

Technical Manual



MDT Glass Push Button II Smart MDT Push Button Smart 86

BE-GT20W.01 from R2.0

BE-TAS86.01

BE-GT20S.01 from R2.0

BE-TAS86T.01

BE-GT2TW.01 from R2.0

BE-GT2TS.01 from R2.0

Further Documents:

Datasheet:

https://www.mdt.de/EN_Downloads_Datasheets.html

Assembly and Operation Instructions:

https://www.mdt.de/EN_Downloads_Instructions.html

Solution Proposals for MDT products:

https://www.mdt.de/EN_Downloads_Solutions.html

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2 Overview

2.1 Overview devices

The description refers to the following devices (order number in bold):

- **BE-GT20W.01** Glass Push Button II Smart, White, from R2.0
 - Second generation of Glass Push Button with up to 12 key functions
- **BE-GT20S.01** Glass Push Button II Smart, Black, from R2.0
 - Second generation of Glass Push Button with up to 12 key functions
- **BE-GT2TW.01** Glass Push Button II Smart, White, Temperature sensor, from R2.0
 - Second generation of Glass Push Button with up to 12 key functions and integrated temperature sensor
- **BE-GT2TS.01** Glass Push Button II Smart, Black, Temperature sensor, from R2.0
 - Second generation of Glass Push Button with up to 12 key functions and integrated temperature sensor
- **BE-TAS86.01** Push Button Smart 86, Plastic, White glossy finish
 - Push Button with up to 12 key functions
- **BE-TAS86T.01** Push Button Smart 86, Plastic, White glossy finish, Temperature sensor
 - Push Button with up to 12 key functions and integrated temperature sensor

2.1.1 Special functions of the Glass Push Button II Smart & Push Button Smart 86

The Glass Push Button II Smart and the Push Button Smart 86 provide a very extensive application with the following special functions:

Large RGB color display for visualization

Large, active color display for function- and status indication can be freely parameterized by the user. The symbols and colors are freely selectable!

Symbols can be reloaded via DCA App

A free DCA app can be used to reload and parameterize any image of the size 64x64 pixels!

Can be used as a 4/6/8/12-button

Up to 3 levels with up to 4 functions per level can be activated. Thus, the button can control up to 12 functions. The levels as well as the functions can be named individually. The levels can be selected using the upper two keys, the hidden sensor keys or a scene.

Extensive application

The function range of the application exceeds that of a "normal" push button by a multiple. In addition to the usual functions such as blinds, switching, dimming, scene, the user is also provided with functions for controlling the HSV color circle or a function for controlling the color temperature (Tunable White). The button contains special symbols to control and visualize these functions!

RGB State LEDs

An RGB status LED is available to the user for each function. This can visualize both, a keystroke as well as an external or internal status with any color.

Logic functions

By means of a total of 4 logic functions it is also possible to realize interleaved function calls, e.g. to release a scene call only in day mode. The logic function can process both internal and external states.

“Slap” function

The "Slap" function, which is triggered by the simultaneous touching of 3 or more keys, allows intuitive operation. By this function, e.g. the light can be switched on when entering the room without the operator having to search for the exact position of the individual keys.

Info-Display

In standby mode up to 4 status elements can be displayed. These status elements can visualize any values of the KNX bus as well as the time or 14 byte status texts.

Message function

A total of 4 1-bit alarms are available, which can display predefined messages. For example, the opening of a window or a motion can be reported. There is also a 14 byte message object which can display text messages sent via the bus.

Long Frame Support

Support of sending longer telegrams and thus the integration of more user data per telegram. This significantly shortens the programming time (as of ETS5).

Requirement: The use of a programming interface which supports the transmission of long frames, e.g. MDT SCN-USBR.01 or SCN-IP000.02/SCN-IP100.02.

2.2 Usage & Possible Applications

The buttons have all the functions of a modern KNX switch and are designed for flush mounting. By means of a keystroke, the pushbutton can carry out parameterized functions, e.g. scenes or dimming. All models have a large color display and 6 buttons, which are equipped with RGB LEDs. For each function specific symbols and colors can be parameterized. All buttons can be parameterized as 4-/6-/8- or 12-fold push button. The selection of the functions 7 to 12 is controlled via levels. Furthermore, the buttons have a brightness sensor with which the button can dynamically adapt to the ambient brightness. 4 logic blocks, a cleaning function and a "Slap function" complete the performance spectrum of the push buttons.

The push buttons of the series BE-GT2T/BE-TAS86T version also have an integrated temperature sensor which can be used for room temperature detection.

The BE-GT2T/BE-TAS86T series has further functionalities for controlling the integrated controller of the MDT heating actuator.

2.3 Exemplary Circuit Diagrams

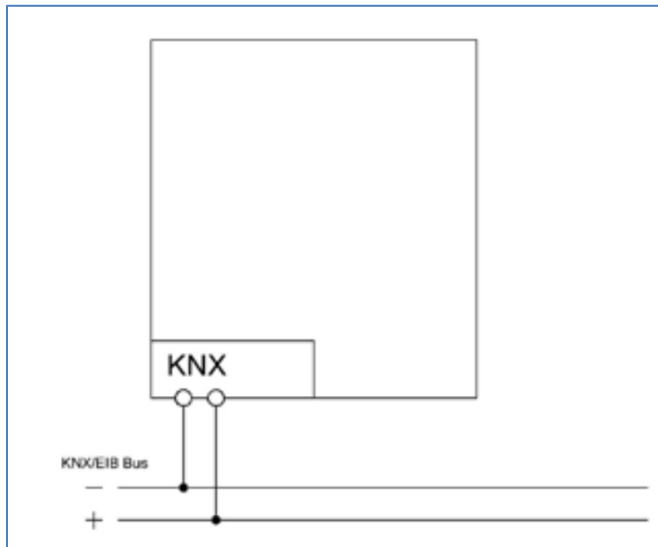


Figure 1: Exemplary circuit diagrams

2.4 Structure & Handling

The following figure shows the structure of the Glass Push button II Smart:

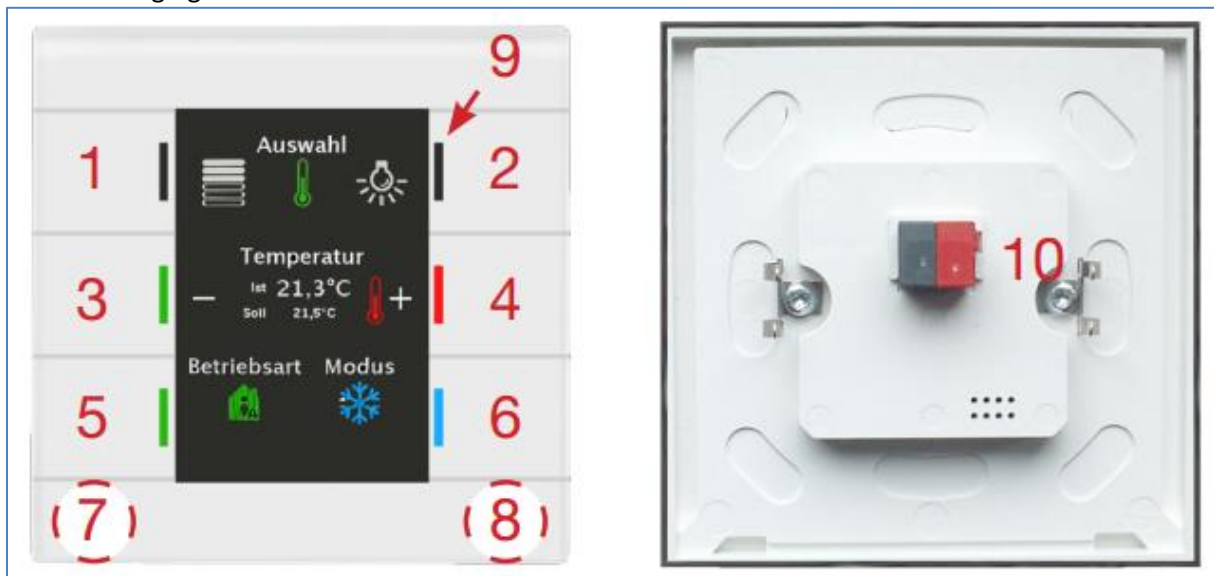


Figure 2: Structure & Handling

- 1, 2, 3, 4, 5, 6 = Sensor surfaces for operating the key functions
- 7, 8 = Press simultaneously to enter the programming mode
- 9 = RGB-Status indication
- 10 = Bus connection terminal

Push Button Smart 86 with identical design, but with 6 mechanical buttons with finger recess (1-6).

2.5 Settings at the ETS-Software

Selection in the product database

Manufacturer: MDT Technologies

Product family: Glass Push Button II Smart

Medium type: Twisted Pair (TP)

Product name: addicted to the used type, e.g.: GT2TW.01

Order number: addicted to the used type, e.g.: GT2TW.01

2.6 Commissioning

After wiring the device, the assignment of the physical address and the programming of the application follow:

- (1) Connect the interface with the bus, e.g. MDT USB Interface
- (2) Set bus power up
- (3) Activate the programming mode by pressing buttons 7 and 8 on the device simultaneously, (Status LEDs on the right and left side of the button alternately flash red)
- (4) Loading of the physical address out of the ETS-Software by using the interface (Red LEDs will turn off as soon as this is successfully completed)
- (5) Loading of the application, with requested parameterization
- (6) If the device is enabled you can test the requested functions (also possible by using the ETS-Software)

2.7 Reload Symbols

Any symbols can be loaded into the device. To do this, a DCA app "MDT Glass Push Button II Smart" has to be downloaded and installed from the MDT website or the my.knx.org shop. The images to be uploaded must meet the following requirements:

- Format: Bitmap
- Size: 64x64 Pixel
- Color: Black/White
- Usage: ETS5 or higher

3 Communication Objects

3.1 Default settings of the communication objects

The following table shows the standard settings for the communication objects:

Default settings per button									
No.	Name	Function	Length	C	R	W	T	U	
0	Push button 1 Push buttons 1/2	Blind Up/Down	1 Bit	X			X		
0	Push button 1 Push button 1/2	Dimming On/Off	1 Bit	X			X		
0	Push button 1 Push button 1/2	Switch Switch On/Off	1 Bit	X			X		
0	Push button 1	Toggle	1 Bit	X			X		
0	Push button 1	Send status	1 Bit	X			X		
0	Push button 1 Push button 1/2	HSV control On/Off	1 Bit	X			X		
0	Push button 1 Push button 1/2	Color temperature	1 Bit	X			X		
0	Push button 1 Push button 1/2	Decimal value	1 Byte	X			X		
0	Push button 1 Push button 1/2	Percent value	1 Byte	X			X		
0	Push button 1 Push button 1/2	Scene	1 Byte	X			X		
0	Push button 1 Push button 1/2	Forcible control	2 Bit	X			X		
0	Push button 1 Push button 1/2	Temperature value	2 Byte	X			X		
0	Push button 1 Push button 1/2	Brightness value	2 Byte	X			X		
0	Push button 1 Push button 1/2	RGB value HSV-value	3 Byte	X			X		
0	Push buttons 1/2	Setpoint shift	1 Bit 1 Byte 2 Byte	X			X		
0	Push buttons 1/2	Basis comfort setpoint	2 Byte	X			X		
0	Push button 1 Push button 1/2	Mode selection (HVAC-Mode)	1 Byte	X			X		
1	Push buttons 1/2	Stop/Slats Open/Close	1 Bit	X			X		
1	Push button 1	Slats/Stop	1 Bit	X			X		
1	Push button 1 Push button 1 short	Value for toggle	1 Bit	X		X	X	X	

1	Push button 1 short Push buttons 1/2 short	State for display	1 Bit	X		X	X	X
1	Push button 1 short Push buttons 1/2 short	Status percent value	1 Byte	X		X	X	X
1	Push button 1 short Push buttons 1/2 short	State decimal value	1 Byte	X		X	X	X
1	Push button 1 short Push buttons 1/2 short	State temperature value	2 Byte	X		X	X	X
1	Push button 1 short Push buttons 1/2 short	State brightness value	2 Byte	X		X	X	X
1	Push button 1 short Push buttons 1/2 short	Dimming relative	4 Bit	X			X	
1	Push button 1 short Push buttons 1/2 short	Change HSV Hue/Saturation/ value relative	4 Bit	X			X	
1	Push button 1 short Push buttons 1/2 short	Change color temperature relative	4 Bit	X			X	
1	Push buttons 1/2	State current temperature	2 Byte	X		X	X	X
1	Push button 1 Push buttons 1/2	State HVAC-Mode HVAC-Status	1 Byte	X		X	X	X
2	Push button 1 long	Switch	1 Bit	X			X	
2	Push button 1 long	Toggle	1 Bit	X			X	
2	Push button 1	Value for toggle	1 Bit	X		X	X	X
2	Push button 1	Value for change of direction	1 Bit	X		X	X	X
2	Push button 1 long Push buttons 1/2 long	Decimal value	1 Byte	X			X	
2	Push button 1 long Push buttons 1/2 long	Percent value	1 Byte	X			X	
2	Push button 1 long Push buttons 1/2 long	Scene	1 Byte	X			X	
2	Push button 1 long Push buttons 1/2 long	Forcible control	2 Bit	X			X	
2	Push button 1 long Push buttons 1/2 long	Temperature value	2 Byte	X			X	
2	Push button 1 long Push buttons 1/2 long	Brightness value	2 Byte	X			X	
2	Push button 1 long Push buttons 1/2 long	RGB value	3 Byte	X			X	
2	Push buttons 1/2	State current setpoint temperature	2 Byte	X		X	X	X
3	Push button 1 long	Value for toggle	1 Bit	X		X	X	X
3	Push button 1 Push buttons 1/2	State State for display	1 Bit	X		X	X	X
3	Push button 1 Push buttons 1/2	State State for display	1 Byte	X		X	X	X

3	Push button 1 Push buttons 1/2	State percent value State of decimal value	1 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	State for Hue (H)	1 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	State for Saturation (S)/ Value (V)	1 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	State for color temperature	1 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	State for display State of temperature value	2 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	State for display State of brightness value	2 Byte	X		X	X	X
3	Push button 1 Push buttons 1/2	Status setpoint shift	1 Byte 2 Byte	X		X	X	X
4	Push button 1 Push buttons 1/2	Blocking object	1 Bit	X		X	X	X
+5	Next Button							

Table 1: Communication objects – Default settings per button

Default settings – Slap-button								
No.	Name	Function	Length	C	R	W	T	U
60	Slap-button short	Switch On	1 Bit	X			X	
60	Slap-button short	Switch Off	1 Bit	X			X	
60	Slap-button short	Toggle	1 Bit	X			X	
60	Slap-button short	Forcible control	2 Bit	X			X	
60	Slap-button short	Percent value Decimal value Scene	1 Byte	X			X	
60	Slap-button short	Temperature value Brightness value Color temperature	2 Byte	X			X	
60	Slap-button short	RGB value HSV value	3 Byte	X			X	
61	Slap-button short	Value for toggle	1 Bit	X		X	X	X
60	Slap-button short	Switch On	1 Bit	X			X	
60	Slap-button short	Switch Off	1 Bit	X			X	
60	Slap-button short	Toggle	1 Bit	X			X	
62	Slap-button long	Forcible control	2 Bit	X			X	
62	Slap-button long	Percent value Decimal value Scene	1 Byte	X			X	
62	Slap-button long	Temperature value Color temperature Brightness value	2 Byte	X			X	
62	Slap-button long	RGB value HSV value	3 Byte	X			X	
63	Slap-button long	Value for toggle	1 Bit	X		X	X	X
64	Slap-button	Blocking object	1 Bit	X		X	X	X

Table 2: Communication objects – Default settings: Slap-button

Default settings – Logic function									
No.	Name	Function	Length	C	R	W	T	U	
65	Logic	Input1A	1 Bit	X		X	X	X	
66	Logic	Input 1B	1 Bit	X		X	X	X	
67	Logic	Output 1 Output 1 Scene Output 1 Value	1 Bit 1 Byte 2 Bit	X	X		X		

Table 3: Communication objects – Default settings: Logic function

Default settings – Status LEDs									
No.	Name	Function	Length	C	R	W	T	U	
77	LED 1	Switch	1 Bit	X		X	X	X	
+1	next LED								
89	LED A	Switch	1 Bit	X		X	X	X	
90	LED B	Switch	1 Bit	X		X	X	X	
91	LED 1 Priority	Switch	1 Bit	X		X	X	X	
+ 1	next LED Priority								
105	LED	Blocking object	1 Bit	X		X	X	X	

Table 4: Communication objects – Default settings: Status LEDs

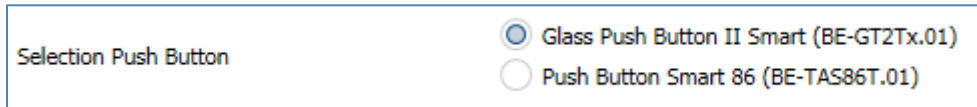
Default settings – Common objects								
No.	Name	Function	Length	C	R	W	T	U
106	Day/Night	Input	1 Bit	X		X	X	X
107	Presence	Input	1 Bit	X		X	X	X
108	Temperature measured value	Output	2 Byte	X	X		X	
109	External temperature measured value	Input	2 Byte	X		X		
110	Message	Maximum temperature	1 Bit	X	X		X	
111	Message	Minimum temperature	1 Bit	X	X		X	
112	Time	Input	3 Byte	X		X	X	X
114	Time/Date	Input	8 Byte	X		X	X	X
115 – 118	Message 1-4 (Message 1 highest priority)	Input	1 Bit	X		X	X	X
119	Message text (lowest priority)	Input	14 Byte	X		X	X	X
120 121	State text 1 State text 2	Input	14 Byte	X		X	X	X
122 – 124	State value 1-3	Input	1 Bit	X		X	X	X
125	Operation	Output	1 Bit	X	X		X	
126	Push button operation	Output	1 Bit	X	X		X	
127	Scene	Switch Page	1 Byte	X		X		
128	Display	Brightness	1 Byte	X	X		X	
129	LED	Blinking status	1 Bit	X			X	

Table 5: Communication objects – Default settings: Common objects

The preset default settings can be taken from the tables above. The priority of the individual communication objects as well as the flags can be adapted as required by the user. The flags assign the respective task to the communication objects in the programming. C stands for communication, R for reading, W for writing, T for transmission, and U for updating.

4 Reference ETS-Parameter

4.1 Hardware Selection

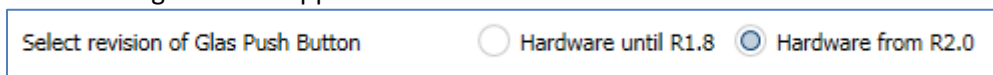


Selection Push Button

Glass Push Button II Smart (BE-GT2Tx.01)
 Push Button Smart 86 (BE-TAS86T.01)

Figure 3: Selection of Push Button

By selecting the hardware, the database is adapted.
The following selection appears if "Glass Push Button II Smart" is selected:



Select revision of Glas Push Button

Hardware until R1.8 Hardware from R2.0

Figure 4: Hardware selection – Glass Push Button II Smart

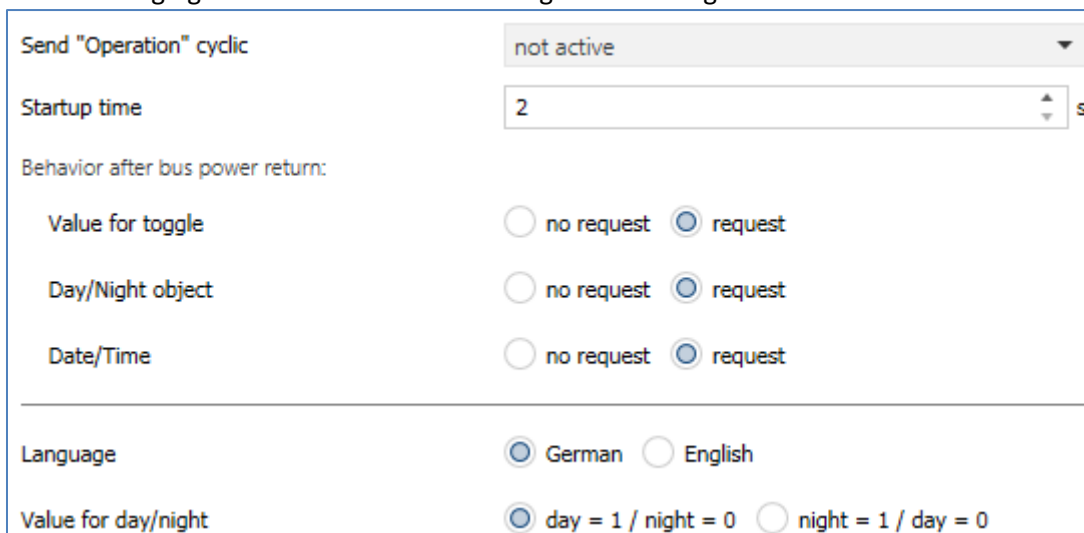
This is where you specify the hardware to be used. The revision is stated on the type plate on the back of the glass push-button.

Hardware up to R1.8 does not support some functions such as "6 functions / 1-2 levels"!

4.2 Operation / Display

4.2.1 General Settings

The following figure shows the menu for the general settings:



Send "Operation" cyclic: not active

Startup time: 2 s

Behavior after bus power return:

Value for toggle: no request request

Day/Night object: no request request

Date/Time: no request request

Language: German English

Value for day/night: day = 1 / night = 0 night = 1 / day = 0

Figure 5: General Settings

The following table shows the possible settings:

ETS-Text	Dynamic range [Default value]	Comment
Send „Operation“ cyclic	not active 1min - 4h	Setting whether a cyclic in-operation telegram is to be sent
Startup time	2 ... 240 s [2 s]	Sets the time between restart and functional start-up of the device
Behavior after bus power return:		
Value for toggle	<ul style="list-style-type: none"> ▪ no request ▪ request 	Setting whether the objects "Value for toggle" are to be requested
Day/Night object	<ul style="list-style-type: none"> ▪ no request ▪ request 	Setting whether the "Day/Night" object is to be requested
Date/Time	<ul style="list-style-type: none"> ▪ no request ▪ request 	Setting whether the objects for "Date/Time" are to be requested
Language	<ul style="list-style-type: none"> ▪ German ▪ English 	Sets the language for the display
Value for Day/Night	<ul style="list-style-type: none"> ▪ Day = 1 / Night = 0 ▪ Night = 1 / Day =0 	Sets the polarity for Day / Night switchover

Table 6: General Settings

4.2.2 Display Settings

4.2.2.1 Display Presentation

The following settings can be used to customize the appearance of the display:

View

Background color day = black; night = black ▼

Font size in function name small big

Font size for labeling of push buttons small big

Behavior if the text is too long text is clipped text size is reduced

Figure 6: Settings – Display Presentation

The following table shows the possible settings:

ETS-Text	Dynamic range [Default value]	Comment
Background color	<ul style="list-style-type: none"> ▪ Day = black Night = black ▪ Day = white Night = black ▪ Day = black Night = white ▪ Day = white Night = white 	Sets the background color of the display
Font size in function name	<ul style="list-style-type: none"> ▪ small ▪ big 	Sets the font size for the function name
Font size for labeling of push buttons	<ul style="list-style-type: none"> ▪ small ▪ big 	Setting the font size for the button labeling
Behavior if the text is too long	<ul style="list-style-type: none"> ▪ Text is clipped ▪ Text size is reduced 	Setting of the behavior when the text can not be displayed completely

Table 7: Settings – Display Presentation

4.2.2.2 Adaption to ambience

The following settings can be used to influence the adaptation of the display to the ambience (Here: Glass Push Button II Smart):

Figure 7: Settings – Adaption to ambience

A proximity sensor is only integrated on the Push Button Smart 86.

This was always present and can also be deactivated from hardware revision R2.4.

Figure 8: Settings – Proximity sensor

If the proximity sensor is active, it causes the same behaviour as the presence object.

The following table shows the possible settings:

ETS-Text	Dynamic range [Default value]	Comment
Proximity sensor	<ul style="list-style-type: none"> ▪ Active ▪ Not active 	Activate/deactivate the proximity sensor. Only for Push Button Smart 86
Behavior at presence --- Behavior at proximity/presence	<ul style="list-style-type: none"> ▪ Display is switched on ▪ Display is switched on and Standby is exited 	Setting the behaviour for a "1" telegram to the presence object or proximity. "Behavior on proximity/presence" only if the proximity sensor is activated and only with the Push Button Smart 86
Adapt display brightness to ambience	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Setting whether the brightness is dynamically adapted to the ambience
Adapt display brightness to ambience: No		
Control of display brightness via bus	<ul style="list-style-type: none"> ▪ Master mode ▪ Slave mode 	Synchronisation of the brightness of several push-buttons via the bus
Brightness at Day	1 – 100 % [10 %]	Setting a fixed brightness value in Day mode
Brightness at Night	1 – 100 % [3 %]	Setting a fixed brightness value in Night mode

Adapt display brightness to ambience: Yes		
Brightness	Brightness level 1 – 10 [Brightness level 8]	Sets the basic brightness of the display
Minimum Brightness at Day	1 – 100 % [10 %]	Setting the minimum brightness of the display. Below this value, the display is not dimmed during daytime operation
Minimum Brightness at Night	1 – 100 % [3 %]	Setting the minimum brightness of the display. Below this value, the display is not dimmed during night operation
Valid for both settings:		
Overnight shutdown in Standby	<ul style="list-style-type: none"> ▪ not active ▪ threshold 1 (moderately dark) ▪ threshold 2 (dark) ▪ threshold 3 (very dark) 	Setting of the display behavior for the overnight shutdown in standby mode

Table 8: Settings – Adaption to ambience

Principle of brightness adjustment:

The Glass Push-Button II Smart/Smart 86 has an **internal brightness sensor** and can dynamically adjust the display brightness to the surroundings. The "**brightness**" parameter influences dimming behaviour and the threshold at which the display is dimmed. The parameter for minimum brightness defines the absolute lowest threshold up to which the display is dimmed.

In the programmed state, the menu for the brightness adjustment can be called up by pressing the sensor surfaces 7 and 8 simultaneously:



In this menu the end user has the possibility to adjust the brightness settings independently (without ETS). The settings are stored permanently in the device until the next transfer of the database.

If the parameter „**Adapt display brightness to ambience**“ is set to “**Yes**”, the following adjustments are available:

Brightness: Defines the basic brightness of the display and influences the dimming behavior of the display according to the measured value for the ambient brightness.

min. Brightness: Defines the minimum brightness at darkness. In day mode, the adjustment for the day mode is set and in night mode the adjustments for the night mode is set.

If the parameter „**Adapt display brightness to ambience**“ is set to “**No**”, the following adjustments are available:

Brightness: Defines the absolute, fixed brightness. In day mode, the adjustment for the day mode is set and in night mode the adjustments for the night mode is set.

In addition, the **brightness** of the buttons can also be controlled **via the bus**. A push-button can be either set as **master** and send its brightness value to the bus.

The push-buttons in **slave** mode then receive the time and adjust their display brightness accordingly. Control via another KNX device is also possible.

Number	Name	Lenght	Usage
107	Presence – Input	1 Bit	Input for presence active, e.g. from presence detector
128	Display – Brightness	1 Byte	Receiving/sending the brightness for the display

Table 9: Communication objects – Display brightness

4.2.2.3 User-defined colors

Up to 3 user-defined colors can be mixed:

user-defined color 1	
Red part	0%
Green part	0%
Blue part	0%
user-defined color 2	
Red part	0%
Green part	0%
Blue part	0%
user-defined color 3	
Red part	0%
Green part	0%
Blue part	0%

Figure 9: Settings – User-defined colors

The user-defined colors can be mixed with the corresponding red / green / blue share and then be used for the display of the symbols.

4.2.2.4 Priority of HVAC Status

This setting affects various functions such as mode switching.

The following setting is available here:

Priority of HVAC Status Frost/Comfort/Night/Standby Frost/Night/Comfort/Standby

Figure 10: Display setting – Priority of HVAC Status

The order of priority is defined here.

Important: For correct presentation the sequence has to be set the same on the controller.

The following table shows the available communication objects which are relevant for the display behaviour of the display:

Number	Name	Lenght	Usage
106	Day/Night	1 Bit	Switching between Day- and Night mode
107	Presence	1 Bit	Input for presence active, e.g. from presence detector
112	Time	3 Byte	Receiving current time
114	Time/Date	8 Byte	Receiving current time and date
126	Button operation	1 Bit	Sending a "1" for button press to switch a basic lighting or the presence object of other momentary-action switches
128	Display – Brightness	1 Byte	Receiving/sending the brightness for the display

Table 10: Communication objects – Display behavior

After each restart, the **Day/Night object** is set to day; even if the communication object is not linked at all.

The **presence object** is used to deactivate the display when no one is in the room. It can, for example, be controlled via a presence detector.

If the presence object is set to the value 0, the display turns off and is only switched on again when the object is set to 1 or a key is pressed. If a key is pressed with the value 0 (= no presence), the display remains switched on until the display switches to standby mode. If Standby is deactivated, the display remains active for 120 seconds.

After each restart, the presence object is set to the value 1 (= presence); even if the object is not linked.

The presence object switches back and forth between the states "display is switched on" or "display is switched on and exits standby" and "display off" depending on the parameterisation.

4.2.3 Information screen

4.2.3.1 Presentation in Standby

The following figure shows the basic settings for the information screen:

Figure 11: Basic Settings – Information Screen

The following table shows the basic settings for the information screen:

ETS-Text	Dynamic range [Default value]	Comment
Color of the orientation LEDs in standby	Any color... [White]	Setting the LED colour when used as an orientation display. Effects the settings for "Standby display at day/night" with use as "...orientation LEDs"
Standby permanently visible in upper keypad (from R3.1)	<ul style="list-style-type: none"> ▪ Not active ▪ Active 	Standby can be permanently activated in the upper keypad. Only from HW revision R3.1
Time until standby	0 ... 60 s [20 s]	Sets the time between the last touch of a button and switching to standby mode

Standby display	<ul style="list-style-type: none"> ▪ Individually in change ▪ In 1 or 2 lines without change 	Setting the display during standby
Standby display at Day	<ul style="list-style-type: none"> ▪ No standby ▪ Standby in upper keypad, LED A/B ▪ Standby on full screen, orientation LEDs ▪ Display off, LEDs off ▪ Display off, orientation-LEDs 	Setting the display behavior of the information screen in day mode
Displayed parameters when selecting " Standby display - individually in change ".		
Change standby display after	1 ... 60 s [5 s]	Setting the changeover time between the activated status elements
State element 1-4 <i>(for Day and Night)</i>	<ul style="list-style-type: none"> ▪ Not active ▪ Time ▪ Internal temperature ▪ State value 1 - 3 ▪ State text 1 (over object 120) ▪ State text 2 (over object 121) 	Activation of up to 4 status elements and what they should display. - "not active" only with Status element 2-4! - "Internal temperature" only at Push-button with temperature sensor.
Displayed parameters when selecting " Standby display - In 1 or 2 lines without change ".		
Line 1 / 2	<ul style="list-style-type: none"> ▪ One state element ▪ Two state elements (right/left) ▪ Two state texts (top/bottom) 	Setting how the standby display is presented
State element	<ul style="list-style-type: none"> ▪ Time ▪ Internal temperature ▪ State value 1 – 3 ▪ State text 1 (over object 120) ▪ State text 2 (over object 121) 	With selection "one status element" Setting what should be displayed as a status element
State element left/right	<ul style="list-style-type: none"> ▪ Time ▪ Internal temperature ▪ State value 1 – 3 	With selection "Two state elements (right/left)" Setting what should be displayed as a status element
State element top/bottom	<ul style="list-style-type: none"> ▪ State text 1 (over object 120) ▪ State text 2 (over object 121) 	With selection "Two state texts (top/bottom)" Setting what should be displayed as a status element
Font size for first/second status line	<ul style="list-style-type: none"> ▪ Big ▪ Small 	Setting the font size in the display

The following parameters are available for both settings		
Indicated level after standby <i>(for Day and Night)</i>	<ul style="list-style-type: none"> ▪ Level 1 ▪ Level 2 ▪ Level 3 	Sets the level that is displayed after Standby. Number of levels depending on the display mode in the menu "Push Button functions. Only visible if more than 1 level is active!
Standby display at Night	<ul style="list-style-type: none"> ▪ No standby ▪ Standby in upper keypad, LED A/B ▪ Standby on full screen, orientation LEDs ▪ Behavior like Day ▪ Display off, LEDs off ▪ Display off, orientation-LEDs 	Setting the display behavior of the information screen in Night mode. When set to " Behavior like Day " the settings are accepted by Day mode and there are no settings for the standby mode
Action at push button if display is disabled	<ul style="list-style-type: none"> ▪ Standby is exited ▪ Standby is displayed 	Setting the behavior when a key is pressed when the display is off (e.g. via presence object)
Action at push button if standby is active	<ul style="list-style-type: none"> ▪ Function is not executed ▪ Funktion is executed 	Setting whether the key function is to be executed with the first key press while being in standby

Table 11: Basic Settings – Information Screen

The settings "Standby over full screen, orientation LEDs" and "Display Off, orientation LEDs" allow RGB status displays of the keys to be used additionally as orientation indicator.

As of hardware version R3.1, there is an option to display **Standby permanently in the upper keypad**.

This function can be parameterised from database version V2.4 and higher

If you select the button functions "4 functions/1-3 levels", the parameter is always displayed.

If you select "6 functions/1-2 levels", the parameter is only displayed if buttons 1/2 and 7/8 are set to "not active".

If the parameter is activated, the following parameter "Standby display at day" is permanently set to "Standby in the upper keypad, LED A/B".

This allows you to control the **LEDs A/B** in Standby mode to display the status during Standby, for example. For details on setting the LEDs A/B see 4.5 State LED.

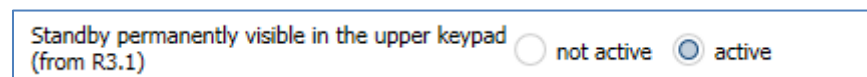


Figure 12: Settings – Standby permanently visible in upper keypad

4.2.3.2 Status values 1-3

The following figure shows the settings for activating the Status values 1-3:

State value 1	Percent 0...100% (DPT 5.001)
Text for the unit	%
Description for measurement	Status
State value 2	Brightness [Lux] (DPT 9.004)
Text for the unit	Lux
Description for measurement	South
State value 3	not active

Figure 13: Settings – State Values 1 - 3

The following table shows the possible settings:

ETS-Text	Dynamic range [Default value]	Comment
State values 1 - 3	<ul style="list-style-type: none"> ▪ Not active ▪ On/Off (DPT 1.001) ▪ Percent 0...100% (DPT 5.001) ▪ Value 0...255 (DPT 5.005) ▪ Current (mA) (DPT 7.012) ▪ Brightness (Lux) (DPT 7.013) ▪ Temperature (°C) (DPT 9.001) ▪ Brightness (Lux) (DPT 9.004) ▪ Wind speed (m/s) (DPT 9.005) ▪ Humidity (%) (DPT 9.007) ▪ Air quality (ppm) (DPT 9.008) ▪ Current (mA) (DPT 9.021) 	Setting the DPT to be displayed as status value
Text for unit	any text [up to 5 bytes allowed]	Enter the text describing the unit
Description for measurement	any text [up to 15 bytes allowed]	Enter the text describing the measurement

Table 12: Settings – State Values 1 - 3

The following table shows the available communication objects for the information screen:

Number	Name	Length	Usage
120	State text 1	14 Byte	Receiving a status text
121	State text 2	14 Byte	Receiving a status text
122	State value 1		Receiving a status value. DPT according to parameter setting
123	State value 2		Receiving a status value. DPT according to parameter setting
124	State value 3		Receiving a status value. DPT according to parameter setting

Table 13: Communication objects – State Values/State texts

4.2.3.3 Messages/Alarms

The following figure shows the available settings for messages and alarms:

The screenshot shows a configuration window for messages and alarms. It includes the following settings:

- Message 1 (Bit Object) (highest priority):** active
- Text:** Meldung 1
- Display time:** until button is pushed
- Message 2 (Bit Object):** not active
- Message 3 (Bit Object):** not active
- Message 4 (Bit Object):** not active
- Message text (14Byte Object) (lowest priority):** active
- Display time:** until button is pushed
- Cancel the message via object:** not active, only push of button and duration
- Color of message text:** red
- Indicate a message via LEDs:** yes
- Color of LEDs:** red

Figure 14: Settings – Messages / Alarms

The following table shows the settings for the messages and alarms:

ETS-Text	Dynamic range [Default value]	Comment
Message 1-4 (Bit Objekt)	<ul style="list-style-type: none"> not active active 	Activation of message 1-4. Message 1 (highest priority)
Text	any text [up to 15 bytes allowed]	Displayed text when the message is triggered
Display time	<ul style="list-style-type: none"> not active until button is pushed 1 s – 8 h 	Setting how long the message should be displayed
Message text (14 Byte Object) (lowest priority)	<ul style="list-style-type: none"> not active active 	Activation of the message text via the 14 byte object. Message text has the lowest priority of all messages
Display time	<ul style="list-style-type: none"> not active until button is pushed 1 s – 8 h 	Setting how long the message should be displayed
Cancel the message via object	<ul style="list-style-type: none"> Not active, only push of button and duration Active, additionally with value 0 over objects "Message 1-4" 	Setting when the message should be taken back

Color of message text	Any color [Red]	Setting of the color for the message text
Indicate a message via LEDs	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Setting if the LEDs should flash at an active message
Color of LEDs	Any color [Red]	Select the colour in which the LEDs display the message. Only visible if "Indicate message via LEDs" is activated.

Table 14: Settings – Messages/Alarms

The message behavior depends on the parameter "Standby display at day / night". The different behaviors are shown below:

Standby display	Incoming message during standby
no Standby	<ul style="list-style-type: none"> ▪ No message is displayed but saved
Standby in upper keypad	<ul style="list-style-type: none"> ▪ Message is displayed on upper button pair and the upper LEDs change between parameterized color and black at 600ms pulse ▪ At the same time, the parameterized color is set to double brightness in order to increase the signal effect ▪ The message is only acknowledged by pressing to one of the upper buttons. ▪ A keystroke on the middle and lower buttons performs the displayed switching functions
Standby on full screen	<ul style="list-style-type: none"> ▪ Message is displayed in the middle of the screen and all LEDs change between parameterized color and black ▪ At the same time, the parameterized color is set to double brightness in order to increase the signal effect. ▪ The message is acknowledged by pressing to any key
Display off	<ul style="list-style-type: none"> ▪ No message is displayed during standby but saved. ▪ The message with the highest priority is indicated by the keystroke after standby ▪ The displayed messages are acknowledged by means of further key strokes ▪ Message is displayed in the middle of the screen and all LEDs change between parameterized color and black ▪ At the same time, the parameterized color is set to double brightness in order to increase the signal effect.
Display off and orientation-LED on	<ul style="list-style-type: none"> ▪ Message is displayed in the middle of the screen and all LEDs change between parameterized color and black ▪ At the same time, the parameterized color is set to double brightness in order to increase the signal effect. ▪ After the "timeout for standby", the LEDs will stop flashing and the message disappears. ▪ If any button is pressed after the LEDs have stopped flashing, the message with the highest priority is displayed again. Further keystrokes acknowledge the messages

Table 15: Behavior of the device to an incoming message during standby

Standby display	Incoming message during operation
no Standby	<ul style="list-style-type: none"> No message is displayed but saved

Table 16: Behavior of the device to an incoming message during operation

Standby display	Incoming message while Standby + Displaybrightness „Off“ via brightness sensor
no Standby	<ul style="list-style-type: none"> No message is displayed but saved
Standby in upper keypad	<ul style="list-style-type: none"> Brings display back to life (dark background lighting) After the "timeout for standby" has expired, the backlight is switched off again. Otherwise as in Standby
Standby on full screen	<ul style="list-style-type: none"> Brings display back to life (dark background lighting) After the "timeout for standby" has expired, the backlight is switched off again. Otherwise as in Standby
Display off	<ul style="list-style-type: none"> Like in Standby
Display off and orientation-LED on	<ul style="list-style-type: none"> Brings display back to life (dark background lighting) After the "timeout for standby" has expired, the backlight is switched off again. Otherwise as in Standby

Table 17: Behavior when incoming message at standby and the operation switched off

Communication objects

The following table shows the available communication objects for the alarms/messages:

Number	Name	Length	Usage
115	Message 1 (highest priority)	1 Bit	Triggering a message
116	Message 2	1 Bit	Triggering a message
117	Message 3	1 Bit	Triggering a message
118	Message 4	1 Bit	Triggering a message
119	Message text (lowest priority)	14 Byte	Triggering a message. Send any message text

Table 18: Communication objects – Alarms/Messages

4.3 Push Button functions

4.3.1 Display mode/Button activation/Level setting

The following settings are available (here for display mode "6 functions/1-2 levels"):

Display mode	<input checked="" type="radio"/> 6 functions / 1-2 levels <input type="radio"/> 4 functions / 1-3 levels
2. level / 12 functions	<input type="radio"/> not active <input checked="" type="radio"/> active
Level 1 (Push buttons 1/2 top, push buttons 3/4 central, push buttons 5/6 bottom)	
Push button 1/2 (left, right)	single-button function ▼
Push buttons 3/4 (left, right)	two-button function ▼
Push buttons 5/6 (left, right)	not active ▼
Level 2 (Push buttons 7/8 top, push buttons 9/10 central, push buttons 11/12 bottom)	
Push buttons 7/8 (left, right)	two-button function ▼
Push buttons 9/10 (left, right)	not active ▼
Push buttons 11/12 (left, right)	not active ▼
Toggle between levels	
	via hidden bottom buttons ▼
Switch to standby level after page change via hidden buttons	
	<input checked="" type="radio"/> 10 sec after last touch <input type="radio"/> not active
Slap / Cleaning function	
	<input type="radio"/> not active <input checked="" type="radio"/> active
Reaction time at the push of button	
	fast ▼
Time for long push of button	
	0,4 s ▼

Figure 15: Settings – Push button functions

Die nachfolgende Tabelle zeigt die verfügbaren Einstellungen:

ETS-Text	Wertebereich [Defaultwert]	Kommentar
Display mode	<ul style="list-style-type: none"> ▪ 6 functions / 1-2 levels ▪ 4 functions / 1-3 levels 	Setting the display mode
Display mode: 6 functions / 1-2 levels		
2. Level/ 12 Functions	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of 2 nd level
Push buttons 1/2 – 11/12	<ul style="list-style-type: none"> ▪ not active ▪ single button function ▪ two button function 	Activates the push button pair and selection of the function
Toggle between levels	<ul style="list-style-type: none"> ▪ Via hidden bottom buttons ▪ Via scene object ▪ Via hidden bottom buttons and scene object 	Setting how to switch between the different levels
Scene number for toggle to level 1/2	1 - 64	Setting the scene number for level change. Only visible if toggling via scene object is activated.
Switch to Standby level after page change via hidden buttons	<ul style="list-style-type: none"> ▪ 10 sec. after last touch ▪ Not active 	Setting whether the push button should automatically return to the standby level after 10s. Only visible if toggling via hidden buttons is active.
Display mode: 4 functions / 1-3 levels		
2. Level/ 8 Functions	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of 2 nd level
3. Level/ 12 Functions	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of 3 rd level. Only visible when 2nd level is active
Push buttons 1/2 – 11/12	<ul style="list-style-type: none"> ▪ not active ▪ single button function ▪ two button function 	Activates the push button pair and selection of the function
Toggle between levels over scene object	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activating level switching by receiving scenes
Scene number for toggle to level 1-3	1 - 64	Setting the scene number for level change
The following settings are available for both display modes		
Slap / Cleaning function	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activates the Slap- and Cleaning function
Reaction time at push of button	<ul style="list-style-type: none"> ▪ fast ▪ medium ▪ slow 	Sets the debouncing time of the buttons
Time for long push of button	0,1 s – 30 s [0,4 s]	Setting from when a long keystroke is detected

Table 19: Settings – Push button functions

The **levels can be switched in display mode 4 functions/ 1-3 levels** with the upper two keys and the menu 4.3.2 Level setting is displayed. In this menu you can set the symbols for the individual levels. Switching is also possible via a scene object. In this way, for example, a level can be called up depending on a particular scene.

The **levels can be switched in display mode 6 functions/ 1-2 levels** using a scene object and/or the hidden sensor keys. The position of these sensor keys is described in 2.4 Structure & Handling. When switching over using the hidden sensor keys, **a long key press on one of these sensor surfaces switches the level**. If the switch-over with the hidden sensor keys is active, you can activate an automatic return to the standby level with the parameter "Switch to standby level after page change with hidden keys". It is also possible to switch over the levels via scenes.

4.3.2 Level setting

If the display mode is set to "4 functions / 1-3 levels", the submenu "Level setting" is displayed. The following figure shows the available settings for the individual levels:

The screenshot shows a settings menu with three sections for Level 1, Level 2, and Level 3. Each section contains three settings: Level labeling, Color of symbol, and Level symbol. Below each 'Level symbol' dropdown is a preview of the selected symbol.

- Level 1 (Functions 1-4)**
 - Level labeling: Light
 - Color of symbol: foreground color
 - Level symbol: Symbol 17: light on
 - Symbol preview: Light bulb icon
- Level 2 (Functions 5-8)**
 - Level labeling: Shutter
 - Color of symbol: foreground color
 - Level symbol: Symbol 12: Shutter >90%
 - Symbol preview: Shutter icon (horizontal bars)
- Level 3 (Functions 9-12)**
 - Level labeling: Scene
 - Color of symbol: foreground color
 - Level symbol: Symbol 24: scene
 - Symbol preview: Scene icon (clapperboard with 'SC')

Figure 16: Settings – Level setting

The number of levels displayed for setting is the same as the number of levels activated under "Push button functions". The following table shows the available settings:

ETS-Text	Dynamic range [Default value]	Comment
Level 1-3 (Functions 1-4 / 5-8 / 9-12)		
Level labeling	any text [15 Bytes erlaubt]	Setting the text for the respective level. The text is displayed above the level symbol
Color of symbol	any color	Sets the color for the symbol
Level symbol	all loaded symbols	Setting of the symbol to be displayed for the appropriate level

Table 20: Settings – Level setting

4.3.3 Overview: Two-button function / Single-button function

Each push button pair can be activated as a single-button function or as a two-button function. For the **single button function**, only one key is used for the function. The **two-button function** always uses 2 buttons for the function and the operating concept works like a rocker. For each key, you can specify the value (On/Off, Up/Down, Lighter/Darker, etc.) that is to be sent.

A **function name** can be set for both, the single-button function and the two-button function. The button labeling, due to the smaller space on the display is only possible for the two-button function. Up to 20 characters are allowed for the function name.

Only with the two-button function is it possible to give the left and right buttons their own names. Up to 6 characters are permitted for the button labelling:

Function name	over text input
Text	Light Kitchen
Key label for left push button	ON
Key label for right push button	OFF

Figure 17: Settings – Button labeling - Two-button function

The functions of the single-button function and the two-button function are described in more detail in chapter 4.4 Push button functions. At the beginning of each function description it is also indicated whether this function is available as a single-button function, as a two-button function or for both operating concepts.

4.3.4 Slap-/Cleaning function

The following figure shows the settings for the submenu of the Slap / Cleaning function:

Figure 18: Settings – Slap-/cleaning function

The following table shows the available settings:

ETS-Text	Dynamic range [Default value]	Comment
Cleaning function	<ul style="list-style-type: none"> ▪ Cleaning not active, slap active ▪ Cleaning = long button, Slap = short button ▪ Cleaning = short button Slap = long button 	Activation of the Cleaning-/Slap function and setting if activation via short or long keystroke
Slap function for short/long push of button	<ul style="list-style-type: none"> ▪ switch Off ▪ switch On ▪ toggle ▪ send value ▪ nothing 	Setting the slap function. Short/long key depending on the selected concept.
Send value	<ul style="list-style-type: none"> ▪ 2Bit DPT 2.001 Switch Control ▪ 1Byte DPT 5.001 Percent (0...100%) ▪ 1Byte DPT 5.005 Decimal factor (0...255) ▪ 1Byte DPT 17.001 Scene number ▪ 2Byte DPT 7.600 Color Temperature (Kelvin) ▪ 2Byte DPT 9.001 Temperature (°C) ▪ 2Byte DPT 9.004 Brightness (Lux) ▪ 3Byte DPT 232.600 RGB Value 3x(0...255) 	Setting the data point type. Depending on the selected DPT, a parameter for the corresponding value to be sent is displayed.
Individual time for long push of button	not active 0,1 s – 30,0 s	Setting an individual time from when a long keystroke is detected
Display behavior of LEDs	any color	Display behavior of the LEDs when the slap function is active
Blocking object	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of the blocking function for the slap function

Table 21: Settings – Slap-/cleaning function

The **Slap-/Cleaning function** will be executed by pressing 3 or more buttons simultaneously.

The **cleaning function** blocks the push button against further operation or sending out a telegram for 10 seconds. If further keys are pressed within these 10 seconds, e.g. when cleaning the glass surface, the device remains locked. The cleaning function is indicated by a white flashing of all status LEDs.

The **slap function** can be used as a further key. This allows the sending of a particular command by simply "slapping" on the button, e.g. when entering a room to turn the light on / off. The slap function is executed when 3 or more keys are pressed simultaneously. The parameter "slap function" can be used to set the value to be transmitted. An active slap function can be signaled with a freely adjustable color via the status LEDs. The status LEDs flash briefly in the set color.

If the cleaning function is deactivated, the slap function can send values for a long keystroke as well as for a short keystroke.

The following table shows the available communication objects for the Slap / Cleaning function:

Number	Name	Length	Usage
60	Slap-button short – Percent value, Decimal value...		Sending the value for the slap button. DPT according to settings in the parameters
61	Slap-button short – Value for toggle	1 Bit	Only for "toggle" function. Receives the current state of the actuator to be controlled
62	Slap-button long – Percent value, Decimal value...		Sending the value for the slap button. DPT according to settings in the parameters
63	Slap-button long – Value for toggle	1 Bit	Only for "toggle" function. Receives the current state of the actuator to be controlled
64	Slap-button – Blocking object	1 Bit	Blocking of the slap function

Table 22: Communication objects – Slap-/cleaning function

4.4 Push button functions

4.4.1 Identical parameter – Blocking object

The blocking object can be activated for both grouped buttons and single buttons. If the blocking object is active, a communication object is displayed for the relevant button or the relevant button pair. This means that up to 12 blocking objects can be parameterised for one push-button. If the blocking object is assigned a logical 1, the corresponding push-button is "blocked" and can therefore no longer be switched. A logical 0 removes the lock.



Figure 19: Identical parameter – Blocking object

The following table shows the available communication object:

Number	Name	Length	Usage
4	Blocking object	1 Bit	Blocks the button function

Table 23: Identical object – Blocking object

4.4.2 Identical parameter – Function name

The presentation of a button function is parameterised identically for all buttons or button pairs. The **function name** is displayed centrally above the respective function and can either be set permanently ("via text input") or set dynamically via a communication object.

With the two-button function, the left and right buttons can also be assigned their own labelling.

The display of the symbols is described under the corresponding button functions.

The following settings are available:

ETS-Text	Dynamic range [Default value]	Comment
Function name	<ul style="list-style-type: none"> ▪ no text ▪ from „message-text“ (14 Byte object 119) ▪ from „State text 1“ (14 Byte object 120) ▪ from „State text 2“ (14 Byte object 121) ▪ over text input ▪ dynamic text according to status value 	<p>Sets the data source for the function name.</p> <p>Selection "dynamic text according to status value" only available for "switching" functions.</p> <p>The function name is changed depending on the telegram received, e.g. "Presence/Absent" can be signalled.</p>
Text	free text [up to 20 bytes allowed]	Input of the function name. Only available for "Function name – over text input"
Key label for left/right push button	free text [up to 6 bytes allowed]	Labelling of left and right button. Only for two-button function.
Text for "Off" / "On"	free text [up to 9 bytes allowed]	Input of a text. Only available for "dynamic text according to status value"

Table 24: Identical Parameter – Function name

The **function name** can be accessed via various parameter settings. This can be done, for example, from text or status messages, via text input or also as dynamic text according to status value.
If the status object for a function is not linked, the switching state is visualised, otherwise the sent value of the button is displayed.

4.4.3 Identical parameter – Description of objects

A text field is available for each button or button pair for free labelling:

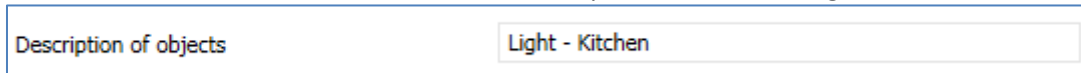
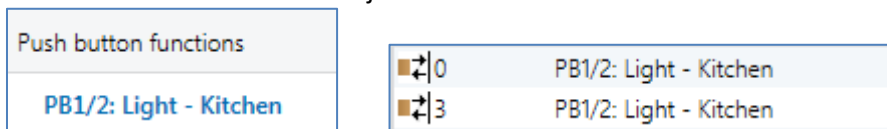


Figure 20: Identical parameter – Text field: Description of objects

A text with up to 30 characters can be entered for the field.

The text entered to describe the objects appears both in the menu behind the corresponding buttons and for the communication objects of the buttons:



4.4.4 Switch – General

The following figure shows the available settings (here with the two-button function):



Description of objects	Light - Kitchen
Two-button function	switch
Assignment of push buttons	<input type="radio"/> On/Off <input checked="" type="radio"/> Off/On
Function name	over text input
Text	Switch
Key label for left push button	OFF
Key label for right push button	ON
Color of symbol for "Off"	foreground color
Symbol for "Off"	Symbol 16: light off 
Color of symbol for "On"	sun orange
Symbol for "On"	Symbol 17: light on 
Blocking Object	<input checked="" type="radio"/> not active <input type="radio"/> active

Figure 21: General settings – Switch

The following parameters are identical for the button function "Switch":

ETS-Text	Dynamic range [Default value]	Comment
Assignment of push buttons	<ul style="list-style-type: none"> ▪ On/Off ▪ Off/On 	Only for two-button function. Defines the sending behavior of the left and right buttons
Subfunction	<ul style="list-style-type: none"> ▪ switch ▪ toggle ▪ send status ▪ send status with on-delay ▪ send status with off-delay 	Only for single-button function. Defines the subfunction and, if necessary, displays further parameters

Value for pushed button	<ul style="list-style-type: none"> ▪ Off ▪ On 	<p>Only for single-button functions “Switch” and “Send status”. Defines the sending behavior of the button.</p>
Value for released button	<ul style="list-style-type: none"> ▪ Off ▪ On 	<p>Only for single-button function “Send status”. Defines the sending behavior of the button.</p>
Time delay	<p>No delay 1 s – 60 min [1 s]</p>	<p>Only for single-button function “Send status with On/Off delay. Defines a delay of the telegram to be sent.</p>

Table 25: General settings – Switch

4.4.4.1 Switch with the two-button function

Two-button function

In the case of the two-button function, the respective value (On/Off) can be assigned to the left and right buttons. Thus, the left and right buttons sends a set fixed value.

The following figure shows the available settings for the two-button function "switch":

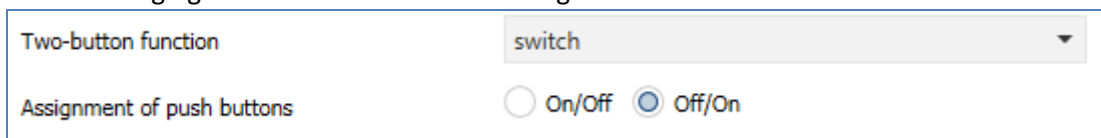


Figure 22: Settings – Two-button function: Switch

Assignment On/Off: The left button sends the value ON and the right button sends the value OFF.

Assignment Off/On: The left button sends the value OFF and the right button sends the value ON.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Switch On/Off	1 Bit	Switch function of the buttons.
3	Push buttons 1/2 – State for display	1 Bit	Status to refresh the display/symbol on the button. Has to be connected to the status of the actuator to be switched.

Table 26: Communication objects – Two-button function: Switch

4.4.4.2 Subfunction: Switch

Single-button function

With this function, the button sends the respective fixed value when pressed. The following figure shows the available settings:

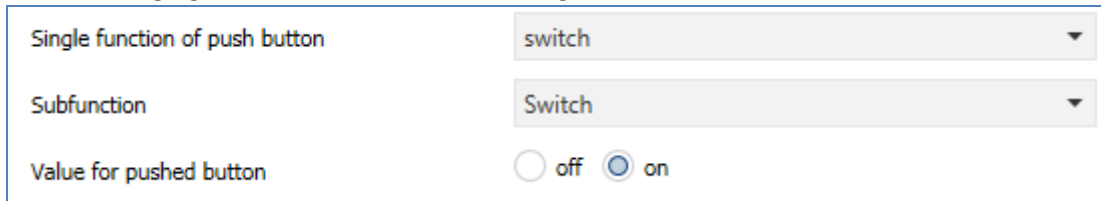


Figure 23: Settings – Single-button function: Switch - Switch

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – Switch	1 Bit	Switch function of the button
3	Push button 1 – State for display	1 Bit	Status to refresh the display/symbol on the push button. Has to be connected to the state of the actuator to be switched

Table 27: Communication objects – Single-button function: Switch - Switch

4.4.4.3 Subfunction: Toggle

Single-button function

With the single button function "Switch" - Subfunction: Toggle, the key sends the respective inverted value with respect to the last received status value. For this purpose, the status object "value for toggle" has to be connected with the status of the actuator to be switched. If an "On" signal has been received as last value, the push button sends an "Off" command at the next keystroke and vice versa. The following figure shows the available settings:

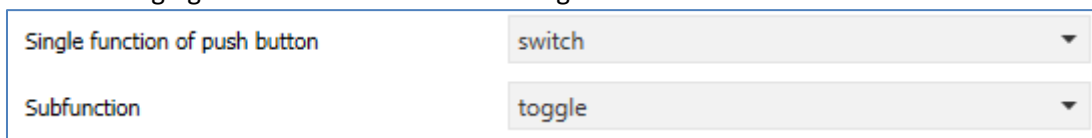


Figure 24: Settings – Single-button function: Switch - Toggle

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – switch	1 Bit	Switch function of the button
1	Push button 1 – Value for toggle	1 Bit	Status to refresh the display/symbol on the push button. Has to be connected to the status of the actuator to be switched so that the correct (inverted) value is always transmitted

Table 28: Communication objects – Single-button function: Switch - Toggle

4.4.4.4 Subfunction: Send status

Single-button function

With the single button function "Switch" - Subfunction: Send status, fixed values for an activated key (rising edge) and a released key (falling edge) can be sent. With this function, non-latching applications can be realized.

The following figure shows the available settings:

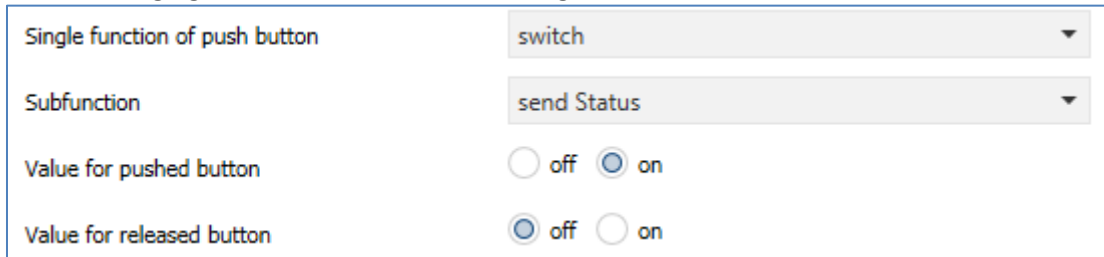


Figure 25: Settings – Single-button function: Switch - Send status

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – Send status	1 Bit	Switch function of the button
3	Push button 1 – State for display	1 Bit	State to refresh the display/symbol on the button. Has to be connected to the status of the actuator to be switched

Table 29: Communication objects – Single-button function: Switch - Send status

4.4.4.5 Subfunction: Send status with on-delay

Single-button function

With the single-button function "Switch" - Subfunction: Send status with on-delay, the key sends the value "On" for pressing the key and the value "Off" for releasing the key. However, the value "On" is delayed by the set time delay. If the key is released before the set time delay has elapsed, no "On" value is sent.

The following figure shows the available settings:

Single function of push button	switch
Subfunction	send Status with on-delay
Time delay	3 s

Figure 26: Settings – Single-button function: Switch - Send status with on-delay

The following diagram illustrates the behavior of this subfunction:

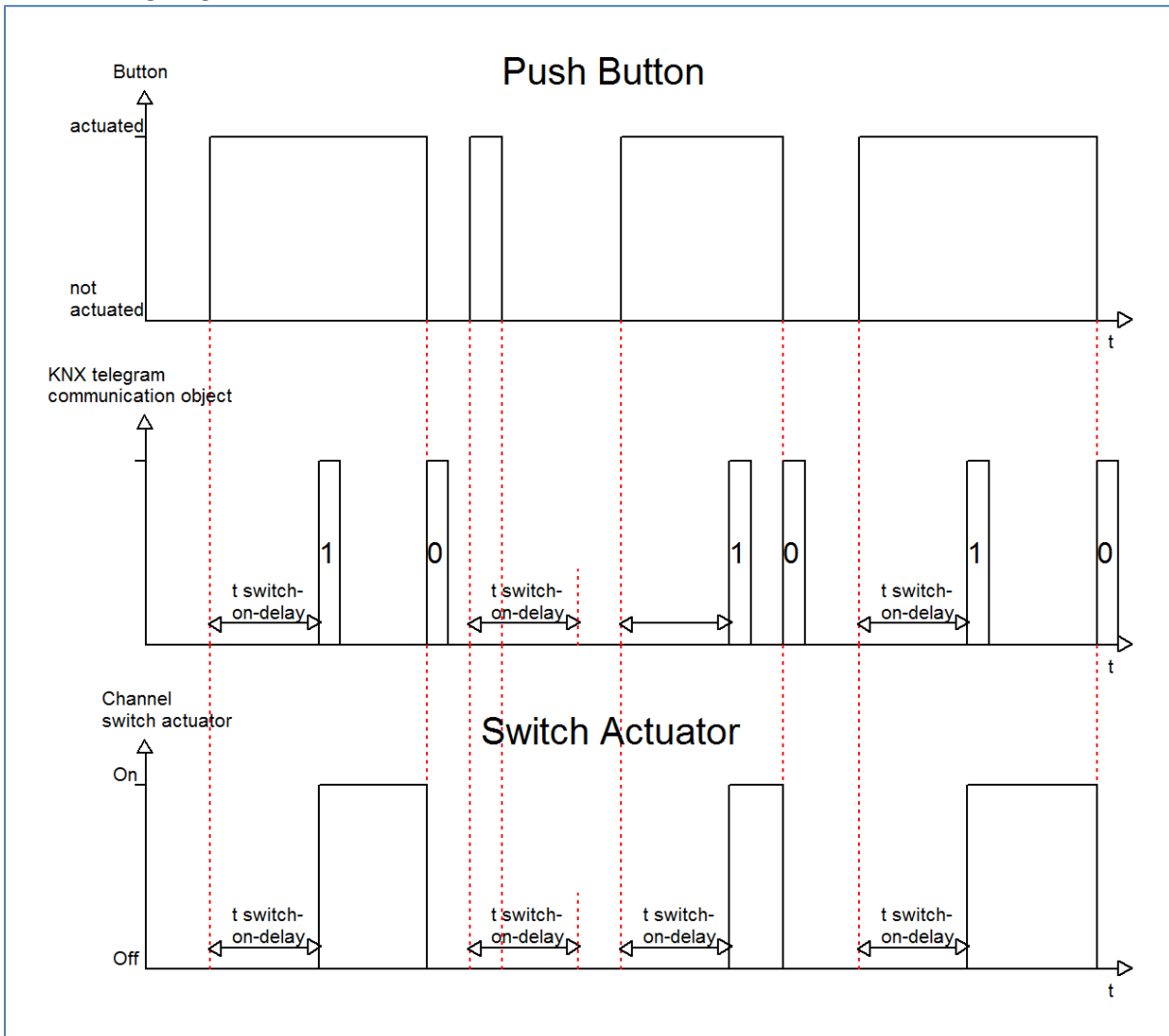


Figure 27: Diagram – Behavior "Send status with on-delay"

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – Send status	1 Bit	Switch function of the button
3	Push button 1 – State for display	1 Bit	Status to refresh the display/symbol on the push button. Has to be connected to the status of the actuator to be switched

Table 30: Communication objects – Single-button function: Switch - Send status with on-delay

4.4.4.6 Subfunction: Send status with off-delay

Single-button function

With the single-button function "Switch" - Sub-function: Send status with switch-off delay, the key sends the value "On" for pressing the key and the value "Off" for releasing the key. However, the value "Off" is delayed by the set time delay.

The following figure shows the available settings:

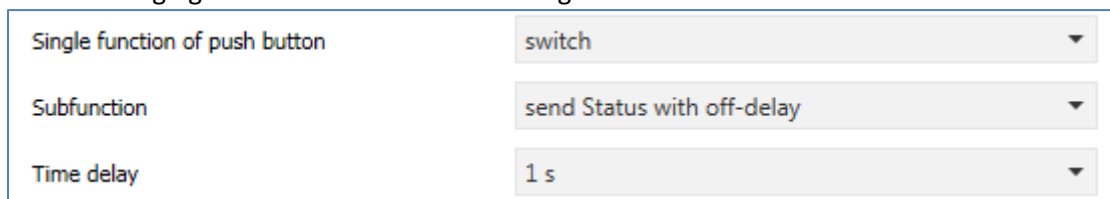


Figure 28: Settings – Single-button function: Switch - Send status with off-delay

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – Send status	1 Bit	Switch function of the button
3	Push button 1 – State for display	1 Bit	State to refresh the display/symbol on the push button. Has to be connected to the state of the actuator to be switched

Table 31: Communication objects – Single-button function: Switch - Send status with off-delay

4.4.4.7 Presentation on display

- Single-button function
- Two-button function

The switching function can display the two possible states (On/Off) by freely selectable symbols with a freely selectable color. Though the evaluated status is visualized:



Color of symbol for "Off"	foreground color
Symbol for "Off"	Symbol 16: light off 
Color of symbol for "On"	red
Symbol for "On"	Symbol 17: light on 

Figure 29: Presentation – Symbols Switching-function

4.4.5 Send values

4.4.5.1 Subfunction: Send values

- Single-button function
- Two-button function

This function allows you to send different values of a data point type.

The following figure shows the available settings (here for the two-button function):

Two-button function	send value
Subfunction	send value
Datapoint type	1Byte DPT 5.001 Percent (0...100%)
Left push button: Percent value (0...100%)	3%
Right push button: Percent value (0...100%)	77%

Figure 30: Settings – Send Values - Subfunction: Send Values

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Datapoint type	<ul style="list-style-type: none"> ▪ 2Bit DPT 2.001 Forcible control ▪ 1Byte DPT 5.001 Percent value (0...100%) ▪ 1Byte DPT 5.005 Decimal factor (0...255) ▪ 1Byte DPT 17.001 Scene number ▪ 2Byte DPT 7.600 Color temperature (Kelvin) ▪ 2Byte DPT 9.001 Temperature (°C) ▪ 2Byte DPT 9.004 Brightness (Lux) ▪ 3Byte DPT 232.600 RGB value 3x(0...255) 	Setting the data point type to be sent
Left/right push button: Percent value, Decimal factor....	any value according to set datapoint type	Only for two-button function. Setting the values to be sent for the two buttons
Percent value, Decimal value....	any value according to set datapoint type	Only for single-button function. Setting the values to be sent for the button

Table 32: Settings – Send Values - Subfunction: Send Values

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1: Push buttons 1/2: – Forcible control, Percent value...	2 Bit 1 Byte 2 Byte 3 Byte	Sending the switching value. DPT depending on the parameter setting
1	Push buttons 1/2: – State of percent value, State of decimal value....	1 Byte 2 Byte	Receive the status for the display. DPT depending on the parameter setting. Status for forcible control, scene number and RGB value not available.
3	Push button 1 – State for display	1 Byte 2 Byte	Receive the status for the display. DPT depending on the parameter setting. Status for forcible control, scene number and RGB value not available.

Table 33: Communication objects – Send Values - Subfunction: Send Values

4.4.5.2 Subfunction: Switching values/scenes (up to 4 values)

- Single-button function
- Two-button function

With the function “Send values - Switching values/scenes (up to 4 values)” can be switched between up to 4 different values of one data point type.

The following figure shows the available settings (here for the two-button function):

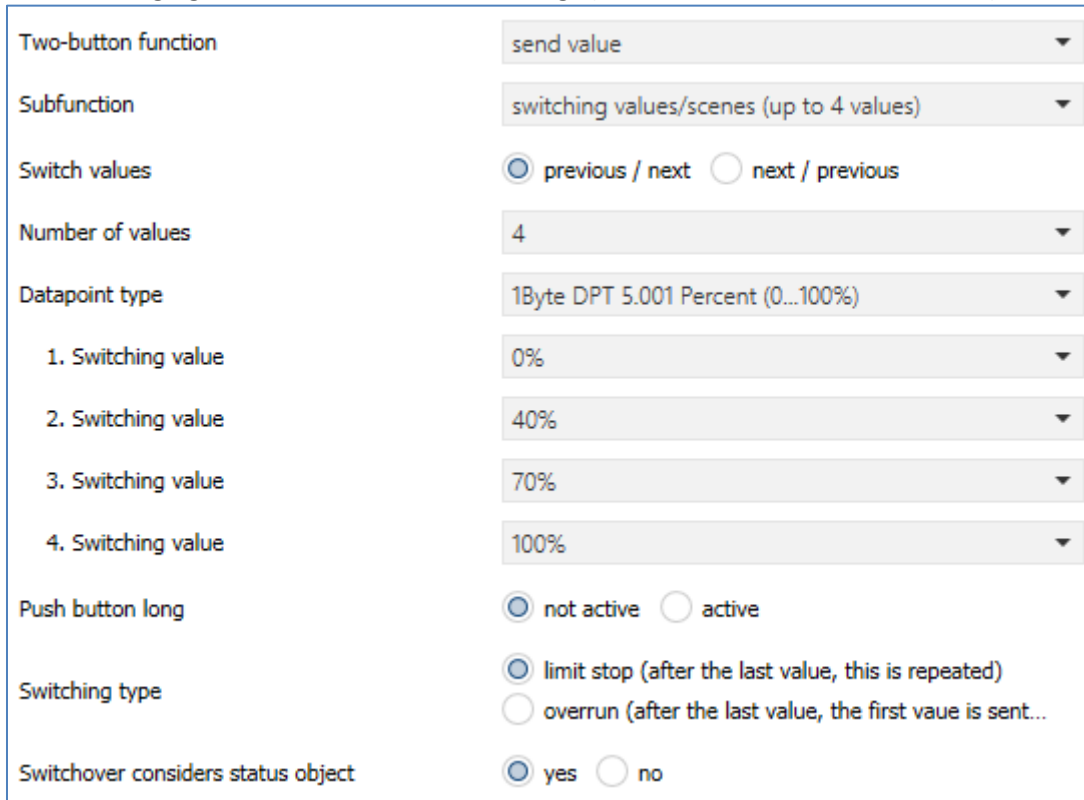


Figure 31: Settings – Send Values - Subfunction: Switching values/scenes (up to 4 values)

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Switch values	<ul style="list-style-type: none"> ▪ Previous/next ▪ next/previous 	Only with two-button function. Setting to which direction is to be moved at pressing left/right buttons
Number of values	<ul style="list-style-type: none"> ▪ 2 ▪ 3 ▪ 4 	Setting between how many values should be switched

Datapoint type	<ul style="list-style-type: none"> ▪ 2Bit DPT 2.001 Forcible control ▪ 1Byte DPT 5.001 Percent value (0...100%) ▪ 1Byte DPT 5.005 Decimal factor (0...255) ▪ 1Byte DPT 17.001 Scene number ▪ 2Byte DPT 7.600 Color temperature (Kelvin) ▪ 2Byte DPT 9.001 Temperature (°C) ▪ 2Byte DPT 9.004 Brightness (Lux) ▪ 3Byte DPT 232.600 RGB value 3x(0...255) 	Sets the data point type to be sent
1. – 4. Switching value	any value according to the selected datapoint type	Sets the respective value for the switching value
Time delay between scene switching	<p>No delay 1 s – 10 s [2 s]</p>	<p>Set a delay between sending the scenes. Only for „DTP 17.001 Scene“</p>
Push button long	<ul style="list-style-type: none"> • not active • active 	Activation of a function with a long keystroke
Left / Right push button: Action with a long push of button	<ul style="list-style-type: none"> • 1. – 4. Switching value • 4. Switching value if previous was 1. value, otherwise 1. value • Send 0 • “Off” at second object • “On” at second object 	<p>Only for two-button function and Push button long is active. Setting the action with long keystroke. Number of possible switching values according to the selection "Number of values".</p>
Action with a long push of button	<ul style="list-style-type: none"> • 1. – 4. Switching value • 4. Switching value if previous was 1. value, otherwise 1. value • Send 0 • “Off” at second object • “On” at second object 	<p>Only for single-button function and Push button long is active. Setting the action with long keystroke. Number of possible switching values according to the selection "Number of values".</p>
Switching type	<ul style="list-style-type: none"> • Limit stop • Overrun 	<p>Only with two-button function. Setting what should happen when the last switching value is reached</p>
Switchover considers status object	<ul style="list-style-type: none"> • Yes • No 	Setting whether the changeover should send the next switching value according to the current status

Table 34: Settings – Send Values - Subfunction: Switching values/scenes (up to 4 values)

Principle of operation:

The function "switching values/scenes" can send up to 4 different values by shortly pressing a button. The values are then switched one after the other. Depending on the set parameters, for example, at a keystroke the second switching value is sent if the 1st switching value has been sent before or the third switching value will be sent if the second switching value has been sent before....

The parameter "**Push button long**" can be used to send a fixed value for a long keypress in addition to the changeover by a short keypress.

When selecting "**1. – 4. Switching value**", a fixed switching value (value corresponding to the assigned switching values) is always sent when a long key is pressed.

The setting "**4th switching value if last 1st switching value, otherwise 1st switching value**" represents a toggle function which switches between the 1st and 4th switching values. If the 1st toggle value was transmitted last, the 4th value is transmitted afterwards. For every other value, the 1st switching value is transmitted.

The setting "**Send 0**" sends the value 0 to the switching object. If, for example, the data point type is set to percentage, the value 0% is sent.

The setting "**On at second object**" or "**Off at second object**" shows another communication object for the long keystroke. The fixed value ON or OFF is then sent to this object with the size 1 bit.

With the setting "**Time delay between scene switching**", the transmission of the telegram is delayed by the set time after you press the key. If you press the key again during the delay time, the next toggle value is activated immediately and the delay time is restarted. If, for example, you want to go directly from the first toggle value to the third toggle value without activating the second one - with a delay time of 2 seconds - press the key twice within 2 seconds.

Parameter "Switching type":

Limit stop: When the switching type "limit stop" is activated, the 4th switching value is sent again after the 4th switching value has been sent.

Overrun: When the switching type "overrun" is activated, the 1st switching value is sent again after the 4th switching value.

For the single-button function, the parameter is set permanently to "overrun".

Parameter "Switchover considers status object":

If the **status value is not taken into account** during the changeover, the button memorizes the last sent value and sends the next or previous value on the next actuation without observing whether another value has been sent to the object in the meantime.

If the **status value is taken into account** during the changeover, the next keystroke will send the next higher or the next lower shift value - with respect to the last received status value. Example: the 2nd switching value is set to 40% and the 3rd switching value is set to 70%. Now, after a received status value of 50%, the value 70% is sent at next keystroke if the next switching value is to be sent and the value 40% if the previous switching value is to be sent.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1: Push buttons 1/2: – Forcible control, percent value...	2 Bit 1 Byte 2 Byte 3 Byte	Sending the switching value. DPT depending on the parameter setting
1	Push button 1: Push buttons 1/2: – State of percent value....	1 Byte 2 Byte	Receive the status for the display. DPT depending on the parameter setting. Status for forcible control, scene number and RGB value not available.
2	Push button 1 long: Push buttons 1/2 long: – Switch	1 Bit	Switch function of long button. Only appears if the setting "On or Off on second object"

Table 35: Communication objects – Send Values - Subfunction: Switching values/scenes

4.4.5.3 Subfunction: Shift value

Two-button function

With the function "send values - shift values", values can be moved up or down within the set limits. The following figure shows the available settings:

Figure 32: Settings – Send values - Subfunction: Shift values

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Datapoint type	<ul style="list-style-type: none"> ▪ 1 Byte (0...100%) ▪ 1 Byte (0...255) 	Sets the datapoint type for the value shift
Lower limit	0 – 100% / 0 – 255 [0%/0]	Sets the lower limit value for the value shift
Upper limit	0 – 100% / 0 – 255 [100%/255]	Sets the upper limit value for the value shift

Step width	1 – 100% / 1 – 255 [10%/10]	Sets the step width between two sending commands
Repeated sending at pressed key	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of the sending repetition while pressing the button
Repetition time	200 ms – 3 s [1 s]	Repetition time between two telegrams while pressing the button
Switching considers status object	<ul style="list-style-type: none"> • Yes • No 	Setting whether the value should be moved according to the current status

Table 36: Settings – Send values: - Subfunction: Shift values

Principle of operation:

The function "shift value" moves the set datapoint type within the set limits. When the "Down" button is pressed, the set step width is subtracted from the last value and sent. When the "Up" button is pressed, the set step width is added to the last value and sent.

Lower/Upper limit:

Within these limits, the value is shifted. The function never falls below the lower limit value and does not exceed the upper limit value.

Step width:

The step width indicates the difference between two transmitted telegrams. Example: step width is set to 10%. If the value 10% was sent with the previous transmission, the value 20% is sent with the next "up" command..

Repeated sending at pressed key:

Repeated transmission while holding down the key allows the function to increase/decrease the value until the upper/lower limit is reached.

Switching considers status object:

If the status value is taken into account, the key function sends the next value depending on the last received status value. If a status value of 15% and a step size of 10% were selected, then the value of 25% would be sent with the next "up" command. If the status value is not taken into account, the push button memorizes the last value that was sent and sends the next value regardless of the status value.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Percent value, Decimal value...	1 Byte	Sending the switching value. DPT depending on the parameter setting
1	Push buttons 1/2 – State for display	1 Byte	Receiving the status. DPT depending on the parameter setting

Table 37: Communication objects – Send values: - Subfunction: Shift values

4.4.5.4 Send value after state

Single-button function

The function "Send values - Send value after state" can send a fixed value according to the set datapoint type and when the key is released a fixed value according to the set datapoint type. The following figure shows the available settings:

Single function of push button	send value
Subfunction	send value after state
Datapoint type	1Byte DPT 5.001 Percent (0...100%)
Value for pushed button	13%
Value for released button	7%

Figure 33: Settings – Send values - Subfunction: Send value after state

The following table shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Datapoint type	<ul style="list-style-type: none"> ▪ 2Bit DPT 2.001 Forcible control ▪ 1Byte DPT 5.001 Percent value (0...100%) ▪ 1Byte DPT 5.005 Decimal factor (0...255) ▪ 1Byte DPT 17.001 Scene number ▪ 2Byte DPT 7.600 Color temperature (Kelvin) ▪ 2Byte DPT 9.001 Temperature (°C) ▪ 2Byte DPT 9.004 Brightness (Lux) ▪ 3Byte DPT 232.600 RGB value 3x(0...255) 	Sets the data point type to be sent
Value for pushed/released button	any value according to set data point type	Setting the values to be sent

Table 38: Settings – Send values - Subfunction: Send value after state

The value to be sent can be set according to the set datapoint type for **pressing** and **releasing** the key. The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1 – Forcible control, Percent value...		Sending the switching value. DPT depending on the parameter setting
3	Push button 1 – State for display		Receives the state. DPT depending on the parameter setting. Status for forcible control, scene number and RGB value not available

Table 39: Communication objects – Send values - Subfunction: Send value after state

4.4.5.5 Presentation (Symbols)

- Single-button function
- Two-button function

The display of the function "Send values" depends on the selected data point type. Depending on the selected data point type, 1-4 different symbols and their color can be selected.

The following table provides an overview of the settings for the various datapoint types:

Datapoint type	Adjustable symbols	Comment
2 Bit Switch control, DPT 2.001	4 symbols can be set: 1 symbol for each possible state	
1 Byte Percent, DPT 5.001	Three icons can be set for the ranges 0%, 1% - 90% and > 90%. Therefore the button evaluates the information of the "Status for display" object	Special presentation possible! Additionally it is possible to display the status value below the symbol.
1 Byte Decimal factor, DPT 5.005	3 symbols can be set for the ranges 0, 1-229 and 230-255. Therefore, the button evaluates the information of the "Status for display" object	Special presentation possible! Additionally it is possible to display the status value below the symbol.
1 Byte Scene Number, DPT 17.001	1 fixed symbol can be set	
2 Byte Color temperature (Kelvin), DPT 7.600	1 fixed symbol can be set	
2 Byte Temperature, DPT 9.001	1 fixed symbol can be set	Special presentation possible!
2 Byte Bgightness, DPT 9.004	1 fixed symbol can be set	
3 Byte RGB Wert, DPT 232.600	1 fixed symbol can be set	

Table 40: Presentation (Symbols) – Send values

Special presentation:

For certain data point types, a special presentation (see table above) is possible. In this presentation, the status is shown on a larger scale on the display.

The following presentations are possible:

ETS-Text	Dynamic range [Default value]	Comment
Special display (DPT 5.001, DPT 5.005)	<ul style="list-style-type: none"> ▪ bar symbol ▪ bar symbol with fan ▪ value as text (0-100%) ▪ value as text (0-255) 	At the settings "bar symbol" and "bar symbol with fan", the corresponding symbol is displayed and the bar is filled according to the current status. With the settings "value as text" the text is displayed large on the display.
Special display (DPT 9.001)	<ul style="list-style-type: none"> ▪ value as symbol + "°C" ▪ value as symbol without unit ▪ value as symbol + "K" 	With the settings "value as symbol" the text is displayed large on the display.

Table 41: Special display – Send values

4.4.6 Switch/send value short/long (with 2 objects)

- Single-button function
- Two-button function

With the function, 2 different values can be sent for the short and long key. The short and the long key have different objects, whereby it is also possible to send out different data point types. The following figure shows the available settings (here for the two-button function):

The screenshot shows a configuration window with the following settings:

- Two-button function:** switch/send value short/long (with 2 objects)
- Action for short push button:** switch
- Selection for value for left button:** off on
- Selection for value for right button:** off on
- Action for long push button:** send value
- Datapoint type:** 1Byte DPT 5.001 Percent (0...100%)
- Left push button: Percent value (0...100%):** 0%
- Right push button: Percent value (0...100%):** 15%
- Individual time for long push of button:** not active
- Display of function short/long:** display action of short push button display action of long push button

Figure 34: Settings – Switch/Send values short/long (with 2 objects)

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Action for short/long push button	<ul style="list-style-type: none"> ▪ switch ▪ switch Off ▪ switch On ▪ toggle ▪ send value ▪ nothing 	Setting the function for the short/long button. - " Switch " only with Two-button function. - " Switch On/Off " only with Single-button function.
Datapoint type	<ul style="list-style-type: none"> ▪ 2Bit DPT 2.001 Forcible control ▪ 1Byte DPT 5.001 Percent value (0...100%) ▪ 1Byte DPT 5.005 Decimal factor (0...255) ▪ 1Byte DPT 17.001 Scene number ▪ 2Byte DPT 7.600 Color temperature (Kelvin) ▪ 2Byte DPT 9.001 Temperature (°C) ▪ 2Byte DPT 9.004 Brightness (Lux) ▪ 3Byte DPT 232.600 RGB value 3x(0...255) 	Setting only available when "Action for short/long push button" is set to "send values" Sets the datapoint type for the value to be sent

Left/Right push button: Percent value, Brightness value....	any value according to set data point type	Only for two-button function. Setting the values to be sent for the two buttons
Percent value, Brightness value....	any value according to set data point type	Only for single-button function. Setting the value to be sent for the button
Individual time for long push of button	not aktiv 0,1 s – 30,0 s	Setting from when a long key press is detected
Display of function short/long	<ul style="list-style-type: none"> ▪ Display action of short push button ▪ Display action of long push button 	Setting which key should be presented on the display as the status

Table 42: Settings – Switch/Send values short/long (with 2 objects)

Principle of operation:

In case of the two-button function, different values for the left and the right button can be sent (for the short as well as for the long button). With the single-button function only one value can be sent for the short as well as for the long button. The datapoint type can be set separately for the short and long button.

Two different functions can be executed here but only one of the functions can be presented on the display. The parameter "**Display of function short/long**" defines which of the two functions this is.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push Button 1 short Push Buttons 1/2 short – Forcible control, Percent value...		Sending the value for the short button. DPT depending on the parameter setting
1	Push Button 1 short Push Buttons 1/2 short – Value for toggle	1 Bit	Receive the status for the short button. Only with the "Toggle" function
1	Push Button 1 short Push Buttons 1/2 short – State of percent value....		Receive the status for the short button. DPT depending on the parameter setting No status possible for 2Bit, scene, RGB
2	Push Button 1 long Push Buttons 1/2 long – Forcible control, Percent value...	1 Bit	Sending the value for the long button. DPT depending on the parameter setting
3	Push Button 1 long Push Buttons 1/2 long – Value for toggle		Receive the status for the long button. Only with the "Toggle" function
3	Push Button 1 long Push Buttons 1/2 long – State of percent value....		Receive the status for the long button. DPT depending on the parameter setting. No status possible for 2Bit, scene, RGB

Table 43: Communication objects – Switch/send values short/long (with 2 objects)

Presentation:

With the button function "switching short/long", the function of the short button or the function of the long button can be displayed. The displayed settings depend on whether the function to be displayed has been parameterized as "switch" (switch, switch on, switch off, toggle) or "send values". If the function has been parameterized as "**switch**", the following presentation settings are possible: The switching function can display the two possible states (On/Off) by freely selectable symbols with a freely selectable color. The evaluated status is visualized:

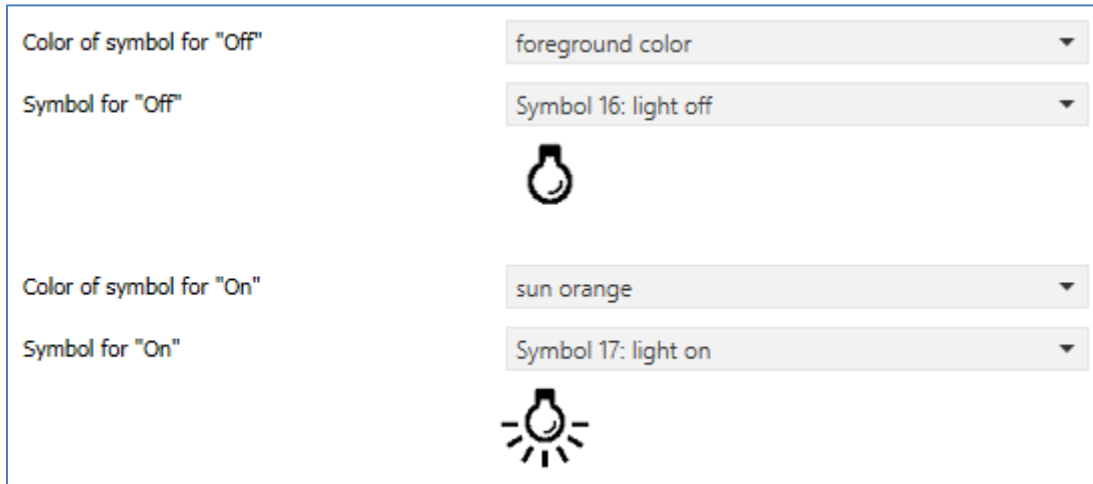


Figure 35: Presentation – Switch function

If the function has been parameterized as "**Send values**", the following settings are possible: The presentation of the function "send values" depends on the selected datapoint type. Depending on the selected datapoint type, 1-4 different symbols and their color can be selected.

The following table provides an overview of the settings for the various datapoint types:

Datapoint type	Adjustable symbols	Comment
2 Bit Switch control, DPT 2.001	4 symbols can be set: 1 symbol for each possible state	
1 Byte Percent, DPT 5.001	Three icons can be set for the ranges 0%, 1% - 90% and > 90%. Therefore the button evaluates the information of the "Status for display" object	Special presentation possible! Additionally it is possible to display the status value below the symbol.
1 Byte Decimal factor, DPT 5.005	3 symbols can be set for the ranges 0, 1-229 and 230-255. Therefore, the button evaluates the information of the "Status for display" object	Special presentation possible! Additionally it is possible to display the status value below the symbol.
1 Byte Scene Number, DPT 17.001	1 fixed symbol can be set	
2 Byte Color temperature (Kelvin), DPT 7.600	1 fixed symbol can be set	
2 Byte Temperature, DPT 9.001	1 fixed symbol can be set	Special presentation possible!
2 Byte Brightness, DPT 9.004	1 fixed symbol can be set	
3 Byte RGB Wert, DPT 232.600	1 fixed symbol can be set	

Table 44: Presentation (Symbols) – Send values

Special presentation:

For certain data point types, a special presentation (see table above) is possible. In this presentation, the status is shown on a larger scale on the display.

The following presentations are possible:

ETS-Text	Dynamic range [Default value]	Comment
Special display (DPT 5.001, DPT 5.005)	<ul style="list-style-type: none"> ▪ bar symbol ▪ bar symbol with fan ▪ value as text (0-100%) ▪ value as text (0-255) 	At the settings “bar symbol” and “bar symbol with fan”, the corresponding symbol is displayed and the bar is filled according to the current status. With the settings "value as text" the text is displayed large on the display.
Special display (DPT 9.001)	<ul style="list-style-type: none"> ▪ value as symbol + “°C” ▪ value as symbol without unit ▪ value as symbol + “K” 	With the settings "value as symbol" the text is displayed large on the display.

Table 45: Special presentation – Send values

4.4.7 Scene

Single-button function

The scene function makes it possible to call up and store scenes. If the memory function is activated, this can be activated by a long key stroke.

The following figure shows the available settings:

Figure 36: Settings – Scene

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Save scene	<ul style="list-style-type: none"> ▪ no save ▪ save 	Release of saving the scenes. The saving is carried out by a long keystroke
Individual time for long push of button	not active 0,1 s – 30,0 s [2,0 s]	Only visible if "Save scene" is active. Setting the time for the long key for saving a scene
Scene number	1 – 64 [1]	Setting the respective scene number

Table 46: Settings – Scene

The following table shows the available communication objects:

Number	Name	Length	Usage
2	Push Button 1 – Scene	1 Byte	Call/Save of a scene

Table 47: Communication object – Scene

Presentation:

Single-button function

The scene function is represented by a fixed symbol. Since the scene function does not get a status, the function is represented by a fixed symbol:

Figure 37: Presentation – Scene

To call a scene or store a new value for the scene, the corresponding code is sent to the corresponding communication object for the scene:

Scene	Call		Save	
	Hex.	Dec.	Hex.	Dec.
1	0x00	0	0x80	128
2	0x01	1	0x81	129
3	0x02	2	0x82	130
4	0x03	3	0x83	131
5	0x04	4	0x84	132
6	0x05	5	0x85	133
7	0x06	6	0x86	134
8	0x07	7	0x87	135
9	0x08	8	0x88	136
10	0x09	9	0x89	137
11	0x0A	10	0x8A	138
12	0x0B	11	0x8B	139
13	0x0C	12	0x8C	140
14	0x0D	13	0x8D	141
15	0x0E	14	0x8E	142
16	0x0F	15	0x8F	143
17	0x10	16	0x90	144
18	0x11	17	0x91	145
19	0x12	18	0x92	146
20	0x13	19	0x93	147
21	0x14	20	0x94	148
22	0x15	21	0x95	149
23	0x16	22	0x96	150
24	0x17	23	0x97	151
25	0x18	24	0x98	152
26	0x19	25	0x99	153
27	0x1A	26	0x9A	154
28	0x1B	27	0x9B	155
29	0x1C	28	0x9C	156
30	0x1D	29	0x9D	157
31	0x1E	30	0x9E	158
32	0x1F	31	0x9F	159
....
64	0x3f	63	0xBF	191

Table 48: Scene call and save

4.4.8 Blind/Shutter

- Single-button function
- Two-button function

The blind function is used to control shutter actuators, which can be used for the adjustment and control of blinds/shutters.

The following figure shows the available settings (here for the two-button function):

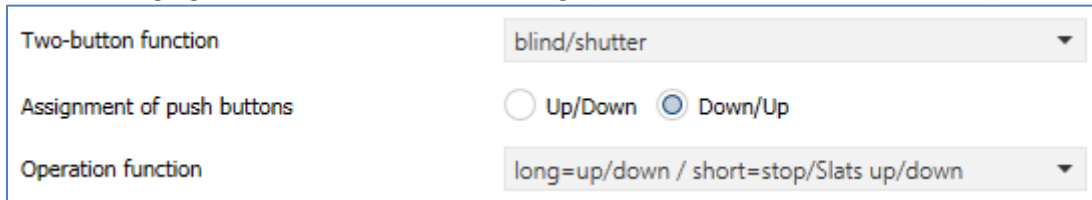


Figure 38: Settings – Blind/Shutter

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Assignment of push buttons	<ul style="list-style-type: none"> ▪ Up/Down ▪ Down/Up 	Only for two-button function. Setting the key assignment (left/right button) for the up/down function
Operation function	<ul style="list-style-type: none"> ▪ Long=move / Short=Stop/Slats Up/Down ▪ Short=move / Long=Stop/Slats Up/Down ▪ Short=Up/Down/Stop (MDT Single Object Control) ▪ Short=Up/Down/Stop Long=Central object (MDT Single Object Control) 	Setting whether to use a long key or a short key for movement. MDT Single Object Control is only available for the two-button function

Table 49: Settings – Blinds/Shutter

Two communication objects are displayed for the "blind" function: the object "Stop/slat open/close" and the object "blinds up/down".

The moving object is used to move the blinds/shutters up and down. The stop/step object is used to adjust the slats. In addition, this function stops the up/down movement as far as the end position has not yet been reached.

In the case of the two-button function, the key assignment can be set; the table below shows the relationships:

Input	Function Up/Down		Function Down/Up	
	Push button left	Push button right	Push button left	Push button right
Moving object	Up	Down	Down	Up
Stop/Step object	Stop/slats open	Stop/slats close	Stop/slats close	Stop/slats open

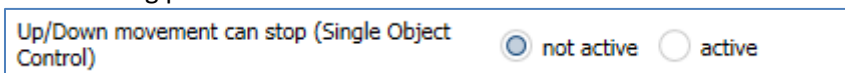
Table 50: Two-button function – Blind function

The one-button function is used to toggle between the up and down movement after each keystroke. Since shutter actuators always use a 1 signal for the down movement and a 0 signal for the up movement, the button also emits this. It is also possible to change the action for long and short keystrokes. It is thus possible to select whether to move via a long or a short keystroke. The stop/step object then adopts the other operating concept.

MDT Single Object Control:

Two-Button function

MDT Single Object Control enables a new operating concept for controlling roller shutters. For use, the following parameter has to be set to “active” in the **MDT Shutter actuator** to be controlled:



Now it is possible to start the up/down movement with a short keystroke and also to stop an active up/down movement with a short keystroke.

With the setting "Short = Up/Down/Stop / Long = Central object (MDT Single Object Control)" an additional object is displayed, which can start the up/down movement with a long keystroke and can also stop an active up/down movement with a long keystroke. This function can be used, for example, to move a single shutter in a room with a short keystroke and to move the entire room with a long keystroke.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push Button 1: Push Buttons 1/2: – Blinds Up/Down	1 Bit	Up/down command for the shutter actuator
0	Push Buttons 1/2 short: – Shutter Up/Down/Stop	1 Bit	Up/down/stop command for shutters in “Single Object Control” mode
1	Push Button 1 – Slats/Stop	1 Bit	Slats open/close and Stop command
1	Push Buttons 1/2: – Stop/Slats Open/Close	1 Bit	Slats open/close and Stop command
1	Push Buttons 1/2 long: – Central Shutter Up/Down/Stop	1 Bit	Additional movement object in "Single Object Control" mode
2	Push Button 1 – value for change of direction	1 Bit	Receiving the status with current information about the direction of the shutter actuator
2	Push Buttons 1/2 – State of slat for display	1 Byte	Receiving the status of the current slat position
3	Push Button 1 – State for display	1 Byte	Receiving the status of the current blind/shutter position
3	Push Buttons 1/2 – State of shutter for display	1 Byte	Receive the status of the current shutter position. Additional object in "Single Object Control" mode

Table 51: Communication objects – Blinds/Shutter

Presentation:

- Single-button function
- Two-button function

The blind function can be displayed with 3 freely selectable symbols and freely selectable color. The button evaluates the information of the "Object 3 - State for display". In addition, the current status can be displayed **as text under the symbol**:




Color of symbol for top (<10%)	foreground color
Symbol for top (<10%)	Symbol 10: Shutter <10%
	
Color of symbol for central (10% - 90%)	foreground color
Symbol for central (10% - 90%)	Symbol 11: Shutter 50%
	
Color of symbol for bottom (>90%)	foreground color
Symbol for bottom (>90%)	Symbol 12: Shutter >90%
	
State value as text under symbol	<input type="radio"/> no display <input checked="" type="radio"/> display in percent

Figure 39: Presentation – Symbols Blind/Shutter

Additional Presentation:

Two-button function

The position of the slats can also be displayed with the two-button function. The symbol for the slats is displayed on the right button. The button evaluates the information from "Object 2 - State of slats for display". The position of the slats can be represented by 3 freely selectable symbols and freely selectable colors:




Slats symbols	<input type="radio"/> not active <input checked="" type="radio"/> active
Color of symbol for slat open (<55%)	foreground color
Symbol for slat open (<55%)	Symbol 13: open slats vertical
	
Color of symbol for slat central (55% - 90%)	foreground color
Symbol for slat central (55% - 90%)	Symbol 14: slats horizontal
	
Color of symbol for slat closed (> 90%)	foreground color
Symbol for slat closed (> 90%)	Symbol 15: close slats vertical
	
State value as text under symbol	<input type="radio"/> no display <input checked="" type="radio"/> display in percent

Figure 40: Presentation – Symbols for Slats

4.4.9 Dimming

- Single-button function
- Two-button function

The dimming function can be used to control dimming actuators.

The following figure shows the available settings (here for two-button function):

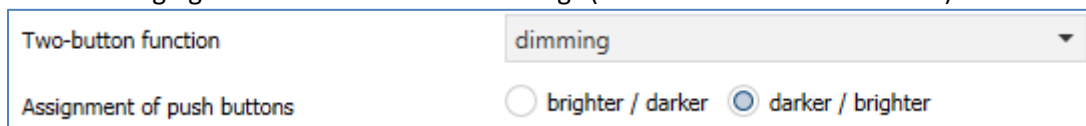


Figure 41: Settings – Dimming

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Assignment of push buttons	<ul style="list-style-type: none"> ▪ brighter/darker ▪ darker/brighter 	Only with two-button function. Setting the key assignment (left/right key) for the direction (brighter/darker)

Table 52: Settings – Dimming

If a button is parameterized as a dimming function, this button shows two communication objects, on the one hand the function for the short keystroke, the switching object "dimming on/off", and on the other hand the function for the long keystroke, the dimming object "dimming relative".

The two-button function "dimming" can be parameterized either as brighter/darker or as darker/brighter. The following table shows the relationships:

	Function brighter/darker		Function darker/brighter	
Button - Input	Button left	Button right	Button left	Button right
Dimming function	brighter	darker	darker	brighter
Switching function	ON	OFF	OFF	ON

Table 53: Two-button function – Dimming

With the one-button function "dimming", the direction (brighter/darker) is reversed as a function of the communication object "value for toggle". The dimming function is a start-stop dimming that means as soon as the dimming function becomes active a light or dark command is assigned to the input until it is released. After releasing, a stop telegram is sent which finishes the dimming process.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1: Push buttons 1/2: – Dimming On/Off	1 Bit	Switching command for the dimming function
1	Push button 1: Push buttons 1/2: – Dimming relative	4 Bit	Command for relative dimming
2	Push button 1 – Value for toggle	1 Bit	Only for single-button operation. Feedback signal about the current state of the actuator to be switched
3	Push button 1: Push buttons 1/2: – State for display	1 Byte	Receive of the status of the current, absolute brightness

Table 54: Communication objects – Dimming

Presentation:

- Single-button function
- Two-button function

This determines how the dimming function is presented on the display:

Normal view:

The dimming function can be displayed with 3 freely selectable symbols and freely selectable colors. The button evaluates the information of object 3 "State for display". In addition, the current status can be displayed as text under the symbol:

Figure 42: Normal view – Dimming

Special presentation:

Here you can alternatively select a bar symbol, a display as a percentage or value (0...255). The information from "Object 3 - Status for display" is also evaluated here:

ETS-Text	Dynamic range [Default value]	Comment
Special symbols	<ul style="list-style-type: none"> ▪ bar symbol ▪ bar symbol with fan ▪ value as text (0-100%) ▪ value as text (0-255) 	With the "bar symbol" setting, the symbol is displayed and the bar is filled according to the current status. With the setting "Value as text", the text is shown in large letters on the display.

Table 55: Special presentation – Dimming

4.4.10 HSV color control

- Single-button function
- Two-button function

With the HSV color control, LED dimmers with RGB/RGBW function can be controlled and their status can be displayed on the display.

The following figure shows the available settings:

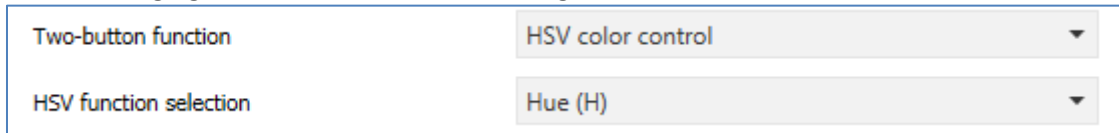


Figure 43: Settings – HSV color control

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
HSV function selection	<ul style="list-style-type: none"> ▪ Hue (H) ▪ Saturation (S) ▪ Value (V) 	Setting of the function to be controlled

Table 56: Settings – HSV color control

The HSV color control can control the 3 parameters (hue, saturation, brightness) of the HSV chromatic circle. A 4bit dimming command and a switching command are available for the control. The switching command is used to switch the LED strip on/off. With the 4 bit dimming command, a cycle through the HSV chromatic circle can be performed. This is a start-stop dimming, that means as soon as the dimming function becomes active, it will move inside the chromatic circle until the button is released. After releasing, a stop telegram is sent which terminates the dimming process.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1: Push buttons 1/2: – HSV control On/Off	1 Bit	Only for subfunction “Value” Switch command for color control
1	Push button 1: Push buttons 1/2: – Change HSV Hue (H)/ Saturation (S)/ Value (V) relative	4 Bit	Cycle through the HSV chromatic circle
2	Push button 1 – Value for toggle	1 Bit	Only for single-button function and subfunction “Value” Feedback signal about the current state of the actuator to be switched
3	Push button 1: Push buttons 1/2: – Status for Hue/ Saturation/ Value	1 Byte	Receiving the status of the HSV chromatic circle

Table 57: Communication objects – HSV color control

Presentation:

- Single-button function
- Two-button function

Hue, Saturation and Value are each represented by a special symbol. The current status is evaluated by the push button and the current position is displayed with an arrow on the respective special symbol.

The 3 special symbols are shown below:

ETS-Text	Symbol	Comment
Hue		
Saturation		Color of the symbol can be switched between red, green, blue
Value		

Table 58: Special symbols – HSV color control

4.4.11 Color temperature (Tunable White)

- Single-button function
- Two-button function

With the Tunable White function the color temperature can be controlled in compatible KNX dimmers and its status can be displayed.

The following figure shows the available settings (here for the two-button function):

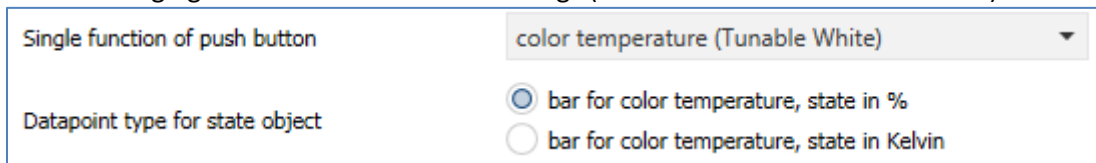


Figure 44: Settings – Color temperature (Tunable White)

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Datapoint type for state object	<ul style="list-style-type: none"> ▪ Bar for color temperature, state in % ▪ Bar for color temperature, state in Kelvin 	Setting the datapoint type for the status

Table 59: Settings – Color temperature (Tunable White)

With color temperature (Tunable White), the light temperature can be controlled. A 4 bit dimming command is available for the control. This allows a dycle through the color temperature. It is a start-stop dimming that means as soon as the dimming function becomes active the control loop runs through the entire range. The dimming process ends either when the lower or upper end is reached or when the push button is released again. A stop telegram is sent with the release.

The following table shows the available communication objects:

Number	Name	Length	Usage
1	Push button 1: Push buttons 1/2: – Change color temperature relative	4 Bit	Cycle through the color temperature
3	Push button 1: Push buttons 1/2: – Status for color temperature	1 Byte	Receiving the status of the color temperature

Table 60: Communication objects – Color temperature (Tunable White)

Presentation:

- Single-button function
- Two-button function

The color temperature is represented by a special symbol. The current status is evaluated by the button and the current position is displayed with an arrow on the special symbol.

The display range for the colour temperature is 2700K - 6000K.
So 2700K corresponds to 0%, 6000K corresponds to 100%.

The special symbol is shown below:


ETS-Text	Symbol	Comment
Color temperature		

Table 61: Special symbol – Color temperature (Tunable White)

4.4.12 Mode selection

- Single-button function
- Two-button function

Function only available for Glass Push Button II Smart with temperature sensor

With the function "Mode selection" the HVAC mode can be toggled in heating actuators or temperature controllers.

The following figure shows the available settings:

Figure 45: Settings – Mode selection

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Switching values	<ul style="list-style-type: none"> ▪ Comfort /Standby ▪ Comfort/Night ▪ Comfort/Standby/Night ▪ Comfort/Standby/ Night/Frost 	Setting between which operating modes can be toggled.
Push Button long	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activates an action for the long keystroke
Left/Right button: Action with a long push of button	<ul style="list-style-type: none"> ▪ Comfort ▪ Standby ▪ Night ▪ Frost 	Setting which operating mode should be called with a long keystroke to the buttons. Only with two-button function.
Action with a long push of button	<ul style="list-style-type: none"> ▪ Comfort ▪ Standby ▪ Night ▪ Frost 	Setting which operating mode should be called with a long keystroke Only with single-button function.
Switching type	<ul style="list-style-type: none"> ▪ Limit stop ▪ Overrun 	Setting what should happen when the last switching value is reached. Only with two-button function

Switchover considers status object	<ul style="list-style-type: none"> • Yes • No 	Setting whether the changeover should send the next switching value according to the current status
Status display	<ul style="list-style-type: none"> • No status • HVAC-Mode • HVAC-Status 	Sets how to output the status. <i>(Parameters below the symbols, see "Presentation" on the next page)</i>

Table 62: Settings – Mode selection

Function principle:

The function "mode selection" can send up to 4 different operating modes by shortly pressing a button. The operating modes are switched one after the other. Depending on the set parameters, for example, at a keystroke the second operating mode is sent if the 1st operating mode has been sent before or the third operating mode will be sent if the second operating mode has been sent before.

Parameter "Push button long":

In addition to switchover by a short keystroke, a fixed operating mode can be sent at a long keystroke.

Here one of the 4 operating modes can be sent. This means that a fixed operating mode (independent of the last switching value) would always be sent with a long keystroke.

Parameter "Switching type":

Limit stop: With the switching type "Limit stop" the 4th operating mode is sent again after sending the 4th operating mode.

Overrun: In the switching type "Overrun", the 1st operating mode is sent again after the 4th operating mode.

For the single-button function, this parameter is set permanently to "Overrun".

Switchover considers status object:

If the **status value is not taken into account** when switching over, the device remembers the last value sent and sends the next or previous value the next time it is pressed, regardless of whether another value has been sent to the object in the meantime.

If the **status value is taken into account** in the changeover, the device sends the next higher or next lower changeover value - with reference to the last received status value - the next time it is pressed.

If, for example, the value "1K" was sent when the last key was pressed and then the value "2K" was sent from another location, the value "2.5K" is sent the next time the "+" key is pressed.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push button 1: Push buttons 1/2: – Mode selection (HVAC Mode)	1 Byte	Switchover of operating mode
1	Push button 1: Push buttons 1/2: – Status HVAC Mode	1 Byte	Receives the status of the heating actuator / temperature controller
1	Push button 1: Push buttons 1/2: – HVAC Status	1 Byte	Receives the status of the heating actuator / temperature controller


Table 63: Communication objects – Mode selection

Presentation:


- Single-button function
- Two-button function

To each operating mode, a fixed symbol is assigned. The color of the symbol can be adjusted for any operating mode:


Color of symbol for comfort mode foreground color ▾




Color of symbol for standby mode foreground color ▾



Color of symbol for night mode foreground color ▾



Color of symbol for frost protection mode foreground color ▾



Status display HVAC-Status ▾

Figure 46: Presentation – Mode selection

4.4.13 Temperature Shift

Two-button function

Function only available for Glass Push Button II Smart/Push button Smart 86 with temperature sensor

The temperature shift can be used to move the setpoint of the heating control.

The following figure shows the available settings:

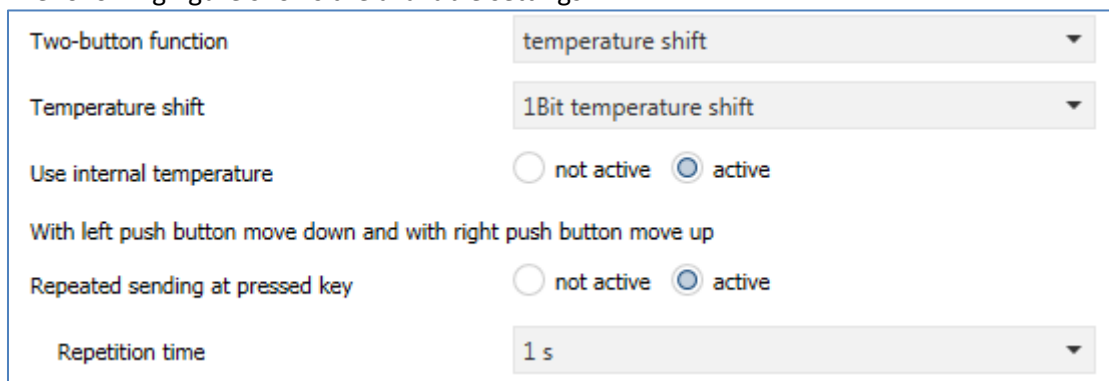


Figure 47: Settings – Temperature shift

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Temperature shift	<ul style="list-style-type: none"> ▪ 1 Bit temperature shift ▪ 1 Byte temperature shift ▪ 2 Byte temperature shift ▪ 2 Byte shift of basis comfort setpoint value 	Setting how the temperature is to be shifted
Use internal temperature	<ul style="list-style-type: none"> ▪ not active ▪ active 	Setting whether the internal temperature measurement value is to be used to display the actual value
Step width	0,1 ... 1 K [0,5 K]	Set the step width between two send commands. Not visible when shifting via 1 bit
Lower limit	-10 ... 10 K [-5 K]	Setting of the lower limit value for the setpoint shift. Only for shifting via 1Byte/2Byte
Upper limit	-10 ... 10 K [5 K]	Setting of the upper limit value for the setpoint shift. Only for shifting via 1Byte/2Byte

Lower limit	0 ... 45 °C [19 °C]	Setting of the lower limit value for the setpoint shift. Only for "2Byte shift of basis comfort setpoint value"
Upper limit	0 ... 45 °C [23 °C]	Setting of the upper limit value for the setpoint shift. Only for "2Byte shift of basis comfort setpoint value"
Repeated sending at pressed key	<ul style="list-style-type: none"> ▪ not active ▪ active 	Setting whether the shift should be repeated at fixed intervals while the key is held
Repetition time	200 ms – 3 s [1 s]	Sets the time between two telegrams of the temperature shift when repetition is activated
Switchover considers status object	<ul style="list-style-type: none"> ▪ yes ▪ no 	Setting whether to perform shifting according to the current status. Not for shifting via 1 bit

Table 64: Settings – Temperature shift

Functional principle:

This function shifts the current setpoint within the set limits. When the "-" key is pressed, the setpoint is subtracted from the last value by the set step width and when the "+" key is pressed, the setpoint is added to the last value by the set step width.

Upper/lower limit:

The value is shifted within these limits. The function never falls below the lower limit value and never exceeds the upper limit value.

Step width:

The step width indicates the distance between two transmitted telegrams. For example, with a step width of 0.5 K and a setpoint value of 21°C, pressing the "-" key would cause 20.5°C and set to 21.5°C when the "+" key is pressed.

Switchover considers status object:

If the **status value is not taken into account** when switching over, the device remembers the last value sent and sends the next or previous value the next time it is pressed, regardless of whether another value has been sent to the object in the meantime.

If the **status value is taken into account** in the changeover, the device sends the next higher or next lower changeover value - with reference to the last received status value - the next time it is pressed. If, for example, the value "1K" was sent when the last key was pressed and then the value "2K" was sent from another location, the value "2.5K" is sent the next time the "+" key is pressed.

The temperature can be shifted in 4 different ways:

1 Bit temperature shift

With the 1-bit temperature shift the glass push button merely transmits the command 1 for a shift of the setpoint upwards and a 0 for a shift of the setpoint downwards.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Setpoint shift	1 Bit	Sends the Setpoint shift
1	Push buttons 1/2 – Status actual temperature	2 Byte	Receiving an external temperature for the display of the current temperature. Is only displayed if the parameter "Use internal temperature value" is set to "not active"
2	Push buttons 1/2 – Status current setpoint	2 Byte	Receiving the current setpoint of the temperature controller to display the status

Table 65: Communication objects – Temperature shift via 1 bit

1 Byte temperature shift

With the 1-byte temperature shifting, the glass push button sends a 1-byte value which is multiplied by the step width set in the controller. In order for the display and the current setpoint value to be synchronous, the step width and the limits of the setpoint shift have to be specified in the push button.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Setpoint shift	1 Byte	Sends the Setpoint shift
1	Push buttons 1/2 – State actual temperature	2 Byte	Receiving an external temperature for the display of the current temperature - is only displayed if the parameter "Use internal temperature value" is set to "not active"
2	Push buttons 1/2 – State current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller to display the status
3	Push buttons 1/2 – State setpoint shift	1 Byte	Receives the current setpoint shift; has to be connected to all 1 byte objects which send the setpoint shift to the controller in order to correctly evaluate the current status of the setpoint shift

Table 66: Communication objects – Temperature shift via 1 Byte

2 Byte temperature shift

With the 2-byte temperature shift, the glass push button sends a 2-byte temperature value which is added or subtracted from the set basic comfort value.

The Glass Push Button sends the shift by the set step width at each keystroke.

In order for the display and the current reference value to be synchronous, the limits of the setpoint shift have to be specified in the Glass Push Button and have to be set to the same values as in the controller.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Setpoint shift	2 Byte	Sends the Setpoint shift
1	Push buttons 1/2 – State actual temperature	2 Byte	Receiving an external temperature for the display of the current temperature - is only displayed if the parameter "Use internal temperature value" is set to "not active"
2	Push buttons 1/2 – State current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller to display the status
3	Push buttons 1/2 – State setpoint shift	2 Byte	Receives the current setpoint shift. Has to be connected to all 2 byte objects which send the setpoint shift to the controller in order to correctly evaluate the current status of the setpoint shift

Table 67: Communication objects – Temperature shift via 2 byte

2 Byte shift of basis comfort setpoint

In the case of the 2-byte shift of basic comfort setpoint, the Push Button sends a new basic comfort setpoint to the controller. It evaluates the object "state basis comfort setpoint" and sends the new setpoint +/- the set step width to the controller.

The range of the setpoint shift can be adjusted via the upper and lower limits.

The following table shows the available communication objects:

Number	Name	Length	Usage
0	Push buttons 1/2 – Basis comfort setpoint	2 Byte	Sends the Setpoint shift
1	Push buttons 1/2 – State actual temperature	2 Byte	Receiving an external temperature for the display of the current temperature. Is only displayed if the parameter "Use internal temperature value" is set to "not active"
2	Push buttons 1/2 – State current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller to display the status
3	Push buttons 1/2 – State basis comfort setpoint	2 Byte	Receives the current setpoint shift. Has to be connected to the basic comfort setpoint value of the controller so that the basic comfort setpoint can be correctly displaced even when changing to a different operating mode

Table 68: Communication objects – 2 Byte shift of comfort setpoint value

Presentation:

- Two-button function

The temperature shift is represented by the temperature symbol. The display is fixed to the symbol 9. In addition, the actual value and the desired value can be labeled as desired:


Text	Setpoint kitchen
Color of symbol	red
	
Label for actual value of temperature	Ist
Label for setpoint temperature	Soll

Figure 48: Presentation – Temperature shift

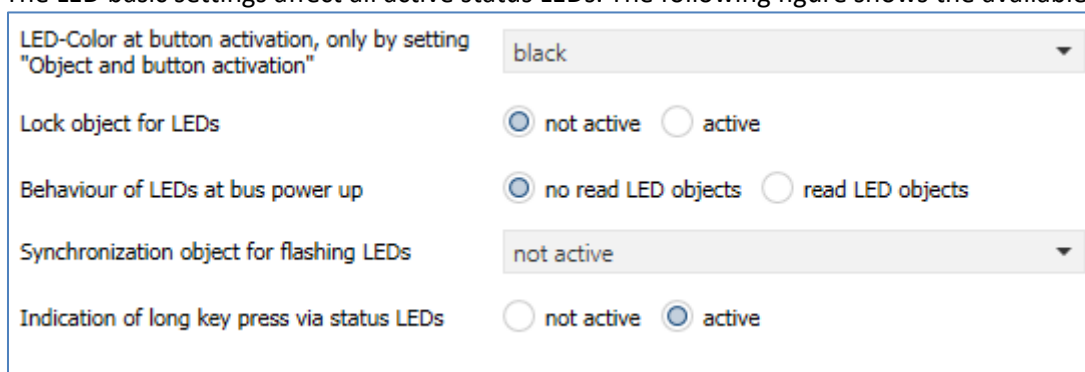
4.5 State LED

Depending on the configuration of the push button (1, 2 or 3 levels), up to 14 status LEDs can be configured. One LED can be configured for each function, which is then marked with 1-12 in the parameters. From hardware revision R.3.1, LEDs A/B can also be controlled in Standby mode to indicate a status during Standby, for example.

For the necessary settings, see the chapter "Info display" under "4.2.3.1 Presentation in Standby".

4.5.1 LED basic settings

The LED basic settings affect all active status LEDs. The following figure shows the available settings:



The screenshot shows a settings panel with the following options:

- LED-Color at button activation, only by setting "Object and button activation":
- Lock object for LEDs: not active active
- Behaviour of LEDs at bus power up: no read LED objects read LED objects
- Synchronization object for flashing LEDs:
- Indication of long key press via status LEDs: not active active

Figure 49: Basic settings – LED

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
LED-color at button activation, only by setting "Object and button activation"	Any color	Parameter is only used at double assignment: "Keystroke + internal / external object"
Lock object for LEDs	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activates a lock object which can disable (= switch off) all LEDs
Behaviour of LEDs at bus power up	<ul style="list-style-type: none"> ▪ no read LED objects ▪ read LED objects 	Setting whether to actively request the objects after a reset. Only effective with "LED reacts to external object"
Synchronization object for flashing LEDs	<ul style="list-style-type: none"> ▪ not active ▪ active as master ▪ active as slave 	Activating a synchronisation object for the LEDs
Indication of long key press via status LEDs	<ul style="list-style-type: none"> ▪ not active ▪ active 	When activated, a long key press is indicated by the status LED going out

Table 69: Basic settings – LED

The parameter "**LED color at button activation**" defines the colour change of all status LEDs when a button is pressed if they are assigned twice by the setting "LED reacts to external/internal object and button activation". In this case, the settings in menu LED 1-12/A/B refer to control via the object; the default setting "LED color at button activation" defines the behaviour when a button is pressed.

Blinking status LEDs can be synchronised via the flashing status **synchronisation object**. In this way, it is possible to ensure that all LEDs in a room flash in the same rhythm. One push-button in the room is defined as master and all other push-buttons as slaves. The objects LED flashing status are linked together in a group address.

The parameter "**Indication of a long key press via status LEDs**" can be used to signal that the action for a long key press has been executed by switching off the status LED. In this way, the operator can be signalled that the long keystroke has been executed and the action is "completed". This setting, however, is only effective if the LEDs react to key presses and is only valid for the following functions:

- Switching/sending values short/long
- Save scene
- Send values/scenes if action for long key press is active
- Operating mode selection, if action for long key press is active
- Shutter

For functions such as dimming, the long key press is not signalled because in this case the function is executed as long as the key is pressed. When the key is released, a "stop telegram" is transmitted

The following table shows the available communication objects:

Number	Name	Length	Usage
105	LED – Blocking object	1 Bit	Blocking of all LED's
129	LED – Blinking status	1 Bit	Synchronising the flashing status

Table 70: Communication objects – LED basic settings

4.5.2 LED 1-12/A/B

The following figure shows the available settings for each of the active LEDs:

Figure 50: Settings – LED 1-12/A/B

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
LED reacts to	<ul style="list-style-type: none"> ▪ external object ▪ internal object ▪ button activation ▪ external object and button activation ▪ internal object and button activation 	Setting how LED is to be controlled
Selection of object number	any object	Parameters only visible when LED reacts to internal object. Linked to internal object

LED display behaviour		
At day (value ON)	Any color	Color for the object value ON when the button is pressed in day mode
At day (value OFF)	Any color	Color for the object value OFF if no button is pressed in Day mode
Behavior at day (value ON)	<ul style="list-style-type: none"> ▪ permanent ▪ blinking 	Setting the lighting behavior when LED has the object value ON or the button is pressed
At night (value ON)	Any color	Color for the object value ON when the button is pressed in Night mode
At night (value OFF)	Any color	Color for the object value OFF if no button is pressed in Night mode
Behavior at night (value ON)	<ul style="list-style-type: none"> ▪ permanent ▪ blinking 	Setting the lighting behavior when LED has the object value ON or the button is pressed

Table 71: Settings – LED 1-12/A/B

Each LED can react either to any external object **or** internal object **or** to button operation. In addition, an LED can also react to an “external/internal object **and** the button operation”. With this setting, the adjustments in the menu LED 1-12/A/B refer to the control of the LEDs via the object. In this case, the behavior of the button operation is set globally for all LEDs and is described in menu 4.5.1 LED basic settings. The behavior for the button operation has priority.

If the "**LED reacts to - internal object**" setting is selected, the object number with which the LED is to be linked is selected.

If, for example (when button 1 is set to Toggle), the LED is to switch when "Object 1 - Status for toggle" has the value 1, enter the object number 1. In this case the status LED would be switched ON if the object has a 1 and switched OFF if the object has a 0.

If the LED is linked to an object which is not 1bit, the LED is switched off when the object is set to 0 and turned on when the value of the object is not 0. For an object of the DPT 5.001 (percent) would mean that the LED is switched off at 0% and is switched on at all other values.

Each LED can accept different colors and behavior for day and night operation and switches depending on the object "106 - day/night".

If the LED reacts to "**external object**" is set, the corresponding LED can be switched to the group address with every 1-bit object. A "1" switches ON, a "0" switches OFF the LED.

Each LED can assume different colours and **behaviour for Day and Night operation** and switches depending on the object "106 - Day/Night".

The following table shows the available communication object:

Number	Name	Length	Usage
77	LED 1 – Switch	1 Bit	Controlling the LED. Object is only displayed if LED reacts to external object

Table 72: Communication object – LED

4.5.2.1 Priority

The LED priority can force the status LED into a defined state and thus exceed the control via an external / internal object or the button operation.

The following figure shows the available settings for each of the active LEDs:

Figure 51: Setting – LED Priority

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Object for priority	<ul style="list-style-type: none"> ▪ not active ▪ active if object LED priority value = 1 ▪ active if object LED priority value = 0 	Sets the polarity of the LED priority
At day	any color [white]	Color for an active LED priority in day mode
Behavior at day (value ON)	<ul style="list-style-type: none"> ▪ permanent ▪ blinking 	Setting the lighting behavior for an active LED priority in day mode
At night	any color [white]	Color for an active LED priority in night mode
Behavior at night (value ON)	<ul style="list-style-type: none"> ▪ permanent ▪ blinking 	Setting the lighting behavior for an active LED priority in night mode

Table 73: Setting – LED Priority

As long as the LED priority is active, the parameterized state for the LED priority is kept and the LED does not react to the "normal" control as described in 4.5.2 LED 1-12/A/B.

The following table shows the available communication objects:

Number	Name	Length	Usage
91	LED 1 Priority – Switch	1 Bit	Controlling the LED priority

Table 74: Communication object – LED Priority

4.6 Logic

4.6.1 Logic basic settings

The Glass Push Button II Smart has 4 additional logic functions.
The following figure shows the activation and basic functions of the logic functions:

Setting Logic 1	disabled
Settings for logic 2	disabled
Settings for logic 3	disabled
Settings for logic 4	disabled
Behaviour at Bus power up	<input checked="" type="radio"/> no read ext. logic objekts <input type="radio"/> read ext. logic objects

Figure 52: Basic settings – Logic

Additional parameters are then displayed for an activated logic.

4.6.2 Logic 1-4

If logic is activated, the logical operation and the object type can be set for the output:

Setting Logic 1	And
Objecttype 1	Switch
Send condition	not automatic
Invert output	<input checked="" type="radio"/> no <input type="radio"/> yes

Figure 53: Settings – Logic 1-4

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Setting Logic 1-4	<ul style="list-style-type: none"> ▪ Disabled ▪ And ▪ Or 	Activates the logic function and set the logical operation
Behavior at Bus power up	<ul style="list-style-type: none"> ▪ No read ext. logic objects ▪ Read ext. logic objects 	Defines whether or not the external objects should be queried after a bus voltage return
Object type 1-4	<ul style="list-style-type: none"> ▪ Switch ▪ Scene ▪ Value ▪ Forcible control 2 Bit 	Sets the object type for sending a value when the logic operation is fulfilled
Scene number/ 1Byte value/ Forcible control	any value according to DPT	Setting the value which is sent when the logic operation is fulfilled. Setting only available with object types Scene / Value / Forcible control 2 Bit
Sending condition	<ul style="list-style-type: none"> ▪ not automatic ▪ at input telegram ▪ at change output ▪ at change output (send only 0) ▪ at change output (send only 1) 	Only with object type "switch". The sending condition can be specified and a sending filter can be set
Invert output	<ul style="list-style-type: none"> ▪ No ▪ Yes 	Only with object type "switch". Determines whether the output signal should be inverted or not

Table 75: Settings – Logic 1-4

The corresponding communication object is displayed depending on the object type of the logic operation:

Number	Name	Length	Usage
67	Logic – Output 1	1 Bit 2 Bit 1Byte	Output of the logic operation

Table 76: Communication object – Logic 1-4

If a logic operation is fulfilled, the corresponding value is transmitted.

For the object type "Switch", a send condition or a send filter for the output can be defined. The logic operation may e.g. at each input telegram, send only when the output of the logic operation changes, or only 1 or 0 are sent out. In addition, the output can be inverted with the object type "Switching", thus making a 0 to a 1 and a 1 to a 0.

4.6.2.1 Submenu – Logic 1-4

A submenu is activated for each activated logic. Up to 2 external logic objects and up to two buttons can be integrated into the logic operation.

The following figure shows the corresponding settings:

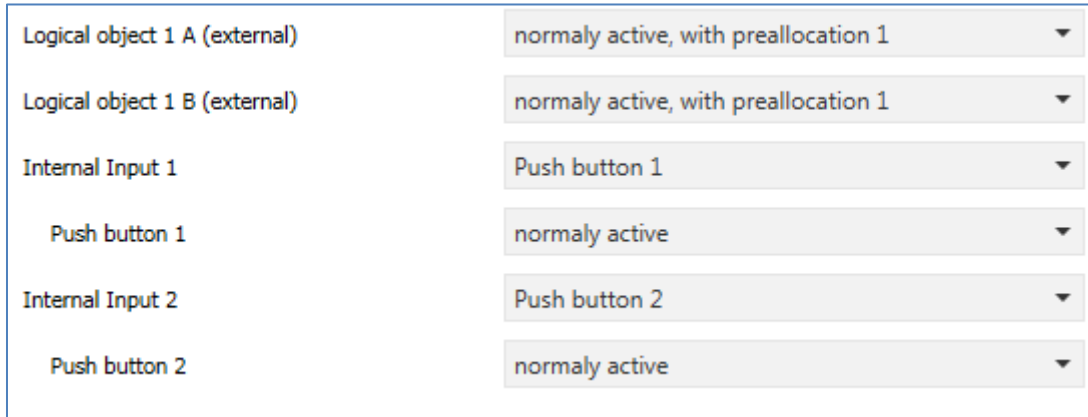


Figure 54: Settings – Submenu: Logic 1-4

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Logical object 1 A/B (external)	<ul style="list-style-type: none"> ▪ disabled ▪ normal active, with preallocation 0 ▪ inverted active, with preallocation 0 ▪ normal active, with preallocation 1 ▪ inverted active, with preallocation 1 	Activation of the external logic object. The preallocation value defines the value of the external logic object after a bus voltage recovery if no value has yet been sent to the communication object
Internal Input 1/2	<ul style="list-style-type: none"> ▪ disabled ▪ Push Button 1-12 	Activation of the buttons for the logic function, each button can be activated normally or inverted
Push button 1-12	<ul style="list-style-type: none"> ▪ disabled ▪ normally active ▪ inverted active 	Each button can be activated normally or inverted

Figure 55: Settings – Submenu: Logic 1-4

Depending on the activated inputs of the logic operations, the corresponding communication objects are displayed:

Number	Name	Length	Usage
65	Logic – Input 1 A	1 Bit	external input for the logic function
66	Logic – Input 1 B	1 Bit	external input for the logic function

Table 77: Communication objects – Inputs Logic 1-4

For each external logic input, a communication object is shown, which can be connected to any other communication object of the size 1 bit, e.g. the status of an actuator. Further, the logic operation can respond to the operation of the keys. Each logic input can be either normal or inverted.

4.7 Temperature measurement

Function only available for Glass Push Button II Smart/Push Button Smart 86 with temperature sensor

The following figure shows the menu for temperature measurement:

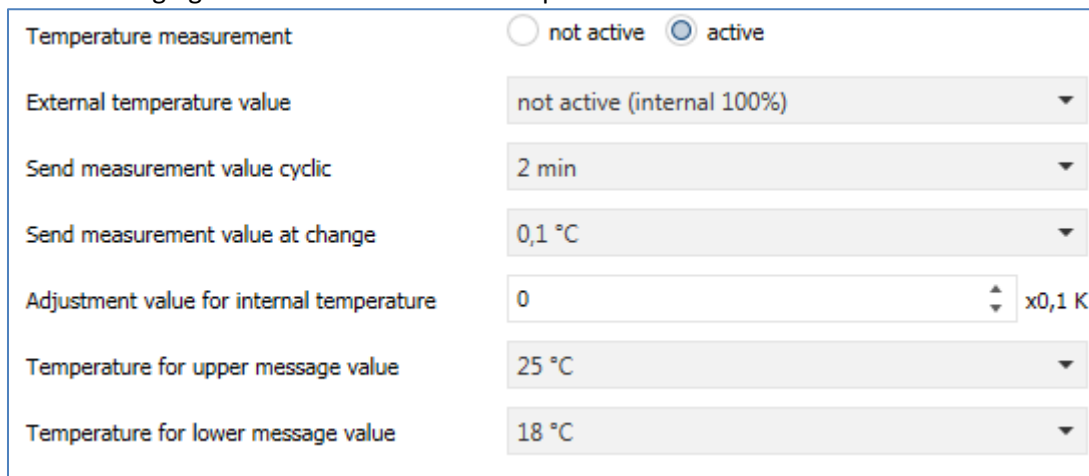


Figure 56: Settings – Temperature measurement

The table below shows all available settings:

ETS-Text	Dynamic range [Default value]	Comment
Temperature measurement	<ul style="list-style-type: none"> ▪ not active ▪ active 	Activation of temperature measurement
External temperature value	<ul style="list-style-type: none"> ▪ not active (internal 100%) ▪ external 10% (internal 90%) ▪ external 20% (internal 80%) ▪ ... ▪ external 90% (internal 10%) 	Activation of an extension for temperature measurement
Send measurement value cyclic	<p>not active 1 min – 4 h [20 min]</p>	Activation of the cyclic sending for the temperature measurement value
Send measurement value at change	<p>nicht senden 0,1 °C – 5 °C [0,2 °C]</p>	Activates the sending of the current temperature value from a certain change
Adjustment value for internal temperature	<p>-50 ... 50 x0,1K [0]</p>	Increase / decrease the internal temperature to correct the measured temperature
Temperature for upper message value	<p>not active 20°C – 45°C</p>	Activation of a message when a certain temperature is reached
Temperature for lower message value	<p>not active 3°C – 30°C</p>	Activation of a message if the temperature falls below a certain temperature

Table 78: Settings – Temperature measurement

The setting "**Send measured value on change**" can be used to set the change on which the sensor sends its current temperature value. If set to "do not send", the sensor does not send a value, regardless of the size of the change.

The setting "**Send measured value cyclically**" can be used to set the intervals at which the sensor sends its current temperature value. The cyclical transmission function can be activated or deactivated independently of the setting "Send measured value on change". Measured values are also sent if the sensor has not detected a change. If both parameters are deactivated, a value is never sent.

In addition, a correction value can be parameterised for the internal sensor under the setting "**Calibration value for internal sensor**". This correction value serves to increase/decrease the actual measured value. The adjustment range is from -50 to 50 x0,1K, i.e. the measured value can be lowered by -5 Kelvin and raised to a maximum of 5 Kelvin. For example, if a value of 20 is set, the measured temperature value is raised by 2 Kelvin. This setting makes sense if the sensor is installed in an unfavourable location, such as above a radiator or in a draught area. The temperature sensor sends the corrected temperature value when this function is activated.

Important: After initial installation/programming the measured value is stable after approx. 30 minutes.

An external sensor can be activated or deactivated via the weighting "**Sensor internal/external**". If the weighting is set to 100% internal, no external sensor is activated and no communication objects appear for the external sensor. With any other weighting, an external sensor is activated and the associated communication objects are also displayed. The "External temperature sensor" object receives the temperature currently measured by the sensor. The "mixed" temperature is shown in the display, and this measured temperature value is transmitted via object 80.

Example:

Weighting: 50% internal / 50% external, internal sensor 25°C, external temperature 15°C
=> transmitted temperature 20°C.

If the "**Messages**" function is activated, two messages can be parameterised. One is the message function for the lower response value, the "lower message value", and the other is the upper response value, the "upper message value".

The two message functions each have a separate communication object.

Principle:

If the maximum value is exceeded, a "1" is transmitted. If the value falls below it, a "0" is transmitted. If the value falls below the minimum value, a "1" is transmitted. If it is exceeded, a "0" is transmitted.

The following table shows the corresponding communication objects:

Number	Name	Length	Usage
108	Temperature measured value – Output	2 Byte	Sends the current temperature
109	External temperature measured value – Input	2 Byte	Receipt of an externally measured temperature
110	Message – Maximum temperature	1 Bit	Sends a message if the upper message value is exceeded
111	Message – Minimum temperature	1 Bit	Sends a message when the value falls below the lower message value

Table 79: Communication objects – Temperature measurement

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6 Attachment

6.1 Statutory requirements

The devices described above must not be used in conjunction with devices which directly or indirectly serve human, health or life safety purposes. Furthermore, the described devices must not be used if their use could cause danger to people, animals or property.

Do not leave the packaging material lying around carelessly. Plastic foil/bags etc. can become dangerous toys for children.

6.2 Disposal routine

Do not throw the old appliances in the household waste. The appliance contains electrical components which must be disposed of as electronic waste. The housing is made of recyclable plastic.

6.3 Assemblage



Danger to life from electric current!

The device may only be installed and connected by qualified electricians. Observe the country-specific regulations and the applicable KNX guidelines.

6.4 Revision History

Version 1.0	- First version of technical manual - Glass Push Button II Smart	10/2017
Version 1.1	- Extended by Push Button Smart 86, revised to DB V2.5	11/2020