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# KNX Technical Reference Manual
# ABB-i-Bus®-KNX Millenium


## Room temperature controller incl. BAU
## 6124/08-981-500

Power and productivity
for a better world™

# 1 Information on the manual

## 1.1 General information

Please read this manual through carefully and adhere to the information listed. This will ensure reliable operation and long service life of your product.
For reasons of clarity this manual does not contain all the detailed information on all the models of the product, nor can it take into consideration all conceivable circumstances related to installation, operation and maintenance. If additional information is required or problems arise that are not dealt with in this manual, the necessary information can be requested from the manufacturer.
The product 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. To maintain this state for the period of its operation the specifications of this manual must be observed and adhered to. Modifications and repairs to the product must only be undertaken if the manual expressly permits this.
It is only the adherence to the safety instructions and all safety and warning symbols in this manual that will ensure the optimum protection of the user and the environment as well as the safe and trouble-free operation of the product.

## 1.2 Structure of the manual

- This manual provides you with the detailed technical information on the device, its installation and programming. The use of the device is explained by means of examples.
- The chapters "Information on the manual", "Safety" and "Overview of functions" contain general specifications and basic information as well as a description of functions.
- Chapters "Setup and function", "Technical data" and "Dimensional drawings and circuit diagrams" explain the device instrumentation.
- Chapter "Mounting and electrical connection" describes the installation, mounting and the electrical connections.
- Chapters "Commissioning" and "Operation" contain instructions on commissioning and how to operate the device.
- One or several chapters "Application ..." contain general information on the individual applications of the device, the setting options of all device parameters and a list of all objects.

### 1.3 Symbols in the manual

#### Danger - danger to life

This symbol in connection with the signal word "Danger" indicates dangerous situations which could lead to immediate death or to serious injury.

#### Warning - danger to life

This symbol in connection with the signal word "Warning" indicates a dangerous situation which could lead to immediate death or to serious injury.

#### Caution - risk of injury

This symbol in connection with the signal word "Caution" indicates a possibly dangerous situation which could lead to slight or moderately serious injury.

#### Attention - damage to property

This symbol indicates a possibly harmful situation. Non-observance of the safety instructions can lead to damage or destruction of the product.

#### Note ...

This symbol indicates information or references to additional useful topics. This is not a signal word for a dangerous situation.

This symbol refers to integrated videos with additional information on the respective chapter. An Acrobat Reader from Version 9.0 is required to view the videos.

This symbol indicates information on the protection of the environment.

Examples on application, installation and programming are displayed with a grey background.

# 2 Safety

## Warning

**Electric voltage!**
Risk of death and fire due to electrical voltage of 230 V.
– Work on the 230V supply system may only be performed by authorised electricians!
– Disconnect the mains power supply prior to installation and/or disassembly!

## Caution

**Risk of damaging the device due to external factors!**
Moisture and contamination can damage the device.
That is why the device must be protected against humidity, dirt and damage during transport, storage and operation!

### 2.1 Intended use

The device must only be operated within the specified technical data!
The room temperature controller is suitable for the control of a ventilator convector with a fan-coil actuator or a conventional heating and cooling system. Extensive functions are available for the room temperature controller. The scope of the application is contained in chapter "Application ..." (only in languages of the countries DE, EN, ES, FR, IT and NL). The integrated bus coupler makes possible the connection of a KNX bus line.

## Note

They may only be installed in dry interior rooms in flush-mounted sockets according to BS 4662:2006+A1:2009.

### 2.2 Improper use

The device represents a danger if it is improperly used. Each non-intended use is deemed improper use. The manufacturer is not liable for damages resulting from such improper use. The associated risk is borne by the user/operator.
The device must never be used outdoors or in bathroom areas. Do not push objects through the openings in the device. The device has an integrated bus coupler. The use of an additional bus coupler is therefore not admissible.

### 2.3 Target groups and qualifications

Installation, commissioning and maintenance of the product must only be carried out by trained and properly qualified electrical installers. The electrical installers must have read and understood the manual and follow the instructions provided. The operator must adhere to the valid national regulations in his country governing the installation, functional test, repair and maintenance of electrical products.

### 2.4 Liability and warranty

Improper use, non-observance of this manual, the use of inadequately qualified personnel, as well as unauthorized modification excludes the liability of the manufacturer for the damages caused. It voids the warranty of the manufacturer.

### 2.5 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 2002/96/EC WEEE and 2002/95/EC RoHS)

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

# 3 Setup and function

## 3.1 Features of function and equipment

The room temperature controller is part of the „Millenium KNX sensor program. It is a monoblock application module which is suitable for installation in flush-mounted boxes according to BS 4662:2006+A1:2009. The device is equipped with an integrated bus coupler.
The room temperature controller senses the current room temperature and regulates the heating or cooling. The device also serves to control two-/four-pipe systems (2-/4-pipe fan coil units) and conventional air-conditioning units. Additionally, further switch-control telegrams can be sent to KNX actuators to activate a connected ventilation fan
Hotel management systems can gain direct access to the room temperature controller via KNX and activate controllers in the room. The fan speed level can also be selected manually via a buttons (forced operation). This makes it possible to very quickly adjust the temperature in a hotel room to the individual wishes of the guests. The device supports the full function for international hotel applications. It can function in the operating modes "heating/cooling", "only heating" and "only cooling".
For operation and display, the room temperature controller is equipped with push-buttons and a rotary control element. An LCD display serves to indicate the current operating states and values. The use of simple symbols on the buttons and in the display allows the room temperature controller to operated easily and intuitively.

The device has four control buttons:
- Fan speed level

Button function is freely parameterizable (switching, dimming, etc.)
- ECO mode
- Room temperature controller On / Off

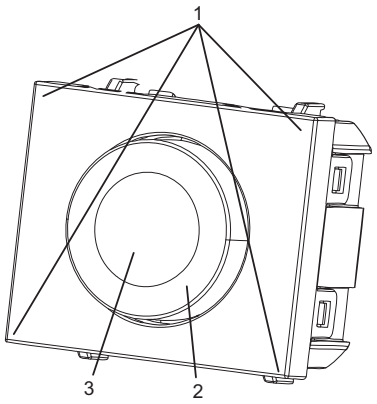
The following table lists the options for use:

| Special features | Function | General functions |
|---|---|---|
| • Function illumination<br>• Freely programmable<br>• Day / night switchover of the LEDs | • Set / actual temperature<br>• Comfort / standby<br>• Night operation<br>• Frost protection<br>• Heat protection<br>• Heating<br>• Cooling<br>• Fan control<br>• Logic functions | • Light scene actuator<br>• Sequence<br>• Logic<br>• Delay<br>• Staircase lighting<br>• Preset<br>• Cyclic telegram<br>• Flashing<br>• Gate<br>• Min/max value transducer<br>• Threshold value / hysteresis<br>• PWM inverter<br>• Priority |

## 3.2 Overview of devices

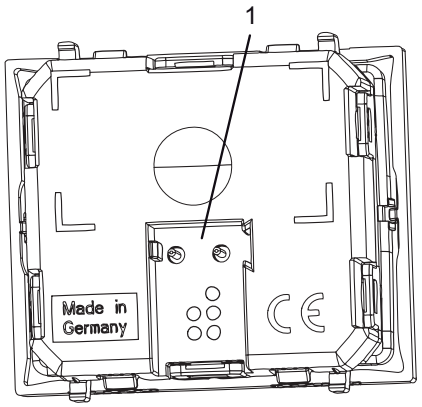
### 3.2.1 Front

| Position | Function |
|---|---|
| 1 | Push-buttons |
| 2 | Rotary control element |
| 3 | Display |




### 3.2.2 Rear

| Position | Function |
|---|---|
| 1 | KNX connection |




### Note

Observe the special mounting instructions in paragraphs "Electrical connection" and "Mounting".

### 3.3 Cover frame and support ring

**Note**

A cover frame and a support ring from the "Millenium" program are additionally required (see the following illustration). These must be ordered separately.

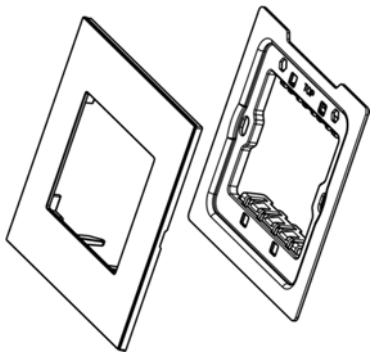


Fig. 1: Cover frame and support ring

# 4 Technical data

| Designation | Value |
|---|---|
| Power supply<br>(via KNX bus line) | 24 V DC |
| Bus subscribers | 1 (12 mA) |
| KNX connection | Bus connecting terminal, screwless |
| Protection type | IP20 according to DIN EN 60529 |
| Ambient temperature range | -5 … 45°C |
| Storage temperature range | -20 … 70°C |
| Dimensions (H x W x D) | 51.5 x 43.6 x 7.8 mm |

# 5 Circuit diagrams and dimensional drawings

## 5.1 Circuit diagram

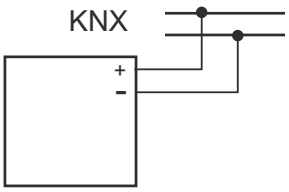



Fig. 2: Circuit diagram

## 5.2 Dimensional drawings

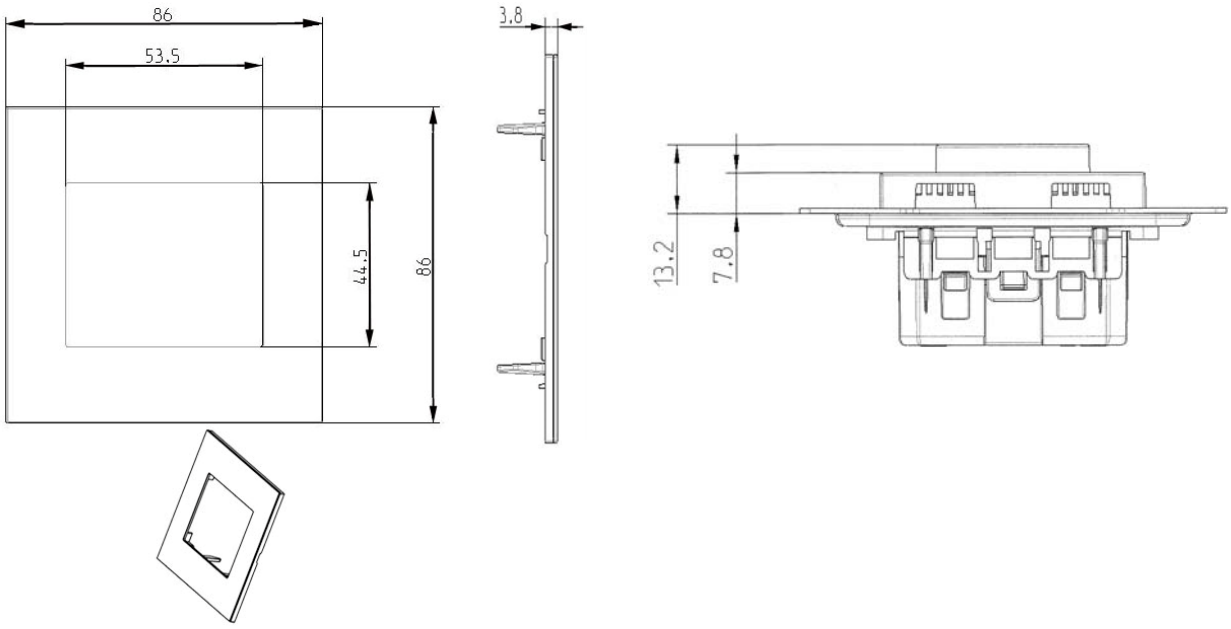



Fig. 3: Dimensional drawings

# 6 Installation and electrical connection

## Warning

**Electric voltage!**
Risk of death due to electrical voltage of 230 V during short-circuit in the low-voltage line.
– Low-voltage and 230 V lines must not be installed together in a flush-mounted socket!

## 6.1 Requirements for the electrician

## Warning

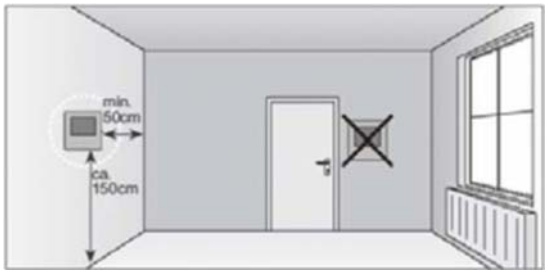
**Electric voltage!**
Install the device only if you have the necessary electrical engineering knowledge and experience.
- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

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 from power;
  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 supply network type (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

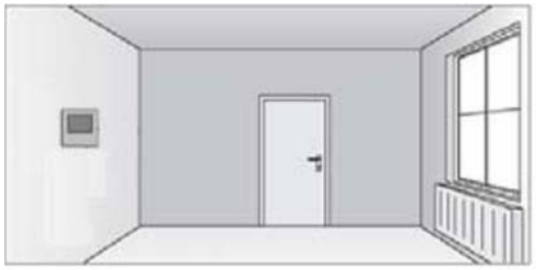
### 6.2 Selection of installation site

For proper commissioning please observe the following steps:

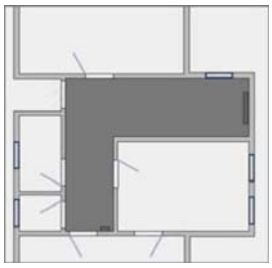
The room temperature controller should be installed at a height of approximately 150 cm from the floor and 50 cm from a door frame.



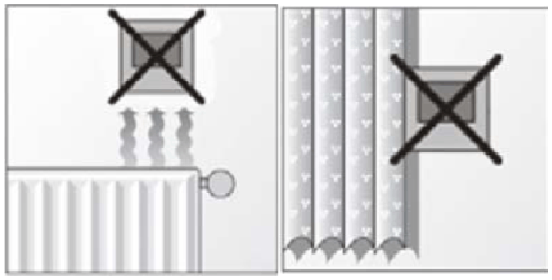

The room temperature controller should be installed on a wall opposite a radiator.



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



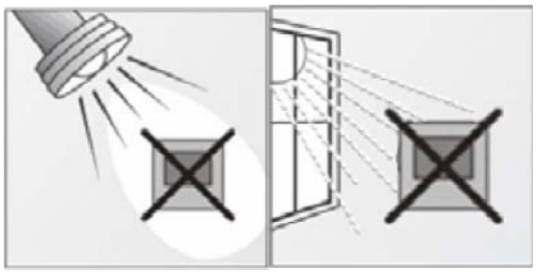
Installing a room temperature controller close to a radiator or behind curtains is not practical.



This equally applies to the installation on an exterior wall - low outside temperatures have an effect on temperature regulation.

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

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



## 6.3 Mounting

### 6.3.1 Installing the unit

The devices with integrated bus coupler have been prepared for installing in flush-mounted boxes according to BS 4662:2006+A1:2009 in connection with the corresponding support ring and cover frame (see also chapter "Cover frame and support ring", on page 13).

1. The side of the support ring with the marking "TOP" must be aligned toward the top. Now insert the device into the support ring in such a way that both sides with the marking "TOP" (on the device and the support ring) are aligned parallel to each other.

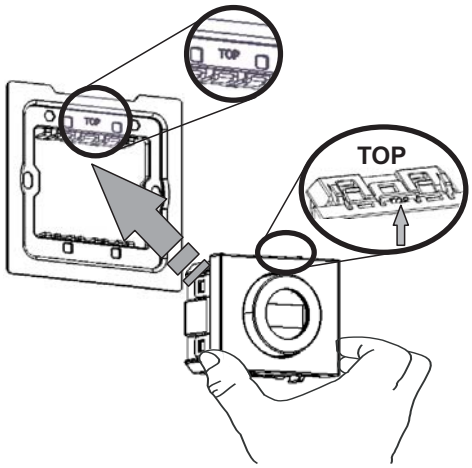



Fig. 4: Inserting the device into the support ring

2. The connection to the KNX bus line is made with the enclosed bus connection terminal (see also chapter "Commissioning", section "Software" on page 20). Now install the support ring with the inserted device in the flush-mounted box ("TOP" toward the top) and screw it on securely.

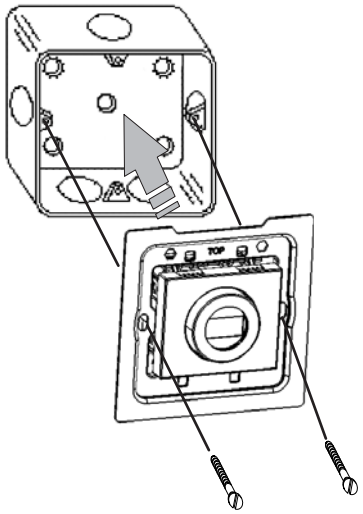


Fig. 5: Inserting into the flush-mounted box

3. Then plug the cover frame onto the support ring.
   – Separate order, see also chapter "Cover frame and support ring", on page 13.

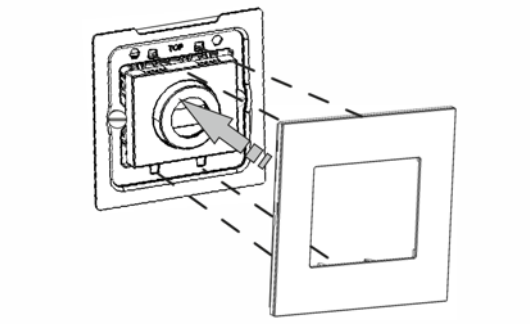


Fig. 6: Attaching the cover frame

## 6.4 7Electrical connection

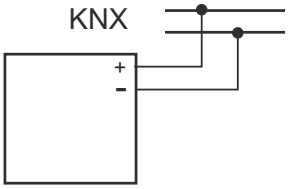



Fig. 7: Circuit diagram

# 7 Commissioning

## 7.1 Software

### 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.

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 (from version ETS 3.0 f, or native application from ETS 4).

### 7.1.1 Preparatory steps

1. Connect a PC via the KNX interface, e.g. the commissioning interface / adapter 6149/21-500, to the KNX bus line. The Engineering Tool Software ETS (from version ETS 3.0 f, or native application from ETS 4) must be installed on the PC.

2. Switch on the bus voltage.

### 7.1.2 Assigning a physical address

1. Press the two top buttons (1) on the device simultaneously.

   The message "PROG" (2) appears in red on the display.

2. After the physical address has been programmed, the message "PROG" goes out.

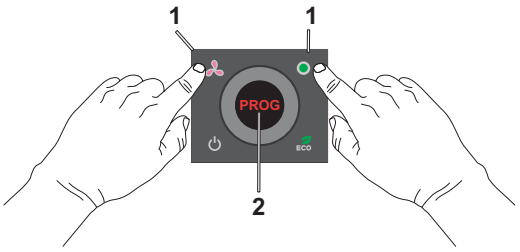



Fig. 8: Assigning a physical address

### 7.1.3 Assigning the group address(es)

The group addresses are assigned in connection with the ETS.

### 7.1.4 Selecting the application program

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

### 7.1.5 Differentiating the application program

Different functions can be implemented via the software application (ETS) (A detailed description of parameters is available in chapter "Application …“ (Only in languages DE, EN, ES, FR, IT and NL).

# 8 Operation

## 8.1 Overview of control elements

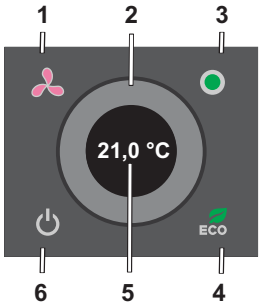



Fig. 9: Control and display elements

| Position | Control / display elements |
|---|---|
| 1 | Button for selecting the fan speed level |
| 2 | Rotary control element (setpoint adjustment) |
| 3 | Button function is freely parameterizable (switching, dimming, etc.) |
| 4 | Button for activating the ECO mode (e.g. during your absence) |
| 5 | Display |
| 6 | Button for activating / deactivating the room temperature controller |

### Note

- The basic setting of the display always indicates the set-point temperature.
- Starting from paragraph "General control and display functions" on page 24 the individual functions and associated control steps are presented.
- For the colour of the indications in the display observe paragraph "LED colour concept" on page 23.

## 8.2 Indications in the display

| Display | Display | Action of the device |
|---|---|---|
| 21,0 °C | Set-point temperature / room temperature controller activated<br>• White: Set-point temperature = actual temperature<br>• Blue (cooling, colder): Set-point temperature > actual temperature<br>• Orange (heating, warmer): Set-point temperature < actual temperature | –<br>No adjustment required<br>Reduce set-point temperature<br>Raise set-point temperature |
| 3 (A) | Automatic ventilation (display of fan speed level plus A) | – |
| 0 | Ventilation off/standby | – |
| 1<br>\|<br>5 | Manual ventilation (display of fan speed level) | – |
| | Room temperature controller is deactivated | – |
| ECO | Eco mode | – |
| | Alarm | – |
| | Frost protection / heat protection | – |
| | Condensate | – |
| | Standby mode | – |
| | Dew point | – |
| | Nighttime temperature reduction | – |

## 8.3 LED colour concept

### 8.3.1 Explanation

| Colour | Meaning |
|---|---|
| White | Set-point temperature = actual temperature |
| Blue | Set-point temperature > actual temperature |
| Orange | Set-point temperature > actual temperature |
| Green | Eco mode |
| White | Alarms and operating modes |

### 8.3.2 Push-buttons

The buttons are permanently backlit in white. The backlighting can be deactivated via a parameter setting. Also the day / night mode can be activated in Power-Tool via a parameter setting. This allows the switchover between bright (day) and darkened backlighting (night).
When the device is deactivated, the backlighting of the buttons remains deactivated until the device is activated again.

### 8.3.3 Display

The graphics display has RGB backlighting. The backlighting can be adjusted darker or brighter via a parameter setting in Power-Tool.

| Display | Display | Action of the device |
|---|---|---|
| White | Temperature / controller on | – |
| White * | Set-point temperature = actual temperature | No adjustment required |
| Blue (cooling, colder): * | Set-point temperature > actual temperature | Reduce set-point temperature |
| Orange (heating, warmer) * | Set-point temperature > actual temperature | Raise set-point temperature |
| Green | Eco mode | – |

* The respective colour is changed whenever the device detects a deviation between the set-point temperature and the actual temperature.

## 8.4 General control and display functions

Operation is carried out by pressing the individual buttons and turning the rotary control element (see also Fig. 9). The functions of the buttons in connection with the rotary control element and the display are described in the following.
The precise function is fixed via the assigned application / function and their parameter settings.
Extensive applications are available for the room temperature controller (see the overview of the applications at the beginning of chapter "Description of applications / objects"). The range of applications is contained in chapter "Description of applications / objects" (only in languages of the countries DE, EN, ES, FR, IT and NL).

### Note

- For the colour of the indications in the display observe chapter "LED colour concept" on page 23.
- The basic setting of the display always indicates the set-point temperature!

## 8.5 Activating, deactivating the room temperature controller

### 8.5.1 Activation

1. Press the "On/Off" button (6).
2. All buttons are backlit in white.

   After renewed activation the functions that were active prior to deactivation are activated.

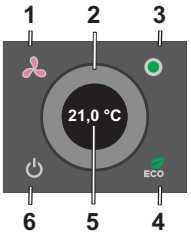



Fig. 10: The device is activated

### 8.5.2 Deactivation

1. Press the "On/Off" button (6).
2. The device switches to the "Off" state.

   All buttons are no longer backlit.

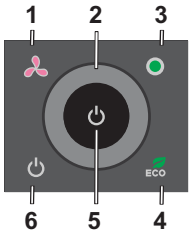


Fig. 11: The device is deactivated

**Note**
All buttons are deactivated.
The device has no function in a deactivated state!

## 8.6 Temperature

### 8.6.1 Display of the set-point temperature

The temperature appears automatically in the display.
For this the device must be switched on!

### 8.6.2 Setting of the set-point temperature

The currently set room temperature can be indicated via the display.
If the rotary control element is actuated, the set-point temperature is shown in the display. If the set-point temperature is unequal to the actual temperature, each change is indicated in the display from white to orange or blue. Here the background becomes correspondingly coloured and the display black.

1. Turn the rotary control element (2) for the setpoint adjustment.
   – to the right: warmer
   – to the left: colder

   Observe the colour change! (See also chapter "LED colour concept" on page 23.).

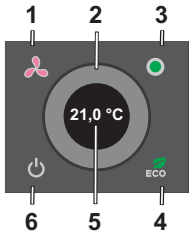


Fig. 12: Device in set value adjustment

2. Set your desired temperature!
3. Wait until the set time expires.

   The adjustment is stored.

After operating the device there is an automatic jump-back to the set-point temperature display after an adjustable time. The set-point temperature can be adjusted again by turning the rotary control element.

### 8.7 Setting the fan speed level (fan coil) or the operating status

To adjust the fan speed levels or the operating status, carry out the following steps:

1. Press the "Fan speed levels" button (1) several times until the desired fan speed level or the desired operating status is displayed.

2. Wait until the set time expires.

   The adjustment is stored.
   After the set time, or when the rotary control element is actuated, the device changes back to the "Setpoint adjustment".

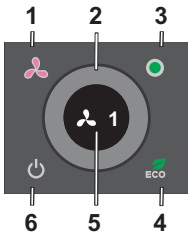


Fig. 13: Device in fan speed level setting

If button "Fan speed levels" (1) is actuated, the currently set fan speed level or the corresponding operating status appears in the display.

| | |
|---|---|
| 3 (A) | Automatic ventilation (display of fan speed level plus A) |
| 0 | Ventilation off/standby |
| 1 … 5 | Manual ventilation (display of fan speed level) |

#### Note

The function of the stages is adjustable via parameters.
When "Fan coil" is not activated via parameters, this button is inactive.

### 8.8 Change into ECO mode

This mode can be used to automatically set a preset temperature, and, if required, a fan speed level. This means that during absence, for example, the temperature is adjusted downward.

1. Press the "ECO mode" button (4).

   The device switches to the "ECO mode (absence)" state.

2. After a renewed press of the "ECO mode" button the device returns to the settings that were active prior to the activation of ECO mode.

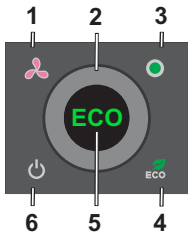


Fig. 14: Device in ECO mode

#### Note

- During ECO mode the temperature cannot, for example, be adjusted manually.
- The function and setting of ECO mode is adjustable via parameters.
  The default setting can not be adjusted via the rotary control element.

### 8.9 Individual button function

The button (3) can be individually programmed with abutton function.

- Operation is carried out with a short or long press of the button.
- The stored functions are not shown in the display.

After the set time, or when the rotary control element is actuated, the device changes back to the "Setpoint adjustment".

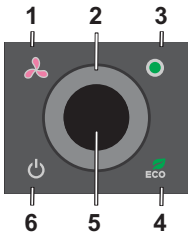


Fig. 15: Individual button function

## 8.10 Additional operating modes and alarms

| | |
|---|---|
|  | **Standby**: Standby mode lowers the temperature during presence below the level of comfort mode. This saves energy. And the room does not cool down during an extended absence. |
|  | **Dew point**: If an appropriate telegram is received from a dew point sensor, the room temperature controller will display the corresponding icon and cease cooling and merely protect against the heat. |
|  | **Alarm**: The alarm can be freely parameterized. For example, it can occur when an external temperature sensor no longer sends values. |
|  | **On/Off**: The room temperature controller can be activated and deactivated. If control is deactivated, this icon appears in the display. The device operates in frost protection mode. |
|  | **Nighttime temperature reduction**: The temperature can be reduced during the night. This saves energy and makes the night's rest comfortable. The heating starts again automatically the next morning to reach a comfortable temperature for rising. |
|  | **Frost protection**: If parameterized, frost protection will ensure that the temperature does not drop below the desired value. It is the lowest setpoint.<br><br>**Heat protection**: If parameterized, heat protection will ensure that the temperature does not exceed the desired value. It is the highest setpoint. |
|  | **Condensate**: The operation of a fan coil may cause condensate water, which is collected in a container. If the fan coil sends out a telegram when the container is full, the icon for condensate mode is displayed. The room temperature controller switches automatically into heat protection mode. |

### Note

Local operation is blocked!
The alarm or the operating mode must first be deactivated.

# 9 Cleaning

Dirty units can be cleaned with a dry cloth. If this is not sufficient, a cloth slightly moistened with a soap solution can be used. Caustic cleaning agents or solvents must not be used.

# 10 Maintenance

The unit is maintenance-free. In case of damage (e.g., during transport or storage), do not perform repairs. Once the unit is opened, the warranty is void!
Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

# 11 Description of applications / objects

## 11.1 Application program

The following applications program is available:

| Application program |
|---|
| Continuous / switching heating cooling TP/7 |

## 11.2 Application program

The application program for the room temperature controller contains the applications listed in the following:

| KNX application |
|---|
| RTC settings |
| Control settings |
| Button top right |
| General functions |

Depending on which device and application are selected, the Engineering Tool Software "ETS" shows different parameters and communication objects. This allows the control element to be set accordingly with multi functions.

## 11.3 Application "RTC"

### 11.3.1 General - Device function

| | |
|---|---|
| Options: | Single device |
| | Master device |
| | Slave device |

– *Single device*: The device is used singly in a room as room temperature controller.

– *Master device*: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The master device is to be linked to the slave devices using the appropriately labelled communication objects. The master device regulates the temperature.

– *Slave device*/temperature sensor: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The slave devices are to be linked to the master device with the appropriately labelled communication objects. The slave device serves the room temperature control functions of the master.

### 11.3.2 General - Control function

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

– *Heating*: For operating a heat-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Heating type" can be programmed for optimal control.

– *Heating with additional stage*: In addition to the control function described under heating, the additional stage enables the activation of an additional heating circuit. This type of additional stage is used, for example, to quickly heat up a bathroom with floor heating via a heated towel rack.

– *Cooling*: For operating a cooling-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Cooling type" can be programmed for optimal control.

– *Cooling with additional stage*: In addition to the control function described under cooling, the additional stage enables the activation of an additional cooling device. This type of additional stage is used, for example, to quickly cool a room via an added cooling device.

– *Heating and cooling*: For operating a two-wire or four-wire system used to heat or cool a room. Switching between heating and cooling takes place using a central switch (two-wire system) or is carried out manually and / or automatically via the single room temperature controller (four-wire system).

– *Heating and cooling* with an additional stage: In addition to the heating and cooling functions, one additional stage each with an autonomous controller type can be programmed.

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

### 11.3.3 General - Operating mode after reset

| | |
|---|---|
| Options: | Comfort |
| | Standby |
| | Eco mode |
| | Cooling with additional stage |
| | Frost/heat protection |

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

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

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

### 11.3.4 General - Additional functions

| | |
|---|---|
| Options: | No |
| | Yes |

– This parameter enables additional functions and communication objects, e.g. window contact and presence detector.

### 11.3.5 General - Send cyclic "In operation" (min)

| | |
|---|---|
| Options: | Setting option between 5 - 3000 minutes |

– The "In operation" communication object serves to inform that the controller still operates. Value "1" is sent cyclic. This parameter is used to set the cycle for sending. If the cyclic telegram fails, the function of the device is faulty and the air-conditioning of the room can be maintained with a forced operation. However, for this the system and/or actuator must have "Forced operation" function.

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

### 11.3.6 Heating control

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

### 11.3.7 Heating control - Control value type

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

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

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

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

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

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

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

### 11.3.8 Heating control - Heating type

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

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

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

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

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

| | |
|---|---|
| Options: | Setting option between 10 - 100 |

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

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

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

| | |
|---|---|
| Options: | Setting option between 0 - 255 |

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

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

### 11.3.11 Heating control - Extended settings

| | |
|---|---|
| Options: | No |
| | Yes |

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

### 11.3.12 Basic stage heating

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

### 11.3.13 Basic stage heating - Status object heating

| | |
|---|---|
| Options: | No |
| | Yes |

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

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

| | |
|---|---|
| Options: | Normal |
| | Inverse |

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

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

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

| | |
|---|---|
| Options: | Setting option between 3 - 255 |

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

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

### 11.3.16 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".

### 11.3.17 Basic stage heating - Cyclic sending of the control value (min)

| | |
|---|---|
| Options: | Setting option between 1 - 60 minutes |

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

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

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

| Options: | Setting option between 1 - 60 minutes |
|---|---|

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

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

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

| Options: | Setting option between 0 - 255 |
|---|---|

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

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

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

| Options: | Setting option between 0 - 255 |
|---|---|

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

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

### 11.3.21 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".

### 11.3.22 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).

### 11.3.23 Control of additional heating stage - Additional heating type

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

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

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

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

### 11.3.24 Control of additional heating stage - P-component (x 0.1°C)

| | |
|---|---|
| Options: | Setting option between 10 - 100 |

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

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

### 11.3.25 Control of additional heating 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 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 "Additional heating type" parameter must be set on "Free configuration".

### 11.3.26 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.

### 11.3.27 Control of additional heating stage - Extended settings

| | |
|---|---|
| Options: | No |
| | Yes |

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

### 11.3.28 Additional heating stage

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

### 11.3.29 Additional heating stage - Mode of the control value

| | |
|---|---|
| Options: | Normal |
| | Inverse |

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

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

### 11.3.30 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%".

### 11.3.31 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".

### 11.3.32 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".

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".

### 11.3.33 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".

### 11.3.34 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".

### 11.3.35 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).

### 11.3.36 Cooling control - Cooling type

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

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

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

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

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

| | |
|---|---|
| Options: | Setting option between 10 - 100 |

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

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

### 11.3.38 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".

### 11.3.39 Cooling control - Extended settings

| | |
|---|---|
| Options: | No |
| | Yes |

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

### 11.3.40 Basic stage cooling

**Note**

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

### 11.3.41 Basic stage cooling - Status object cooling

| | |
|---|---|
| Options: | No |
| | Yes |

This parameter enables the "Status cooling" communication object.

### 11.3.42 Basic stage cooling - Mode of the control value

| | |
|---|---|
| Options: | Normal |
| | Inverse |

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

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

### 11.3.43 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".

### 11.3.44 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 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

### 11.3.45 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".

### 11.3.46 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".

### 11.3.47 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".

### 11.3.48 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).

### 11.3.49 Control of additional cooling stage - Cooling type

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

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

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

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

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

| | |
|---|---|
| Options: | Setting option between 10 - 100 |

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

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

### 11.3.51 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".

### 11.3.52 Control of additional cooling stage - Extended settings

| | |
|---|---|
| Options: | No |
| | Yes |

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

### 11.3.53 Additional cooling stage

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

### 11.3.54 Additional cooling stage - Mode of the control value

| | |
|---|---|
| Options: | Normal |
| | Inverse |

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

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

### 11.3.55 Additional cooling stage - Hysteresis (x 0.1°C)

| | |
|---|---|
| Options: | Setting option between 3 - 255 |

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

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

### 11.3.56 Additional cooling stage - Control value difference for sending of cooling control value

| | |
|---|---|
| Options: | 2% |
| | 5% |
| | 10% |

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".

### 11.3.57 Additional cooling stage - Cyclic sending of the control value (min)

| | |
|---|---|
| Options: | Setting option between 1 - 60 minutes |

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

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

### 11.3.58 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".

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

| | |
|---|---|
| Options: | Setting option between 0 - 255 |

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

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

### 11.3.60 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".

### 11.3.61 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.

### 11.3.62 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".

### 11.3.63 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.

### 11.3.64 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".

### 11.3.65 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.

### 11.3.66 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".

### 11.3.67 Setpoint settings

**Note**

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

### 11.3.68 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".

### 11.3.69 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".

### 11.3.70 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".

### 11.3.71 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" or "Heating with additional stage".

### 11.3.72 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".

### 11.3.73 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.

### 11.3.74 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".

### 11.3.75 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".

### 11.3.76 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".

### 11.3.77 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".

### 11.3.78 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".

### 11.3.79 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.

### 11.3.80 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.

### 11.3.81 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.

### 11.3.82 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".

### 11.3.83 Setpoint adjustment

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

### 11.3.84 Setpoint adjustment — Maximum manual increase during heating mode (0 - 15°C)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

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

**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".

### 11.3.85 Setpoint adjustment — Maximum manual reduction during heating mode (0 - 15°C)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

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

**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".

### 11.3.86 Setpoint adjustment — Maximum manual increase during cooling mode (0 - 15°C)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

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".

### 11.3.87 Setpoint adjustment — Maximum manual reduction during cooling mode (0 - 15°C)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

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".

### 11.3.88 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.

### 11.3.89 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.

### 11.3.90 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.

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

### 11.3.92 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.

### 11.3.93 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".

### 11.3.94 Temperature reading - Weighting of internal measurement (0 to 100%)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

Specifies the weighting of the internal measurement at a level between 0% and 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".

### 11.3.95 Temperature reading - Weighting of external measurement (0 to 100%)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

Specifies the weighting of the external measurement at a level between 0% and 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".

### 11.3.96 Temperature reading - Weighting of external measurement 2 (0 to 100%)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

Specifies the weighting of the external measurement 2 at a level between 0% and 100%. When added together with the (0%...100%) weighting of the external measurement, the result must be 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".

### 11.3.97 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.

### 11.3.98 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 parameterized difference between the measured actual temperature and the previous actual temperature that was sent, the changed value will be transmitted.

### 11.3.99 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".

### 11.3.100 Temperature reading - Monitoring time for temperature reading (0 = no monitoring) (min)

| | |
|---|---|
| Options: | Setting option between 0 - 120 |

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

### 11.3.101 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".

### 11.3.102 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. Therefore, a control value which is suitable for protecting the building will be selected.

### 11.3.103 Alarm functions

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

### 11.3.104 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".

### 11.3.105 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".

### 11.3.106 Alarm functions - Frost alarm temperature for HVAC and RHCC status (°C)

| | |
|---|---|
| Options: | Setting option between 0 - 15 |

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

### 11.3.107 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.

### 11.3.108 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".

### 11.3.109 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.

### 11.3.110 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.

### 11.3.111 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.

### 11.3.112 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.

### 11.3.113 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.

### 11.3.114 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".

### 11.3.115 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".

### 11.3.116 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.

### 11.3.117 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.

### 11.3.118 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".

### 11.3.119 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".

### 11.3.120 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.

### 11.3.121 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.

### 11.3.122 Summer compensation

**Note**

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

### 11.3.123 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.

### 11.3.124 Summer compensation - (Lower) Starting temperature for summer compensation (°C)

| Options: | Setting option between -127 - 127 |
|---|---|

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

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

### 11.3.125 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".

### 11.3.126 Summer compensation - (Upper) exit temperature for summer compensation (°C)

| Options: | Setting option between -127 - 127 |
|---|---|

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

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

### 11.3.127 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".

## 11.4 Additional Millennium RTC – Application "Control settings"

### 11.4.1 General – Jump-back to the primary function

| | |
|---|---|
| Options: | 5 s |
| | 10 s |
| | 20 s |
| | 30 s |
| | 1 min. |
| | 2 min. |
| | 3 min. |

The parameter is used to specify the time period of non-operation after which there is a jump-back to the first function of the rotary control element.

### 11.4.2 Temperature display – Temperature unit

| | |
|---|---|
| Options: | °C |
| | °F |

This is where the temperature unit is selected for the display on the device. The parameter is used to choose between Celsius (°C) and Fahrenheit (°F).

### 11.4.3 General - Setting the temperature unit via object

| | |
|---|---|
| Options: | No |
| | Yes |

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

### 11.4.4 General - Setpoint display

| | |
|---|---|
| Options: | Absolute setpoint (e.g. 21°C) |
| | Relative setpoint (e.g. -5°C to +5°C) |

The parameter is used to define whether the absolute or the relative setpoint is displayed.

### 11.4.5 General - Display of actual temperature

| | |
|---|---|
| Options: | No |
| | Yes |

If the actual temperature is to be shown on the display, the parameter must be set on active. The device will then primarily display the actual temperature. When actuating the rotary control element the display changes to the setpoint adjustment. After non-actuation of the device the current actual temperature again appears in the display after the set waiting period.

### 11.4.6 General - Waiting period for display of actual temperature

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

After non-actuation of the device the current actual temperature again appears in the display after the set waiting period.

### 11.4.7 General - Display of actual temperature in eco mode

| | |
|---|---|
| Options: | No |
| | Yes |

If the actual temperature is to be shown in ECO mode on the display, the parameter must be set on active. The device will then primarily display the actual temperature. When actuating the rotary control element the display changes to the setpoint adjustment. After non-actuation of the device the current actual temperature again appears in the display after the set waiting period.

### 11.4.8 Brightness setting – Day/Night mode

| | |
|---|---|
| Options: | No |
| | Yes |

Via the activated communication object "Day/Night" the backlighting of the display is shown bright during day mode and darker during night mode.

**Note**
The operation only applies to the display. It does not apply to the backlighting of the buttons.

### 11.4.9 Brightness setting – Brightness of display backlighting

| | |
|---|---|
| Options: | Dark |
| | Bright |

This can be used to define the brightness of the display backlighting independent of day or night mode.

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

### 11.4.10 Extended settings - Colour scheme of display backlighting

| | |
|---|---|
| Options: | Coloured |
| | Black and white |

The device has a preset colour scheme for the room temperature controller. This means that the display indicates the modes.

- Set-point temperature < actual temperature = orange (warmer, heating)
- Set-point temperature > actual temperature = blue (colder, cooling)
- Set-point temperature = actual temperature = white (warmer, heating)
- ECO mode = green

If the colour concept is not required, the display can be selected in black and white. The display then does not indicate the specific statuses ("Heating" / "Cooling").

### 11.4.11 Extended settings – Backlighting of icons

| | |
|---|---|
| Options: | No |
| | Yes |

This is used to define whether the icons are backlit or not.

### 11.4.12 Extended settings - Font type

| | |
|---|---|
| Options: | Normal |
| | Filigree |

Allows parameterization of the font type and font size of the display.

## 11.5 Communication objects - RTC

### 11.5.1 Heating control value

| Number | Name | Object function | Data type |
|---|---|---|---|
| 1 | Heating control value (control value heating/cooling) | Output | 1. Switching<br>2. Percent (0 to 100%) |

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

### 11.5.2 Additional heating stage

| Number | Name | Object function | Data type |
|---|---|---|---|
| 2 | Additional heating stage (additional heating/cooling stage) | Output | 1. Switching<br>2. Percent (0 to 100%) |

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

**Note**

The additional stage can also be used as a parallel second heating stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

### 11.5.3 Cooling control value

| Number | Name | Object function | Data type |
|---|---|---|---|
| 3 | Cooling control value | Output | 1. Switching<br>2. Percent (0 to 100%) |

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

### 11.5.4 Additional cooling stage

| Number | Name | Object function | Data type |
|---|---|---|---|
| 4 | Additional cooling stage | Output | 1. Switching<br>2. Percent (0 to 100%) |

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

**Note**
The additional stage can also be used as a parallel second cooling stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

### 11.5.5 Control On/Off

| Number | Name | Object function | Data type |
|---|---|---|---|
| 5 | 1. Control On/Off | Output | Switching |
| | 2. Control On/Off (master) | Output | Switching |
| | 3. Control On/Off (slave) | Output | Switching |

If a 0 telegram 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 objects are queried in order to determine the new operating mode.

**Note**
About item 2:
During active ON/OFF controller function in master/slave mode the ON/OFF (master) control object is to be linked with this object.

About item 3:

During active ON/OFF controller function in master/slave mode the ON/OFF (slave) control object is to be linked with this object.

### 11.5.6 Actual temperature

| Number | Name | Object function | Data type |
|---|---|---|---|
| 6 | 1. Actual temperature | Output | 2-byte floating point value |
| | 2. Actual temperature weighted | Output | 2-byte floating point value |

1. The object outputs the measured (room) temperature, adjusted by the calibration value.
2. The object outputs the temperature value which is calculated from the recording and weighting of internal and up to two external temperatures.

**Note**
An external temperature measurement for room control may be practical for larger rooms and/or floor heating.

### 11.5.7 External actual temperature

| Number | Name | Object function | Data type |
|---|---|---|---|
| 7 | External actual temperature | Input | 2-byte floating point value |

2-byte communication object for reading an external temperature value provided via the KNX bus.

### 11.5.8 External actual temperature 2

| Number | Name | Object function | Data type |
|---|---|---|---|
| 8 | External actual temperature 2 | Input | 2-byte floating point value |

2-byte communication object for reading an additional external temperature value provided via the KNX bus.

### 11.5.9 Fault, actual temperature

| Number | Name | Object function | Data type |
|---|---|---|---|
| 9 | 1. Fault, actual temperature | Output | Switching |
| | 2. Fault, actual temperature (master) | Output | Switching |
| | 3. Fault, actual temperature (slave) | Output | Switching |

If one of the parameterized input temperatures is unavailable to the controller for a period longer than the monitoring time, the controller enters the error mode. The error mode is sent to the bus as the value 1.

**Note**

About item 2:

This object must be connected to the "Fault, actual temperature (slave)" object in order to indicate the error mode.

About item 3:

This object must be connected to the "Fault, actual temperature (slave)" object in order to indicate the error mode.

### 11.5.10 Local actual temperature

| Number | Name | Object function | Data type |
|---|---|---|---|
| 10 | Local actual temperature | Output | Switching |

Not visible!

### 11.5.11 Current setpoint

| Number | Name | Object function | Data type |
|---|---|---|---|
| 11 | Current setpoint | Output | 2-byte floating point value |

The object outputs the current setpoint temperature resulting from the following: the parameterized setpoint temperature of the current operation type and operating mode, the manual setpoint temperature adjustment, a change in the base setpoint temperature via the base setpoint value object. This is purely a transmitting object.

### 11.5.12 Operating mode

| Number | Name | Object function | Data type |
|---|---|---|---|
| 12 | 1. Operating mode | Input / output | HVAC mode |
| | 2. Operating mode (master) | Input / output | HVAC mode |
| | 3. Operating mode (slave) | Input / output | HVAC mode |

The "Operating mode" object receives, as a 1-byte value, the operating mode that is to be set. Here value 1 means "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

**Note**

Item 2:

If the master/slave mode is the active operating mode, the Operating mode (slave) object must be connected to this object.

Item 3:

If the master/slave mode is the active operating mode, the operating mode (master) object must be connected to this object.

### 11.5.13 Superimposed operating mode

| Number | Name | Object function | Data type |
|---|---|---|---|
| 13 | 1. Superimposed operating mode | Input | HVAC mode |
| | 2. Superimposed operating mode (master/slave) | Input | HVAC mode |

The "Superimposed operating mode" object receives the operating mode that is to be set as 1-byte value. Here value 0 means "Superimposition inactive", value 1 "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

**Note**

Item 2:

If the master/slave mode is active, the "Superimposed operating mode" object of the master and the slave must be connected to the group address of the transmitter.

### 11.5.14 Window contact

| Number | Name | Object function | Data type |
|---|---|---|---|
| 14 | 1. Window contact | Input | Switching |
| | 2. Window contact (master/slave) | Input | Switching |

The object uses the value 1 to signal an open window to the controller. If no other object with a higher priority is present, then the "Window contact" message causes the controller to be set to the setpoint value for frost/heat protection. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate water alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

**Note**

Item 2:

If the master/slave mode is active, the "Window contact (master/slave)" object of the master and the slave must be connected to the group address of the transmitter.

### 11.5.15 Presence detector

| Number | Name | Object function | Data type |
|---|---|---|---|
| 15 | 1. Presence detector | Input | Switching |
| | 2. Presence detector (master/slave) | Input | Switching |

This object transmits the value 1 to the controller to signal that there are people in the room. If not other object with a higher priority is present, then the "Presence detector" causes the controller to be set to the comfort setpoint value. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate water alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

**Note**

Item 2:

If the master/slave mode is active, the "Presence detector (master/slave)" object of the master and the slave must be connected to the group address of the transmitter.

### 11.5.16 Heating status

| Number | Name | Object function | Data type |
|---|---|---|---|
| 16 | Heating status | Output | Switching |

The room temperature controller sends an ON telegram via the "Heating status" object as soon as it is active in the heating mode. If the controller is in the inactive zone between heating and cooling or is in cooling mode, the room temperature controller transmits an OFF telegram on the "Heating status" object.

### 11.5.17 Cooling status

| Number | Name | Object function | Data type |
|---|---|---|---|
| 17 | Cooling status | Output | Switching |

The room temperature controller sends an ON telegram via the "Cooling status" object as soon as it is active in the cooling mode. If the controller is in the inactive zone between heating and cooling or is in heating mode, the room temperature controller transmits an OFF telegram on the "Cooling status" object.

### 11.5.18 Basic load

| Number | Name | Object function | Data type |
|---|---|---|---|
| 16 | Basic load | Input / output | Switching |

This object uses the value 1 to activate a parameterized base load, i.e. a minimum control value greater than zero. The value 0 deactivates the base load. When the base load is deactivated, the control value can be lowered all the way to zero if necessary when the setpoint temperature is reached, despite the minimum value set in the parameter.

**Note**
Deactivating the basic load for a floor heating system is always useful in the summer, since it saves heating energy.

### 11.5.19 Switchover heating/cooling

| Number | Name | Object function | Data type |
|---|---|---|---|
| 17 | Switchover heating/cooling | Input / output | Switching |

1. Automatic: If the switchover between heating and cooling is performed automatically by the room temperature controller, then this object is used to provide information on the current heating (0) or cooling (1) status to the KNX bus. It is a transmitting object.
2. Only via object: The switchover between heating and cooling on the room temperature controller occurs solely via this 1-bit communication object. The value (0) activates the heating mode, and the value (1) activates the cooling mode. This is a receiving object.
3. Manual or via object: The switchover between heating and cooling on the room temperature controller occurs by user interaction or via the 1-bit communication object. The information on the respective heating (0) or cooling (1) status is available to the KNX bus. This is a receiving and sending object.

### 11.5.20 Fan coil manual

| Number | Name | Object function | Data type |
|---|---|---|---|
| 18 | 1. Fan coil manual | Output | Switching |
| | 2. Fan coil manual (master) | Output | Switching |
| | 3. Fan coil manual (slave) | Output | Switching |

Using this 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 room temperature controller 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.

**Note**

Item 2:

If fan coil manual is active in the master/slave mode, the fan coil manual (slave) object must be connected to this object.

Item 3:

If fan coil manual is active in the master/slave mode, the fan coil manual (master) object must be connected to this object.

### 11.5.21 Fan coil step

| Number | Name | Object function | Data type |
|---|---|---|---|
| 19 | 1. Fan coil step | Output | 2-byte floating point value |
| | 2. Fan coil step (master) | Output | 2-byte floating point value |
| | 3. Fan coil step (slave) | Output | 2-byte floating point value |

The fan speed level in the fan coil actuator is selected via the 1-byte communication object. Whether the fan speed level information is transmitted in manual or also in automatic fan speed level mode can be set. The formats that can be selected for the 1-byte communication object are the fan speed level (0..5) or a percentage value (0..100%) which is calculated back to a fan speed level in the fan coil actuator.

**Note**

Item 2:

If fan coil step is active in the master/slave mode, the fan coil step (slave) object must be connected to this object.

Item 3:

If fan coil step is active in the master/slave mode, the fan coil step (slave) object must be connected to this object.

### 11.5.22 Fan coil step status

| Number | Name | Object function | Data type |
|---|---|---|---|
| 20 | Fan coil step status | Input / output | 2-byte floating point value |

Using the "Fan coil step status" object, the room temperature controller receives the current fan speed level of the fan coil actuator.

### 11.5.23 Fan speed level 1

| Number | Name | Object function | Data type |
|---|---|---|---|
| 21 | Fan speed level 1 | Output | Switching |

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

### 11.5.24 Fan speed level 2

| Number | Name | Object function | Data type |
|---|---|---|---|
| 22 | Fan speed level 2 | Output | Switching |

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

### 11.5.25 Fan speed level 3

| Number | Name | Object function | Data type |
|---|---|---|---|
| 23 | Fan speed level 3 | Output | Switching |

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

### 11.5.26 Fan speed level 4

| Number | Name | Object function | Data type |
|---|---|---|---|
| 24 | Fan speed level 4 | Output | Switching |

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

### 11.5.27 Fan speed level 5

| Number | Name | Object function | Data type |
|---|---|---|---|
| 25 | Fan speed level 5 | Output | Switching |

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

### 11.5.28 Basic setpoint

| Number | Name | Object function | Data type |
|---|---|---|---|
| 26 | Basic setpoint | Input | 2-byte floating point value |

This 2-byte communication object can be used to change/adjust the parameterized basic setpoint value via the KNX bus. Parameters can be used to define whether the value received by this object is interpreted as "Setpoint heating comfort", "Setpoint cooling comfort" or an average between heating and cooling comfort.

### 11.5.29 Resetting manual setpoints

| Number | Name | Object function | Data type |
|---|---|---|---|
| 27 | Resetting manual setpoints | Input | Switching |

This 1-bit communication object is used to reset the manual setpoint adjustment that was set on the device.

### 11.5.30 Dew point alarm

| Number | Name | Object function | Data type |
|---|---|---|---|
| 28 | Dew point alarm | Input | Switching |

This 1-bit communication object is used to place the controller in the dew point alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by dew.

**Note**

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. This information is indicated by a corresponding icon on the control unit.

### 11.5.31 Condensate water alarm

| Number | Name | Object function | Data type |
|---|---|---|---|
| 29 | 1. Condensate water alarm | Input | Switching |
| | 2. Condensate water alarm (master/slave) | Input | Switching |

This 1-bit communication object is used to place the controller in the condensation alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by an overflowing condensation container.

**Note**

Item 1:

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. This information is indicated by a corresponding icon on the device.

Item 2:

- 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. This information is indicated by a corresponding icon on the device.
- When the master/slave mode is active, the condensate water alarm (master/slave) objects must be connected to the alarm transmitter.

### 11.5.32 Outside temperature for summer compensation

| Number | Name | Object function | Data type |
|---|---|---|---|
| 30 | Outside temperature for summer compensation | Input | 2-byte floating point 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 of the outside temperature (summer compensation). This, for example, prevents the air-conditioning system from further reducing the room temperature to 24°C with an outside temperature of 35°C.

This function can only be used with an outside temperature sensor. This 2-byte communication object must then be used to provide the controller with the current outside temperature.

### 11.5.33 Summer compensation active

| Number | Name | Object function | Data type |
|---|---|---|---|
| 31 | Summer compensation active | Output | Switching |

This 1-bit communication object is used to indicate via the bus whether the summer compensation is active (1) or inactive (0). If it is active, the setpoint value configured for the cooling mode is increased by the summer compensation function. A decrease of the cooling mode setpoint temperature below the value calculated by the parameterized summer compensation function is not possible. An increase of the setpoint temperature for the cooling mode is always possible.

### 11.5.34 Setpoint reached

| Number | Name | Object function | Data type |
|---|---|---|---|
| 32 | Setpoint reached | Output | Switching |

When the setpoint set on the device in comfort mode has been reached it is sent by means of value (1) as information to the KNX bus via the 1-bit communication object. The function is started by activating the comfort or presence mode. If the reaching of the setpoint temperature is interfered with by the preselection of a different operating mode or by adjustment to a new setpoint, value (0) is sent.

### 11.5.35 Fahrenheit

| Number | Name | Object function | Data type |
|---|---|---|---|
| 33 | 1. Fahrenheit | Input / output | Switching |
| | 2. Fahrenheit (master) | Input / output | Switching |
| | 3. Fahrenheit (slave) | Input / output | Switching |

The temperature indication on the display can be changed from Celsius (°C) to Fahrenheit (°F). The conversion from Celsius to Fahrenheit always takes place in the display unit, since only Celsius values are sent over the KNX bus. The value (0) results in a temperature indication in Celsius, while the value (1) results in Fahrenheit.

**Note**

Item 2:

If the Fahrenheit object is active in the master/slave mode, the Fahrenheit (slave) object must be connected to this object.

Item 3:

If the Fahrenheit object is active in the master/slave mode, the Fahrenheit (master) object must be connected to this object.

### 11.5.36 Display backlighting

| Number | Name | Object function | Data type |
|---|---|---|---|
| 34 | Display backlighting | Input / output | Switching |

The display backlighting is activated with value (1) and deactivated with value (0) via the 1-bit communication object.

**Note**

This function is mainly used in rooms where backlighting during the night is considered to be a disturbing factor, such as in hotel rooms and bedrooms.

### 11.5.37 On/Off request

| Number | Name | Object function | Data type |
|---|---|---|---|
| 35 | 1. On/off request (master) | Input | Switching |
| | 2. On/off request (slave) | Input | Switching |

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.38 Setpoint display

| Number | Name | Object function | Data type |
|---|---|---|---|
| 36 | 1. Setpoint display (master) | Input / output | 2-byte floating point value |
| | 2. Setpoint display (slave) | Input / output | 2-byte floating point value |

This 2-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.39 Request setpoint

| Number | Name | Object function | Data type |
|---|---|---|---|
| 37 | 1. Request setpoint (master) | Input | Percent (0..100%) |
| | 2. Request setpoint (slave) | Input | Percent (0..100%) |

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.40 Confirm setpoint

| Number | Name | Object function | Data type |
|---|---|---|---|
| 38 | 1. Confirm setpoint (master) | Input / output | Percent (0..100%) |
| | 2. Confirm setpoint (slave) | Input / output | Percent (0..100%) |

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.41 Heating/cooling request

| Number | Name | Object function | Data type |
|---|---|---|---|
| 39 | 1. Heating/cooling request (master) | Input | Switching |
| | 2. Heating/cooling request (slave) | Input | Switching |

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.42 Request fan speed level manual

| Number | Name | Object function | Data type |
|---|---|---|---|
| 40 | 1. Request fan speed level manual (master) | Input | Switching |
| | 2. Request fan speed level manual (slave) | Input | Switching |

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.43 Request fan speed level

| Number | Name | Object function | Data type |
|---|---|---|---|
| 41 | 1. Request fan speed level (master) | Input | Percent (0..100%) |
| | 2. Request fan speed level (slave) | Input | Percent (0..100%) |

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.44 Confirm fan speed level

| Number | Name | Object function | Data type |
|---|---|---|---|
| 42 | 1. Confirm fan speed level (master) | Input / output | Percent (0..100%) |
| | 2. Confirm fan speed level (slave) | Input / output | Percent (0..100%) |

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

### 11.5.45 Controller status RHCC

| Number | Name | Object function | Data type |
|---|---|---|---|
| 43 | Controller status RHCC | Output | 2-byte floating point value |

This communication object outputs the heating/cooling operation type, active/inactive operation, the frost and heat alarm, and the error (actual temperature reading failure) in accordance with the specification for the RHCC (Room Heating Cooling Controller) status.

### 11.5.46 Controller status HVAC

| Number | Name | Object function | Data type |
|---|---|---|---|
| 44 | 1. Controller status HVAC | Output | Percent (0..100%) |
| | 2. Controller status HVAC (master) | Output | Percent (0..100%) |
| | 3. Controller status HVAC (slave) | Output | Percent (0..100%) |

This communication object outputs the current operating mode, the heating/cooling mode, active/inactive mode, the frost alarm and the dew point alarm in accordance with the specification for the HVAC (Heating Ventilation Air Conditioning) status.

**Note**

Item 2:

If the master/slave mode is active, the HVAC status (slave) object must be connected to this object.

Item 3:

If the master/slave mode is active, the HVAC status (master) object must be connected to this object.

### 11.5.47 Commissioned

| Number | Name | Object function | Data type |
|---|---|---|---|
| 45 | Commissioned | Output | Switching |

The controller uses this 1-bit communication object to send a cyclical "sign of life". This signal can be used to monitor the device, e.g. by means of a visualisation.

## 11.6 Additional Millennium RTC – Communication objects "Control settings"

### 11.6.1 Day/Night mode

| Number | Name | Object function | Data type |
|---|---|---|---|
| 47 | Day/Night mode | – | Switching |

Description:

Via the activated communication object "Day/Night" the backlighting of the display is shown bright during day mode and darker during night mode.

Note: The operation only applies to the display. It does not apply to the backlighting of the buttons.

## 11.7 Applications for "Button top right"

### 11.7.1 Application "1-button switching"

When actuated or released a switching telegram is sent out. In each case, the application makes a separate set of parameters and communication objects available for the 1st and the 2nd button. The other side of the button can be assigned a further "button-oriented" function.

#### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Reaction on rising edge | • On<br>• Off<br>• alternating on/off<br>• no reaction | – |
| Reaction on falling edge | • On<br>• Off<br>• alternating on/off<br>• no reaction | – |

#### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Switching | 1 Bit EIS1 / DPT 1.001 | C, W ,T ,U |

### 11.7.2 Application "1-button dimming"

The push-buttons have communication objects for switching and dimming. A distinction is made between a short (switching) and long (dimming) press of the button. In each case, the application makes a separate set of parameters and communication objects available for the 1st and the 2nd button. The application allows a lamp to be dimmed with the one button and the other button to be assigned with other "button-oriented" functions.

#### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Duration of long operation (s) | Time input from 0.3 to 3.0 seconds | General |
| Working mode of the buttons for switching | • deactivated<br>• Off<br>• On<br>• alternating on/off | Advanced |
| Working mode of the buttons for dimming | • alternating brighter/darker<br>• darker<br>• brighter | |

#### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Switching | 1 Bit EIS2 / DPT 1.001 | C, W ,T ,U |
| 1 | relative dimming | 4 Bit EIS2 / DPT 3.007 | C, T |

### 11.7.3 Application "2-button value transmitter"

With an actuation of the 1st or 2nd button a telegram with a predefined value is sent out. The application differentiates here between whether the 1st or 2nd button is actuated.

#### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Object type | • 1 bit<br>• 1-byte 0..100%<br>• 1-byte 0..255<br>• 2-byte float<br>• 2-byte signed<br>• 2-byte unsigned<br>• 4-byte float<br>• 4-byte signed<br>• 4-byte unsigned | – |
| Working mode of the buttons | • 1st button value 1, 2nd button value 2<br>• 1st button value 2, 2nd button value 1<br>• alternating value1/value2 | |
| Value 1 | For 1 bit | • On<br>• Off |
| | For 1-byte 0..100% | 0 … 100 % |
| | For 1-byte 0..255 | 0..255 |
| | For 2-byte float | -671088,6 … +670760,9 |
| | For 2-byte signed | -32768 … +32767 |
| | For 2-byte unsigned | 0 … 65535 |
| | For 4-byte float | -4000000 … +4000000 |
| | For 4-byte signed | 2147483648 … 2147483647 |
| | For 4-byte unsigned | 0 … 4294967295 |
| Value 2 | For 1 bit | • On<br>• Off |
| | For 1-byte 0..100% | 0 … 100 % |
| | For 1-byte 0..255 | 0..255 |
| | For 2-byte float | -671088,6 … +670760,9 |
| | For 2-byte signed | -32768 … +32767 |
| | For 2-byte unsigned | 0 … 65535 |
| | For 4-byte float | -4000000 … +4000000 |
| | For 4-byte signed | 2147483648 … 2147483647 |
| | For 4-byte unsigned | 0 … 4294967295 |

### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Value switching (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W ,T ,U |
| | Value switching (1 Byte 0 … 100 %) | 1 Byte EIS6 / DPT 5.001 | C, W ,T ,U |
| | Value switching (1 Byte 0 … 255) | 1 Byte EIS14 / DPT 5.010 | C, W ,T ,U |
| | Value switching (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, W ,T ,U |
| | Value switching (2 Byte Signed) | 2 Byte EIS10 / DPT 7.001 | C, W ,T ,U |
| | Value switching (2 Byte Unsigned) | 2 Byte EIS10 / DPT 8.001 | C, W ,T ,U |
| | Value switching (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, W ,T ,U |
| | Value switching (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, W ,T ,U |
| | Value switching (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W ,T ,U |

### 11.7.4 Application "1-button value transmitter, 2 objects"

When actuating and/or releasing the buttons, two telegrams with predefined values are sent from two different communication objects. In each case, the application makes a separate set of parameters and communication objects available for the 1st and the 2nd button. The application makes it possible, for example, to send out a switching function and a floating point value when actuating one side of the button and to assign an additional "button-oriented" function to the other side of the button.

### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Objcet type for rising edge | • 1 bit<br>• 1-byte 0..100%<br>• 1-byte 0..255<br>• 2-byte float<br>• 2-byte signed<br>• 2-byte unsigned<br>• 4-byte float<br>• 4-byte signed<br>• 4-byte unsigned | – |
| Objcet type for falling edge | • 1 bit<br>• 1-byte 0..100%<br>• 1-byte 0..255<br>• 2-byte float<br>• 2-byte signed<br>• 2-byte unsigned<br>• 4-byte float<br>• 4-byte signed<br>• 4-byte unsigned | – |

| Additional Parameters | Settings | Comments |
|---|---|---|
| Reaction on rising edge | • no reaction<br>• Value 1<br>• Value 2<br>• alternating value1/value2 | – |
| Reaction on falling edge | • no reaction<br>• Value 1<br>• Value 2<br>• alternating value1/value2 | – |
| Value 1 / 2 for a rising edge | – | Only available when parameter "Reaction to rising edge" is set on "Alternating value 1 / value 2". |
| | für 1 bit | • On<br>• Off |
| | für 1-byte 0..100% | 0 … 100 % |
| | für 1-byte 0..255 | 0..255 |
| | für 2-byte float | -671088,6 … +670760,9 |
| | für 2-byte signed | -32768 … +32767 |
| | für 2-byte unsigned | 0 … 65535 |
| | für 4-byte float | -4000000 … +4000000 |
| | für 4-byte signed | 2147483648 … 2147483647 |
| | für 4-byte unsigned | 0 … 4294967295 |
| Value 1 / 2 for falling edge | – | Only available when parameter "Reaction to falling edge" is set on "Alternating value 1 / value 2". |
| | für 1 bit | • On<br>• Off |
| | für 1-byte 0..100% | 0 … 100 % |
| | für 1-byte 0..255 | 0 … 255 |
| | für 2-byte float | -671088,6 … +670760,9 |
| | für 2-byte signed | -32768 … +32767 |
| | für 2-byte unsigned | 0 … 65535 |
| | für 4-byte float | -4000000 … +4000000 |
| | für 4-byte signed | 2147483648 … 2147483647 |
| | für 4-byte unsigned | 0 … 4294967295 |

### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Switching (rising edge) (1 bit) | 1 Bit EIS1 / DPT 1.001 | C, W ,T ,U |
| | Switching (rising edge) (1-byte 0..100%) | 1 Byte EIS6 / DPT 5.001 | C, W ,T ,U |
| | Switching (rising edge) (1-byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W ,T ,U |
| | Switching (rising edge) (2-byte float) | 2 Byte EIS5 / DPT 9.xxx | C, W ,T ,U |
| | Switching (rising edge) (2-byte signed) | 2 Byte EIS10 / DPT 7.001 | C, W ,T ,U |
| | Switching (rising edge) (2-byte unsigned) | 2 Byte EIS10 / DPT 8.001 | C, W ,T ,U |
| | Switching (rising edge) (4-byte float) | 4 Byte EIS9 / DPT 14.xxx | C, W ,T ,U |
| | Switching (rising edge) (4-byte signed) | 4 Byte EIS11 / DPT 13.001 | C, W ,T ,U |
| | Switching (rising edge) (4-byte unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W ,T ,U |
| 1 | Switching (falling edge) (1 bit) | 1 Bit EIS1 / DPT 1.001 | C, W ,T ,U |
| | Switching (falling edge) (1-byte 0..100%) | 1 Byte EIS6 / DPT 5.001 | C, W ,T ,U |
| | Switching (falling edge) (1-byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W ,T ,U |
| | Switching (falling edge) (2-byte float) | 2 Byte EIS5 / DPT 9.xxx | C, W ,T ,U |
| | Switching (falling edge) (2-byte signed) | 2 Byte EIS10 / DPT 7.001 | C, W ,T ,U |
| | Switching (falling edge) (2-byte unsigned) | 2 Byte EIS10 / DPT 8.001 | C, W ,T ,U |
| | Switching (falling edge) (4-byte float) | 4 Byte EIS9 / DPT 14.xxx | C, W ,T ,U |
| | Switching (falling edge) (4-byte signed) | 4 Byte EIS11 / DPT 13.001 | C, W ,T ,U |
| | Switching (falling edge) (4-byte unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W ,T ,U |

### 11.7.5 Application "1-button light scene extension unit with memory function"

When a button is actuated a predefined light scene number is called up. In each case, the application makes a separate set of parameters and communication objects available for the 1st and the 2nd button. The application makes it possible to call up a light scene via one button side while the other button side can be assigned with a further "button-oriented" function. The user has the option to trigger a light scene memory command via a long actuation of the button.

### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Duration of long operation (s) | Time input from 0.3 to 10.0 seconds | Only available when parameter "Storage function light scenes" is set on "activated". |
| Storage function light scenes | • deactivated<br>• activated | – |
| Number of light scene | 1 … 64 | – |

### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Number of light scene | 1 Byte EIS6 / DPT 18.001 | C, T |

### 11.7.6 Application "1-button step switch"

Different switching processes are triggered with each new actuation of the 1st or 2nd button.

For example:

- First actuation (2nd button) switches lamp 1 on.
- Second actuation (2nd button) switches lamp 1 off and lamp 2 on.
- Third actuation (2nd button) switches lamp 2 off and lamp 3 on.
- Fourth actuation (1st button) switches lamp 3 off and lamp 2 on.
- Fifth actuation (1st button) switches lamp 2 off and lamp 1 on.
- etc.

Up to five switching levels can be activated.

The application differentiates between whether the 1st or 2nd button was actuated. Depending on the setting, one lower or one higher level can be switched to.

#### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Number of objects | 1 … 5 | – |
| Evaluation period (s) | 1,0 … 5,0 | – |

| Additional Parameters | Settings | Comments |
|---|---|---|
| Working mode of the buttons | • 1st button Up, 2nd button Down<br>• 1st button down. 2nd button up | – |
| Sending of objects | • for operation<br>• for change of value | – |
| Object values | • Normal<br>• inverse | – |
| Bit pattern of the object values | • 1 of n<br>• x of n | – |

#### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Switching stage 1 | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 1 | Switching stage 2 | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 2 | Switching stage 3 | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 3 | Switching stage 4 | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 4 | Switching stage 5 | 1 Bit EIS1 / DPT 1.001 | C, W, T |

### 11.7.7 Application "1-button short-long operation"

The application makes two separate functions available on one side of the button which can be called up via a short or long button press, while the other side of the button can be assigned a further "button-oriented" function. In each case, the application makes a separate set of parameters and communication objects available for the 1st and the 2nd button.

#### Parameters

| General parameter | Settings | Comments |
|---|---|---|
| Object type | • 1 bit<br>• 1-byte 0..100%<br>• 1-byte 0..255<br>• 2-byte float<br>• 2-byte signed<br>• 2-byte unsigned<br>• 4-byte float<br>• 4-byte signed<br>• 4-byte unsigned | General |
| Reaction on short operation | • no reaction<br>• Value 1<br>• Value 2<br>• alternating value1/value2 | |
| Reaction on long operation | • no reaction<br>• Value 1<br>• Value 2<br>• alternating value1/value2 | |
| Duration of long operation (s) | • Time input from 0.3 to 3.0 seconds | Advanced |

#### Objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Value switching for short operation | 4 Byte EIS14 / DPT 12.001 | C, W ,T ,U |
| 1 | Value switching for long operation | 4 Byte EIS14 / DPT 12.001 | C, W ,T ,U |

## 11.8 Application for "General functions"

### 11.8.1 Cyclic telegram

Via the "Cyclic telegram" application and after receipt of a telegram on the "Input" object, a telegram with the same volume is cyclically sent out on the "Cyclic output" object.
The object types for "Input" and "Output" can be collectively parameterised for the different applications.
The times for cyclic sending on the "Output" object are adjustable.
Via an additional "Enable" object, there is the option of temporarily blocking the function.

**Cyclic telegram objects**

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Input (1-bit switching) | 1 Bit EIS1 / DPT 1.001 | C, W |
| 0 | Input (1-bit alarm) | 1 Bit EIS1 / DPT 1.001 | C, W |
| 0 | Input (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, W |
| 0 | Input (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W |
| 0 | Input (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, W |
| 0 | Input (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, W |
| 0 | Input (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, W |
| 0 | Input (2-byte temperature) | 2 Byte EIS5 / DPT 9.001 | C, W |
| 0 | Input (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, W |
| 0 | Input (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, W |
| 0 | Input (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W |
| 1 | Output (1-bit switching) | 1 Bit EIS1 / DPT 1.001 | C, T |
| 1 | Output (1-bit alarm) | 1 Bit EIS1 / DPT 1.001 | C, T |
| 1 | Output (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, T |
| 1 | Output (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, T |
| 1 | Output (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, T |
| 1 | Output (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, T |
| 1 | Output (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, T |
| 1 | Output (2-byte temperature) | 2 Byte EIS5 / DPT 9.001 | C, T |
| 1 | Output (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, T |
| 1 | Output (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, T |
| 1 | Output (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, T |
| 2 | Enable | 1 Bit EIS1 / DPT 1.001 | C, W |

### 11.8.2 Priority

The "Priority" application has 3 communication objects, a 1-bit object "Switch input", a 2-bit object "Input priority" and a 1-bit object "Output". The telegrams received on the "Switch input" are transferred to the "Output" depending on the state of the "Input priority" object.
The 2-bit object "Input priority" can receive and differentiate between four different values (0, 1, 2 and 3). Here, the "Output" object is positively driven. Three different states are differentiated:

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

During a positive drive, changes of the "Switch input" object are saved, even if the current state on the "Output" object does not immediately change through this. If the positive drive is terminated, a telegram transmission on the "Output" occurs according to the current value of the "Switch input" object.

### Priority objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Switch input | 1 Bit EIS1 / DPT 1.001 | C, W |
| 1 | Priority input | 2 Bit EIS8 / DPT 2.001 | C, W |
| 2 | Output | 1 Bit EIS1 / DPT 1.001 | C, T |

## 11.8.3 Logic

### Logic objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Output (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 0 | Output (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, T |
| 1 | Input 1 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 1 | Input 1 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 2 | Input 2 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 2 | Input 2 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 3 | Input 3 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 3 | Input 3 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 4 | Input 4 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 4 | Input 4 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 5 | Input 5 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 5 | Input 5 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 6 | Input 6 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 6 | Input 6 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 7 | Input 7 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 7 | Input 7 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 8 | Input 8 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 8 | Input 8 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 9 | Input 9 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 9 | Input 9 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |
| 10 | Input 10 (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, U |
| 10 | Input 10 (1 Byte) | 1 Byte EIS14 / DPT 5.010 | C, W, U |

### 11.8.4 Gate

The "Gate" application allows specific signals to be filtered and the signal flow to be temporarily blocked. The function has three communication objects: "Control input", "Input" and "Output".
The input or output object can assume different sizes.
The bit size can be freely assigned with the "Not assigned" setting. This means that the first internal or external group address/action that is assigned and already connected to some 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 occur via an ON or an OFF telegram.
If, for example, the "Control input" setting is set to "ON telegram", only telegrams from the input are transmitted to the output, if prior to this 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 interesting for a sensor and the sensor does not offer any filter function in its application program.

**Gate objects**

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Input | - | C, W, T |
| 1 | Output | - | C, W, T |
| 2 | Control input | 1 Bit EIS1 / DPT 1.001 | C, W |

### 11.8.5 Staircase lighting

With the "Staircase lighting" application, switching telegrams or value telegrams can be provided with a light-on time.
Depending on the parameterisation, the application shows different communication objects:

– a 1-bit object for input and output
  If an ON telegram is received via the "Input/Output" object, the light-on time is started immediately. This can be a light-on time of 00:10 min to 88:45 min, which is adjustable in 0.1 s steps. After expiration of the light-on time, the "Input/Output" object sends an OFF telegram.
– two 1-bit objects for input and output
– two 1-byte objects for input and output
  If a telegram is received via the "Input" object, the light-on time is started immediately and a telegram with the same value of the telegram received on the input is sent out on the "Output" object. This can be a light-on time of 00:10 min to 88:45 min, which is adjustable in 0.1 s steps. After expiration of the light-on time, the "Output" object sends out an OFF telegram (1-bit) or a telegram with the value "0" (1-byte).
  Via two additional communication objects, it is possible to specify the light-on time and the switch-off prewarning time. The 2-byte values received are written to the memory of the device and are retained even after a bus power failure and subsequent return of voltage.

**Staircase lighting objects**

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Input (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W |
| 0 | Input (1 Byte) | 1 Bit EIS14 / DPT 5.010 | C, W |
| 0 | Input_Output (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W, T |
| 1 | Light-on time (2 Byte) | 2 Byte EIS10 / DPT 7.001 | C, R, W |
| 2 | Switch-off pre-warning | 2 Byte EIS10 / DPT 7.001 | C, R, W |
| 3 | Output (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, T |
| 3 | Output (1 Byte) | 1 Bit EIS14 / DPT 5.010 | C, T |

### 11.8.6 Delay

Telegrams can be received via the "Input" object using the "Delay" application. The telegrams received are sent out on the "Output" object with a set delay time.
The object types for "Input" and "Output" can be collectively parameterised for different applications.

**Delay objects**

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Input (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, W |
| 0 | Input (1 Bit) | 1 Bit EIS7 / DPT 1.008 | C, W |
| 0 | Input (1 Bit) | 1 Bit EIS7 / DPT 1.007 | C, W |
| 0 | Input (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, W |
| 0 | Input (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W |
| 0 | Input (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, W |
| 0 | Input (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, W |
| 0 | Input (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, W |
| 0 | Input (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, W |
| 0 | Input (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, W |
| 0 | Input (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W |
| 1 | Output (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, T |
| 1 | Output (1 Bit) | 1 Bit EIS7 / DPT 1.008 | C, T |
| 1 | Output (1 Bit) | 1 Bit EIS7 / DPT 1.007 | C, T |
| 1 | Output (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, T |
| 1 | Output (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, T |
| 1 | Output (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, T |
| 1 | Output (2 Byte Signed) | 2 Byte EIS10 / DPT 7.001 | C, T |
| 1 | Output (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, T |
| 1 | Output (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, T |
| 1 | Output (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, T |
| 1 | Output (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, T |
| 2 | Delay time (2 Byte) | 2 Byte EIS10 / DPT 7.001 | C, R, W |

### 11.8.7 Min/Max value transducer

Up to eight input values can be compared with each other using the "Min/max value transducer" application. The application can output the highest input value, the smallest input value or the average of all input values on the output.
The size of the input objects, and with it also the size of the output object can be adapted for the most diverse applications. You can select from the following object types:

– 1-byte 0..100 %, for comparison of percent values
– 1-byte 0..255, for the comparison of decimal values between 0 and 255
– 2-byte float, for the comparison of 2-byte floating point values (physical values such as temperature, brightness value etc.)
– 2-byte signed, for the comparison of decimal values between -32,768 and +32,767
– 2-byte unsigned, for the comparison of decimal values between 0 and 65,535
– 4-byte float, for the comparison of 4-byte floating point values (physical values such as acceleration, electrical current, work etc.)
– 4-byte signed, for the comparison of decimal values between -2,147,483,648 and 2,147,483,647
– 4-byte unsigned, for the comparison of decimal values between 0 and 4,294,967,295

Hint:
With whole numbers the average value is rounded.

### Min/Max value transducer objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Output (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, T |
| 0 | Output (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, T |
| 0 | Output (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, T |
| 0 | Output (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, T |
| 0 | Output (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, T |
| 0 | Output (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, T |
| 0 | Output (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, T |
| 0 | Output (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, T |
| 1…10 | Input 1 [2…10] (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, W |
| 1…10 | Input 1 [2…10] (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W |
| 1…10 | Input 1 [2…10] (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, W |
| 1…10 | Input 1 [2…10] (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, W |
| 1…10 | Input 1 (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, W |
| 1…10 | Input 1 [2…10] (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, W |
| 1…10 | Input 1 [2…10] (4 Byte Signed) | 4 Byte EIS11 / DPT 13.001 | C, W |
| 1…10 | Input 1 [2…10] (4 Byte Unsigned) | 4 Byte EIS11 / DPT 12.001 | C, W |

## 11.8.8 Threshold value / hysteresis

With the "Threshold value / Hysteresis" application, value telegrams can be received on an input communication object and compared with threshold values specified in the device.
Predefined values are sent out on the communication "Output" communication object if the upper or lower thresholds are exceeded. The size of the object can be adjusted for different applications.
The function can be temporarily blocked via an enable object.
If the value of the lower threshold lies above the value for the upper threshold, the function is not executed.

### Threshold value / hysteresis objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Input (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, W |
| 0 | Input (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, W |
| 0 | Input (2 Byte Float) | 2 Byte EIS5 / DPT 9.xxx | C, W |
| 0 | Input (2 Byte Signed) | 2 Byte EIS10 / DPT 8.001 | C, W |
| 0 | Input (2 Byte Unsigned) | 2 Byte EIS10 / DPT 7.001 | C, W |
| 0 | Input (4 Byte Float) | 4 Byte EIS9 / DPT 14.xxx | C, W |
| 0 | Input (4 Byte Signed) | 4 Byte EIS11 / DPT 12.001 | C, W |
| 0 | Input (4 Byte Unsigned) | 4 Byte EIS11 / DPT 13.001 | C, W |
| 1 | Output (1 Bit) | 1 Bit EIS1 / DPT 1.001 | C, T |
| 1 | Output (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, T |
| 1 | Output (1 Byte 0..255) | 1 Byte EIS14 / DPT 5.010 | C, T |
| 2 | Enable | 1 Bit EIS1 / DPT 1.001 | C, W |

### 11.8.9 Light scene actuator

With the "Light scene actuator" 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 "Scene call-up". A maximum of eight scenes with up to eight actuator objects can be created.
For triggering different actuators, the size of the actuator groups communication objects can be set under the "Actuator group type" parameter.
The user has the option of saving the scenes himself. A corresponding save telegram must be received for this (see the description of the individual parameters).

#### Light scene actuator objects

| No. | Object name | Data type | Flags |
|---|---|---|---|
| 0 | Light scene call-up (1 Byte) | 1 Byte / DPT18.001 | C, W, U |
| 1…10 | Actuator group A [B…J] (1-bit switching) | 1 Bit EIS1 / DPT 1.001 | C, W, T, U |
| 1…10 | Actuator group A [B…J] (1-bit Venetian blind) | 1 Bit EIS7 / DPT 1.008 | C, W, T, U |
| 1…10 | Actuator group A [B…J] (1 Byte 0..100 %) | 1 Byte EIS6 / DPT 5.001 | C, W, T, U |
| 1…10 | Actuator group A [B…J] (1-byte light scene number) | 1 Byte / DPT 18.001 | C, W, T, U |
| 1…10 | Actuator group A [B…J] (Temperature value absolute) | 2 Byte EIS5 / DPT 9.001 | C, W, T, U |
| 10…19 | Enable scene 1 [Scene 2 … Scene 10] | 1 Bit EIS1 / DPT 1.001 | C, W, T |

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