5.010 Counting pulses (0..255)
GFx: Output	Output	9.* 2-byte Floating point value
GFx: Output	Output	8.001 Pulse difference
GFx: Output	Output	7.001 Pulses
GFx: Output	Output	10.001 Daytime
GFx: Output	Output	11.001 Date
GFx: Output	Output	14.* 4-byte Floating point value
GFx: Output	Output	13.001 Counting pulse (signed)
GFx: Output	Output	12.001 Counting pulse (unsigned)

The communication object is used to send telegrams for controlling gates and for display. The object can take on different sizes. The bit size is specified via the "Object type" parameter.

### 12.1.130 Staircase lighting - Input

Name	Object function	Data type
GFx: Input	Input	1.001 Switching
GFx: Input_Output	Input / output	1.001 Switching
GFx: Input	Input	5.001 Percent (0..100%)

The 1-bit communication object can be used to receive On and Off telegrams to start or stop the switch-off delay for staircase lighting. Off telegrams are transferred directly to the output and the switch-off delay is stopped.

The 1-byte communication object can be used to receive value telegrams (percentage values), to start or stop the switch-off delay for staircase lighting. After expiration of the switch-off delay, the "Output" object sends a telegram with value "0".

The bit size of the object is specified via the "Object type/number" parameter.

### 12.1.131 Staircase lighting - Switch-off delay

Name	Object function	Data type
GFx: Switch-off delay	Input	7.005 Time (s)

The 2-byte communication object is used to receive telegrams with the set switch-off delay. The received values are written to the memory of the device and are retained also after a power failure.

### 12.1.132 Staircase lighting - Switch-off pre-warning time

Name	Object function	Data type
GFx: Switch-off pre-warning time	Input	7.005 Time (s)

The 2-byte communication object "GFx: Switch-off pre-warning time" is used to receive telegrams with the set time for switch-off pre-warning. The received values are written to the memory of the device and are retained also after a power failure.

### 12.1.133 Staircase lighting - Output

Name	Object function	Data type
GFx: Output	Output	1.001 Switching
GFx: Output	Output	5.001 Percent (0..100%)

The 1-bit communication object is used to send On and Off telegrams.

The 1-byte communication object is used to send value telegrams (percentage values). Telegrams that are received via communication object "Input" are transferred direct to object "Output". After expiration of the switch-off delay, the "Output" object sends an Off telegram or value "0". The bit size of the object is specified via the "Object type/number" parameter.

### 12.1.134 Delay - Input

Name	Object function	Data type
GFx: Input	Input	1.001 Switching
GFx: Input	Input	1.008 Up/Down
GFx: Input	Input	5.001 Percent (0..100%)
GFx: Input	Input	5.010 Counting pulses (0..255)
GFx: Input	Input	9.* 2-byte Floating point value
GFx: Input	Input	8.001 Pulse difference
GFx: Input	Input	7.001 Pulses
GFx: Input	Input	14.* 4-byte Floating point value
GFx: Input	Input	13.001 Counting pulse (signed)
GFx: Input	Input	12.001 Counting pulse (unsigned)

The communication object is used to receive telegrams with a fixed size. The function that is triggered depends on the application selected. The bit size of the object is specified via the "Object type" parameter.

### 12.1.135 Delay - Output

Name	Object function	Data type
GFx: Output	Output	1.001 Switching
GFx: Output	Output	1.008 Up/Down
GFx: Output	Output	5.001 Percent (0..100%)
GFx: Output	Output	5.010 counting pulses (0..255)
GFx: Output	Output	9.* 2-byte Floating point value
GFx: Output	Output	8.001 Pulse difference
GFx: Output	Output	7.001 Pulses
GFx: Output	Output	14.* 4-byte Floating point value
GFx: Output	Output	13.001 Counting pulse (signed)
GFx: Output	Output	12.001 Counting pulse (unsigned)

The telegrams received via communication object "GFx: Input" are transferred to object "GFx: Output" depending on the state of the "GFx: Delay time" object. The bit size of the object is specified via the "Object type" parameter.

### 12.1.136 Delay - Delay time

Name	Object function	Data type
GFx: Delay time:	Input	7.005 Time (s)

The 2-byte communication object is used to receive telegrams with the set delay time. The received values are written to the memory of the device and are retained also after a power failure.

### 12.1.137 Min/max value transducer - Output

Name	Object function	Data type
GFx: Output	Output	5.001 Percent (0..100%)
GFx: Output	Output	5.010 counting pulses (0..255)
GFx: Output	Output	9.* 2-byte Floating point value
GFx: Output	Output	8.001 Pulse difference
GFx: Output	Output	7.001 Pulses
GFx: Output	Output	14.* 4-byte Floating point value
GFx: Output	Output	13.001 Counting pulse (signed)
GFx: Output	Output	12.001 Counting pulse (unsigned)

The communication object is used to send either the largest input value, the smallest input value or the average of all input values. The bit size of the object is specified via the "Object type" parameter.

### 12.1.138 Min/max value transducer - Input x

Name	Object function	Data type
GFx: Input	Input	5.001 Percent (0..100%)
GFx: Input	Input	5.010 counting pulses (0..255)
GFx: Input	Input	9.* 2-byte Floating point value
GFx: Input	Input	8.001 Pulse difference
GFx: Input	Input	7.001 Pulses
GFx: Input	Input	14.* 4-byte Floating point value
GFx: Input	Input	13.001 Counting pulse (signed)
GFx: Input	Input	12.001 Counting pulse (unsigned)

The communication objects (GFx: Input 1 to 8) are used to receive telegrams with a fixed size. The bit size of the object is specified via the "Object type" parameter.

### 12.1.139 Light scene actuator - Scene call-up

Name	Object function	Data type
GFx: Scene call-up	Input	18.001 Scene control

The 1-byte communication object is used to receive scene numbers that are stored in the device.

### 12.1.140 Light scene actuator - Actuator group x

Name	Object function	Data typee
GFx: Actuator group x	Input / output	18.001 Scenes Control
GFx: Actuator group x	Input / output	1.001 Switching
GFx: Actuator group x	Input / output	1.008 Up/Down
GFx: Actuator group x	Input / output	5.001 Percent (0..100%)
GFx: Actuator group x	Input / output	9.* 2-byte Floating point value

The communication object is used to activate different actuators. At a call up of a scene, telegrams are sent consecutively to the connected actuators via the object. The bit size of the object is specified via the "Object type actuator group x" parameter.

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