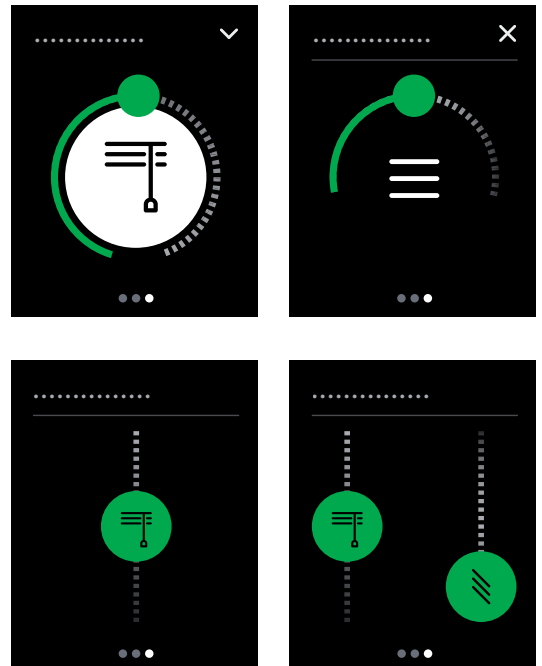# KNX

KNX Multitouch Pro

Multitouch with RTCU 1920/1.1

Application description

This document describes the software application 1920/1.1. The software application is designed to program the KNX Multitouch Pro

MTN6215-0310 | MTN6215-5910 | MTN6216-5910

10/17-1920/1.1

Schneider Electric

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Read through the following instructions carefully and familiarise yourself with the device prior to installation, operation and maintenance. The warnings listed below can be found throughout the documentation and indicate potential risks and dangers, or specific information that clarifies or simplifies a procedure.

The addition of a symbol to "Danger" or "Warning" safety instructions indicates an electrical danger that could result in serious injuries if the instructions are not followed.

This symbol represents a safety warning. It indicates the potential risk of personal injury. Follow all safety instructions with this symbol to avoid serious injuries or death.

DANGER

DANGER indicates an imminently hazardous situation that will inevitably result in serious or fatal injury if the instructions are not observed**.**

WARNING

WARNING indicates a possible danger that could result in death or serious injuries if it is not avoided.

CAUTION

CAUTION indicates a possible danger that could result in minor injuries if it is not avoided.

NOTE

NOTE provides information about procedures that do not present any risk of physical injury.

Further information

The information provided must be complied with, otherwise program or data errors may occur.

You will find additional information here to make your work easier.

Depictions in this document

Style and text features used

Text features used

Text feature	Meaning
Programming Select the *Programming service button* *Relay operation* – *Make contact* – *Flashing*	Body text contains: Service buttons, tab name, parameter name and values.
File/Save	Menu and menu sequences
Save changes?	System notifications
Choice: **10 %**/90 % ...	Preselected values in the ETS are highlighted in bold in the tables.
.. influences the *switch object*.	Group objects
<u>Operation chapter</u>	Cross-references

Setting tabs, parameters and values

Overview - setting functions

The following overview allows you to **understand** the steps needed to access the functions and settings. This overview also provides you with the correct sequence for accessing the functions.

Button	Select button function	Scene
	↺	
	Select scene function	Extended
	Number of objects	2
↺		
Scene extended	...	...

Example

Meaning: First go to the *Button* tab and set the *Select button function* parameter to value *Scene*. Further parameters will then appear in the tab. These can be used to change settings. A new tab will also open.

ETS operation

Requirements for safe operation

Knowledge of the basic rules for operating programs using Windows® is a prerequisite for operation.

The ETS is the software for the KNX system, and is not manufacturer-specific. Knowledge of ETS operation is required. This also includes selection of the correct sensor or actuator, transferring it to the line and commissioning it.

Special features of the ETS software

Restoring defaults

You can set the factory-specified defaults using the *Default parameters* service button in the ETS4 and ETS5.

You can use the *Default* and *Default parameters* service buttons to switch all parameters back to the settings on delivery (following consultation). The ETS will then permanently delete all manual settings.

Express settings

You can use the *Express settings* to call up largely pre-set functions (Screens with 1 function --> 18).

Extended settings

With the *Extended settings*, you can configure individual functions with a wide range of options, if necessary (Screens with 1-4 functions (extended) --> 53).

Dependent functions and parameters

Many functions are affected by how other functions are set. This means that dependent functions can only be seen and selected in the ETS when the upstream function is enabled.

- If you de-select functions or change parameters, previously connected group addresses may be removed in the process.
- The values of some parameters only become active once the functions influenced by these parameters are activated.
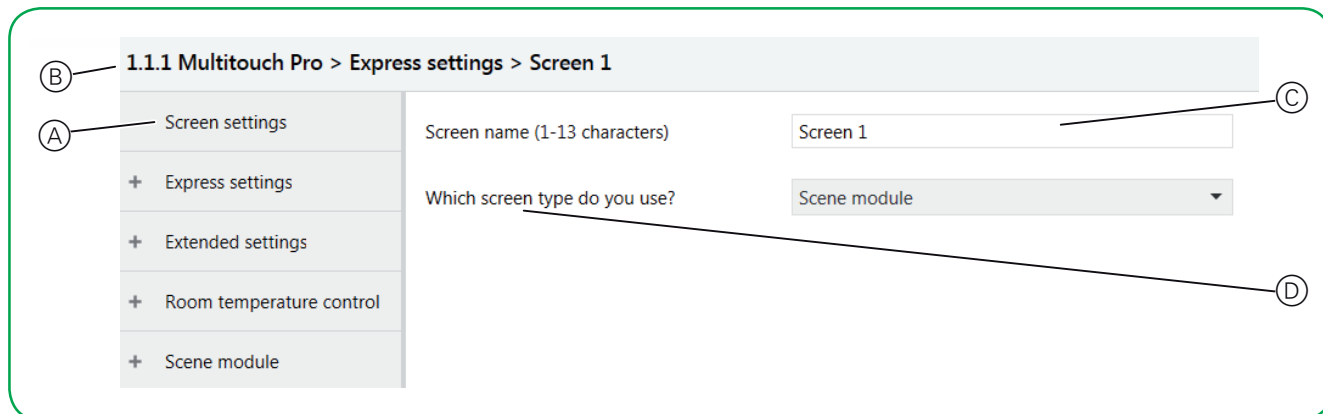
Appropriate ETS version

Application files are optimised for the corresponding ETS version:

- ETS4: knxprod
- ETS5: knxprod

If you load an ETS4 application in the ETS5, time will be wasted on conversion.

User interface

In the ETS, the device parameters are opened using the *Edit parameters* service button. The user interface is divided into 2 sections: The tabs are on the left and the parameters on the right, together with their values.

> **1.1.1 Multitouch Pro > Express settings > Screen 1**
>
> Screen settings
>
> + Express settings
>
> + Extended settings
>
> + Room temperature control
>
> + Scene module
>
> Screen name (1-13 characters)   Screen 1
>
> Which screen type do you use?   Scene module ▼

Ⓐ Tab
Ⓑ Name of device
Ⓒ Input fields for parameter values
Ⓓ Parameter

Group objects in the ETS

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Blind position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
197	Message 1	Messages	1 bit	Receives	1.001 switching

DPT

The data point types (DPT) in this application are preset.

Table of contents

1   For your safety

> ⚠️ **WARNING**
>
> **Risk of serious damage to property and personal injury due to incorrect electrical installation.**
>
> Safe electrical installation can only be ensured if the person in question can prove basic knowledge in the following areas:
>
> - Connection to installation networks
> - Connecting several electrical devices
> - Laying electric cables
> - Connecting and establishing KNX networks
> - Commissioning KNX installations
>
> These skills and experience are normally only possessed by certified specialists who are trained in the field of electrical installation technology. If these minimum requirements are not met or are disregarded in any way, you will be personally liable for any damage to property or personal injury.

1.1   Qualified personnel

This document is aimed at personnel who are responsible for setting up, installing, commissioning and operating the device and the system in which it is installed.

Detailed expertise gained by means of training in the KNX system is a prerequisite.

2 General information on the application 1920/1.1

You can use this application to program the KNX Multitouch Pro. The KNX Multitouch Pro is a control unit with touch screen suitable for installation in a single or multiple frame. You can control up to 32 room functions on up to 8 screen pages, e.g. switching or dimming light, controlling blinds or setting the required room temperature.

2.1 Screen type and functions

You can set up as many as 9 screen pages in the *Screen settings*. Select the following types for screens 1-8.

- 1 function
- 2 functions
- 1-4 functions (extended)
- Room temperature control unit
- Scene module
- Settings

Screen 9 can exclusively be used for settings.

Screens for 1 function

The following functions are available for this screen type.
- Switching
- Dimming
- Dimming RGB
- Roller shutter
- Roller shutter with stop on release
- Blind
- Scene (external)
- Information display

Express settings   All functions are preset to a large extent. You set the functions directly using the *Express settings* of the screen in question.

Rotary design
Vertical design   In some functions, you select between the rotary and the vertical design. Depending on the design, there are differences in operation and in the function scope (Overview --> 18).

Screens for 2 functions

Select any combination of two from the following functions in vertical design for this screen type.
- Switching
- Dimming
- Roller shutter/blind position
- Roller shutter with stop on release
- Slat position
- Setpoint temperature change

Express settings   For this screen type, there are *Express settings*, which you can select and adjust directly in the tab of the respective screen (Overview --> 42).

Screens for 1-4 functions

Button design

With this screen type in the button design, you can select functions for up to 4 buttons on each screen page independently of one another. The following functions can be selected.

- Toggle
- Switching
- Dimming
- Blind
- Edge function
- Edges with 2 byte values
- 8 bit slider with button
- Scenes

Extended settings

After the screen has been selected, set the functions individually using the *extended settings* tab (Overview --> 53).

Room temperature control unit

Rotary design
Vertical design

The KNX Multitouch Pro has room temperature control unit with an internal thermostat that you can allocate to each of the screens 1-8. You select between the rotary and the vertical design. The thermostat has the following functions.

- Heating and cooling with additional stage
- PI and 2-step control
- Continuous and switching output
- Connecting and evaluating an external remote sensor for floor temperature
- Receiving and evaluating external temperature via bus
- Setpoint shift and basis setpoint shift
- controlling fan steps of a KNX fan coil actuator

You set the functions of the thermostat in the *Room temperature control* tab (Overview and mode of function --> 94).

Scene module

You can use the *Scene module* to save up to four scenes internally, each with up to four room functions. For each scene, you can transmit up to four values for room functions. The following functions can be selected.

- Switching
- Moving up/down
- 1 byte values (absolute or percentage)
- Operating modes for room temperature control
- Temperature values

You set the functions of the scene module in the *Scene module* tab (Overview --> 124).

Messages

Messages are short texts which are triggered by objects when certain events occur. The texts are not assigned to any screen, and are displayed instead of the current screen page (Messages --> 128).

Settings

You can assign the settings for ongoing operation to all 9 screens. Screen 9 can only be used for settings (Overview --> 130).

General settings

In the *General settings* tab, you set up the user interface, set gesture and proximity function, write texts for messages and decide which functions can be set in ongoing operation (Overview --> 130).

2.2 Program environment

The device is commissioned using KNX-certified software. The application and the technical descriptions are updated regularly and can be found on the Internet.

This application can be run in conjunction with the ETS software in versions 4 and 5.

3   Screen settings

You can set up as many as 9 screen pages in total. On up to 8 screen pages, you control up to 32 room functions, e.g. switching or dimming light, controlling blinds or setting the required room temperature. You can assign the settings for ongoing operation to all screen pages. Screen 9 can only be used for settings.

3.1   Selecting screens

You select up to 9 screens.

Screen settings	How many screens to you use (1-9)

Following the selection, the corresponding screens appear under the *Express settings* tab.

Screen settings	
Express settings	
Screen 1	
...	
Screen 9 - settings	

You can increase the number of screens up to the maximum value at any time. Settings that have already been made are not lost when you do this. If you reduce the number, the previous settings remain stored in the background. Group addresses that are already allocated are disconnected at the remote screens, however.

Screen types

The number of screens that are required depends on the function scope and the selected screen types. The following screen types exist (Screen type and functions --> 13).

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	**1 function**
		2 functions
		1-4 functions
		Room temperature control unit
		Scene module
		Settings

- Screen for 1 function (Overview --> 18)
    - Configuration directly via the *Express settings*
    - All functions are independent of one another (max. 8 of 8 pages)
- Screen for 2 functions (Overview --> 42)
    - Configuration directly via the *Express settings*
    - All functions are independent of one another (max. 16 of 8 pages)
- Screen for 1-4 functions (Overview --> 53)
    - Configuration via the *Extended settings* tab
    - All functions are independent of one another (max. 32 of 8 pages)
- Room temperature control unit (Overview and mode of function --> 94)
    - Configuration via the Room temperature control tab
    - Function can be assigned to each of screens1-8

- Scene module (Overview --> 124)
  - Function can be assigned to each of screens1-8
- Settings during ongoing operation (Overview --> 130)
  - Configuration via the General settings tab
  - Function can be assigned to each of screens 1 to 9

3.2 Main screen

You can define a screen as the main screen. If the current screen is no longer touched, the main screen appears after a particular time (30-600 s). If activated, you can select the main screen during ongoing operation on the *Main screen number* function page and set the duration of the *Duration until main screen* page. Following a reset or download, the currently set main screen also appears.

Settings in ETS

You activate the *Main screen* in the *Screen settings* tab. The selection of the main screen depends on the number of screens that are used.

Settings screen	How many screens do you use (1-9)?	
	Use main screen	Yes
	Select main screen	
	Call main screen after 30-600 s	

Settings for ongoing operation

In the *Setting screen*, activate the *Main screen number* and *Duration until main screen* sub function pages, and select a name up to 13 characters in length in each case.

4 Screens with 1 function

4.1 Overview

In the Settings, you can activate up to 9 screens which are then located under the Express settings tab.

Screen 1-8 You can select the *1 function* screen type for each of the screens 1 to 8. Select a screen name, as is the case for all screens.

Functions For this screen type, there are *Express settings* which you make and set directly in the tab of the corresponding screen. Select one of the following functions for each screen.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	1 function
	Function	Switching
		Dimming
		Dimming RGB
		Roller shutter
		Roller shutter with stop on release
		Blind
		Scene (external)
		Information display

Design

In the Dimming, Shutter and Blind functions, you select between the rotary and vertical design. The designs and their functions are shown in the following overviews and described in the function descriptions.
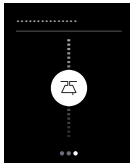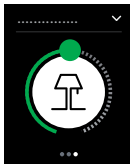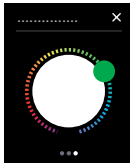
There are differences in the function scope depending on the design. For example, when dimming in the rotary design, there is an additional switching command function.

Sub function pages

There are additional sub function pages depending on the function and design. For example, there is a sub function page for slat control in the rotary design (Functions and status display in the rotary design --> 23). The screen name appears on the main and the sub function page.
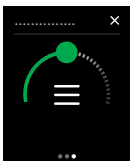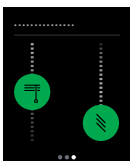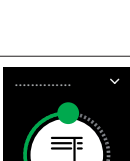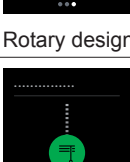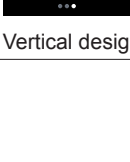
Overview of the switching and dimming functions

Screen type *1 function*

ETS design	ETS	Function	Objects
Switching	Switching	**Switching**	
		– Toggle On/Off	– Switch object 1 bit
		– Switching On	– Switch object 1 bit
		– Switching Off	– Switch object 1 bit
		– Bell push function	– Switch object 1 bit
		Advertisements	
		– Toggle On/Off: display On/Off	– Status feedback object 1 bit
		– Other functions: display button touch	
Rotary design	Dimming	**Dimming**	
		Cyclically brighter/darker with values 0-100 %	Value object 1 byte
		Select value directly	
		Set maximum % value	
		Display brightness	Status feedback object value1 byte
		Switching	
		– Toggle On/Off (Use only value object = No)	– Switch object 1 bit
		– Sends values (Use only value object = Yes)	– Value object 1 byte
		Display On/Off	
		– Use only value object = No	– Status feedback object 1 bit
		– Use only value object = Yes	– Status feedback object value1 byte
Vertical design	Dimming	**Dimming**	
		Cyclically brighter/darker with values 0-100 %	Value object 1 byte
		Send value directly	
		Set maximum % value	
		Display brightness	Status feedback object value 1 byte
		Display On/Off	
		– Use only value object = No	– Status feedback object 1 bit
		– Use only value object = Yes	– Status feedback object 1 byte
Rotary design	Dimming RGB	**Adjusting brightness**	
		Cyclically brighter/darker with values 0-100 %	Value object 1 byte
		Select value directly	
		Set maximum % value	
		Display brightness	Status feedback object value 1 byte
		Switching	
		– Toggling On/Off (Use value object only = No)	– Switch object 1 bit
		– Transmits values (Use value object only = Yes)	– Value object 1 byte
		Show On/Off	
		– Use value object only = No	– Status feedback object 1 bit
		– Use value object only = Yes	– Status feedback object value 1 byte
Rotary design	Dimming RGB Scenes RGB	**Retrieve external RGB scenes**	
		– Retrieval of 8 scenes on the value scale	– Colour scene object 1 byte
		– Retrieval of 1 scene on the central button	– Colour scene object 1 byte
		Display	
		Displaying the last retrieved scene on the value scale	
Rotary design	Dimming RGB Colour temperature	**Transmitting colour temperature values**	
		Transmit colour temperature values in Kelvin	Colour temperature object 2 byte
		Setting the minimum and maximum colour temperature value	
		Display	
		Displaying the last transmitted value on the value scale	
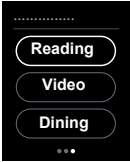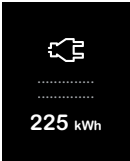
Overview of the blind and roller shutter functions

Screen type *1 function*

ETS design	ETS	Function	Objects
 Rotary design	Blind	**Blind** Cyclically with position values 0-100% Send position value directly Move up and down Stop Display blind position	 Blind position 1 byte Movement object Stop/step object 1 bit Status feedback blind 1 byte
 Rotary design		**Slats** Cyclically with position values 0-100% Send position value directly Display slat position	 Slat position 1 byte Status feedback slats 1 byte
 Vertical design	Blind	**Blind** Move with position values 0-100 % Stop Display blind position	 Blind position 1 byte Stop/step object 1 bit Status feedback blind 1 byte
		Slats Cyclically with position values 0-100% Send position value directly Display slat position	**Slats** Slat position 1 byte Status feedback slats 1 byte
 Rotary design	Roller shutter	**Roller shutter** Cyclically with position values 0-100 % Send position value directly Move up and down Stop Display roller shutter position	 Roller shutter position 1 byte Movement object Stop object 1 bit Status feedback roller shutter 1 byte
 Vertical design	Roller shutter	**Roller shutter** Cyclically position values 0-100 % Stop Display roller shutter position	 Roller shutter position 1 byte Stop object 1 bit Status feedback roller shutter 1 byte
 Vertical design	Roller shutter with stop on release	**Roller shutter** Move down Move up Stop when button is released	 Movement object Movement object Stop object 1 bit

Overview of scenes and information display

Screen type *1 function*

ETS design	ETS	Function	Objects
Button with text	Scenes (external)	**Scene function per button** Call up scene externally Save scene externally 1-3 scenes Display button touch Individual scene name	 Scene object 1 byte Scene object 1 byte
Button with symbol	Scenes (external)	**Scene function per button** Call up scene externally Save scene externally 1-4 scenes Display button touch Individual scene symbol	 Scene object 1 byte Scene object 1 byte
225 kWh	Information display	**Display 1-2 values** – Internal temperature °C or °F (sensor) – External temperature °C or °F (object) – Energy consumption kWh – Water consumption m^3 – Relative humidity % – CO_2 content ppm	 – (no object) – Display Temperature – Display Energy consumption kWh – Display Water consumption m^3 – Display Humidity % – Display CO_2 content ppm

4.2 Switching

Using the *Switching* function, you can switch over, switch On, switch Off or use the bell push function.

The following illustration shows the *Switching* function for the *1 function* screen type.

Function symbol

Press button

Switching

Function of the button

You can select one of the following functions in the ETS.

- Tapping can be used to switch on and off in alternation (*Toggle On/Off*).
- Tap only to switch on (*Switch On*).
- Tap only to switch off (*Switch Off*).
- Tap and hold to switch on and release to switch off (*Bell push function*).

Status indication

With the *Toggling On/Off* function, triggering is performed using the *Status feedback object*.

State	Display
On	Button lights up white
Off	Button lights up grey

With the *Switch On* and *Switch Off* functions, the colour of the button changes briefly when it is tapped.

In the *Bell push function*, the button displays when touched.

State	Display
Touch the button	Button lights up white
Do not touch the button	Button lights up grey

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Switching
	⊂	
	Type of switching function	
	Which function symbol do you use?	

Screen name

You select a name up to 13 characters in length for the switching command function.

Type of switching command function

You select *Toggle, Switch On, Switch Off* or *Bell push function*.

Function symbol

Table/standard lamp	Ceiling lamp	Spot	Bulb	Bulb with radiance

Start	Brightness

Group objects

The switching command function is carried out via the *switch object*. With the toggle function the status indication is controlled via the *status feedback object*.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object	Screen x	1 bit	Sends, receives	1.001 switching
x	Status feedback object	Screen x	1 bit	Receives	1.001 switching

Information for single-button operation

Single-button switching also works with central functions that have several group addresses on the side of the switching actuator. It is not necessary to adapt the switch object of the KNX Multi-Touch Pro. The switching command function is synchronised via the status feedback object. If the status feedback object receives a new value and then the button is touched, the switch object sends the appropriate value. For example, if the status feedback object last received the value "1" then the switch object sends the value "0".

4.3   Dimming

Using the *Dimming* function, you can increase and reduce the dimming with values and switch the lighting on and off. You select between the *Rotary* and the *Vertical design*.

Functions and status display in the rotary design

The following illustration shows the *Dimming* function for the *1 function* screen type in the *Rotary design*

Dimming
Rotary design
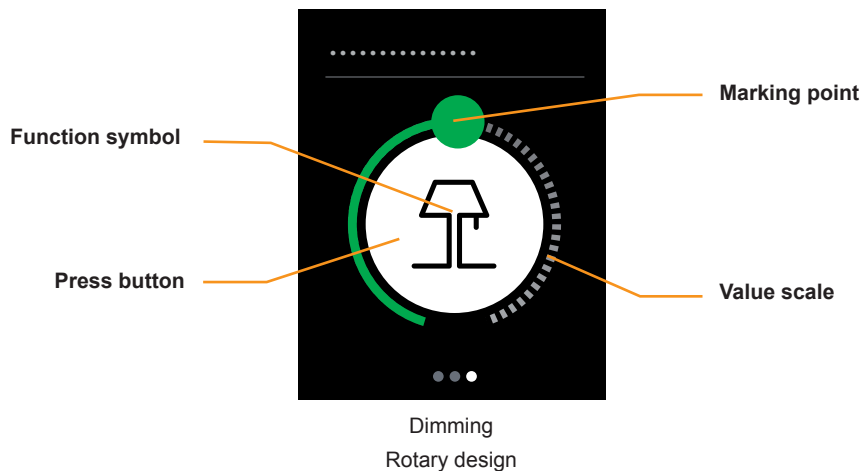
Dimming

- Swiping the value scale sends dimming values from 0-100 %. You can change the maximum dimming value to adapt the dimming behaviour to the dimming actuator.
- Touching the value scale sends a value.

Switching command function

- Touching the button switches alternately the lighting on and off, optionally with 1 bit or 1 byte.

Status indication

- The central button shows the current switching state. Control is via the *Status feedback object* or the *Status feedback object value*.
- The position of the marking point on the value scale shows the current brightness value. Control uses the *Status feedback object value.*

State	Display
Illumination on	Button lights up white
Illumination off	Button lights up grey
Brightness	Position of the marking point

Function and status display in vertical design

The following illustration shows the *Dimming* function for the *1 function* screen type in the *Vertical design*.

Dimming
Vertical design
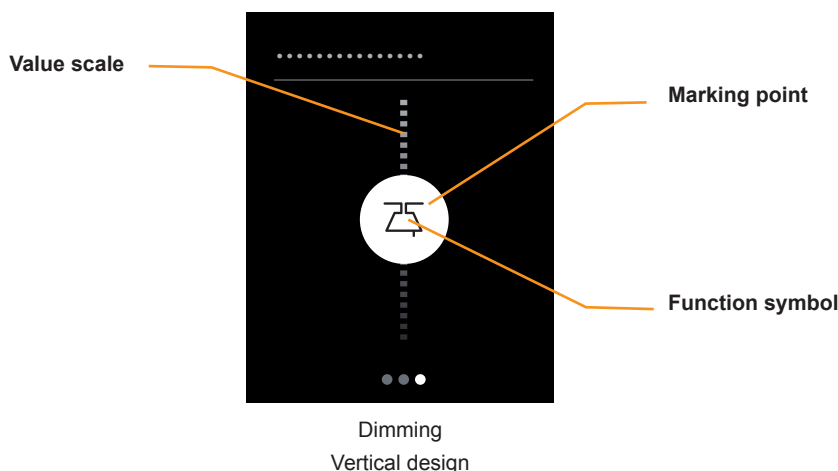
Dimming
- Swiping the value scale sends dimming values from 0-100 %. You can restrict the dimming range by changing the maximum dimming value.
- Touching the value scale sends a value.

Status indication
- The marking point shows the current switching state. Control is via the 1 bit *Status feedback object* or the *Status feedback object value*.
- The position of the marking point on the value scale shows the current brightness value. Control uses the *Status feedback object value*.

State	Display
Illumination on	Marking point lights up white
Illumination off	Marking point lights up grey
Brightness	Position of the marking point

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Dimming
	Which screen design do you use?	
	Use only value object	
	Cycle time when dimming = 100 ms * factor (2-10)	
	Maximum dimming value (50-100%)	
	Which function symbol do you use?	

Screen name
You select a name up to 13 characters in length for the dimming function.

Design of the screen
You select the *Rotary* or the *Vertical design*. In the *Vertical design*, you always send values. In the *Rotary design*, there are additionally switching command functions.

Cycle time when dimming
If you swipe the value scale during ongoing operation, then messages are sent cyclically. You set at what interval the messages are sent.

Function symbol

| Table/standard lamp | Ceiling lamp | Spot | Bulb | Bulb with radiance |

| Start | Brightness |

Maximum dimming value

You can set the maximum dimming value for dimming in order to adapt the dimming behaviour to the dimming actuator. For the user interface, set the same maximum dimming value as in the dimming actuator.

Use only value object

- Switching function with *Rotary design*
    - Switching is done via values. The lighting is switched on with the last brightness value (memory function).
- Status indication with *Rotary Design* or *Vertical Design*
    - The display whether the lighting is switched on or off is controlled using the *Status feedback object value*.

Group objects

Switching is carried out via the *Switch object* or the *value object*. The *Switch object* only exists in the *Rotary design*. Dimming is carried out via the *Value object*. The status indication is controlled via the *Status feedback object* and the *Status feedback object value*.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object	Screen x	1 bit	Sends, receives	1.001 switching
x	Value object	Screen x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Status feedback object	Screen x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x	1 byte	Receives	5.001 percent (0-100 %)

Information for single-button operation

Simple switching also functions with central functions that have several group addresses on the side of the switching actuator. It is not necessary to adapt the switch object of the KNX Multitouch Pro. The switching command function is synchronised via the status feedback object. If the status feedback object receives a new value and then the button is touched, the switch object sends the appropriate value. For example, if the status feedback object last received the value "1" then the switch object sends the value "0".

4.4   Dimming RGB

The *Dimming REG* function is an extended dimming function for KNX devices that support colour control. There is a main function page and up to 2 sub function pages with a rotary design for the user interface.

- The brightness of devices for colour control is set on the main function page.
- External RGB scenes can be retrieved using the sub function page *RGB scenes*. The values for the colours are set and saved in the external device.
- The *Colour temperature* sub function page can be used to transmit values that are used to set the colour temperature in Kelvin in the external device.

You can choose between activating either *RGB scenes*, *Colour temperature* or both.

The KNX DALI gateway REG-K/1/16(64)/64/IP1 (firmware version 1.3 or higher) supports DALI DT-8 devices with colour selection and separate brightness control. The brightness is controlled on the individual device (DALI EVG), and the colour is selected by retrieving scenes.

Adjusting brightness

Brightness values are transmitted and switched on and off via the main function page.

You can set the maximum brightness value to match the setting in the colour control device. Switching is carried out using one bit or one byte.

The settings in the ETS and the display on the user interface correspond exactly to the *Dimming* function with *rotary design* (Functions and status display in the rotary design --> 23). In order to ensure that the selected colour remains in effect when dimmed brighter or darker, you will require a colour control device with an additional input for brightness.

Retrieving RGB scenes

The following illustration shows the *RGB scenes* sub function.

RGB scenes
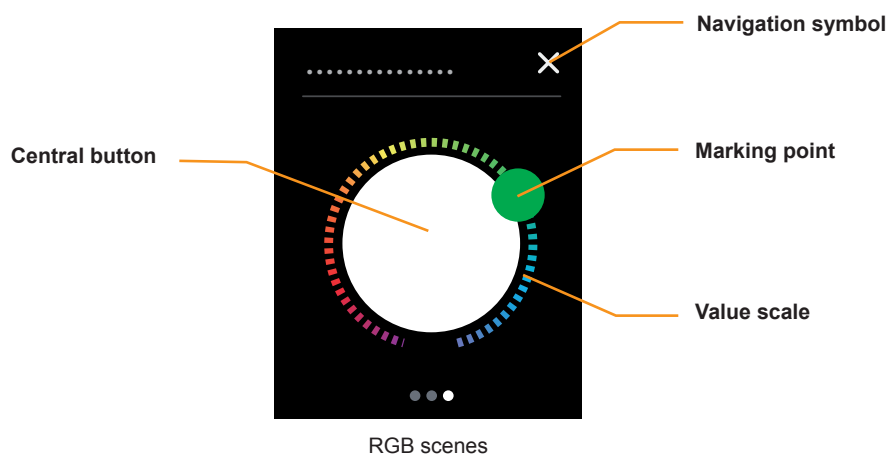
Retrieving Scenes 1-8
- Tapping on the value scale retrieves between one and eight external scenes. The positions on the value scale are shown in the illustration below (ranges for scenes)
- Swiping the value scale retrieves up to eight external scenes.

Retrieving a scene with the central button
- Tapping on the central button retrieves an additional scene.

Navigation
- Tap the navigation symbol to access the main function page.
- Swipe right/left to access an additional sub function.
- Tap the navigation symbol on the main function page to access the sub function page.

Ranges on the value scale

The following illustration shows the ranges for retrieving the scenes. The scale is divided up into eight ranges. The marking point engages in the middle of the currently selected range. The division into ranges is not shown on the user interface.

Ranges for scenes
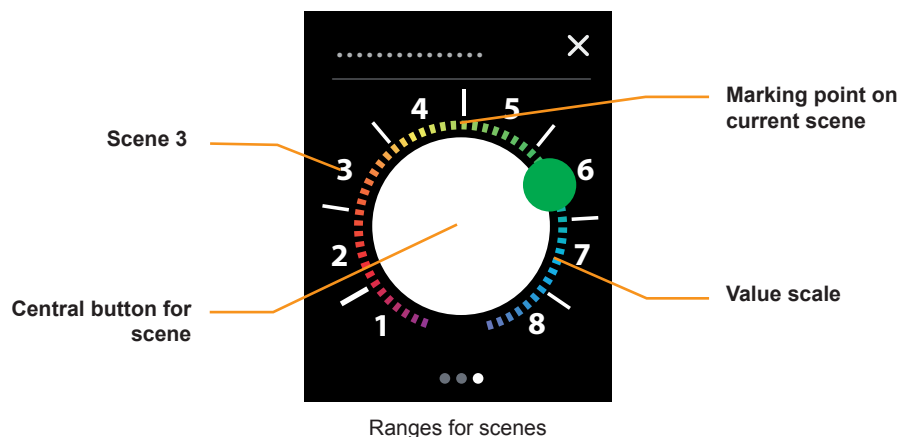
RGB colours

The following table shows the values for the RGB colours of ranges 1-8 and for the central button.

Range	Red	Green	Blue	Colour
1	255	0	255	Pink
2	255	0	0	Red
3	255	127	0	Orange
4	255	255	0	Yellow
5	127	255	0	Green-yellow
6	0	255	0	Green
7	0	255	255	Blue-green
8	0	0	255	Blue
Button	255	255	255	White

Note that the colours may be displayed differently, depending on the colour control device and the lamps being used.

XY colour space display

The type of colour setting depends on the devices being used for the colour setting. In addition to RGB selection, there are also other processes for adjusting the colour setting. This includes the XY colour space display.

The colour is determined in a colour space using xy coordinates. The xy coordinates can be used to specify every point in space, and thus to define every colour. This procedure can be used for DALI DT-8 devices for controlling RGB-LED modules, for example.

i Observe the permitted ranges for the devices and lamps in question. If the xy coordinates lie outside the ranges specified by the manufacturer, this could lead to errors and to colours that cannot be reproduced.

Colour temperature

The following illustration shows the *Colour temperature* sub function page.

Colour temperature
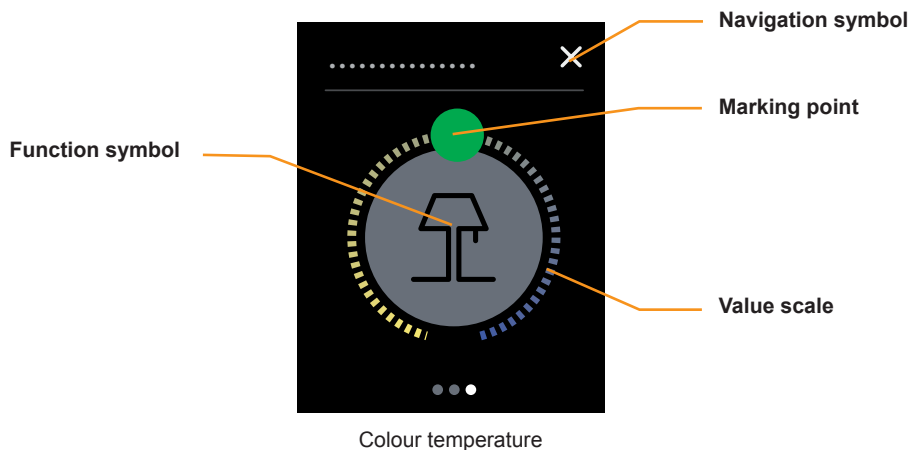
Transmitting colour temperature values
- Swiping the value scale transmits 2 bytes of colour temperature values. You can set the minimum and maximum values. The presetting is 1500-5000 Kelvin.
- Tapping the value scale transmits a single colour temperature value.

Status indication
- The position of the marking point on the value scale shows the current colour temperature value.

i Display on the value scale

The usable value range depends on the control device and the lamps. The colours on the value scale do not correspond to the colours that are actually visible.

Navigation
- Tap the navigation symbol to access the main function page.
- Swipe right/left to access an additional sub function.
- Tap the navigation symbol on the main function page to access the sub function page.

Setting the minimum and maximum colour temperature values

The following illustration shows the colour temperature values on the "Black-Body-Line" (BBL).
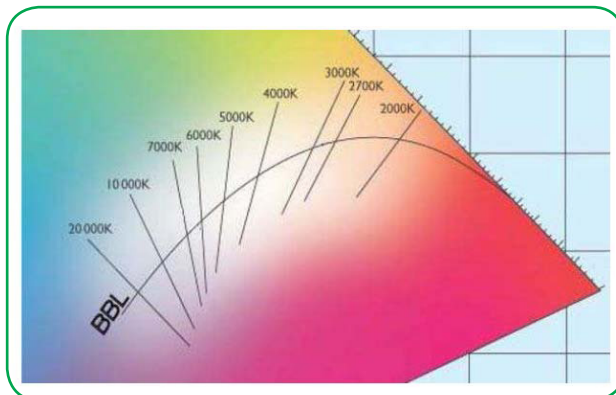
The colour temperature refers to the temperature to which a theoretical black object would need to be heated in order for it to emit the light of the respective colour. The various white tones are located along a line within the overall colour space. This line is designated the Black Body Line (BBL).

The unit for the colour temperature is Kelvin. A low colour temperature is perceived as warm (yellow-red), a high colour temperature as cold (blue). Daylight has low values (3200 K) at sunrise and sunset and higher values for sunlight at midday (5500 K). The colour temperature of blue sky is 9000-12000 K.

Controlling the colour temperature makes it possible to render artificial light warmer or colder. A typical application is a white-light control with warm white and cold white LEDs. Colour temperatures are usually between 1500 and 8000 Kelvin.

KNX DALI Gateway

The KNX DALI gateway REG-K/1/16(64)/64/IP1 (firmware version 1.3 or higher) supports DT-8 devices for white light control with warm-white and cold-white LEDs. However, this function is triggered via KNX by retrieving scenes. The values for the colour temperature are set in the DALI scenes.

Settings in ETS

The settings for brightness correspond exactly to the *Dimming* function with the *rotary design* ()

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Dimming RGB
	↻	
	Use value object only	
	Cycle time when dimming = 100 ms * factor (2-10)	
	Maximum dimming value (50-100%)	
	Which function symbol do you select?	

The following settings exist for the RGB scenes and the colour temperature.

Screen x - RGB settings	Function of the sub screens	RGB scenes
		Colour temperature
		RGB scenes / Colour temperature
[RGB scenes]	Scene call x (0-63) [1-8]	
	Scene call with central button (0-63)	
[Colour temperature]	Minimum value of the colour temperature in Kelvin	
	Minimum value of the colour temperature in Kelvin	

RGB scenes
- You can select up to eight addresses (0-63) for the retrieval of the RGB scenes. There are eight ranges on the value scale on the *RGB scenes* sub function page.
- You can select an address (0-63) for retrieving an external RGB scene with the *central button*.

Colour temperature
- You can select the minimum and the maximum colour temperature values. The usable value range depends on the control device and the lamps. The control device must support the 2-byte data point type 7.001.

Group objects

Switching is performed using the *switch object* or the *value object*. A value for brightness is transmitted via the *value object*. The status indication is controlled using the *Status feedback object* and the *Status feedback object value*.

The external REG scenes are retrieved via the *Colour scene object*. The value for the colour temperature is transmitted via the *Colour temperature object*.

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object	Screen x	1 bit	Sends, receives	1.001 switching
x	Value object	Screen x	1 byte	Sends, receives	5.001 percent (0-100%)
x	Status feedback object	Screen x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Colour scene object	Screen x	1 byte	Sends	18.001 scene monitoring
x	Colour temperature object	Screen x	2 byte	Sends	7.001 pulses

4.5 Blind and roller shutter

With the *Blind* function, you can move a blind with values and adjust the slats.

With the *Roller shutter* function, you can move roller shutters with values.

You select between the *Rotary* and the *Vertical design*. In the *Rotary design*, there is a main and a sub function page for the blind function, whereas in the vertical design, all functions are on one screen page.

Functions and status indication in the rotary design

The following illustration shows the *Blind* or *Roller shutter* function for the *1 function* screen type in the *Rotary design*.

Blind
Roller shutter
Rotary design
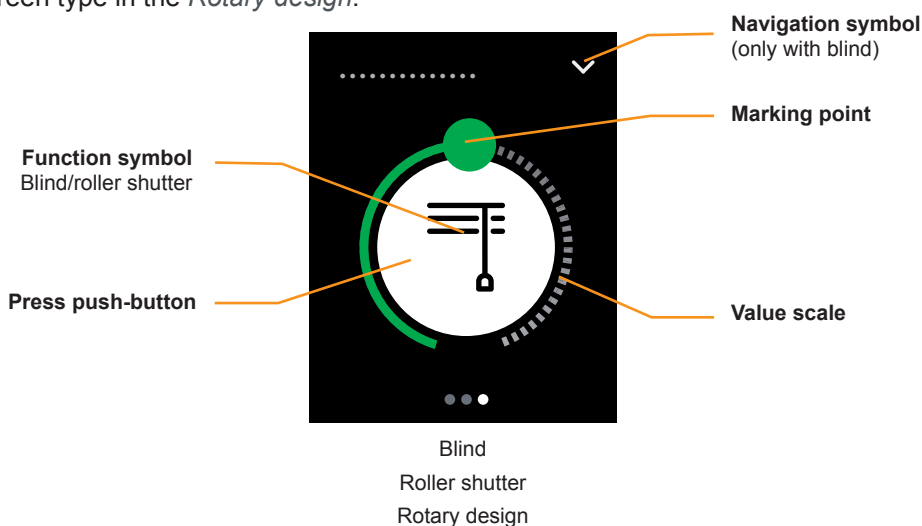
Move blind or roller shutter
- Swiping on the value scale sends values from 0-100%.
- Touching the value scale sends a value.
- Tapping and holding the button moves the blind or the roller shutter using the 1 bit *Movement object*.
- Tapping the button stops the movement using the 1 bit *Stop/step object* or the *Stop object*.
- Tapping the navigation symbol calls up the sub function page on which you move the slats (*Blind* function).

The following illustration shows the sub function page for adjusting the slats for the *Blind* function.
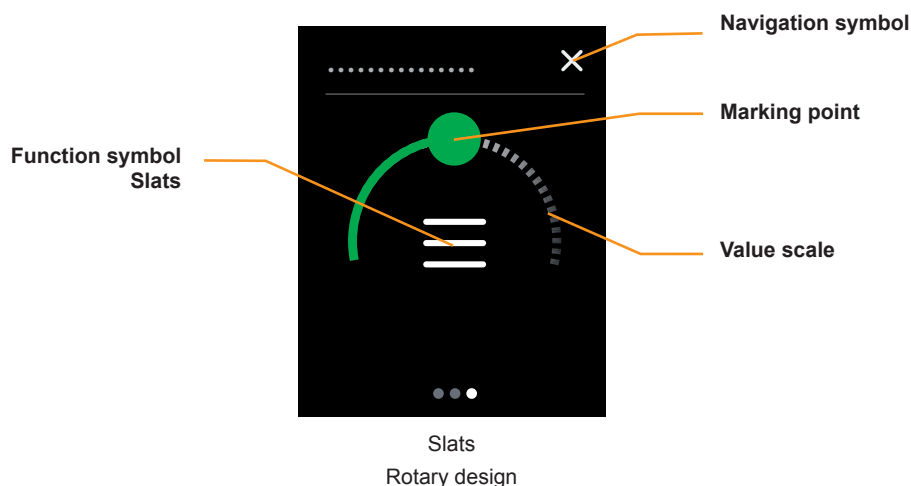
Slats
Rotary design

Position slats
- Swiping the value scale sends values from 0-100 %.
- Tapping the value scale sends a value.

- Tapping the navigation symbol returns you to the main function page on which you move the blind.

Status indication
- The marking point on the value scale on the main function page shows the position of the blind or the roller shutter. Control is via the *Status feedback blind* object.
- The marking point on the value scale on the sub function page shows the position of the slats. Control is via the *Status feedback slat* object (*Blind* function).

State	Display
Blind position	Position of the marking point
	Function symbols for 5 positions of the blind
Slat position	Position of the marking point
	Function symbols for 3 positions of the slats

Functions and status indication in the vertical design

The following illustrations show the *Roller shutter* and *Blind* functions for the *1 function* screen type in the *Vertical design*.

Roller shutter
Vertical design

Blind
Vertical design
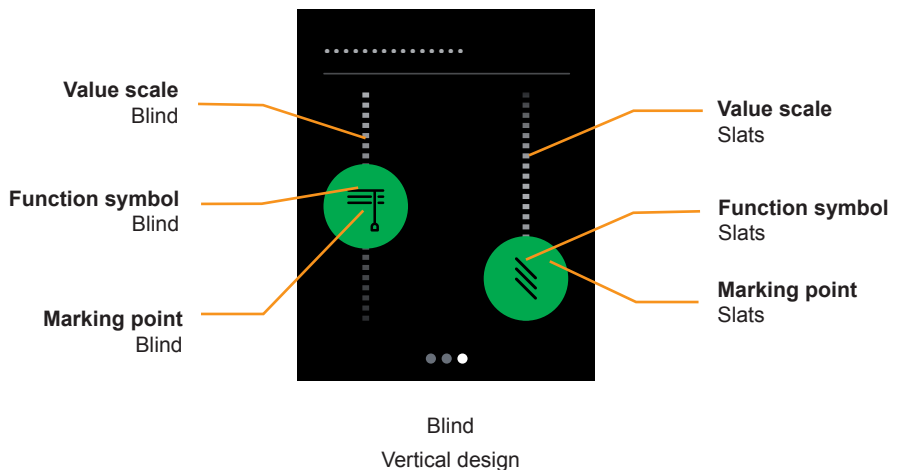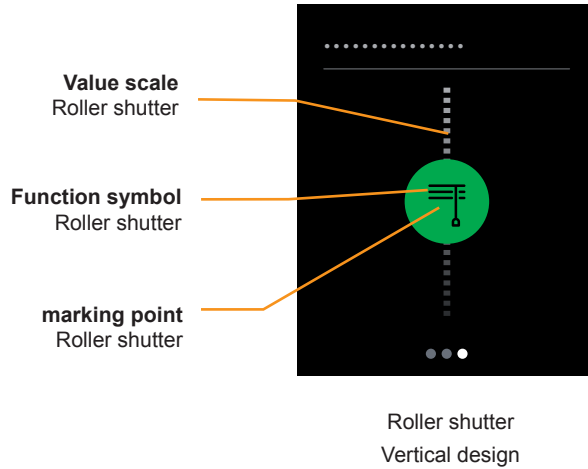
Moving blind or roller shutter
- Swiping the value scale sends values from 0-100 %.
- Touching the value scale the movement is stopped.

Position slats
- Swiping the value scale of the slats sends values from 0-100 %.

- Touching the value scale sends a value.

Status indication
- The marking point on the value scale of the blind shows the position. Control is via the *Status feedback blind* object.
- The marking point on the value scale of the roller shutter shows the position. Control is by the *Status feedback roller shutter* object.
- The marking point on the value scale of the slats shows the position. Control is by the *Status feedback slat* object.

State	Display
Blind/roller shutter position	Position of the marking point
	Function symbols for 5 positions of the blind
Slat position	Position of the marking point
	Function symbols for 3 positions of the slats

Position of slats

You can adjust blind to various opening angles. However, the symbol for the slat position does not reflect the actual opening angle.

The slat position reached with a position value depends on the particular blind.
- For example, there are blinds with an opening angle of 180° which move up and down when the slats are positioned vertically. When the position value is 50%, the slats are horizontal.
- Other blinds, for example, have an opening angle of 90° and move up when the slats are positioned horizontally, and down when the slats are positioned vertically. These blinds turn to the horizontal position with the value 0% and to the half-opened position with the value 50%.

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Roller shutter
		Blind
	⌡	
	Which screen design do you use?	
[Blind]	Pause for change slat direction = 100 ms * factor (5-200)	

You select the *Rotary* or *Vertical design* and choose a screen name with up to 13 characters for the function.

Group objects

The blind is moved using the *Blind position* object and slat is adjusted using the *Slat position* object.

The roller shutter is moved using the *Roller shutter position* object

The *Stop/step object* stops the blind and the *Stop object* stops the roller shutter.

When the *rotary design* is used, movement is also initiated using the *movement object*.

The status indication is controlled using the status feedback objects.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Blind position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Roller shutter position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Slat position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Stop/step object	Screen x	1 bit	Sends	1.007 step
x	Stop object	Screen x	1 bit	Sends	1.007 step
x	Movement object	Screen x	1 bit	Sends	1.008 up/down
x	Status feedback blind	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Status feedback roller shutter	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Slat status feedback	Screen x	1 byte	Receives	5.001 percent (0-100 %)

Additional object in the rotary design

The *Movement object* moves the blind or roller shutter up or down. The *Stop/step object* stops the blind and the *Stop object* stops the roller shutter.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Movement object	Screen x	1 bit	Sends	1.008 up/down

4.6   Roller shutter with stop on release

With the function *Roller shutter with stop on release* it is possible to select a special operation with a stop function. Using this function, you move a roller shutter up or down with 2 buttons. When you release the button the movement is stopped. This function makes it particularly easy to stop a drive in good time.

The following illustration shows the control with stop when a button is released.

Marking ring
Button for roller shutter

Function symbol
Button for roller shutter

Roller shutter with stop on release
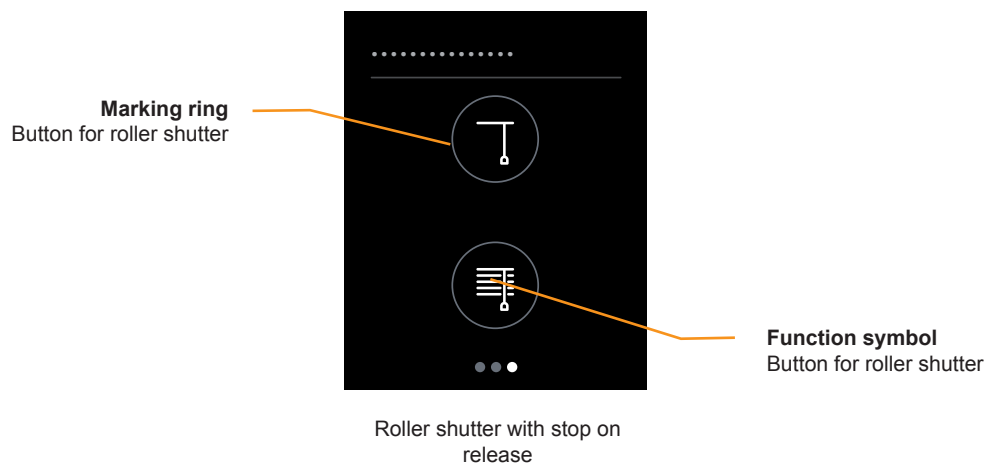
Move roller shutter
- Tapping and holding a button causes the roller shutter to move until you release the button or the end point is reached. For moving down, the *Movement object* sends the value "1" and it sends the value "0" for moving up. On release, the *Stop/step object* sends a stop command.

Status indication

The marking ring indicates whether the button has been touched. Object values are not evaluated.

State	Display
Touch button	Marking ring lights up white
Do not touch button	Marking ring lights up grey

Settings in ETS

You select the function *Roller shutter with stop on release*.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Roller shutter with stop on release

In addition, you select a screen name up to 13 characters long for the function.

Group objects

The blind is moved using the *Movement object* and is stopped using the *Stop object*.

Group objects

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Stop object	Screen x	1 bit	Sends	1.007 step
x	Movement object	Screen x	1 bit	Sends	1.008 up/down

4.7 External scenes

The *Scene (external)* function can be used for calling up and saving scenes.

Call up room functions

With one scene, you can change several room functions at the same time. Loading a scene allows you, for example, to dim the room lighting to a specific value, move the blinds into the desired position and switch on the power supply to the socket outlets in a room.

Save room functions

You can change the values for the individual room functions in a scene. To do this, use further button functions such as switching, dimming or move blind. You can use these button functions to change the values for the room functions consecutively. Then save the new values on the scene button.

Select between 2 designs on the user interface.
- Button with text
- Button with symbol

Functions and status indication

The following illustration shows the *Scenes* function for the *1 function* screen type in the *Button with text* and *Button with symbol* design.

Marking ring
Button 1 for scene

Scenes with text

Marking ring
Button 1 for scene

Symbol
Button 3 for scene

Scenes with symbol
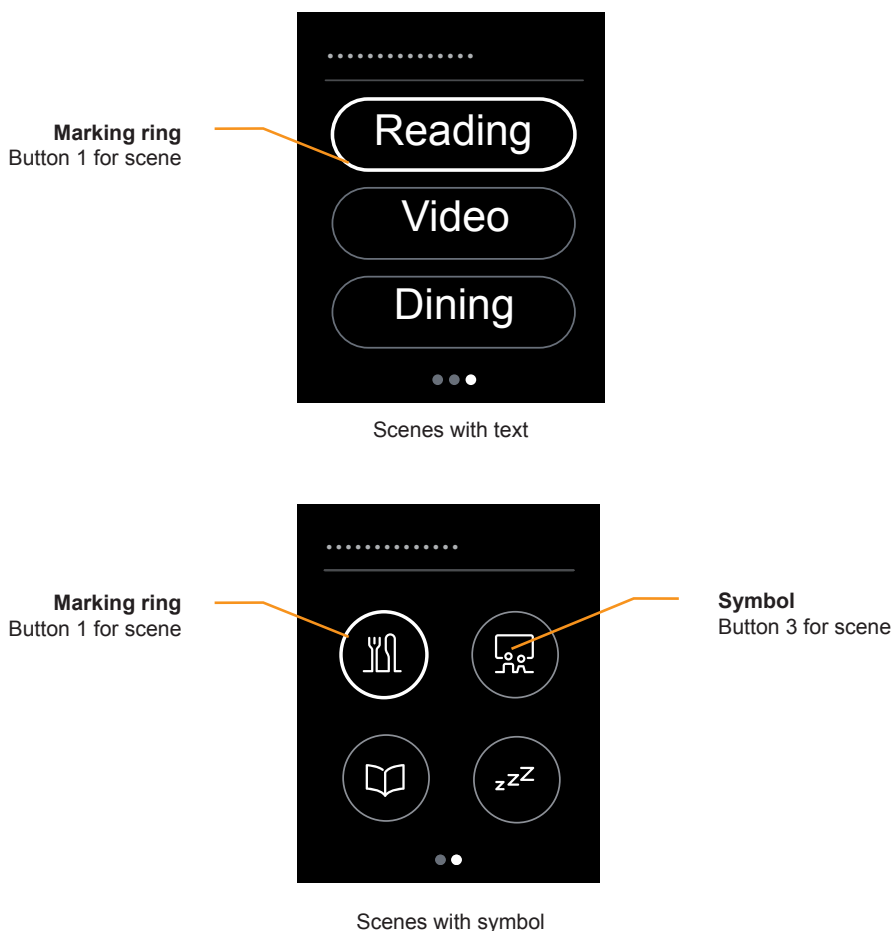
Call up scenes
- Tapping a button calls up a scene.

Save scenes
- Tapping and holding a button saves the current values for a scene.

Status indication
- To make operation easier, the marking ring on the button lights up when you tap it.

State	Display
Touch top button briefly (tap)	Marking ring is wide and lights up brightly
Other states	Marking ring is narrow and lights up less brightly

Settings in ETS

You select a screen name up to 13 characters long.

You can set a *scene address* for each button (0-63). You can use this value to call up a scene externally in actuators and in scene modules.

If you use the function for saving scenes, the values are automatically assigned for saving (128 -191).

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Scenes (external)
	Which design do you use?	**Button with text**
		Button with symbol
	Value of the scene address (0-63)	

Settings in button with text

Screen x	Scene x [1-3]
	Scene name 1 (1-8 characters)

For each of the 3 scenes, you select a scene name up to 8 characters long. If you do not enter a scene name, the button is not shown on the screen. The position of the other buttons is not changed by this.

Settings in button with symbol

Screen x	Position of buttons	
	Scene x [1-4]	
	Symbol of the scene	Screen with 1 function

- You select 1-4 buttons. The positions of the buttons correspond to those of the *1-4 buttons* screen type (Number and position of the buttons --> 53).
- Select a symbol for each button.
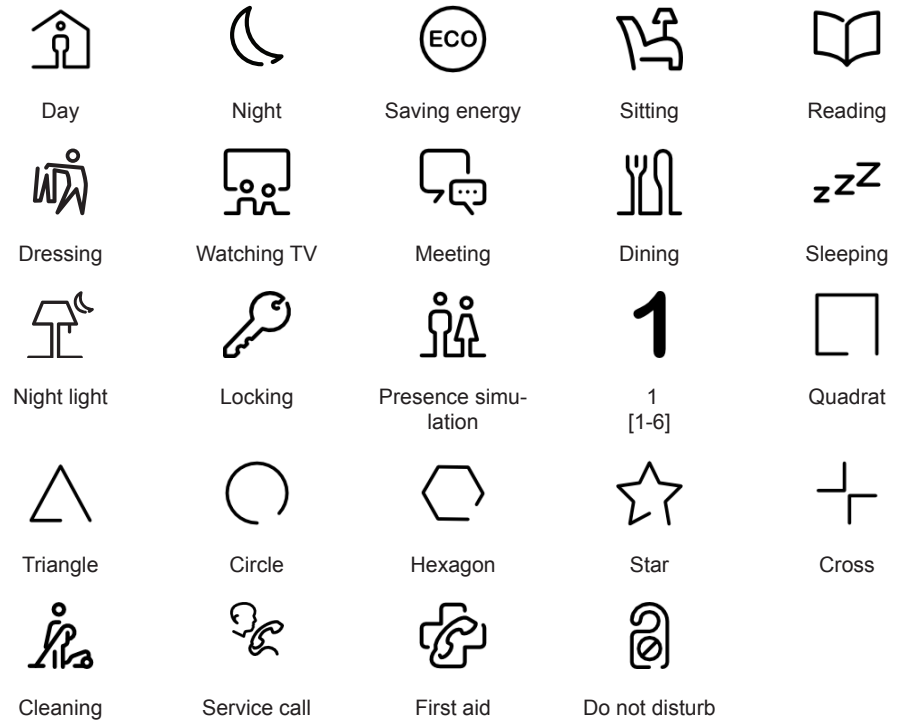
Day	Night	Saving energy	Sitting	Reading
Dressing	Watching TV	Meeting	Dining	Sleeping
Night light	Locking	Presence simu-lation	1 [1-6]	Quadrat
Triangle	Circle	Hexagon	Star	Cross
Cleaning	Service call	First aid	Do not disturb	

Group object

Group object

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Scene object	Screen x	1 byte	Sends	18.001 scene monitoring

4.8 Information display

The *Information display* function shows 1 or 2 measurement values on one screen page. The measurement values are received via group objects. The internal temperature is measured by the temperature sensor of the KNX Multitouch Pro. When the internal temperature is displayed, the measured temperature is evaluated directly. The selection of the temperature unit °C/°F appears under the tab *General Settings* in the tab *User Interface*. If the unit Fahrenheit is selected, the values are converted for the display on the user interface. The following overview shows the information displays which you can select and set in the ETS.

Symbol	Information display	Area	Unit	Objects
🌡	Internal temperature (sensor)	-5...55 °C 23...131 °F	°C/°F	
	External temperature (object)	-273...989 °C -169...1812 °F	°C/°F	Display Temperature DPT 9.001 temperature (°C)
🔌	Energy usage	-9.999.999... 9.999.999	kWh	Display energy consumption DPT 13.013 real energy (kWh)
💧	Relative humidity	0...100	%	Display humidity DPT 9.007 humidity (%)
CO_2	CO_2 content	0...670760	ppm	Display CO2 content DPT 9.008 parts/million (ppm)
🚰	Water consumption	0...9.999.999	m^3	Display water consumption DPT 12.001 counter pulses

The symbols are assigned automatically. No symbols are displayed if you show 2 values. However, you can display an information text for each value.

The following illustration shows the *Energy consumption kWh* information display for the *1 function* screen type.

Function symbol

Information
Line 1 and 2

Energy
Consumption

225 kWh

Display
Current measured value

Unit

Energy usage
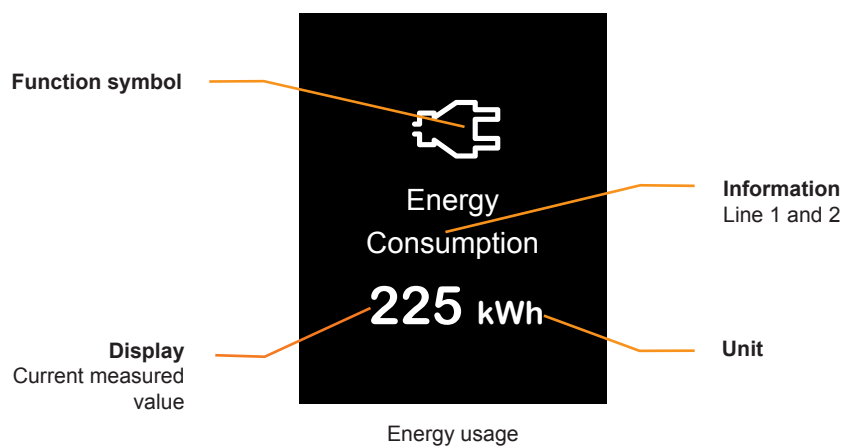
Display
• The measured value is received via the *Display Energy consumption kWh* object and is displayed together with the unit.

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function	Information display
	Number of information (1-2)	
	Information (1-12 characters)	
	Which value is displayed?	

Screen name and information

You select a name up to 13 characters long for the information display. You can also write 2 texts matching the selected values. If you display 2 values, there is one text for each value.

Group objects

You can choose the following group objects.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Display Temperature	Screen x	2 byte	Receives	9.001 temperature (°C)
x	Display Energy consumption kWh	Screen x	4 byte	Receives	13.013 real energy (kWh)
x	Display Humidity %	Screen x	2 byte	Receives	9.007 humidity (%)
x	Display Water consumption m3	Screen x	4 byte	Receives	12.001 counter pulses
x	Display CO_2 content	Screen x	2 byte	Receives	9.008 parts/million (ppm)

5   Screens with 2 functions

5.1   Overview

In the screen settings, you can activate up to 9 screens. These will then be located under the *Express settings* tab.

Screen 1-8

You can select the *2 functions* screen type for each of the screens 1 to 8. Select a screen name, as is the case for all screens.

Functions for one half of the screen

For this screen type, there are *Express settings*, which you can select and adjust directly in the tab of the respective screen. Select two of the following functions in any combination for each screen.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	2 functions
	↰	
	Left-hand side	
	Function	**Switching**
		Dimming
		Roller shutter/blind position
		Roller shutter with stop on release
		Slat position
		Change temperature setpoint
	Right-hand side	
	Function	**Switching** [selection as on right-hand side]

Design

The functions are displayed in *Vertical design*. For a screen page, select 1 function for the right-hand side and 1 function for the left-hand side.
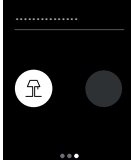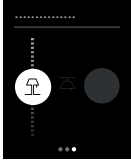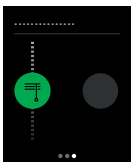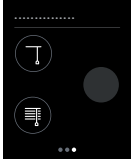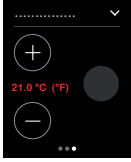
The *Switching* function corresponds to *Switching* for the *1 Function* screen type.

The functions *Dimming*, *Roller shutter/blind position*, *Roller shutter with stop upon release* and *Slat position* correspond to the functions in *Vertical design* for the *1 Function* screen type.

The *Change temperature setpoint* function can be used to set the setpoint temperature of internal or external room temperature control units.

Overview of functions for one half of the screen

Screen type *2 functions*

Design *		Function	Objects
	Switching	**Switching**	
		– Toggle On/Off	– Switch object 1 bit
		– Switching On	– Switch object 1 bit
		– Switching Off	– Switch object 1 bit
		– Bell push function	– Switch object 1 bit
		Display	
		– Toggle On/Off: Show On/Off	– Status feedback object 1 bit
		– Other functions: Display button touch	
	Dimming	**Dimming**	
		Cyclically brighter/darker with values 0-100 %	Value object 1 byte
		Transmit value directly	
		Set maximum % value	
		Display brightness	Status feedback object value 1 byte
		Show On/Off	
		– Use value object only = No	– Status feedback object 1 bit
		– Use value object only = Yes	– Status feedback object value 1 byte
	Blind/roller shutter position	**Blind or roller shutter**	
		Move with position values 0-100%	Blind position 1 byte
		Stop	Stop/step object 1 bit
		Display position	Blind status feedback 1 byte
	Slat position	**Slats**	
		Cyclically with position values 0-100%	Slat position 1 byte
		Transmit position value directly	
		Display slat position	Slats status feedback 1 byte
	Roller shutter with stop on release	**Roller shutter**	
		Move down	Movement object
		Move up	Movement object
		Stop when button is released	Stop object 1 bit
	Change tempera-ture setpoint	**Setpoint Temperature**	
		Increase incrementally (+ 0.5°C)	Setpoint 2 byte
		Reduce incrementally (- 0.5°C)	Setpoint 2 byte
		Display	
		Setpoint temperature for room temperature control unit	Setpoint status 2 byte

* Function displayed on the left-hand side, each function can also be set on the right-hand side.

5.2 Switching

The *Switching* function can be used to toggle, switch on or switch off, or to use the bell push function.

The following illustration shows the switching function for the *2 Functions* screen type on the left-hand side of the screen.

Function symbol

Button

Switching

Function of the button

You can select one of the following functions in the ETS.

• Tapping can be used to switch on and off in alternation (*Toggle On/Off*).
• Tap only to switch on (*Switch On*).
• Tap only to switch off (*Switch Off*).
• Tap and hold to switch on and release to switch off (*Bell push function*).

Status indication

With the *Toggling On/Off* function, triggering is performed using the *Status feedback object*.

State	Display
On	Button lights up white
Off	Button lights up grey

With the *Switch On* and *Switch Off* functions, the colour of the button changes briefly when it is tapped.

In the *Bell push function*, the button displays when touched.

State	Display
Touch the button	Button lights up white
Do not touch the button	Button lights up grey

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 2 functions
	Function [right button/left button]	Switching
	Type of switching command function	
	Which function symbol do you use?	

Screen name

You can select a name up to 13 characters in length for the switching command function.

Type of switching command function

You can select *Toggle On/Off, Switch On, Switch Off* or *Bell push function*.

Function symbol

Table/standard lamp	Ceiling lamp	Spot	Bulb	Bulb with radiance

Start	Brightness

Group objects

The switching command function is carried out via the *switch object*. When the *Toggling On/Off* function is in use, the status indication is controlled via the *Status feedback object*.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object	Screen x *	1 bit	Sends, receives	1.001 switching
x	Status feedback object	Screen x *	1 bit	Receives	1.001 switching

* left or right

Information for single-button software operation

Single-button switching also works with central functions that have several group addresses on the page of the switching actuator. It is not necessary to adapt the switch object of the KNX Multitouch Pro. The switching command function is synchronised via the Status feedback object. If the Status feedback object receives a new value and then the service button is touched, the switch object transmits the appropriate value. For example, if the Status feedback object last received the value "1" then the switch object transmits the value "0".

5.3 Dimming

Using the *Dimming* function, you can increase and reduce the dimming with values and switch the lighting on and off.

The following illustration shows the *Dimming* function for the *2 functions* screen type on the left-hand side of the screen.
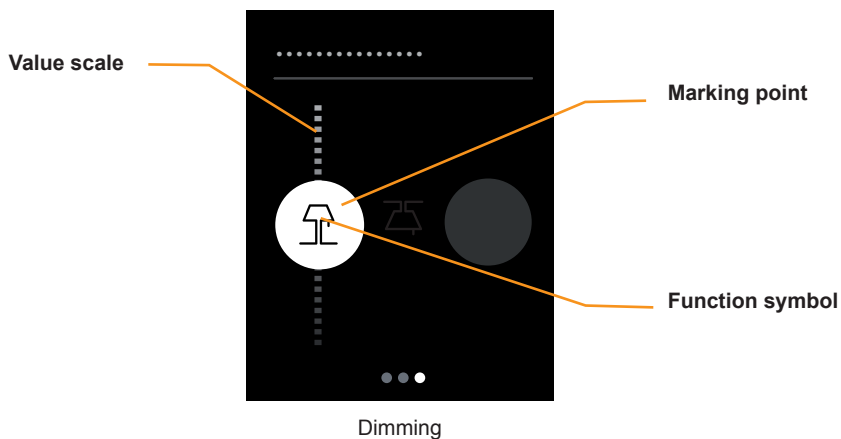
Dimming

Dimming
- Swiping the value scale transmits dimming values from 0-100%. You can restrict the dimming range by changing the maximum dimming value.
- Tapping the value scale transmits a single value.

Status indication
- The marking point shows the current switching state. The function is triggered using the *Status feedback object* and the *Status feedback object value*.
- The position of the marking point on the value scale shows the current brightness value. The function is triggered using the *Status feedback object value.*

State	Display
Lighting on	Marking point lights up white
Lighting off	Marking point lights up grey
Brightness	Position of the marking point

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 2 functions
	Function [right button/left button]	Dimming
	Use value object only	
	Cycle time when dimming = 100 ms * factor (2-10)	
	Maximum dimming value (50-100%)	
	Which function symbol do you select?	

Screen name
You can select a name up to 13 characters in length for the dimming function.

Cycle time when dimming

If you swipe the value scale during ongoing operation, then telegrams are transmitted cyclically. You can set at what interval the telegrams are transmitted.

Function symbol

| Table/standard lamp | Ceiling lamp | Spot | Bulb | Bulb with radiance |

| Start | Brightness |

Maximum dimming value

You can set the maximum dimming value for dimming in order to adapt the dimming behaviour to the dimming actuator. For the user interface, set the same maximum dimming value as in the dimming actuator.

Use value object only

The status indication for whether the lighting is switched on or off is controlled using the Status feedback object value.

Group objects

Dimming is performed using the value object. The status indication is controlled using the *Status feedback object* and the *Status feedback object value*.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Value object	Screen x *	1 byte	Sends, receives	5.001 percent (0-100%)
x	Status feedback object	Screen x *	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x *	1 byte	Receives	5.001 percent (0-100%)

* left or right

5.4   Blind/roller shutter position

You can use the *Blind/roller shutter position* function to move blinds or a roller shutter up or down using values.

The following illustration shows the *Blind/Roller shutter position* for the *2 Functions* screen type on the left-hand side of the screen.

Value scale
Blind/roller shutter

Function symbol
Blind/roller shutter

Marking point
Blind/roller shutter
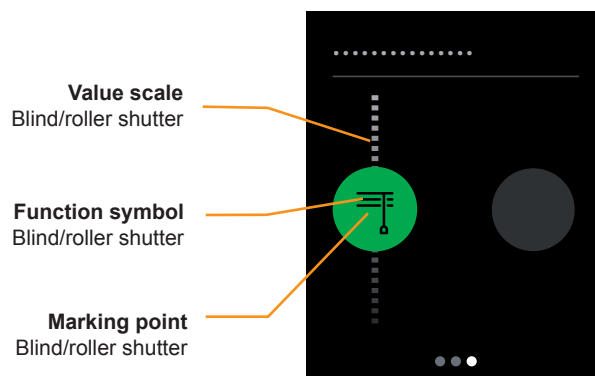
Moving blinds/roller shutters

Moving blinds or roller shutters
- Swiping the value scale transmits values from 0-100%.
- Tapping the value scale stops movement.

Status indication
- The marking point on the value scale shows the position. The function is triggered using the *Status feedback blind* object.

State	Display
Blind/roller shutter position	Position of the marking point
	Function symbols for 5 positions of the blind

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 2 functions
	Function [right button/left button]	Blind/roller shutter position

You can select a screen name up to 13 characters in length for the function.

Group objects

Movement is initiated using the *Position of blind* object.

Movement can be stopped immediately using the *Stop object*.

The status indication is controlled using the *Status feedback blind* object.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Blind position	Screen x *	1 byte	Sends	5.001 percent (0-100 %)
x	Stop object	Screen x *	1 bit	Sends	1.007 step
x	Status feedback blind	Screen x *	1 byte	Receives	5.001 percent (0-100 %)

* left or right

5.5 Slat position

The slats of a blind can be adjusted using the *Slat position* function.

The following illustration shows the *Slats position* function for the *2 Functions* screen type on the left-hand side of the screen.

Value scale
Blind/roller shutter

Function symbol
Blind/roller shutter

Marking point
Blind/roller shutter
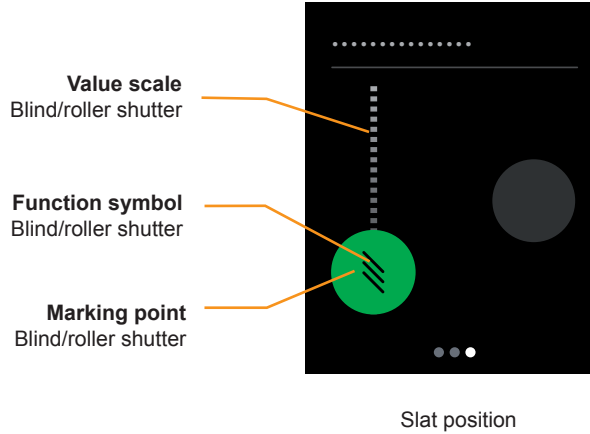
Slat position

Slat position

Swiping the value scale for the slats transmits values from 0-100%.
• Tapping the value scale transmits a value.

State	Display
Slat position	Position of the marking point
	Function symbols for 3 positions of the slats

You can adjust the blind to various opening angles. However, the symbol for the slat position does not reflect the actual opening angle.

How each positional value translates to the actual slat position depends on the blind in question.
• For example, there are blinds with an opening angle of 180° that move up and down when the slats are positioned vertically. When the positional value is 50%, the slats are horizontal.
• Other blinds, for example, have an opening angle of 90° and move up when the slats are positioned horizontally, and down when the slats are positioned vertically. These blinds turn to the horizontal position at a value of 0%, and to the half-open position at a value of 50%.

Status indication
• The marking point on the value scale for the slats shows the position. The function is triggered using the *Slat status feedback* object.

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 2 functions
	Function [right button/left button]	Slat position

You can select a screen name up to 13 characters in length for the function.

Group objects

The slat is repositioned using the *Slat position* object.

The status indication is controlled using the Blind status feedback object.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Slat position	Screen x *	1 byte	Sends	5.001 percent (0-100 %)
x	Status feedback slat	Screen x *	1 byte	Receives	5.001 percent (0-100 %)

* left or right

5.6   Roller shutter with stop on release

You can use the *Roller shutter with stop on release* function to select a special operation with a stop function. Using this function, you can move a roller shutter up or down with 2 buttons. When you release the button, the movement stops. This function makes it particularly easy to stop a drive in good time.

The following illustration shows the *Roller shutter with stop on release* function for the *2 functions* screen type on the left-hand side of the screen.

Marking ring
Button for roller shutter

Function symbol
Button for roller shutter

Roller shutter with stop on release
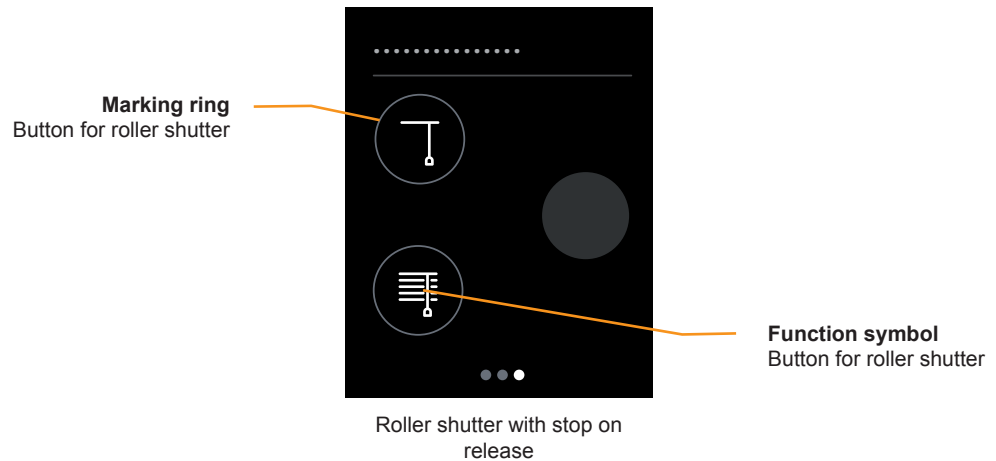
Moving the roller shutter
Tapping and holding a button causes the roller shutter to move until you release the button or the end point is reached. The *Movement object* transmits the value "1" for moving down and "0" for moving up. On release, the *Stop object* transmits a stop command.

Status indication
The marking ring indicates whether the button has been touched. Object values are not evaluated.

State	Display
Touch the button	Marking ring lights up white
Do not touch the button	Marking ring lights up grey

Settings in ETS

You can select the *Roller shutter with stop on release* function.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 1 function
	Function [right button/left button]	Roller shutter with stop on release

In addition, you can select a screen name up to 13 characters long for the function.

Group objects

The blind is moved using the *Movement object* and is stopped using the *Stop object* object.

Group objects

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Stop object	Screen x *	1 bit	Sends	1.007 step
x	Movement object	Screen x *	1 bit	Sends	1.008 Up/Down

* left or right

5.7   Setpoint temperature change

You can use the *Setpoint temperature change* function to change the current setpoint of a room temperature control unit. The *Setpoint* object is used to transmit 2-byte temperature values that can be received by internal or external room temperature control units.

The following illustration shows the *Setpoint temperature change* function for the *2 Functions* screen type on the left-hand side of the screen.

Button
Increase setpoint

Display
Target temperature

21.0 °C (°F)

Button
Decrease setpoint
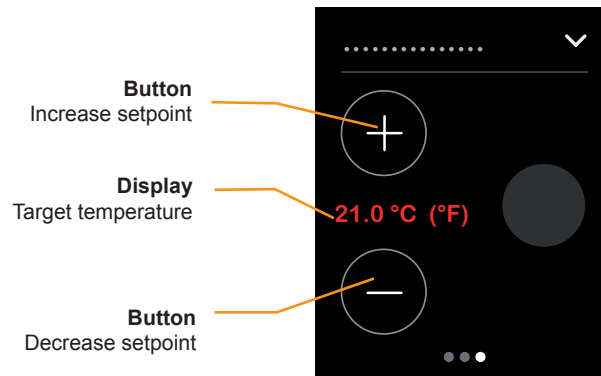
Setpoint temperature change

Change setpoint

Tapping on a button increases or decreases the setpoint in increments of 0.5°C. The setpoint can only be changed up to the limits that apply to the room temperature control unit in question.

Status indication

The status indication shows the current setpoint that is being transmitted by the room temperature control unit. Values in Fahrenheit are displayed in whole numbers without decimals.

Settings in ETS

You can set the following parameters.

Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Screen with 2 functions
	Function [right button/left button]	Setpoint temperature change
	Starting value	°C

Screen name

You can select a screen name up to 13 characters in length for the function.

Starting value

You can use the start value to define which temperature value will be raised or lowered if the *Setpoint status* object has not yet received any other value.

Group objects

The setpoint temperature is transmitted via the *Setpoint* object and the status indication via the *Setpoint status* object.

Group objects

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Setpoint	Screen x *	1 bit	Sends	9.001 temperature (°C)
x	Setpoint status	Screen x *	1 bit	Receives	9.001 temperature (°C)

* left or right

Information on status indication

Use different group addresses for the Setpoint and Setpoint status objects. To display the actual setpoint temperature, connect the *Setpoint status* object to the output object of the controlled room temperature controller. When using internal room temperature control units, this object is the *Setpoint output*.

6 Screens with 1-4 functions (extended)

6.1 Overview

In the screen settings, you can activate up to 9 screens which are then located under the *Express settings* tab.

Screen type

For each of the screens 1 to 8, you can select the *1-4 functions (extended)* screen type. For this screen type, you additionally define the number and position of the buttons. A separate tab then appears under the *Extended settings* tab for each button.

The screens with 1-4 functions offer functions in the *Button design* which you can set individually depending on the button. Select a function symbol for each button.

Number and position of the buttons

Express settings

Under the Express settings tab, set the screens 1-8, select the *1-4 functions (extended)* screen type, define the number and position of the buttons and select a screen name.

Express settings		
Screen x		
	Screen name (1-13 characters)	
	Which screen type do you use?	1-4 functions (extended)
	⤺	
	Position of buttons	

1 button centred

2 buttons horizontal

2 buttons vertical

3 buttons
2 upper horizontal
1 bottom centred

3 buttons
1 upper centred
2 bottom horizontal

3 buttons
2 left vertical
1 right centred

3 buttons
1 left centred
2 right vertical
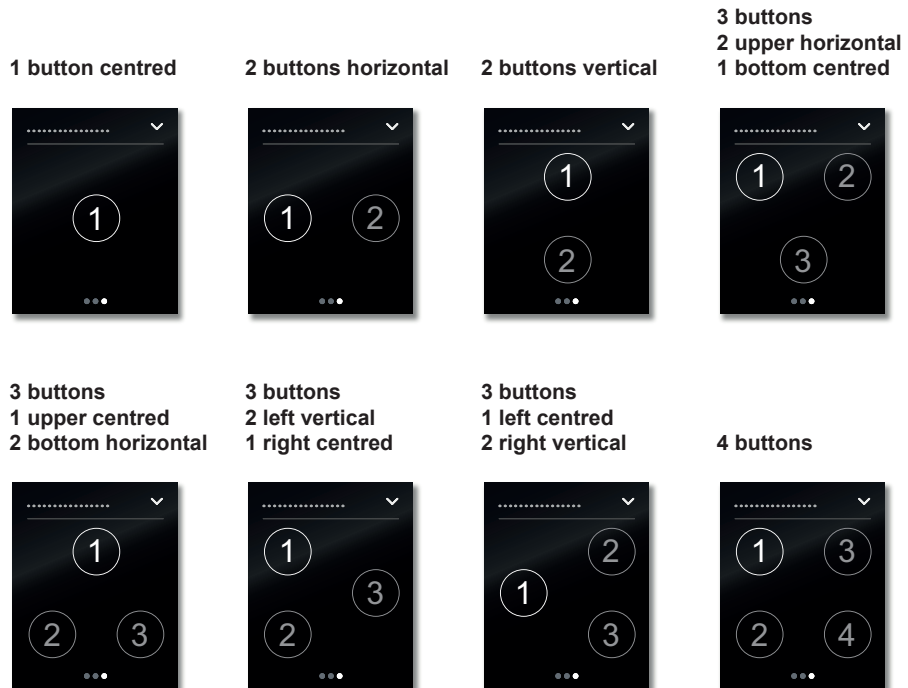
4 buttons

Push-button functions

Extended settings

For each of the up to 4 buttons, select a function under the *Extended settings* tab and then set this.

Extended settings	
Screen x, button x	Function
	↻
	...
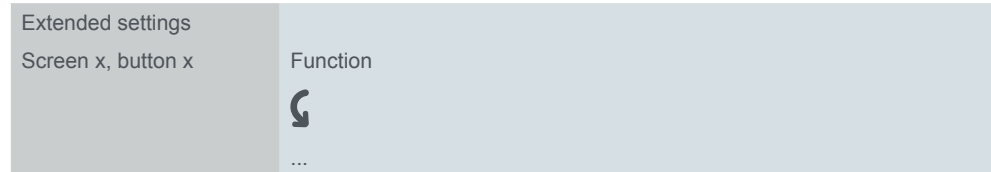
Functions

The *Toggle*, *Switching*, *Dimming* and *Blind* functions have additional settings for the corresponding button function. Dimmable lights are switched and dimmed using 2 brightness values, for example. Blinds are controlled with *positioning values*, for example.

The *Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values* function can be used everywhere. It includes the functions *Switching*, *Priority control*, *Dimming* and *Send values*. You can select 2 functions for each. You can also set the actions for short and long operation of the button. Cyclical and delayed sending is also possible. Examples of individual solutions can be found in section Application examples for edge function --> 75.

The *Edges with 2 byte values* function sends values of the floating point or integer type. For example, brightness values are sent to control the lighting.

The *8 bit slider* function sends a range of values with a button. The values are increased or decreased in steps. For example, multiple scenes are called up in succession with 1 button.

The *Scene* function offers additional settings for simultaneous control of multiple room functions. For example, with 1 button a scene is called up immediately and a second scene is called up after a delay.

Overview of button functions
- Toggle
  – 2 objects
  – 1 bit, 1 byte
- Switching
  – 2 objects
  – 1 bit, 1 byte
- Dimming
  – Step dimming
- Blind
  – Control with positioning values
  – Single-button operation
- Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
  – 2 objects
  – Functions for short and long button actions
  – Cyclical sending and staircase lighting function
  – Priority control (2 bit)
  – Dimming (4 bit)
  – Dimming with values (1 byte)
  – Values (1 byte)
- Edges with 2 byte values
  – Floating point value

- Integer with sign
- Integer without sign
- 8 bit slider
  - With limit values
  - Send cyclically
  - Increase or reduce stepwise
- Scene
  - Calling up and saving
  - Call up 2 scenes
  - Cyclical sending and staircase lighting function

Function symbols

Select a function symbol for each button. *Symbols with background* and *Symbols with indication ring* are available. The background colour of the symbols with background changes from white to grey. The indication ring of the symbols with indication ring changes from large and bright to small and less bright.

You can set the behaviour of the symbols for each button ("Status indication" on page 57).

Indication ring
Button touched

Indication ring
Button not touched

Buttons with symbol with indication ring

Background
Lamp on

Background
Lamp off
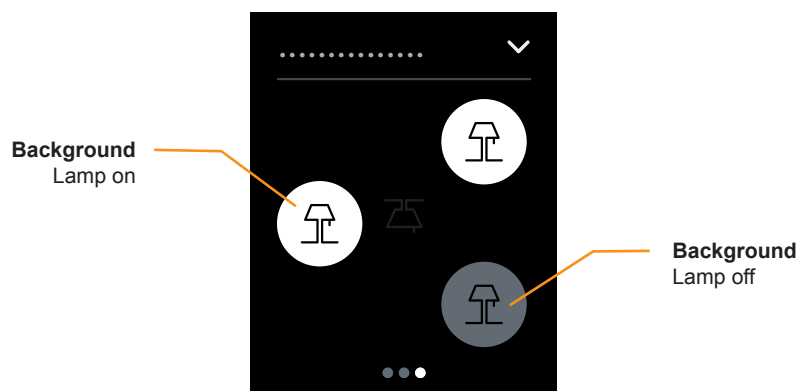
Buttons with symbol with background

You can select the following function symbols.

Day	Night	Saving energy	Sitting	Reading
Watching TV	Meeting	Dining	Sleeping	Presence simulation
Night light	Locking	Table/standard lamp	Ceiling lamp	Spot
Bulb	Bulb with radiance	Blind at top	Blind 25 %	Blind in middle
Blind 75 %	Blind at bottom	Number 1 [1-6]	Square	Triangle
Circle	Hexagon	Star	Cross	Plus
Minus	On	Off	Start	Up
down	Cleaning	Service call	First Aid	Do not disturb

For all functions, select the symbols under the *Extended settings* tab.

Extended settings		
Button x screen x	Function	
	Which symbol type do you use?	**Symbol with background**
		Symbol with indication ring
	Which function symbol do you use?	

Status indication

The status indication is set individually for each button function. The status indication is controlled either by a group object or by touching the button.

For all functions, select the status indication under the *Extended settings* tab.

Extended settings	
Screen x function x	Function
	How is the status indication triggered?

Activation by objects

If the status indication is activated by objects, the system evaluates whether the object value is equal to or greater than "0". The status indication can be activated by the following objects:

- [Switch/value object]
  - 1 bit or 1 byte
  - For edge function, also 2 bit, 4 bit or 2 byte
  - Switch/value object A
  - Switch/value object B
- [Status feedback object]
  - Status feedback object 1 bit
  - Status feedback object value 1 byte
- Collected status feedback object 4 byte
  - For this object, you set the channel of the actuator that sends the status feedback (channel 1–16). You can connect a shared collected status feedback object for all buttons and set the corresponding actuator channel for each button function.

Parameter value	Object value	Status indication*
[Switch/value object] = On/Off	> 0	Button lights up white
	= 0	Button lights up grey
[Status feedback object] = On/Off	> 0	Button lights up white
	= 0	Button lights up grey
[Switch/value object] not equal to 0 = Flashes	> 0	Button flashes
	= 0	Button lights up grey
[Switch/value object] equal to 0 = Flashes	> 0	Button lights up grey
	= 0	Button flashes
[Status feedback object] not equal to 0 = Flashes	> 0	Button flashes
	= 0	Button lights up grey
[Status feedback object] equal to 0 = Flashes	> 0	Button lights up grey
	= 0	Button flashes
Collected status feedback object = On/Off	> 0	Button lights up white
	= 0	Button lights up grey

* The indication ring of the symbols with indication ring is large and bright or small and less bright.

Activation by button operation

If the status indication is controlled by pressing a button, the status changes when the button is touched and released.

Parameter value	Operation	Status indication
On when button pressed	Operation	Button lights up white
	Release	Button lights up grey
Flashes when button pressed	Operation	Button flashes
	Release	Button lights up grey

* The indication ring of the symbols with indication ring is large and bright or small and less bright.

Permanent activation

The status indication can also be switched on or flash permanently.

Parameter value	Object value and operation	Status indication
Always On	Not evaluated	Button lights up white
Always Off	Not evaluated	Button lights up grey
Flashes	Not evaluated	Button flashes

* The indication ring of the symbols with indication ring is large and bright or small and less bright.

6.2 Toggling

With the *Toggle* function, you switch on and off alternately with 1 button. This involves single-button operation.

You can change and extend the *Toggle* with the following functions.
- Send simultaneously with 2 objects
- Switch on and off and send values
- Trigger status indication

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
↰		
Extended settings		
Screen x function x	Function	Toggle
↰		
	Number of objects	
	Type of object A/B	
	How is the status indication triggered?	

1 bit, 1 byte button functions

Number of objects — You can select 2 objects. You can specify the object type of each object.

Send On and Off — With the 1 bit object type, you can switch on and off alternately with each button action. The current object value is inverted and then sent to the bus. The values "1" and "0" are sent alternately.

Send values — With the 1 byte object type, you can send 2 values alternately with each button action. You can select the values to be absolute (0 – 255) or a percentage.

Status indication

In the default setting, the status indication is triggered by the switch/value object.

Object value	Display
On (> 0)	Button lights up white
Off (= 0)	Button lights up grey

You can find comprehensive settings in Chapter

Application example with on/off and brightness values

In a corridor, a lighting strip is to remain switched on at a low brightness after the lights are switched off, to aid orientation. 2 objects are set for this function.

	Main lighting	Orientation lighting
	Switch object A	Value object B
Switching On	On	Value 1 = 80 %
Switching Off	Off	Value 2 = 20 %

Group objects

You can select the following group objects.

Group objects for "Toggle" function

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object A/B	Screen x function x	1 bit	Sends, receives	1.001 switching
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.005 decimal factor (0-255)
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

Information for single-button operation

In the case of a two-way or central circuit, the switching channel is also switched via another sensor. With single-button operation, it is possible to adjust to the current state of the switching channel. To do this, the state of the actuator has to be loaded to the push-button. For switch objects (1 bit), this involves the values "1" and "0".

- To do this, also connect the group address of the status feedback object for the connected channel to the switch object (1 bit) for the button function.

Loading is also possible for values. Adjust the same values for all push-buttons, e.g. 70 % for value 1 and 0 % for value 2. This way, you can switch on a dimmer at a selected brightness from multiple locations, and switch it off again. If the last sent or received value is the same as value 1, value 2 is sent the next time that the button is pressed, otherwise value 1 is sent.

- For a two-way circuit, check that the 1 byte objects for the 2 push-buttons are linked to the same group address.
- In the case of a central push-button, also connect the central group address of the 1 byte object to the 1 byte objects of the other push-buttons.

6.3　Switching

With the *Switching* function, you switch only either on or off with 1 button. This is a two-button operation.

You can change and extend the *Switching* with the following functions.
- Send simultaneously with 2 objects
- Switch on and send a value
- Switch off and send a value
- Send 2 values
- Trigger status indication

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Switching
	Number of objects	
	Type of object A/B	
	How is the status indication triggered?	

1 bit, 1 byte button functions

Number of objects | You can select 2 objects. You can specify the object type of each object.

Send On and Off | The 1 bit object type is used for normal switching.

Send values | You can use the 1 byte object type to send a value. You can select the value to be absolute (0 – 255) or a percentage.

Status indication

In the default setting, the status indication is triggered by the switch/value object.

Object value	Display
On (> 0)	Button lights up white
Off (= 0)	Button lights up grey

You can find comprehensive settings in Chapter

Group objects

You can select the following group objects.

Group objects for "Switching" function

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object A/B	Screen x function x	1 bit	Sends, receives	1.001 switching
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

6.4   Dimming

With *Dimming*, you can switch and dim the dimmable lighting with 1 or 2 buttons.

Two-button dimming is the default setting. A short button action switches on or off. A long button action dims brighter or darker. Releasing after pushing and holding the button ends the dimming process.

You can change and extend the dimming function with the following functions.
- Dim alternately brighter or darker with each button (single-button operation)
- Only dim brighter or only darker with each button (two-button operation)
- Operating time for long button action
- Dim in steps with multiple dimming commands
- Trigger status indication

Single-button dimming

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Dimming
	Long operation = 100 ms * factor (6-250)	
	Dimming direction	
	Step dimming (brighter)	
	Step dimming (darker)	
	Send dimming command cyclically	
	How is the status indication triggered?	

In the default setting, a single command is sufficient to run through the dimming range. Hold the button down until the required level of brightness has been reached. When you release the button, the *dimming object* sends a stop telegram and ends the dimming process.

Step dimming If desired, you can divide the dimming process into dimming steps (1/2 – 1/64 brighter or darker). If you select 1/4 brighter, you can dim a maximum of 25 % brighter with each button action. The dimming process also ends in this case when you release the button.

Send cyclically You can send dimming commands cyclically. The dimming process ends when you release the button.

Two-button dimming

The settings for single-button and two-button operation are largely similar. For dimming with dimming steps, you can use the parameter *Send stop telegram after release*. In the default setting, as with single-button operation, a stop telegram ends the dimming process when the button is released. If, however, no stop telegram is sent, the dimming process continues even after the button is released. A long button action is then enough to dim a step brighter or darker. If you select the dimming step *1/4 brighter*, you can dim from minimum to maximum brightness with 4 long button actions.

Send stop telegram

Status indication

In the default setting, the status indication is triggered by the switch object.

Object value	Display
On	Button lights up white
Off	Button lights up grey

You can find comprehensive settings in Chapter

Group objects

You can select the following group objects.

Group objects for "Toggle" function

No.	Name	Object func-tion	Length	Properties	DPT ETS4/5
x	Switch object	Screen x func-tion x	1 bit	Sends, receives	1.001 switching
x	Dimming object	Screen x func-tion x	4 bit	Sends, receives	3.007 dimmer step
x	Status feedback object	Screen x func-tion x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x func-tion x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

i

Information for single-button operation

In the case of a two-way or central circuit, the dimmer is also switched and dimmed via another sensor. With single-button operation, it is possible to adjust to the current state of the dimming channel. To do this, the state of the dimming channel has to be loaded to the push-button.

- To load the switching command function, connect the group address of the 1 bit status feedback object for the connected channel to the switch object for the button function.
- For a two-way circuit, check that the dimming objects for the 2 push-buttons are linked to the same group address.
- In the case of a central circuit, also connect the central group address of the dimming object for the central push-button to the dimming objects of the other push-buttons.

6.5 Blind

With the *Blind* function, you can raise and lower a blind and adjust the slats.

In the default setting, you raise a blind and adjust the slats. To lower the blind, you need a second button function. You can choose from the following operation concepts.

- Raise and lower the blind alternately and adjust the slats with each button (single-button blind operation).
- Only raise or only lower the blind and adjust the slats with each button (two-button blind operation).
- Move the blind to a previously specified position and adjust the slats.
- Move the blind back and forth between 2 previously specified positions and adjust the blinds.

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Blind

Two-button operation of blind

You can now move the blind either up or down by pressing and holding the corresponding button. A short button action stops the travel. A short button action also adjusts the slats in steps. You can set the operating time for the long button action.

Extended settings		
Screen x function x	Function	Blind
	Movement direction of blind	Moving blind up
	Long operation = 100 ms * factor (6-250)	

The blind is moved up or down via the *Movement object*, while the stopping and adjusting of the slats is controlled via the *Stop/step object*. You need 2 button functions, each of which you connect to the same group addresses.

Single-button operation of blind

A long button action alternately raises or lowers the blind. The current movement direction of the blind is always dependent on the previous action. You can set the operating time for the long button action.

Pause on change in direction

You can adjust the slats in the same direction in multiple steps. To do so, briefly press the button repeatedly until the desired position is reached. The slats adjust in the same direction provided that the next button action follows within an adjustable pause time. Once this *pause* elapses, the slat direction of rotation changes.

Extended settings		
Screen x function x	Function	Blind
	⌇	
	Movement direction of blind	Moving blind up/down
	Long operation = 100 ms * factor (6-250)	
	Pause for change slat direction = 100 ms * factor (5-50)	

The blind is moved alternately up and down via the *Movement object*, while the stopping and adjusting of the slats is controlled via the *Stop/step object*.

Moving blind with positioning values

If the blind actuator supports activation of positions, you can use this function to set 1 or 2 positions. You can select the positioning values to be absolute (0 – 255) or a percentage.

Blind position and slat position

If positioning is activated, when you press the button, the set values for the blind position and slat position are sent.

Number of positionings

If you have set 1 position, the values for the blind and slats are sent when you press the button briefly. If you have set 2 positions, you specify a total of 4 values. You send the values for position 1 after a brief button action and the values for position 2 after a long button action.

Extended settings		
Screen x function x	Function	Blind
	⌇	
	Direction of movement of the blind	Moving blind with positioning values
	Number of positionings	
	Scaling (short operation)	
	Position 1 of blind	
	Position 1 of slats	

You send the values for the positions via the 1 byte objects *Position of blind* and *Position of slat*. The movement object and stop/step object are not available if you move the blinds with positioning values.

Status indication

In the default setting, the status indication is triggered by pressing the button.

State	Display
Operation	Button lights up white
No operation	Button lights up grey

If the blind actuator returns feedback for the current position of the blind, it is possible to display whether the blind is completely open. The status feedback can be evaluated via the *status feedback value* for the button function.

You can display whether blind movement is locked. Blind actuators can raise the blinds in the event of strong winds and lock them against being lowered again. This safety function is generally triggered via an On telegram.
① Select the value *Status feedback object equal to 0 = Flashes*.
② Connect the group address of the safety function to the status feedback object of the push-button.

You can find comprehensive settings in Chapter

Group objects

You can select the following group objects:

Group objects for "Blind" function

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Stop/step object	Screen x function x	1 bit	Sends, receives	1.007 step
x	Movement object	Screen x function x	1 bit	Sends, receives	1.008 up/down
x	Blind position	Screen x function x	1 byte	Sends	5.001 percent (0-100 %)
x	Slat position	Screen x function x	1 byte	Sends	5.001 percent (0-100 %)
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching

Buttons and button functions

Information for single-button operation

In the case of a two-way or central circuit, the blind is also controlled via another sensor. With single-button operation, it is possible to adjust the change of direction. To do this, the state of the other *Movement* and *Stop/step objects* has to be loaded.

- For a two-way circuit, check that the movement objects for the 2 push-buttons are linked to the same group address. The same applies to the stop/step objects.
- In the case of a central circuit, also connect the central group addresses of the movement object for the central push-button to the movement objects of the other push-buttons. The same applies to the stop/step objects.

6.6   Edges 1 bit, 2 bit (priority), 4 bit, 1 byte

The *edge function* for 1 bit, 2 bit, 4 bit and 1 byte has a wide range of adjustment options for a variety of individual applications. In the default setting, you switch on 1 consumer when you operate the button and switch it off when you release the button.

You can choose between the normal and extended edge functions and set the following functions.

- Send with 2 objects
- Type per object: 1 bit, 2 bit (priority control commands), 4 bit (dimming commands), 1 byte (0–100 %) or (0–255)
- Values per object
- Action on operation and on release
- Additionally, actions for long and short operation (extended edge function)
- Additionally, send cyclically and with delay (extended edge function)
- Trigger status indication

A list of applications with the edge function is provided in Chapter .

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
	Select edge function	Normal (operate, release)
		Extended (+ long and short operation)
	Long operation = 100 ms * factor (6-250)	[Extended edge function]
	Number of objects	
	How is the status indication triggered?	

Normal edge function

With the normal edge function, you can specify which actions should be carried out when a button is pressed, and which should be carried out when a button is released.

You can set 2 objects independently of each other.

- 1 bit
- 2 bit (priority control commands)
- 4 bit (dimming commands)
- 1 byte (0-100 %)
- 1 byte (0-255)

You can select 2 values for each object.

Object type	Selection 1 [value]	Selection 2 [value]
1 bit	1	0
> 1 bit	Value 1	Value 2

Actions for "Normal edge function"

You can set the following actions.

Value: *Sends [value]*
Sends the value in question

Value: *Sends its value*
The current object value is sent. Therefore you can, for example, send a value with the sending group address that was previously received via another group address. In so doing, you save a value in the push-button and this value is sent when needed.

Value: *Toggles*
With a 1 bit object, the inverted object value is always sent. If the object last sent or received an On telegram, an Off telegram is sent next. Accordingly, after an Off telegram, an On telegram is sent.

For the other object types, either value 1 or value 2 is sent. Values that have not been set can also be received via the bus. If the object last sent or received value 1, value 2 is sent next; otherwise, value 1 is sent.

In the case of a two-way or central circuit, set the same values for all sending objects, e.g. 70 % for value 1 and 0 % for value 2.

Value: *None*
No action is carried out

Parameters per object | There is an additional tab under the *Screen x function x* tab for each group object.

Extended settings		
Screen x function x	Function	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
	Select edge function	Normal (operate, release)
Screen x function x edges object A	Type of object A	
	Action on operation	
	Action on release	
	Value 1	
	Value 2	

Principle of the normal edge function

The following diagrams show how the edge function behaves when a button is pressed and released.

(operate button icon)	Operate button
(release button icon)	Release button
Object A	Sends telegrams
Sends 1/ None	Action on operation/action on release

Example 1　Object A = 1 bit

Sends 1/None　　　　　　　　　　　None/Sends 0

Object A

1　1　1　　　　　　　　　0　0　0

Example 2　Object A = 1 bit

Sends 1/Sends 0　　　　　　　　Sends 0/Sends 1

Object A

1　0　1　0　1　0　　　　　0　1　0　1　0　1

Example 3   Object A = 1 bit

Toggles/None   None/Toggles
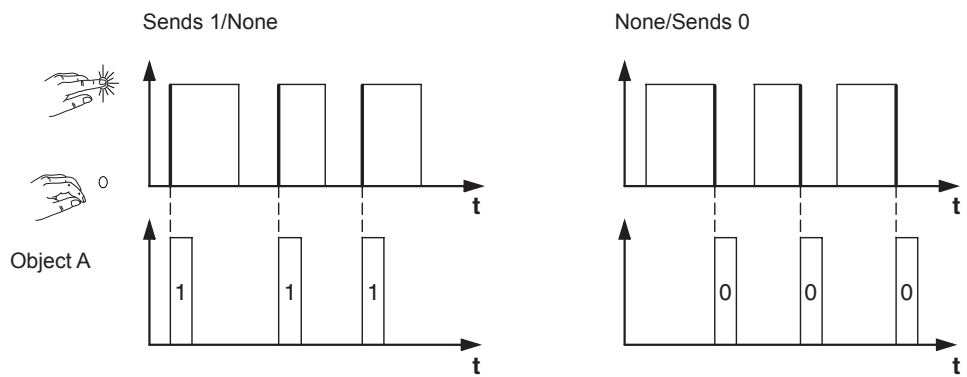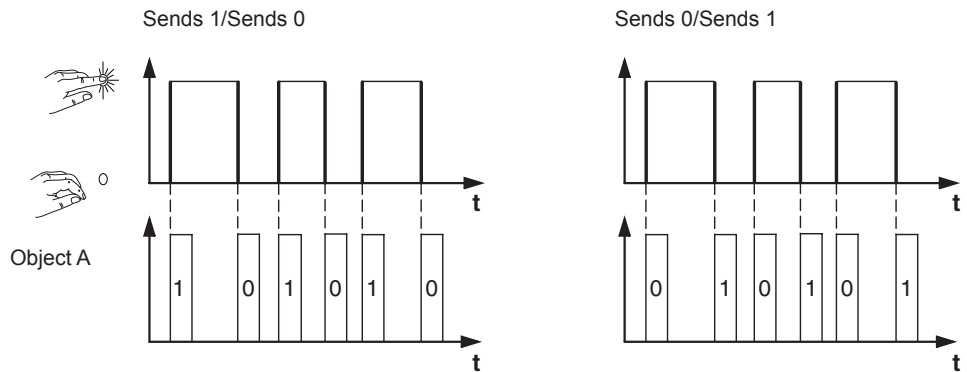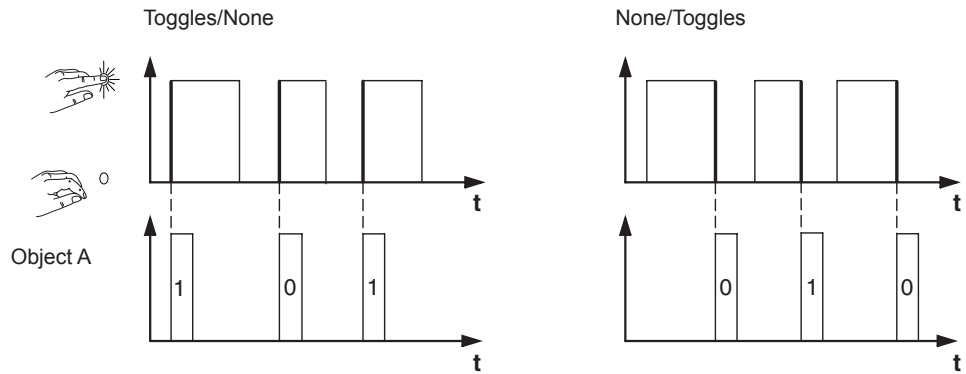
Object A

Example 4   Object A = 1 byte continuously 0–255
Value 1 = 255
Value 2 = 50

Sends value 1/Sends value 2   Toggles/None

Object A
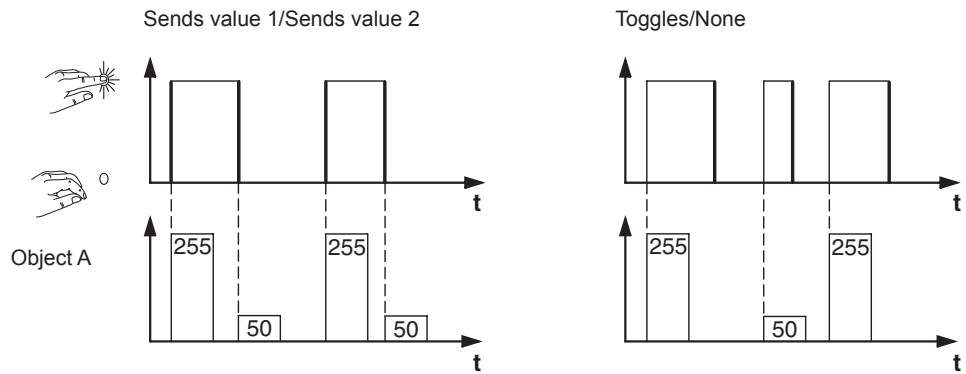
Example 5   Object A = 2 bit (priority control)
Deadman control   Value 1 = 11 (switch on with priority)
Toggle priority control   Value 2 = 10 (switch off with priority)

Sends value 1/Sends value 2   Toggles/None

Object A
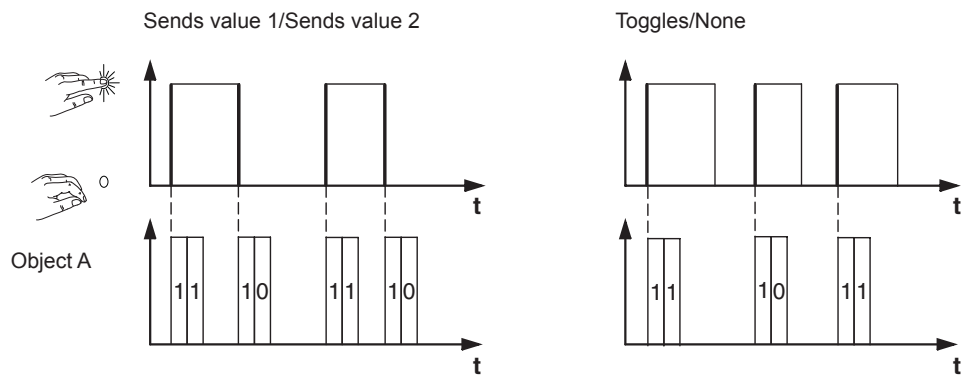
Deadman control   Toggle with priority

Extended edge function

With the extended edge function, an even wider range of functions is available. In addition to the normal edge function, the extended function differentiates between short and long operation. In total, you set 4 actions for operation and release.

① **Direct action on operation**
  – The action is executed each time the button is operated.
② **Action on release before the long operating time has elapsed**
  – The action is only executed after a short operation.
③ **Action on achieving the long operating time**
  – The action is executed directly when the button is pressed and held. You press the button until the action (e.g. switch light) is carried out.
④ **Action on release after achieving the long operating time**
  – The action is also performed on release after pressing and holding.
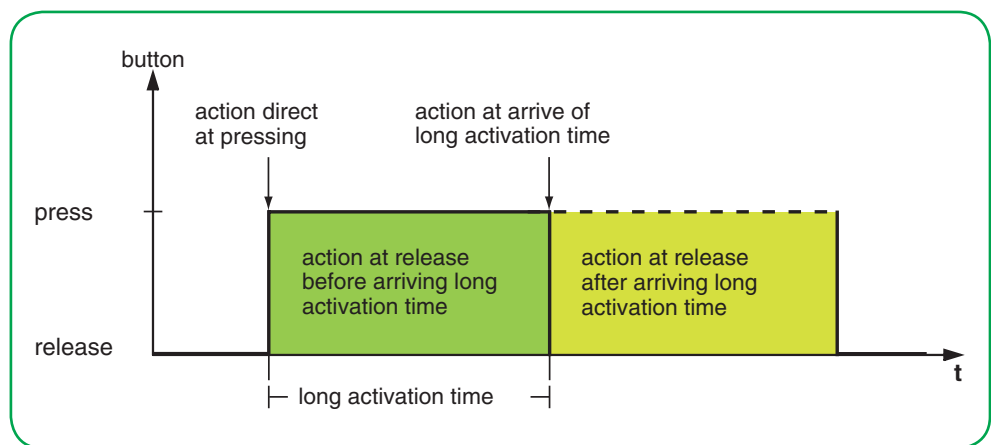
You set the relevant action for each operation phase. In addition to the normal edge function, you can set a cycle time for each object. You can send once or cyclically. For example, you can use the action *Toggles cyclically, sends immediately, then cyclically* to toggle cyclically between lighting scenes. You can use the action *Sends value 1 and then value 2 after a cycle time* to execute a staircase lighting function. Examples with the extended edge function are provided in Chapter .

- When setting the parameters, remember that you have to set all 4 operating phases for the push-button to function as required.
- In order to read the object values, you have to set the **R**ead flags manually.

You can set 2 objects independently of each other.
- 1 bit
- 2 bit (priority control commands)
- 4 bit (dimming commands)
- 1 byte (0-100 %)
- 1 byte (0-255)

You can select 2 values for each object.

Object type	Selection 1 [value]	Selection 2 [value]
1 bit	1	0
> 1 bit	Value 1	Value 2

Actions for "Extended edge function"

You can set the following actions.

Value: *Sends [value]*

Sends the value in question once and stops cyclical sending.

Value: *Sends [value] immediately and then cyclically*

If no cycle time is running, the value is sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the value is sent and a new cycle time is started. The value then continues to be sent cyclically. You can use this function to dim in steps, for example (e.g. 1/8 brighter).

Value: *Sends [value] only cyclically*

If no cycle time is running, the value is sent immediately and a new cycle time is started. If a cycle time is already running, it is not interrupted; the value is sent after the current cycle time has elapsed, and a new cycle time is started. The value then continues to be sent cyclically. You can use this function to monitor the push-button function, for example.

Value: *Sets object value to [value] (readable only)*

The value is written to the object and is not sent. Any active cycle time is terminated. If you want the value to be read by a visualisation, for example, you have to set the **R**ead flag for the object.

Value: *Toggles*

Sends the set values alternately. The toggling is also controlled via the bus.

With a 1 bit object, the inverted object value is always sent. If the object last sent or received an On telegram, an Off telegram is sent next. Accordingly, after an Off telegram, an On telegram is sent.

For the other object types, either value 1 or value 2 is sent. Values that have not been set can also be received via the bus. If the object last sent or received value 1, value 2 is sent next for the next action; otherwise, value 1 is sent.

In the case of a two-way or central circuit, set the same values for all sending objects, e.g. 70 % for value 1 and 0 % for value 2.

Value: *Toggles, sends immediately, then cyclically*

If no cycle time is running, the value is toggled once, sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the value toggled once is sent and a new cycle time is started. Then, the value continues to be sent cyclically, but without further toggling (see *Toggles*).

Value: *Toggles, only sends cyclically*

If no cycle time is running, the value is toggled once, sent immediately and a new cycle time is started. If a cycle time is already running, this is not interrupted, the value toggled once is sent after the current cycle time has elapsed, and a new cycle time is started. Then, the value continues to be sent cyclically, but without further toggling (see *Toggles*).

Value: *Toggles and is not sent*

The toggled value is written to the object and is not sent. Any active cycle time is terminated (see *Toggles*). If you want the value to be read by a visualisation, for example, you have to set the **R**ead flag for the object.

Value: *Toggles cyclically, sends immediately, then cyclically*

If no cycle time is running, the value is toggled, sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the toggled value is sent and a new cycle time is started. Then, the value continues to be toggled and sent cyclically (see *Toggles*).

You can use this function to switch cyclically between lighting scenes, for example.

Value: *Toggles cyclically, only sends cyclically*

If no cycle time is running, the toggled value is sent immediately and a new cycle time is started. If a cycle time is already running, it is not interrupted; the toggled

value is sent after the current cycle time has elapsed, and a new cycle time is started. Then, the value continues to be toggled and sent cyclically (see *Toggles*).

Value: *Toggles cyclically and is not sent*
The toggled value is written to the object and is not sent. Subsequently, the value is always toggled cyclically and the new value is written to the object (see *Toggles*). If you want the value to be read by a visualisation, for example, you have to set the **R**ead flag for the object.

Value: *Sends its value* (not for 2 bit priority control)
The current object value is sent. Any active cycle time is terminated. Therefore you can, for example, send a value with the sending group address that was previously received via another group address. In so doing, you save a value in the push-button and this value is sent when needed.

Value: *Sends its value immediately and then cyclically* (not for 2 bit priority control)
If no cycle time is running, the current object value is sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the current object value is sent and a new cycle time is started. Subsequently, the current object value continues to be sent cyclically.

Value: *Cyclically increase current object value by value 1* (for 1 byte only)
If no cycle time is running, *value 1* is added to the current object value, the object value is sent, and a new cycle time is started. If a cycle time is already running, it is not interrupted; the current object value with *value 1* added is sent and a new cycle time is started. You can use this function to increase and send multiple values in succession by holding down the button, for example. When the value "255" is exceeded, the value is reset to 0.

Example
- Current object value = 255
- Value 1 = 5
- Next value sent = 4

If, for example, you increase the current object value of "255" by the value "5", the value "4" is sent.

If you want to always send the same values, select values with base 2 (from 2^0 to 2^7). However, the bus can overwrite the values and move them. The values are always increased from the current object value.

If you want to increase the values only in 1 direction and only up to a maximum value, select the function *8 bit slider* with limit values.

Value: *Cyclically reduce current object value by value 2* (for 1 byte only)
If no cycle time is running, *value 2* is subtracted from the current object value, the object value is sent, and a new cycle time is started. If a cycle time is already running, it is not interrupted; the current object value with *value 2* subtracted is sent and a new cycle time is started. You can use this function to subtract and send multiple values in succession by holding down the button, for example. If the value falls below "0", the value is reset to 255.
- Current object value = 0
- Value 1 = 5
- Next value sent = 250

If you want to always send the same values, select values with base 2 (from 2^0 to 2^7). However, the bus can overwrite the values and move them. The values are always subtracted from the current object value.

If you want to reduce the values only in 1 direction and only down to a minimum value, select the function *8 bit slider* with limit values.

Value: *Sends [value A] and then [value B] after a cycle time*

Value 1 is sent immediately, and value 2 is sent after a cycle time, regardless of whether a cycle time is already running or not. For a 1 bit object, "1" is sent immediately and, after a cycle time elapses, "0" is sent. With this staircase lighting function, you can call up the comfort mode for a room temperature control unit, for example, and switch back to standby mode after the cycle time elapses. You set the duration via the cycle time.

Value: *None (stops cyclical sending)*

No action is carried out, and any active cycle time is stopped. Select this function if you also want to stop cyclical sending.

Value: *No change*

The current action is retained and any active cyclical sending is retained. You select this action for the release if, for example, you have activated the action *Sends value 1 and then value 2 after a cycle time*.

Value: *None (stop after current cycle time)*

No action is currently carried out, but any active cycle time is not stopped. It runs through until the end and then the corresponding value is sent once.

Parameters per object

There is an additional tab under the *Screen x function x* tab for each group object.

Extended settings		
Screen x function x	Function	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
	Select edge function	Extended (+ long and short operation)
Screen x function x edges object A	Type of object A	
	Direct action on operation	
	Action on release before the long operating time has elapsed	
	Action on achieving the long operating time	
	Action on release after achieving the long operating time	
	Value 1	
	Value 2	
	Cycle time = basis * factor	

Application examples for edge function

The following activation sequence chart shows the phases into which the edge function is divided.

"Extended edge function" sequence chart
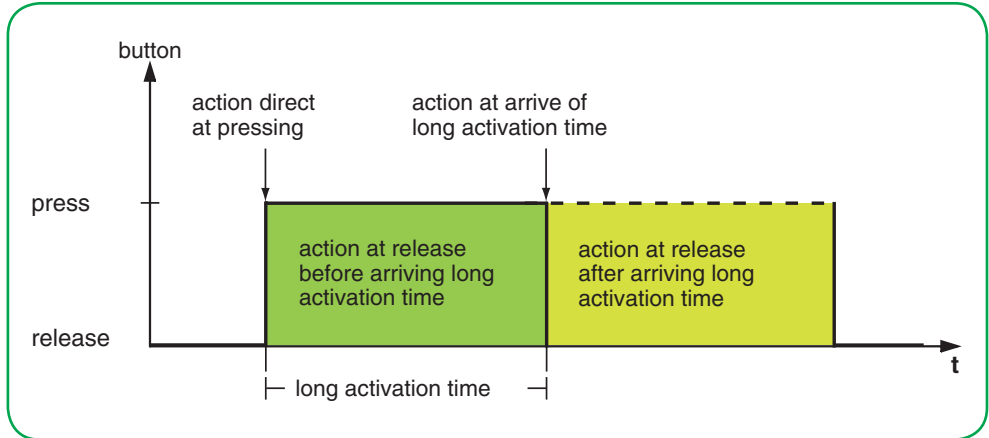
"Normal edge function" sequence chart

Object A = 1 bit
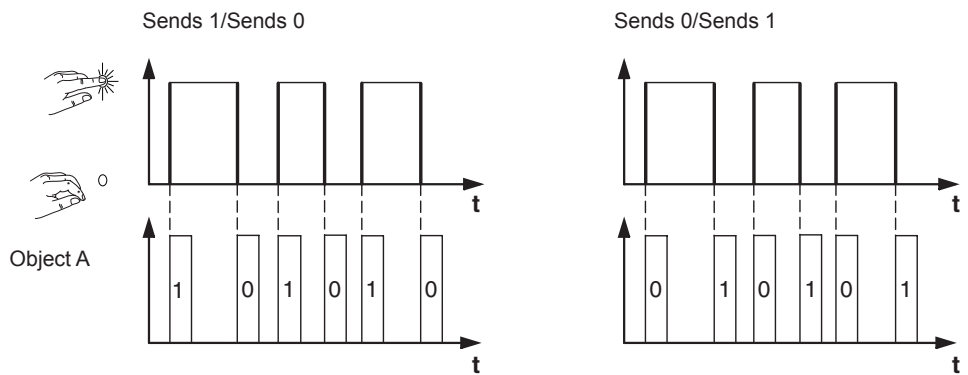
	Operate button
	Release button
Object A	Sends telegrams
Sends 1/ Sends 0	Action on operation/action on release

Application example for stair-
case cleaning

Staircase lighting function with cleaning light function

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

- Number of objects = 2 (object A/B)
- Object A/B = 1 bit
- Object A:
  - *Action on release before the long operating time has elapsed = Sends 1*
  - Other actions = *None (stops cyclical sending)*
- Object B:
  - *Action on achieving the long operating time = Toggles.*
  - Other actions = *None (stops cyclical sending)*

To do this, connect object A to the switch object and object B to the locking object of the switch actuator.
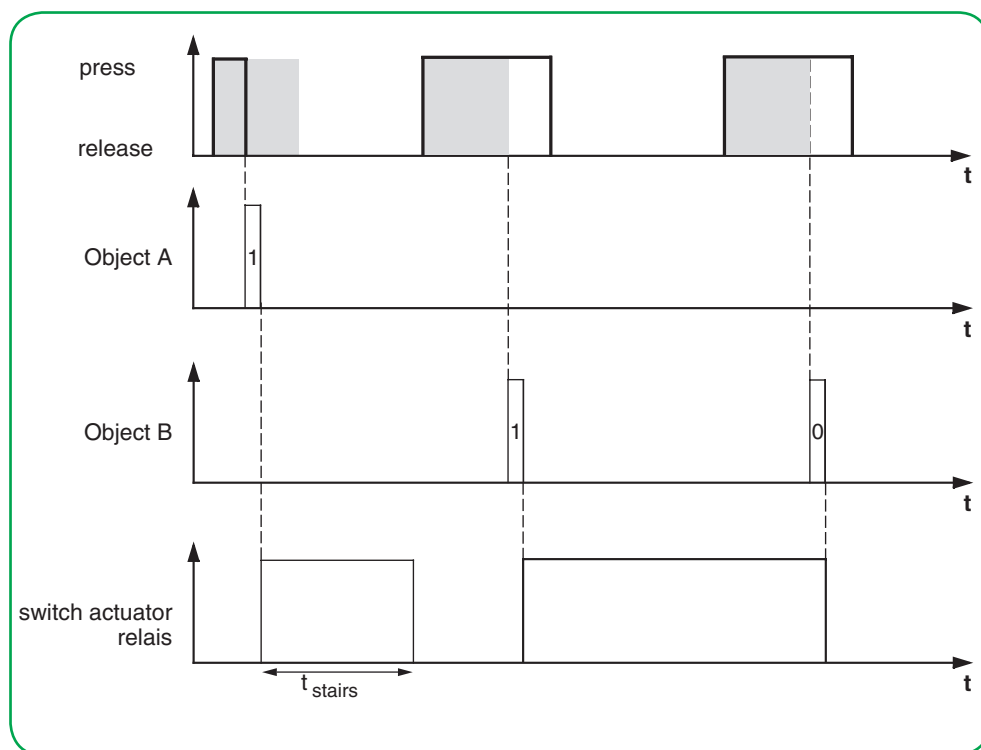
Short and long staircase lighting time

You can use this function to implement a short and a long staircase lighting time with the push-button. The switch actuator does not need a staircase lighting function for this requirement.

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

- Number of objects = 2 (object A/B)
- Object A/B = 1 bit
- Object A:
  - *Action on release before the long operating time has elapsed* = *Sends 1 and then 0 after a cycle time* (3 min)
  - Other actions = *No change*
- Object B:
  - *Action on release after achieving the long operating time* = *Sends 1 and then 0 after a cycle time* (6 min)
  - Other actions = *No change*

To do this, connect object A and object B to the switch object of the switch actuator.
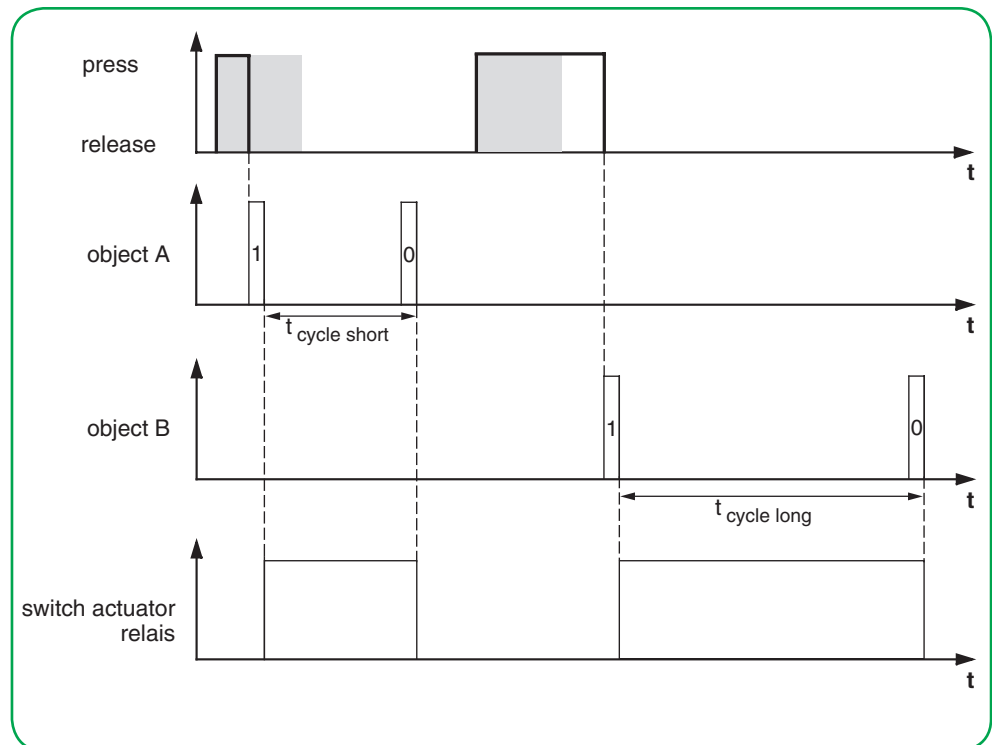
Switching the light on/off permanently, or switching off after a cycle time has elapsed

With a brief button action, the switch actuator switches the light permanently on or off. A long button action switches the light on, and after a set cycle time (e.g. 6 minutes), it is switched back off again. Due to the adjustable cycle time in the push-button, the switch actuator for this function does not require a staircase lighting function.

- Number of objects = 2 (object A/B)
- Object A/B = 1 bit
- Object A:
  - *Action on release before the long operating time has elapsed* = *Toggles*
  - Other actions = *None (stops cyclical sending)*

- Object B:
  - *Action on achieving the long operating time* = *Sends 1 and then 0 after a cycle time* (6 min)
  - Other actions = *No change*

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

Application example for setting up theft protection

Electronic protection against theft

This example will show you how to program electronic theft protection for the push-button. It is activated by a brief button action and then sends cyclically. As soon as the push-button is separated, this can be shown on a display.

- Number of objects = 1 (object A)
- Object A = 1 bit
- Object A:
  - *Action on release before the long operating time has elapsed* = *Sends 1 immediately and then cyclically* (10 min)
  - Other actions: *No change*

Connect object A to an object that listens cyclically for telegrams (e.g. a safety object). The monitoring time set on the safety object must be longer than the cycle time of the push-button. If the safety object receives no telegrams from the push-button during this time, an adjustable reaction is activated (e.g. channel is switched on).
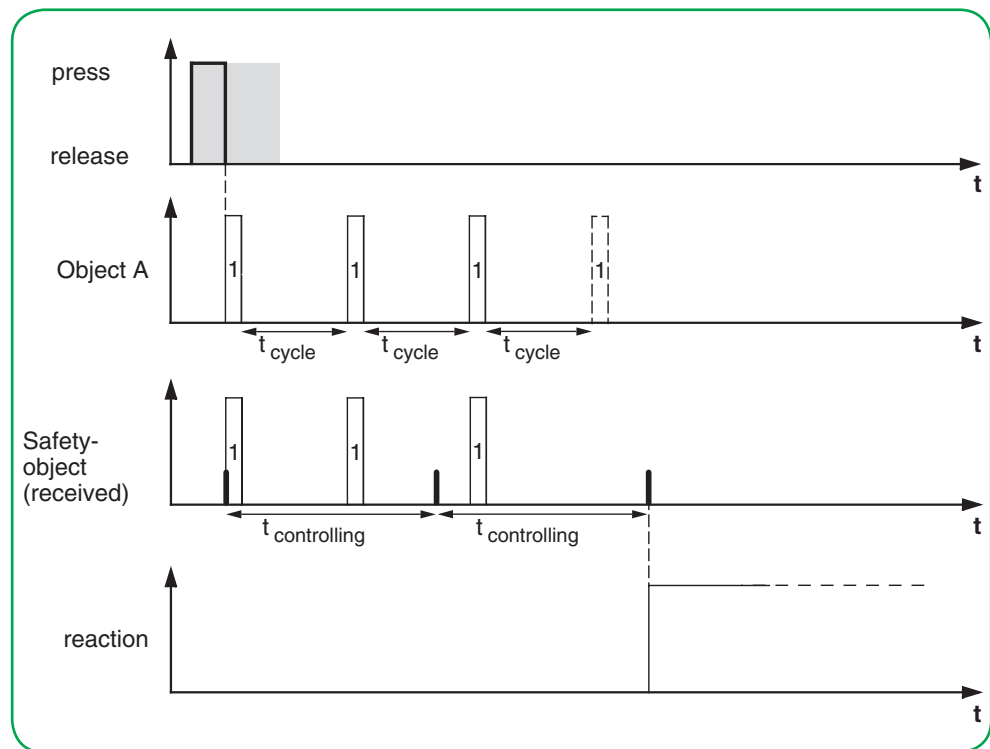
Effect lighting

This example shows you how to program effect lighting, for example for a display window. A long button action switches between 2 different lighting scenes. A short button action stops the toggling and sends a scene address that switches everything off. The scene module of the actuator that was activated is used to retrieve the scene.

- Number of objects = 2 (object A/B)
- Object A/B = 1 byte continuously 0–255
- Object A (*Value 1* = 3):
  - *Action on release before the long operating time has elapsed* = Sends value 1
  - Other actions = *None (stops cyclical sending)*
- Object B (*Value 1* = 1, *Value 2* = 2):
  - *Action on release after achieving the long operating time* = *Toggles cyclically, sends immediately, then cyclically* (1 min)
  - Other actions = *None (stops cyclical sending)*

To do this, connect object A and object B to a scene module.

Status indication

In the default setting, the status indication is triggered by the switch/value object.

Object value	Display
On (> 0)	Button lights up white
Off (= 0)	Button lights up grey

You can find comprehensive settings in Chapter

Group objects

You can select the following group objects.

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object A/B	Screen x function x	1 bit	Sends, receives	1.001 switching

Group objects for "Toggle" function

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Dimming object A/B	Screen x function x	4 bit	Sends, receives	3.007 dimmer step
x	Priority control object A/B	Screen x function x	2 bit	Sends, receives	2.001 prio. Switching
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

Information for single-button operation

In the case of a two-way or central circuit, the push-button function is also controlled via another sensor. With single-button operation, it is possible to adjust to the current state. To do this, the last value sent has to be loaded to the push-button. For switch objects (1 bit), this involves the values "1" and "0".

In the case of toggling with switch actuators, you can use the status feedback function of the switch actuator.

• Also connect the group address of the status feedback object for the connected channel to the switch object (1 bit) for the button function.

Loading values is possible for all object types. Set the same values for all push-buttons, e.g. 70 % for value 1 and 0 % for value 2. If the last sent or received value is the same as value 1, value 2 is sent the after the next action, otherwise value 1 is sent.

• For a two-way circuit, check that the objects for the 2 push-buttons are linked to the same group address.

• In the case of a central push-button, also connect the central group address to the objects of the other push-buttons.

6.7　Edges with 2 byte values

With this *edge function*, you can send a 2 byte object in floating point format or in integer format (with or without sign). In the default setting, you send the value "10" in floating point format on operation.

You can choose between the normal and extended edge functions and set the following functions.

- Send values in floating point format
- Send values in integer format with or without sign
- Values per object
- Action on operation and on release
- Additionally, actions for long and short operation (extended edge function)
- Additionally, send cyclically and with delay (extended edge function)
- Trigger status indication

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Edges with 2 byte values
	Select edge function	Normal (operate, release)
		Extended (+ long and short operation)
[Normal]	Action on operation	
	Action on release	
[Extended]	Long operation = 100 ms * factor (6-250)	
	Direct action on operation	
	Action on release before the long operating time has elapsed	
	Action on achieving the long operating time	
	Action on release after achieving the long operating time	
[Extended]	Cycle time = basis * factor	
[Edge function]	How is the status indication triggered?	

For setting the 2 byte values, there is an additional tab under the *Screen x function x* tab.

Screen x function x edges values	Type of object	Floating point
		Integer with sign (-32768…32767)
		Integer without sign (0-65535)
[Floating point]	Basis 1 (possible values in brackets)	0.01...327.68
	Factor 1 (0-2047)	0-2047
[Integer with sign]	Value 1/2 (-32768...32767)	-32768...32767
[Integer without sign]	Value 1/2 (0-65535)	0-65535

Normal edge function

With the normal edge function, you can specify which actions should be carried out when a button is pressed, and which should be carried out when a button is released.

Actions for "Normal edge function"

You can set the following actions.

Value: *Sends value 1*
Sends value 1 and stops cyclical sending.

Value: *Sends value 2*
Sends value 2 and stops cyclical sending.

Value: *Sends its value*
The current object value is sent. Therefore you can, for example, send a value with the sending group address that was previously received via another group address. In so doing, you save a setpoint in the push-button and this value is sent when needed.

Value: *None*
No action is carried out

Extended edge function

With the extended edge function, an even wider range of functions is available. In addition to the normal edge function, the extended function differentiates between short and long operation. In total, you set 4 actions for operation and release.

① **Direct action on operation**
   – The action is executed each time the button is operated.
② **Action on release before the long operating time has elapsed**
   – The action is only executed after a short operation.
③ **Action on achieving the long operating time**
   – The action is executed directly when the button is pressed and held. You press the button until the action (e.g. send setpoint) is carried out.
④ **Action on release after achieving the long operating time**
   – The action is also performed on release after pressing and holding.
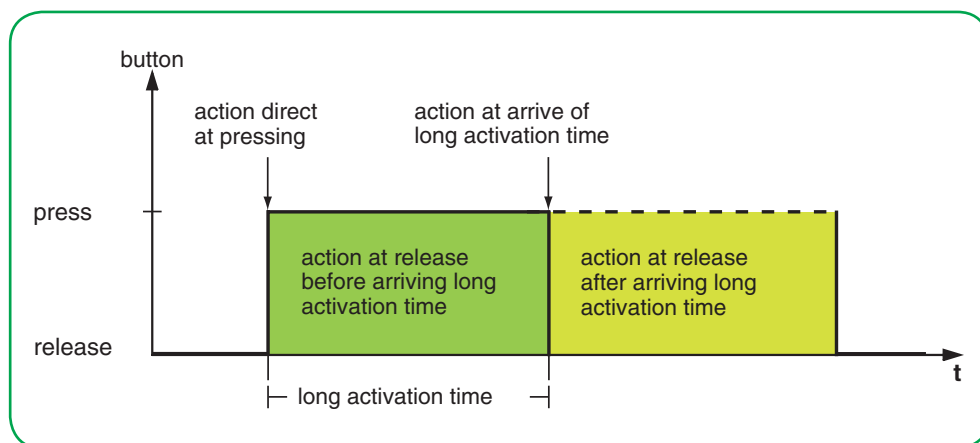
You set the relevant action for each operation phase. In addition to the normal edge function, you can set a cycle time for each object. You can send once or cyclically. You can use the action *Sends value 1 and then value 2 after a cycle time* to send a second value after a delay.

- When setting the parameters, remember that you have to set all 4 operating phases for the push-button to function as required.
- In order to read the object values, you have to set the **R**ead flags manually.

Actions for "Extended edge function"
You can send up to 2 values.

Selection 1 [value]	Selection 2 [value]
Value 1	Value 2

You can set the following actions.

Value: *Sends [value]*
Sends the value in question once and stops cyclical sending.

Value: *Sends [value] immediately and then cyclically*
If no cycle time is running, the value is sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the value is sent and a new cycle time is started. The value then continues to be sent cyclically.

Value: *Sends [value] only cyclically*
If no cycle time is running, the value is sent immediately and a new cycle time is started. If a cycle time is already running, it is not interrupted; the value is sent after the current cycle time has elapsed, and a new cycle time is started. The value then continues to be sent cyclically.

Value: *Sets object value to [value] (readable only)*
The value is written to the object and is not sent. Any active cycle time is terminated. If you want the value to be read by a visualisation, for example, you have to set the **R**ead flag for the object.

Value: *Sends its value*
The current object value is sent. Any active cycle time is terminated. Therefore you can, for example, send a value with the sending group address that was previously received via another group address. In so doing, you save a setpoint in the push-button and this value is sent when needed.

Value: *Sends value 1 and then value 2 after a cycle time*
Value 1 is sent immediately, and value 2 is sent after a cycle time, regardless of whether a cycle time is already running or not. You can use this function to send a second setpoint after a delay, for example. You set the duration via the cycle time.

Value: *None (stops cyclical sending)*
No action is carried out, and any active cycle time is stopped. Select this function if you also want to stop cyclical sending.

Value: *No change*
The current action is retained and any active cyclical sending is retained. You select this action for the release if, for example, you have activated the action *Sends value 1 and then value 2 after a cycle time*.

Status indication

In the default setting, the status indication is triggered by pressing the button.

State	Display
Operation	Button lights up white
No operation	Button lights up grey

You can find comprehensive settings in Chapter Status indication --> 57

Group objects

You can select the following group objects.

Group objects for edges with 2 byte values

No.	Name	Object function	Length	Properties	DPT in ETS4
x	Value object A	Screen x function x	2 byte	Sends, receives	7.001 pulse 2 byte without sign
x	Value object A	Screen x function x	2 byte	Sends, receives	8.001 pulse difference 2 byte with sign
x	Value object A	Screen x function x	2 byte	Sends, receives	9.004 lux 2 byte floating point value
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 shade
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

6.8 8 bit-slider with button

With the *slider function*, you can send values stepwise or cyclically with 1 button. The values are increased or reduced in steps. You can operate the button in 2 ways.

- Send a value with each button action. If, for example, you want to send 5 values with the button, press the button 5 times.
- Send values cyclically when pressing and holding the button. If you want to send multiple values, press and hold the button until the last value has been sent.

In the default setting, the object value is raised by the value "10" if you release the button before the long operation time elapses.

Parameter

You can select the following functions.

- Slider with or without limit values
- Step width of slider
- Either increase or reduce values per button action
- Either increase or reduce values until release
- Either increase or reduce values cyclically from the starting value
- First increase then reduce values per button action
- Toggle direction and send values cyclically

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	8 bit slider
	Long operation = 100 ms * factor (6-250)	

In an additional tab under the *Screen x function x* tab, you set the *limit values*, the *step width* and the *actions* for the slider.

Screen x function x slider	Slider function	
	Direct action on operation	
	Action on release before the long operating time has elapsed	
	Action on achieving the long operating time	
	Action on release after achieving the long operating time	
	Limit value 1 (0-255)	[only for slider function with limit values]
	Value of step width	
	Limit value 1 (0-255)	[only for slider function with limit values]
	Cycle time = basis x factor	
	Basis	
	Factor (3-255)	

Setting the slider

Extended edge function

For the slider, you always use the extended edge function. The actions differentiate between short and long operation. In total, you set 4 actions for operation and release.

① **Direct action on operation**
  – The action is executed each time the button is operated.
② **Action on release before the long operating time has elapsed**
  – The action is only executed after a short operation.
③ **Action on achieving the long operating time**
  – The action is executed directly when the button is pressed and held. You press the button until the action is carried out.
④ **Action on release after achieving the long operating time**
  – The action is also performed on release after pressing and holding.
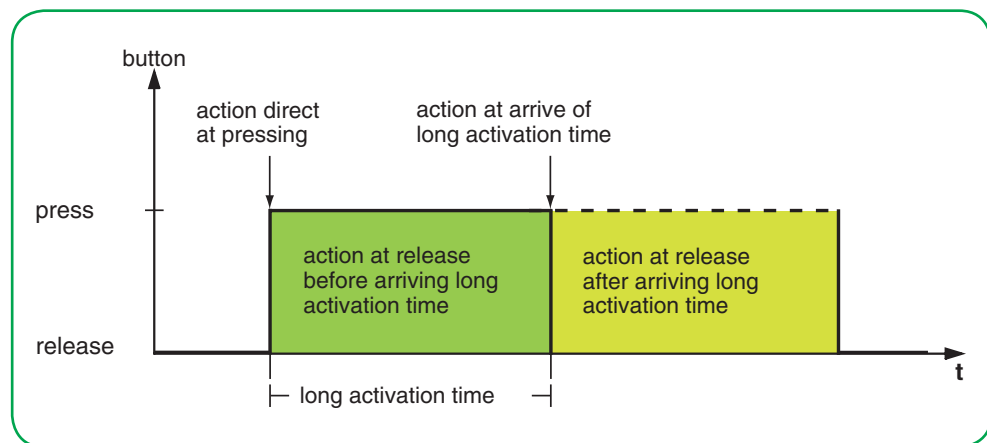
You set the relevant action for each operation phase. You can choose between one-time and cyclically repeated actions.

• When setting the parameters, remember that you have to set all 4 operating phases for the push-button to function as required.

You can use the slider with and without limit values.

Without limit values   If you select no limit values for an action, the value returns to value "0" once the maximum value of "255" is exceeded. If the value falls below the minimum value of "0", the value returns to value "255".

With limit values   If you select limit values for an action, the behaviour at the upper and lower limit depends on the action in question. With the action *Increase current object value cyclically*, values are increased up to *limit value 2* and the value does not return to *limit value 1* for this action. With the action *Increase stepwise within limits*, once the upper limit value is reached, the value continues to increase by 1 step width from the lower limit value. Some actions can only be selected together with limit values.

• Limit value 1 is always the lower limit and limit value 2 is the upper limit. Make sure that limit value 1 is always lower than limit value 2.
• If you want to increase or reduce the values consistently by the same interval, select coordinated values. The difference between the upper limit value and the lower limit value must be a multiple of the step width.
  – Example: Limit value 1 = 5, limit value 2 = 50, step width = 5.

Actions   You can set the following actions.

Value: *Send value 1, then increase cyclic. by step width*
You can only select this action with limit values. *Limit value 1* is sent immediately and a new cycle time starts. Next, the value is increased and sent cyclically until

limit value 2 is reached. *Limit value 2* is also sent if the last step is smaller than the step width.

Example

- Limit value 1 = 10
- Limit value 2 = **55**
- Step width = 10
- Sent values: 10, 20, 30, 40, 50, **55**

Cyclical sending can be interrupted. In the next cyclical sending, the value starts again at *limit value 1*. The values are not overwritten from the bus even if the **W**rite flag is set.

Value: *Send value 2, then reduce cyclically by step width*

You can only select this action with limit values. *Limit value 2* is sent immediately and a new cycle time starts. Next, the value is reduced and sent cyclically until *limit value 1* is reached. *Limit value 1* is also sent if the last step is smaller than the step width.

Example

- Limit value 1 = **15**
- Limit value 2 = 50
- Step width = 10
- Sent values: 50, 40, 30, 20, **15**

Cyclical sending can be interrupted. In the next cyclical sending, the value starts again at *limit value 2*. The values are not overwritten from the bus even if the **W**rite flag is set.

Value: *Increase current object value cyclically*

The current object value is increased cyclically by the set step width.

With limit values, the value is increased and sent cyclically until *limit value 2* is reached. *Limit value 2* is also sent if the last step is smaller than the step width.

Example

- Minimum value = 10
- Maximum value = **55**
- Step width = 10
- Sent values: 10, 20, 30, 40, 50, **55**

If you use limit values for this action, you have to set the **W**rite flag. You also need a second action to reduce the values again. The action *Reduce current object value cyclically* is a suitable complement. To ensure that the values do not shift, select the same step width and the same matching limit values for both actions.

Alternatively, you can use the action *Reverse slide direction and send cyclically* to alternately increase and reduce values.

Without limit values, the value is increased and sent cyclically until the largest possible value is reached. Subsequently, the value "0" is sent and increased cyclically again.

Example

- Step width = 10
- Sent values: ... 230, 240, 250, **0,** 10, 20 ...

The value "255" is only sent if it is reached with the selected step width.

Value: *Increase current object value once*

The current object value is increased once by the set step width. Any active cycle time is terminated.

With limit values, the action can be repeated until *limit value 2* is reached. *Limit value 2* is also sent if the last step is smaller than the step width.

- Minimum value = 10
- Maximum value = **55**
- Step width = 10
- Sent values: 10, 20, 30, 40, 50, **55**

i If you use limit values for this action, you have to set the **W**rite flag. You also need a second action to reduce the values again. The action *Reduce current object value once* is a suitable complement. To ensure that the values do not shift, select the same step width and the same matching limit values for both actions.

Alternatively, you can use the action *Stepwise to the limit values and back again* to increase and reduce values stepwise.

Without limit values, the action can be repeated until the largest possible value is reached. In subsequent actions, the value "0" is sent and increased stepwise again.

Example
- Step width = 10
- Sent values: ... 230, 240, 250, **0,** 10, 20 ...

The value "255" is only sent if it is reached with the selected step width.

Value: *Reduce current object value cyclically*
The current object value is reduced cyclically by the set step width.

With limit values, the value is sent until *limit value 1* is reached. *Limit value 1* is also sent if the last step is smaller than the step width.

i If you use limit values for this action, you have to set the **W**rite flag. You also need a second action to increase the values again. The action *Increase current object value cyclically* is a suitable complement. To ensure that the values do not shift, select the same step width and the same matching limit values for both actions.

Alternatively, you can use the action *Reverse slide direction and send cyclically* to alternately increase and reduce values.

Without limit values, the value is reduced until the smallest possible value is reached. Subsequently, the value "255" is sent and reduced cyclically again.

Example
- Step width = 10
- Sent values: ... 25, 15, 5, **255,** 245, 235 ...

The value "0" is only sent if it is reached with the selected step width.

Value: *Reduce current object value once*
The current object value is reduced once by the set step width. Any active cycle time is terminated.

With limit values, the action can be repeated until the minimum value (value 1) is reached. *Limit value 1* is also sent if the last step is smaller than the step width.

i If you use limit values for this action, you have to set the **W**rite flag. You also need a second action to increase the values again. The action *Increase current object value once* is a suitable complement. To ensure that the values do not shift, select the same step width and the same matching limit values for both actions.

Alternatively, you can use the action *Stepwise to the limit values and back again* to increase and reduce values stepwise.

Without limit values, the action can be repeated until the smallest possible value is reached. In subsequent actions, the value "255" is sent and reduced stepwise again.

Example
- Step width = 10

- Sent values: ... 25, 15, 5, **255,** 245, 235 ...

The value "0" is only sent if it is reached with the selected step width.

Value: *Reverse slide direction and send cyclically*

The slider direction is reversed and increased or reduced cyclically in the opposite direction by the set step width.

With limit values, the value is sent cyclically until a limit value is reached. The limit value is always sent at the end. Cyclical sending can also be stopped before the limits are reached. Before the next cyclical sending, the direction is reversed and the value is increased or reduced by 1 step width.

Example

- Minimum value = 0
- Maximum value = 250
- Step width = 50
- Cyclical sending: 50, 100, 150
- Next cyclical sending: 100, 50

Without limit values, the value is increased cyclically in 1 direction until the largest possible value is reached, the value "0" is sent and increased further cyclically in steps. In the other direction, the value is reduced cyclically until the smallest possible value is reached, the value "255" is sent and reduced further cyclically in steps. Cyclical sending can also be stopped before the end values are reached. Before the next cyclical sending, the direction is reversed and the value is increased or reduced by 1 step width.

Example

Step width 50

Cyclical sending: 50, 100, 150, 200, 250, 0, 50

Next cyclical sending: 0, 255, 205

When increasing, the value "255" is only sent if it is reached with the selected step width. When reducing, the value "0" is only sent if it is reached exactly with the selected step width.

Value: *Stepwise to the limit values and back again*

You can only select this action with limit values. The current object value is changed by 1 step width each time. When a limit value is reached, the slide direction is reversed for the next action.

Example

- Minimum value = 0
- Maximum value = **55**
- Step width = 10
- Sent values: 0, 10, 20, 30, 40, 50, **55**, 45, 35, 25, ...

Value: *Increase stepwise within limits*

You can only select this action with limit values. The current object value is increased by 1 step width each time. Once the largest possible value is reached, the minimum value (value 1) is sent the next time the button is operated. If the maximum value cannot be reached with the specified step width, it is not sent.

Example

- Minimum value = 10
- Maximum value = **55**
- Step width = 10
- Sent values: 10, 20, 30, 40, **50**, 10, 20 ...

Value: *Decrease stepwise within limits*

You can only select this action with limit values. The current object value is reduced by 1 step width each time. Once the smallest possible value is reached, the max-

imum value (value 2) is sent the next time the button is operated. If the minimum value cannot be reached with the specified step width, it is not sent.

Example
- Minimum value = **15**
- Maximum value = 50
- Step width = 10
- Sent values: 50, 40, 30, **20**, 50, 40 ...

Value: *None (stops cyclical sending)*

No action is carried out, and any active cycle time is stopped.

Value: *No change*

No action is carried out, and any active cycle time is continued.

Status indication

In the default setting, the status indication is triggered by pressing the button.

State	Display
Operation	Button lights up white
No operation	Button lights up grey

You can find comprehensive settings in Chapter Status indication --> 57

Group objects

You can select the following group objects.

Group objects for slider

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Value object A	Screen x function x	1 byte	Sends	5.004 percent (0-255 %)
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

6.9 Scene

You can use the scene function to call up and save scenes in actuators and in scene modules. Alternatively to the normal scene function, you can select an extended function. In the default setting, you call up scene address "0" with a short button action and save the values for the scene with a long button action.

Parameter   You can select the following functions.

Express settings		
Screen x	Which screen type do you use?	1-4 functions (extended)
Extended settings		
Screen x function x	Function	Scene
	Long operation = 100 ms * factor (6-250)	
	Select edge function	Normal (operate, release)
		Extended (+ long and short operation)
	Scene address	[Normal edge function]
	Number of objects	[Extended edge function]
	How is the status indication triggered?	

Normal scene function

A short button action calls up a scene. A long button action saves the current values for the scene.

Call up room functions   You can use a scene to change multiple room functions at the touch of a button. Loading a scene allows you, for example, to dim the room lighting to a specific value, move the blinds into the desired position and switch on the power supply to the socket outlets in a room.

Save room functions   You can change the values for the individual room functions in a scene. To do this, use further button functions such as switching, dimming or move blind. You can use these button functions to change the values for the room functions consecutively. You then save the new values to the scene button by pressing and holding the button.

Settings   In the normal scene function, the parameter *Scene address (0-63)* appears. You can use this value to call up a scene in actuators and in scene modules. The values for saving (128 – 191) are assigned automatically. You can adjust the duration of a long button action. The default setting is a duration of 3 s.

Extended scene function

With the extended scene function, an even wider range of functions is available. In total, you set 4 actions for operation and release.

① **Direct action on operation**
  – The action is executed each time the button is operated.
② **Action on release before the long operating time has elapsed**
  – The action is only executed after a short operation.
③ **Action on achieving the long operating time**
  – The action is executed directly when the button is pressed and held. You press the button until the action is carried out.
④ **Action on release after achieving the long operating time**
  – The action is also performed on release after pressing and holding.
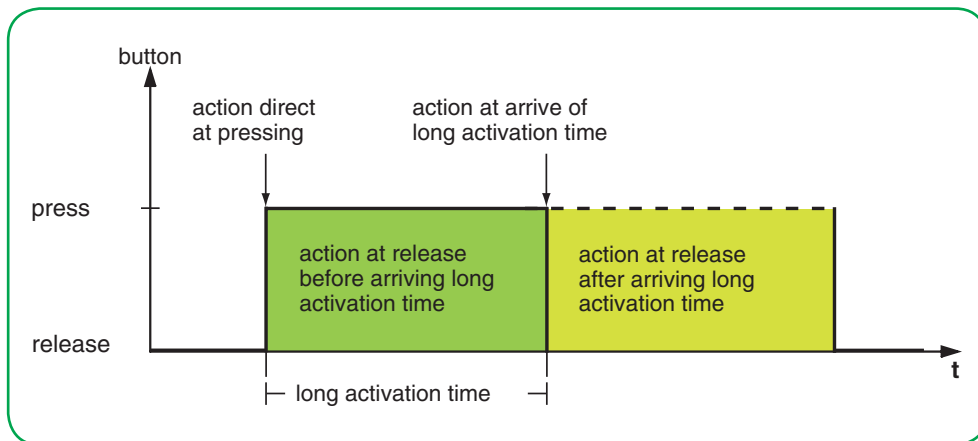
You set the relevant action for each operation phase. You can set 2 values for the scene address for each scene object. For both values, you can set whether the scene is called up or saved. The appropriate value for saving a scene is automatically derived from the scene address.

In addition to the normal scene function, you can set a cycle time. You can send once or cyclically. You can use the action *Sends value 1 and then value 2 after a cycle time* to send a second scene address after a delay.

You can set the actions for 1 or 2 scene objects.

i

- When setting the parameters, remember that you have to set all 4 operating phases for the push-button to function as required.

Actions for "Extended edge function"

You can set the following actions.

Value: *Send value 1*
Sends the value 1 in question once and stops cyclical sending.

Value: *Send value 2*
Sends the value 2 in question once and stops cyclical sending.

Value: *Toggles*
Sends the set values alternately. The toggling is not controlled via the bus. Received telegrams are not evaluated.

Value: *Toggles, sends immediately, then cyclically*

If no cycle time is running, the value is toggled once, sent immediately and a new cycle time is started. If a cycle time is already running, it is interrupted, the value toggled once is sent and a new cycle time is started. Then, the value continues to be sent cyclically, but without further toggling. The toggling is not controlled via the bus. Received telegrams are not evaluated.

Value: *Sends value 1 and then value 2 after a cycle time*
Sends scene address 1 immediately, and scene address 2 after a cycle time, regardless of whether a cycle time is already running or not. With this action, you can call up a scene for an adjustable duration and then switch back to another scene.

Value: *None (stops cyclical sending)*
No action is carried out, and any active cycle time is stopped.

Value: *No change*
No action is carried out, and any active cycle time is continued.

For each scene object, there is another tab under the *Screen x function x* tab.

	Screen x function x scene object x	Direct action on operation
		Action on release before the long operating time has elapsed
		Action on achieving the long operating time
		Action on achieving the long operating time
		Value 1 Scene address (0-63)
		Value 1 to retrieve/save the scene
		Value 2 Scene address (0-63)
		Value 1 to retrieve/save the scene
		Cycle time = basis * factor
		Basis
		Factor (3-255)

Status indication

In the default setting, the status indication is triggered by pressing the button.

State	Display
Operation	Button lights up white
No operation	Button lights up grey

You can find comprehensive settings in Chapter

Group objects

You can select the following group objects.

Group objects for scene function

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Scene object A/B	Screen x function x	1 byte	Sends	18.001 scenes control
x	Status feedback object	Screen x function x	1 bit	Receives	1.011 status
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

7 Room temperature control unit

You can operate the internal room temperature control unit on one of 8 screen pages.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Room temperature control unit

If you use a screen with the room temperature control, you activate the control. If the control is activated, you can see this in the *Control General* tab. Heating with warm water heating is preset already. However, you must check all parameters to make sure that they are set correctly and appropriately for your installation's local conditions.

7.1 Overview and mode of function

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

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

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

Four operating modes (comfort, ECO, night and frost/heat protection), each with programmable setpoints, are available for differentiated control with different requirements. During ongoing operation, you can temporarily move the setpoints within adjustable limits, or move them jointly for several operation modes. Optionally, the basis for the setpoints can also be moved. On the user interface, you can activate the comfort mode temporarily and set its duration.

Additional functions of the room temperature control unit are joint/separate correcting variable outputs, selection of the operation mode after the bus voltage returns, status information, valve protection.

The KNX Multitouch Pro has an input for a remote sensor for measuring the temperature in the floor. The controller can evaluate the room temperature and floor temperature proportionally. If the controller only measures and evaluates the floor temperature, the floor temperature is matched to the specified setpoints.

Using the room temperature control unit, you can also control a KNX Fan Coil actuator. In addition to the control, set a fan step for manual mode in ongoing operation and change between automatic and manual mode. In automatic mode, the fan coil actuator takes over control of the fan steps.

7.2 Screen pages for room temperature control

The user can adapt the room temperature control individually to the current room usage and his/her individual requirements. You can set the following functions.

- Setpoint (adjust within the limits set in the parameters)
- Basic setpoint shift (optional)
- Operating mode
- Time control for the comfort extension
- Fan control (when using fan convectors)

The functions shown on a main function page and sub function pages. The number of screen pages varies depending on the selected design and function. You select between the *Rotary* and the *Vertical design*.

Rotary design

Room temperature control unit in rotary design

The following illustration shows the main function page of the room temperature control unit in the rotary design.

Room temperature control unit
Main function page
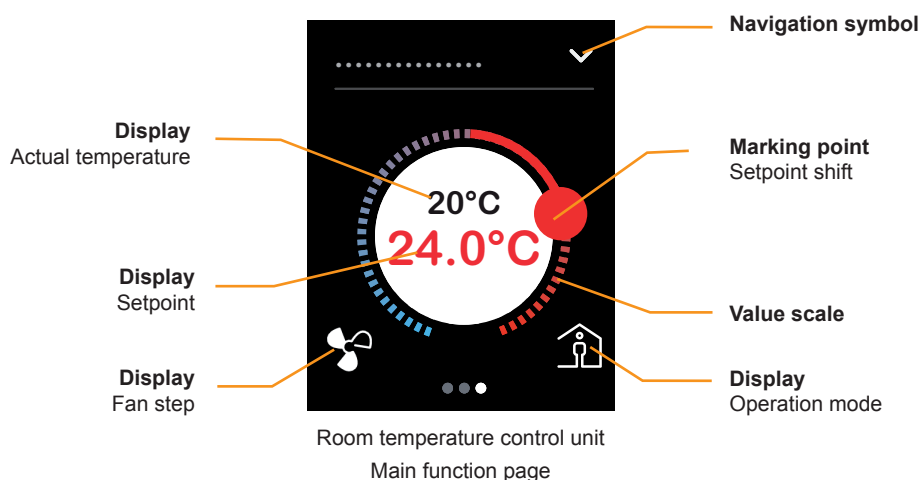
- Tapping or swiping the value scale changes the setpoint temperature. Moving is only possible within the limits set in the parameters. The function corresponds to adjusting using the *Setpoint shift input* or *Setpoint input* objects.
- Tap the central button to switch to frost/heat protection.
- Tap the navigation symbol to access a sub function page. On the sub function pages, set the operation modes and the time function for comfort mode. If activated, there are sub function pages for the basic setpoint shift and for selecting fan steps.
- The fan step display does not appear if no fan control is set in the parameters
- If released in the ETS, adjust the basic setpoints on a sub function page. The function corresponds to adjusting using the *Basic setpoint shift input* object.

Vertical design

Room temperature control unit in button design

The following illustration shows the main function page of the room temperature control unit in the vertical design. The fan step display does not appear if no fan control is set in the parameters.

Room temperature control unit
Main function page
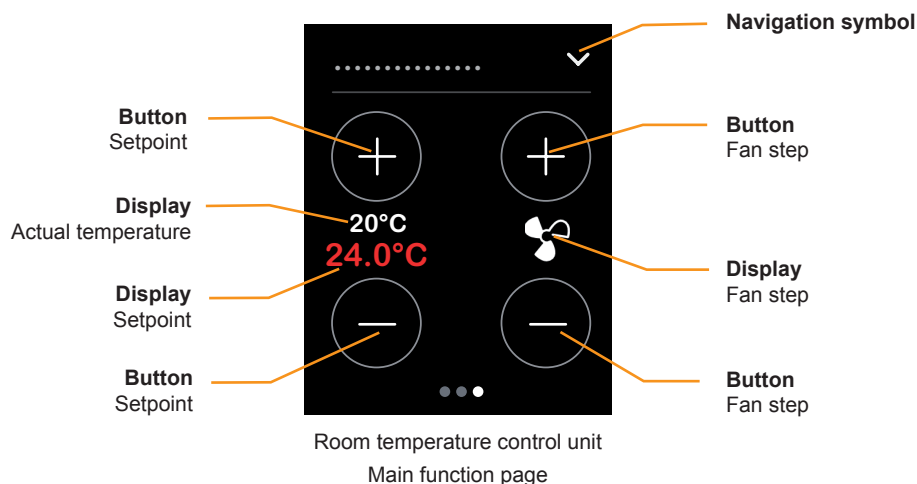
- Tap the *Setpoint* buttons to change the setpoint temperature in steps. The function corresponds to adjusting using the *Setpoint shift input* or *Setpoint temperature input* objects.
- Tap the *Fan step* buttons to change the fan step gradually.
- Tap the navigation symbol to access a sub function page. On the sub function pages, set the operation modes and the time function for the comfort extension.
- If released in the ETS, adjust the basic setpoints on a sub function page. The function corresponds to adjusting using the *Basic setpoint shift input* object.

Settings for the user interface

You can operate the room temperature control unit on one of 8 screen pages. Then define a screen name up to 13 characters long and the design. The screen name appears on all sub function pages.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Room temperature control unit
	∫	
	Which screen design do you use?	

In the *Fan step* tab, activate objects and a sub function page for setting the fan steps.

In the *Setpoints and operation modes* tab, activate objects and a sub function page by means of which the setpoints can be changed beyond the set limits (basic setpoint shift).

7.3 Setpoints and operation modes

4 operating modes are available for controlling room temperature:

- Comfort mode
  - Controls the room temperature when the room is being used. Use the *Time control* sub function on the user interface to activate comfort mode additionally for the set duration.
- ECO mode
  - Slight reduction in temperature if the room is not used or the reduced temperature is sufficient for the current room usage.
- Night mode
  - Lowers temperature significantly, e.g. at night or during the weekend.

- Frost/heat protection
  – In this operation mode, heating or cooling is switched off.
  – To prevent the heating freezing or the room overheating, heating or cooling is switched back on if adjustable temperature setpoints are undershot or exceeded.

The operation mode is selected using the bus or the user interface.

- With a button on the user interface
- With the *Operation mode input* object
- With the *Frost/heat protection input* object

For each operation mode, you can specify setpoints for heating and cooling. When changing the operation mode, the relevant setpoint for continued room temperature control is used. The setpoints of all operation modes (except for frost/heat protection) can be adjusted manually using the user interface or objects.

Screen pages for the setpoints and operation modes

The setpoints for the current operation mode are adjusted on the main function page of the room temperature control (). The operation modes are changed on the *Operation modes* sub function page.

Room temperature control unit
Sub function page
Operating modes
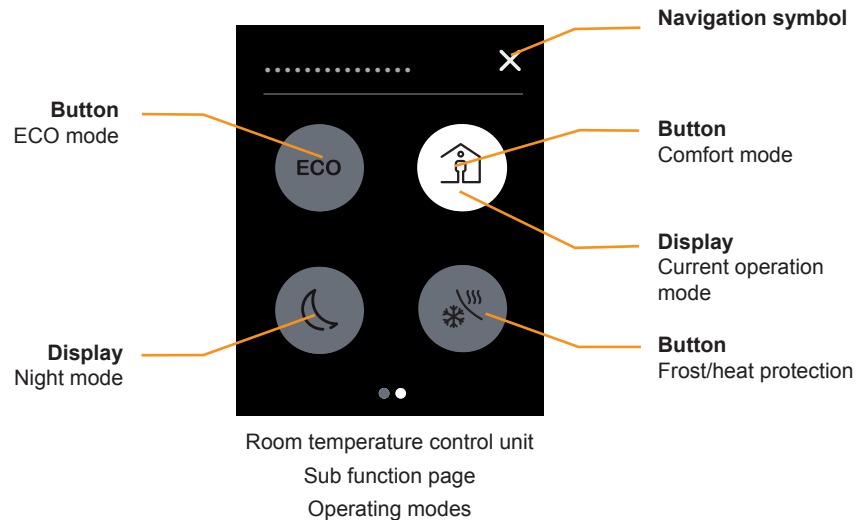
- Tap a button to activate the corresponding operation mode.
- The button with the currently selected operation mode lights up white.
- Tap the navigation symbol to access the main function page.

If activated, the setpoints can be adjusted beyond the limits set in the parameters on another sub function page (basic setpoint shift).

Setpoint adjustment

The setpoint shift changes the setpoint temperature of the current operation mode directly. Optionally, the other operation modes are also adapted as well. You can also change the basis for the setpoint shift. Only the setpoints for the frost/heat protection are not changed. These operation modes also specify the limits of the setpoint adjustment. It is therefore not possible to set setpoint temperatures lower than the frost protection or higher than the heat protection.

The following illustration shows the setpoint and basic setpoint shift.
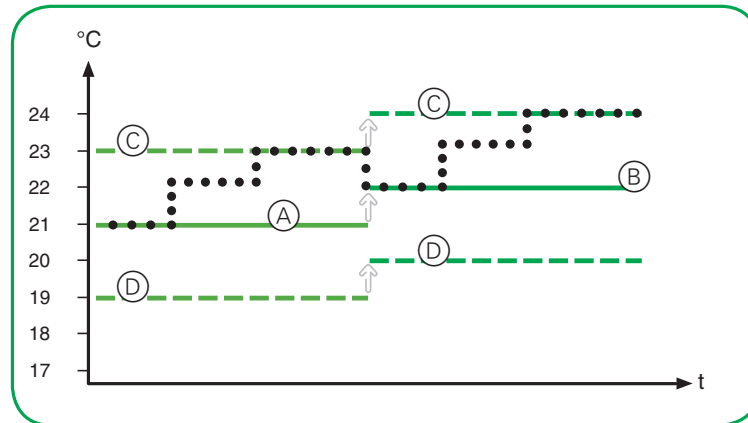
Ⓐ Setpoint set in the parameters

Ⓑ Basic setpoint shift 1 K

Ⓒ Limit for setpoint shift +2 K

Ⓓ Limit for setpoint shift -2 K

The setpoint set in the parameters (Ⓐ) is the starting point for changing the setpoint.

You can only change the setpoints within the limits for the setpoint shift (Ⓒ Ⓓ).

With a basic setpoint shift (Ⓑ), you change the current setpoints and the basis for further setpoint shifts. The value of the last setpoint shift set to "0".

Following a basic setpoint shift, you can change the setpoint up to the shifted limits of the setpoint shift (Ⓒ Ⓓ).

An example of a basic setpoint shift with one value for all operation modes can be found in section Basic setpoint shift input object --> 100.

You can adjust the setpoint temperatures in different ways.

- Use the *Setpoint shift input* object to adjust the setpoints to a limited extent up and down.
- Use the *Setpoint input* object to adjust the setpoint temperature to a limited extent up and down.
- Use the user interface to adjust the setpoints to a limited extent up and down.
- Use the *Basic setpoint shift input* object to adjust all setpoints. The setpoints can be shifted again on the basis of the new values.
- If released in the ETS, adjust the basic setpoints on the user interface

Setpoint shift input object

Setpoint shift input object

With the *Setpoint shift input*, you can specify the setpoint shift directly. The basis for the setpoint shift is the setpoints set in the parameters or the setpoints most recently adjusted using the *Basic setpoint shift input* object.

Starting from this base, the limits set in the parameters also apply to the setpoint shift. When a setpoint shift is received via the bus, the controller checks whether the value is within the limits set in the parameters. If this is not the case, adjustment as far as the limits takes place.

If a setpoint shift is performed using the user interface this is also adapted to the limit.

The setpoint shift is always carried out in the currently valid operation mode. You can set whether the *Setpoint shift maintained after change in operation mode* applies. If it is retained, the setpoints are adjusted by the same value in all operation modes. Otherwise, the setpoints set in the parameters apply once again after an operation mode change, or else the setpoints adjusted using the basic setpoint shift input most recently.

Example: Setpoint shift for all operation modes

The setpoint shift is maintained after the operation mode is changed. The setpoint shifts take place using the *Setpoint shift input* object. The basis for the setpoint shift is the setpoints set in the parameters.

Settings in ETS

• Limits of setpoint adjustment = +3 K/-3 K

Setpoint adjustment maintained after change in operation mode = Yes

Actions

① +5 K setpoint shift (value is 2 K higher than the limit set in the parameters)

② +2 K setpoint shift

③ -2 K setpoint shift

The results of the actions ① - ③ are shown in the following table.

Operating mode	ETS setpoints	Result ①	Result ②	Result ③
Cooling				
Heat protection	35°C	35°C	35°C	35°C
Night	28 °C	31 °C	30 °C	26 °C
ECO	26 °C	29 °C	28 °C	24 °C
Comfort	24 °C	27 °C	26 °C	22 °C
Heating				
Comfort	21 °C	24 °C	23 °C	19 °C
ECO	19 °C	22 °C	21 °C	17 °C
Night	17 °C	20 °C	19 °C	15 °C
Frost protection	7 °C	7 °C	7 °C	7 °C

Example: Setpoint shift until change of operation mode

The setpoint shift is not maintained after the change of operation mode. The setpoint shifts take place using the *Setpoint shift input* object. The basis for the setpoint shift is the setpoints set in the parameters.

Settings in ETS

- Limits of setpoint adjustment = +3 K/-3 K
- Setpoint adjustment maintained after change in operation mode = No

Initial status

Setpoints are the same as the values set in the ETS parameters

Actions

① Setpoint shift by +3 K in comfort operation mode
② Change to another operation mode

The results of the actions ① and ② are shown in the following table.

Operating mode	ETS setpoints	Result ①	Result ②
Cooling			
Heat protection	35°C		35°C
Night	28 °C		28 °C
ECO	26 °C		26 °C
Comfort	24 °C	**27** °C	24 °C
Heating			
Comfort	21 °C	**24** °C	21 °C
ECO	19 °C		19 °C
Night	17 °C		17 °C
Frost protection	7 °C		7 °C

Setpoint input object

Setpoint temperature input object

You can use the *Setpoint input* object to adjust setpoints, similarly to using the *Setpoint shift input* object. If you want to increase the setpoint set in the parameters by 2 K from 21°C, you can send the setpoint 23°C as an alternative. When a setpoint temperature is received by the bus, the controller checks whether the value is within the limits set in the parameters. If a setpoint shift is performed using the user interface this is also adapted to the limit.

Setpoint shift after reset and download

You can define whether the setpoint shift is maintained after a reset. If the values should be stored and called up, select *Setpoint shift maintained after reset*. You can also set the behaviour following a download.

Basic setpoint shift input object

Basic setpoint shift input object

You can use the *Basic setpoint shift input* to define a new basis for the setpoint temperatures. The received value is applied in all operation modes except for frost/heat protection. The setpoints set in the parameter are increased or decreased with the received value. This adjustment is only limited by the set values for the frost and heat protection.

The new setpoints are then the basis for additional setpoint shifts using the *Setpoint shift input* and *Setpoint input* objects.

Example: Adjust setpoint using the *Setpoint shift input* and *basic setpoint shift input* objects

Settings in ETS

- Limits set in the parameters for the setpoint shift = +2 K/-2 K
- Setpoint adjustment maintained after change in operation mode = Yes

Actions

① Setpoint adjustment 2 K

② Basic setpoint shift 1 K

③ Setpoint adjustment 2 K

The results of the actions ① - ③ are shown in the following table.

Operating mode	ETS setpoints	Result ①	Result ②	Result ③
Cooling				
Heat protection	35°C	35°C	35°C	35°C
Night	28 °C	30 °C	29 °C	31 °C
ECO	26 °C	28 °C	27 °C	29 °C
Comfort C	24 °C	26 °C	25 °C	27 °C
Heating				
Comfort	21 °C	23 °C	22 °C	24 °C
ECO	19 °C	21 °C	20 °C	22 °C
Night	17 °C	19 °C	18 °C	20 °C
Frost protection	7 °C	7 °C	7 °C	7 °C

The basic setpoint shift changes the limits for the setpoint shift. In this example, the limits are changed by +1 K from +2 K/-2 K to +3 K/-1 K. The adjustment applies to all operation modes except frost/heat protection.

In total, the possible setpoint shifts are only still limited for the values for the frost/heat protection t. It is not possible to set setpoint temperatures lower than the frost protection or higher than the heat protection.

Basic setpoint shift after reset and download

The basic setpoint shift is maintained after a reset. If the values should be deleted after a download, select *Delete setpoint shift and basic setpoint shift after download*.

Operation mode after bus voltage return and download

You can set that the controller automatically switches to a particular operation mode after a reset or a download.

You select the following operating statuses after a download or reset.

Comfort mode

ECO mode

Night mode

Comfort mode

The symbol on the user interface indicates that the controller is in comfort mode. This operation mode is used to control the room temperature when the room is being used.

Comfort mode is selected via the bus or the user interface.

• With the *Operation mode input* object and the value "1"
• With the *Comfort mode* button on the user interface
• With the *Time control* button on the user interface

Toggling with the user interface and the *Operation modes input* object takes place with equal priority. The most recently performed action is carried out.

Comfort mode is activated for the set duration using the *Time control* sub function. The duration for which comfort mode is extended can be set on the user interface. The behaviour after the time has expired can be set. If another operation mode is

called up previously using the user interface, comfort mode is cancelled and the other operation mode is activated directly. With the time control, you interrupt night mode, for example, if the room should be used for longer in the evening.

At the end of this time, the controller can change to any of the following operation modes.

- Operation mode that corresponds to the current value of the operation mode input object
- ECO
- Night
- Frost/heat protection

You can set the controller to automatically switch to comfort mode after the bus voltage returns or after a download.

ECO mode

The symbol on the user interface indicates that the controller is in ECO operation mode. This operation mode allows the room temperature to be reduced or increased to a level set in the parameters. ECO mode is selected if the room is no longer used or if a slightly reduced temperature is adequate for the current room usage. A brief heating period or cooling period is triggered by a low difference in temperature to the comfort mode.

ECO mode is selected using the bus or the user interface.

- With the *Operation mode input* object and the value "2"
- With the *ECO mode* button on the user interface

Toggling with the user interface or the *Operation modes input* object takes place with equal priority. The most recently performed action is carried out.

You can set the controller to automatically switch to this status after the bus voltage returns or after a download.

Night mode

The symbol on the user interface indicates that the controller is in night mode. This operation mode enables you to reduce or increase the room temperature to a greater extent during the night or over the weekend.

ECO mode is selected using the bus or the user interface.
- With the *Operation mode input* object and the value "3"
- With the *Night mode* button on the user interface

Toggling with the user interface and the *Operation modes input* object takes place with equal priority. The most recently performed action is carried out.

You can set the controller to automatically switch to this status after the bus voltage returns or after a download.

Frost/heat protection

The symbol on the user interface indicates that the controller is in *Frost/heat protection* mode. In this operation mode, heating or cooling is switched off. To prevent the heating freezing or the room overheating, heating or cooling is switched back on if adjustable temperature setpoints are undershot or exceeded. In the default setting, the value for the frost protection is +7°C and for the heat protection +35°C.

The frost/heat protection is selected using the bus or the user interface.
- With the *Operation mode input* object and the value "4"
- With the *Frost/heat protection* object and the value "1"
- With the *Frost/heat protection* button on the user interface

Toggling with the user interface and the *Operation modes input* object takes place with equal priority. The most recently performed action is carried out.

Frost/heat protection with priority

The frost/heat protection is activated with priority using the *Frost/heat protection* object and the value "1". If the object has the value "1", the transfer to another operation mode is blocked. This applies to the buttons on the user interface and the *Operation mode input* object. The value "0" exits the frost/heat protection again and calls up the most recently selected operation mode.

Dew point alarm

The dewpoint alarm causes an unconditional deactivation of the cooling. This provides a countermeasure against reaching the dewpoint temperature and the associated condensation. You require a dewpoint sensor for this function. If the KNX Multitouch Pro receives a "1" telegram on the *Dewpoint alarm* object, then the cooling is switched off. This operation mode has the highest priority. A "0" telegram terminates the dewpoint alarm and the current operation mode is used. If the heating controller mode is active, then the dewpoint has no effect.

Priority when switching over operation modes

You can switch back and forth between the 4 operation modes of Comfort, ECO, Night, and Frost/heat protection in different ways.
• Select an operation mode on the user interface
• Select an operation mode using the *Operation mode input* object
• Select the Frost/heat protection operation mode using the *Frost/heat protection input* object

Toggling with the user interface and the *Operation modes input* object takes place with equal priority. The action performed last is carried out. However, changing over is only carried out if no function with a higher priority is active.

The highest priority when calculating the setpoints is the dewpoint alarm. If this goes off, heating is still possible but cooling is deactivated ("0" at controller output"). The dewpoint alarm is terminated when its object is set to "0".

The second highest priority is frost/heat protection if it is triggered via the 1 bit object *Frost/heat protection*. Frost/heat protection is activated with the *Frost/heat protection* object and the value "1". The transfer to another operation mode is blocked as long as the object has the value "1". This applies to the buttons on the user interface and the *Operation mode input* object. The value "0" leaves frost/heat protection again and the last selected operation mode is called up.

Comfort mode is activated for the set duration using the *Time control* sub function. During this time, the received values are only stored on the *Operation mode input* object. Only after the time has elapsed does the controller change to the operation mode corresponding to the last received value. This behaviour is shown in the following diagram.

Alternatively, the change to *ECO*, *Night* or *Frost/heat protection* operation mode can be set. If another operation mode is called up previously using the user interface, comfort mode is cancelled and the other operation mode is activated directly.
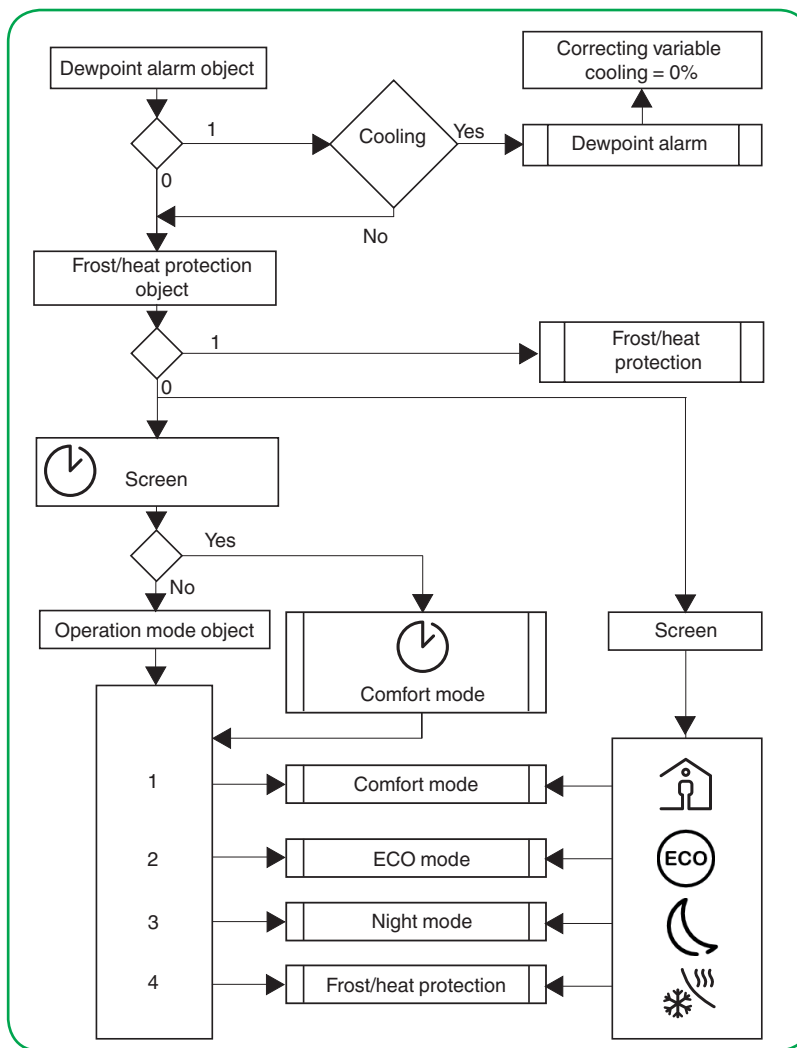
7.4 Heating and cooling

You can select the *Heating*, *Cooling* or *Heating and cooling* controller modes. In the Heating and cooling controller mode, the transition takes place automatically or via the *Heating/Cooling* object. Both heating and cooling are controlled by comparing the setpoint and the actual temperature.

The actual temperature can be registered using various temperature sensors.

- With the internal temperature sensor of the controller
- With an external temperature sensor, the values of which are received by the *External temperature* object
- With an external remote sensor connected to the controller

The controller can evaluate 2 temperatures proportionately from 0-100 %.

Room temperature or floor temperature

The external remote sensor can control the floor temperature as well instead of the room temperature. Proportional evaluation of the room and floor temperature is also possible.

Heating controller mode

In the heating control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature lies below the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0".

Heating with constant correcting variables (e.g. EMO valve drive)
- Radiator/convector warm water heating
- Underfloor warm water heating
- 2-circuit underfloor warm water heating
- Air convectors

Heating with switching correcting variables (e.g. switch actuator)
- Electric convector
- Night storage heating
- Ceiling heating
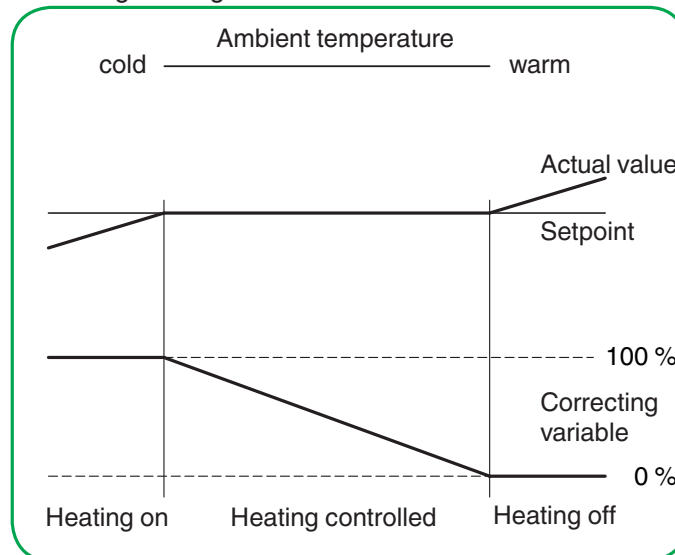
Cooling

In the cooling control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature lies above the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0".

Cooling with constant correcting variables (e.g. EMO valve drive)
- Cooling ceiling
- Air convectors

Cooling with switching correcting variables (e.g. switch actuator):
- Cooling ceiling
- Air convectors
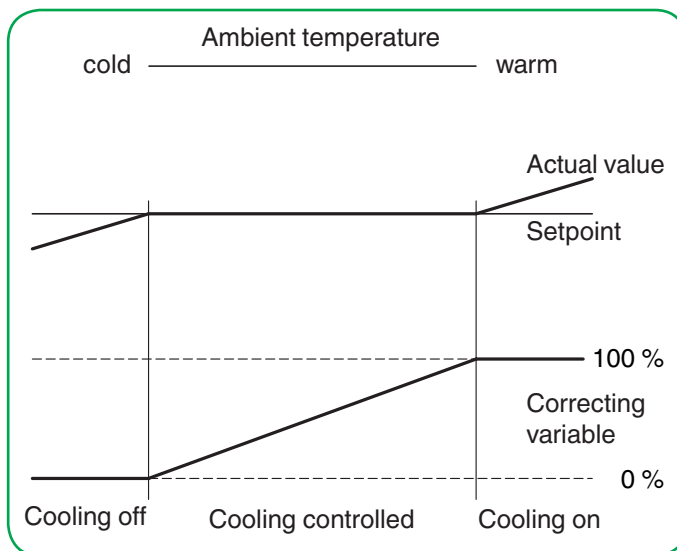
Heating and cooling

You can set how the change between heating and cooling takes place using the *Toggle between heating and cooling* parameter.

- Automatically by the controller
- Set externally via the *Heating/cooling* object

If you have selected the *Heating/cooling* object, the controller can only be forced into heating or cooling mode by the object value. You define the mode to which the controller changes after download or reset.

i The status of an external device for changing over between heating and cooling can be interrogated. To do this, set the *Reading on init* flag on the *Heating/cooling input* object. Note that the external unit is operational after a reset and supports the read request. Also set cyclical sending on the external device.

If automatic mode was selected, the controller decides which control mode is suitable based on the parametrised setpoints, the insensitive zone and the current actual temperature.

Dead zone   The insensitive zone prevents the controller from switching frequently between heating and cooling. For example, if a heater is used for heating, it has sufficient thermal energy after the valve has been closed to continue to heat the room above the setpoint temperature. If you have projected the same value for the heating and cooling setpoints, the insensitive zone is set to "0 K". After a delay time that can be set has elapsed, the air conditioning system cools because the setpoint for cooling has been exceeded. If there is a short delay time, the controller switches the controller mode particularly frequently.

Also make sure that the heating setpoint is always less than the cooling setpoint.
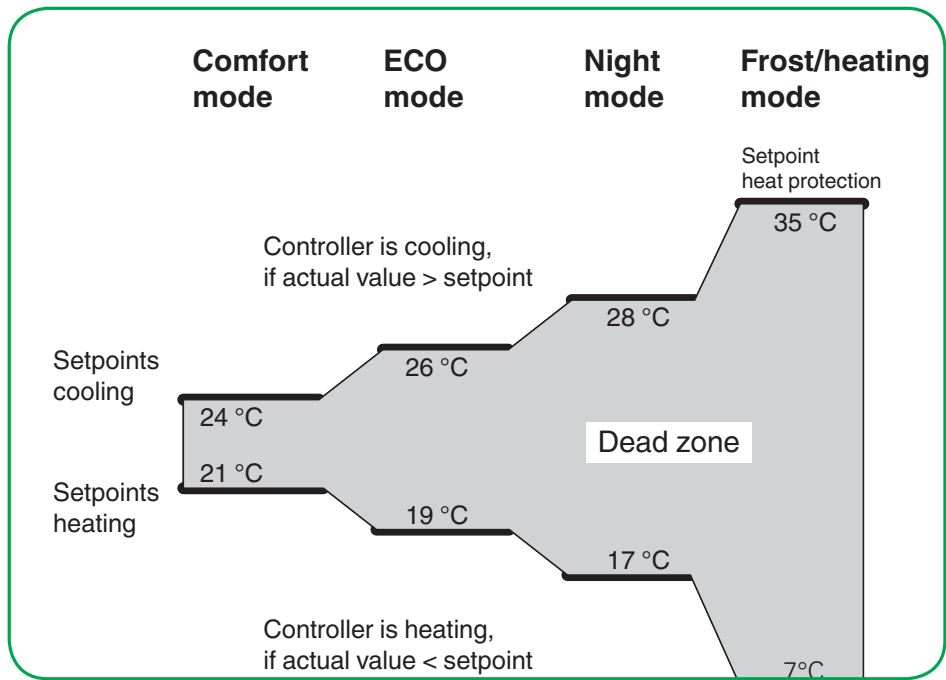
Heating and cooling with constant correcting variables (e.g. EMO valve drive):
- 2-pipe fan coil
- 4-pipe fan coil (with external switching between heating and cooling)
- 4-pipe fan coil (with automatic switching between heating and cooling)
- 1-circuit air conditioned ceiling
- Cooling ceiling with combined warm water heating
- Cooling ceiling with combined underfloor heating
- Variable air volume

Heating and cooling with switching correcting variables (e.g. switch actuator):
- Cooling ceiling
- Air convectors
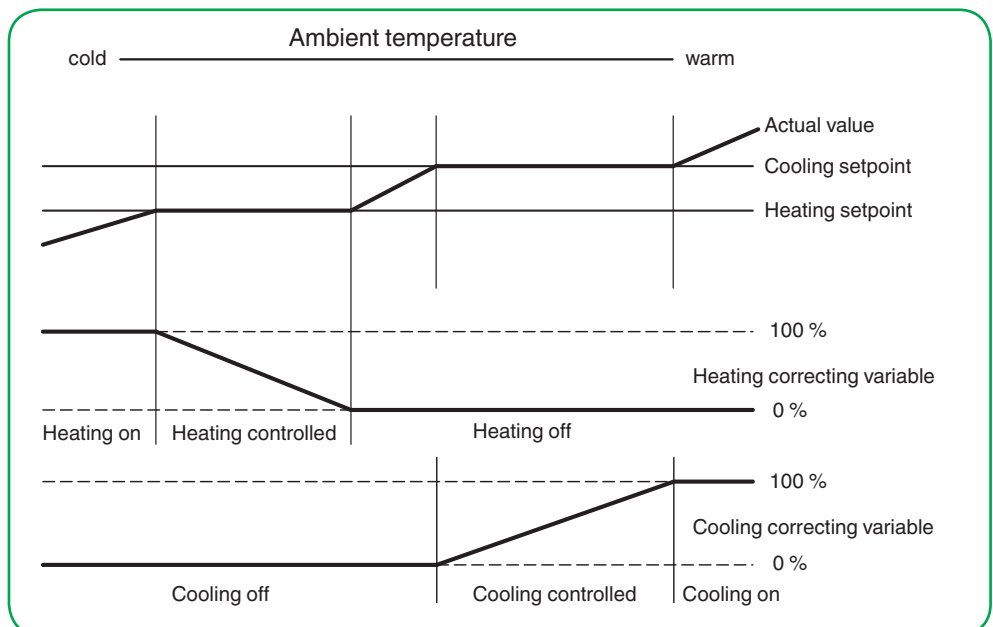
Adjust the setpoint ranges for heating and cooling together

The difference between the two setpoints (heating and cooling) is interpreted as the insensitive zone.

The setpoint shift acts jointly on heating and cooling.

Moving the setpoint for heating changes the setpoint for cooling accordingly.

When the setpoints are adjusted, the system takes account of whether the changed setpoint temperature can be achieved by heating or cooling. If the actual temperature during heating is the same as or greater than the setpoint temperature for cooling, then there is a change to the setpoint temperature for cooling.

Example

The setpoint is moved in steps of 1 K using the user interface of the room temperature control unit. Reducing the setpoint is shown in the following graphic.
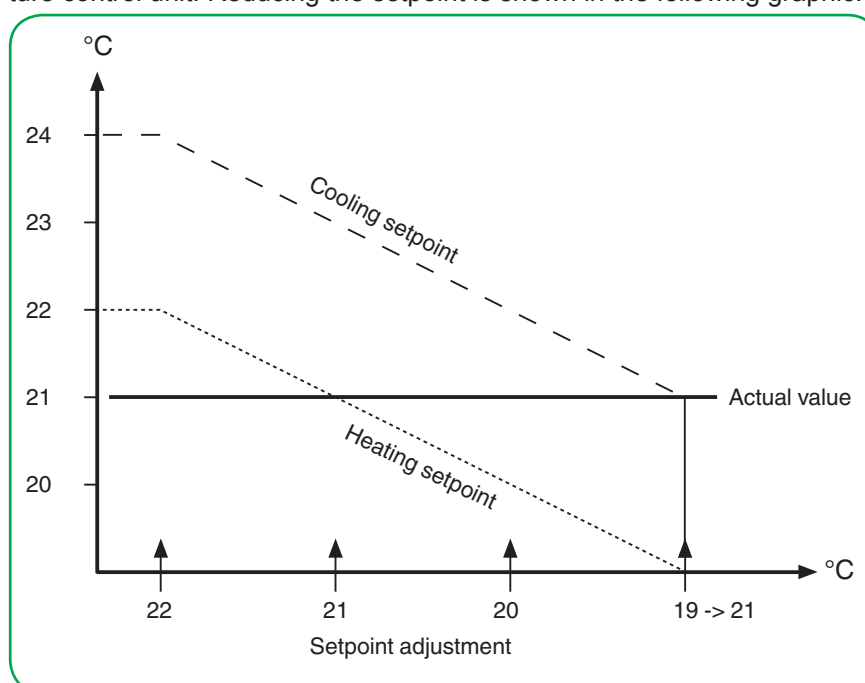
Initial status
- Current setpoint comfort mode heating = 22 °C
- Dead zone 2 K
- Actual temperature = 21 °C

Actions
- Reduce setpoint 3 x by 1 K

Result
- Display of the setpoint on the user interface: 21°C, 20 °C, 21 °C

In the transition from heating to cooling, the setpoint jumps from 20°C to 21°C. At a setpoint temperature for heating of 19°C and a dead zone of 2 K, the setpoint temperature for cooling is 21°C. The actual temperature is now equal to the setpoint temperature for cooling.

The corresponding thing applies to the transition from cooling to heating. If the actual temperature during is the same as or less than the setpoint temperature for heating, then there is a change to the setpoint temperature for cooling.

Two-step heating

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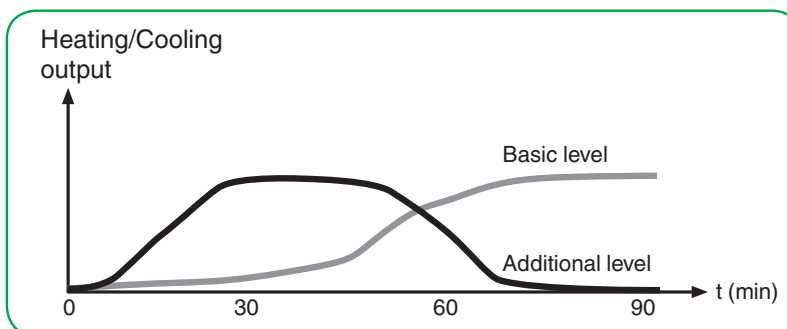
The same behaviour applies with cooling systems.

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

Example

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

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

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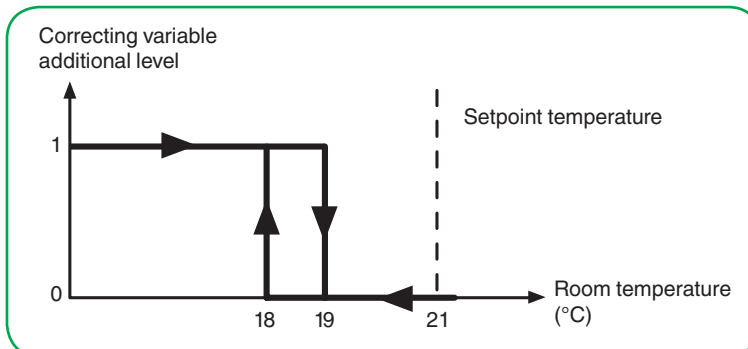
7.5 Controller types and correcting variables

For the basic level, select the *PI control* or *2-step control* controller types.

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

- Continuous 2-step control
- Switching 2-step control
- Continuous PI control
- Switching PI control

Continuous and switching 2-step control

The 2-step control is the simplest type of control. The heating switches on as soon as the actual temperature falls below a specific value, and switches off as soon as the setpoint temperature has been exceeded.

Switching 2-step control
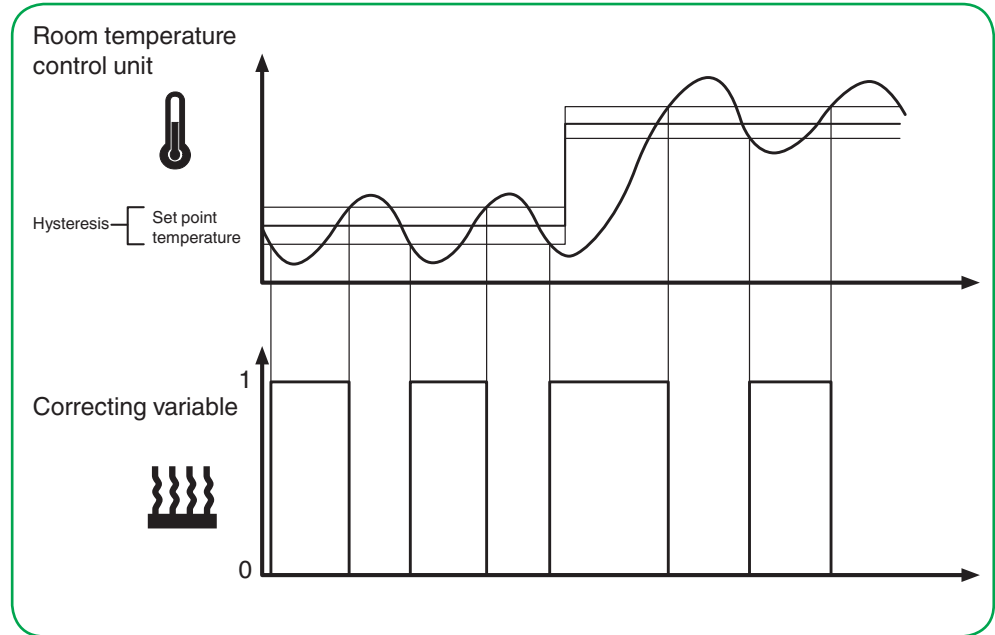
Continuous 2-step control
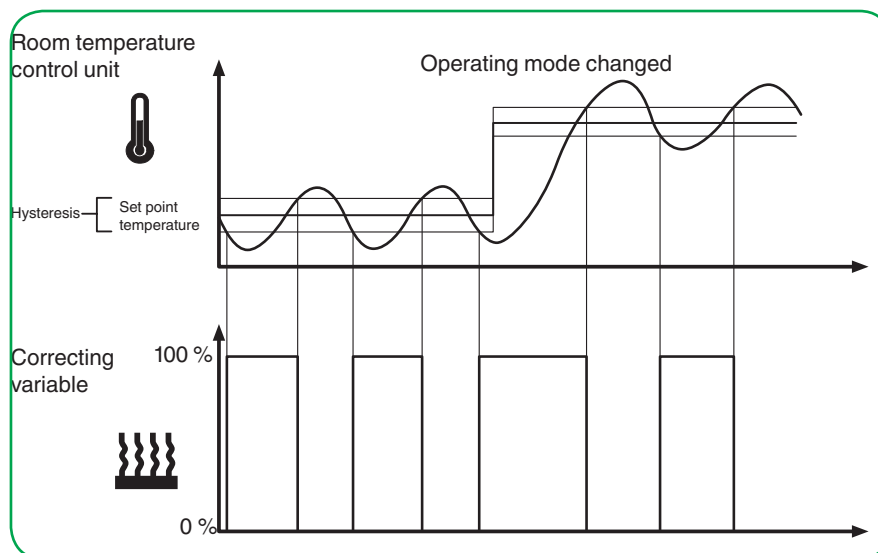
Features

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

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

Setting rules for the 2-step control

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

Continuous and switching PI control

For the PI control, the correcting variable is calculated from a proportional and an integral share. The calculation is governed by the following parameters.

- Temperature difference between actual value and setpoint
- Proportional range
- Reset time

In this way, the controller can correct the room temperature accurately. The corresponding correcting variable is transferred via a 1 bit/1 byte value to the bus.

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

- Warm water heating
- Underfloor heating
- Electric heating
- Fan convector
- Split unit
- Cooling ceiling

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

Continuous PI control

For the continuous PI control, the corresponding 1 byte correcting variable is transmitted 0-100 % directly via the bus to the heating actuator or an EMO valve drive, which convert the correcting variable directly to a degree of opening. However, this is only transmitted when the newly calculated correcting variable has changed by a specified percentage.
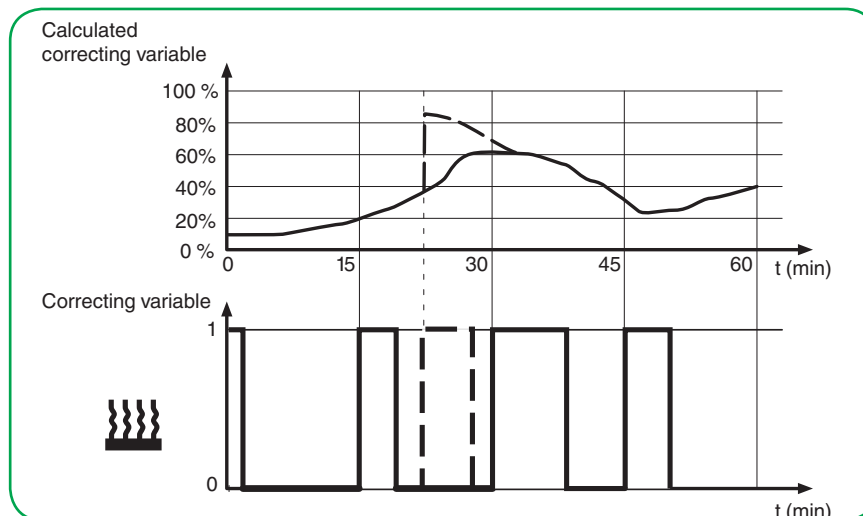
Switching PI control (PWM)

With the switching PI control, also known as the PWM control, the correcting variables calculated by the controller (0-100 %) are converted into a pulse-width modulation (PWM). Within a constant, defined cycle time, the control actuator is opened ("1") and then closed again ("0") for the calculated percentage period. For example, when a correcting variable of 25 % is calculated for a cycle time of 12 minutes, a "1" is transmitted at the beginning of the cycle time, and a "0" is transmitted after three minutes (= 25 % of 12 minutes)
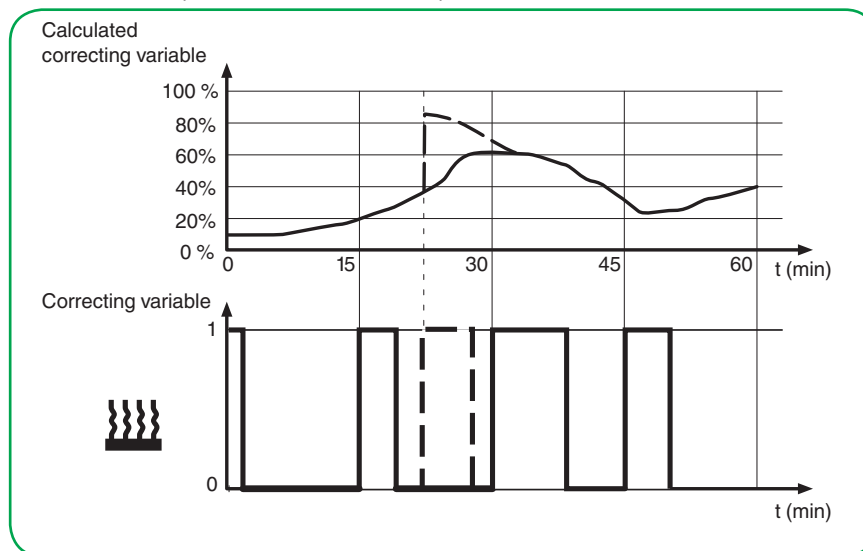
When the setpoint temperature changes, the controller recalculates the required correcting variable and transmits it in the actual cycle (broken line).

Setting rules for the PI control
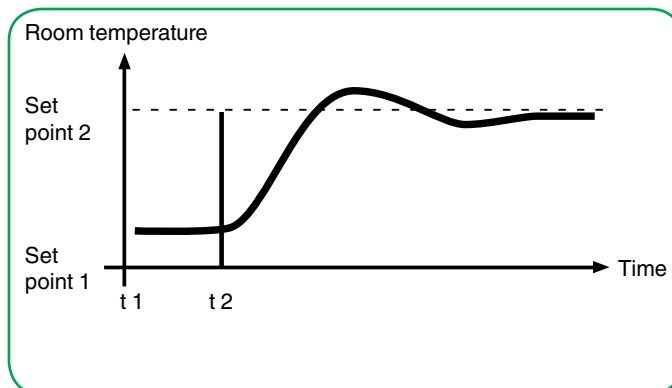
In general
- Large system increases (e.g. high heating output, steep characteristic curves for valves) are controlled with large proportional ranges.
- Slow heating systems (e.g. underfloor heating) are controlled with high-level reset times.

Adjustment via control parameter

If no satisfactory control result is achieved by selecting an appropriate heating or cooling system, you can improve the adaptation via *control parameters*.
- Low proportional range
  - Large overshoot for setpoint changes (also continuous oscillation under certain circumstances), rapid adjustment to the setpoint.
- Large proportional range
  - No (or little) overshooting, but slow adjustment.
- No reset time
  - Rapid correction of control deviations (ambient conditions), risk of continuous oscillation.
- Long reset time
  - slow correction of control deviations.

The framework conditions for setting the cycle time
- For small values, the switching frequency and the bus load are increased.
- For large values, temperature fluctuations are created in the room.
- Short cycle time for rapid heating systems (e.g. electric heating)
- Long cycle time for slow heating systems (e.g. underfloor warm water heating)

Examples

Warm water radiator heating with motorised valve drives

Properties	Parameter	Settings
Heating only	Controller type	Heating
	Correcting variable output	Continuous PI control
	Adjusting the controller to the heating system	Hot-water heating (5 K / 150 min)

Cooling ceiling with motorised valve drives

Properties	Parameter	Settings
Cooling only	Controller type	Cooling
	Correcting variable output	Continuous PI control
	Adjusting the controller to the cooling system	Adjustment via control parameter
	Cooling proportional range	Approx. 5 K (depending on the application)
	Reset time for cooling	Approx. 240 min. (depending on the application)

Switching electric radiator heating

Properties	Parameter	Settings
Heating only	Controller type	Heating
	Correcting variable output	Switching PI control
	Adjusting the controller to the heating system	Electric heating (4 K / 100 min)

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

Properties	Parameter	Settings
Heating or cooling as required, with automatic switching	Controller type	Heating and cooling
	Correcting variable output - heating	E.g. switching PI control
	Adjusting the controller to the heating system	Air convector (4 K/90 min)
	Correcting variable output - cooling	E.g. switching PI control
	Adjusting the controller to the cooling system	Air convector (4 K/90 min)
E.g. automatically switch between heating and cooling	Switch between heating and cooling	Automatically via the controller

Temperature limitation using shading facility

Properties	Parameter	Settings
Cooling only	Controller type	Cooling
	Correcting variable output - heating	Switching 2-step control
	Hysteresis	Large (e.g. 2 K)

7.6 Setting the room temperature control unit

Setting the general control parameters

You can activate the room temperature control unit on one of 8 screen pages.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Room temperature control unit

If you use a screen with the room temperature control, you activate the control. In the *Control General* tab you see: *Use control*: *Yes*.

If you have parametrised the *Heating and cooling* controller type, either the controller automatically switches between heating and cooling or it is done by the *Heating/cooling input* object accordingly. You can set a waiting time between heating and cooling.

Toggle automatically   If the controller automatically switches between heating and cooling, it is either in heating mode or cooling mode. The correcting variable of the non-active mode is switched to 0% (off).

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

The *Controller mode after reset/download* parameter is only significant if the controller switches over between heating and cooling using the *Heating/cooling* object.

The status of an external device for changing over between heating and cooling can be interrogated. To do this, set the *Reading on init* and the *Update* flag on the *Heating/cooling input* object. Note that the external unit is operational after a reset and supports the read request. Also set cyclical sending on the external device.

Further information is available in chapter .

Control general	Use control	Yes
	Controller type	**Heating**, cooling, heating and cooling
	Send heating/cooling object cyclically	Yes, **No**
	Toggle between heating and cooling	**Automatically (via the controller)**
		Externally (via heating/cooling object)
	Controller mode after reset/download	**Heating,** cooling
	Waiting time after switching-over heating and cooling	Yes, **No**
	Waiting time (1-60 min)	1-60, **1**
	Controller mode after reset/download	Cooling, **heating**

Selection of operation mode   You select the operation mode after download and reset .

On the user interface C*omfort mode* is activated for the set duration using the *Time control* sub function. At the end of this time, the controller changes to the selected operation mode.

Control general	Operation mode after reset/download	**ECO mode,** Comfort Mode, Night mode
Screen x	Operation mode after timed comfort mode	**Like operation mode object**, ECO mode, Night mode, Frost/heat protection

Set control heating/cooling and additional level

In the *Control general* tab, select the *Heating*, *Cooling* or *Heating and cooling* controller mode. For heating, the *Control heating* tab appears and for cooling, the *Control cooling* tab. Information on heating and cooling with and without 2 levels can be found in chapter Heating and cooling --> 104.

Here, you can set which heating control type should be activated. For PI controls, you can select between five standard system types when heating, for which the recommended parameters have already been preconfigured. When cooling with PI controls, you can select between three standard system types. However, if you have sufficient specialised knowledge, you can also set the control parameters as required. For 2-step control, set the hysteresis here. Information about the controller types can be found in chapter Controller types and correcting variables --> 109.

Control heating Control cooling	Basic level	
	Type of correcting variable	2-step control
		PI control
Control heating	Select heating system	Adjustment via control parameter
		Hot-water heating (5 K / 150 min)
		Underfloor heating (5 K / 240 min)
		Electric heating (4 K / 100 min)
		Air convector (4 K / 90 min)
		Split unit (4 K/90 min)
Control cooling	Select cooling system control	Adjustment via control parameter
		Air convector (4 K / 90 min)
		Split unit (4 K / 90 min)
		Cooling ceiling (5 K / 240 min)
[Adjustment via control parameter - PI]	Proportional range for heating (cooling) in 0.1 K (10-255)	10 - 255, **40**
[Adjustment via control parameter - PI]	Reset time heating (cooling) (1-255 min)	**No**, 1 - 255
Control heating Control cooling	Hysteresis [2-step control]	0.2 K - 2.0 K, **0.5 K**

Next, set the additional level.

Control heating Control cooling	Use additional level	Yes, **No**
	Interval level = factor (10-100) * 0.1 K	10-100, **20**
	Hysteresis	0.3 K - 2.0 K, **0.5 K**

If you use the valve protection for the basic level then valve protection is also set up for the additional level.

Correcting variables and valve protection

Information about the different controller types and correcting variables can be found in chapter Controller types and correcting variables --> 109. Different parameters must be set depending on the controller type and correcting variable.

Correcting variables

For all controller types, you can additionally set a *Cycle time for automatic sending of correcting variable*. If the valve drive has not received a value (e.g. during commissioning), the room could continuously heat up or cool down. To prevent this, set the "Cycle time for automatic sending of correcting variable". The correcting variable is transmitted again within the set time.

With constant PI control, you define the change from which point onwards the correcting variable is sent.

You can set the minimum and maximum correcting variable with a continuous PI control. Note that the valve can remain open continuously at a minimum control value > "0".

For a switching PI control, define the cycle time of the switching correcting variable for the pulse-width modulation. Within a constant, defined cycle time, the control actuator is opened ("1") and then closed again ("0") for the calculated percentage period.

PI control   Next, set the correcting variables for the basic level of a PI control.

Correcting variables heating Correcting variables cooling	Output of the PI control	PI control (switching)
		PI control (continuous)
[PI control switching]	Cycle time of the switching correcting variable (2-60 min)	2-60, **15**
[PI control continuous]	Minimum correcting variable (0-100 %)	0-100 %, **0 %**
[PI control continuous]	Maximum correcting variable (100-0 %)	100-0 %, **100 %**
[PI control continuous]	Change for sending of correcting variable	2-10 %, **3 %**
	Send correcting variable cyclically	Yes, **No**
	Cycle time for automatic transmission of the control value in min (1-60)	1-60, **5**
	Don´t send inactive value cyclically	Yes, **No**

2-step control   Next, set the correcting variables for the basic level of a 2-step control.

Correcting variables heating Correcting variables cooling	Output of the 2-step control	**2-step control (switching)**
		2-step control (continuous)
	Send correcting variable cyclically	Yes, **No**
	Cycle time for automatic transmission of the control value in min (1-60)	1-60, **5**

Valve protection

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

Next, set the valve protection.

Correcting variable heating Correcting variable cooling	Use valve protection	Yes, **No**

Activate valve protection every (1-30 days)	1-30, **15**
Move to end position for (1-30 min)	1-30, **4**

If you use the valve protection for the basic level then valve protection is also set up for the additional level.

Temperature unit Celsius or Fahrenheit

On the user interface temperature values can either be displayed with the unit Celsius or Fahrenheit. The general selection is done under the *General Settings* tab in the *User Interface* tab.

General Settings		
User interface	Temperature unit	**Celsius,** Fahrenheit

The selected unit is used for the actual and setpoint temperature of the room temperature control unit and the information display. The communication on the bus is only done via values with the units Celsius or Kelvin. If the unit Fahrenheit is selected, the values are converted for the display on the user interface.

Room and floor temperature

Evaluate and mix temperature sensor

3 sources are available for calculating the actual temperature.
- Internally measured room temperature of the room temperature control unit
- External room temperature via the *External temperature* object
- Floor temperature measured by an additionally connected remote sensor

The controller can evaluate 2 temperatures proportionately from 0-100 %.

Room temperature control unit

The internally and externally measured room temperature can be mixed proportionally for measuring the room temperature. The controller adapts this actual value to the specified setpoints.

Floor temperature control

If the controller only measures and evaluates the floor temperature, the floor temperature is adapted to the specified setpoints. Proportional mixing of the room and floor temperature is also possible. The remote sensor for KNX room temperature control unit is available as an accessory (art. no. MTN6181-6035).

Temperature correction

You can set a correction value for the temperature sensor installed in the room temperature control unit. This is useful, for example, if the controller is mounted at an unfavourable position in the room. The temperature recording is different when exposed to a draught or close to sources of heat, for example, compared to other places in the room. The following formula applies: Actual temperature = measured temperature + correction value.

Send conditions

The temperature of the remote sensor for KNX room temperature control unit is corrected in the same way if required.

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

Floor temperature alarm and temperature alarm

When the set floor temperature is reached, the value "1' is sent using the *Floor temperature alarm* object, and the value "0" is sent if this temperature is undershot. The hysteresis is 0.5 K. The outputs for heating are also set to the value "0". The actual temperature is evaluated proportionately in the temperature alarm. The alarm is sent via the *Temperature alarm (resultant)* object. However, the outputs for heating are not influenced.

Next, set the internal temperature, the resulting actual temperature and the floor temperature.

Actual temperature (resultant)	Internal temperature	
	Correct internal actual temperature = factor (-120 ... 120) * 0.1 K	- 120...120, **0**
	Actual temperature (resulting)	
	Mixing of temperatures	**Internal sensor / External object**
		Internal sensor / Floor sensor
		External object / Floor sensor
	Proportion of first temperature (0-100 %)	0-100 %**, 100 %**
	Send actual temperature at deviation (0-2 K)	0.1...2 K, **0.2 K**
	Send actual temperature every (0-60 min)	0-60 min, **5 min**
	Actual temperature (resultant) alarm limit	No, 20-40 °C, **40**
	Floor temperature	
	Correct floor temperature factor (-120...120) * 0.1 K	- 120...120, **0**
	Alarm limit for floor temperature	No, 0-40 °C, **35**

Setpoints and operation modes

For each operation mode, you can specify setpoints for heating and cooling. When changing the operation mode, the relevant setpoint for continued room temperature control is used. You can adjust the setpoints for all operation modes (except frost/heat protection) within adjustable limits manually using the user interface or objects. With the basic setpoint shift, you can additionally move the setpoints set in the parameters, and thereby change the basis for further shifts. For information, see chapter .

Setpoints per operation mode   Depending on the previously selected controller mode (*Control general*tab), the setpoints for heating, cooling or heating and cooling are shown. You can define the following setpoints.

Setpoints and operation modes	Heating	
	Comfort setpoint	5.0 - 45 °C, **21.0 °C = 69.8 °F**
	Setpoint ECO	5.0 - 45 °C, **19.0 °C = 66.2 °F**
	Night setpoint	5.0 - 45 °C , **17.0 °C = 62.6 °F**
	Frost protection setpoint	5.0 - 45 °C, **7.0 °C = 44.6 °F**
	Cooling	
	Comfort setpoint	5.0 - 45 °C , **24.0 °C = 75.2 °F**
	Setpoint ECO	5.0 - 45 °C, **26.0 °C = 78.8 °F**
	Night setpoint	5.0 - 45 °C, **28.0 °C = 82.4 °F**
	Heat protection setpoint	5.0 - 45 °C, **35.0 °C = 95.0 °F**

Setpoint adjustment

Limits for setpoint shift

You can only change the setpoints within the limits for the setpoint shift. To do this, define the values for the upper and lower setpoint shift. You select whether a setpoint shift is maintained after the change of operation mode.

Basic setpoint shift

If you use the basic setpoint shift, you can change the current setpoints and the basis for further setpoint shifts (Setpoint adjustment --> 97).

Reset and download

You can define whether the setpoint shift is maintained after a reset. If the values should be stored and called up, select *Setpoint shift maintained after reset*. You can also set the behaviour following a download.

The basic setpoint shift is maintained after a reset. If the values should be deleted after a download, select *Delete setpoint shift and basic setpoint shift after download*.

The values of a setpoint shift or a basic setpoint shift are permanently saved only after 10 s. A new value, received immediately before a failure, can not be saved.

Max. upper setpoint adjustment	0-10 K, **5 K**
Max. lower setpoint adjustment	0-10 K, **5 K**
Setpoint adjustment maintained after change in operation mode	Yes, **No**
Setpoint shift maintained after reset	Yes, **No**
Setpoint shift and basic setpoint shift deleted after download	Yes, **No**
Use basic setpoint shift	Yes, **No**

Status reports

If you want to display the system's status using visualisation software, there is one 1 bit, one 1 byte and one 2 byte status object available for this purpose. For the 1 bit status object, you define which information is reported.

	Status reports	Define 1 bit status object	Bit 0: Comfort
			Bit 1: ECO
			Bit 2: Night mode
			Bit 3: Frost/heat protection
			Bit 4: Dew point alarm
			Bit 5: Heating (1)/cooling (0)
			Bit 6: Controller inactive
			Bit 7: Temperature alarm (1)

Structure of the 1 byte status object

Bit 0   Comfort (1/0)

Bit 1   ECO (1/0)

Bit 2   Night mode (1/0)

Bit 3   Frost/heat protection (1/0)

Bit 4   Dewpoint alarm (1/0)

Bit 5   Heating (1) / cooling (0)

Bit 6   Controller inactive (1/0) - all correcting variables are = 0

Bit 7   Floor or room temperature alarm (1/0)

Structure of the 2 byte status object

Bit 00   Error (1/0)

Bit 01   * (0)

Bit 02   * (0)

Bit 03   * (0)

Bit 04   Heating additional level (1/0)

Bit 05   * (0)

Bit 06   * (0)

Bit 07   Heating inactive (1/0)

Bit 08   Heating (1) / cooling (0)

Bit 09   * (0)

Bit 10   Cooling additional level (1/0)

Bit 11   Cooling inactive (1/0)

Bit 12   Dewpoint alarm (1/0)

Bit 13   Frost/heat protection (1/0)

Bit 14   Floor or room temperature alarm (1/0)

Bit 15   * (0)

* Not supported

Fan speeds

Using the room temperature control unit, you can also control a KNX Fan Coil actuator. In addition to control, you set a fan step during ongoing operation for manual mode and change between automatic and manual mode. In automatic mode, the fan coil actuator takes over control of the fan steps.

The following illustration shows the *Fan steps* sub function page.

Room temperature control unit
Sub function page
Fan speeds
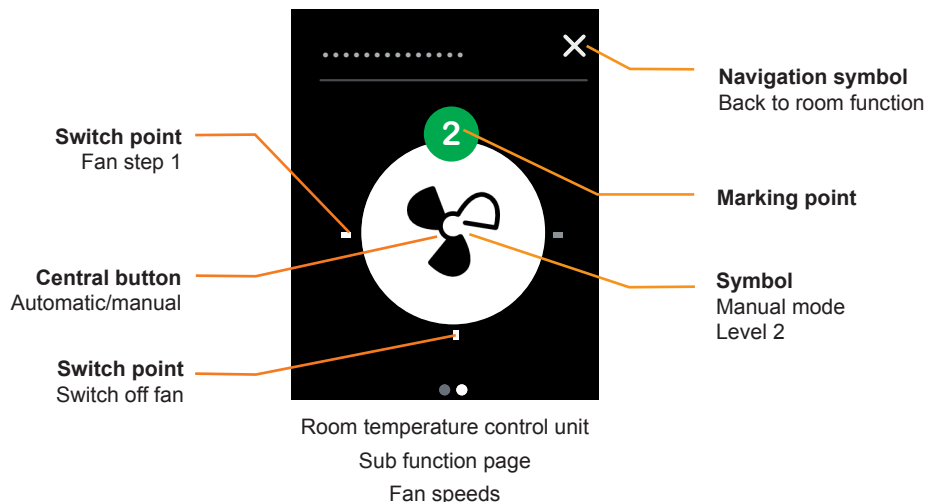
- Tap one of the 4 switching points to set the fan step.
- Tap the central button to change between automatic and manual mode.
- The symbol and marking point show the current fan step in manual mode.

Settings in ETS

You define the thresholds for display of a fan step. In addition, you select the value for changing over between manual and automatic mode with the *Manual mode* 1 bit object.

Fan speed	Use fan	Yes, **No**
	Number of fan speeds	**3**, 4, 5
	Display of the fan step 1 from … % [3, 4, 5 fan steps]	1-100%, [**10 %, 5 %, 5 %**]
	Display of the fan step 2 from … % [3, 4, 5 fan steps]	1-100%, [**40 %, 20 %, 20 %**]
	Display of the fan step 3 from … % [3, 4, 5 fan steps]	1-100%, [**70 %, 40 %, 40 %**]
	Display of the fan step 4 from … % [4, 5 fan steps]	1-100%, [**60 %, 60 %**]
	Display of the fan step 5 from … % [5 fan steps]	1-100%, [**80 %**]
	Show "Auto" on the display	**If the status automatic = "0"**
		If the status automatic = "1"

You can also set the values for the fan steps and manual mode with fan coil actuators. Make sure that the values are identical.

7.7 Group objects

Group objects for room temperature control

No.	Name	Object function	Length	Properties	DPT ETS4/5
217	Heating/cooling input	Temperature control	1 bit	Receives	1.001 switching
218	Heating/cooling output	Temperature control	1 bit	Sends	1.001 switching
219	Operation mode input	Temperature control	1 byte	Receives	5.010 counter impulses (0-255)
220	Operation mode output	Temperature control	1 bit	Sends	5.010 counter impulses (0-255)
221	Frost/heat protection input	Temperature control	1 bit	Receives	1.001 switching
222	Frost/heat protection output	Temperature control	1 bit	Sends	1.001 switching
223	Dew point alarm	Temperature control	2 byte	Receives	1.001 switching
224	Status	Temperature control	1 bit	Sends	1.001 switching
225	Status 1 byte	Temperature control	1 byte	Sends	5.010 counter impulses (0-255)
226	Status 2 byte	Temperature control	2 byte	Sends	7.001 counter impulses without sign
227	Setpoint input	Temperature control	2 byte	Receives	9.001 temperature (°C)
228	Setpoint output	Temperature control	2 byte	Sends	9.001 temperature (°C)
229	Setpoint adjustment input	Temperature control	2 byte	Receives	9.002 temperature difference (K)
230	Setpoint adjustment output	Temperature control	2 byte	Sends	9.002 temperature difference (K)
233	Basic setpoint shift input	Temperature control	2 byte	Receives	9.002 temperature difference (K)
234	Basic setpoint shift output	Temperature control	2 byte	Sends	9.002 temperature difference (K)
235	External temperature 2 byte	Temperature control	2 byte	Receives	9.001 temperature (°C)
237	Actual temperature (resulting)	Temperature control	2 byte	Sends	9.001 temperature (°C)
238	Temperature alarm (resultant)	Temperature control	1 bit	Sends	1.001 switching
239	Floor temperature alarm	Temperature control	1 bit	Sends	1.001 switching
240 241	Correcting variable heating (basic level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
243	Correcting variable heating (additional level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
244 245	Correcting variable cooling (basic level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
247	Correcting variable cooling (additional level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
248	Manual mode input	Fan control	1 byte	Receives	1.001 switching
249	Fan step input	Fan control	1 bit	Receives	5.001 percent (0-100 %)
250	Manual mode output	Fan control	1 byte	Sends	1.001 switching
251	Fan step output	Fan control	1 bit	Sends	5.001 percent (0-100 %)

8   Scene module

Overview

You can operate the scene module from one of eight screen pages.

Express settings		
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Scene module

You can configure the scene module in the *Scene module* tab.

You can use the *Scene module* to save up to four scenes internally, each with up to four room functions. For each scene, you can transmit up to four values for room functions.

Transmit room functions

You can transmit several values for room functions with a single scene. For example, with a single scene you can dim the room lighting to a specific value, move the blinds or change the current operating mode of the room temperature control unit.

Save room functions

You can set the values for up to four different room functions for each of the up to four scenes. You can save a maximum of up to 16 values. During operation, you can change all values and set which values are to be transmitted.

Transmitting values for scenes

The following illustration shows a screen page with the *Scene module* function.

Marking ring
Button 1 for scene

Symbol
Button 3 for scene

Scene module
Main function page
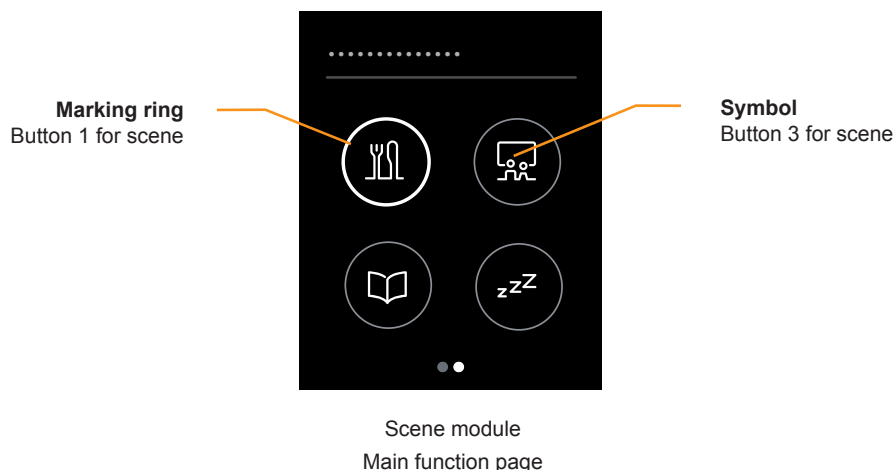
Transmitting values for a scene
- Tapping on a button transmits up to four values for one scene.

Navigating to the values
- Tapping and holding a button switches to the sub functions of a scene.

Status indication
- To make operation easier, the marking ring on the button lights up when you tap it. Object values are not evaluated.

State	Display
Touch top button briefly (tap)	Marking ring is wide and lights up brightly
Other states	Marking ring is narrow and lights up less brightly

Adjusting values

Adjusting values
Sub function page
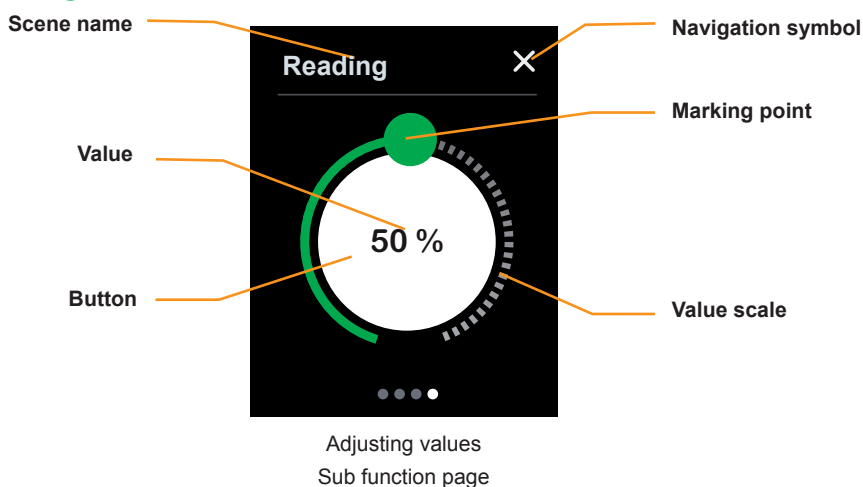
Adjusting values
- Swiping the value scale changes a value.
- Tapping the value scale changes the value directly.

Enabling transmission of the value
- Tap on the button to enable or block the transmission of the value for the scene.

Status indication value
- The position of the marking point shows the currently saved value.
- The current value is also displayed on the button.

Enabled display
- The button lights up in white when transmission is enabled, otherwise in grey.

State	Display
Enabling transmission	Button lights up white
Transmission blocked	Button lights up grey

Navigation
- Tap the navigation symbol to return to the main function page. There, you can transmit the values for the scenes.
- Swipe right/left to access additional pages for setting the values.

Settings in ETS

You can alter the layout of the screen page.

Scene module screen	Position of buttons
	Which function symbol do you use for scene x [1-4]?

- You can select 1-4 buttons. The positions of the buttons correspond to those of the *1-4 buttons* screen type ().
- Select a symbol for each button.

Day	Night	Saving energy	Sitting	Reading
Dressing	Watching TV	Meeting	Dining	Sleeping
Night light	Locking	Presence simu-lation	1 [1-6]	Quadrat
Triangle	Circle	Hexagon	Star	Cross
Cleaning	Service call	First Aid	Do not disturb	
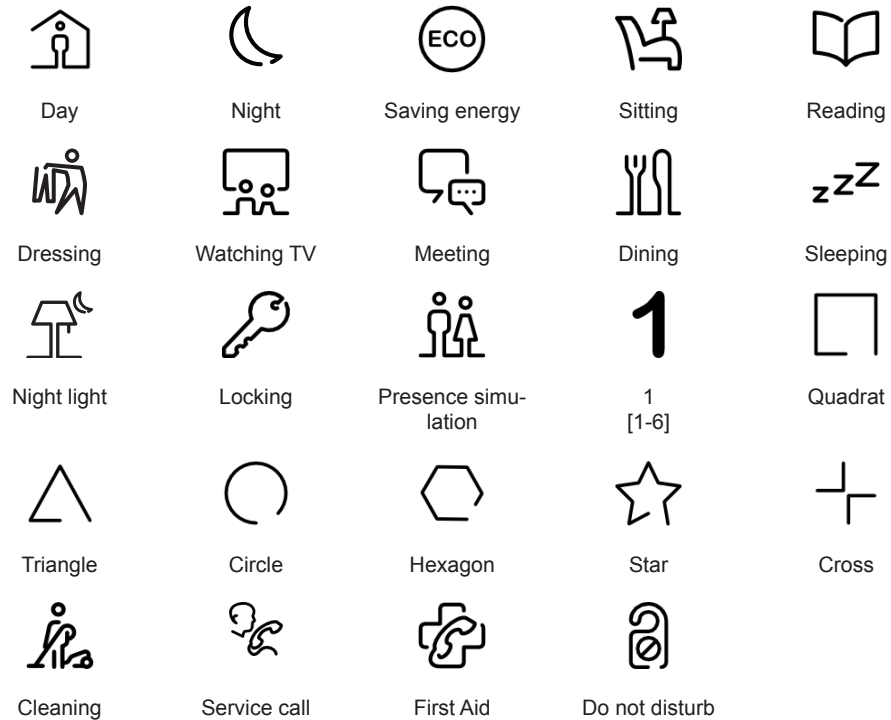
Settings for each scene

Scene module	
Scene x [1-4]	Scene name [1-8 characters]
	Value of the scene address [0-63]
	Function of the value x [1-4]
	After download send value when calling a scene

Scene name

You can select a scene name that is between one and eight characters long.

Scene address

You can also retrieve a scene externally via a bus. To accomplish this, define the value for the retrieval of the respective scene of the scene module.

Function of the value

Select up to four functions for each scene.
- No function
- Switching
- Move up/down
  - Blind or roller shutter
  - 1 bit (movement object)
- 1 byte value
  - Values of 0-255 with limit values
- 1 byte percent
  - Values of 0-100% with limit values
- Operating modes
  - Comfort mode, ECO mode, night mode, frost/heat protection
- Temperature
  - 2-byte temperature values with limit values

Transmit value on scene retrieval

Define whether the value will be transmitted when the scene is retrieved after a download or reset. During operation, you can enable or block transmission for each value.

Group objects

For each scene, select up to four functions, each with one object. The values are transmitted when the scene is retrieved. The *Scene address input* object can be used to retrieve the scenes via the bus.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
x	Switch object x	Scene module - scene x	1 bit	Sends	1.001 switching
x	Movement object x	Scene module - scene x	1 bit	Sends	1.001 switching
x	Value percent x	Scene module - scene x	1 byte	Sends	1.008 up/down
x	Value absolute x	Scene module - scene x	1 byte	Sends	5.001 percent (0-100 %)
x	Operation mode x	Scene module - scene x	1 byte	Sends	5.010 counter impulses (0-255)
x	Temperature object x	Scene module - scene x	2 byte	Sends	9.001 temperature (°C)
263	Scene address input	Scene module	1 byte	Receives	18.001 scene monitoring

9   Messages

In ongoing operation, 5 general and 5 service messages can be shown. As long as a message is activated, the screen saver and the standby function are deactivated. Messages also terminate the cleaning mode.

9.1   Service messages

In ongoing operation, 5 service messages can be shown. The service messages are used in the hotel business above all else. A typical message for a device in the corridor is *Please clean*. The corresponding service message is always activated and deactivated using the bus. You can configure up to 5 service messages.

The following illustration shows an activated service screen.
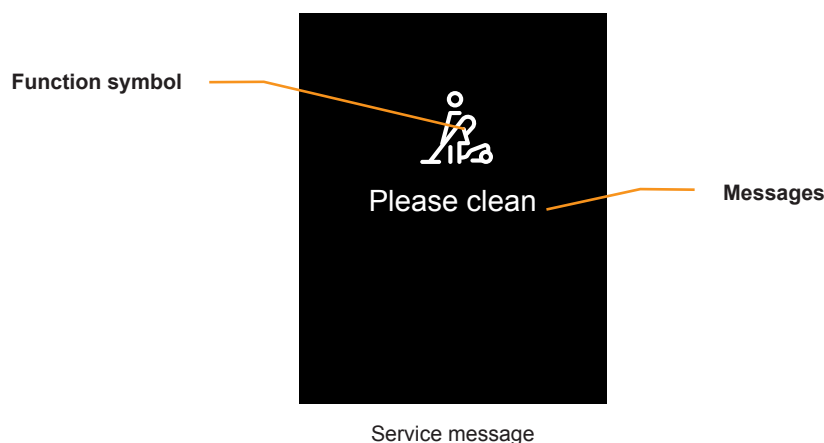
Service message

Settings in ETS

You select the parameters under the *General settings* tab.

General settings		
Service messages	Use service messages	Yes, **No**
	↳	
	How many service messages?	
	Service message x (1-14 characters)	
	Service symbol x	

Service message

For each of the 5 messages, you enter a text up to 14 characters long. There is a *Service object* 1 bit object for each message. The value "1" calls up the message and blocks all other functions. The value "0" deletes the message and the screen that was active before the message appears and can be used. If sever service messages are activated, the last activated message is displayed.

Symbol

Select a symbol for each service message.

| Cleaning | Service call | First Aid | Do not disturb | No symbol |

Group objects

There is a *Service message* 1 bit object for each of the 5 service messages.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
203	Service message 1	Service messages	1 bit	Receives	1.001 switching

9.2 Messages

Messages are short texts that are triggered on certain events. For example, an anemometer can trigger the *Strong wind* message. The message in question is always activated via the bus. Messages also terminate prematurely the cleaning mode. The message disappears when you touch the screen. You can configure up to 5 messages.

In contrast to the service messages, no symbol can be displayed with the messages.

Settings in ETS

You select the parameters under the *General settings* tab.

General settings		
Messages	Use messages	Yes, **No**
	How many messages?	
	Colour of background	
	Colour of text	
	Message x (1-14 characters)	

Messages

For each of the 5 messages, you enter a text up to 14 characters long. You select colours for the background and for the text. There is a *Message x* 1 bit object for each message. The value "1" calls up the message. When you touch the screen, the screen that was active before the message appears. If several messages are activated, the last activated message is shown.

Group objects

There is a 1 bit *Message object* for each of the 5 messages.

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
197	Message 1	Messages	1 bit	Receives	1.001 switching

10 General settings

10.1 Overview

In the General settings, you set up the user interface, set gesture and proximity function, write texts for messages and decide which functions can be set in ongoing operation.

Settings in ongoing operation

You can use each of the up to 9 screen pages for the settings in ongoing operation (Selecting screens --> 16). There is a main function page (1-4 functions) and up to 9 sub function pages.

You activate and deactivate functions on the main function page.

- Screen saver
- Gesture function
- Standby and Always On function
- Day and night operation

You can set and activate functions on the sub function pages.

- Brightness for day mode
- Brightness for night mode
- Duration until standby
- Duration until screen saver is called up
- Number of the main screen
- Duration until main screen is called up
- Screen lock
- Duration of clean mode
- System information and versions
- Start for firmware update
  - Read before the start of a firmware update: New firmware version --> 143

The functions are described briefly below.

Screen saver function

When the screen is no longer touched and no proximity is detected, the screen saver appears after a certain time (30-600 s).

Standby and proximity function

When the proximity function is active, the screen is only visible when you approach within approx. 20 cm of the KNX Multitouch Pro. In addition, telegrams can be sent directly when proximity is detected and with a delay after the last detection.

As soon as proximity is no longer detected, the time (30-600 s) until standby starts. The backlighting is switched off when in standby.

The delay until standby is also triggered after the last touch of the screen.

Always On function

The current screen is displayed continuously when Always On function is activated. If a main screen has been set up, it appears after the set time has elapsed. If a screen saver is additionally activated, this appears after a certain time. Either the the Always On function or the standby function is active.

Gesture function

When the gesture function is switched on, the KNX Multitouch Pro can detect a hand movement and thus call up the functions that you have defined. This means the light can be switched on and off with gestures. The gestures are detected at a distance of about 5 cm from the device.

Day and night operation

You can set different brightness values for the backlighting in day and night mode. The change between day and night mode takes place using the bus or the user interface. The brightness can also be changed using the bus.

Main screen

You can define a screen as the main screen. If the current screen is no longer touched, the main screen appears after the set time (30-600 s).

Screen lock

The screen lock protects the KNX Multitouch Pro against unauthorised use. The lock is set using the user interface or the bus.

You release the screen again by entering a 4-digit numerical code with the digits 1-9. Alternatively, the release is via the bus.

An activated lock continues even after the KNX Multitouch Pro is restarted.

Cleaning mode

If you activate the clean mode on the user interface, the screen does not react on contact for 15-90 s. New messages will still appear and terminate the cleaning mode prematurely.

New firmware version

Read before the start of a firmware update: .

NOTE
Unprofessional use of the update function can put the device permanently out of operation.
Activate the button for firmware update only just before you update!
Note the advice for a safe transfer of the firmware.

Messages and service messages

You can set up to 5 messages and 5 service messages in the ETS. Each of the messages is called up with an On telegram. Messages can be deleted on the screen by tapping, whereas service messages can only be deleted with an Off telegram ().

10.2 Settings screen page

On the *Settings* screen page, you activate and deactivate device functions with 4 buttons. The sub function pages for additional settings are called up using the navigation symbol.

Operate settings screen page

The following illustration shows the *Settings* main function page.

Navigation symbol
To the sub functions

Button 1
Screen saver function

Button 3
Standby function /
Always On function

Button 2
Gesture function

Button 4
Day/night mode

Settings
Main function page
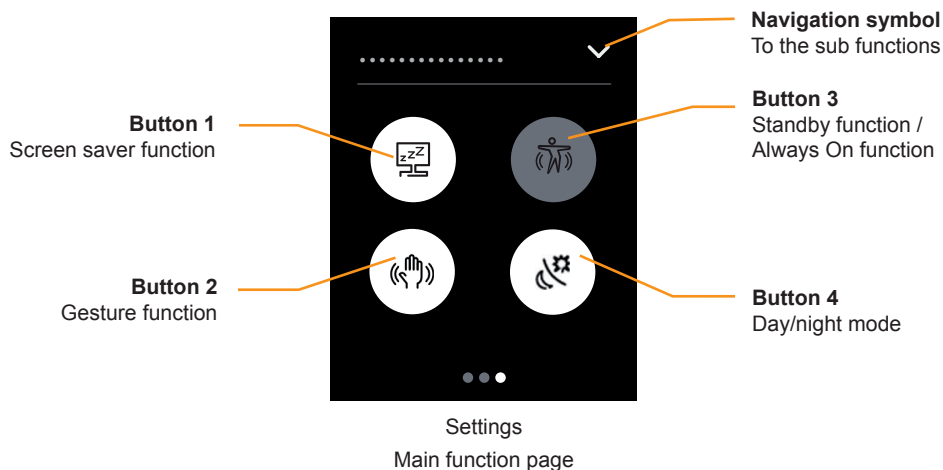
Screensaver
- Tap button 1 to activate and deactivate the function for calling up the screen saver.
- The button lights up white when the screen saver function is activated.

Gesture function
- Tap button 2 to activate and deactivate the gesture function.
- The button lights up white when the gesture function is activated.

Standby function / Always On function
- Tap button 3 to change between the standby function and Always On function.
- The button lights up white when the standby function is activated.

Day and night operation
- Tap button 4 to change between day and night mode.
- The transition between day and night mode also takes place using the *Night mode input* object.
- The button lights up white when day mode is activated.

Functions on the sub function pages
The navigation symbol accesses the screen pages with the following functions.
- Brightness of day mode
- Brightness of night mode
- Duration until screen saver is called up
- Duration until standby
- Number of the main screen
- Duration until main screen is called up
- Screen lock
- Duration of clean mode
- System information and versions
- Start button for firmware update

Set Settings screen page in the ETS

Select screen
As in all screens, you also select the *Settings* using the express settings.

Express settings		
Screen x [1-9]	Screen name (1-13 characters)	
	Which screen type do you use?	Settings

Settings in ongoing operation

If you do not select a page for the settings, there are no settings in ongoing operation. Functions or sub functions for the *Settings* screen can then not be used.

Activate functions for the Settings main function page
You can activate and deactivate the screen saver, proximity and gesture function. Only if these are deactivated in the ETS do they also appear on the *Settings* screen page.

General settings		
User interface	Screen saver	
	Use screen saver	Yes, **No**

General settings		
Gesture/proximity	Gesture function	
	Use gesture function	Yes, **No**
	...	
	Proximity function	
	Use proximity function	Yes, **No**

Activate settings on sub function pages
You select the settings for ongoing operation and enter a name up to 13 characters long for each sub function page.

General settings		
Settings screen	Brightness of day mode	Yes, **No**
	Brightness of night mode	Yes, **No**
	Duration until screen saver *	Yes, **No**
	Duration until standby*	Yes, **No**
	Main screen number *	Yes, **No**
	Duration until main screen *	Yes, **No**
	Screen lock *	Yes, **No**
	Duration of clean mode	Yes, **No**
	System information and versions	Yes, **No**
	Start button for firmware update	Yes, **No**

* Function must have been activated first

The *Screen saver On/Off* function is located on the main function page *Settings*.

10.3 Day and night mode

You can set different brightness values for the backlighting for day and night mode. The change between day and night mode is performed using the *Night mode input* group object. A typical application is the automatic change with a KNX time switch. The *Settings* screen page (Page 132) shows the current status, and you can change manually between day and night mode.

When activated, set the brightness in ongoing operation on the *Brightness of day mode* and *Brightness of night mode* sub function pages. You can also set the brightness of the screen using the *Brightness* object. The received value is not stored and is only retained until the change to another operation mode or until the screen saver or standby is activated.

Settings in ETS

The following parameters are available for the brightness in day and night mode.

User interface	Brightness of day mode (10-100 %)	10%, 15%...100%, **75%**
	Brightness of day mode (10-100 %)	10%, 15%...100%, **45 %**

Settings for ongoing operation

In the *Setting screen* tab, you activate the *Brightness of day mode* and *Brightness of night mode* sub function pages. You give a name up to 13 characters long to each page.

Group objects

Group object

No.	Name	Object function	Length	Properties	DPT ETS4/5
193	Brightness	User interface	1 byte	Receives	5.001 percent (0-100%)
194	Night mode input	User interface	1 bit	Receives	1.001 switching

10.4 Proximity function and standby

When the proximity function is active, the screen is visible again when you approach within approx. 20 cm of the KNX Multitouch Pro.

In addition, telegrams can be sent when proximity is detected and after the last detection.

As soon as proximity is no longer detected, the device returns to standby after a pre-programmed amount of time. The backlighting is switched off when in standby.

You can use the screen saver and standby together. Set the duration for calling up the standby longer than that for calling up the screen saver. Then the screen saver will appear first and subsequently the backlighting will be switched off in standby.

Settings in ETS

The following parameters are available for the proximity function.

Gesture / proximity	Use proximity function	Yes, **No**
	Send when proximity is detected?	**No telegram**, 1 bit, 1 byte
	Proximity status	**No telegram**, 1 bit, 1 byte

Use proximity function

If you have activated the proximity or gesture function in the ETS, the proximity sensor is calibrated during the start. In order to ensure optimal results, the device is not permitted to register any movements at this time. Otherwise, the configuration will start up again or the result will be incorrect. For this reason, move away from the device when you perform a reset or after a download.

Output telegrams

The *Proximity detection output* object sends when the proximity sensor has detected a proximity movement. You can select a 1 bit or 1 byte telegram and define the required value.

The *Proximity status* object displays whether the proximity sensor has detected a proximity movement.
- Value > "0": Sensor has detected proximity
- Value = "0": Sensor has not detected proximity

You can select 1 bit or 1 byte telegrams and define the required values.

Input telegrams

The proximity function is triggered via the sensor or the *Proximity input* object.

The sensor and the proximity object are linked to each other. The result of the link corresponds to an OR link. The proximity status remains active if the proximity object has the value "1". The times until the screen saver and standby are called up are not started.

Proximity detected	Proximity object = 1	State
Yes	No	Proximity
No	Yes	Proximity
Yes	Yes	Proximity
No	No	No proximity

The *Proximity status* object and the *Proximity detection output* object only evaluate the proximity sensor. The value of the *Proximity input* object is not evaluated.

Standby

You select whether you use the *Standby* function. If you use the standby function, you can set the duration until standby.

If you deactivate the standby, you can control the screen saver with the proximity function nevertheless. On proximity movement, there is a change from the screen saver to the last screen or the main screen.

User interface	Use standby	Yes, **No**
	Call standby after 30-600 s	30-600 s, **60 s**

Settings for standby for ongoing operation

In the *Setting screen* tab, activate the *Duration until standby* sub function page and select a name up to 13 characters long.

You also define, if the standby function is activated after a download.

Group objects

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
213	Proximity detection output	Proximity function	1 bit	Sends	1.001 switching
213	Proximity detection output	Proximity function	1 byte	Sends	5.010 counter im-pulses (0-255)
215	Proximity status	Proximity function	1 bit	Sends	1.001 switching
215	Proximity status	Proximity function	1 byte	Sends	5.010 counter im-pulses (0-255)
216	Proximity input	Proximity function	1 bit	Receives	1.001 switching

10.5 Screen saver

If the screen is no longer touched and no proximity movement is detected, the screen saver appears after an adjustable time (30-600 s).

On the *Settings* screen page (Page 132), you can activate and deactivate the screen saver function in ongoing operation. If released, you change the duration until the screen saver is activated on the *Duration until screen saver* sub function page.

You can use the screen saver and standby together. Set the duration for calling up standby longer than the duration for calling up the screen saver. Then the screen saver appears first and later the backlighting is switched off for standby.

Settings in ETS

The following parameters are available for the screen saver-function.

User interface	Use screen saver	Yes, **No**
	Call screen saver after 30-600 s	30-600 s, **30 s**
	Type of screen saver	Shows logo
		Shows blank screen
	Brightness of screen saver	10%, 15%...100%, **75%**
	Screen saver logo	Manufacturer
		User defined logo

Use screen saver

In the *User interface* tab you can deactivate the screen saver function permanently.

Duration until switch on

The duration until the screen saver is switched on is 30-600 s.

Type of screen saver

You can select 2 types of screen saver.

Type	Behaviour of the screen saver
Shows blank screen	The backlighting is switched off. The time for the screen saver applies to triggering.
Shows logo	Call the manufacturer's logo: Schneider Electric
	Call the "LOGO_URS.BMP" file with a company logo. Comply with the following instructions so as to avoid malfunctions.

You can use the mini USB socket on the lower side of the KNX Multitouch Pro to access the file system of the KNX Multitouch Pro and transfer a file with your company logo. If there are errors in creating and transferring the file, the function of the KNX Multitouch Pro may be partly or entirely disrupted.

Comply with the following points when creating and transferring the "logo.bmp" file.

- You can only use the USB socket if no frame is mounted.
- The file is a bitmap file.
- MTN6181-6035
  - The file for **System M** has exactly the following format: 176 x 220 pixels with 8-bit (= 256) colours.
- MTN6215-0310
  - The file for **System Design** has exactly the following format: 240 x 320 pixels with 8-bit (= 256) colours.
- The name of the file is "LOGO_USR.BMP".
- The "LOGO_USR.BMP" file is stored in the subfolder "LOGO" of the file system of the KNX Multitouch Pro.
- The frame is removed so that the mini USB socket can be used.
- The device is disconnected from the KNX (no connection to the bus).
- When transferring from the PC or laptop to the KNX Multitouch Pro, there is a secure connection which is not interrupted during the transfer.

Settings for ongoing operation

In the *Settings screen* tab you can activate the *Duration until screen saver* sub function page. Select a name up to 13 characters long for this page

You can also define whether the screen saver function is activated after the download.

10.6 Gesture function

When the gesture function is switched on, the KNX Multitouch Pro can detect a hand movement and thus call up a function that you have defined. In this way, the light can be switched on by a gesture when you enter the room, for example. The gesture is then detected at a distance of about 5 cm in front of the device. On the *Settings* screen page (Page 132), you can activate and deactivate the gesture function in ongoing operation.

Settings in ETS

The following parameters are available for the *gesture function*.

Gesture / proximity	Sensitivity of sensor	High, **Middle**, Low
	Use gesture function	Yes, **No**
	Movement direction	**Horizontal**, vertical
[Horizontal]	Move left	
	Value of object	
	Move right	
	Value of object	
[Vertical]	Move up	
	Value of object	
	Move down	
	Value of object	

Sensitivity of sensor

In case of overrange you can reduce the sensitivity of the sensor.

Use gesture function

You can permanently deactivate the gesture function. When activated, you can activate and deactivate the function in ongoing operation.

If you have activated the proximity or gesture function in the ETS, the proximity sensor is calibrated during the start. In order to ensure optimal results, the device is not permitted to register any movements at this time. Otherwise, the configuration will start up again or the result will be incorrect. As a result, move away from the device when you perform a reset or after a download.

In the *Settings screen* tab you define weather the gesture function is activated after a download.

Movement direction

The direction of movement for the hand movement is horizontal or vertical. Only one of the two directions of movement is evaluated.

Functions when on detecting gestures

In the horizontal direction of movement, there are 2 functions for each direction of movement:
- Function for move left
- Function for move right

In the vertical direction of movement, there are 2 functions for each direction of movement:
- Function for move up
- Function for move down

You can assign the following functions in each case
- Switching On
- Switching Off
- Send value (0-100 %)

Group objects

Group objects

No.	Name	Object function	Length	Properties	DPT ETS4/5
209	Movement left	Gesture function	1 bit	Sends	1.001 switching
209	Movement left	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
210	Movement right	Gesture function	1 bit	Sends	1.001 switching
210	Movement right	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
211	Movement up	Gesture function	1 bit	Sends	1.001 switching
211	Movement up	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
212	Movement down	Gesture function	1 bit	Sends	1.001 switching
212	Movement down	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)

10.7 General screen lock

The screen lock protects the KNX Multitouch Pro against unauthorised use. The lock is set using the user interface or the bus.

You release the screen again by entering a 4-digit numerical code with the digits 1-9. Alternatively, the release is via the bus.

An activated lock continues even after the KNX Multitouch Pro is restarted.

Operate screen lock sub function page

The following illustration shows the *General screen lock* sub function page.

Screen lock
Sub function page

Screen lock
Sub function page
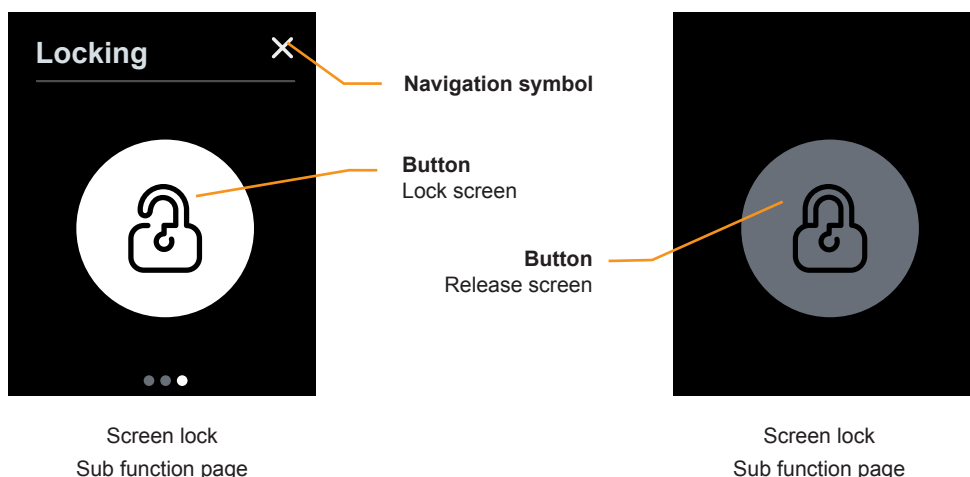
Lock
- Tap the navigation symbol to access the *Settings* main function page (Page 132).
- Tap and hold the *Lock screen* button to lock the screen. The button then changes to grey.

Enable
- Tap the *Release screen* button to activate a 4-digit button array with the digits 1-9. The screen is released again by entering the correct number combination. The number combination can only be set in the ETS parameters.

Locking using the user interface is only possible if in the *User interface* tab and the *Settings screen* tab the *General screen lock* has been selected.

Settings in ETS

You can set the following parameters.

User interface	Use general screen lock	Yes, **No**
	PIN code position 1	
	PIN code position 2	
	PIN code position 3	
	PIN code position 4	

Use general screen lock
You activate or deactivate the screen lock for ongoing operation. When activated, you can lock the screen pages of the KNX Multitouch Pro. You lock with the value "1" and release with the value "0". The release is also possible using the screen with the PIN code.

When activated, you can also lock the screen using the *Screen lock* sub function page.

PIN code

You select a 4-digit number combination with the digits 1-9. The preset number combination is 1234.

Settings for ongoing operation

In the *Settings screen* tab, activate the *Screen lock* sub function page and select a name up to 13 characters long.

Group object

Group object

No.	Name	Object function	Length	Properties	DPT ETS4/5
195	General screen lock	User interface	1 bit	Receives	1.001 switching

10.8 Main screen

You can define a screen as the main screen. If the current screen is no longer touched, the main screen appears after the set time (30-600 s). When activated, you can select the main screen in ongoing operation on the *Main screen number* function page and set the duration on the *Duration until main screen* page.

Settings in ETS

You activate the *main screen* in the *Screen settings* tab (Main screen --> 17).

Settings for ongoing operation

In the *Setting screen*, activate the *Main screen number* and *Duration until main screen* sub function pages, and select a name up to 13 characters in length in each case.

10.9 Cleaning mode

The clean mode is activated in ongoing operation using the *Settings* screen on the *Duration of clean mode* sub function page. In clean mode, the screen does not react on contact for 15-90 s. However, new messages will still appear and terminate the cleaning mode prematurely.

Settings for ongoing operation

In the *Settings screen* tab, you activate the *Duration of clean mode* sub function page and select a name up to 13 characters long.

10.10   System information

You can display system information about the version of the KNX Multitouch Pro and the software status on a sub function page.

11 Reset and failure of the bus voltage

11.1 Behaviour on reset

The following events take place after the bus voltage returns or after a download.

- Software start, display of the system information followed by display of the main screen.
- Telegrams can be sent depending on the setting. In many functions, you can set that telegrams are sent cyclically. With room temperature control, telegrams of the control function (actual values and correcting variables) can be sent.
- In active room temperature control, the operation mode set in the parameters (Comfort, ECO, Night) is activated. Setpoint shifts remain in place, depending on the setting.

If you have activated the proximity or gesture function in the ETS, the proximity sensor is calibrated during the start. In order to ensure optimal results, the device is not permitted to register any movements at this time. Otherwise, the configuration will start up again or the result will be incorrect. As a result, move away from the device when you perform a reset or after a download.

11.2 Behaviour when bus voltage fails

Following a bus voltage failure, the backlighting goes out and the device has no function.

12 New firmware version

To use new or modified features, an update is required. For KNX Multitouch Pro to transfer a new firmware is in addition to the import of a new version of the ETS application possible.

An update is only recommended when you need the new or changed features for your project. If you use a new version of the ETS application, you must then configure the device again.

12.1 ETS Application and firmware

A firmware version is also associated with a matching ETS version. You detect this by the names of the files for the firmware update:

*   „Firmware_Vxx_System_M_xxx6215-0310_for_Application_Vxx"
*   „Firmware_Vxx_System_Design_xxx6215-5910_for_Application_Vxx"

Before installing a new firmware, you should check if this version is already installed on your device.

Checking actual version of firmware version

If configured, the current firmware is displayed on a screen of the KNX Multitouch Pro.

① Select in the ETS application in the *Screen x* tab the *Settings* screen type.
② Select in the ETS application in the *Settings screen* tab the *System information*.
③ Transfer the ETS application via the KNX interface.
④ Navigate on the KNX Multitouch Pro via the *settings* screen to the *System Information* sub function page. You can find the firmware version in the row *Server*.

Checking actual version of ETS application

The current version can be found in the ETS application of KNX Multitouch Pro.

① Open the *properties* window of the ETS application.
② Under *Information*, *Application* see the *Program Version: x.x.*

12.2 Transferring firmware and ETS application

The transfer of the firmware and the ETS application is done in 3 steps:

① Making visible start button for firmware update on KNX Multitouch Pro
② Transferring new firmware version
③ Configuring and transferring new ETS application

Making visible start button for firmware update

NOTE
Unprofessional use of the update function can put the device permanently out of operation. Activate the button for firmware update only just before you update! Note the advice for safe transfer of firmware.
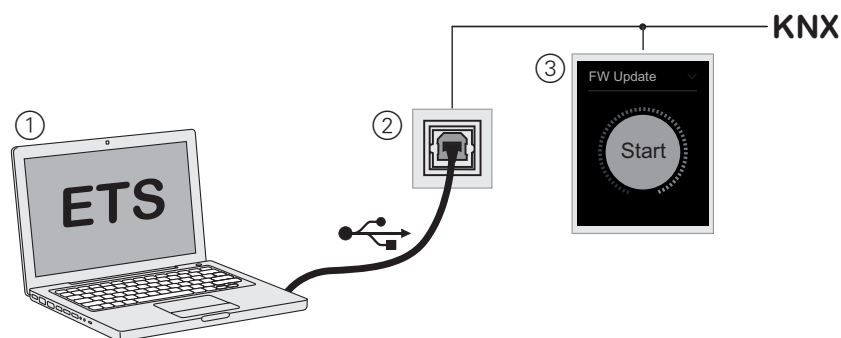
① **Configure parameter in the ETS**
- Select in the *Screen x* tab the *Settings* screen type.
- Select in the *Settings screen* tab the *Start button for firmware update*.

② **Transfer**
- Transfer the ETS application via the KNX interface.

③ **Result**
- You can navigate on the KNX Multitouch Pro via the *Settings* screen to the *Firmware Update* sub function page. There you will find the start button for firmware update.

Transferring new Firmware

NOTE
An interruption during the update process will put the device out of operation. For a safe transfer of the firmware note the following: • KNX Multitouch Pro is connected and powered via the bus. • KNX Multitouch Pro and the computer have a direct USB connection. • The computer is supplied by a mains power supply. • Exactly 1 KNX Multitouch Pro is in firmware update mode and connected with the computer. • For a System M device the firmware file for system M is selected • For a System Design device the firmware file for system Design is selected.
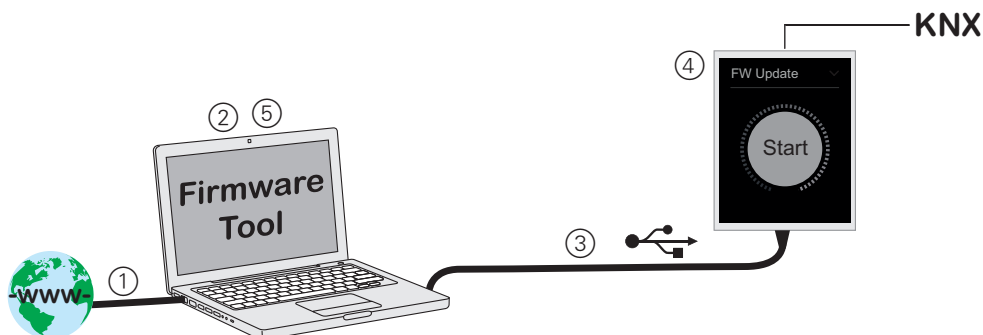
① **Transfer firmware tool to a computer**
- The firmware tool and the update files are packed in the file „*Multitouch_Pro_Update.zip*".
- You find the file on the internet: www.schneider-electric.com.

② **Install firmware tool**
- Unpack the file „*Multitouch_Pro_Update.zip*"
- Start the installation by running "*Setup.exe*".
- Follow the messages during installation.
- Install the drivers for Windows 7®.
    - Directories: -> Driver -> Win 7 - > 64 or 32
    - File: *.exe

③ **Connect KNX Multi-Touch Pro with the computer**
- Dismount the device and the frame. The mini USB connector is located on the lower side of the device.
- Ensure that your computer is supplied by a power supply.
- Ensure that KNX Multi-Touch Pro is connected via the bus and ready for operation.
- Connect the device directly with a USB port of the computer.

④ **Touch start button for firmware update**
- Navigate on the KNX Multitouch Pro via the *settings* screen to the *Firmware update* sub function page.
- Tap and hold the start button until the outer green ring has disappeared and the screen goes black.

⑤ **Run firmware update**
- Start on the computer the program "*Multitouch_Pro_Update*".
    - Directories: „-> *Programs -> Schneider Electric*"
- Press "*Start Update*". The button is enabled, when a KNX Multitouch Pro is detected in update operation.
- For a **System M** device, select the following file:
    - Firmware_Vxx_System_M_xxx6215-0310_for_Application_Vxx
- For a **System Design** device, select the following file:
    - Firmware_Vxx_System_Design_xxx6215-5910_for_Application_Vxx
- Press "*OK*" to start the transfer.
- The completion of the transfer is displayed: "Device successfully updated". Subsequently, the device is restarted and the tool is completed.

Configuring and transferring new ETS application
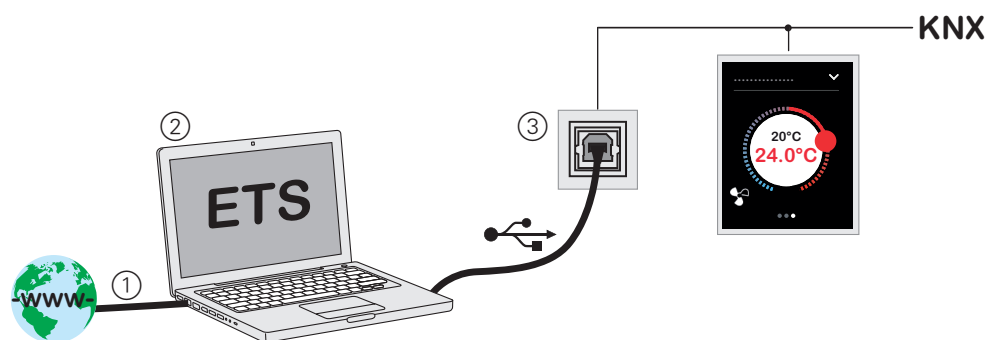
① **Transfer ETS application file from Internet**
- You find the files on the internet: www.schneider-electric.com. You can find the version number (**_xx**) of the ETS application directly behind the article number (MTN6180-xxxx**_xx**).
- Product file for **System M**:
  - MTN6180-03xx_xx_ETS4_ETS5x_201x_xx_All_8.knxprod
- Product file for **System Design**:
  - MTN6180-59xx_xx_ETS4_ETS5x_201x_xx_All_8.knxprod

② **Import, exchange and configure ETS application**
- Run in the ETS in the *Catalogue* the *Import* function.
- Replace the device with the old application and configure the device with the new application.

③ **Transfer**
- Transfer the ETS application and physical address via the KNX interface.

13 Overview of parameters and values

Screen settings

Tab	Parameter	Value
Screen settings	How many screens do you use (1-9)?	1-9, **1**
	Use main screen	Yes, **No**
	Select main screen	1-9
	Call main screen after 30-600 s	30-600, **30**

Express setting: Screen x: all functions

Tab	Parameter	Value
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	**1 function**
	[Screen 1-8: all functions]	2 functions
	[Screen 9: Settings]	1-4 functions extended
		Room temperature control unit
		Scene module
		Settings
	Function [Screen type 1 function]	**Switching**
		Dimming
		Dimming RGB
		Roller shutter
		Roller shutter with stop on release
		Blind
		Scene (external)
		Information display

Express setting: Screen x: Switch function
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Switching
	Type of switching function	**Toggle**
		Switch On
		Switch Off
		Bell push function
	Which function symbol do you use?	**Table/standard lamp**
		Ceiling lamp
		Spot
		Bulb
		Bulb with radiance
		Start
		Brightness

Express setting: Screen x: Dimming function and dimming RGB
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Dimming
	Which screen design do you use? [Dimming only]	Vertical design
		Rotary design
	Use only value object	**No**, Yes
	Cycle time when dimming = 100 ms * factor (2-10)	2-10, **2**
	Status feedback only via value object	Yes, **No**
	Which function symbol do you use?	**Table/standard lamp**
		Ceiling lamp
		Spot
		Bulb
		Bulb with radiance
		Start
		Brightness

Express setting: Screen x - RGB settings: Dimming RGB function
Screen type: 1 function

Tab	Parameter	Value
Screen x - RGB settings	Function of the sub screens	**RGB scenes**
		Colour temperature
		RGB scenes/colour temperature
	Scene address for external RGB scenes	
	Scene call x (0-63) [x = 1-8]	0-63, **[0-7]**
	Scene call with central button (0-63)	0-63, **8**
	Limits of colour temperature	
	Minimum value of colour temperature in Kelvin	0-65535, **1500**
	Maximum value of colour temperature in Kelvin	0-65535, **5000**

Express setting: Screen x: Roller shutter and blind function
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Roller shutter
		Blind
	Which screen design do you use?	Vertical design
		Rotary design
	Pause for change slat direction = 100 ms * factor (5-200) [only blind]	5-200, **20**

Express setting: Screen x: Roller shutter with stop on release
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Roller shutter with stop on release

Express setting: Screen x: Scene (external)
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Scene (external)
	Which design do you use?	**Button with text**
		Button with symbol
	Scene name (1-8 characters) [Buttons with text, 1-3 buttons]	
	Position of buttons [Buttons with symbol, 1-4 buttons]	1 button centred
		2 buttons horizontal
		2 buttons vertical
		3 buttons, 2 top horizontal, 1 button centred
		3 buttons, 1 top centred, 2 buttons horizontal
		3 buttons, 2 left vertical, 1 right centred
		3 buttons, 1 left centred, 2 right vertical
		4 buttons
	Symbol of the scene [Buttons with symbol, 1-4 buttons]	[Settings in button with symbol --> 38]
	Value of the scene address (0-63)	0-63, **0**

Express setting: Screen x: Information display
Screen type: 1 function

Tab	Parameter	Value
Screen x	Function	Information display
	Number of information (1-2)	
	Information (1-12 characters)	
	Which value is displayed?	**Energy consumption kWh**
		Internal temperature (sensor)
		External temperature (object)
		Relative humidity %
		CO_2 content ppm
		Water consumption m^3

Express setting: Screen x: Functions
Screen type: 2 functions

Tab	Parameter	Value
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	2 functions
	[respectively: Left side/Right side]	
	Function	**Switching**
		Dimming
		Roller shutter/blind position
		Roller shutter with stop on release
		Slat position
		Setpoint temperature change

Tab	Parameter	Value
Screen x	[respectively: Left side/Right side]	
	Function	Switching
	Type of switching command function	**Toggle On/Off**
		Switch On
		Switch Off
		Bell push function
	Which function symbol do you use?	**Table/standard lamp**
		Ceiling lamp
		Spot
		Bulb
		Bulb with radiance
		Start
		Brightness

Tab	Parameter	Value
Screen x	[respectively: Left side/Right side]	
	Function	Dimming
	Use value object only	**No**, Yes
	Cycle time when dimming = 100 ms * factor (2-10)	2-10, **2**
	Maximum dimming value	50-100, **100**
	Which function symbol do you use?	**Table/standard lamp** [like switching function]

Tab	Parameter	Value
Screen x	[respectively: Left side/Right side]	
	Function	Setpoint temperature change
	Starting value	7°C (44.6°F)...43°C (109.4°F), **21°C (69.8°F)**

Express setting: Screen x: 1-4 functions (extended settings)

Tab	Parameter	Value
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	1-4 functions extended
	Function	**1 button centred**
		2 buttons horizontal
		2 buttons vertical
		3 buttons, 2 top horizontal, 1 button centred
		3 buttons, 1 top centred, 2 buttons horizontal
		3 buttons, 2 left vertical, 1 right centred
		3 buttons, 1 left centred, 2 right vertical
		4 buttons

Advanced setting: Screen x, function x: All functions

Tab	Parameter	Value*
Screen x, function x	Screen name (1-13 characters)	
	Which screen type do you use?	1-4 functions extended
	Function	Toggle
		Dimming
		Blind
		Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
		Edges with 2 byte values
		8 bit slider
		Scenes
	Which symbol type do you use?	**Symbol with background**
		Symbol with indication ring
	Which function symbol do you use?	[Function symbols --> 55]
	How is the status indication triggered?	[Status indication --> 57]

Extended settings: Screen x function x: Toggle

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	**Toggle**
		[other functions to follow]
	Number of objects	**1**
		2
	Type of object A/B	**1 bit**
		1 byte (0 %-100 %)
		1 byte (0-255)
	Value 1 of object A	**100 %**, 90 %, 80 % ..., 0 %, 25 %, 75 %
		255, 254, 253, ... 0
	Value 2 of object A	**0 %**, 10 %, 20 % ..., 100 %, 25 %, 75 %
		0, 1, 2, ... 255
	How is the status indication triggered?	**Switch/value object A = On/Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Switching

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Switching
		[other functions before/to follow]
	Number of objects	**1**
		2
	Type of object A/B	**1 bit**
		1 byte (0 %-100 %)
		1 byte (0-255)
	Value 1 of object A	**On telegram**, Off telegram
		100 %, 90 %, 80 % ..., 0 %, 25 %, 75 %
		255, 254, 253, ... 0
	Value 2 of object A	**On telegram**, Off telegram
		0 %, 10 %, 20 % ..., 100 %, 25 %, 75 %
		0, 1, 2, ... 255
	How is the status indication triggered?	**Switch/value object A = On/Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Dimming

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
		[other functions before/to follow]
	Long operation = 100 ms * factor (6-250)	6-250, **6**
	Dimming direction	**Dimming brighter/darker**
		Dimming brighter
		Dimming darker
	Step dimming (brighter)	**To max. brightness**
		1/2 brighter
		1/4 brighter
		1/8 brighter
		1/16 brighter
		1/32 brighter
		1/64 brighter
	Value 2 of object A	**To min. brightness**
		1/2 darker
		1/4 darker
		1/8 darker
		1/16 darker
		1/32 darker
		1/64 darker
	Send dimming command cyclically	Yes
		No
	Cycle time = basis * factor	
	Basis	**0.1 s,** 1 s, 1 min
	Factor (3-255)	3-255, **8**
	Send stop telegram after release	**Yes**
	[only for two-button dimming]	No
	How is the status indication triggered?	**Switch/value object A = On/Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Blind

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Blind
		[other functions before/to follow]
	Movement direction of blind	**Moving blind up**
		Moving blind down
		Moving blind up/down
		Moving blind with positioning values
	Long operation = 100 ms * factor (6-250)	6-250, **6**
	Pause for change slat direction = 100 ms * factor (5-50) [only for single-button blind operation]	5-50, **10**
	Number of positionings	**1 (short operation)**
	[Blind with positioning values]	2 (short/long operation)
	Scaling (short operation)	**0-100 %**
	[Blind with positioning values]	0-255
	Position 1 of blind	**100 %**, 90 %, 80 % ..., 0 %, 25 %, 75 %
		255, 254, 253, ... 0
	Position 1 of slats	**0 %**, 10 %, 20 % ..., 100 %, 25 %, 75 %
		0, 1, 2, ... 255
	Position 2 of blind [for 2 positions]	**100 %**, 90 %, 80 % ..., 0 %, 25 %, 75 %
		255, 254, 253, ... 0
	Position 2 of slats [for 2 positions]	**0 %**, 10 %, 20 % ..., 100 %, 25 %, 75 %
		0, 1, 2, ... 255
	How is the status indication triggered?	**Operation = On / Release = Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
		[other functions before/to follow]
	Select edge function	**Normal (operate, release)**
		Extended (+ long and short operation)
	Long operation = 100 ms * factor (6-250) [Extended edge function]	6-250, **6**
	Number of objects	**1**
		2
	How is the status indication triggered?	**Switch/value object A = On/Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values

Type of object A

Type of object B

Actions for normal edge function

Tab	Parameter	Value
Extended settings		
Screen x function x		Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
Screen x function x edges object A / edges object B	Type of object A / Type of object B	**1 bit**
		2 bit (priority control)
		4 bit
		1 byte (0 %-100 %)
		1 byte (0-255)
	Action on operation [normal edge function]	**Sends 1**
		Sends 0
		Toggles
		Sends its value
		None
		Sends value 1
		Sends value 2
	Action on release [Normal edge function]	Sends 1
		Sends 0
		Toggles
		Sends its value
		None
		Sends value 1
		Sends value 2

Extended settings: Screen x function x: Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
Actions for extended edge function

Tab	Parameter	Value
Screen x function x edges object A / edges object B [edges: extended]	Direct action on operation Action on release before the long operating time has elapsed Action on achieving the long operating time Action on release after achieving the long operating time	**Sends 1**
		Sends 1 immediately and then cyclically
		Sends 1 only cyclically
		Sets object value to 1 (readable only)
		Sends 0
		Sends 0 immediately and then cyclically
		Sends 0 only cyclically
		Sets object value to 0 (readable only)
		Sends value 1
		Sends value 1 immediately and then cyclically
		Sends value 1 only cyclically
		Sets object value to value 1 (readable only)
		Sends value 2
		Sends value 2 immediately and then cyclically
		Sends value 2 only cyclically
		Sets object value to value 2 (readable only)
		Toggles
		Toggles, sends immediately, then cyclically
		Toggles, only sends cyclically
		Toggles and is not sent
		Toggles cyclically, sends immediately, then cyclically
		Toggles cyclically, only sends cyclically
		Toggles cyclically and is not sent
		Sends its value [not for 2 bit]
		Sends its value immediately and then cyclically [not for 2 bit]
		Sends 1 and then 0 after a cycle time
		Sends value 1 and then value 2 after a cycle time
		Cyclically increase current object value by value 1 [only for 1 byte]
		Cyclically reduce current object value by value 2 [only for 1 byte]
		Value 2 cyclically
		None (stops cyclical sending)
		No change
		None (stop after current cycle time)

Extended settings: Screen x function x: Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values

Value 1

Value 2

Cycle time for extended edge function

Tab	Parameter	Value
Screen x function x edges object A / edges object B	Value 1 / Value 2 [2 bit]	**Switch on with priority (11)**
		Switch off with priority (10)
		Remove priority control (00)
		1 byte (0 %-100 %)
		1 byte (0-255)
	Value 1 / Value 2 [4 bit]	Dim-darker-stop
		To min. brightness
		1/2 darker
		1/8 darker
		1/16 darker
		1/32 darker
		1/64 darker
		1/4 darker
		Dim-brighter-stop
		To max. brightness
		1/2 brighter
		1/4 brighter
		1/8 brighter
		1/16 brighter
		1/32 brighter
		1/64 brighter
	Value 1 / Value 2 [1 byte]	**100 %**, 90 %, 80 % ..., 0 %, 25 %, 75 %
		255, 254, 253, ... 0
	Cycle time = basis * factor [Extended edge function]	
	Basis	0.1 s, 1 s, **1 min**, 1 h, 1 day
	Factor (3-255)	3-255, **10**

Extended settings: Screen x function x: Edges with 2 byte values

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Edges 1 bit, 2 bit (priority), 4 bit, 1 byte values
		[other functions before/to follow]
	Select edge function	**Normal (operate, release)**
		Extended (+ long and short operation)
	Long operation = 100 ms * factor (6-250) [Extended edge function]	6-250, **6**
	Action on operation [Normal edge function]	**Sends value 1**
		Sends value 2
		Sends its value
		None
	Action on release [Normal edge function]	Sends value 1
		Sends value 2
		Sends its value
		None
	Direct action on operation Action on release before the long operating time has elapsed Action on achieving the long operating time Action on release after achieving the long operating time [Extended edge function]	Sends value 1
		Sends value 1 immediately and then cyclically
		Sends value 1 only cyclically
		Sets object value to value 1 (readable only)
		Sends value 2
		Sends value 2 immediately and then cyclically
		Sends value 2 only cyclically
		Sets object value to value 2 (readable only)
		Sends its value
		Sends value 1 and then value 2 after a cycle time
		None (stops cyclical sending)
		No change
	Cycle time = basis * factor [Extended edge function] Basis	0.1 s, 1 s, **1 min**, 1 h, 1 day
	Factor (3-255)	3-255, **10**
	How is the status indication triggered?	**Operation = On / Release = Off**
		[see Status indication --> 57]

Extended settings: Edges with 2 byte values Screen x, function x edges values

Tab	Parameter	Value
Screen x function x edges values	Type of object	Floating point
		Integer with sign (-32768…32767)
		Integer without sign (0-65535)
	Basis 1 (possible values in brackets)	0.01...327.68; **0.01**
	Factor 1 (0-2047)	0-2047, **1000**
	Basis 2 (possible values in brackets)	0.01...327.68; **0.01**
	Factor 2 (0-2047)	0-2047, **2000**
	Value 1 (-32768...32767)	-32768...32767, **32767**
	Value 2 (-32768...32767)	-32768...32767, **-32768**
	Value 1 (0-65535)	0-65535, **65535**
	Value 2 (0-65535)	0-65535, **0**

Extended settings: Screen x function x: 8 bit slider

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	8 bit slider
		[other functions before/to follow]
	Long operation = 100 ms * factor (6-250) [Extended edge function]	6-250, **6**
	How is the status indication triggered?	**Operation = On / Release = Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: 8 bit slider

Tab	Parameter	Value
Screen x function x slider	Slider function	With limit values
		Without limit values
	Direct action on operation Action on release before the long operating time has elapsed Action on achieving the long operating time Action on release after achieving the long operating time	Send value 1, then increase cyclic. by step width
		Send value 2, then reduce cyclically by step width
		Increase current object value cyclically
		Increase current object value once
		Reduce current object value cyclically
		Reduce current object value once
		Reverse slide direction and send cyclically
		Stepwise to the limit values and back again
		Increase stepwise within limits
		Decrease stepwise within limits
		None (stops cyclical sending)
		No change
	Limit value 1 (0-255)	0-255, **0**
	Limit value 2 (0-255)	0-255, **100**
	Value of step width	1-255, **10**
	Cycle time = basis * factor Basis	0.1 s, 1 s, **1 min**, 1 h, 1 day
	Factor (3-255)	3-255, **5**

Extended settings: Screen x function x: Scene

Tab	Parameter	Value
Extended settings		
Screen x function x	Function x	Scene
		[other functions before/to follow]
	Long operation = 100 ms * factor (6-250)	6-250, **30**
	Select scene function	**Normal (short = recall / long = save)**
		Extended
	Scene address (0-63) [Normal scene function]	0-63, **0**
	Number of objects [Extended scene function]	**1**
		2
	How is the status indication triggered?	**Switch/value object A = On/Off**
		[see Status indication --> 57]

Extended settings: Screen x function x: Scene - Scene object A / Scene object B

Tab	Parameter	Value
Screen x function x scene object A / scene object B	Direct action on operation Action on release before the long operating time has elapsed Action on achieving the long operating time Action on release after achieving the long operating time	Sends value 1
		Sends value 2
		Toggles
		Toggles cyclically, sends immediately, then cyclically
		Sends value 1 and then value 2 after a cycle time
		None (stops cyclical sending)
		No change
	Value 1 Scene address (0-63)	0-255, **0**
	Value 1 to retrieve/save the scene	**Retrieve**
		Save
	Value 2 Scene address (0-63)	0-255, **0**
	Value 2 to retrieve/save the scene	Retrieve
		Save
	Cycle time = basis * factor Basis Factor (3-255)	
		0.1 s, **1 s**, 1 min, 1 h, 1 day
		3-255, **10**

Express setting: Screen x: Room temperature control unit

Tab	Parameter	Value
Screen x	Screen name (1-13 characters)	
	Which screen type do you use?	Room temperature control unit

Room temperature control unit

Tab	Parameter	Value
Room temperature control unit	[see: Setting the room temperature control unit --> 114]	
Control general	Use control	Yes, **No**
	[Setting the general control parameters --> 114]	
Status reports	[Status reports --> 121]	
Setpoints / operation modes	[Setpoints and operation modes --> 119]	
Actual temperature (resulting)	[Room and floor temperature --> 118]	
Control heating	[Set control heating/cooling and additional level --> 116]	
Correcting variable heating	[Correcting variables and valve protection --> 116]	
Control cooling	[Set control heating/cooling and additional level --> 116]	
Correcting variable cooling	[Correcting variables and valve protection --> 116]	
Fan speed	[Fan speeds --> 122]	

Express setting: Screen x: Scene module

Tab	Parameter	Value
Scene module screen	Position of buttons	**1 button, centred**
		[Number and position of the buttons --> 53]
	Which function symbol do you use for scene x?	[Settings in button with symbol --> 38]
Scene x	Scene name (1-8 characters)	
	Value of the scene address (0-63)	0-63, **0-3**
	Function of value x	**No function**
		Switching
		Moving up/down
		1 byte (0-100%)
		1 byte (0-255)
		Operation modes (**comfort mode, ECO mode, night mode, frost/heat protection**)
		Temperature (**21.0°C = 69.8°F**),
	Minimum [1 byte (0-100%)]	0-100%, **0%**
	Maximum [1 byte (0-100%)]	0-100%, **100%**
	Minimum [1 byte (0-255)]	0-255, **0**
	Maximum [1 byte (0-255)]	0-255, **255**
	Minimum [Temperature]	**7°C = 44.6°F**...43°C = 109.4°F
	Maximum [Temperature]	7°C = 44.6°F...**43°C = 109.4°F**
	After download send value when calling a scene	No, **Yes**

Express setting: Screen x: Settings

Tab	Parameter	Value
Screen x	Screen name (1-13 characters)	
	Which screen type do you use? [Screen 1-8: all functions] [Screen 9: Settings]	**1 function**
		1-4 functions extended
		Room temperature control unit
		Settings

General settings: User interface

Tab	Parameter	Value
User interface	Temperature unit	**Celsius**
		Fahrenheit
	Brightness - day mode	10-100%, **75 %**
	Brightness - night mode	10-100 %, **45 %**
	Use standby	Yes, **No**
	Call standby after 30-600 s	30-600 s, **60 s**
	Use screen saver	Yes, **No**
	Call screen saver after 30-600 s	30-600 s, **30 s**
	Type of screen saver	**Shows logo**
		Shows blank screen
	Screen saver logo	**Manufacturer**
		User defined logo
	General screen lock	Yes, **No**
	PIN code position 1	1-9, **1**
	PIN code position 2	1-9, **2**
	PIN code position 3	1-9, **3**
	PIN code position 4	1-9, **4**

General settings: Gesture/proximity

Tab	Parameter	Value
Gesture / Proximity	Sensitivity of sensor	High, **Middle**, Low
	Gesture function	
	Use gesture function	Yes, **No**
	Movement direction	**Horizontal,** Vertical
	Move left	**No telegram,** 1 bit, 1 byte
	Move up	**No telegram,** 1 bit, 1 byte
	Value of object	Off, **On**
	Value of the object (0-255)	0-255, **255**
	Move right	**No telegram,** 1 bit, 1 byte
	Move down	**No telegram,** 1 bit, 1 byte
	Value of object	**Off,** On
	Value of the object (0-255)	0-255, **0**
	Proximity function	
	Use proximity function	Yes, **No**
	Send when proximity is detected?	**No telegram,** 1 bit, 1 byte
	Value of object	**Off,** On
	Value of the object (0-255)	0-255, **1**
	Proximity status	**No telegram,** 1 bit, 1 byte
	Value of the object (1-255)	1-255, **1**

General settings: Messages

Tab	Parameter	Value
Messages	Use messages	Yes, **No**
	How many messages?	1-5, **5**
	Colour of background	Blue, Light blue, Dark blue,
		Green, Light green, Dark green,
		Red, **Light red**, Dark red,
		Cyan, Light cyan, Dark cyan,
		Magenta, Light magenta, Dark magenta,
		Yellow, Light yellow, Dark yellow
		Grey, Light grey, Dark grey,
		White, Black, Brown, Orange
	Colour of text	Blue, Light blue, Dark blue,
		Green, Light green, Dark green,
		Red, Light red, Dark red,
		Cyan, Light cyan, Dark cyan,
		Magenta, Light magenta, Dark magenta,
		Yellow, Light yellow, Dark yellow
		Grey, Light grey, Dark grey,
		White, Black, Brown, Orange
	Message x (1-14 characters)	

General settings: Service messages

Tab	Parameter	Value
Service messages	Use service messages	Yes, **No**
	How many messages?	1-5, **5**
	Service message x (1-14 characters)	
	Service symbol x [Service messages --> 128]	Do not disturb
		First Aid
		Cleaning
		Service call

General settings: Settings screen

Tab	Parameter	Value
Settings screen	Allow to access to the following parameters:	
	Gesture function after download activated	**Yes**, No
	Brightness of day mode	Yes, **No**
	Brightness of night mode	Yes, **No**
	Screen saver function after download activated	**Yes,** No
	Duration until screen saver	Yes, **No**
	Standby function after download activated	**Yes**, No
	Duration until standby	Yes, **No**
	Number of the main screen	Yes, **No**
	Duration until main screen	Yes, **No**
	Screen lock	Yes, **No**
	Duration of clean mode	Yes, **No**
	System information and versions	Yes, **No**
	Start button for firmware update	Yes, **No**

14 Overview of group objects

Screen type 1 function

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Switch object	Screen x	1 bit	Sends, receives	1.001 switching
x	Value object	Screen x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Status feedback object	Screen x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Colour scene object	Screen x	1 byte	Sends	18.001 scene monitoring
x	Colour temperature object	Screen x	2 byte	Sends	7.001 pulses
x	Blind position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Roller shutter position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Slat position	Screen x	1 byte	Sends	5.001 percent (0-100 %)
x	Status feedback blind	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Status feedback roller shutter	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Status feedback slat	Screen x	1 byte	Receives	5.001 percent (0-100 %)
x	Movement object	Screen x	1 bit	Sends	1.008 up/down
x	Stop/step object	Screen x	1 bit	Sends	1.007 step
x	Stop object.	Screen x	1 bit	Sends	1.007 step
x	Scene object	Screen x	1 byte	Sends	18.001 scene monitoring
x	Display Temperature	Screen x	2 byte	Receives	9.001 temperature (°C)
x	Display Energy consumption kWh	Screen x	4 byte	Receives	13.013 real energy (kWh)
x	Display Humidity %	Screen x	2 byte	Receives	9.007 humidity (%)
x	Display Water consumption m3	Screen x	4 byte	Receives	12.001 counter pulses
x	Display CO_2 content	Screen x	2 byte	Receives	9.008 parts/million (ppm)

Screen type 2 functions

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Switch object	Screen x *	1 bit	Sends, receives	1.001 switching
x	Value object	Screen x *	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Status feedback object	Screen x *	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x *	1 byte	Receives	5.001 percent (0-100 %)
x	Blind position	Screen x *	1 byte	Sends	5.001 percent (0-100 %)
x	Slat position	Screen x *	1 byte	Sends	5.001 percent (0-100 %)
x	Status feedback blind	Screen x *	1 byte	Receives	5.001 percent (0-100 %)
x	Status feedback slat	Screen x *	1 byte	Receives	5.001 percent (0-100 %)
x	Movement object	Screen x *	1 bit	Sends	1.008 up/down
x	Stop object	Screen x *	1 bit	Sends	1.007 step
x	Setpoint	Screen x *	1 bit	Sends	9.001 temperature (°C)
x	Setpoint status	Screen x *	1 bit	Receives	9.001 temperature (°C)

* left or right

Screen type 1-4 functions

No.	Name	Object function	Length	Properties	DPT in ETS4
x	Switch object A/B	Screen x function x	1 bit	Sends, receives	1.001 switching
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.001 percent (0-100 %)
x	Value object A/B	Screen x function x	1 byte	Sends, receives	5.005 decimal factor (0-255)
x	Dimming object	Screen x function x	4 bit	Sends, receives	3.007 dimmer step
x	Stop/step object	Screen x function x	1 bit	Sends, receives	1.007 step
x	Movement object	Screen x function x	1 bit	Sends, receives	1.008 up/down
x	Blind position	Screen x function x	1 byte	Sends	5.001 percent (0-100 %)
x	Slat position	Screen x function x	1 byte	Sends	5.001 percent (0-100 %)
x	Dimming object A/B	Screen x function x	4 bit	Sends, receives	3.007 dimmer step
x	Priority control object A/B	Screen x function x	2 bit	Sends, receives	2.001 prio. switching
x	Value object A	Screen x function x	2 byte	Sends, receives	7.001 pulse 2 byte without sign
x	Value object A	Screen x function x	2 byte	Sends, receives	8.001 pulse difference 2 byte with sign
x	Value object A	Screen x function x	2 byte	Sends, receives	9.004 lux 2 byte floating point value
x	Value object A	Screen x function x	1 byte	Sends	5.004 percent (0-255 %)
x	Scene object A/B	Screen x function x	1 byte	Sends	18.001 scenes control
x	Status feedback object	Screen x function x	1 bit	Receives	1.001 switching
x	Status feedback object value	Screen x function x	1 byte	Receives	5.004 percent (0–255 %)
196	Collected status feedback object	Status feedback	4 byte	Receives	27.001 bit-combined info On/Off

Room temperature control unit

No.	Name	Object function	Length	Properties	DPT in ETS4/5
217	Heating/cooling input	Temperature control	1 bit	Receives	1.001 switching
218	Heating/cooling output	Temperature control	1 bit	Sends	1.001 switching
219	Operation mode input	Temperature control	1 byte	Receives	5.010 counter impulses (0-255)
220	Operation mode output	Temperature control	1 bit	Sends	5.010 counter impulses (0-255)
221	Frost/heat protection input	Temperature control	1 bit	Receives	1.001 switching
222	Frost/heat protection output	Temperature control	1 bit	Sends	1.001 switching
223	Dew point alarm	Temperature control	2 byte	Receives	1.001 switching
224	Status	Temperature control	1 bit	Sends	1.001 switching
225	Status 1 byte	Temperature control	1 byte	Sends	5.010 counter impulses (0-255)
226	Status 2 byte	Temperature control	2 byte	Sends	7.001 counter impulses without sign
227	Setpoint input	Temperature control	2 byte	Receives	9.001 temperature (°C)
228	Setpoint output	Temperature control	2 byte	Sends	9.001 temperature (°C)
229	Setpoint adjustment input	Temperature control	2 byte	Receives	9.002 temperature difference (K)
230	Setpoint adjustment output	Temperature control	2 byte	Sends	9.002 temperature difference (K)
233	Basic setpoint shift input	Temperature control	2 byte	Receives	9.002 temperature difference (K)
234	Basic setpoint shift output	Temperature control	2 byte	Sends	9.002 temperature difference (K)
235	External temperature 2 byte	Temperature control	2 byte	Receives	9.001 temperature (°C)
237	Actual temperature (resulting)	Temperature control	2 byte	Sends	9.001 temperature (°C)
238	Temperature alarm (resultant)	Temperature control	1 bit	Sends	1.001 switching
239	Floor temperature alarm	Temperature control	1 bit	Sends	1.001 switching
240 241	Correcting variable heating (basic level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
243	Correcting variable heating (additional level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
244 245	Correcting variable cooling (basic level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
247	Correcting variable cooling (additional level)	Temperature control	1 byte 1 bit	Sends	5.001 percent (0-100 %) 1.001 switching
248	Manual mode input	Fan control	1 byte	Receives	1.001 switching
249	Fan step input	Fan control	1 bit	Receives	5.001 percent (0-100 %)
250	Manual mode output	Fan control	1 byte	Sends	1.001 switching
251	Fan step output	Fan control	1 bit	Sends	5.001 percent (0-100 %)

General settings: Messages and service messages

No.	Name*	Object function	Length	Properties	DPT in ETS4/5
197	Message 1	Messages	1 bit	Receives	1.001 switching
203	Service message 1	Service messages	1 bit	Receives	1.001 switching

* Message: 1-5, service message: 1-5

Scene module

No.	Name	Object function	Length	Properties	DPT in ETS4/5
x	Switch object x	Scene module - scene x	1 bit	Sends	1.001 switching
x	Movement object x	Scene module - scene x	1 bit	Sends	1.001 switching
x	Value percent x	Scene module - scene x	1 byte	Sends	1.008 up/down
x	Value absolute x	Scene module - scene x	1 byte	Sends	5.001 percent (0-100 %)
x	Operation mode x	Scene module - scene x	1 byte	Sends	5.010 counter impulses (0-255)
x	Temperature object x	Scene module - scene x	2 byte	Sends	9.001 temperature (°C)
263	Scene address input	Scene module	1 byte	Receives	18.001 scene monitoring

General settings

No.	Name	Object function	Length	Properties	DPT in ETS4/5
193	Brightness	User interface	1 byte	Receives	5.001 percent (0-100%)
194	Night mode input	User interface	1 bit	Receives	1.001 switching
195	General screen lock	User interface	1 bit	Receives	1.001 switching
209	Movement left	Gesture function	1 bit	Sends	1.001 switching
209	Movement left	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
210	Movement right	Gesture function	1 bit	Sends	1.001 switching
210	Movement right	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
211	Movement up	Gesture function	1 bit	Sends	1.001 switching
211	Movement up	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
212	Movement down	Gesture function	1 bit	Sends	1.001 switching
212	Movement down	Gesture function	1 byte	Sends	5.010 counter impulses (0-255)
213	Proximity detection output	Proximity function	1 bit	Sends	1.001 switching
213	Proximity detection output	Proximity function	1 byte	Sends	5.010 counter impulses (0-255)
215	Proximity status	Proximity function	1 bit	Sends	1.001 switching
215	Proximity status	Proximity function	1 byte	Sends	5.010 counter impulses (0-255)
216	Proximity input	Proximity function	1 bit	Receives	1.001 switching

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