State 10/2022 Version V1.0

Technical Manual

MDT Glass Push-button II Smart
MDT Push-button Smart 86

BE-GT20W.02
BE-GT20S.02
BE-GT2TW.02
BE-GT2TS.02

BE-TAS86.02
BE-TAS86T.02

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

Functional Overview:
https://www.mdt.de/en/for-professionals/downloads/functional-overview.html

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

1 Content

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2 Overview

2.1 Overview devices

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

- **BE-GT20W.02** Glass Push-button II Smart with colour display, white
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display

- **BE-GT20S.02** Glass Push-button II Smart with colour display, black
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display

- **BE-GT2TW.02** Glass Push-button II Smart with colour display and temperature sensor, white
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display
  - Temperature sensor for room temperature measurement

- **BE-GT2TS.02** Glass Push-button II Smart with colour display and temperature sensor, black
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display
  - Temperature sensor for room temperature measurement

- **BE-TAS86.02** Push-button Smart 86 with colour display, plastic, white glossy finish
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display

- **BE-TAS86T.02** Push-button Smart 86 with colour display, plastic, white glossy finish, with temperature sensor
  - Up to 12 functions on 2 or 3 levels (2x6 or 3x4 functions)
  - Up to 6 functions without level switching
  - 6 sensor surfaces and RGB status display
  - Temperature sensor for room temperature measurement

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2.2 Special functions

Button functions and levels
A function can be triggered by means of a pair of buttons or a single button, thus providing a wide range of operating options. The functions can be distributed over up to 3 levels. The switching of the levels is either fixed via the two upper sensor surfaces or via two hidden sensor surfaces on the lower edge of the unit.

Mapping function
By means of a mapping function, configured button functions can be easily assigned to other sensor surfaces. There is no need for time-consuming reprogramming.

RGB Status LEDs
Next to the sensor surfaces are RGB LEDs, which can react to internal or external objects and/or to button actuation. The display behaviour can be set differently for "Day" and "Night" mode. The RGB status can also be displayed during Standby. The flashing rhythm of several push-buttons is synchronised by means of a master/slave object.

Logic functions
The push-button offers 4 (AND/OR) logic functions with which nested functions can also be realised. Both internal and external input objects can be processed, the send condition and the output type can be set.

Slap- and cleaning function
The slap function can take over frequent functions such as switching the main lighting on and off. All it takes is a short, flat touch on the push-button (Slap!). Almost every single button function can be set as a push-button function and used as an input of the integrated logic. To clean the Push-button Smart, it can be switched to cleaning mode by touching it flat for a long time. After cleaning, the cleaning function is automatically deactivated again.

Standby and status elements
In Standby, up to 6 status elements are displayed in up to 3 lines. These visualise any values of the KNX bus. In addition to the date, the time can be displayed in 24 h or 12 h AM/PM format. Multimedia information such as artist, title or running text can be output via 14-byte status texts. The standby display can be deactivated via an object.

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

Images downloadable via DCA App
Via a free DCA App, any images of the size 64x64 pixels can be reloaded and configured.

Long Frame Support
Support of sending longer telegrams and thus the integration of more user data per telegram. This significantly shortens the programming time.

Updateable via DCA
With the help of the MDT Update Tool, the devices can be updated if necessary. The download is available free of charge at www.mdt.de and www.knx.org.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2.3 Exemplary Circuit Diagram

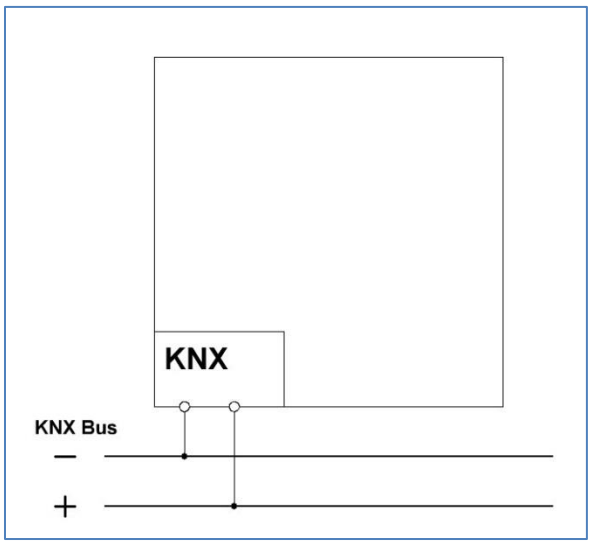


Figure 1: Exemplary circuit diagram

2.4 Structure & Handling

The following picture shows the structure of the device:

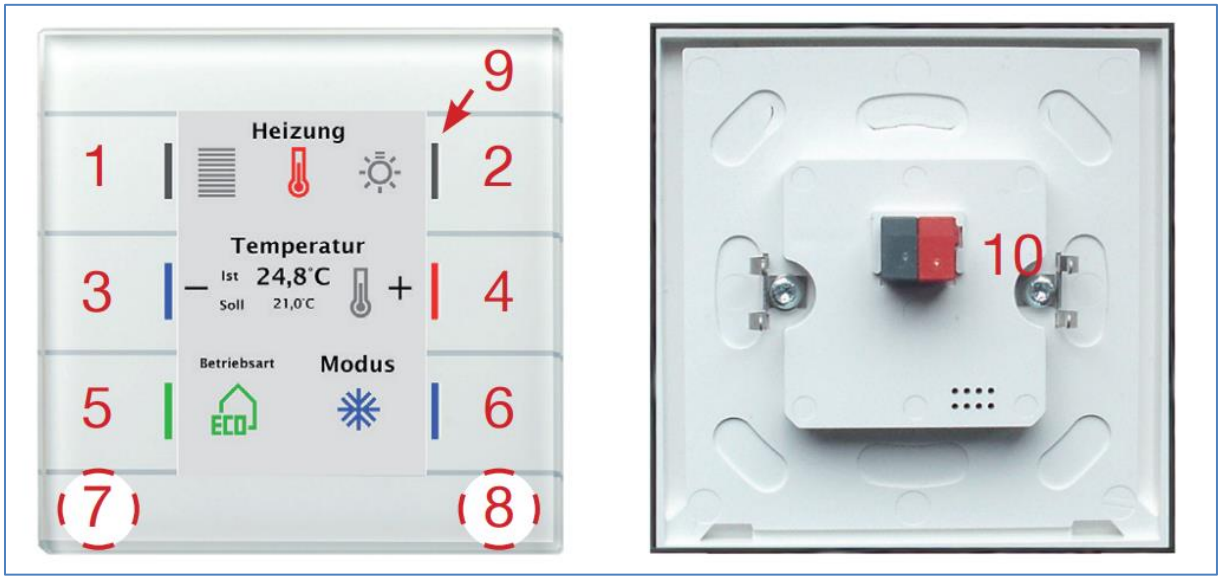


Figure 2: Structure & Handling

1, 2, 3, 4, 5, 6	=	Sensor surfaces for operating the button functions
7, 8	=	Hidden sensor surfaces, touch simultaneously to enter programming mode
9	=	RGB-status display
10	=	Bus connection terminal

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

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2.5 Commissioning

After wiring the unit, the physical address is assigned, and the application is programmed:

(1) Connect the programming interface with the bus, e.g. with MDT USB Interface.
(2) Switch-on bus voltage.
(3) Activate programming mode by simultaneously touching/pressing buttons 7 and 8 on the unit (status LEDs on the right and left of the button light up red alternately).
(4) Loading the physical address from the ETS software via the interface (red LED goes out as soon as this has been successfully completed).
(5) Loading the application, with desired parameterization.
(6) If the device is enabled, you can test the requested functions (also possible by using the ETS-Software).

2.6 Reload symbols

Any symbols can be reloaded into the Push-button. For this purpose, a DCA app "MDT Glass Push-button II Smart/Push-button Smart 86" must be downloaded and installed once from the MDT website or from the shop at my.knx.org. The images to be reloaded must fulfil the following requirements:

- Format: Bitmap
- Size: 64x64 Pixels
- Colour: Black/White
- Using ETS5 or higher

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

3 Communication objects

3.1 Standard settings of the communication objects

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

Standard settings – Buttons								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	F1: F1/2:	Switch	1 Bit	X			X	
0	F1: F1/2:	Dimming On/Off	1 Bit	X			X	
0	F1: F1/2:	Blinds Up/Down	1 Bit	X			X	
0	F1:	Toggle	1 Bit	X			X	
0	F1:	Send status	1 Bit	X			X	
0	F1: F1/2:	HSV control On/Off	1 Bit	X			X	
0	F1: F1/2:	Forcible control	2 Bit	X			X	
0	F1: F1/2:	Percent value Decimal value Scene	1 Byte	X			X	
0	F1: F1/2:	Temperature value Colour temperature Brightness value	2 Byte	X			X	
0	F1: F1/2:	RGB value HSV value	3 Byte	X			X	
0	F1/2:	Setpoint shift	1 Bit 1 Byte 2 Byte	X			X	
0	F1/2:	Basic Comfort setpoint	2 Byte	X			X	
0	F1: F1/2:	Mode selection (HVAC Mode)	1 Byte	X			X	
0	F1 short: F1/2 short:	Switch	1 Bit	X			X	
0	F1 short: F1/2 short:	Toggle	1 Bit	X			X	
0	F1 short: F1/2 short:	Forcible control	2 Bit	X			X	
0	F1 short: F1/2 short:	Percent value Decimal value Scene	1 Byte	X			X	

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

0	F1 short: F1/2 short:	Temperature value Colour temperature Brightness value	2 Byte	X			X	
0	F1 short: F1/2 short:	RGB value HSV value	3 Byte	X			X	
0	F1/2 short:	Shutter Up/Down/Stop	1 Bit	X			X	
1	F1: F1/2:	Stop / Slats Open/Close	1 Bit	X			X	
1	F1/2 long:	Central Shutter Up/Down/Stop	1 Bit	X			X	
1	F1: F1 short: F1/2 short:	Status for toggle	1 Bit	X		X	X	X
1	F1: F1 short: F1/2: F1/2 short:	Status for display	1 Bit 2 Bit 1 Byte 2 Byte	X		X	X	X
1	F1: F1/2:	Status of forcible control	2 Bit	X		X	X	X
1	F1: F1/2:	Status of percent value Status of decimal value Status of scene	1 Byte	X		X	X	X
1	F1: F1/2:	Status of temperature value Status of colour temperature Status of brightness value	2 Byte	X		X	X	X
1	F1: F1/2:	Dimming relative	4 Bit	X			X	
1	F1: F1/2:	Change HSV Hue (H) relative Change HSV Saturation (S) relative Change HSV Value (V) relative	4 Bit	X			X	
1	F1: F1/2:	Change colour temperature relative	4 Bit	X			X	
1	F1/2:	Status actual temperature	2 Byte	X		X	X	X
1	F1: F1/2:	Status HVAC Mode HVAC Status	1 Byte	X		X	X	X
2	F1:	Status for toggle	1 Bit	X		X	X	X
2	F1:	Status for change of direction	1 Bit	X		X	X	X
2	F1:	Scene	1 Byte	X			X	
2	F1 long: F1 Group long: F1: (2. object): F1/2 long: F1/2 Group long: F1/2: (2. object):	Switch	1 Bit	X			X	
2	F1 long: F1 Gruppe long: F1/2 long:	Toggle	1 Bit	X			X	

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2	F1 long: F1 Group long: F1: (2. object): F1/2 long: F1/2 Group long: F1/2: (2. object):	Forcible control	2 Bit	X			X	
2	F1 long: F1 Group long: F1: (2. object): F1/2 long: F1/2 Group long: F1/2: (2. object):	Percent value Decimal value Scene	1 Byte	X			X	
2	F1 long: F1 Group long: F1: (2. object): F1/2 long: F1/2 Group long: F1/2: (2. object):	Temperature value Colour temperature Brightness value	2 Byte	X			X	
2	F1 long: F1 Group long: F1: (2. object): F1/2 long: F1/2 Group long: F1/2: (2. object):	RGB value HSV value	3 Byte	X			X	
2	F1/2:	Status current setpoint	2 Byte	X		X	X	X
2	F1/2:	Status „slats“ for display	1 Byte	X		X	X	X
3	F1 long: F1/2 long:	Status for toggle	1 Bit	X		X	X	X
3	F1: F1 long: F1/2 long:	Status for display	1 Bit	X		X	X	X
3	F1 long:	Status for display	2 Bit	X		X	X	X
3	F1: F1 long: F1/2: F1/2 long:	Status for display	1 Byte	X		X	X	X
3	F1 long: F1/2 long:	Status for display	2 Byte	X		X	X	X
3	F1: F1/2:	Status Hue (H) Status Saturation (S) Status Value (V)	1 Byte	X		X	X	X
3	F1: F1/2:	Status: Colour temperature	1 Byte 2 Byte	X		X	X	X
3	F1: F1/2:	Status „height“ for display	1 Byte	X		X	X	X

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

3	F1: F1/2:	Status of dimming value for display	1 Byte	X		X	X	X
3	F1/2:	Status of percent value	1 Byte	X		X		X
3	F1/2:	Status of decimal value	1 Byte	X		X		X
3	F1/2:	Status of temperature value	2 Byte	X		X		X
3	F1/2:	Status of brightness value	2 Byte	X		X		X
3	F1/2:	Status setpoint shift	1 Byte 2 Byte	X		X	X	X
3	F1/2:	Status Basic Comfort setpoint	2 Byte	X		X	X	X
4	F1 Group extra long: F1/2 Group extra long:	Switch	1 Bit	X			X	
4	F1 Group extra long: F1/2 Group extra long:	Toggle	1 Bit	X			X	
4	F1 Group extra long: F1/2 Group extra long:	Blinds Up/Down	1 Bit	X			X	
4	F1 Group extra long: F1/2 Group extra long:	Forcible control	2 Bit	X			X	
4	F1 Group extra long: F1/2 Group extra long:	Percent value Decimal value Scene	1 Byte	X			X	
4	F1 Group extra long: F1/2 Group extra long:	Temperature value Colour temperature Brightness value	2 Byte	X			X	
4	F1 Group extra long: F1/2 Group extra long:	RGB value HSV value	3 Byte	X			X	
4	F1/2:	Status control value	1 Byte	X		X	X	X
4	F1/2:	Status Heating=1/Cooling=0	1 Bit	X		X	X	X
5	F1 Group extra long: F1/2 Group extra long:	Stop / Slats Open/Close	1 Bit	X			X	
6	F1: F1/2:	Lock object	1 Bit	X		X	X	X
+7	**next button**							

Table 1: Communication objects – Buttons

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Standard settings – Slap-button								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
84	Slap-button Slap-button short	Switch	1 Bit	X			X	
84	Slap-button Slap-button short	Toggle	1 Bit	X			X	
84	Slap-button Slap-button short	Forcible control	2 Bit	X			X	
84	Slap-button	Send status	1 Bit	X			X	
84	Slap-button	Dimming On/Off	1 Bit	X			X	
84	Slap-button	Blinds Up/Down	1 Bit	X			X	
84	Slap-button Slap-button short	Percent value Decimal value Scene	1 Byte	X			X	
84	Slap-button Slap-button short	Temperature value Colour temperature Brightness value	2 Byte	X			X	
84	Slap-button Slap-button short	RGB value HSV value	3 Byte	X			X	
85	Slap-button Slap-button short	Status for toggle	1 Bit	X		X	X	X
85	Slap-button	Dimming relative	4 Bit	X			X	
85	Slap-button	Stop / Slats Open/Close	1 Bit	X			X	
86	Slap-button	Status for change of direction	1 Bit	X		X	X	X
86	Slap-button	Scene	1 Byte	X			X	
86	Slap-button long Slap-button (2. object) Slap-button: Group long	Switch	1 Bit	X			X	
86	Slap-button long Slap-button: Group long	Toggle	1 Bit	X			X	
86	Slap-button long Slap-button (2. object) Slap-button: Group long	Forcible control	2 Bit	X			X	
86	Slap-button long Slap-button (2. object) Slap-button: Group long	Percent value Decimal value Scene	1 Byte	X			X	
86	Slap-button long Slap-button (2. object) Slap-button: Group long	Temperature value Colour temperature Brightness value	2 Byte	X			X	
86	Slap-button long Slap-button (2. object) Slap-button: Group long	RGB value HSV value	3 Byte	X			X	
87	Slap-button long	Status for toggle	1 Bit	X		X	X	X

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

88	Slap-button: Group extra long	Switch	1 Bit	X			X	
88	Slap-button: Group extra long	Toggle	1 Bit	X			X	
88	Slap-button: Group extra long	Blinds Up/Down	1 Bit	X			X	
88	Slap-button: Group extra long	Forcible control	2 Bit	X			X	
88	Slap-button: Group extra long	Percent value Decimal value Scene	1 Byte	X			X	
88	Slap-button: Group extra long	Temperature value Colour temperature Brightness value	2 Byte	X			X	
88	Slap-button: Group extra long	RGB value HSV value	3 Byte	X			X	
89	Slap-button: Group extra long	Stop / Slats Open/Close	1 Bit	X			X	
90	Slap-button	Lock object	1 Bit	X		X	X	X

Table 2: Communication objects – Slap-button

Standard settings – Logic								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
91	Logic 1	Input A	1 Bit	X		X	X	X
92	Logic 1	Input B	1 Bit	X		X	X	X
93	Logic 1	Output: Switch	1 Bit	X	X		X	
93	Logic 1	Output: Value	2 Bit	X	X		X	
93	Logic 1	Output: Value	1 Byte	X	X		X	
93	Logic 1	Output: Scene	1 Byte	X	X		X	
+3	**next Logic**							

Table 3: Communication objects – Logic

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Standard settings – Status LED								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
103	LED 1	Switch	1 Bit	X		X	X	X
103	LED 1	Percent value Decimal value	1 Byte	X		X	X	X
+1	**next LED (2 - 12, A, B)**							
117	LED 1 Priority	Switch	1 Bit	X		X	X	X
+ 1	**next LED Priority (2 - 12, A, B)**							
131	LED	Lock object	1 Bit	X		X	X	X

Table 4: Communication objects – Status LED

Standard settings – General objects								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
132	Standby display	Lock object	1 Bit	X		X	X	X
133	Day / Night	Night = 1 / Day = 0 Day = 1 / Night = 0	1 Bit	X		X	X	X
134	Presence	Input	1 Bit	X		X	X	X
135	Temperature	Send measured value	2 Byte	X	X		X	
136	Temperature	External sensor - Input	2 Byte	X		X		
137	Temperature	Maximum value exceeded	1 Bit	X	X		X	
138	Temperature	Minimum value fallen below	1 Bit	X	X		X	
139	Time	Receive current value	3 Byte	X		X	X	X
140	Date	Receive current value	3 Byte	X		X	X	X
141	Time/Date	Receive current values	8 Byte	X		X	X	X
142	Message 1 (highest priority)	Input	1 Bit	X		X	X	X
143	Message 2	Input	1 Bit	X		X	X	X
144	Message 3	Input	1 Bit	X		X	X	X
145	Message 4	Input	1 Bit	X		X	X	X
146	Message 5 (lowest priority)	Input	14 Byte	X		X	X	X
147	Status text 1	Input	14 Byte	X		X	X	X
148	Status text 2	Input	14 Byte	X		X	X	X
149 - 152	Status value 1 - 4	Switch	1 Bit	X		X	X	X
149 - 152	Status value 1 - 4	Percent value 0...100% Value 0...255	1 Byte	X		X	X	X

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

149 - 152	Status value 1 - 4	Value in ppm Value in mA Value in Lux Value in °C Value in m/s Value in l/h Value in kW Value in %	2 Byte	X		X	X	X
149 - 152	Status value 1 - 4	Value in W Value in Wh Value in kWh Value in m^3 Value in m^3/h Value in m^3/s Value in m/s Value in l/h	4 Byte	X		X	X	X
149 - 152	Status value 1 - 4	Text	14 Byte	X		X	X	X
153	In operation	Output	1 Bit	X	X		X	
154	Button operation	Output	1 Bit	X	X		X	
155	Scene	Switch page	1 Byte	X		X		
156	Display	Brightness	1 Byte	X		X	X	X
156	Display	Brightness	1 Byte	X	X		X	
157	LED	Flashing status	1 Bit	X		X		
157	LED	Flashing status	1 Bit	X			X	

Table 5: Communication objects – General objects

The table above shows the preset default settings. The priority of the individual communications objects and the flags can be adjusted by the user as required. The flags assign the communication objects their respective tasks in programming, where C stands for communication, R for read, W for write, T for transmit and U for update.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4 Reference ETS-Parameter

4.1 Device-selection

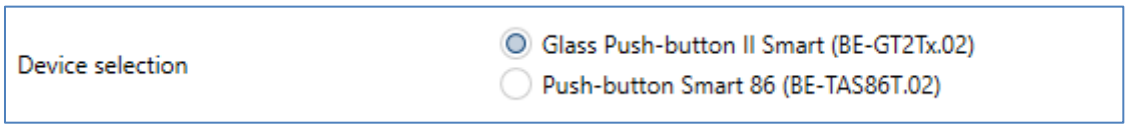


Figure 3: Setting – Device selection

This selection determines which push-button is configured in the sequence. The two devices differ in the proximity sensor (BE-TAS86 only). All other parameters are identical.

4.2 Operation / Display

4.2.1 General settings

The following picture shows available settings:

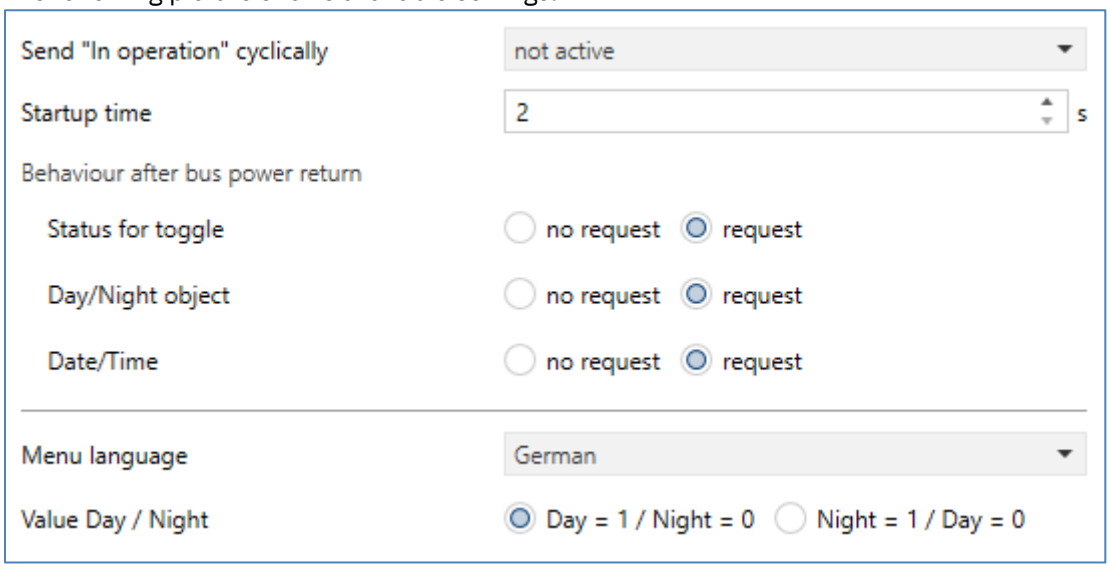


Figure 4: General settings

The following table shows the possible settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Send „In operation“ cyclically	**not active** 1 min – 4 h	Activation of a cyclic "in operation" telegram.
Startup time	2 ... 240 s **[2 s]**	Sets the time between restart and functional start-up of the device.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Behaviour after bus power return		
Status for toggle	▪ no request ▪ **request**	Setting whether the values/objects are to be automatically requested when the bus voltage returns.
Day/Night object	▪ no request ▪ **request**	
Date/Time	▪ no request ▪ **request**	
Menu language	▪ **German** ▪ English ▪ French ▪ Spanish	Setting the language for the menus.
Value Day/Night	▪ **Day = 1 / Night = 0** ▪ Night = 1 / Day = 0	Sets the polarity for the Day/Night object.

Table 6: General settings

Startup time
This time defines when the unit "boots up" after a restart (reset, reprogramming, bus voltage recovery). This can be important if - example 1 - a bus reset is carried out. If there are many units on a line, all units would start at the same time and load the bus. With a variable time, the units can thus start differently.
Example 2: If “Time/Date”, “Status for toggle” or “Day/Night” object are queried, it makes sense that the units responsible for them start up first, this unit only a little later. This ensures that all values are available and correct.

„In operation“
"In operation" is used to show on the bus that the unit is "alive". If activated, an ON telegram is sent cyclically.

Value for Day/Night:
Here the polarity for “Day/Night” is defined. Regardless of this polarity, the device always starts in “Day”-mode after reprogramming.

Menu language
The set language refers to the "Programming mode" menu (accessible by simultaneously touching the hidden sensor surfaces on the bottom right and left).

The **object " Button operation**" is permanently displayed. A "1" is sent via this object when any button is pressed. If buttons are pressed at short intervals, the next telegram is sent at the earliest after a fixed delay of 30 seconds.

The table shows the general communication objects:

Number	Name/Object Function	Length	Usage
133	Day/Night – Night = 1 / Day = 0 Day = 1 / Night = 0	1 Bit	Input of the value, whether "Day" or "Night"
139	Time – Receive current value	3 Byte	Receiving the time
140	Date – Receive current value	3 Byte	Receiving the date
141	Time / Date– Receive current values	8 Byte	Receiving time and date via a common object
153	In operation – Output	1 Bit	Sending a cyclic "In operation" telegram
154	Button operation – Output	1 Bit	Sending a "1" when a button is pressed

Table 7: General communication objects

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.2 Display settings

4.2.2.1 Presentation

The following settings can be used to adjust the presentation on the display:

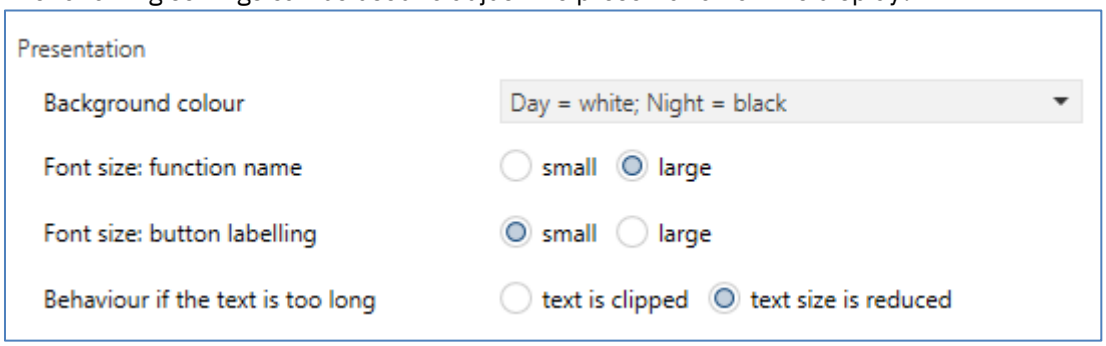


Figure 5: Display settings – Presentation

The following table shows the possible settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Background colour	▪ Day = black; Night = black ▪ **Day = white; Night = black** ▪ Day = black; Night = white ▪ Day = white; Night = white	Sets the background colour of the display
Font size: function name	▪ small ▪ **large**	Setting the font size for the function name.
Font size: labelling of buttons	▪ **small** ▪ large	Setting the font size for the button labelling.
Behaviour if the text is too long	▪ text is clipped ▪ **text size is reduced**	Setting the behaviour when the text cannot be displayed completely.

Table 8: Display settings – Presentation

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.2.2 Adaption to ambience

The following settings can be used to influence the adaptation of the display to the ambience (here using the example of the Glass push-button II Smart):

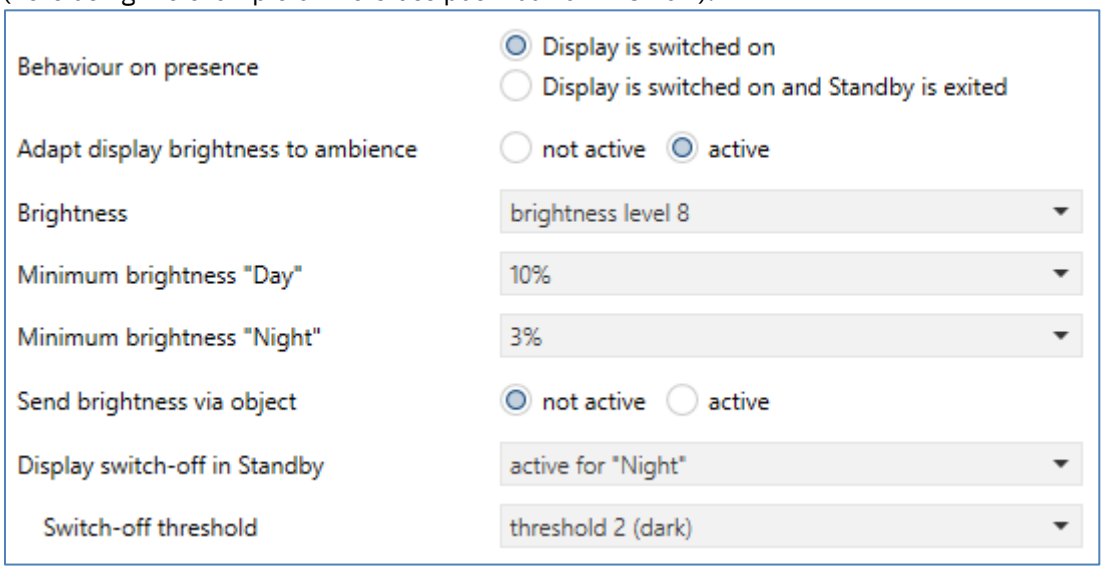


Figure 6: Display settings – Adaption to ambience

Important: Only the Push-button Smart 86 has an integrated proximity sensor.

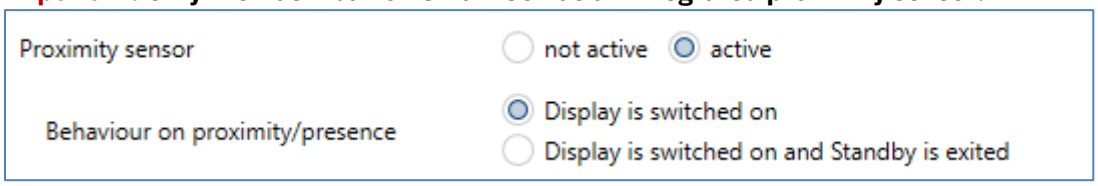


Figure 7: Display settings – Proximity sensor

In doing so, the push-button detects an approach and enables - without contact - a "waking up" of the unit. If the **proximity sensor is active**, it causes the same behaviour as the presence object. The corresponding action is set via "Behaviour on proximity/presence".

If the **proximity sensor is not active**, only the "Behaviour on presence" is selected. Either only the display can be switched on (but remains in Standby) or the display is switched on and Standby is exited. The unit is then in normal operating mode.

The following table shows the possible settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Proximity sensor	▪ **not active** ▪ active	Activation/deactivation of the proximity sensor. **Only with Push-button Smart 86**
Behaviour on proximity --- Behaviour on proximity/presence	▪ **Display is switched on** ▪ Display is switched on and Standby is exited	Setting of the behaviour on presence object or approach. **"Behaviour on proximity/presence" only if proximity sensor is "active" and only with Push-button Smart 86**
Adapt display brightness to ambience	▪ not active ▪ **active**	Setting whether the brightness is dynamically adapted to the ambience.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Adapt display brightness to ambience**: not active**		
Brightness „Day“	1 – 100 % **[10 %]**	Setting a fixed brightness value in Day mode.
Brightness „Night“	1 – 100 % **[3 %]**	Setting a fixed brightness value in Night mode.
Adapt display brightness to ambience**: active**		
Brightness	Brightness level 1 – 10 **[Brightness level 8]**	Setting the basic brightness of the display.
Minimum brightness „Day“	1 – 100 % **[10 %]**	Setting of the brightness that cannot be undercut during dimming in “Day” operation.
Minimum brightness „Night“	1 – 100 % **[3 %]**	Setting of the brightness that cannot be undercut during dimming in “Night” mode.
Send brightness via object to the bus	▪ **not active** ▪ active	Setting whether the current display brightness is sent.
Display switch-off in Standby	▪ not active ▪ **active for „Night“** ▪ active for „Day“ and „Night“	Setting for which operation the display switch-off should apply.
Switch-off threshold	▪ threshold 1 (moderately dark) ▪ **threshold 2 (dark)** ▪ threshold 3 (very dark)	Setting at which threshold the display should switch off. **Only visible if the display switch-off is "active".**

Table 9: Display settings – Adaption to ambience

Principle of brightness adjustment

The Push-button Smart has an **internal brightness sensor** and can dynamically adjust the display brightness to the environment. The "Brightness" parameter influences the dimming behaviour and the threshold from which the display is dimmed. The parameter for the minimum brightness defines the absolute lowest threshold up to which the display is dimmed.

In the programmed state, the menu for setting the brightness can be called up by simultaneously pressing sensor surfaces 7 and 8. The brightness is set by pressing/touching the surfaces/buttons 1/2. Pressing/touching the surfaces/buttons 3/4 sets the minimum brightness:

In this menu, the end user can adjust the brightness settings independently (without ETS). The settings made are permanently stored in the unit until the next time the database is transferred.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

If the parameter "**Adapt display brightness to ambience**" is set to "**active**", the following settings are available:
Brightness: Defines the basic brightness of the display and influences the dimming behaviour of the display according to the measured value for the ambient brightness.

Minimum brightness: Defines the brightness that the display has in any case. This brightness can be set separately for "Day" mode and for "Night" mode.

With activation of the parameter "**Send brightness via object**", object 156 appears.
"**Display - Brightness**" appears. The current value is sent to the bus via this object.

In addition, a "**display switch-off in standby**" can be activated. This can apply either for "Night" or only for "Day" and "Night". The "**switch-off threshold**" defines the threshold at which the display switches off completely.

If the parameter "**Adapt display brightness to ambience**" is set to "not active", a fixed brightness is set for "Day" operation and for "Night" operation.
Here it is possible to control the brightness via object 156 "Display - Brightness", for example to synchronise several displays.

The table shows the general communication objects:

Number	Name/Object Function	Length	Usage
134	Presence – Input	1 Bit	Input for presence active, e.g. from a presence detector
156	Display – Brightness	1 Byte	Receiving/sending the brightness for the display

Table 10: Communication objects – Adaption to ambience

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.2.3 User-defined colours

After activation, up to 3 colours can be individually defined by the user.
The following settings are available:

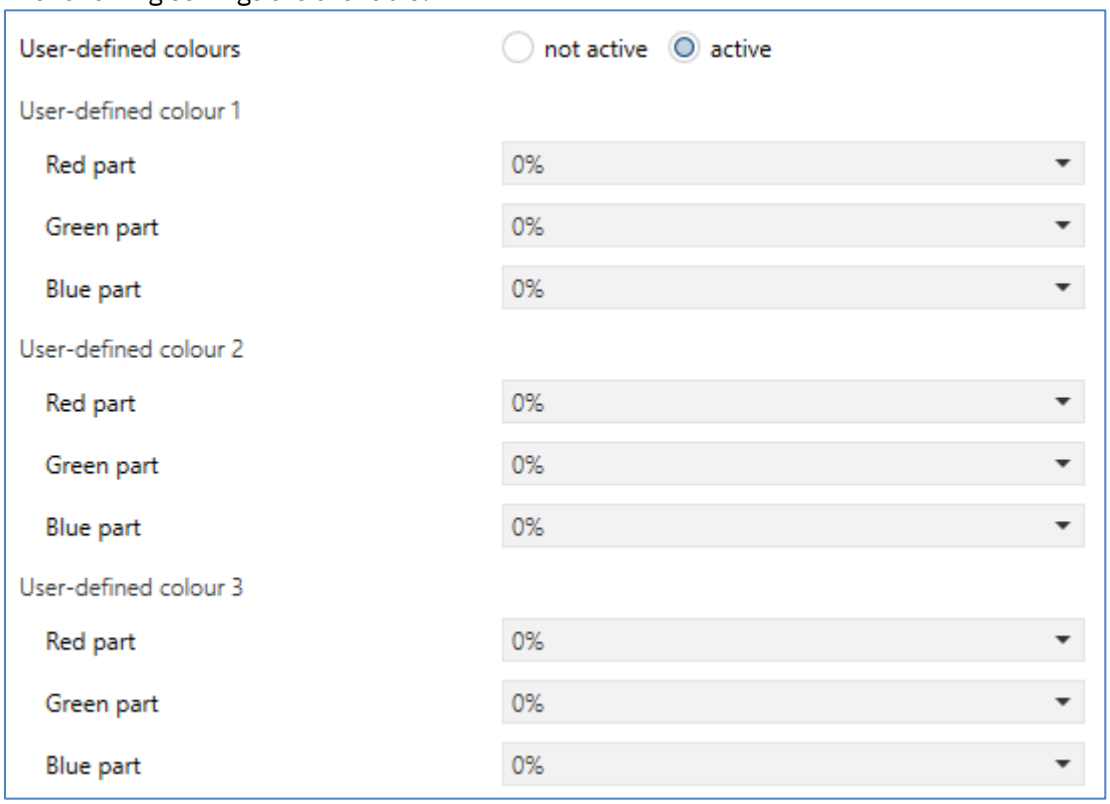


Figure 8: Display settings – User-defined colours

The user-defined colours 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, for example, the operating mode switchover.

The following setting is available here:

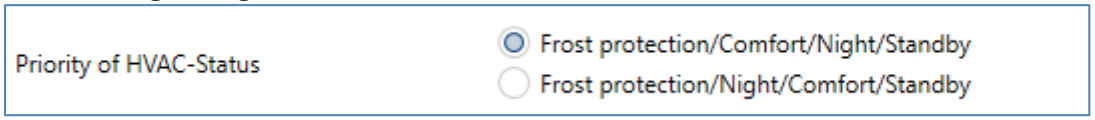


Figure 9: Display settings – Priority of HVAC-Status

The order of priorities is set here.

Important: For correct display, the order must be set the same on the controller.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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

Number	Name/Object Function	Length	Usage
133	Day/Night – Night = 1 / Day = 0 Day = 1 / Night = 0	1 Bit	Input of a value, if „Day“ or „Night“
134	Presence – Input	1 Bit	Input for presence "active", e.g. from presence detector
139	Time – Receive current value	3 Byte	Receiving the time
140	Date – Receive current value	3 Byte	Receiving the date
141	Time / Date– Receive current values	8 Byte	Receiving time and date via a common object
154	Button operation – Output	1 Bit	Sending out a "1" for an active button operation, e.g. for switching on an orientation light
156	Display – Brightness	1 Byte	Receive/send brightness for the display

Table 11: Communication objects – Display

After each restart, the "**Day/Night" object** is set to "Day", even if the communication object is not linked.
The **presence object** is used to deactivate the display when no one is in the room and can be controlled via a presence detector, for example.
If the presence object is set to the value "0", the display switches off and is only switched on again when the object is set to the value "1" or a button is pressed. If a button is pressed when the object value is "0" (= no presence), the display remains switched on until the display switches to standby. 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.
Depending on the parameterisation, 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".

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.3 Info display

4.2.3.1 Presentation in Standby

The following picture shows the basic settings for the display:

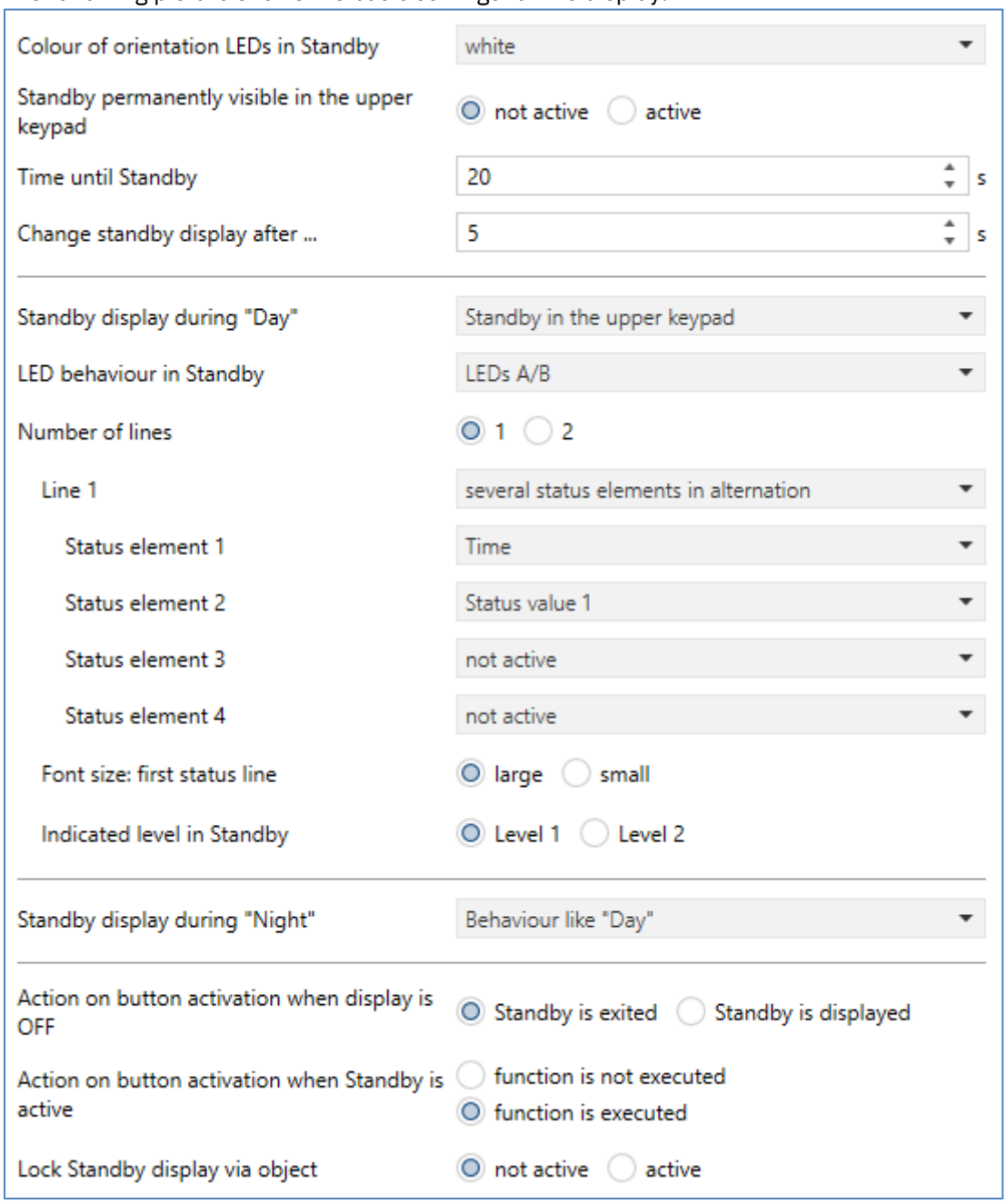


Figure 10: Settings – Info display: Presentation in Standby

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the basic settings for the info display:

ETS-Text	Dynamic range **[Default value]**	Comment
Colour of the orientation LEDs in Standby	Any colour... **[White]**	Setting the LED colour when used as an orientation display. **Effects on settings of the "Standby display during Day/Night". with "...orientation LEDs".**
Standby permanently visible in upper keypad	▪ **not active** ▪ active	Standby can be permanently activated here in the upper keypad (*Info - see below the table*).
Time until Standby	0 ... 60 s **[20 s]**	Sets the time between the last touch of a button and switching to Standby mode.
Change Standby display after ...	1 ... 60 s **[2 s]**	Setting the changeover time between the activated status elements.
Standby display during „Day“	▪ no Standby ▪ **Standby in upper keypad** ▪ Standby over full screen ▪ Display OFF / black	Setting the display behaviour of the information screen in “Day” mode
LED behaviour in Standby	▪ off ▪ Orientation LEDs ▪ Button LEDs ▪ **LEDs A/B**	Setting for how the LEDs should behave during Standby.
Number of lines	▪ **1** ▪ 2 ▪ 3	Setting of how many lines are displayed in Standby. - 2 lines possible with "Standby in upper keypad". - 3 lines possible for "Standby over full screen".
Line 1 / 2 / 3	▪ **one status element** ▪ several status elements in alternation ▪ two status elements (left/right) ▪ two status elements (top/bottom)	Setting how the Standby display is shown. **„Several status elements in alternation" only with line 1.**
Status element 1 – 4 left/right top/bottom *(for „Day“ und „Night“)*	▪ not active ▪ **Time** ▪ Time (AM/PM) ▪ Date ▪ Internal temperature ▪ Status value 1 – 4 ▪ Status text 1 (via object 147) ▪ Status text 2 (via object 148)	Activation of up to 4 status elements and what they should display. - "not active" only for status element 2 - 4! - "Internal temperature" only for device with temperature sensor. - "Status text 1/2" not available with "two status elements (left/right)".

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Font size for first/second/third status line	▪ **large** ▪ small	Setting the font size in the display. Third status line visible with setting “Standby over full screen” and Number of lines” → “3”
Indicated level in Standby *(for „Day“ and „Night“)*	▪ **Level 1** ▪ Level 2 ▪ Level 3	Setting of the level that is displayed during Standby. **With setting "Standby in upper keypad".** Number of levels depends on the activated levels in the "Button / Function Setting" menu. **Only visible if more than 1 level is active!**
Indicated level after Standby *(for „Day“ and „Night“)*	▪ **Level 1** ▪ Level 2 ▪ Level 3	Setting of the level that is displayed after Standby. **With setting "Standby over full screen".** Number of levels depends on the activated levels in the "Button / Function Setting" menu. **Only visible if more than 1 level is active!**
Standby display during „Night“	▪ no Standby ▪ **Behaviour like “Day”** ▪ Standby in upper keypad ▪ Standby over full screen ▪ Display OFF / black	Setting the display behaviour of the info display in Night mode. With the setting "**Behaviour like Day**", the settings from Day mode are adopted and there are no settings for Standby mode.
Action on button activation when display is OFF	▪ **Standby is exited** ▪ Standby is displayed	Setting the behaviour for button activation when the display is OFF (e.g. via presence object).
Action on button activation when Standby is active	▪ Function is not executed ▪ **Function is executed**	Setting whether the underlying function should also be executed with the first keystroke in Standby.
Lock Standby display via object	▪ **not active** ▪ active	Activation of a lock object to lock Standby.

Table 12: Settings – Info display: Representation in Standby

"**Standby permanently visible in the upper keypad**" is permanently displayed when "4 functions/1-3 levels" is selected (in the "Button/Function Setting" menu).
If "6 functions/1-2 levels" is selected, the parameter is only shown when the "upper buttons" are set to "not active" in all activated levels.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.3.2 Status values 1-4

The following picture shows the available settings:

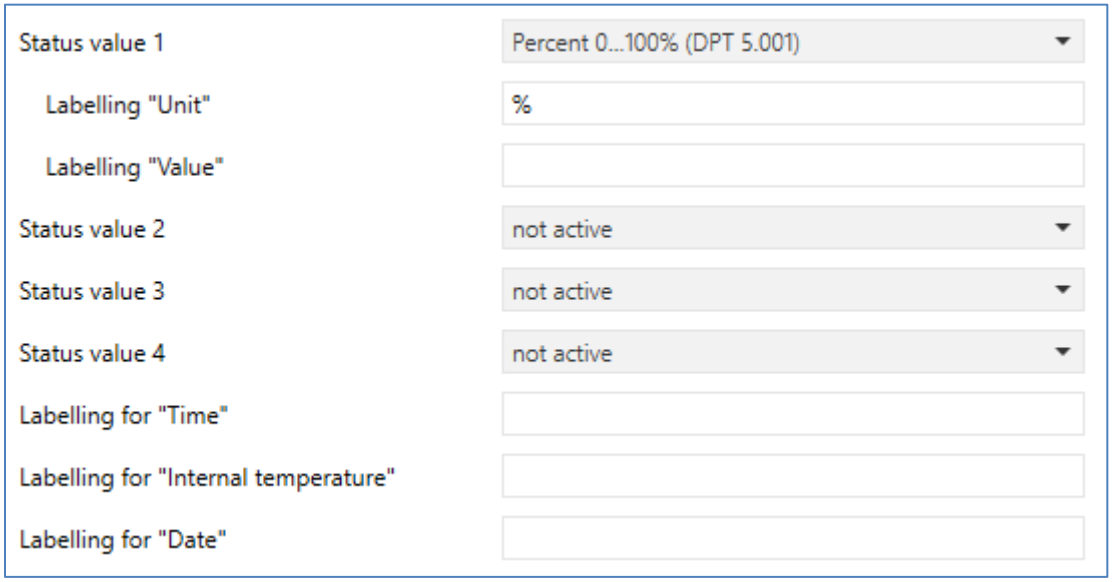


Figure 11: Settings – Info display: Status values 1-4

Up to 4 different status values can be defined, which are then displayed in Standby when the status elements are selected accordingly. In addition, there is the option of free labelling for the "Unit" and the selected "Value" or "Text".

The text fields for "Time", "Internal temperature" and "Date" refer to the corresponding status elements in the previous chapter "Presentation in Standby".

The following table shows the setting options:

ETS-Text	Dynamic range **[Default value]**	Comment
Status value 1 – 4	▪ **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) ▪ Power [kW] (DPT 9.024) ▪ Flow Rate [l/h] (DPT 9.025) ▪ Volume [l] (DPT 12.1200) ▪ Volume [m^3] (DPT 12.1201) ▪ Flow Rate [m^3/h] (DPT 13.002) ▪ Active Energy [Wh] (DPT 13.010) ▪ Active Energy [kWh] (DPT 13.013) ▪ Power [W] (DPT 14.056) ▪ Speed [m/s] (DPT 14.065) ▪ Volume [m^3] (DPT 14.076)	Setting of the data point type to be displayed as a status value.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

	▪ Flow Rate [m³/s] (DPT 14.077) ▪ Flow Rate [m³/h] (DPT 14.1200) ▪ String (DPT 16.000)	
Labelling „Unit“	Any text [up to 5 Bytes allowed]	Enter the text to describe the unit.
Labelling „Value“	Any text [up to 15 Bytes allowed]	Enter the text to describe the value.
Labelling „Text“	Any text [up to 15 Bytes allowed]	Enter the text to describe the string
Labelling „Time“	Any text [up to 15 Bytes allowed]	Enter the text to describe the time.
Labelling „Internal temperature“	Any text [up to 15 Bytes allowed]	Enter the text to describe the internal temperature.
Labelling „Date“	Any text [up to 15 Bytes allowed]	Enter the text to describe the date.

Table 13: Settings – Info display: Status values 1-4

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
147	Status text 1	14 Byte	Receiving a status text
148	Status text 2	14 Byte	Receiving a status text
149	Status value 1		Receiving a status value. DPT according to parameter setting
150	Status value 2		Receiving a status value. DPT according to parameter setting
151	Status value 3		Receiving a status value. DPT according to parameter setting
152	Status value 4		Receiving a status value. DPT according to parameter setting

Table 14: Communication objects – Status values/texts

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.2.3.3 Messages

The following picture shows the available settings for messages:

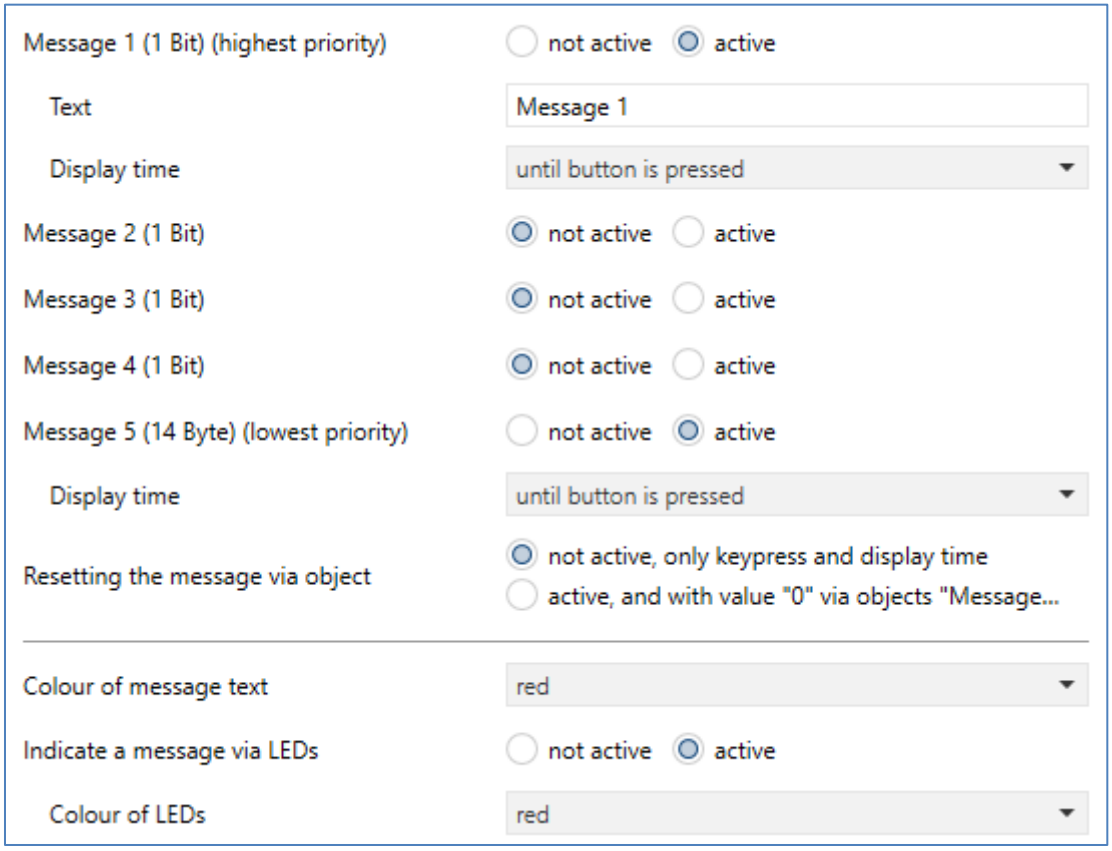


Figure 12: Settings – Messages

The following table shows the settings for the messages:

ETS-Text	Dynamic range **[Default value]**	Comment
Message 1-4 (1 Bit)	▪ **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	▪ not active ▪ **until button is pressed** ▪ 1 s – 8 h	Setting how long the message should be displayed.
Message 5 (14 Byte) (lowest priority)	▪ **not active** ▪ active	Activation of the message via the 14-byte object. Message 5 has the lowest priority of all messages.
Display time	▪ not active ▪ **until button is pressed** ▪ 1 s – 8 h	Setting how long the message should be displayed.
Resetting the message via object	▪ **not active, only keypress and display time** ▪ active, and with value “0” via objects “Message (1-4)”	Setting when the message should be taken back.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Colour of message text	Any colour **[red]**	Setting of the colour for the message text.
Indicate a message via LEDs	▪ **not active** ▪ active	Setting if the LEDs should flash at an active message.
Colour of LEDs	Any colour **[red]**	Select the colour in which the LEDs display the message. **Only visible if "Indicate a message via LEDs" is activated**.

Table 15: Settings – Messages

The message behaviour depends on the parameter "Standby display during “Day / Night". The different behaviours are shown below:

Standby display	**Incoming message during Standby**
No Standby	▪ No message is displayed but saved
Standby in upper keypad	▪ Message is displayed on upper button pair and the upper LEDs change between parameterized colour and black at 600ms pulse ▪ At the same time, the parameterized colour 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 over full screen	▪ Message is displayed in the middle of the screen and all LEDs change between parameterized colour and black ▪ At the same time, the parameterized colour is set to double brightness in order to increase the signal effect. ▪ The message is acknowledged by pressing to any key
Display off	▪ 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 keystrokes ▪ Message is displayed in the middle of the screen and all LEDs change between parameterized colour and black ▪ At the same time, the parameterized colour is set to double brightness in order to increase the signal effect.
Display off and orientation-LED on	▪ Message is displayed in the middle of the screen and all LEDs change between parameterized colour and black. ▪ At the same time, the parameterized colour is set to double brightness in order to increase the signal effect. ▪ After the "time until 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 16: Behaviour of the device to an incoming message during Standby

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Standby display	Incoming message during operation
No Standby	▪ No message is displayed but saved

Table 17: Behaviour of the device to an incoming message during operation

Standby display	Incoming message while Standby + Display brightness „Off“ via brightness sensor
No Standby	▪ No message is displayed but saved
Standby in upper keypad	▪ Brings display back to life (dark background lighting) ▪ After the " time until Standby " has expired, the backlight is switched off again. ▪ Otherwise as in Standby
Standby over full screen	▪ Brings display back to life (dark background lighting) ▪ After the " time until Standby " has expired, the backlight is switched off again. ▪ Otherwise as in Standby
Display off	▪ Like in Standby
Display off and orientation-LED on	▪ Brings display back to life (dark background lighting) ▪ After the " time until Standby " has expired, the backlight is switched off again. ▪ Otherwise as in Standby

Table 18: Behaviour on arrival of a message in Standby with operation disabled

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
142	Message 1 (highest priority) – Input	1 Bit	Triggering a message
143	Message 2 – Input	1 Bit	Triggering a message
144	Message 3 – Input	1 Bit	Triggering a message
145	Message 4 – Input	1 Bit	Triggering a message
146	Message 5 (lowest priority) – Input	14 Byte	Triggering a message. Send any message text

Table 19: Communication objects – Messages

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.3 Button-/Function settings

4.3.1 Activation/Display Mode/Level setting

Important: To make all functions 1-12 visible, all levels must be active!

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

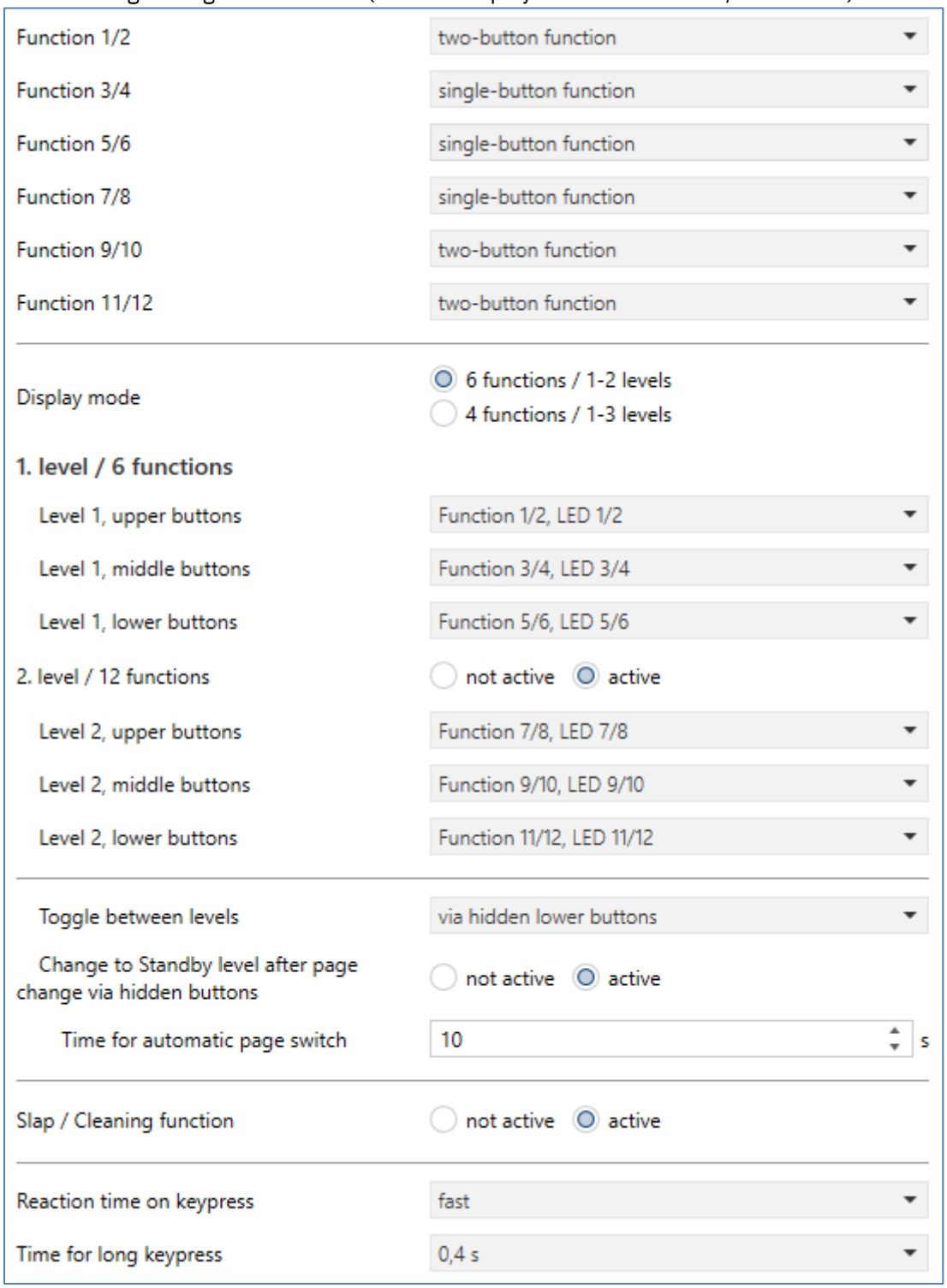


Figure 13: Settings – Button / Function setting

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Function 1/2 – 11/12	▪ **not active** ▪ single-button function ▪ two-button function	Setting whether the functions are to operate in single or two-button mode.
Display mode	▪ **6 functions / 1-2 levels** ▪ 4 functions / 1-3 levels	Setting the display mode.
Display mode: 6 functions / 1-2 levels		
1. level / 6 functions	Always displayed, no parameter	
Level 1, upper buttons Level 1, middle buttons Level 1, lower buttons	▪ not active ▪ Function 1/2, LED 1/2 ▪ Function 3/4, LED 3/4 ▪ Function 5/6, LED 5/6 ▪ Function 7/8, LED 7/8 ▪ Function 9/10, LED 9/10 ▪ Function 11/12, LED 11/12	Assignment of the functions including the LEDs to a specific button pair.
2. level / 12 functions	▪ **not active** ▪ active	Activation of the 2nd level.
Level 2, upper buttons Level 2, middle buttons Level 2, lower buttons	▪ not active ▪ Function 1/2, LED 1/2 ▪ Function 3/4, LED 3/4 ▪ Function 5/6, LED 5/6 ▪ Function 7/8, LED 7/8 ▪ Function 9/10, LED 9/10 ▪ Function 11/12, LED 11/12	Assignment of the functions including the LEDs to a specific button pair.
Toggle between levels	▪ **via hidden lower buttons** ▪ via scene object ▪ via hidden lower buttons and scene object	Setting for how to switch between the different levels. **Only shown if 2nd level is active**.
Scene number for change to level 1/2	1 - 64	Setting of the scene number for the level change. **Only visible when switching via scene object**.
Change to Standby level after page change via hidden buttons	▪ not active ▪ **active**	Setting whether the device should fall back to the Standby level. **Only visible when switching via hidden buttons**.
Time for automatic page switch	1 ... 255 s **[10 s]**	Setting the time for the page switch. **Visible if "Change..." is active**.
Display mode: 4 functions / 1-3 levels		
1. level / 4 functions	Always displayed, no parameter	
Level 1, middle buttons Level 1, lower buttons	▪ not active ▪ Function 1/2, LED 1/2 ▪ Function 3/4, LED 3/4 ▪ Function 5/6, LED 5/6 ▪ Function 7/8, LED 7/8 ▪ Function 9/10, LED 9/10 ▪ Function 11/12, LED 11/12	Assignment of the functions including the LEDs to a specific button pair.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2. level/ 8 functions	▪ **not active** ▪ active	Activation of the 2nd level.
Level 2, middle buttons Level 2, lower buttons	▪ not active ▪ Function 1/2, LED 1/2 ▪ Function 3/4, LED 3/4 ▪ Function 5/6, LED 5/6 ▪ Function 7/8, LED 7/8 ▪ Function 9/10, LED 9/10 ▪ Function 11/12, LED 11/12	Assignment of the functions including the LEDs to a specific button pair. **Visible when 2nd level is active.**
3. level / 12 functions	▪ **not active** ▪ active	Activation of the 3rd level. **Visible when 2nd level is active.**
Level 3, middle buttons Level 3, lower buttons	▪ not active ▪ Function 1/2, LED 1/2 ▪ Function 3/4, LED 3/4 ▪ Function 5/6, LED 5/6 ▪ Function 7/8, LED 7/8 ▪ Function 9/10, LED 9/10 ▪ Function 11/12, LED 11/12	Assignment of the functions including the LEDs to a specific button pair. **Visible when 3rd level is active.**
Toggle between levels via scene object	▪ **not active** ▪ active	Activate level switching via receiving scenes. **Visible when 2nd level is active.**
Scene number for change to level 1-3	1 - 64	Setting of the scene number for the level change.
The following settings are available in both display modes		
Slap / Cleaning function	▪ **not active** ▪ active	Activates the Slap- and Cleaning function
Reaction time on keypress	▪ **fast** ▪ medium ▪ slow	Sets the debouncing time of the buttons
Time for long keypress	0,1 s – 30 s **[0,4 s]**	Setting from when a long keystroke is detected

Table 20: Settings – Button / Function setting

By means of a **mapping function**, button functions that have been set up can be easily assigned to other sensor surfaces/buttons. There is no need for time-consuming reprogramming.
The functions are defined first. These can be set either as "single buttons" or as "grouped buttons". A separate menu then appears for each activated function, in which the function can be configured.
Within the setting of the levels, each function can be assigned to specific buttons as desired. If, for example, "Function 1/2" is changed from "Level 1, upper buttons" to "Level 2, lower buttons", the configuration of the function is retained. Only the group addresses must then be reconnected.

Important:

- A function may only be assigned to one button pair at a time. If a function is accidentally assigned twice, the following message appears in the ETS:

- With the assignment of the functions, the corresponding LEDs are also always taken over.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Switching the levels in the display mode 4 functions/ 1-3 levels is possible via the upper two buttons and the menu 4.3.2 Level setting is displayed. In this menu, the symbols for the individual levels can be set. In addition, switching is possible via a scene object. For example, a level can be called up depending on a certain scene.

Switching the levels in the display mode 4 functions/ 1-3 levels can be done via a scene object and/or the **hidden sensor buttons**. The position of this buttons is described in chapter 2.4 Structure & Handling. When switching over via the hidden sensor keys, a long keystroke on one of these sensor surfaces leads to switching over the level. If switching via the hidden sensor keys is active, an automatic fallback to the Standby level can be activated via the parameter "Change to Standby level after page change via hidden buttons". The time for the fallback can be set individually. In addition, switching the levels via scenes is also possible here.

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:

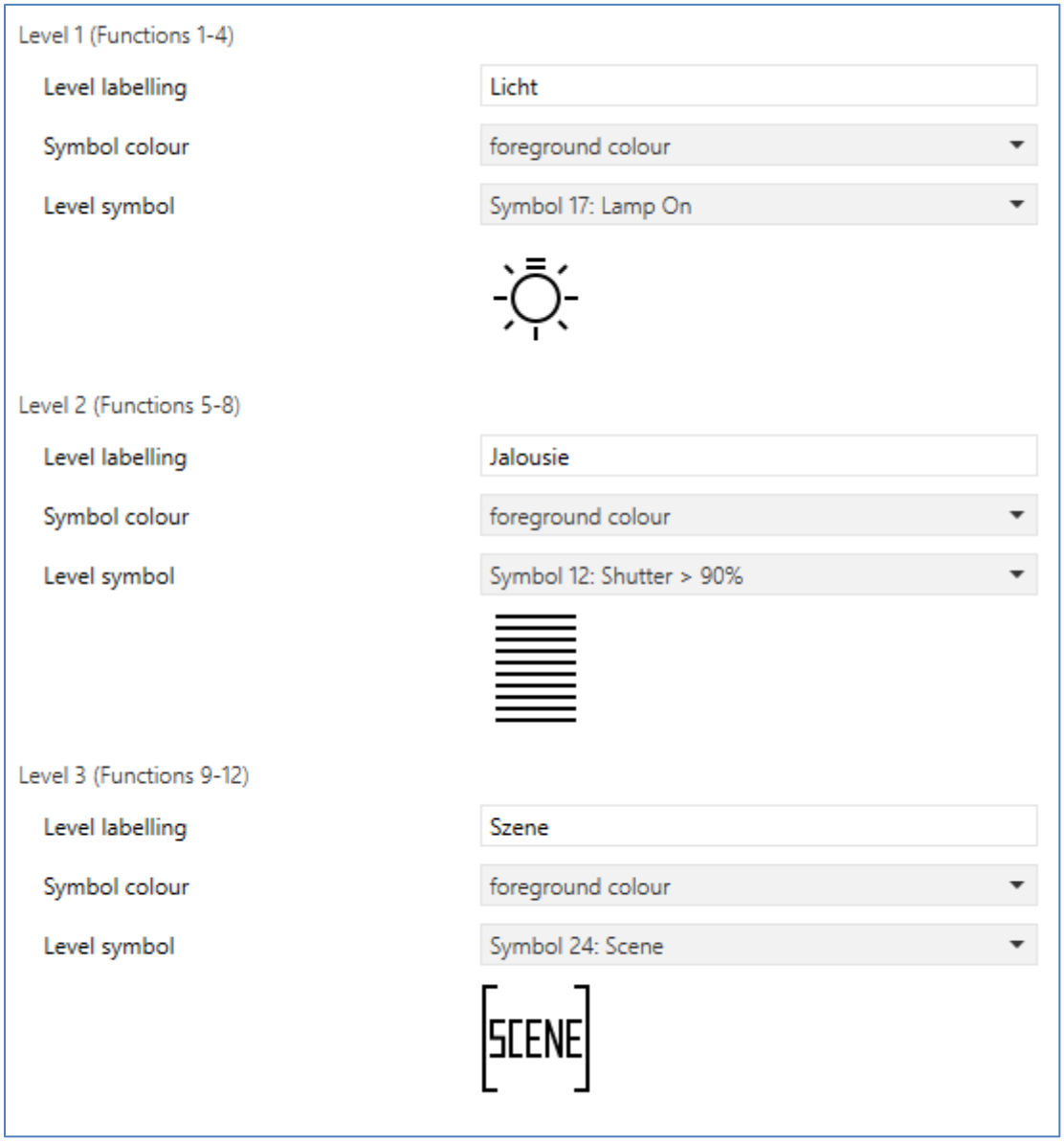


Figure 14: Settings – Level setting

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

As many levels are displayed for setting as have been activated in the "Button/Function setting" menu.

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 labelling	any text [15 Bytes allowed]	Setting the text for the respective level. The text is displayed above the level symbol.
Symbol colour	any colour	Sets the colour for the symbol.
Level symbol	all loaded symbols	Setting of the symbol to be displayed for the appropriate level.

Table 21: Settings – Level setting

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

Each pair of buttons can be activated as a single-button function or as a two-button function.
With the **single-button function**, only one button is used for one function.
With the **two-button function**, two buttons are always used for one function and the operating concept works like a rocker. It is possible to specify for each button which value (On/Off, Up/Down, Brighter/Darker, etc.) it is to send.

A **function name** can be set for both, the single-button function and the two-button function. The button labelling, 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**:

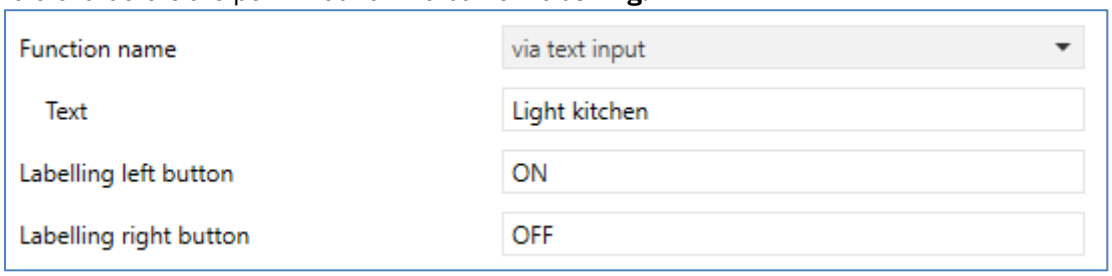


Figure 15: Settings – Button labelling - Two-button function

The functions of the single-button function and the two-button function are described in more detail in chapter 4.4 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.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.3.4 Slap / Cleaning function

The function is triggered by touching/pressing 3 or more buttons simultaneously.

The following picture shows the available settings:

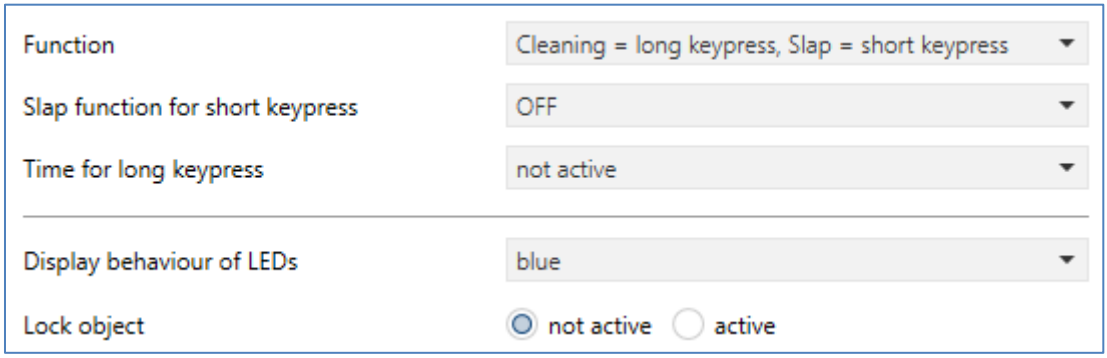


Figure 16: Settings – Slap / Cleaning function

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Function	▪ Cleaning not active, Slap active ▪ **Cleaning = long button, Slap = short button** ▪ Cleaning = short button Slap = long button	Activation of the Slap / Cleaning function and setting if activation via short or long keystroke
Function: Slap / Cleaning = long / short button		
Slap function for short/long keypress	▪ **OFF** ▪ ON ▪ toggle ▪ send value ▪ not active	Setting the slap function. Short/long button depending on the selected concept.
Datapoint type	▪ 2 Bit DPT 2.001 Switch Control ▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour Temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600 RGB Value 3x(0...255)	**If selecting "Send values"**: Setting the data point type of the value to be sent. **Depending on the selected DPT, a parameter for the corresponding value to be sent is displayed**.
Time for long keypress	**not active** 0,1 s – 30,0 s	Setting an individual time from when a long keystroke is detected.
Display behaviour of LEDs	any colour	Display behaviour of the LEDs when the slap function is active.
Lock object	▪ **not active** ▪ active	Activation of the lock object for the slap function.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Function: Cleaning not active, Slap active		
Single-button function	▪ not active ▪ switch ▪ send values ▪ switch/send values short/long (with 2 objects) ▪ scene ▪ blinds/shutter ▪ dimming	Setting of the slap function. Short/long button depending on the selected concept.
Note: In the following, the " single-button functions" with all - depending on the selection of the function - possible settings are not listed further. The function corresponds in each case to the single-button function for the functions/buttons 1-12. The detailed description of each function follows from the next chapter 4.4 Button functions in the respective subitem.		
Display behaviour of LEDs	any colour	Display behaviour of the LEDs when the slap function is active.
Lock object	▪ **not active** ▪ active	Activation of the lock object for the slap function.

Table 22: Settings – Slap / Cleaning function

The **Cleaning function** locks the push-button against further operation or the transmission of a telegram for a period of 10 seconds. If other buttons are touched/pressed within this time, the unit remains locked. This allows the surface of the push-button to be cleaned without triggering any functions. The cleaning function is signalled by white flashing of all status LEDs.

The **Slap function** can be used as an additional button. This enables a certain command to be sent by simply "slapping" the button, e.g. switching the light on/off when entering a room. The slap function is executed when 3 or more buttons are pressed/touched simultaneously. The value to be sent out can be set via the "Slap function" parameter. An active slap function can be indicated with a freely adjustable colour via the status LEDs. The status LEDs flash briefly in the set colour.

With the setting "**Cleaning not active, Slap active**", the slap function can send out values with both a long and a short keystroke. Almost all functions of the regular "single-button functions" are available to the user.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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

Number	Name/Object Function	Length	Usage
84	Slap button Slap button short – Percent value, Decimal value...		Sending the value for the slap button. DPT according to settings in the parameters
85	Slap button Slap button short – Status for toggle, Dimming relative, Stop Slats Open/Close	1 Bit 4 Bit	Receives the current state of the actuator to be controlled (with function „toggle“) or sending dimming or blind commands.
86	Slap button Slap button long Slap button: Group long Slap button (2. object) – Percent value, Decimal value ...		Sending the value for the slap button. DPT according to settings in the parameters
87	Slap button long – Status for toggle	1 Bit	Receives the current state of the actuator to be controlled (with function „toggle“)
88	Slap button: Group extra long – Percent value, Decimal value ...		Sending the value for the slap button. DPT according to settings in the parameters
89	Slap button: Group extra long – Stop Slats Open/Close	1 Bit	Sending a telegram for "Blind control"
90	Slap button – Lock object	1 Bit	Locking the slap function

Table 23: Communication objects – Slap / Cleaning function

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4 Button functions

4.4.1 Identical parameter – Lock object

The lock object can be activated for grouped buttons as well as for single buttons. If the lock object is active, a communication object is displayed for the respective button or button pair. Up to 13 lock objects (12 button functions + push-button) can be configured for a push-button. If the blocking object is assigned a logical "1", the corresponding button is "locked" and can therefore no longer be switched. A "0" cancels the lock.

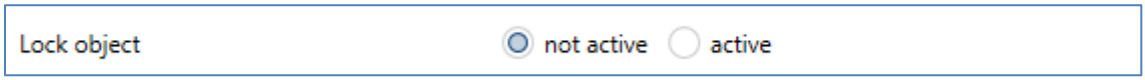


Figure 17: Identical parameter – Lock object

The following table shows the available communication object:

Number	Name/Object Function	Length	Usage
6	Lock object	1 Bit	Locks the button function

Table 24: Identical communication object – Lock object

4.4.2 Identical parameter – Function name

The presentation of a button function is configured identically for all buttons or button pairs. The **function name** is displayed centrally above the respective function and can be set either permanently ("via text input") or dynamically via communication object.
With the two-button function, the left and right buttons can each be assigned their own label.

Note: The presentation of the symbols is described under the corresponding button functions.

The following settings are available for this:

ETS-Text	Dynamic range **[Default value]**	Comment
Function name	▪ no text ▪ from „Message-text“ (14 Byte object 146) ▪ from „Status text 1“ (14 Byte object 147) ▪ from „Status text 2“ (14 Byte object 148) ▪ **via text input** ▪ dynamic text according to status value	Sets the data source for the function name. **Selection "dynamic text according to status value" only available for "switch" functions**. The function name is changed depending on the telegram received, e.g. "Present/Absent" can be signalled.
Text	free Text [up to 20 bytes allowed]	Input of the function name. **Only available for “Function name – via text input”**
Labelling left/right 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 25: Identical Parameter – Function name

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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.

Note: 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 – Function/Object description

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

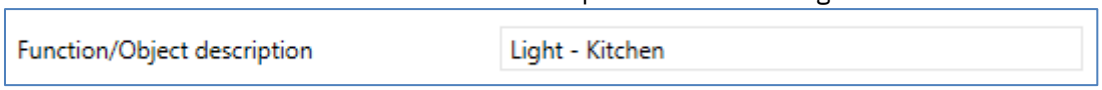
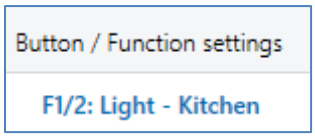
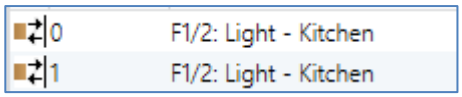


Figure 18: Identical parameter – Text field: Function/Object description

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

The text entered in "**Function/Object description**" appears both in the menu behind the corresponding functions and with the communication objects of the functions.





MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.4 Switch – General

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

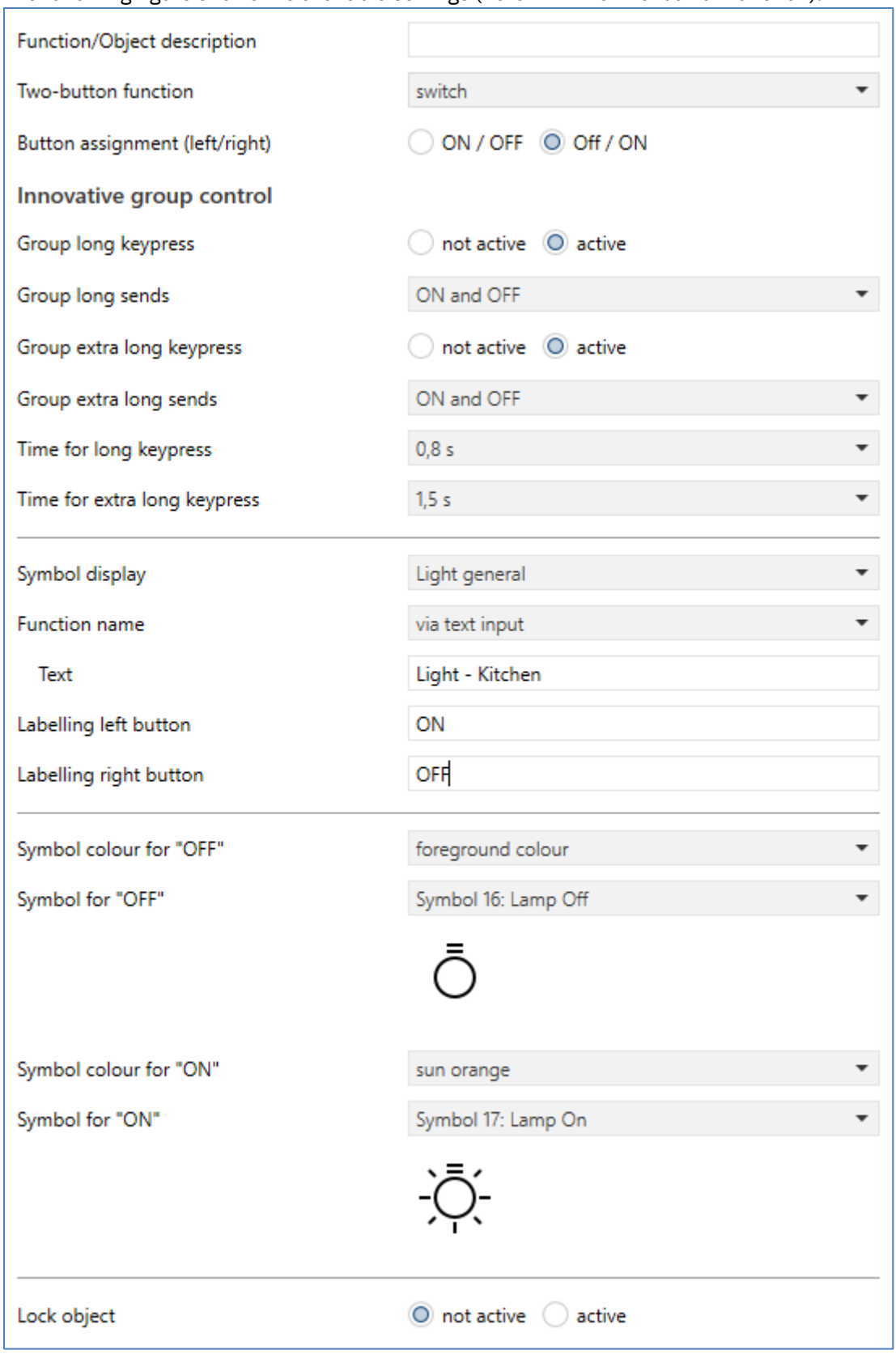


Figure 19: General settings – Switch

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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

ETS-Text	Dynamic range **[Default value]**	Comment
Button assignment (left/right)	▪ ON / OFF ▪ **OFF / ON**	**Only for two-button function.** Defines the sending behaviour of the buttons.
Subfunction	▪ **switch** ▪ toggle ▪ send status	**Only for single-button function.** Defines the sub-function and displays further parameters if necessary.
Value for pressed button	▪ OFF ▪ **ON**	**Only for single-button function, „switch“ and „send status“**. Defines the sending behaviour of the button.
Value for released button	▪ **OFF** ▪ ON	**Only for single-button function, „send status“**. Defines the sending behaviour of the button.
Delay for releases button	▪ **not active** ▪ active	**Only for single-button function, „send status“**. Setting whether to send with a delay.
Time delay	1 s – 60 min **[1 s]**	**Visible when "Time delay" is active.** Defines a delay of the telegram to be sent.
Innovative group control		
Group long keypress	▪ **not active** ▪ active	Activation of the group for long keypress.
Group long sends	▪ **ON and OFF** ▪ Only ON ▪ Only OFF	**Only shown when a long keypress is active!** Defines the sending behaviour when a long keypress is active. **For single button functions, the sending behaviour is defined according to the subfunction.**
Group extra long keypress	▪ **not active** ▪ active	Activation of the group for extra long keypress.
Group extra long sends	▪ **ON and OFF** ▪ Only ON ▪ Only OFF	**Only shown when a long and extra long keypress is active!** Defines the sending behaviour. **For single button functions, the sending behaviour is defined according to the subfunction.**
Time for long keypress	**Basic setting** 0,1 s – 30,0 s	Setting from when a long keypress is detected. Basic setting refers to the time at "general setting".
Time for extra long keypress	0,1 s – 30,0 s **[2,0 s]**	Setting from when an extra long keypress is detected
Configuration of the symbols		
Symbol display	any selection	Pre-selection of a group of symbols for further symbol allocation.
Symbol colour for „OFF“ / „ON“	any colour	Colour and symbol can be freely assigned according to the selection in the dropdowns.
Symbol for „OFF“ / „ON“	any Symbol	

Table 26: General Settings – Switch

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

With the “**Innovative group control”**, it is possible to send to up to three different group addresses by touching/pressing a button for a longer time. The time for the long and the extra-long keystroke is set individually.
With the single-button function, the value defined in the sub-function is always sent for the long and the extra-long group.
With the two-button function, the transmission behaviour for the long and the extra-long group can be set individually.

Note: All groups are always sent one after the other.

Example:
Time long key press: 2 s
Time extra long key press: 4 s
If the key is now pressed for at least 4 seconds, the first value is transmitted immediately, after 2 seconds the value for "group long" and after 4 seconds the value for "group extra long".

4.4.4.1 Two-button function – Switch

☑ Two-Button function

With the two-button function, the respective value (ON/OFF) can be assigned to the left and right button. Thus, the left or right button sends the set, fixed value. The following picture shows the available settings for the two-button function “switch”:

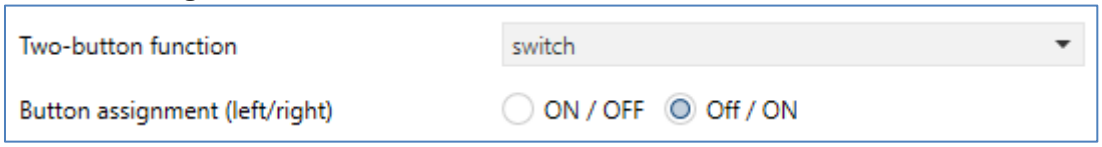


Figure 20: Settings – Two-button function: Switch

Button assignment ON/OFF: The left button sends the value ON, the right button sends the value OFF.
Button assignment OFF/ON: The left button sends the value OFF, the right button sends the value ON.

Note:
For details on the **Innovative group control**, see 4.4.4 Switch – General.
For details on the **configuration of the symbols**, see 4.4.4.5 Presentation (Symbols).

he following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1/2: – Switch	1 Bit	Switching function of the buttons
1	F1/2: – Status for display	1 Bit	Status to update display/symbol on the push-button. Must be connected to the status of the actuator to be switched
2	F1/2 Group long: – Switch	1 Bit	Switching function of the buttons with long keystroke
4	F1/2 Group extra long: – Switch	1 Bit	Switching function of the buttons with extra long keystroke

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

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.4.2 Subfunction: Switch

☑ Single-Button function
☑ Slap-Button

Here, the button sends the respective fixed value when pressed.
The following picture shows the available settings:

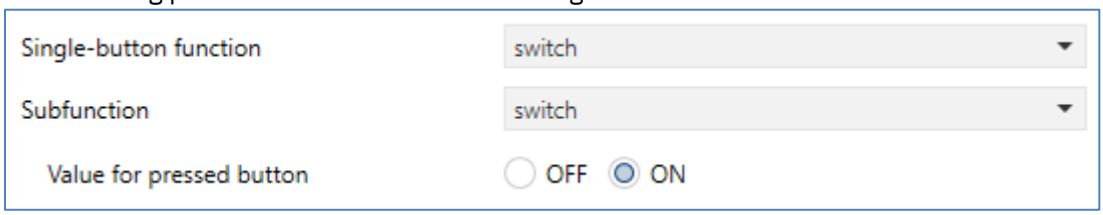


Figure 21: Settings – Single-button function: Switch - Subfunction: Switch

Note:
For details on the **Innovative group control**, see 4.4.4 Switch – General.
For details on the **configuration of the symbols**, see 4.4.4.5 Presentation (Symbols).

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: – Switch	1 Bit	Switching function of the buttons
1	F1: – Status for display	1 Bit	Status to update display/symbol on the push-button. Must be connected to the status of the actuator to be switched
2	F1 Group long: – Switch	1 Bit	Switching function of the button with long keystroke
4	F1 Group extra long: – Switch	1 Bit	Switching function of the button with extra long keystroke

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

4.4.4.3 Subfunction: Toggle

☑ Single-Button function
☑ Slap-Button

With this function, the button sends the respective inverted value in relation to the last received status value.
For this purpose, the status object "Status for toggle" is connected to the status of the actuator to be controlled. If a "1" signal was received as the last value, the button sends a "0" command to the "Toggle" object the next time it is pressed.

The following image shows the available settings:

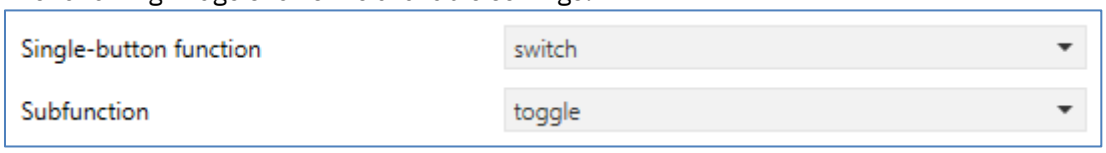


Figure 22: Settings – Single-button function: Switch - Subfunction: Toggle

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Note: For details on the **Innovative group control**, see 4.4.4 Switch – General.
For details on the **configuration of the symbols**, see 4.4.4.5 Presentation (Symbols).

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: – Toggle	1 Bit	Toggle function of the button.
1	F1: – Status for toggle	1 Bit	Status to update display/symbol on the push-button. Must be connected to the status of the actuator to be switched
2	F1 Group long: – Toggle	1 Bit	Toggle function of the button with long keystroke
4	F1 Group extra long: – Toggle	1 Bit	Toggle function of the button with extra long keystroke

Table 29: Communication objects – Single-button function: Switch - Subfunction: Toggle

4.4.4.4 Subfunction: Send Status

☑ Single-Button function
☑ Slap-Button

With this function, fixed values can be sent for a pressed button (rising edge) and a released button (falling edge).
The following picture shows the available settings:

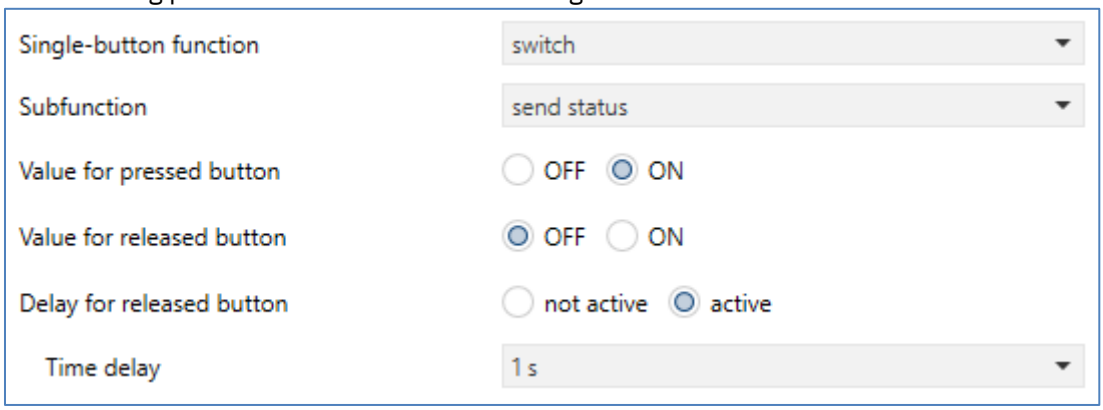


Figure 23: Settings – Single-button function: Switch - Subfunction: Send status

In addition, it is possible to set a delay for the released button. This means that the value for the pressed button is sent immediately, but the value for the released button is sent only after the respective set delay.

Note: For details on the **configuration of the symbols**, see 4.4.4.5 Presentation (Symbols).

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: – Send status	1 Bit	Switching function of the button
3	F1: – Status for display	1 Bit	Status to update the display/symbol on the key. Must be connected to the status of the actuator to be switched

Table 30: Communication objects – Single-button function: Switch - Subfunction: Send status

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.4.5 Presentation (Symbols)

☑ Single-Button function
☑ Two-Button function

The switch function can represent the two possible states (ON/OFF) by means of freely selectable symbols with freely selectable colours. The evaluated status is visualised in each case:

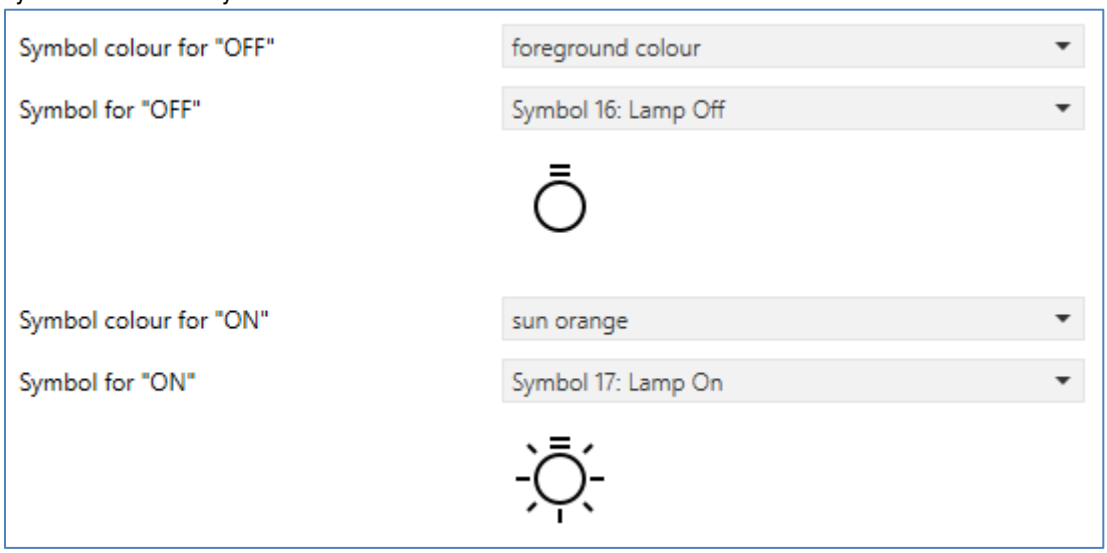


Figure 24: Settings – Presentation of switch-function

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.5 Send Values

4.4.5.1 Subfunction: Send Values

☑ Single-Button function
☑ Two-Button function
☑ Slap-Button

With this function, different values of a datapoint type can be sent.
The following picture shows the available settings (here with the two-button function):

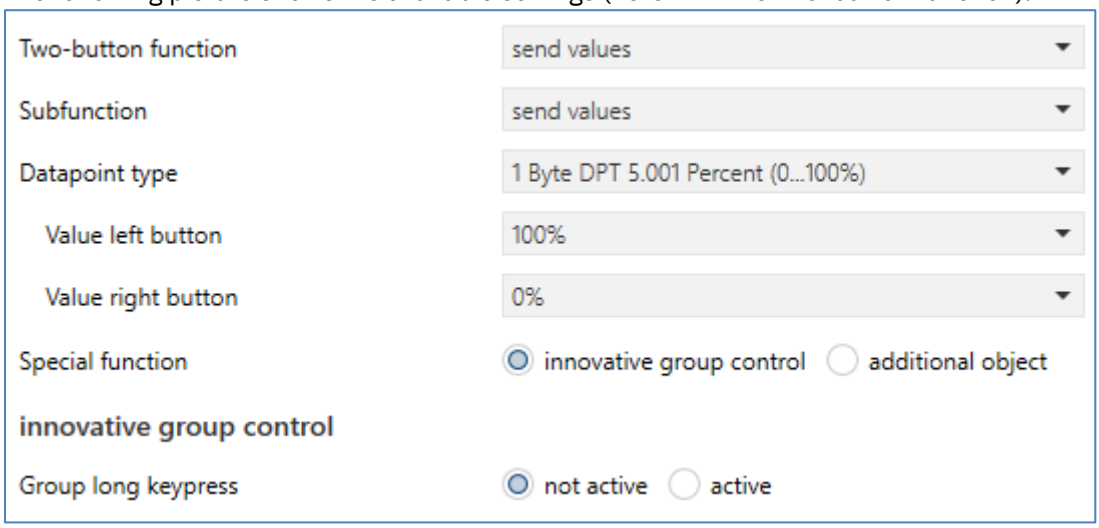


Figure 25: Settings – Send values - Subfunction: Send values

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Datapoint type	▪ 1 Bit DPT 1.001 Switch ▪ 2 Bit DPT 2.001 Switch Control ▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour Temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600RGB Value 3x(0...255)	Setting the type of datapoint to be sent.
Value left/right button	any value according to set datapoint type	**Only with two-button function!** Setting the values to be sent for the two buttons.
Value	any value according to set datapoint type	**Only for single button function!** Setting the value to be sent for the button.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Special function	▪ **innovative group control** ▪ additional object	Selection of the possible special function
Special function: Innovative Group control		
Group long keypress	▪ **not active** ▪ active	Activating a function with a long keystroke
Group long sends	▪ **value for left and right button** ▪ only value for left button ▪ only value for right button	**Only with two-button function.** Setting, which button is to send when the button is pressed long.
Group extra long keypress	▪ **not active** ▪ active	Activating a function with an extra long keystroke
Group extra long sends	▪ **value for left and right button** ▪ only value for left button ▪ only value for right button	**Only with two-button function.** Setting, which button is to send when the button is pressed extra long.
Time for long keypress	Basic setting 0.1 s – 30.0 s **[0.8 s]**	Setting of an individual time from when a long keystroke is detected.
Time for extra long keypress	0.1 s – 30.0 s **[1.5 s]**	Setting of an individual time from when a extra long keystroke is detected.
Special function: Additional object		
Datapoint type (2. object)	▪ 1 Bit DPT 1.001 Switch ▪ 2 Bit DPT 2.001 Switch Control ▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour Temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600RGB Value 3x(0...255)	Setting the type of datapoint to be sent.
Value left/right button	any value according to set datapoint type	**Only with two-button function.** Setting the values to be sent to the 2nd object.
Value	any value according to set datapoint type	**Only for single button function.** Setting the value to be sent to the 2nd object.

Table 31: Settings – Send values - Subfunction: Send values

Note: For details on the **Innovative group control**, see 4.4.4 Switch – General.

When selecting "**additional object**", another communication object appears. It is possible here to send different values to two separate objects when pressing a button. For example, a dimming value in "%" can be sent to a dimming actuator with the first object and at the same time an "RGB value" to an LED controller.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: F1/2:– Switch control, Percent value ...		Switch function of the button(s). DPT depending on the parameter setting.
1	F1: F1/2: – Status for display		Receiving the status for the display. DPT depending on parameter setting. **Status for RGB value not available**.
2	F1 (2. object) F1/2 (2. object) – Switch control, Percent value ...		Switch function of the button/s on the second object. DPT depending on the parameter setting.
2	F1 Group long F1/2 Group lang – Switch control, Percent value ...		Switch function with long keystroke. DPT depending on the parameter setting.
4	F1 Group extra long F1/2 Group extra long – Switch control, Percent value ...		Switch function with extra long keystroke. DPT depending on the parameter setting.

Table 32: Communication objects – Send values - Subfunction: Send values

Note: The object numbers for the slap-button are 84 - 88. There is no "Status for display" object.

4.4.5.2 Subfunction: Toggle Values/Scenes (up to 4 Values)

☑ Single-Button function
☑ Two-Button function
☑ Slap-Button

This function can be used to switch between up to 4 different values of a datapoint type.
The following picture shows the available settings, here with the two-button function:

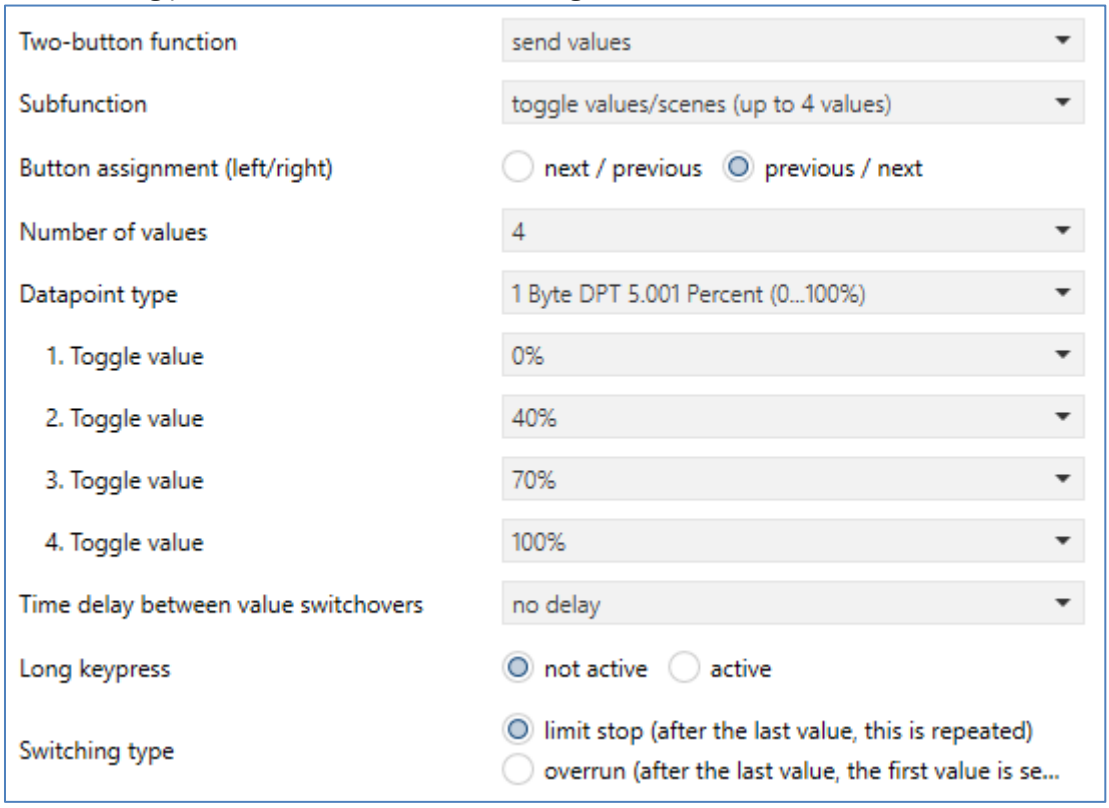


Figure 26: Settings – Send Values - Subfunction: Toggle values/scenes (up to 4 values)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Button assignment (left/right)	▪ **next / previous** ▪ previous / next	**Only for two-button function.** Setting in which direction to switch when the left/right button is pressed.
Number of values	▪ **2** ▪ 3 ▪ 4	Setting between how many values are to be switched.
Datapoint type	▪ 2 Bit DPT 2.001 Switch Control ▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour Temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600 RGB Value 3x(0...255)	Setting the type of datapoint to be sent.
1.-4. Toggle value	any value according to set datapoint type	Setting the respective value for the toggle value.
Time delay between value switchovers	**no delay** 1 s – 10 s	Setting a delay between sending the toggle values.
Long keypress	▪ **not active** ▪ active	Activating a function with a long keystroke.
Action on left/right button	▪ 1.-4. Toggle value ▪ 4. Toggle value if last 1. Toggle value, otherwise 1. Toggle value ▪ Send “0” ▪ “OFF” to second object ▪ “ON” to second object	**Only for two-button function!** Setting the action with long keystroke. **Number of possible switching values according to the selection "Number of values".**
Action on long keypress	▪ 1.-4. Toggle value ▪ 4. Toggle value if last 1. Toggle value, otherwise 1. Toggle value ▪ Send “0” ▪ “OFF” to second object ▪ “ON” to second object	**Only for single-button function.** Setting the action with long keystroke. **Number of possible switching values according to the selection "Number of values"**
Time for long keypress	**Basic setting** 0,1 s – 30 s	Setting of a time from when a long keystroke is detected.
Switching type	▪ **Limit stop** (after the last value, this is repeated) ▪ Overrun (after the last value, the first value is sent again)	**Only for two-button function.** Setting what should happen when the last switching value is reached.

Table 33: Settings – Send Values - Subfunction: Toggle values/scenes (up to 4 values)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Functional principle
This function can send up to 4 different values when a button is pressed shortly. The values are toggled one after the other. Depending on the set parameters, for example, when the button is pressed, the 2nd toggle value is sent if the 1st toggle value was previously sent and the 3rd toggle value if the 2nd toggle value was previously sent.

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

If you select "**1. – 4. Toggle value**", a fixed toggle value (value corresponding to the assigned toggle values) is always transmitted when a long button is pressed.

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

The setting "**Send 0**" sends the value “0” to the switchover object. If, for example, the datapoint type is set to percentage, the value 0% is sent.

The setting ”**ON” to second object**" or "**OFF” to second object**" displays another communication object for the long keypress. The fixed value “ON” or “OFF” is then transmitted to this 1-bit object.

With the setting "**Time delay between value switchovers**", the sending of the telegram is delayed by the set time after the button is pressed. If you press the button 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 1st toggle value to the 3rd toggle value without activating the second one - with a delay time of 2 seconds - press the key twice within 2 seconds.

Parameter “Switching type” (only available with two-button function)

Limit stop: With the switching type limit stop, the 4th toggle value is sent again after sending the 4th toggle value.
Overrun: With the overrun switching type, the 1st toggle value is sent again after the 4th toggle value.

Note: For the single button function, this parameter is permanently set to “overrun”.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: F1/2: – Forcible control, Percent value...		Transmission of the toggle value. DPT depending on the parameter setting
1	F1: F1/2: – Status of percent value, Status of forcible control ...		Receiving of the status. DPT depending on the parameter setting. **Status for RGB value not available**
2	F1 long: F1/2 long: – Switch	1 Bit	Switching function of the long button. **Only appears with the setting "ON or OFF to second object".**

Table 34: Communication objects – Send Values - Toggle values/scenes (up to 4 values)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.5.3 Subfunction: Shift Value

☑ Two-Button function

With this function - only with the two-button function - values can be moved up or down within the set limits.
The following picture shows the available settings:

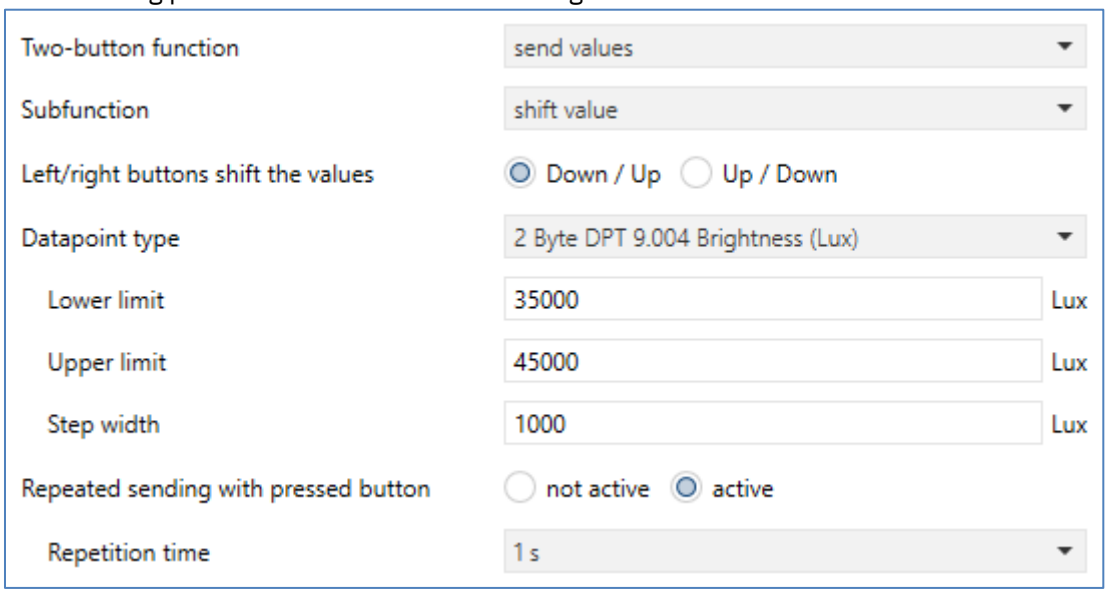


Figure 27: Settings – Send Values - Subfunction: Shift Values

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Left/right buttons shift the values ...	▪ **Down / Up** ▪ Up / Down	Setting with which button is shifted in which direction.
Datapoint type	▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux)	Setting the datapoint type for the value shift
Lower limit	0 – 100% / 0 – 255 / 0 ... 45 °C / 0 ... 100000 Lux **[0% / 0 / 19 °C / 35000 Lux]**	Setting the lower limit value for the value shift
Upper limit	0 – 100% / 0 – 255 / 0 ... 45 °C / 0 ... 100000 Lux **[0% / 0 / 23 °C / 45000 Lux]**	Setting the upper limit value for the value shift
Step width	1 – 100% / 1 – 255 / 0,1 ... 5 K / 0 ... 100000 Lux **[10% / 10 / 0,5 K / 1000 Lux]**	Setting the step width between two sending commands
Repeated sending with pressed button	▪ **not active** ▪ active	Setting whether telegrams are to be repeated with pressed button.
Repetition time	200 ms – 3 s **[1 s]**	Repetition time between two telegrams with button pressed.

Table 35: Settings – Send Values - Subfunction: Shift Values

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Functional principle
The "Shift value" function shifts 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 when the "Up" button is pressed, the set step width is added to the last value.

Lower/Upper 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 sent telegrams. If the value 10% was sent during the previous transmission, the value 20% is sent with the next "Up" command - with a set step width of 10%.

Repeated sending with pressed button
Repeated sending while holding down the button allows the function to increase/decrease the value until the upper/lower limit is reached.

The following table shows the available communications objects:

Number	Name/Object Function	Length	Usage
0	F1/2 – Percent value, Decimal value ...	1 Byte 2 Byte	Sending of the value to be shifted. DPT depending on the parameter setting
3	F1/2 – Status Percent value, Status Decimal value ...	1 Byte 2 Byte	Receiving of the status value. DPT depending on the parameter setting

Table 36: Communication objects – Send Values - Subfunction: Shift Values

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.5.4 Subfunction: Send value by state

☑ Single-Button function
☑ Slap-Button

This function allows a fixed value to be sent according to the selected datapoint type when pressing or releasing the button.

The following picture shows the available settings:

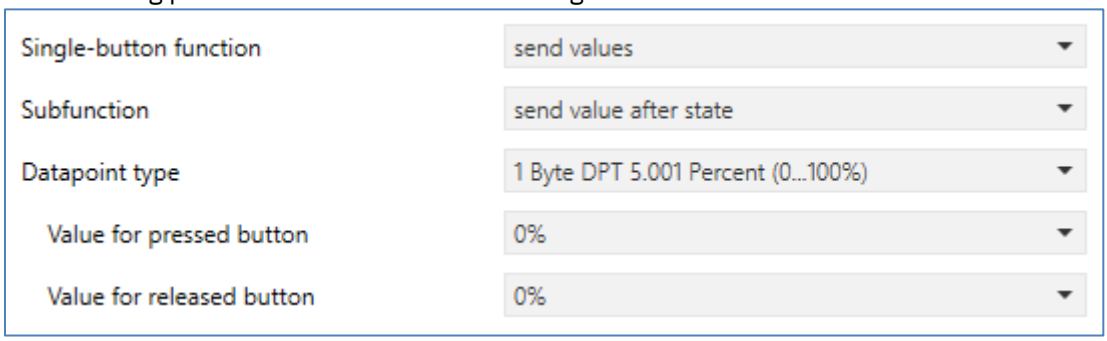


Figure 28: Settings – Send values - Subfunction: Send value by state

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Datapoint type	▪ 2 Bit DPT 2.001 Switch Control ▪ **1 Byte DPT 5.001 Percent (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour Temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600 RGB Value 3x(0...255)	Setting the type of datapoint to be sent.
Value for pressed / released button	any value according to the set datapoint type	Setting of the values to be sent.

Table 37: Settings – Send values - Subfunction: Send value by state

The value to be sent can be set according to the set datapoint type for **pressing** as well as for **releasing** the key.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: – Forcible control, Percent value ...		Sending the value. DPT depending on the parameter setting
3	F1: – Status for display		Receiving the status. DPT depending on parameter setting. **Status for RGB value not available**

Table 38: Communication objects – Send values - Subfunction: Send value by state

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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 colour 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 Colour 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 39: Presentation (Symbols) – Send values

Special presentation

For certain datapoint 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 presentation	▪ **bar symbol** ▪ bar symbol with fan ▪ value as text (0-100%) ▪ value as text (0-255)	**Only for DPT 5.001 and DPT 5.005.** If "bar symbol" and "bar symbol with fan" are selected, the corresponding symbol is presented, and the bar is filled depending on the current status. If "value as text" is selected, the text is shown large on the display.
Special presentation	▪ **value as symbol + "°C"** ▪ value as symbol without unit ▪ value as symbol + "K"	**Only for DPT 9.001.** With the settings "value as symbol", the text is shown large on the display.

Table 40: Special presentation – Send values

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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

☑ Single-Button function
☑ Two-Button function
☑ Slap-Button

With this function, 2 different values can be sent for the short and long button. The short and the long button have different objects, whereby it is also possible to send out different datapoint types.

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

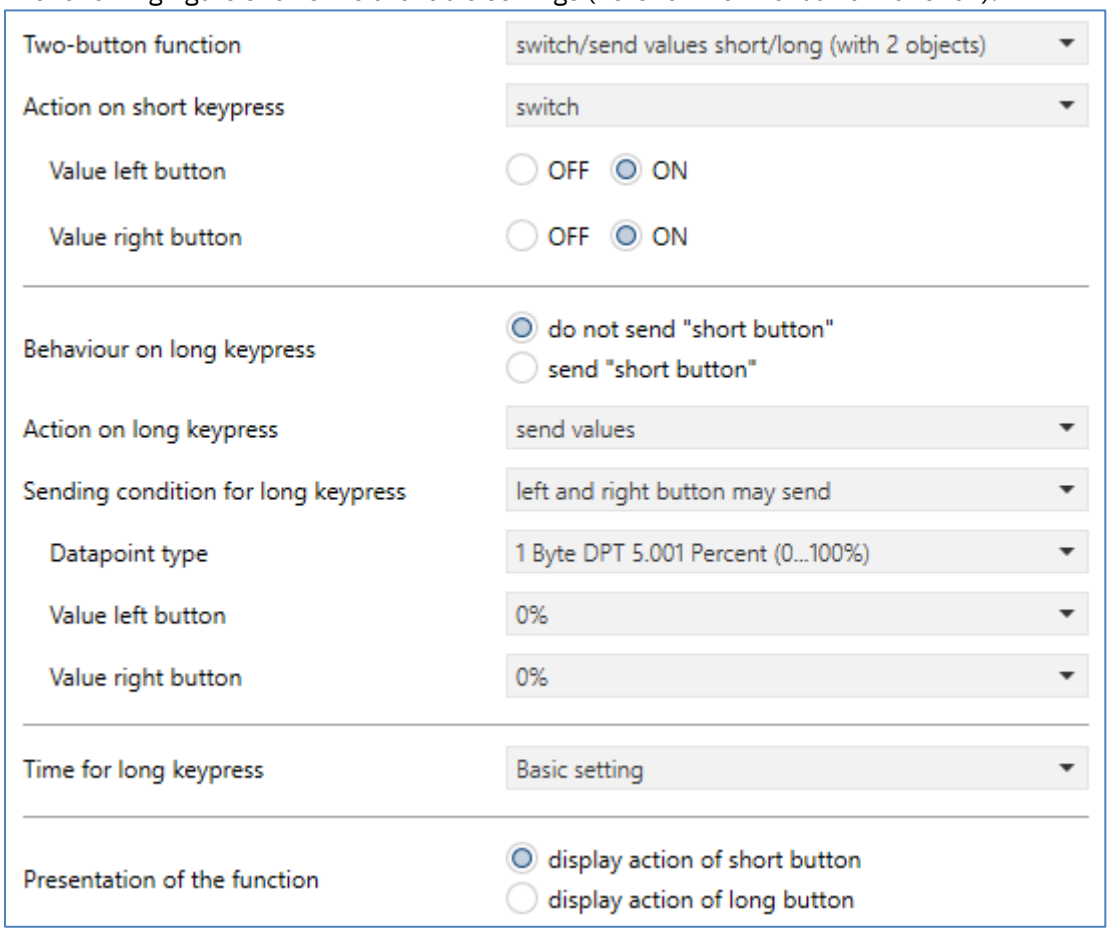


Figure 29: Settings – Switch/Send values short/long (with 2 objects)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The table below shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Action on short/long keypress	▪ **switch** ▪ OFF ▪ **ON** ▪ toggle ▪ send value ▪ not active	Setting the function for the short/long button. **- " Switch" only with Two-button function.** **- " Switch On/Off" only with Single-button function**.
Datapoint type	▪ 2 Bit DPT 2.001 Forcible control ▪ **1 Byte DPT 5.001 Percent value (0...100%)** ▪ 1 Byte DPT 5.005 Decimal factor (0...255) ▪ 1 Byte DPT 17.001 Scene number ▪ 2 Byte DPT 7.600 Colour temperature (Kelvin) ▪ 2 Byte DPT 9.001 Temperature (°C) ▪ 2 Byte DPT 9.004 Brightness (Lux) ▪ 3 Byte DPT 232.600 RGB value 3x(0...255)	**Only available for "send values"** Sets the datapoint type for the value to be sent.
Value left/right button	any value according to set datapoint type	**Only for two-button function**. Setting the values to be sent for the two buttons.
Value	any value according to set datapoint type	**Only for single-button function**. Setting the value to be sent for the button.
Behaviour on long keypress	▪ **do not send „short button“** ▪ send „short button“	Setting whether the value for the short button should also be sent when the long button is pressed.
Sending condition for long keypress	▪ left and right button may send ▪ only left button may send ▪ only right button may send	**Only for two-button function.** Setting the sending condition for the long button.
Time for long keypress	**Basic setting** 0,1 s – 30,0 s	Setting from when a long keypress is detected.
Presentation of the function	▪ **display action of short button** ▪ display action of long button	Setting which button is to be shown as the status in the display.

Table 41: Settings – Switch/Send values short/long (with 2 objects)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Functional principle
With the two-button function, different values can be sent for the left and right buttons (for the short and the long button). With the single-button function, only one value can be sent for both the short and the long button. The data point type can be set separately for the short and the long button.

Presentation of the function
Since different datapoint types can be set for the short and the long button, either the function for the long button or the function for the short button can be presented.
The "Status for display" object therefore only appears for the function that is being presented.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1 short: F1/2 short: – Switch, Percent value ...		Sending the value for the short button. DPT depending on the parameter setting
1	F1 short: F1/2 short: – Status for toggle	1 Bit	Receive the status for the short button. **Only with the "Toggle" function**
1	F1 short: F1/2 short: – Status for display		Receive the status for the short button. DPT depending on the parameter setting **No status possible for RGB**
2	F1 long: F1/2 long: – Switch, Percent value ...		Sending the value for the long button. DPT depending on the parameter setting
3	F1 long: F1/2 long: – Status for toggle	1 Bit	Receive the status for the long button. **Only with the "Toggle" function**
3	F1 long: F1/2 long: – Status for display		Receive the status for the long button. DPT depending on the parameter setting. **No status possible for RGB**

Table 42: Communication objects – Switch/send values short/long (with 2 objects)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Presentation
With the button function "Switch short/long", either the function of the short button or the function of the long button can be presented. The settings shown for the presentation depend on whether the function to be displayed has been configured as "Switch" (switch, ON, OFF, toggle) or as "Send values".

If the **"Switch" function** has been set, the following presentation settings are possible:
The switch function can represent the two possible states (ON/OFF) by freely selectable symbols with freely selectable colours. The evaluated status is visualised in each case:

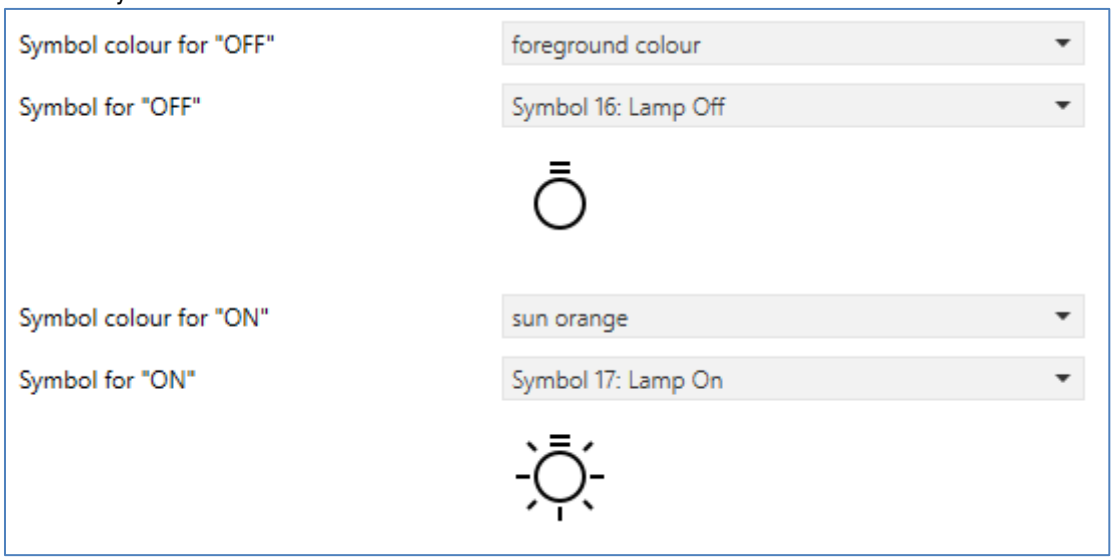


Figure 30: Presentation – Switch function

The following presentation settings are possible for the **"Send values" function:**
The presentation depends on the selected datapoint type. Depending on the selected datapoint type, 1-4 different symbols and their colour can be selected. The following table gives an overview of the setting options for the different 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 Colour 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 43: Presentation – Send values

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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 presentation	▪ **bar symbol** ▪ bar symbol with fan ▪ value as text (0-100%) ▪ value as text (0-255)	**Only for DPT 5.001 and DPT 5.005.** If "bar symbol" and "bar symbol with fan" are selected, the corresponding symbol is presented, and the bar is filled depending on the current status. If "value as text" is selected, the text is shown large on the display.
Special presentation	▪ **value as symbol + "°C"** ▪ value as symbol without unit ▪ value as symbol + "K"	**Only for DPT 9.001.** With the settings "value as symbol", the text is shown large on the display.

Table 44: Special presentation – Send values

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.7 Temperature Shift

☑ Two-button function

Important: This function is only available for devices with temperature sensor!

The temperature shift can be used to move the setpoint of the heating control.
The following figure shows the available settings using the example "via 1 bit" :

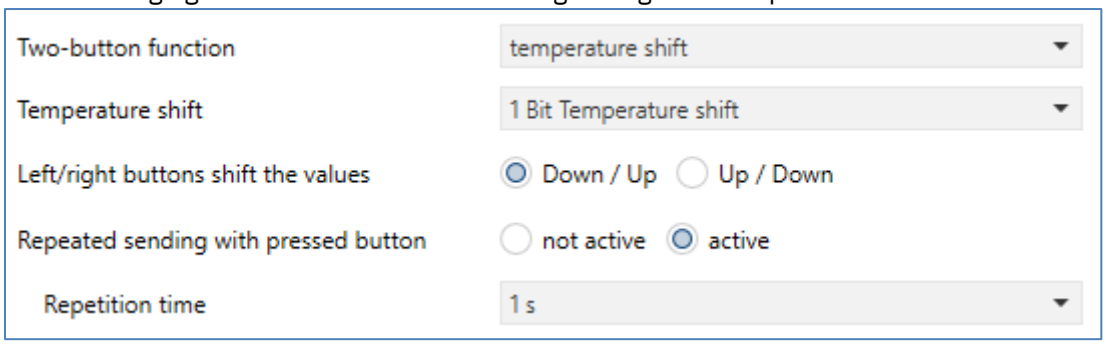


Figure 31: Settings – Temperature shift

The table below shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Temperature shift	▪ **1 Bit temperature shift** ▪ 1 Byte temperature shift ▪ 2 Byte temperature shift ▪ 2 Byte shift of “Basis Comfort Setpoint”	Setting how the temperature is to be shifted
Step width	0.1 ... 1 K **[0.5 K]**	Set the step width between two send commands. **Not visible when shift via “1 Bit”.**
Lower limit	-10 ... 10 K **[-3 K]**	Setting of the lower limit value for the setpoint shift. **Only for shift via “1 Byte/2 Byte”.**
Upper limit	-10 ... 10 K **[3 K]**	Setting of the upper limit value for the setpoint shift. **Only for shift via 1 “Byte/2 Byte”.**
Lower limit	0 ... 45 °C **[19 °C]**	Setting of the lower limit value for the setpoint shift. **Only for “2 Byte shift of “Basic Comfort setpoint”.**
Upper limit	0 ... 45 °C **[23 °C]**	Setting of the upper limit value for the setpoint shift. **Only for “2 Byte shift of “Basic Comfort setpoint”.**
Repeated sending at pressed key	▪ **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

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Shift based on	▪ object „Status setpoint shift“ ▪ **object „Setpoint shift“**	Setting on which principle the shift is based. **Only for shift via "1 Byte/2 Byte".**
	▪ object „Status Basic Comfort setpoint“ ▪ **object „Basic Comfort setpoint“**	Setting on which principle the shift is based. **Only for “2 Byte shift of “Basic Comfort setpoint".**

Table 45: Settings – Temperature shift

Functional principle
This function shifts the current setpoint within the set limits. When the "-" button is pressed, the setpoint is subtracted from the last value by the set step width and when the "+" button 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 "-" button would cause 20.5°C and set to 21.5°C when the "+" button is pressed.

Shift based on
If no reference value were considered when switching, the unit would only remember the last value sent and send the following value the next time it was pressed, without considering whether another value was sent to the object in the meantime.

With the selection "**Shift based on**", a reference value is thus set with which the device operates. The next time the button is pressed, the next higher or the next lower shift value - in relation to the last value received - is sent.
If, for example, the value "1 K" was sent when the button was last pressed and then the value "2 K" was sent from another location, the value "2.5 K" is sent the next time the "+" button is pressed.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The temperature can be shifted in 4 different ways:

1 Bit temperature shift
With the 1-bit temperature shift, the push-button sends a "1" for an upward shift of the setpoint and a "0" for a downward shift of the setpoint.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1/2: – Setpoint shift	1 Bit	Sends the Setpoint shift
1	F1/2: – 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	F1/2: – Status current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller – to display the status

Table 46: Communication objects – Temperature shift via 1 Bit

1 Byte temperature shift
With the 1-byte temperature shifting, the 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/Object Function	Length	Usage
0	F1/2: – Setpoint shift	1 Byte	Sends the Setpoint shift
1	F1/2: – 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	F1/2: – Status current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller – to display the status
3	F1/2: – Status setpoint shift	1 Byte	Reception of the current setpoint shift. Must be connected to all 1-byte objects that send the setpoint shift to the controller to be controlled in order to correctly evaluate the current status of the setpoint shift.

Table 47: Communication objects – Temperature shift via 1 Byte

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2 Byte temperature shift

With the 2-byte temperature shift, the push-button sends a 2-byte temperature value which is added to or subtracted from the set basic Comfort value.
Each time the button is pressed, the button sends the shift by the set increment.
To ensure that the display and the current setpoint are synchronous, the limits of the setpoint shift must be specified in the push-button and set to the same values as in the controller to be controlled.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1/2: – Setpoint shift	2 Byte	Sends the Setpoint shift
1	F1/2: – 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	F1/2: – Status current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller – to display the status
3	F1/2: – Status setpoint shift	2 Byte	Reception of the current setpoint shift. Must be connected to all 2-byte objects that send the setpoint shift to the controller to be controlled in order to correctly evaluate the current status of the setpoint shift.

Table 48: Communication objects – Temperature shift via 2 Byte

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

2 Byte shift of “Basic Comfort setpoint”

With the "2-byte shift of the Basic Comfort setpoint" the push-button sends a new basic comfort setpoint to the controller to be activated. It evaluates the object "Status Basic Comfort setpoint" and sends the new setpoint +/- the set step width to the controller to be actuated.
The range for the setpoint adjustment can be limited via the limits of the setpoint adjustment to be set.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1/2: – Basic Comfort setpoint	2 Byte	Sending the new, shifted setpoint.
1	F1/2: – 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	F1/2: – Status current setpoint	2 Byte	Receiving the current setpoint temperature of the temperature controller – to display the status
3	F1/2: – Status Basic Comfort setpoint	2 Byte	Receipt of the Basic Comfort Setpoint. Must be connected to the Basic Comfort Setpoint status of the controller to be controlled in order to be able to shift the Basic Comfort Setpoint correctly when changing to another operating mode.

Table 49: Communication objects – 2 Byte shift of Basic Comfort setpoint

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Presentation
☑ Two-Button function

The following settings are available:

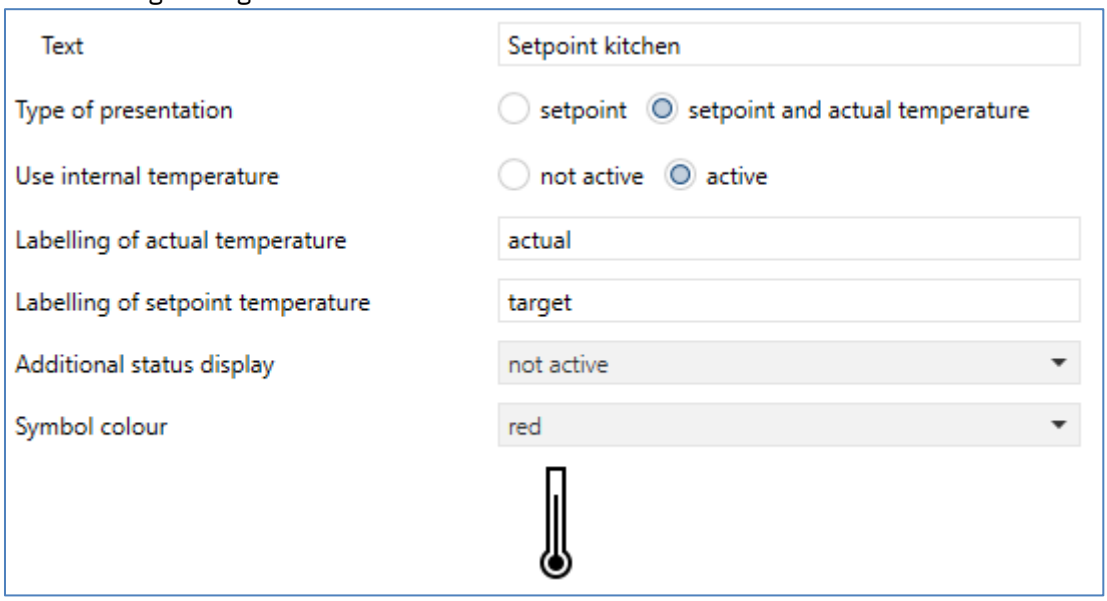


Figure 32: Presentation – Temperature shift

The temperature shift is presented with the symbol “Temperature”. The presentation is fixed to the symbol. In addition, the actual and setpoint values can be labelled as desired.
With the "**Type of presentation**" you can set whether only the setpoint or also the actual temperature is to be shown in the display.

The parameter "**Use internal temperature**" is used to select whether the internal value or an external temperature value is to be displayed. With the setting "not active", a new communication object "Status actual temperature" is displayed. An external value is received via this object.

Via "**Additional status display**", when activated - as an alternative to the standard symbol - either "Heating/cooling (1 bit)" or the "Control value (0-100%)" can be signalled via symbol and symbol colour.
For "**Heating/Cooling (1 bit)**", one symbol can be selected for "Heating" and one for "Cooling". An object "Status Heating = 1 / Cooling = 0" appears for the switchover. With the value via this object, the corresponding symbol is displayed.
For the setting "**Control value (0-100%)**", a symbol for "0%" and one for "> 0%" can be selected. Switching is done via the "Status control value" object that is displayed for this purpose, to which an external control value is sent.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.8 Mode selection

☑ Single-Button function
☑ Two-Button function

Important: This function is only available for push-buttons with a temperature sensor.

The operating mode switchover function can be used to switch the HVAC mode in heating actuators or temperature controllers.

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

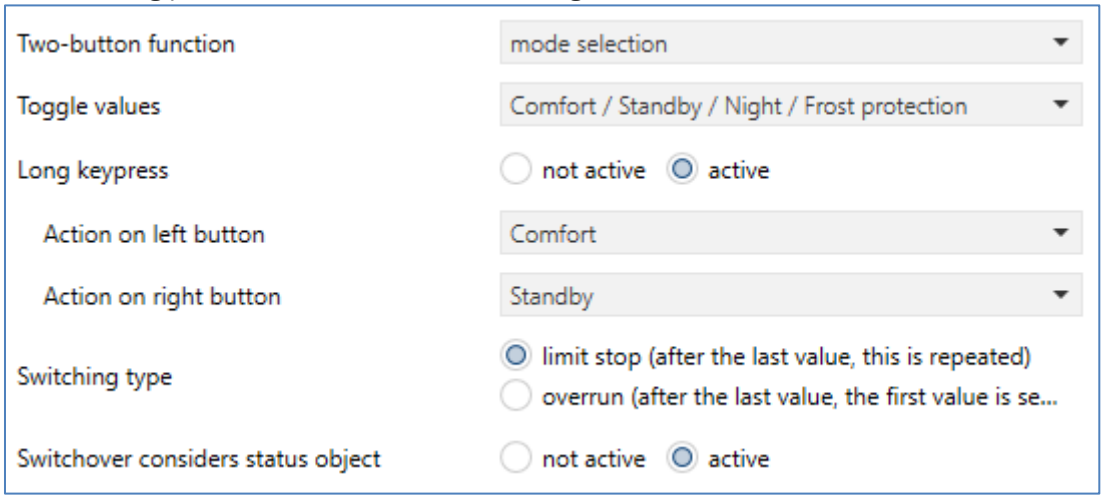


Figure 33: Settings – Mode selection

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Toggle values	▪ **Comfort / Standby** ▪ Comfort / Night ▪ Comfort / Standby / Night ▪ Comfort / Standby / Night / Frost protection	Setting between which operating modes can be toggled.
Long keypress	▪ **not active** ▪ active	Activates an action for the long keystroke
Action on left/right button	▪ **Comfort** ▪ Standby ▪ Night ▪ Frost protection	Setting which operating mode is to be called up with a long keystroke of the left or right button. **Only with two-button function.**
Action on long keypress	▪ **Comfort** ▪ Standby ▪ Night ▪ Frost protection	Setting which operating mode is to be called up with a long keystroke. **Only with single-button function.**
Switching type	▪ **limit stop (after the last value, this is repeated)** ▪ overrun (after the last value, the first value is sent again)	Setting what should happen when the last switching value is reached. **Only with two-button function.**
Switchover considers status object	▪ not active ▪ **active**	Setting whether the switchover is to be carried out according to the current status.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Status display	▪ **not active** ▪ HVAC-Mode ▪ HVAC-Status	Setting how the status is received via object. (*Parameter below the symbols, see "Presentation" next page).*

Table 50: 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 2nd operating mode is sent if the 1st operating mode has been sent before or the 3rd operating mode will be sent if the 2nd operating mode has been sent before...

Long keypress
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.

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

Switchover considers status object
If the **status value is not considered** during the switchover, the unit remembers the last value sent and sends the next or previous value during the next operation without considering whether another value was sent to the object in the meantime.
If the **status value is considered** during the switchover, the unit sends the next higher or the next lower switchover value - in relation to the last received status value - at the next actuation.

Status display
If the status on the controller changes (e.g. via Day/Night switchover, frost alarm, etc.) and this is sent, the display can be updated with this. To display the status correctly, it must be set whether it is sent as "HVAC status" or as "HVAC mode". According to the selection, a communication object appears via which the status of the controller is received.
After the update, the button then sends the next switching value when the button is pressed again.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: F1/2: – Mode selection (HVAC Mode)	1 Byte	Switchover of operating mode
1	F1: F1/2: – Status HVAC Mode	1 Byte	Receives the status of the heating actuator / temperature controller
1	F1: F1/2: – HVAC Status	1 Byte	Receives the status of the heating actuator / temperature controller

Table 51: Communication objects – Mode selection

Presentation
☑ Single-Button function
☑ Two-Button function

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

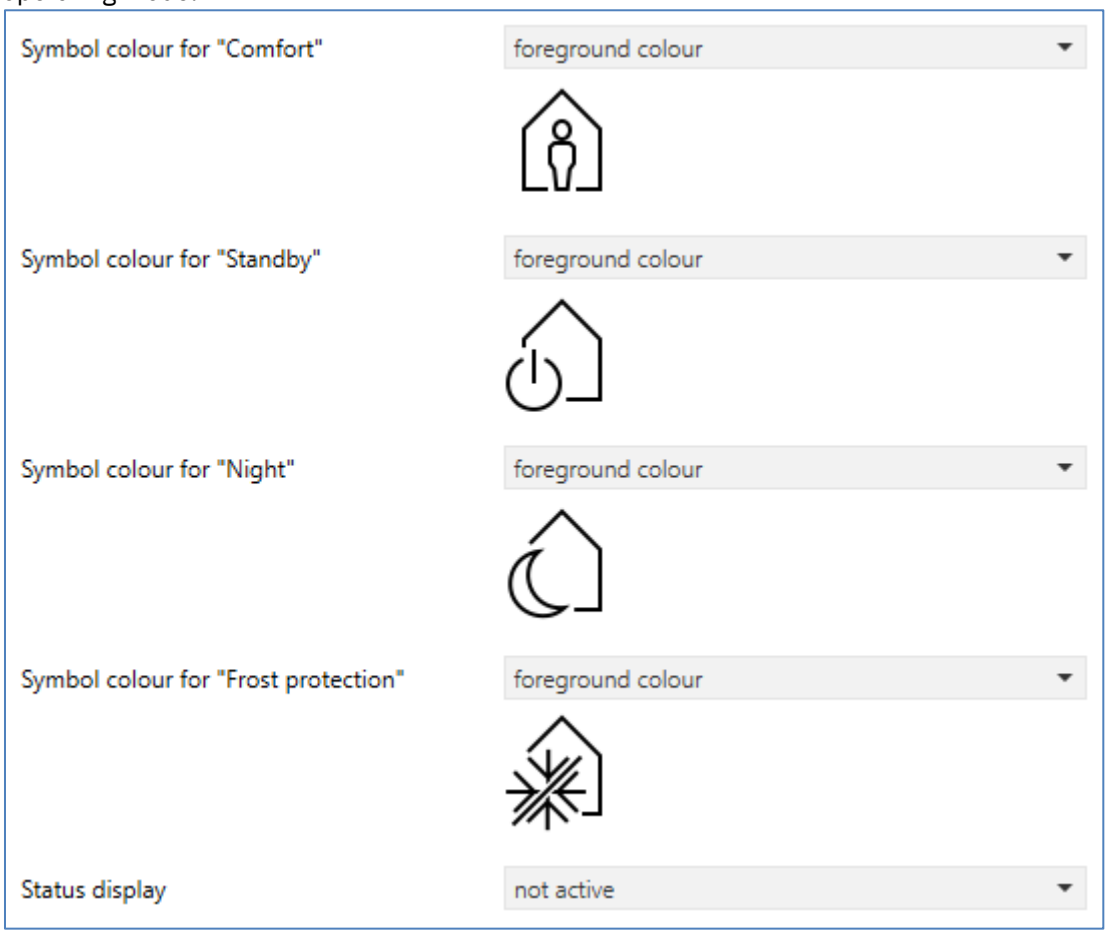


Figure 34: Presentation – Mode selection

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.9 Scene

☑ Single-Button function
☑ Slap-Button

The scene function allows you to call up and save scenes that cover different trades. If the memory function is activated, it can be executed by pressing and holding down a key.
The following figure shows the available settings:

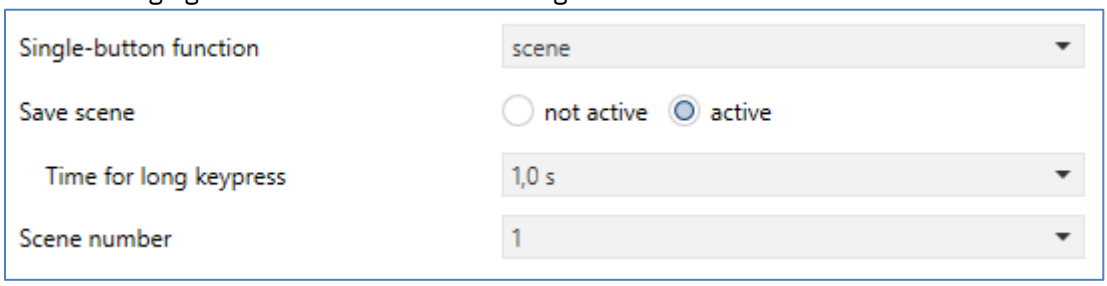


Figure 35: Settings – Scene

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Save scene	▪ **not active** ▪ active	Release of saving the scenes. The saving is carried out by a long keystroke.
Time for long keypress	Basic setting 0,1 s – 30,0 s **[1,0 s]**	**Only visible if "Save scene" is active.** Setting the time for the long keypress to save a scene.
Scene number	1 – 64 **[1]**	Setting the respective scene number.

Table 52: Settings – Scene

The following table shows the available communication object:

Number	Name/Object Function	Length	Usage
2	F1: – Scene	1 Byte	Call up/saving of scenes

Table 53: 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:

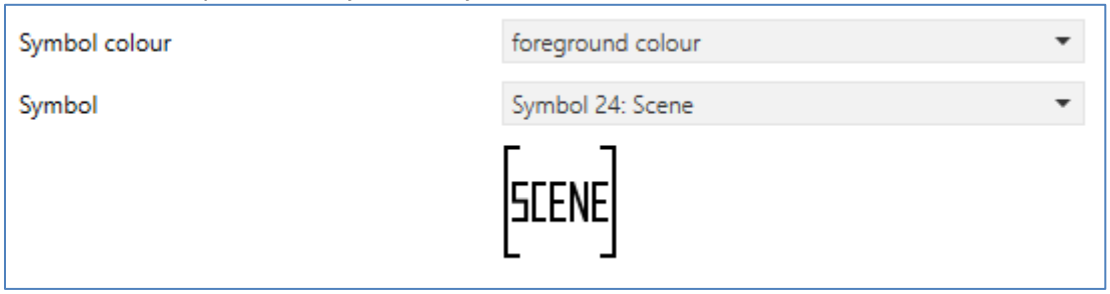


Figure 36: Presentation – Scene

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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 54: Scene call and save

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.10 Blinds/Shutter

☑ Single-Button function
☑ Two-Button function
☑ Slap-Button

The blinds/shutter 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: Two-button function):

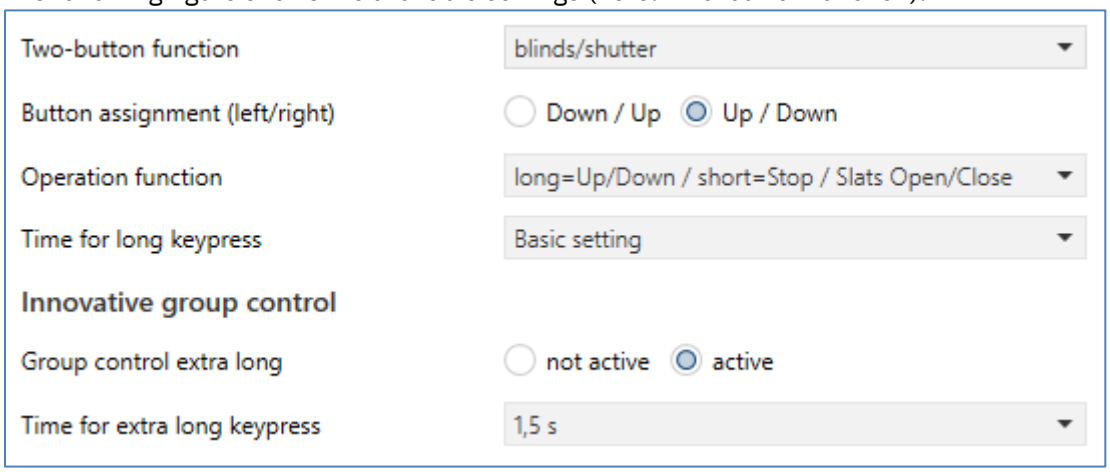


Figure 37: Settings – Blinds/Shutter

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Button assignment (left/right)	▪ Up/Down ▪ **Down/Up**	**Only with two-button function!** Setting the key assignment (upper/left or lower/right key) for the up/down function
Operation function	▪ **long=Up/Down (or "move")/ short=Stop / Slats Open/Close** ▪ short=Up/Down (or "move") / long=Stop / Slats Open/Close ▪ short=Up/Down/Stop (MDT Single Object Control) ▪ short=Up/Down/Stop / long=Central object (MDT Single Object Control)	Setting the concept of how to operate with long/short buttons. **Functions with "MDT Single Object Control" only available with two-button function!**
Time for long keypress	**Basic setting** 0,1 s – 30 s	Setting of an individual time from when a long keystroke is detected
Innovative group control (Only with setting „long=Up/Down / short=Stop/Slats Open/Close")		
Group control extra long	▪ **not active** ▪ active	Activation of a further function with extra long keystroke
Time for extra-long keypress	0,1 s – 30,0 s **[1,5 s]**	Setting of an individual time from when an extra long keystroke is detected

Table 55: Settings – Blinds/Shutter

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Two communication objects are displayed for the "blinds/shutter" function: the object "Stop/Slats 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 button assignment can be set.
The table below shows the relationships:

	Function Up/Down			**Function Down/Up**	
Input	Button left	Button right		Button left	Button right
Moving object	Up	Down		Down	Up
Stop/Step object	Stop/Slats Open	Stop/Slats Close		Stop/Slats Close	Stop/Slats Open

Table 56: Functionality – Two-button movement blinds/shutter

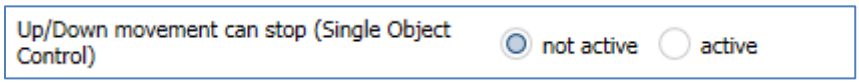
With the **single-button function**, the system switches between "Up" and "Down" after each button is pressed.
Since shutter actuators always use a "1" signal for the downward movement and a "0" signal for the upward movement, the push-button outputs this as well.
It is also possible to swap the action for the long and short button presses. In this way, it is possible to select whether the movement is to take place via a long or a short button press. The stop/step object then adopts the other operating concept.

Only one object is available as "**Status for display**". It refers to the height position. A position for the slat cannot be visualised.

Group control extra long
If the key is pressed extra long, the single blind starts moving after 0.5 s.
After another 1.5 s, the group starts with the same movement.
This activates the group function:
If Stop is then pressed briefly, all blinds stop. If the slat is adjusted with "short", the group also adjusts the slat.
After approx. 90 s the group function is deactivated again internally and a Stop only affects the individual channel.

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 must 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.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: F1/2: – Blinds Up/Down	1 Bit	Up/down command for the shutter actuator
0	F1/2 short: – Shutter Up/Down/Stop	1 Bit	**MDT Single Object Control.** Up/Down/Stop function. **Only with two-button function and for roller shutters!**
1	F1: F1/2: – Stop / Slats Open/Close	1 Bit	Open/close slats and stop command
1	F1/2 long: – Central Shutter Up/Down/Stop	1 Bit	**MDT Single Object Control.** Central object for up/down/stop function. **Only with two-button function and for roller shutters!**
2	F1: – Status for change of direction	1 Bit	**Only with single-button function.** Receipt of the status with current information about the direction of the shutter actuator
2	F1/2: – Status „slats“ for display	1 Bit	**Only with two-button function.** Receiving the status of the current slat position.
3	F1: F1/2: – Status „height“ for display	1 Byte	Receive the status of the current blind/shutter position.
4	F1 Group extra long: F1/2 Group extra long: – Blinds Up/Down	1 Bit	Up/down command for the shutter actuator
5	F1 Group extra long: F1/2 Group extra long: – Stop / Slats Open/Close	1 Bit	Slat control with open/close and stop command

Table 57: Communication objects – Blinds/Shutter

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Presentation
☑ Single-Button function
☑ Two-Button function

The blind function can be presented with 3 freely selectable symbols and freely selectable colour.
The push-button evaluates the information of "Object 3 - Status "height" for display".

In addition, the status can be displayed as **text under the symbol** (here for single-button function):

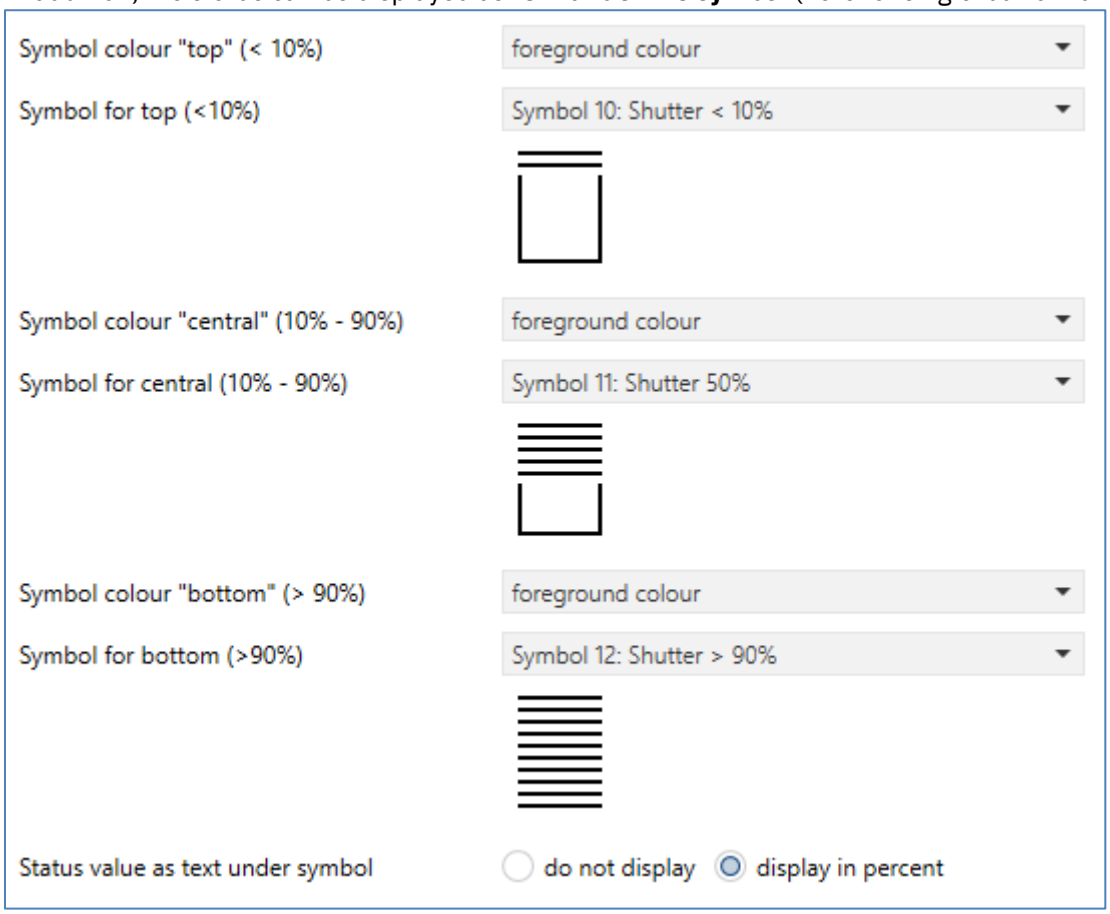


Figure 38: Presentation – Blinds/Shutter

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Additional presentation
☑ Two-Button function

With the two-button function, the **position of the slats** can also be presented. The symbol for the slats is displayed on the right button. The button evaluates the information of the "Object 2 - Status "slats" for display". The position of the slats can be presented by 3 freely selectable symbols and freely selectable colours.

In addition, the status can be displayed as **text under the symbol**:

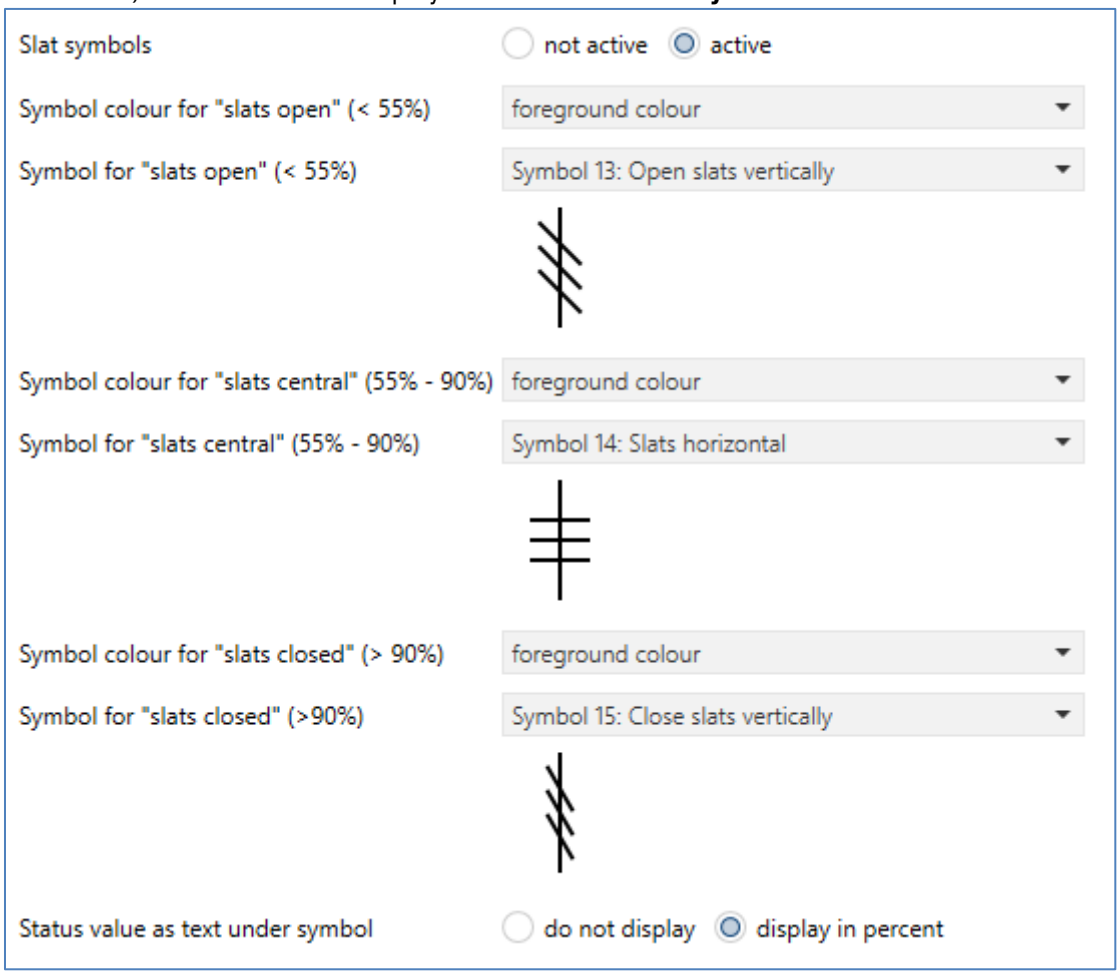


Figure 39: Presentation – Slat symbols

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.11 Dimming

☑ Single-Button function
☑ Two-Button function
☑ Slap-Button

The dimming function can be used to control dimming actuators.
The following figure shows the available settings (here: for the two-button function):

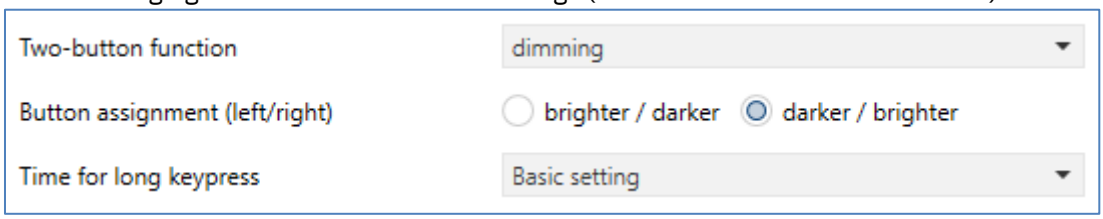


Figure 40: Settings – Dimming

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Button assignment (left/right)	▪ **brighter/darker** ▪ darker/brighter	**Only with two-button function.** Setting the button assignment for the direction (brighter/darker).
Time for long keypress	**Basic setting** 0.1 s – 30.0 s	Setting of the time from when a long keystroke is to be detected.

Table 58: Settings – Dimming

With the **single-button function "dimming"**, two communication objects appear for this button. Firstly, the function for a short button action, the "Dimming On/Off" switch object, and secondly the function for a long button action, the dimming object "Dimming relative".

The **two-button function "dimming"** can be set either as brighter/darker or as darker/brighter. The relationships are shown in the following table:

	Function brighter/darker			**Function darker/brighter**	
Input	Button left	Button right		Button left	Button right
Dimming function	brighter	darker		darker	brighter
Switch function	ON	OFF		OFF	ON

Table 59: Functionality – Two-button Dimming

With the single-button function "dimming", the direction (brighter/darker) is reversed depending on the communication object "Status for toggle".
The dimming function is a start-stop dimming function, i.e. as soon as the dimming function becomes active, a brighter or darker command is assigned to the input until it is released. After the command is released, a stop telegram is sent which ends the dimming process.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
0	F1: F1/2: – Dimming On/Off	1 Bit	Switch command for the dimming function
1	F1: F1/2: – Dimming relative	4 Bit	Command for relative dimming
2	F1: – Status for toggle	1 Bit	**Only for single button function.** Receipt of the status with current information about the status of the actuator to be controlled
3	F1: F1/2: – Status of dimming value for display	1 Byte	Receiving the status of the current absolute brightness
3	F1: F1/2: – Status for display	1 Byte	Reception of a status value as text (with presentation as "special presentation"). DPT according to the setting.

Table 60: Communication objects – Dimming

Type of presentation
☑ Single-Button function
☑ Two-Button function

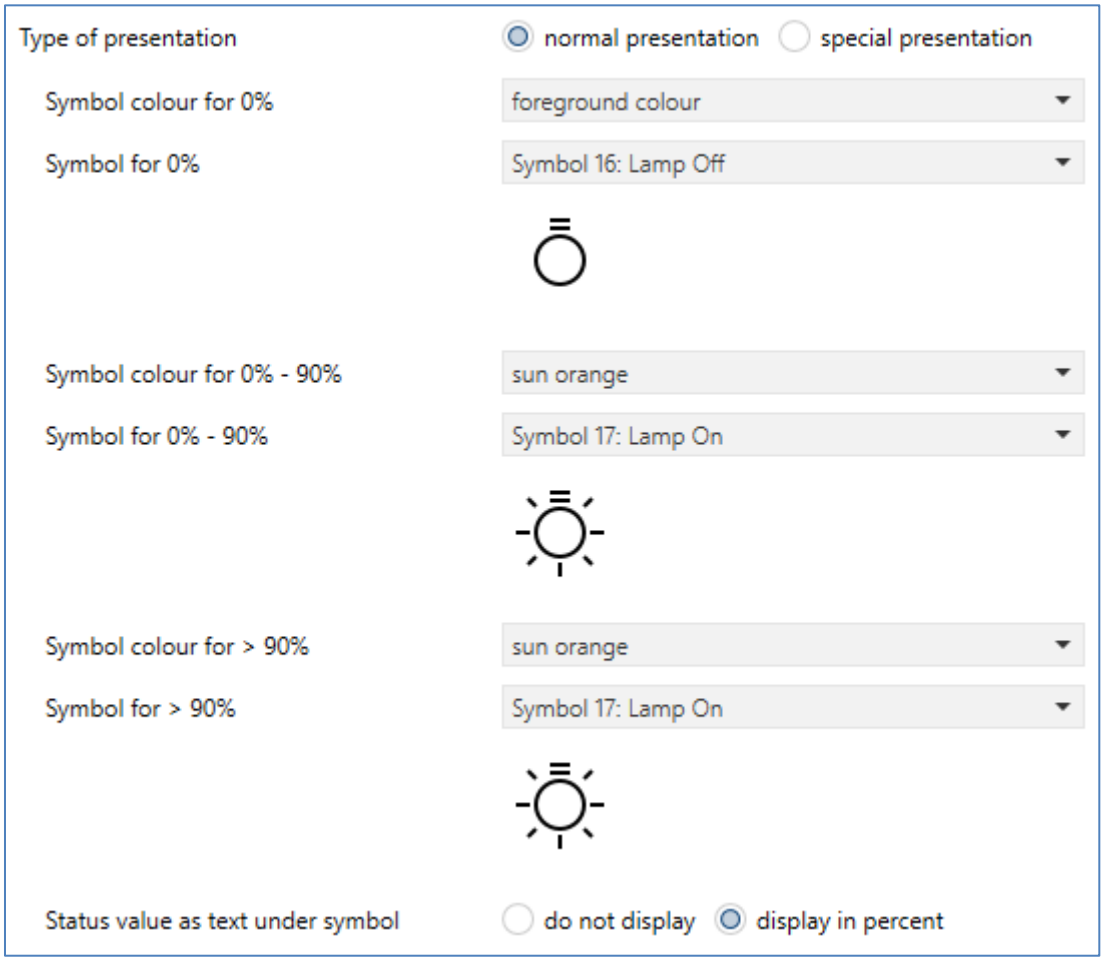


Figure 41: Normal presentation – Dimming

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

Normal presentation
The dimming function can be presented with 3 freely selectable symbols and freely selectable colours. The push-button evaluates the information of the "Object 3 - Status of dimming value for display".
In addition, the current status can be displayed as text under the symbol.

Special presentation
Alternatively, a special symbol or a value can be displayed as text here. The information from "Object 3 - Status for display" is also evaluated here.

The following settings are available for this:

ETS-Text	Dynamic range **[Default value]**	Comment
Special presentation	▪ **bar symbol** ▪ bar symbol with fan ▪ value as text (0 - 100%) ▪ value as text (0 - 255)	With the "bar symbol" settings, the symbol is presented and the bar is filled according to the current status. With the settings "value as text", the text is shown large on the display.

Figure 42: Special presentation – Dimming

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.4.12 HSV colour control

☑ Single-Button function
☑ Two-Button function

With the HSV colour 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:

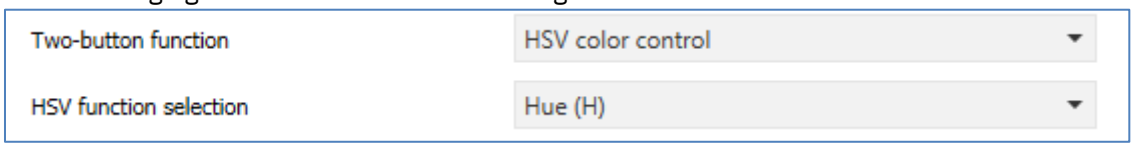


Figure 43: Settings – HSV colour control

The table below shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
HSV function selection	▪ **Hue (H)** ▪ Saturation (S) ▪ Value (V)	Setting of the function to be controlled

Table 61: Settings – HSV colour control

The HSV colour control can control the 3 parameters (hue, saturation, brightness) of the HSV chromatic circle. A 4-bit 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/Object Function	Length	Usage
0	F1: F1/2: – HSV control On/Off	1 Bit	**Only for subfunction “Value”** Switch command for colour control
1	F1: F1/2: – Change HSV Hue (H)/ Saturation (S)/ Value (V) relative	4 Bit	Cycle through the HSV chromatic circle
2	F1: – Status for toggle	1 Bit	**Only for single-button function and subfunction “Value”.** Receiving the status with current information about the status of the actuator to be controlled
3	F1: F1/2: – Status for Hue/ Saturation/ Value	1 Byte	Receiving the state of the HSV chromatic circle

Table 62: Communication objects – HSV colour control

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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		Colour of the symbol can be switched between red, green, blue.
Value		

Table 63: Special symbols – HSV colour control

4.4.13 Colour temperature (Tunable White)

☑ Single-Button function
☑ Two-Button function

With the “Tunable White” function the colour 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):

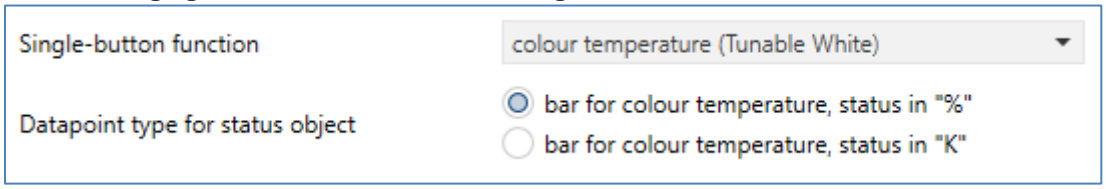


Figure 44: Settings – Colour temperature (Tunable White)

The table below shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Datapoint type for status object	▪ **bar for colour temperature, status in “%”** ▪ bar for colour temperature, status in “K”	Setting the datapoint type for the status.

Table 64: Settings – Colour temperature (Tunable White)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

With colour temperature (Tunable White), the light temperature can be controlled. A 4-bit dimming command is available for the control. This allows a cycle through the colour 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. When released, a "stop" telegram is sent.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
1	F1: F1/2: – Change colour temperature relative	4 Bit	Cycle through the colour temperature
3	F1: F1/2: – Status for colour temperature	1 Byte	Receiving the status of the colour temperature

Table 65: Communication objects – Colour temperature (Tunable White)

Presentation
☑ Single-Button function
☑ Two-Button function

The colour 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.

bar for colour temperature, status in “%”
It should be noted here: The value in percent corresponds to the “cold white” content.

bar for colour temperature, status in “%”
The limits for the colour temperature can be limited here via parameters.
The possible "minimum display range" is 2000 ... 3300 K **[2700].**
The possible "maximum display range" is 4000 ... 8000 K **[6000].**

The special symbol is shown below:

ETS-Text	Symbol	Comment
Symbol presentation		

Table 66: Special symbol – Colour temperature (Tunable White)

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.5 Status LED

Depending on the configuration of the push-button, up to 14 status LEDs can be configured. One LED can be configured per function, which are then marked with "LED 1 - 12" in the parameters. In addition, "LED A/B" can be controlled separately in standby, e.g. to indicate a status during Standby.

4.5.1 LED basic settings

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

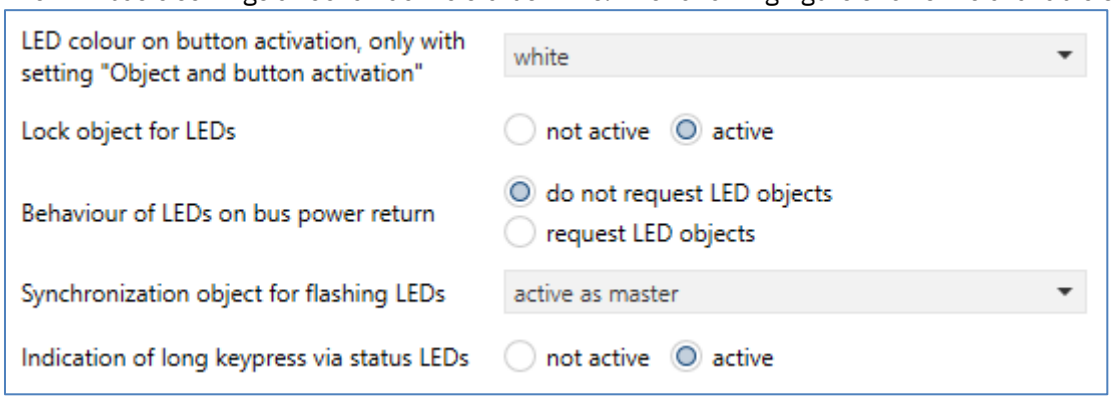


Table 67: Basic settings – LED

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
LED-colour on button activation, only with setting “Object and button activation”	any colour **[white]**	Parameter is only used with double assignment: Button activation + internal/external object.
Lock object for LEDs	▪ **not active** ▪ active	Activates a lock object which can disable (= switch off) all LEDs.
Behaviour of LEDs on bus power return	▪ **do not request LED objects** ▪ request LED objects	Setting whether to actively request the objects after a reset. **Only active when "LED reacts to external object**".
Synchronization object for flashing LEDs	▪ **not active** ▪ active as Master ▪ active as Slave	Activation of a synchronisation object for the LEDs.
Indication of long keypress via status LEDs	▪ not active ▪ **active**	When activated, a long keystroke is indicated by the status LED switching off.

Table 68: Basic settings – LED

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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

The "**Synchronisation object for flashing LEDs**" can be used to ensure that flashing status LEDs of different push-buttons flash in the same rhythm. One push-button in the room is defined as the master and all other push-buttons as slaves.
The "LED flashing status" objects are linked together in a group address.

Via the parameter "**Indication of long keypress via status LEDs**", the execution of the action for the long keystroke can be signalled by the status LED going out. In this way, it can be signalled to the operator that the long keypress has been carried out and the action is "completed". However, this setting is only effective if the LEDs react to button activation and is only valid for the following functions:

- switch/send values short/long (with 2 objects)
- save scene
- send values/scenes - when action for long button is active
- mode selection - when action for long button is active
- blinds

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

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
131	LED – Lock object	1 Bit	Locking of all LED´s
157	LED – Flashing status	1 Bit	Sends the flashing status for Master or receives the status as Slave

Table 69: Communication objects – LED basic settings

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.5.2 LED 1-12/A/B

The following figure shows the available settings for all active LEDs:

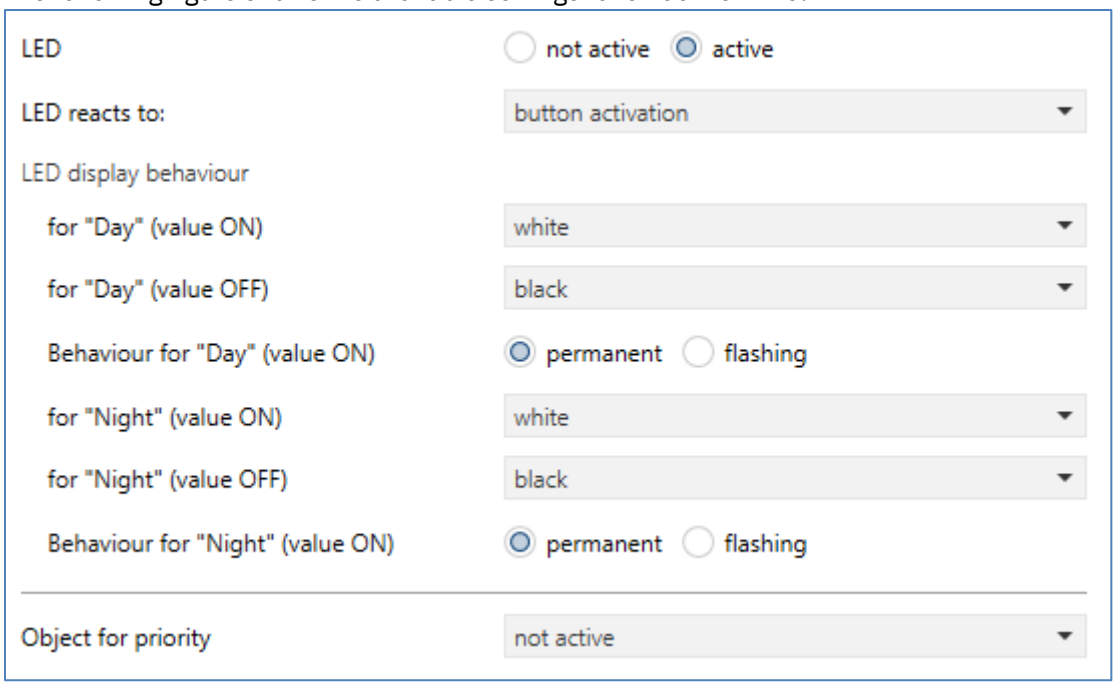


Figure 45: Settings – LED 1-12/A/B

The table below shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
LED	▪ not active ▪ **active**	Activation of the LED
LED reacts to	▪ 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 0 ... 157 **[0]**	Link to internal object. **Only available if LED reacts to internal object.**
Datapoint type	▪ **1Bit DPT 1.001 Switch** ▪ 1Byte DPT 5.001 Percent value (0...100%) ▪ 1 Byte DPT 5.005 Decimal factor (0...255)	Selection of the datapoint type for external object. **Only available if LED reacts to "external object".**

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

LED display behaviour		
for „Day“ (value ON)	any colour	Colour for the object value ON when the button is pressed in Day mode.
for „Day“ (value OFF)	any colour	Colour for the object value OFF if no button is pressed in Day mode.
Behaviour for „Day“ (value ON)	▪ **permanent** ▪ flashing	Setting the lighting behaviour when LED has the object value ON, or the button is pressed.
for „Night“ (value ON)	any colour	Colour for the object value ON when the button is pressed in Night mode.
for „Night“ (value OFF)	any colour	Colour for the object value OFF if no button is pressed in Night mode.
Behaviour for „Night“ (value ON)	▪ **permanent** ▪ flashing	Setting the lighting behaviour when LED has the object value ON, or the button is pressed.

Table 70: Settings – LED 1-12/A/B

Each LED can react either to any external object **or** internal object **or** to button activation.
In addition, a LED can also react to an “external/internal object **and** the button activation”. 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 behaviour of the button operation is set globally for all LEDs and is described in chapter 4.5.1 LED basic settings. The behaviour for the button activation has priority here.

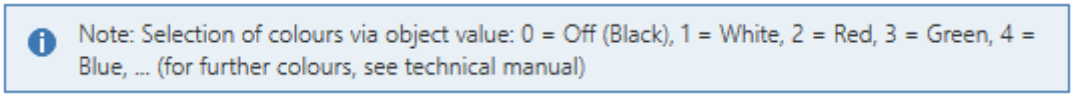
If the setting LED reacts to "**internal object**" is selected, the object number to which the LED is to be linked is selected. For example, if the LED is to switch when (with the setting "Button 1" to "toggle") the "Object 1 - Status for toggle" has the value "1", the object number "1" must be entered. In this case, the status LED would be switched on if the object has the value "1" and switched off if the object has the value "0".
If the LED is linked to an object that does not have the size 1 bit, the LED is switched off if the object has the value "0" and switched on if the value of the object is not equal to "0". For an object of the "DPT 5.001 - Percent", this means that the LED is switched off at 0% and switched on at all other values.

With the setting "**LED reacts to: external object**", the corresponding LED can be controlled either via a 1-bit object or 1-byte objects as a percentage value or decimal value.

With **DPT "Switch"** the LED is switched on with a "1" and with a "0" the LED is switched off.

With **DPT "Percent value"**, the LED switches on with the set value and switches off again when the value falls below this value.

With **DPT "Decimal value"**, sending the following object values causes the corresponding colour.
The following note appears in ETS:



The colours listed are the most used standard colours. However, other colours are also possible.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following list shows colour choices:
0 = Black
1 = White
2 = Red
3 = Green
4 = Blue
5 = Yellow
6 = Orange
7 = Sun orange
8 = Dark green
9 = Light blue
10 = Violet
11 = Pink
12 = Red (pastel)
13 = Sun orange (pastel)
14 = Orange (pastel)
15 = Yellow (pastel)
16 = Light green (pastel)
17 = Light blue (pastel)
18 = Blue (pastel)
19 = Violet (pastel)
20 = Pink (pastel)
21 = Grey tone 1
22 = Grey tone 2
23 = Grey tone 3
24 = User defined colour 1
25 = User defined colour 2
26 = User defined colour 3
27 = Background colour
28 = Foreground colour

Each LED can assume different colours and **behaviour for “Day” and “Night” operation** and switches depending on the object 133-Day/Night.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
103	LED 1 – Switch, Percent value, Decimal value	1 Bit 1 Byte	Control of the LED. DPT depending on the parameter setting. **Only with "LED reacts to external object".**

Table 71: Communication object – LED

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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:

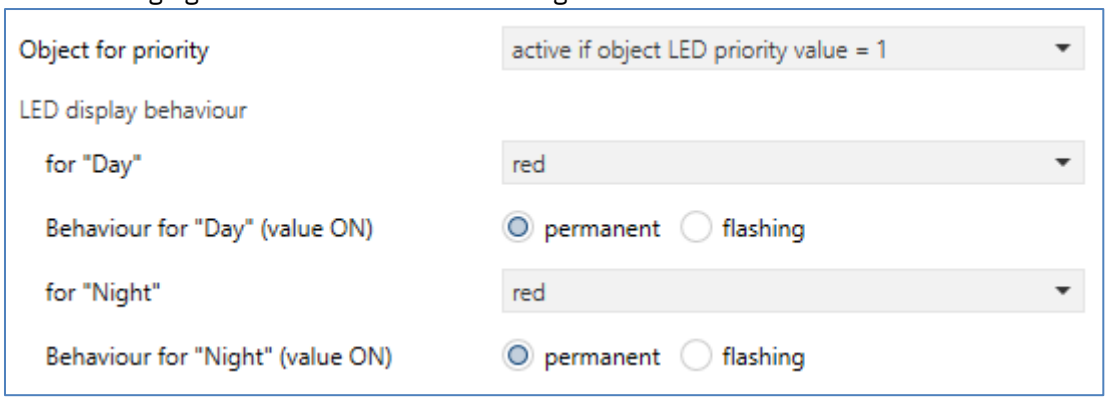


Figure 46: Settings – LED Priority

The following table shows all available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Object for priority	▪ **not active** ▪ active if object LED priority value = 1 ▪ active if object LED priority value = 0	Sets the polarity of the LED priority.
LED display behaviour		
for “Day”	any colour **[red]**	Colour for an active LED priority in Day mode.
Behaviour for “Day” (value ON)	▪ **permanent** ▪ flashing	Setting of the lighting behaviour with active LED priority in Day mode.
for “Night”	any colour **[red]**	Colour for an active LED priority in Night mode.
Behaviour for “Night” (value ON)	▪ **permanent** ▪ flashing	Setting of the lighting behaviour with active LED priority in Night mode.

Table 72: Settings – 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 chapter 4.5.2 LED 1-12/A/B.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
117	LED 1 Priority – Switch	1 Bit	Controlling the LED priority

Table 73: Communication object – LED Priority

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.6 Logic

4.6.1 Logic basic settings

The following figure shows the activation and the basic functions of the logic functions:

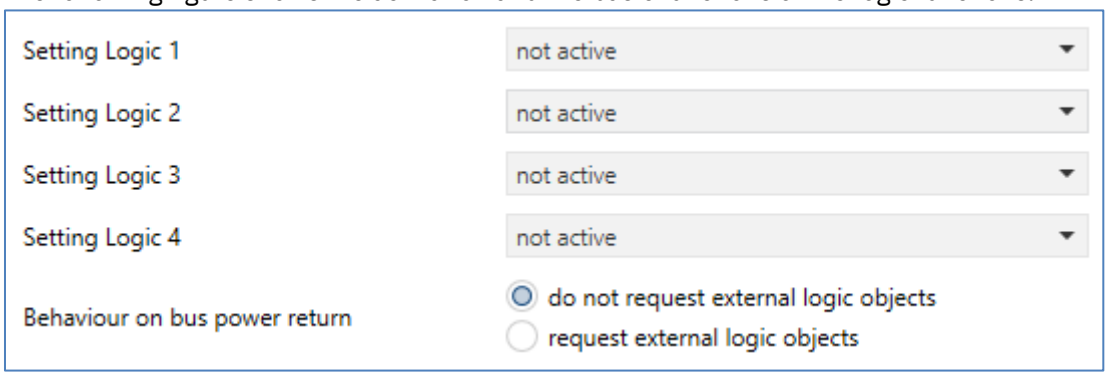


Figure 47: Basic settings – Logic

For an activated logic, further parameters are then displayed.

4.6.2 Logic 1-4

If a logic is activated, the following settings are available:

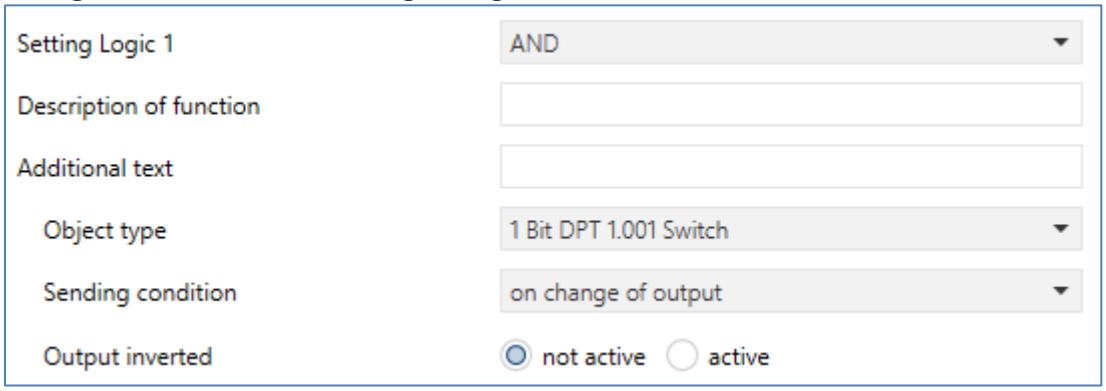


Figure 48: Settings – Logic 1-4

2 text fields are available:

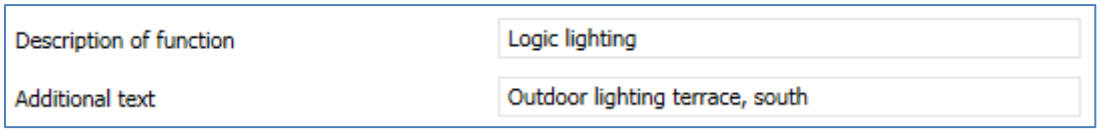
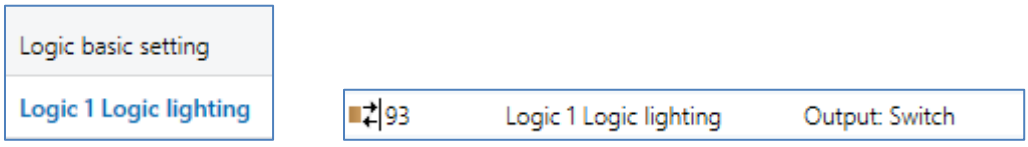


Figure 49: Settings – Text fields Logic 1-4

The text entered for the "**Description of function**" (up to 30 characters allowed) appears both in the menu behind the corresponding logic and with the communication objects of the logic.



The "**Additional text**" (up to 80 bytes allowed) is only additional information to the logic. This text is not visible anywhere else.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Setting Logic 1-4	▪ **not active** ▪ AND ▪ OR	Activates the logic function and set the logical operation.
Behaviour on bus power return	▪ **do not request external logic objects** ▪ request external logic objects	Defines whether the external objects are to be requested automatically after bus voltage recovery.
Object type 1-4	▪ **1 Bit DPT 1.001 Switch** ▪ 2 Bit DPT 2.001 Forcible control ▪ 1 Byte DPT 5.005 Decimal value (0...255) ▪ 1 Byte DPT 17.001 Scene number	Setting of the object type for sending a value when the logic operation is fulfilled.
Forcible control/ 1 Byte value/ Scene number if output = 0 / 1	any value according to DPT	Setting of the value that is sent when the logic operation is fulfilled. Values to be sent depend on the sending condition. **Only for object types: Scene/ Decimal number/ Forcible control.**
Sending condition	▪ **not automatic** ▪ on input telegram ▪ on change of output ▪ on change of output (send only 0) ▪ on change of output (send only 1)	The sending condition can be specified and a sending filter can be set
Output inverted	▪ **not active** ▪ active	**Only for object type "Switch".** Determines whether the output signal should be inverted.

Table 74: Settings – Logic 1-4

Depending on the object type of the logic operation, the corresponding communication object is shown:

Number	Name/Object Function	Length	Usage
93	Logic 1 – Output: Switch, Value, Scene		Output of the logic operation. DPT depending on the parameter setting

Table 75: Communication object – Logic 1-4

If a logic operation is fulfilled, a value or a scene can be sent according to the selected **object type**.

The **sending condition** for the output can be defined. The logic operation can, for example, send with every input telegram, only send when the output of the logic operation changes, or a send filter can be activated. In this case, only a "1" or "0" is sent for the "Switch" object type. With the object types "Forcible control, scene, decimal value", it can be specified that only the set value or scene for the output value "0" or "1" of the logic operation is sent. With the "not automatic" setting, no output value is sent, but this can be queried.

In addition, with the "Switch" object type, the **output can be inverted** and thus a "0" can be made into a "1" and a "1" into a "0".

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.6.2.1 Submenu – Logic 1-4

A submenu is activated for each activated logic.
The following picture shows the corresponding settings:

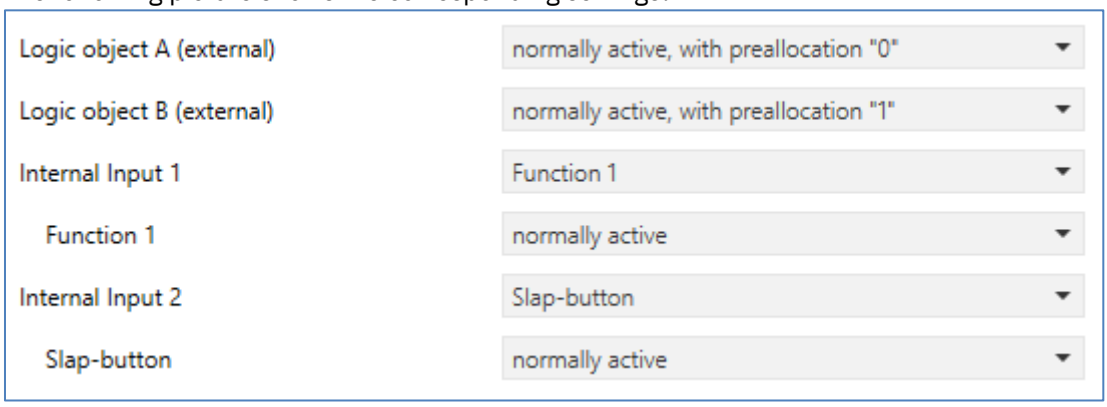


Figure 50: Settings – Submenu Logic 1-4

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Logic object A/B (external)	▪ **disabled** ▪ normally 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	▪ **not active** ▪ Function 1 – 12 ▪ Slap-button	Activation of the functions for the logic function.
Function 1-12, Slap-button	▪ **not active** ▪ normally active ▪ inverted active	Each function/button can be activated normally or inverted.

Figure 51: Settings – Submenu Logic 1-4

The following communication objects are available:

Number	Name/Object Function	Length	Usage
91	Logic 1 – Input A	1 Bit	external input for the logic function
92	Logic 1 – Input B	1 Bit	external input for the logic function

Table 76: 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 size 1 bit, e.g. the status of an actuator. Furthermore, the logic operation can react to the operation of the buttons.
Each logic input can be integrated either normally or inverted.

Note: For "internal input", the "functions 1-12" are available for selection. As these can be variably assigned to different buttons, the buttons are consequently not available for selection.

Exception: The slap-button, as this remains unchanged.

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

4.7 Temperature measurement

Important: This function is only available for push-buttons with temperature sensor!

Using the internal temperature sensor, the actual temperature of the room can be recorded and output to the bus.
The following picture shows the menu for temperature measurement:

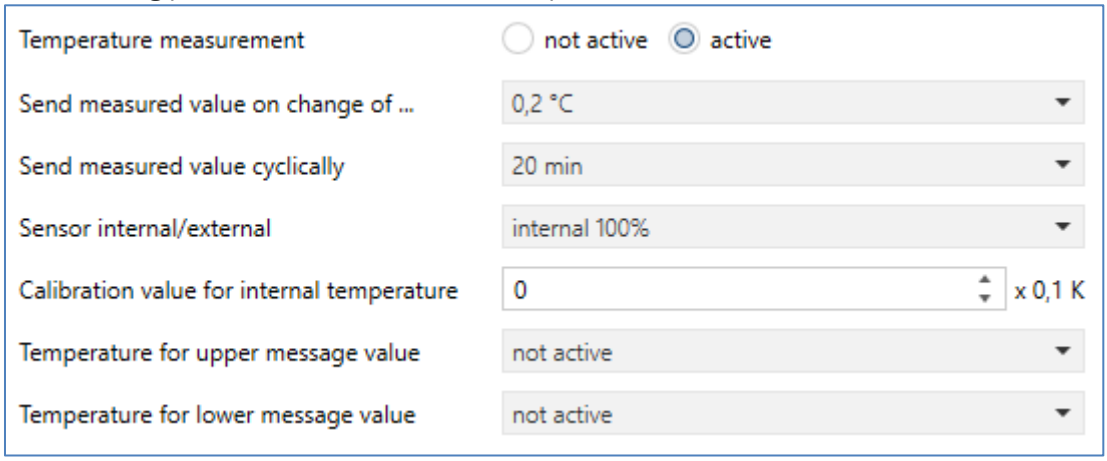


Figure 52: Settings – Temperature measurement

The following table shows the available settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Temperature measurement	▪ **not active** ▪ active	Activation of the temperature measurement.
Send measured value on change of ...	not active, 0.1 °C – 5.0 °C **[0.2 °C]**	Setting whether and at which change the measured value is to be sent.
Send measurement value cyclically	not active, 1 min – 4 h **[20 min]**	Setting whether and at what interval the measured value is to be sent cyclically.
Sensor internal/external	▪ **internal 100%** ▪ external 10% / internal 90% ▪ external 20% / internal 80% ▪ ... ▪ external 90% / internal 10% ▪ external 100%	Activation of an extension for temperature measurement and setting of the weighting between internal and external sensor.
Calibration value for internal sensor	-50 ... 50 x 0.1 K **[0]**	Raise/lower the internal temperature to correct the measured temperature.
Temperature for upper message value	**not active** 20 °C – 45 °C	Activation of a message when a certain temperature is exceeded.
Temperature for lower message value	**not active** 3 °C – 30 °C	Activation of a message when the temperature falls below a certain level.

Table 77: Settings – Temperature measurement

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

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 x 0,1 K”, 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.
Note: After initial installation/programming the measured values are 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 135.
Example:
Weighting: 50% internal / 50% external, internal sensor 25°C, external temperature 15°C
=> transmitted temperature 20°C.

Two messages can be output via "**Temperature for upper message value**" and "**Temperature for lower message value**" when activated. Both signalling functions each have a separate communication object.
Principle:
If the maximum value is exceeded, a "1" is sent. If the value falls below it, a "0" is sent.
If the value falls below the minimum value, a "1" is sent. If it is exceeded, a "0" is sent.

The following table shows the available communication objects:

Number	Name/Object Function	Length	Usage
135	Temperature – Send measured value	2 Byte	Sends the current temperature
136	Temperature – External sensor - Input	2 Byte	Receives the temperature of the external sensor
137	Temperature – Maximum value exceeded	1 Bit	Sends a message if the upper message value is exceeded
138	Temperature – Minimum value fallen below	1 Bit	Sends a message when the value falls below the lower message value

Table 78: Communication objects – Temperature measurement

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

5 Index

5.1 Register of illustrations

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

5.2 List of tables

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de

6 Appendix

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 devices described must not be used if their use may cause danger to people, animals, or property.
Do not leave the packaging material carelessly lying around. Plastic foils/ bags etc. can become a dangerous toy for children.

6.2 Disposal

Do not dispose of the old devices in the household waste. The device contains electrical components that must be disposed of as electronic waste. The housing is made of recyclable plastic.

6.3 Assembly

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
The units are approved for operation in the EU and bear the CE mark. Use in the USA and Canada is not permitted!

6.4 History

V1.0	First Version of Technical Manual	DB V3.0	10/2022

MDT technologies GmbH • 51766 Engelskirchen • Papiermühle 1 • Germany
Phone: +49-2263-880 • knx@mdt.de • www.mdt.de