



Product documentation

Push-button BCU
Art. No. 4071.0x LED, 4072.0x LED

Push-button BCU IP44
Art. No. 8471.0x LED W, 8472.0x LED W



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1 Product definition

1.1 Product catalogue

Description: Push-button BCU / Push-button BCU IP44

Use: Sensor

Design: FM (flush-mounted)

Art. No. 4071.0x LED, 4072.0x LED / 8471.0x LED W, 8472.0x LED W

1.2 Function

The KNX bus coupler push-button (push-button BCU) combines the functions of a simple push-button sensor, in just one device. Rocker switches of various switch programs can be attached to the bus coupler push-button, in which KNX operating functions can be integrated conventionally into the electrical installations.

The bus coupler push-button must be configured with the ETS and put into operation. It is suitable for installation in flush-mounted appliance boxes (device versions 407x.01 LED, 407x.02 LED) or for the IP44 splash-proof surface-mounting (device versions 847x.01 LED W, 847x.02 LED W).

Depending on the device version - 1-gang or 2-gang - rocker switches or two-circuit switching rockers are used. In the "neutral position" device version, the rocker switch can be operated on both sides (top or bottom). In the ETS, the operation concept can then be configured to rocker function (the same KNX function on both control elements) or alternatively to push-button function (the same or different KNX functions on the control elements). In the "neutral position" version, the rocker switches are upright when they are not pressed.

In the "switch position" version, the rocker switch can only be operated on one side (e.g. at the bottom) so that only push-button functions are executable. In this case, the rocker switch is slanting when it is not pressed.

In the ETS, the KNX functions "Switching", "Dimming" and "Venetian blind" are configurable for rocker switch operation concepts. In the pushbutton control concepts, the KNX functions "Switching", "Dimming", "Venetian blind", "1-byte value transmitter" and "scene extension" are configurable.

Two single-colour LEDs can be used for orientation lighting, for button-press display or for status display. In case of status display, the LEDs have their own 1-bit communication objects for activation.

In the 1-gang push-button bus coupler, both LEDs always perform the same display function. In the 2-gang device, the LEDs can perform different functions independent of each other.

This product documentation describes the product variants listed in the following table...

| Name | Article number | Design |
|---|----------------|--------|
| 1-gang push-button BCU, switch position | 4071.01 LED | FM |
| 1-gang push-button BCU, neutral position | 4071.02 LED | FM |
| 2-gang push-button BCU, switch position | 4072.01 LED | FM |
| 2-gang push-button BCU, neutral position | 4072.02 LED | FM |
| 1-gang push-button BCU IP44, switch position | 8471.01 LED W | SM |
| 1-gang push-button BCU IP44, neutral position | 8471.02 LED W | SM |
| 2-gang push-button BCU IP44, switch position | 8472.01 LED W | SM |
| 2-gang push-button BCU IP44, neutral position | 8472.02 LED W | SM |

2 Installation, electrical connection and operation

2.1 Safety instructions

Electrical equipment may only be installed and fitted by electrically skilled persons. The applicable accident prevention regulations must be observed.

Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

Make sure during the installation that there is always sufficient insulation between the mains voltage and the bus. A minimum distance of at least 4 mm must be maintained between bus conductors and mains voltage cores.

The device may not be opened or operated outside the technical specifications.

2.2 Device components

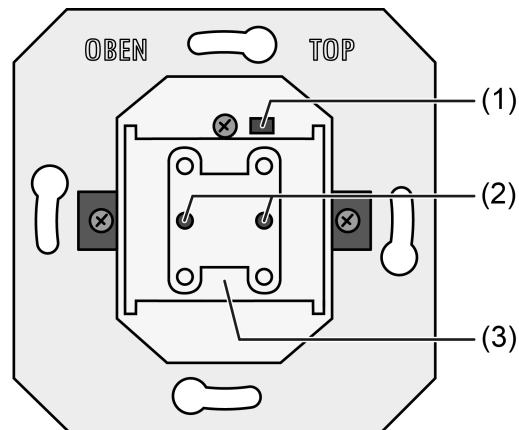


Figure 1: "1-gang" device component version (example as flush-mounted variant)

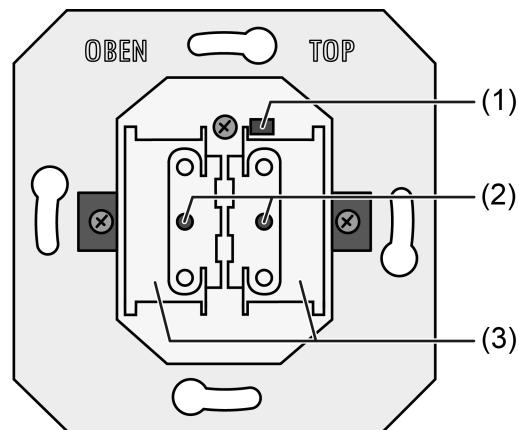


Figure 2: "2-gang" device component version (example as flush-mounted variant)

(1) Programming button with LED

(2) Status LED

(3) Sockets for design operating rockers

i In the "1-gang" device version, rocker switches are used. In the "2-gang" device version, two-circuit switching rockers are used.

2.3 Fitting and electrical connection

Mounting and connecting the device

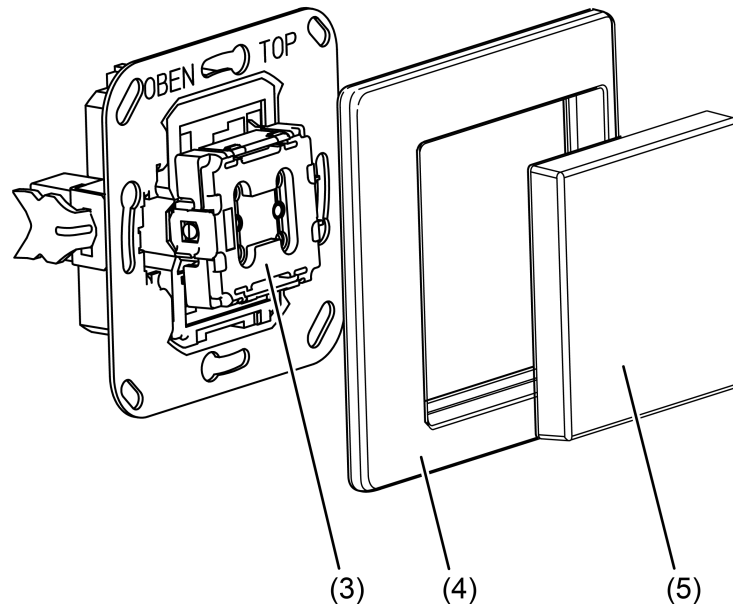


Figure 3: Device fitting using the example of the "1-gang" flush-mounted version.

(3) Socket for design operating rockers

(4) Design frame

(5) Design rocker cover

i The figure shows, by way of example, the mounting of the flush-mounted 1-gang device version. Other device versions (SM, 2-gang) are mounted basically the same.

With flush-mounted device version:

- Use connecting terminal to connect bus cable to the bus connection at the back of the device.
- Install the device in the right orientation on an appliance box. Observe the marking OBEN / TOP.

With SM device version (no figure):

- Install the SM appliance box on the wall. Insert the bus line into the appliance box and connect to the bus connection at the back of the push-button insert using the terminal.
- Insert the push-button insert carefully into the SM appliance box. When doing so, ensure that no cables are squashed.
- Fit the SM appliance box cover and fasten with screws.

All device versions:

- i** Before final fitting of the rocker covers, the physical address has to be loaded into the device (see page 7).
- Attach design-frame (4) and rocker switches (5) to the sockets (3).

2.4 Commissioning

Loading the physical address and application software

The commissioning of the device is basically confined to programming of the physical address and the application data with the ETS.

Configuring and commissioning of the device using the ETS3 (from version d with patch A) or using the ETS4.

The device must have been connected and ready for use.

An appropriate device must be created and configured in the ETS project.

The programming button is located on the front of the device (see chapter 2.2. Device components). Before final fitting of the rocker covers, the physical address has to be loaded into the device.

- Activating Programming mode: press the programming button (1).
The programming LED lights up red.
- Program the physical address with the help of the ETS.
The programming LED goes out.
- Load the application data into the device using the ETS.
- Install rocker cover(s).

2.5 Operation

The KNX bus coupler push-button (push-button BCU) fulfills the functions of a simple push-button. The device must be configured and put into operation using the ETS. In the unprogrammed delivery state, the device does not function. Only the status-LEDs of the rockers will be activated (see page 24).

Depending on the device version - 1-gang or 2-gang - the device is installed with rocker switches or two-circuit switching rockers. In the "neutral position" device version, the rocker switch can be operated on both sides (top or bottom). With this version, the rocker switches are upright when they are not pressed. In the "switch position" version, the rocker switch can only be operated on one side (e.g. at the bottom) so that only push-button functions are executable. In this case, the rocker switch is slanting when it is not pressed.

The ETS configuration has a significant influence over the function of the device. In the "neutral position" device version, the operation concept can be configured to rocker switch function (the same KNX function on both control elements), or alternatively, to push-button function (the same or different KNX functions on both operating elements).

In the ETS, the KNX functions "Switching", "Dimming" and "Venetian blind" are configurable for rocker switch operation concepts. In the pushbutton control concepts - as well as generally with the "switch position" device variant - the KNX functions "Switching", "Dimming", "Venetian blind", "1 byte value transmitter" and "scene extension" are configurable.

3 Technical data

General

| | |
|-------------------------------|---------------------------------------|
| Protection class | III |
| Mark of approval | KNX/EIB |
| Ambient temperature | -25 ... +55 °C |
| Storage/transport temperature | -25 ... +70 °C |
| Relative humidity | 5 ... 93 % (No moisture condensation) |

KNX/EIB supply

| | |
|-----------------------|---------------------|
| KNX medium | TP 1 |
| Commissioning mode | S-mode |
| Rated voltage KNX | DC 21 ... 32 V SELV |
| Power consumption KNX | typical 150 mW |
| Connection mode KNX | Connection terminal |

4 Software description

4.1 Software specification

| | |
|-------------------|--|
| ETS search paths: | - Push-button / Push-button, 1-gang / Push-button BCU - Push-button / Push-button, 2-gang / Push-button BCU |
| | - Push-button / Push-button, 1-gang / Push-button BCU IP44 - Push-button / Push-button, 2-gang / Push-button BCU IP44 |
| Configuration: | S-mode standard |
| PEI type: | "00" _{Hex} / "0" _{Dec} |
| PEI connector: | No connector |

Application for the push-button bus coupler 1-gang switch position

| No. | Short description | Name | Version | from mask version |
|-----|---|--|---|-------------------|
| 1 | Push-button bus coupler application with one one-sided operated control surface (1 x button). | Switching, dimming, Venetian blind, value, scene 10FA12 | 1.2 for ETS3.0 Version d onwards patch A or ETS4 | 705 |

Application for the push-button bus coupler 1-gang neutral position

| No. | Short description | Name | Version | from mask version |
|-----|--|--|---|-------------------|
| 1 | Push-button bus coupler application with one two-sided operated control surface (1 x rocker switch or 2 x button). | Switching, dimming, Venetian blind, value, scene 10FB12 | 1.2 for ETS3.0 Version d onwards patch A or ETS4 | 705 |

Application for the push-button bus coupler 2-gang button position

| No. | Short description | Name | Version | from mask version |
|-----|--|--|---|-------------------|
| 1 | Push-button bus coupler application with two one-sided operated control surfaces (2 x button). | Switching, dimming, Venetian blind, value, scene 10FC12 | 1.2 for ETS3.0 Version d onwards patch A or ETS4 | 705 |

Application for the push-button bus coupler 2-gang neutral position

| No. | Short description | Name | Version | from mask version |
|-----|--|---|--|-------------------|
| 1 | Push-button bus coupler application with two one-sided operated control surfaces (2 x rocker switch / 4 x button). | Switching, dimming, Venetian blind, value, scene 10FD12 | 1.2 for ETS3.0 Version d onwards patch A or ETS4 | 705 |

4.2 Software "10Fx12"

4.2.1 Scope of functions

General:

- 4 application programs adjusted to the device variants. Only one application program is required per device variant.
- In the "neutral position" device variant, the operation concept of a control surface can be set to "rocker switch" (the same KNX function on both control elements) or to "button" (the same or different KNX functions on the control elements). In the "switch position" variant, push-button functions are exclusively configurable because each rocker cover only has one actuation pressure point.
- In the ETS, the KNX functions "Switching", "Dimming" and "Venetian blind" are configurable for rocker switch operation concepts. In the pushbutton control concepts, the KNX functions "Switching", "Dimming", "Venetian blind", "1-byte value transmitter" and "scene extension" are configurable.

KNX "Switching" function:

- Available with rocker switch or button operation concept.
- With rocker switch: Command on pressing rocker switch at the top and at the bottom is configurable (ON, OFF, TOGGLE; no reaction).
- With button: Command on pressing and releasing the buttons is configurable (ON, OFF, TOGGLE, no reaction).

KNX "Dimming" function:

- Available with rocker switches or button operation concept.
- With rocker switch: Command on pressing rocker switch at the top and at the bottom is configurable (Brighter ON, Brighter OFF, Darker TOGGLE; no reaction).
- With button: Command on pressing the buttons is configurable (Brighter ON, Darker OFF, Brighter/Darker TOGGLE, Brighter TOGGLE, Darker TOGGLE, no reaction).
- Time between switching and dimming can be set.
- Sending a stop telegram at the end of the actuation.
- Telegram repeat if pressed long.

KNX "Venetian blind" function:

- Available with rocker switches or button operation concept.
- With rocker switch: Command on pressing rocker switch is configurable (rocker switch at the top: UP / rocker switch at the bottom: DOWN, rocker switch at the top: DOWN / rocker switch at the bottom: UP).
- With button: Command on pressing the buttons is configurable (UP, DOWN, no reaction).
- Time between short-time and long-time commands can be set.

KNX function "Value transmitter 1 byte":

- Available with button operation concept.
- Function is configurable (0...255, 0...100%).
- Value on pressing the buttons is configurable.

KNX function "Scene extension":

- Available with button operation concept.
- Function configurable (with or without save function on long button-press).
- Scene number (1...64) on pressing the buttons is configurable.

Functions of the status LED:

- Two single-colour LEDs can be used for orientation lighting or for button-press display. The light period of button-press display can be configured generally.
- A LED can also be used as a status indicator. In this case, the LED has its own 1-bit communication objects for activation.
- In the 1-gang push-button bus coupler, both LEDs always perform the same display function. In the 2-gang device, the LEDs can perform different functions independent of each other.

4.2.2 Notes on software

ETS project design and commissioning

For configuration and commissioning of the device, ETS3.0 from Version "d" Patch "A" onwards or ETS4 is required. Through use of these ETS version, advantages are gained with regard to the programming process and the parameter presentation.

Using the application programs

The device variants...

- 1-gang switch position
- 1-gang neutral position
- 2-gang switch position
- 2-gang neutral position

...each have their own application programs. When configuring and commissioning the push-button bus coupler, make sure that the product catalogue entry used in the ETS project matches the application program for the installed device hardware.

The ETS prevents the programming of application programs of devices with switch position in devices with neutral position or vice versa. The ETS does not intercept the programming of an application program of the 1-gang device variant in a 2-gang device (or vice versa). Undesirable functions can result here due to missing or redundant buttons/LED if the wrong application programs are used.

- i** The device variants of the "FM" and "IP44" designs have the same functionality. Hence, the "push-button bus coupler 1-gang switch position FM" is configured with the same application program and commissioned just like the "push-button bus coupler 1-gang switch position IP44". This is basically the same for all other device variants of the designs.

Application program versions

Different application programs are available for the device variants. The application programs can be identified by means of the application version "1.1" (first version) and "1.2" (second version). Devices configured and commissioned with the application programs of version "1.1" do not have the status LED functionality with the button functions. All other functions are identical to the application programs with version "1.2".


- i** This product documentation documents the function range of the application programs with version "1.2". It applies equally to the application programs of version "1.1" except for the status LED functionality with the button functions.

4.2.3 Object table

| | |
|----------------------------------|--|
| Number of communication objects: | Depends on the device variant and the set function. max. 10 (largest object number: 17) |
| Number of addresses (max): | 100 |
| Number of assignments (max): | 100 |
| Dynamic table management | No |
| Maximum table length | --- |


Objects for "switching"

Function: Switching

| Object | Function | Name | Type | DPT | Flag |
|---|-----------|-------------------------|-------|-------|---------|
|  ^{0, 2} | Switching | Rocker 1-2 ¹ | 1-bit | 1.xxx | C, W, T |

Description 1-bit object for transmission of switching telegrams (ON, OFF). This object is only visible with rocker functions.


Function: Switching

| Object | Function | Name | Type | DPT | Flag |
|---|-----------|-------------------------|-------|-------|---------|
|  ^{0, 1, 2, 3} | Switching | Button 1-4 ¹ | 1-bit | 1.xxx | C, W, T |

Description 1-bit object for transmission of switching telegrams (ON, OFF). This object is only visible with button functions.


Objects for "dimming"

Function: Switching

| Object | Function | Name | Type | DPT | Flag |
|---|-----------|-------------------------|-------|-------|---------|
|  ^{0, 2} | Switching | Rocker 1-2 ¹ | 1-bit | 1.xxx | C, W, T |

Description 1-bit object for transmission of switching telegrams (ON, OFF). This object is only visible with rocker functions.


Function: Dimming

| Object | Function | Name | Type | DPT | Flag |
|--|----------|-------------------------|-------|-------|---------|
|  ^{8, 10} | Dimming | Rocker 1-2 ¹ | 4-bit | 3.007 | C, W, T |

Description 4-bit object for relative brightness adjustment between 0% and 100 %. This object is only visible with rocker functions.


1: The number of rockers or buttons depends on the planned device variant.

Function: Switching

| Object | Function | Name | Type | DPT | Flag |
|--|-----------|-------------------------|-------|-------|---------|
|  0, 1, 2, 3 | Switching | Button 1-4 ¹ | 1-bit | 1.xxx | C, W, T |

Description 1-bit object for transmission of switching telegrams (ON, OFF). This object is only visible with button functions.


Function: Dimming

| Object | Function | Name | Type | DPT | Flag |
|--|----------|-------------------------|-------|-------|---------|
|  8, 9, 10, 11 | Dimming | Button 1-4 ¹ | 4-bit | 3.007 | C, W, T |

Description 4-bit object for relative brightness adjustment between 0% and 100 %. This object is only visible with button functions.


Objects for "Venetian blind"

Function: Venetian blind

| Object | Function | Name | Type | DPT | Flag |
|--|----------------------|-------------------------|-------|-------|---------|
|  0, 2 | Short time operation | Rocker 1-2 ¹ | 1-bit | 1.007 | C, -, T |


Description 1-bit object for short-time operation of a blind or roller shutter. This object is only visible with rocker functions.

Function: Venetian blind

| Object | Function | Name | Type | DPT | Flag |
|---|---------------------|-------------------------|-------|-------|---------|
|  8, 10 | Long-time operation | Rocker 1-2 ¹ | 1-bit | 1.008 | C, W, T |

Description 1-bit object for long-time operation of a blind or roller shutter. This object is only visible with rocker functions.


Function: Venetian blind

| Object | Function | Name | Type | DPT | Flag |
|--|----------------------|-------------------------|-------|-------|---------|
|  0, 1, 2, 3 | Short time operation | Button 1-4 ¹ | 1-bit | 1.007 | C, -, T |

Description 1-bit object for short-time operation of a blind or roller shutter. This object is only visible with button functions.

1: The number of rockers or buttons depends on the planned device variant.


Function: Venetian blind

| Object | Function | Name | Type | DPT | Flag |
|--|---------------------|-------------------------|-------|-------|---------|
|  ^{8,9,10,11} | Long-time operation | Button 1-4 ¹ | 1-bit | 1.008 | C, W, T |

Description 1-bit object for long-time operation of a blind or roller shutter. This object is only visible with button functions.


Objects for "1 byte value transmitter"

Function: Value transmitter

| Object | Function | Name | Type | DPT | Flag |
|--|----------|-------------------------|--------|-------|---------|
|  ^{0,2} | Value | Rocker 1-2 ¹ | 1 byte | 5.xxx | C, -, T |

Description 1-byte object for the transmission of values from 0 to 255 (0 ... 100 %). This object is only visible with rocker functions.


Function: Value transmitter

| Object | Function | Name | Type | DPT | Flag |
|--|----------|-------------------------|--------|-------|---------|
|  ^{0,1,2,3} | Value | Button 1-4 ¹ | 1 byte | 5.xxx | C, -, T |

Description 1-byte object for the transmission of values from 0 to 255 (0 ... 100 %). This object is only visible with button functions.


Objects for "scene extension"

Function: Scene extension

| Object | Function | Name | Type | DPT | Flag |
|--|-----------------|-------------------------|--------|--------|---------|
|  ^{0,2} | Scene extension | Rocker 1-2 ¹ | 1 byte | 18.001 | C, -, T |

Description 1-byte object for recalling or for storing a scene. This object is only visible with rocker functions.

Function: Scene extension


| Object | Function | Name | Type | DPT | Flag |
|--|-----------------|-------------------------|--------|--------|---------|
|  ^{0,1,2,3} | Scene extension | Button 1-4 ¹ | 1 byte | 18.001 | C, -, T |

Description 1-byte object for recalling or for storing a scene. This object is only visible with button functions.

1: The number of rockers or buttons depends on the planned device variant.


Objects for status LED

Function: Status LED

| Object | Function | Name | Type | DPT | Flag |
|---|-------------------|------|-------|-------|---------|
|  ¹⁶ | Status indication | LED | 1-bit | 1.xxx | C, W, - |


Description 1-bit object for activation of the status LED (polarity configurable). Only visible with the device version "1-gang neutral position" and LED function equal to "status indicator" or "inverted status indication"!

Function: Status LED

| Object | Function | Name | Type | DPT | Flag |
|---|-------------------|----------|-------|-------|---------|
|  ¹⁶ | Status indication | LED left | 1-bit | 1.xxx | C, W, - |

Description 1-bit object for activation of the left status LED (polarity configurable). Only visible with the device version "2-gang neutral position" and LED function equal to "status indicator" or "inverted status indication"!

Function: Status LED

| Object | Function | Name | Type | DPT | Flag |
|---|-------------------|-----------|-------|-------|---------|
|  ¹⁷ | Status indication | LED right | 1-bit | 1.xxx | C, W, - |

Description 1-bit object for activation of the right status LED (polarity configurable). Only visible with the device version "2-gang neutral position" and LED function equal to "status indicator" or "inverted status indication"!

4.2.4 Functional description

4.2.4.1 Rocker switch and button arrangement

In the push-button bus coupler, switches are used depending on the device version - 1-gang or 2-gang - rocker switches or two-circuit switching rockers (figure 4). In the "neutral position" device version ((8) + (9)), the rocker switch can be operated on both sides (top or bottom). In the ETS, the operation concept can then be configured to rocker function (the same KNX function on both control elements) or alternatively to push-button function (the same or different KNX functions on the control elements). In the "neutral position" version, the rocker switches are upright when they are not pressed.

In the "switch position" version ((6) + (7)), the rocker switch can only be operated on one side (e.g. at the bottom) so that only push-button functions are executable. In this case, the rocker switch is slanting when it is not pressed.

The figure below shows the device variants and illustrates the position of the rocker switches and buttons and the status-LED.

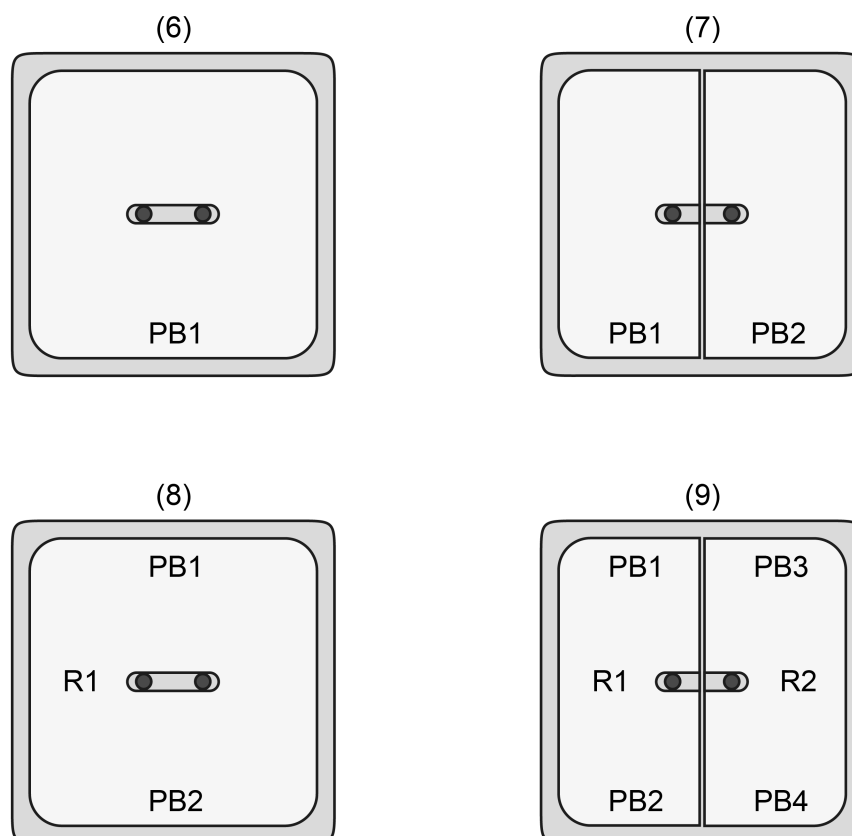


Figure 4: Position of the rocker switches, buttons and status-LED of the device variants

- (6) Push-button bus coupler 1-gang, switch position
- (7) Push-button bus coupler 2-gang, switch position
- (8) Push-button bus coupler 1-gang, neutral position
- (9) Push-button bus coupler 2-gang, neutral position

4.2.4.2 Rockers and button functions

KNX function "Switching"

For each rocker or button with the function set to "Switching", the ETS indicates a 1-bit communication object. The parameters of the rocker or button permit fixing the value this object is to adopt on pressing and / or on releasing (ON, OFF, TOGGLE – toggling of the object value). No distinction is made between a brief or long press.

KNX function "Dimming"

For each rocker or button with the function set to "Dimming", the ETS indicates a 1-bit object and a 4-bit object. Generally, the device transmits a switching telegram after a brief press and a dimming telegram after a long press. The time needed by the push button before it is identified as "long" actuation can be set in the parameters.

Single-surface and double-surface operation in the dimming function

There are two control surfaces in the two button operation, which are either connected to together mechanically (1 rocker switch), or are mechanically independent, but belong together functionally (2 buttons). When using buttons, two buttons must therefore be set to the KNX function dimming.

The control surfaces connected together mechanically or functionally in the two button operation usually execute contrary commands. This means, for example, that the upper button transmits a telegram for switching on after a brief press, and a telegram for increasing the brightness is transmitted after a long press ("Brighter"). Similarly, the lower button transmits a telegram for switching off after a brief press and transmits a telegram for reducing the brightness after a long press ("Darker").

In the single-surface operation there is only one actuation point for dimming. The device toggles the dimming and/or switching command each time the button is pressed. Individual buttons are normally configured to single-surface operation. Rocker switches can also be configured in the ETS to the toggle command "TOGGLE" resulting in a large control surface with two actuation points that have functionally identical commands.

The parameters "Command on pressing the button" and "Command on pressing the rocker switch top / bottom" define the single-surface or double-surface dimming function. For the rockers and also for the button functions, the command issued on pressing the button or rocker can basically be selected at the user's discretion.

- i** If, for example, a dimmer actuator can be controlled from several sensors, a faultless single-surface operation requires that the activated actuator reports its switching state back to the 1-bit object of the button or rocker switch. In addition, the 4-bit objects must be interconnected via an identical group address. Otherwise, a rocker switch or button cannot detect if the dimmer actuator has been controlled from another sensor.

By reporting back the status of the actuator and interconnecting the dimming objects, a rocker switch or button does not have to be actuated twice during the next application in order to achieve the desired reaction.

Advanced parameters

The advanced parameters can be used to determine whether the device is to cover the full adjusting range of the actuator with one dimming telegram continuously ("Increase brightness by 100 %", "Reduce brightness by 100 %") or whether the dimming range is to be divided into several small levels (50 %, 25 %, 12.5 %, 6 %, 3 %, 1.5 %). In the continuous dimming mode (100%), the device transmits a telegram only at the beginning of a long press in order to start the dimming process. A stop telegram is normally then transmitted after the end of the press. For dimming in small levels it may be useful if the device repeats the dimming telegram in case of a sustained press for a presettable time (parameter "Telegram repetition"). The stop telegram after the end of the press is then not needed.

KNX function "Venetian blind"

For each rocker or button with the function set to "Venetian blind", the ETS indicates the two 1-bit objects "Short-time operation" and "Long-time operation".

Operation concept of the Venetian blind function

For the control of Venetian blind, roller shutter, awning or similar drives, the device supports the "short - long" operation concept.

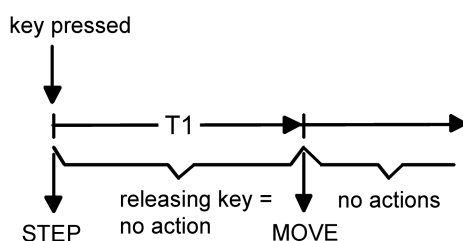


Figure 5: Operation concept "short – long"

In the operation concept "short - long" the telegrams are transmitted in a specific time sequence...

- Immediately on pressing the rocker switch or button, the device transmits a short time telegram (step) to the bus. Pressing the button stops a running drive and starts time T1 ("time between short time and long time command"). If, within T1, the button is released again, the device transmits no further telegram. The purpose of transmitting the short time telegram is to stop a continuous movement. The "time between short time and long time command" should be selected shorter than the short time operation of the actuator to prevent a jerky movement of the blind.
- If the rocker switch or button is kept depressed longer than T1, the device transmits a long time telegram after the end of T1 (Move) for the continuous movement of the drive.
- No further telegram is transmitted by the device when the button or the rocker is released. The drive remains on until the end position is reached.

Command of the Venetian blind function

The parameters "Command on pressing the button" and "Command on pressing the rocker switch" define the command transmitted to the bus on pressing a button. In a rocker switch, the configurable commands for both actuation pressure points are always contrary (at the top: UP / at the bottom: DOWN, at the top DOWN / at the bottom: UP). The commands can be allocated arbitrarily for buttons.

KNX function "Value transmitter 1 byte"

For each button with the function set to "Value transmitter 1-byte", the ETS indicates a 1-byte communication object. On pressing a button, the value configured in the ETS is transmitted to the bus.

The "Function" parameter determines the value range used by the value transmitter. As a 1-byte value transmitter, the push button sensor can optionally transmit integers from 0 ... 255 or relative values within a range of 0 ... 100 % (e.g. as dimming value transmitter). The value matching these areas to be transmitted to the bus on pressing a button, can be configured by the parameter "value on pressing the button".

i The function "Value transmitter 1 byte" is only available for buttons.

KNX function "Scene extension"

For each button with the function set to "scene extension unit" the ETS indicates a 1-byte communication object and the "Function" parameter which distinguishes between the following settings...

- "Scene extension without storage function",
- "Scene extension with storage function",

In the scene extension function, the device transmits a scene number (1...64) to the bus, which is preset in the ETS via a separate communication object after a button-press according to KNX data type 18.001. This feature permits recalling scenes stored in other devices and also storing them, if the storage function is used.

In the setting "Scene extension without storage function", a button-press triggers the simple recall of a scene. The device then transmits the configured scene number immediately on pressing the button. A long button-press has no additional effect.

In the setting "scene extension with storage function", the device monitors the length of the actuation. A button-press of less than a second results in a simple recall of the scene as mentioned above. After a button-press of more than five seconds, the device generates a storage instruction and transmits a storage telegram to the bus according to KNX data type 18.001.

An operation lasting between one and five seconds will be discarded as invalid. The device then does not react to the button-press.

The parameter "Scene number on pressing the button" specifies which of the maximum of 64 external scenes is to be activated after a button-press.

i The "Scene extension" function is only available for buttons.

The KNX function "Scene extension with storage function" can particularly affect the status LED allocated to the actuated button. If the status LED is configured to "button-press display", the LED always lights up for the configured light period when the button is pressed (1...5 s). When transmitting a storage telegram after pressing the button for a long time (> 5 s), the status-LED is additionally activated for 3 seconds in order to indicate that the storage instruction was transmitted to the bus.

4.2.4.3 Status LED

Two single-colour status LEDs can be used as orientation lighting, as button-press display or as status display. In case of a status display, the LEDs have their own 1-bit communication objects for activation.

The status LEDs are configured on their own parameter pages. The "function" parameters on these parameter pages define the LED display functions. In the 1-gang push-button bus coupler, both LEDs always perform the same display function. In the 2-gang device, the LEDs can perform different functions independent of each other.

The following LED functions are available for selection in the configuration...

- "always OFF"
The corresponding status LED is always off in this parameter setting.
- "always ON"
The corresponding status LED is always on in this parameter setting (orientation lighting).
- "button-press display"
At the same time, the device switches on a status LED for the "Light period of status LED for button-press indicator" as soon as a corresponding rocker switch or button is pressed. The period is configured jointly as button-press display for all status LEDs on the "General" parameter page. The status LED lights up when the rocker or button is pressed even if the telegram is transmitted by the device only when the button or rocker is released. The dependency of the status LED to the rocker switches or buttons depends on the device variant. (see page 19)...
 - "1-gang switch position": Both status LEDs (left and right) light up on pressing button 1,
 - "1-gang neutral position": Both status LEDs (left and right) light up on pressing the rocker switch 1 or buttons 1 and 2,
 - "2-gang switch position": The left status LED lights up when on the button 1, the right status LED lights up on pressing button 2,
 - "2-gang neutral position": The left status LED lights up on pressing the rocker switch 1 or buttons 1 and 2, the right status LED lights up on pressing the rocker switch 2 or the buttons 3 and 4.
- i The KNX function "Scene extension with storage function" can particularly affect the status LED allocated to the actuated button. If the status LED is configured to "button-press display", the LED always lights up for the configured light period when the button is pressed (1...5 s). When transmitting a storage telegram after pressing the button for a long time (> 5 s), the status-LED is additionally activated for 3 seconds in order to indicate that the storage instruction was transmitted to the bus.
- "Status indicator (via LED object)"
At the same time, the status LEDs can indicate the state of a separate 1-bit communication object. It is possible to switch the LED on or off statically via the 1-bit object value received (object value "0" = OFF, "1" = ON).
After a bus reset or after ETS programming, the value of the LED object is always "0".
- "Inverted status indicator (via LED object)"
At the same time, the status LEDs can indicate the state of a separate 1-bit communication object. It is possible to switch the LED on or off statically via the 1-bit object value received (object value "1" = OFF, "0" = ON).
After a bus reset or after ETS programming, the value of the LED object is always "0".

4.2.4.4 Delivery state

In the unprogrammed delivery state, the device reacts passively, i. e. no telegrams are sent out to the bus during a pushbutton/rocker switch operation. The physical address is preset to 15.15.255. The device can be programmed and put into operation via the ETS after the installation.

When a button is pressed, the corresponding status LED lights up for the length of the button-press (simple function test). At the same time, both status LEDs always light up simultaneously in the 1-gang device variant.

This condition persists until the application is programmed into the device by the ETS.

- i** Unloading of the application program by the ETS completely deactivates the device function. In this case, the device is not reset to the delivery state described above. The operating rockers and the status LED are then without any function.

4.2.5 Parameters

| Description | Values | Comment |
|---|--|---|
| ☐ General | | |
| Light period of status LED for button-press indicator | 1 sec 2 sec 3 sec 4 sec 5 sec | This parameter defines the switch-on time the status LED is lit up to indicate actuation. The setting concerns status LEDs whose function is set to "Button-press display". |
| ☐ Operation concept (only visible with the device variants "neutral position"!) | | |
| Rocker 1 | Button function Rocker function | This parameter defines for the rocker switch 1 whether it is to be used as a rocker switch with a common basic function or as two different buttons with completely independent functions. Depending on this setting, the ETS displays different communication objects and parameter pages. i This parameter is only visible in the device variant "1-gang neutral position"! |
| Rocker 1 left | Button function Rocker function | This parameter defines for the rocker switch 1 whether it is to be used as a rocker switch with a common basic function or as two different buttons with completely independent functions. Depending on this setting, the ETS displays different communication objects and parameter pages. i This parameter is only visible in the device variant "2-gang neutral position"! |
| Rocker 2 right | Button function Rocker function | This parameter defines for the rocker switch 2 whether it is to be used as a rocker switch with a common basic function or as two different buttons with completely independent functions. Depending on this setting, the ETS displays different communication objects and parameter pages. i This parameter is only visible in the device variant "2-gang neutral position"! |
| ☐ Rocker switch 1 (only visible in the device variants "neutral position" and operation concept "rocker switch function"!) | | |
| Function | No function Switching Dimming Venetian blind | This KNX function of the rocker is defined here. Additional parameters and objects are visible depending on this parameter setting. |

With function "Switching"...

| | | |
|------------------------------------|---|---|
| Command on pressing the top rocker | No reaction ON OFF TOGGLE | This parameter defines the command on pressing the rocker switch at the upper pressure point. |
|------------------------------------|---|---|

| | | |
|---------------------------------------|---|---|
| Command on pressing the bottom rocker | No reaction ON OFF TOGGLE | This parameter defines the command on pressing the rocker switch at the lower pressure point. |
|---------------------------------------|---|---|

With function "Dimming"...

| | | |
|------------------------------------|---|--|
| Command on pressing the top rocker | No reaction Brighter (ON) Darker (OFF) Brighter / darker (TOGGLE) Brighter (TOGGLE) Darker (TOGGLE) | This parameter defines the command on pressing the rocker switch briefly and long at the upper pressure point. |
|------------------------------------|---|--|

| | | |
|---------------------------------------|---|--|
| Command on pressing the bottom rocker | No reaction Brighter (ON) Darker (OFF) Brighter / darker (TOGGLE) Brighter (TOGGLE) Darker (TOGGLE) | This parameter defines the command on pressing the rocker switch briefly and long at the lower pressure point. |
|---------------------------------------|---|--|

| | | |
|------------------------|---|--|
| Increase brightness by | 1.5 % 3 % 6 % 12.5 % 25 % 50 % 100 % | This parameter sets the relative dimming level when the brightness is increased. On each long operation, the brightness is changed at maximum by the configured level. |
|------------------------|---|--|

| | | |
|---|---|---|
| Reduce brightness by | 1.5 % 3 % 6 % 12.5 % 25 % 50 % 100 % | This parameter sets the relative dimming level when the brightness is reduced. On each long operation, the brightness is changed at maximum by the configured level. |
| Time between switching and dimming | 300 ms 400 ms 500 ms 700 ms 1s | This parameter defines how long the rocker switch must be pressed for the device to transmit a dimming telegram (time for long button-press). |
| Transmit stop telegram? | Yes No | On "Yes" the device transmits a telegram for stopping the dimming process when the rocker is released. When the device transmits telegrams for dimming in small steps, the stop telegram is generally not needed (setting: "No"). |
| Telegram repeat? | Yes No | This parameter can be used to activate telegram repetition for dimming. With the rocker switch held down at the top or bottom, the pushbutton sensor will then transmit the relative dimming telegrams (in the programmed level width) until the rocker/button is released again. |
| Time between two telegrams | 200 ms 300 ms 400 ms 500 ms 750 ms 1 sec 2 sec | This parameter defines the interval at which the dimming telegrams are automatically repeated in the telegram repetition mode. This parameter is visible only if "Telegram repetition ? = Yes"! |
| With function "Venetian blind"... | | |
| Command on pressing rocker | Rocker up: UP / Rocker down: DOWN Rocker up: DOWN / Rocker down: UP | Defines the command when the rocker switch is pressed at the top and at the bottom. |
| Time between short-time and long-time command | 300 ms 400 ms 500 ms | This parameter defines the time between a short-time and a long-time telegram. |

700 ms

1s

☐ For rocker 2 see rocker 1. (Rocker switch 2 only in device version "2-gang neutral position" and operation concept "rocker switch function".)

☐ Button 1 (in the device variants "neutral position" only visible in the operation concept "push-button function"!)

| | | |
|----------|---|--|
| Function | No function Switching Dimming Venetian blind 1-byte value transmitter Scene extension | The KNX function of the button is defined here. Additional parameters and objects are visible depending on this parameter setting. |
|----------|---|--|

With function "Switching"...

| | | |
|--------------------------------|---|--|
| Command on pressing the button | No reaction ON OFF TOGGLE | This parameter defines the command on pressing the button. |
|--------------------------------|---|--|

| | | |
|---------------------------------|---|---|
| Command on releasing the button | no reaction ON OFF TOGGLE | This parameter defines the command on releasing the button. |
|---------------------------------|---|---|

With function "Dimming"...

| | | |
|--------------------------------|---|---|
| Command on pressing the button | No reaction Brighter (ON) Darker (OFF) Brighter / darker (TOGGLE) Brighter (TOGGLE) Darker (TOGGLE) | This parameter defines the command for a short and long button-press. |
|--------------------------------|---|---|

| | | |
|------------------------|--------------|---|
| Increase brightness by | 1.5 % 3 % | This parameter sets the relative dimming level when the brightness is |
|------------------------|--------------|---|

| | | |
|------------------------------------|--|--|
| | <p>6 % 12.5 % 25 % 50 % 100 %</p> | <p>increased. During each long operation, the brightness is changed at maximum by the configured level.</p> |
| Reduce brightness by | <p>1.5 % 3 % 6 % 12.5 % 25 % 50 % 100 %</p> | <p>This parameter sets the relative dimming level when the brightness is reduced. During each long operation, the brightness is changed at maximum by the configured level.</p> |
| Time between switching and dimming | <p>300 ms 400 ms 500 ms 700 ms 1s</p> | <p>This parameter defines how long the rocker switch must be pressed for the device to transmit a dimming telegram (time for long button-press).</p> |
| Transmit stop telegram? | <p>Yes No</p> | <p>On "Yes" the device transmits a telegram for stopping the dimming process when the button is released. When the device transmits telegrams for dimming in small steps, the stop telegram is generally not needed (setting: "No").</p> |
| Telegram repeat? | <p>Yes No</p> | <p>This parameter can be used to activate telegram repetition for dimming. With the button held down, the device will then transmit the relative dimming telegrams (in the programmed level width) until the button is released again.</p> |
| Time between two telegrams | <p>200 ms 300 ms 400 ms 500 ms 750 ms 1 sec 2 sec</p> | <p>This parameter defines the interval at which the dimming telegrams are automatically repeated in the telegram repetition mode. This parameter is visible only if "Telegram repetition ? = Yes"!</p> |
| With function "Venetian blind"... | | |
| Command on pressing the button | <p>No reaction UP DOWN</p> | <p>Defines the command when a button is pressed.</p> |

| | | |
|---|--|--|
| Time between short-time and long-time command | 300 ms 400 ms 500 ms 700 ms 1s | This parameter defines the time between a short-time and a long-time telegram. |
| With function "Value transmitter 1 byte"... | | |
| Function | Value transmitter 0...255 Value transmitter 0...100 % | A button configured as "Value transmitter 1 byte" permits selecting whether the values to be transmitted are interpreted as integers from 0 to 255 or as a percentage from 0 % to 100 %. |
| Value on pressing the button (0...255) | 0... 255 | This parameter defines the value to be transmitted to the bus when the button is pressed. Visible only if "Function = 0...255"! |
| Value on pressing the button (0...100 %) | 0... 100 | This parameter defines the value to be transmitted to the bus when the button is pressed. Visible only if "Function = 0...100 %"! |
| With function "Scene extension"... | | |
| Function | Scene extension without storage function Scene extension with storage function | In the setting "Scene extension without storage function", a button-press triggers the simple recall of a scene. The device then transmits the configured scene number immediately on pressing the button. A long button-press has no additional effect. In the setting "Scene extension with storage function", the device monitors the length of the actuation. A button-press of less than a second results in a simple recall of the scene. After a button-press of more than five seconds, the device generates a storage instruction and transmits a storage telegram to the bus according to KNX data type 18.001. |
| Scene number on pressing the button (1...64) | 1...64 | In accordance with the KNX standard, objects with data type 18.001 "Scene Control" can recall or store up to 64 scenes by their numbers. The parameter defines the scene number to be transmitted when the button is pressed. |

☐↵ Buttons 2-4 see Button 1! (In the device variants "neutral position" only visible in the operation concept "push-button function"! / buttons 3 & 4 only in device version "2-gang neutral position".)

☐↵ Button 1/2 - LED (In the device variants "neutral position" only visible in the operation concept "push-button function"!)

☐↵ Button 3/4 - LED (Only visible in the device variant "2-gang neutral position" and only in the operation concept "push-button function"!)

☐↵ Rocker switch 1 - LED (Only visible in the device variants "neutral position" and in the operation concept "rocker switch function"!)

☐↵ Rocker switch 2 - LED (Only visible in the device variants "2-gang neutral position" and only in the operation concept "rocker switch function"!)

| | | |
|----------|--|--|
| Function | always OFF | The status-LED is always off in this parameter setting. |
| | always ON | The status-LED is always on in this parameter setting (orientation lighting). |
| | Button-press display | <p>With this setting, the device switches on the status LED for the "Light period of status LED for button-press indicator" as soon as a corresponding rocker switch or button is pressed. The ON time is configured jointly as button-press display for all status LEDs on the "General" parameter page. The status LED lights up when the rocker or button is pressed even if the telegram is transmitted by the device only when the button or rocker is released.</p> <p>i The KNX function "Scene extension with storage function" can particularly affect the status LED. If the status LED is configured to "button-press display", the LED always lights up for the configured light period when the button is pressed (1...5 s). When transmitting a storage telegram after pressing the button for a long time (> 5 s), the status-LED is additionally activated for 3 seconds in order to indicate that the storage instruction was transmitted to the bus.</p> |
| | Status indicator (via LED object) | With this setting, the status LED can indicate the state of a separate 1-bit communication object. It is possible to switch the LED on or off statically via the 1-bit object value received (object value "0" = OFF, "1" = ON). |
| | Inverted status indicator (via LED object) | In this configuration, the status LED can indicate the state of a separate 1-bit communication object in inverted form. It is possible to switch the LED on or off statically via the 1-bit object value |

received (object value "1" = OFF, "0" = ON).

5 Appendix

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