



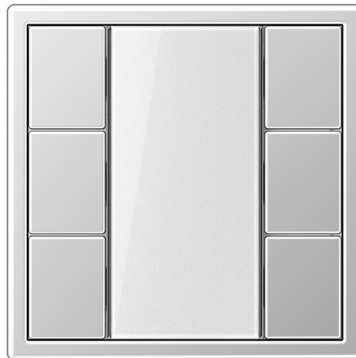
Product documentation

Standard push-button module, 1-gang
Art. No. 5071 TSM

Standard push-button module, 2-gang
Art. No. 5072 TSM

Standard push-button module, 3-gang
Art. No. 5073 TSM

Standard push-button module, 4-gang
Art. No. 5074 TSM



ALBRECHT JUNG GMBH & CO. KG
Volmestraße 1
58579 Schalksmühle

Telefon: +49.23 55.8 06-0
Telefax: +49.23 55.8 06-2 04
kundencenter@jung.de
www.jung.de

Service Center
Kupferstr. 17-19
44532 Lünen
Germany

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1 Product definition

1.1 Product catalogue

Product name:	Standard push-button module, 1-gang / Standard push-button module, 2-gang / Standard push-button module, 3-gang / Standard push-button module, 4-gang
Use:	Sensor
Design:	FM (flush-mounted)
Art. No.	5071 TSM / 5072 TSM / 5073 TSM / 5074 TSM

1.2 Function

Push button functions

When its buttons are pushed, the standard pushbutton sensor modules send telegrams to the KNX, depending on the ETS parameter settings. These can be, for instance, telegrams for switching or push button control, for dimming or for controlling blinds. It is also possible to program 1-byte value transmitter functions (e.g. dimming value transmitters).

The pushbutton sensor modules consist of several control surfaces. The operation concept can be configured in the ETS either as a rocker function or alternatively as a push button function (only "Switching" function). With the rocker function, two neighbouring control surfaces are combined into one rocker switch. In the pushbutton function, each control surface is evaluated as single-surface operation.

LED functions

The Standard push-button modules have one red status LED for each rocker switch. The status LEDs can be switched on or off permanently, or can function as a status indicator. As an alternative, with the aid of separate communication objects, they can signal widely varying display information completely independently of the push-button function, e.g. operation states of lighting systems or room temperature controllers.

An operation LED can optionally serve as an orientation light. The colour of the operation LED can be configured in the ETS (red, green, blue). In programming operating mode, the operation LED flashes permanently with a frequency of approx. 8 Hz.

Energy saving mode

The device has an energy saving mode to save electrical energy during operation. If the function is used, the device switches to the energy saving mode after a preset time without operation or controlled by an external telegram to a separate object, and switches off the signalling function of the device. The energy saving mode can be deactivated by an operation or by a special telegram. Afterwards, the device is fully functional again.

Bus coupling unit

The pushbutton sensor modules contain a bus coupling unit and thus can be connected directly to the bus line.

1.3 Accessories

Cover kit 1-gang, complete
Cover kit 2-gang, complete
Cover kit 3-gang, complete
Cover kit 4-gang, complete

Art. No. ..501 TSA..
Art. No. ..502 TSA..
Art. No. ..503 TSA..
Art. No. ..504 TSA..

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.

Danger of electric shock. 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.

Use only the enclosed plastic screws for fastening to the supporting frame! Otherwise safe operation cannot be ensured. Electrostatic discharges can cause defects in the device.

Do not open device or operate it beyond the technical specification.

2.2 Device components

Device components of standard push-button sensors TSM

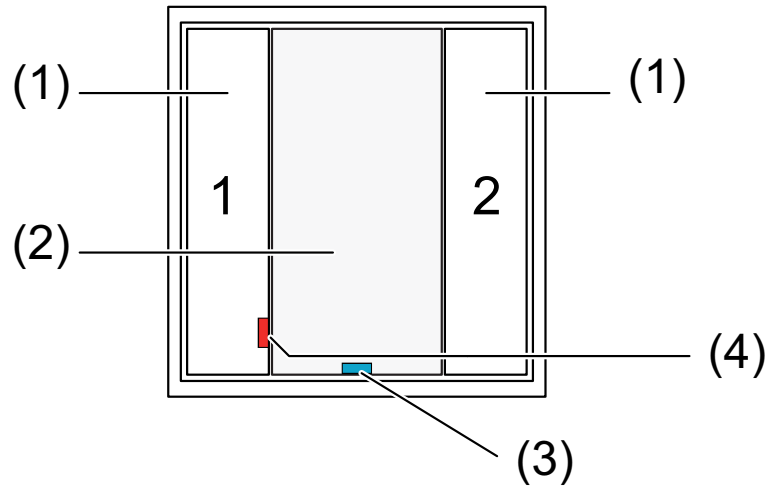


Figure 1: Front view, standard pushbutton sensor module, 1-gang

- (1) 2 control surfaces configurable as rocker 1 or as buttons 1...2.
- (2) Labelling field (white)
- (3) 1 operation LED (red, green, blue)
- (4) 1 status LEDs (red)

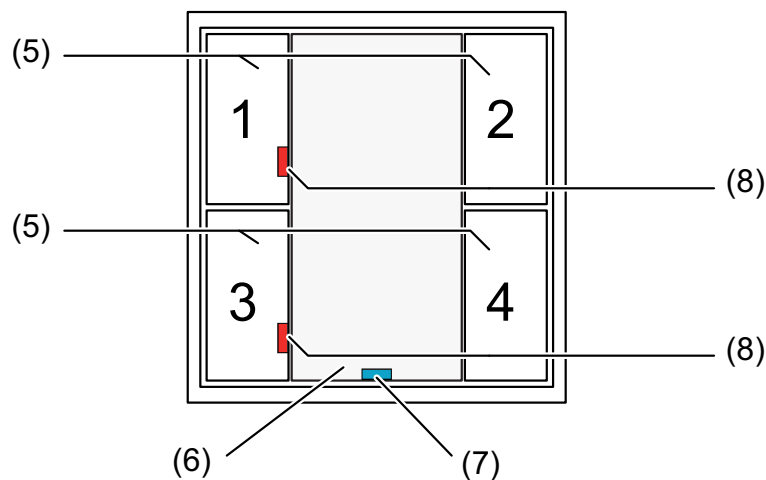


Figure 2: Front view, standard pushbutton sensor module, 2-gang

- (5) 4 control surfaces configurable as rocker 1...2 or as buttons 1...4.
- (6) Labelling field (white)
- (7) 1 operation LED (red, green, blue)
- (8) 2 status LEDs (red)

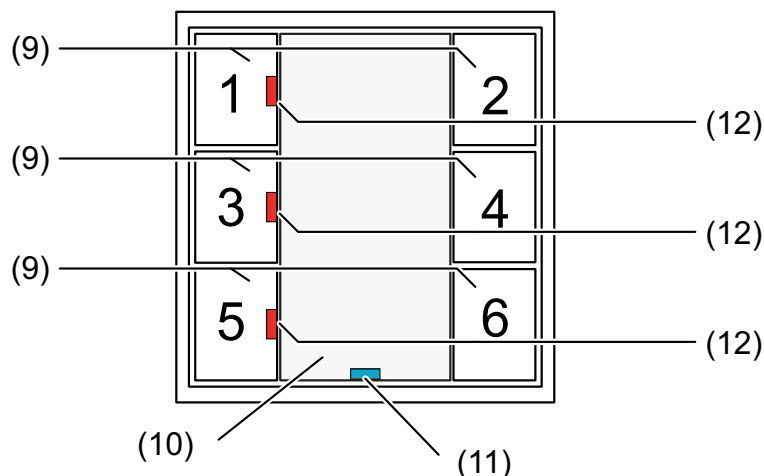


Figure 3: Front view, standard pushbutton sensor module, 3-gang

- (9) 6 control surfaces configurable as rocker 1...3 or as buttons 1...6.
- (10) Labelling field (white)
- (11) 1 operation LED (red, green, blue)
- (12) 3 status LEDs (red)

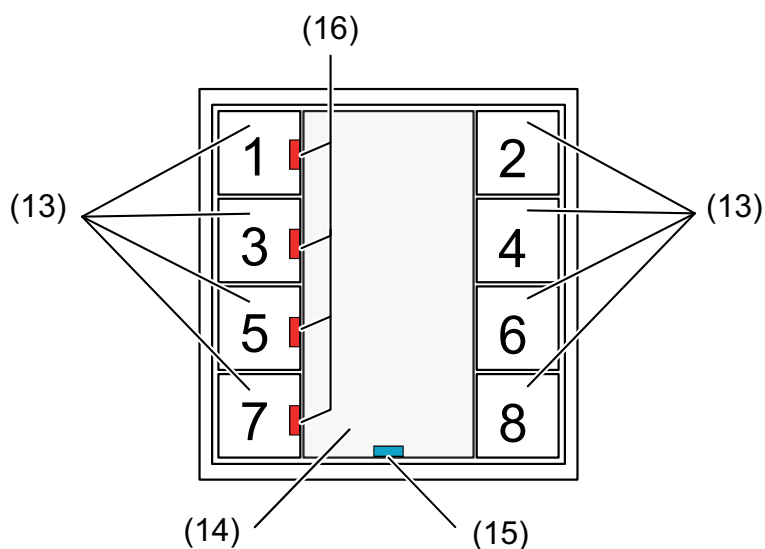


Figure 4: Front view, standard pushbutton sensor module, 4-gang

- (13) 8 control surfaces configurable as rocker 1...4 or as buttons 1...8.
- (14) Labelling field (white)
- (15) 1 operation LED (red, green, blue)
- (16) 4 status LEDs (red)

i The pushbutton sensor modules can be integrated into the switch programs A500, LS990 or CD500.

2.3 Fitting and electrical connection

Installing the push button sensor and connecting it

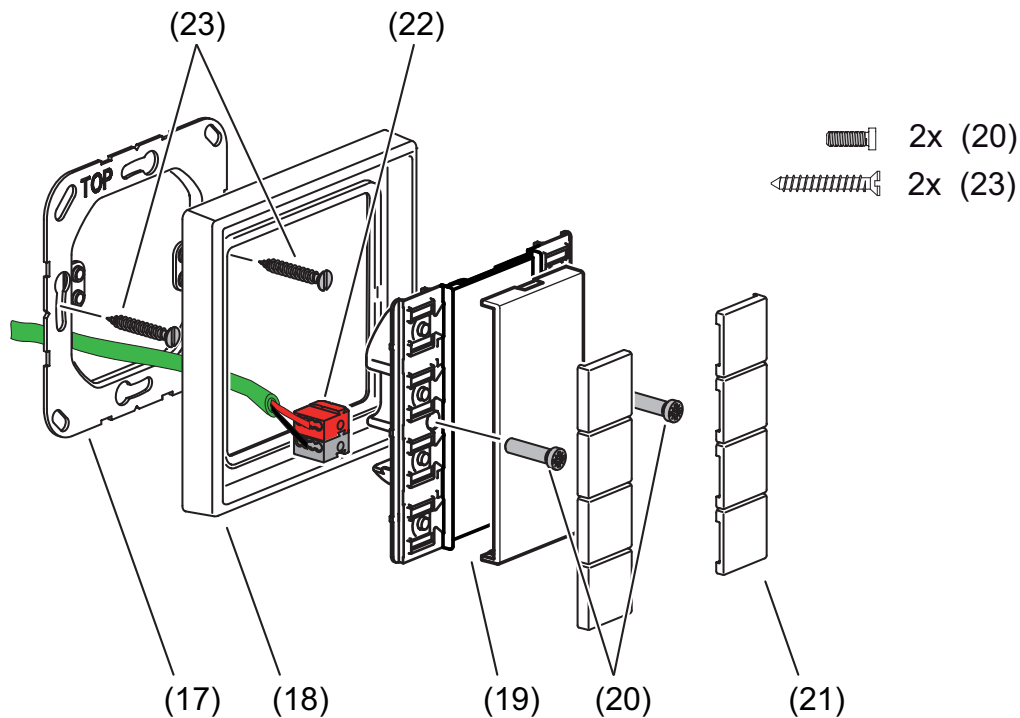


Figure 5: Installing the push-button module

- (17) Supporting frame
- (18) Design frame
- (19) Button sensor module
- (20) Fastening screws
- (21) Design control surfaces
- (22) KNX connection terminal
- (23) Box screws

- Mount supporting frame (17) in the right orientation on an appliance box. Note the **TOP** marking. Use the enclosed box screws (23).
- Position the decorative frame (18) on the supporting frame.
- Connect the push button module (19) with KNX connection terminal (22), which is connected to the KNX bus line, on the rear side of the module. Run the connection cable downwards from the push button module and then into the accessory socket from the rear.
- Attach the push button module onto the supporting frame.
- Fasten push button module to supporting frame using the enclosed plastic screws (20). Tighten the plastic screws only lightly.
- Before mounting the control surfaces (21), load the physical address into the device (see page 9-10).

2.4 Commissioning

After connection and mounting, the pushbutton sensor module can be put into operation. The start-up procedure is basically confined to programming with the ETS and attaching the decorative control surfaces.

- i** The extension module does not receive any physical address of its own. It is activated by the application program loaded in the basic module.

Programming the physical address

The pushbutton sensor does not have a separate programming button or LED. Programming mode is activated by a defined and time-delayed press of the upper left and lower right of the pushbutton. Programming mode is signalled by flashing operation LED. To program the physical address, the decorative control surfaces can be snapped onto the device.

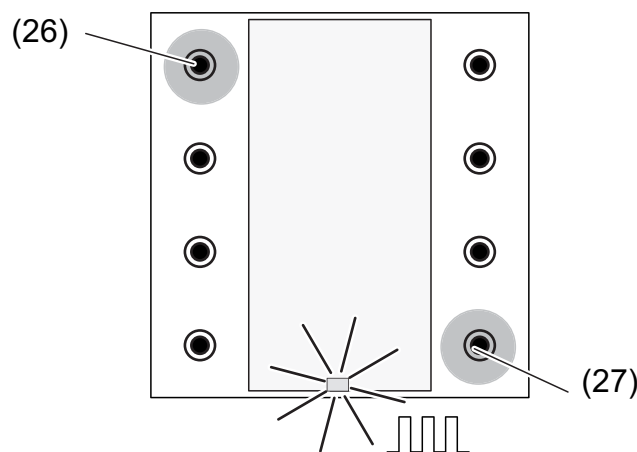


Figure 6: Buttons for activating Programming mode

- i** If the device does not receive any application software, or the wrong application software, then the operation LED (Colour: blue) flashes slowly.

For commissioning, the pushbutton sensor module must be connected and the bus voltage switched on.

- Activate Programming mode. Press button at the top left (26) and keep it depressed (figure 6). Then press second push-button at the lower right (27).

Programming mode is activated. The operation LED (26) flashes quickly (approx. 8 Hz).

- i** Use suitable objects to push the buttons (e.g. thin screwdriver, tip of a ballpoint pen, etc.)
- i** To exclude any inadvertent activation of Programming mode during a 'normal' use of the control surface in later operation, the time between the first and the second button actuation must be at least 200 ms. Pressing both buttons simultaneously (time between first and second actuation < 200 ms) will not result in an activation of Programming mode.
- i** In programming mode, the operation LED flashes steadily in the colour blue. The flashing rate remains the same until the operating mode is ended. The state of the LED defined by Programming mode will always prevail.
 - Program the physical address with the help of the ETS.
 - Programming mode ends:
 - Automatically after adoption of the physical address
 - By pressing a button

- i** If Programming mode is to be activated or deactivated in a device which is already programmed with a valid application, there is the possibility that telegrams will be transmitted to the bus at the time the button is pressed. The telegram transmitted depends on the button function programmed.

Programming the application program

Program the application into the device with the help of the ETS. For commissioning it is recommended to use the ETS4 or ETS3.0 from Version "d" onwards.

The ETS detects automatically whether a valid application has already been programmed into the device before. To reduce the programming time, the ETS downloads the whole application only if the device was programmed beforehand with another application or with no application at all. In all other cases, the ETS makes a time-optimised partial download in which only the modified data is loaded into the device.

Installing the decorative control surfaces

The decorative control surfaces are available as a complete set of buttons. Individual buttons or the complete set of buttons can be replaced using buttons with icons.

The decorative control surfaces are not included in the scope of delivery of the push button sensor module. These must be ordered specially according to the required design.

- Place control surfaces on the pushbutton sensor module in the right orientation and snap in with a short push.

2.5 Operation

Control surfaces

The standard pushbutton sensor modules consist of several control surfaces. The operation concept can be configured in the ETS either as a rocker function or alternatively as a push button function (only "Switching" function). With the rocker function, two neighbouring control surfaces are combined into one rocker switch. In the pushbutton function, each control surface is evaluated as single-surface operation.

The number of control surfaces depends on the push-button sensor used.

The Standard push-button modules have one red status LED for each rocker switch. The status LEDs can be switched on or off permanently, or can function as a status indicator. As an alternative, with the aid of separate communication objects, they can signal widely varying display information completely independently of the push-button function, e.g. operation states of lighting systems or room temperature controllers.

The operation LED can also signal the switching state of its own object, flash or be permanently on or off. Besides functions that can be set using the ETS, the operation LED also indicates that the push button sensor is in the programming mode for commissioning or diagnosis purposes.

- i Configuration of the control surfaces (button or rocker function) is described in detail in the chapter "Software description"

3 Technical data

General

Protection class	III
Mark of approval	KNX/EIB
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C

KNX/EIB supply

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

4 Software description

4.1 Software specification

ETS search paths:	Push-button / Push-button, 1-gang / Standard push-button module, 1-gang
	Push-button / Push-button, 2-gang / Standard push-button module, 2-gang
	Push-button / Push-button, 3-gang / Standard push-button module, 3-gang
	Push-button / Push-button, 4-gang / Standard push-button module, 4-gang
Configuration:	S-mode standard
PEI type:	"00" _{Hex} / "0" _{Dec}
PEI connector:	no connector

Application for standard pushbutton sensor module, 1-gang:

No.	Short description	Name	Version	from mask version
1	Standard push button sensor application: Two control surfaces, alternatively as a rocker or push-button function (only switching possible with push-button function).	Standard TSM 110A11	1.1 for ETS3.0 Version d onwards and ETS4	705

Application for standard pushbutton sensor module, 2-gang:

No.	Short description	Name	Version	from mask version
1	Standard push button sensor application: Four control surfaces, alternatively as a rocker or push-button function (only switching possible with push-button function).	Standard TSM 110B11	1.1 for ETS3.0 Version d onwards and ETS4	705

Application for standard pushbutton sensor module, 3-gang:

No.	Short description	Name	Version	from mask version
1	Standard push button sensor application: Six control surfaces, alternatively as a rocker or push-button function (only switching possible with push-button function).	Standard TSM 110C11	1.1 for ETS3.0 Version d onwards and ETS4	705

Application for standard pushbutton sensor module, 4-gang:

No.	Short description	Name	Version	from mask version
1	Standard push button sensor application: Eight control surfaces, alternatively as a rocker or push-button function (only switching possible with push-button function).	Standard TSM 110D11	1.1 for ETS3.0 Version d onwards and ETS4	705

4.2 Software "Standard TSM 110x11"

4.2.1 Scope of functions

Scope of functions

- Each control surface can be used as independent button or – when linked with the opposite button – as a rocker function.
- Each rocker can be used for the functions 'switching', 'dimming', 'blind/shutter', '1-byte value transmitter' and 'scene extension'.
- Each button can be used for the switching functions.
- The switching function permits the following settings: reaction after pressing and/or releasing, switch on, switch off, and toggle.
- Dimming permits the following settings: times for short and long presses.
- The shutter control permits the following settings: command on pressing (up, down, TOGGLE), setting of times for short and long press and slat adjustment.
- The 1-byte value transmitter function permits the following settings: selection of the value range (0 ... 100 %, 0 ... 255), value on pressing.
- Scene control permits the following settings: calling up or saving of external scenes using a settable scene number (1...64).
- Each rocker has one status LED of its own available. The Status LEDs are configured independently of one another and can be switched on permanently, for orientation purposes, or controlled for switching via a 1-bit communication object. The status LEDs can also function as an operation indication as an option.
- The operation LED can be switched permanently on or off. When the operation LED is used, its colour can be configured in the ETS (red, green, blue).
- To save energy, an energy-saving mode can be activated. If the energy-saving mode is used, the signalling function of the device is switched off after a preset time without operation or by an external telegram. The energy saving mode can be deactivated by an operation or by a special telegram. Afterwards, the device is fully functional again.

4.2.2 Notes on software

ETS configuration and commissioning

Configuration and commissioning of the device with the following ETS versions...

- ETS3.0 Version d or higher
- ETS4.0.7 or higher

The necessary product database is offered in the *.VD4 format. No product database is available for ETS2 and older versions of ETS3.


4.2.3 Object table

Number of communication objects:	max. 17 objects (4-gang variant)
Number of addresses (max):	254
Number of assignments (max):	255

4.2.3.1 Objects for rocker or button functions


Objects for rocker or button function:

Function: Switching

Object	Function	Name	Type	DPT	Flag
 0, 1, ... 7	Switching	Rocker/button 1 ^{1,2}	1-bit	1.xxx	C, W, T, (R) ³


Description 1-bit object for transmission of switching telegrams (ON, OFF).

Function: Dimming

Object	Function	Name	Type	DPT	Flag
 0, 2, 4, 6	Switching	Rocker 1 ^{1,2}	1-bit	1.xxx	C, W, T, (R) ³

Description 1-bit object for the transmission of switching telegrams (ON, OFF) for the dimming function.

Function: Dimming

Object	Function	Name	Type	DPT	Flag
 18, 20, 22, 24	Dimming	Rocker 1 ^{1,2}	4-bit	3.007	C, W, T, (R) ³


Description 4-bit object for the transmission of relative dimming telegrams.

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

2: The objects have been described for rocker 1 or button 1 as an example. The objects for the other rockers/buttons are defined in the same way by shifting the object number and changing the object name.


3: For reading, the R-flag must be set. The last value written to the object via the bus will be read.

Function: Venetian blind

Object	Function	Name	Type	DPT	Flag
 0, 2, 4, 6	Short time operation	Rocker 1 ^{1,2}	1-bit	1.007	C, -, T, (R) ₃


Description 1-bit object for the transmission of telegrams with which a Venetian blind or shutter drive motor can be stopped or with which the blind slats can be adjusted by short time operation.

Function: Venetian blind

Object	Function	Name	Type	DPT	Flag
 18, 20, 22, 24	Long-time operation	Rocker 1 ^{1,2}	1-bit	1.008	C, W, T, (R) ₃


Description 1-bit object for the transmission of telegrams with which a Venetian blind or shutter drive motor can be moved upwards or downwards.

Function: 1-byte value transmitter

Object	Function	Name	Type	DPT	Flag
 0, 2, 4, 6	Value	Rocker 1 ^{1,2}	1 byte	5.xxx	C, W, T, (R) ₃

Description 1-byte object for the transmission of values from 0 to 255 (corresponding to values from 0 % to 100 %).

Function: Scene extension

Object	Function	Name	Type	DPT	Flag
 0, 2, 4, 6	Scene extension	Rocker 1 ^{1,2}	1 byte	18.001	C, -, T, (R) ₃

Description 1-byte object for recalling or for storing one of 64 external scenes max.


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

2: The objects have been described for rocker 1 or button 1 as an example. The objects for the other rockers/buttons are defined in the same way by shifting the object number and changing the object name.

3: For reading, the R-flag must be set. The last value written to the object via the bus will be read.

4.2.3.2 Objects for status LED

Objects for status LED:

Function: Status LED (control via separate LED object)					
Object	Function	Name	Type	DPT	Flag
 36, 38, 40, 42	Switching	Status LED 1 ¹	1-bit	1.xxx	C, W, -, (R) ₂
Description	1-bit object for activation of the status LED.				


1: The objects have been described for status LED 1 as an example. The objects for the other status LED are defined in the same way by shifting the object number and changing the object name.

2: For reading, the R-flag must be set. The last value written to the object via the bus will be read.

4.2.3.3 Object for energy saving mode

Object for energy saving mode:

Function: Energy saving mode

Object	Function	Name	Type	DPT	Flag
 ¹⁵⁴	Activate / deactivate	Energy saving mode	1-bit	1.001	C, W, -, (R) 1

Description 1-bit object for activating or deactivating the energy saving mode. The function (only activate, only deactivate, activate and deactivate) and the telegram polarity are configurable. If the transmission flag is set, then other devices can be informed of the deactivation of energy-saving mode through operation on the local device, causing them also to leave energy-saving mode (precondition: all the devices are linked to the same group address and the deactivation via an object must be possible in the parameterisation of the other devices). When energy-saving mode is deactivated when the transmission flag is set, the device sends an "Energy-saving mode deactivated" telegram to the bus, according to the inverted activated telegram polarity.

1: For reading, the R-flag must be set. The last value written to the object via the bus will be read.

4.2.4 Functional description

4.2.4.1 General settings

4.2.4.1.1 Operation concept and button evaluation

In the ETS, the change-over between rocker and button operation takes place on the "Operation concept" parameter page. The "Operation concept..." parameters specify for each control surface whether the opposing buttons are combined into a common rocker function, or are evaluated as two separate pushbutton functions.

The additional parameter pages and the communication objects of the rockers or buttons are then also created and adapted depending on the setting parameterized here.

- i** Pressing several rockers or buttons at the same time will be considered as a wrong operation.

The functions of the individual rockers or buttons are set on the parameter pages "Rocker switch ... (buttons ...)" or "Button ...".

Button pair as rocker function

For rocker functions, the opposing buttons affect the communication objects together. As a rule, actuation of the two buttons then result in directly opposite information (e.g. switching: ON - OFF / blind: UP - DOWN). When a button is pressed, the commands should be made independently of each other.

Button pair as push-button function

With button operation, the control surfaces are evaluated independently of each other (single-surface operation). With button operation, only the "Switching" function can be configured.

4.2.4.1.2 Operation LED

Some of the functions of the operation LED of the pushbutton sensor modules are permanently predefined internally:

- In a non-programmed device (delivery state) or with an incorrectly-loaded application program, this LED flashes at a slow frequency of approx. 0.75 Hz. For this case, the colour is permanently set to blue.
- When the push-button sensor is switched over into the programming mode for commissioning or for diagnosis purposes, the LED flashes at a fast rate of about 8 Hz (cf. "Commissioning" in the hardware description of this documentation). In this case too, the colour is permanently set to blue.

In ETS, the operation LED can be switched on permanently for the purpose of orientation using a parameter. Alternatively, it is possible to deactivate the operation LED permanently (OFF).

If several of the above states occur at the same time, the priority is as follows:

1. Indication of the programming mode.

The programming mode is cancelled automatically after any actuation.

2. The permanent states (on, off).

4.2.4.2 Rockers and button functions

The following contains descriptions of the various functions that can be configured for the rocker switches or buttons of the push-button in the ETS. Only the "Switching" function can be configured for the "Button" operation concept. All the described functions can be configured for the rocker operation concept.

4.2.4.2.1 Switching function

For each rocker or each 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.

The status LEDs can be configured independently (see page 28).

4.2.4.2.2 Dimming function

For each rocker with the function set to "Dimming", the ETS indicates a 1-bit object and a 4-bit object. Generally, the push button sensor transmits a switching telegram after a brief press and a dimming telegram after a long press. In the standard parameterisation, the push button sensor transmits a telegram for stopping the dimming action after a long press. The time needed by the push button sensor to detect an actuation as a long actuation can be set in the parameters.

The status LEDs can be configured independently (see page 28).

The parameters "Command on pressing rocker..." specify which dimming command is transmitted to the bus when a left or right button is pressed. The Standard push-button module always transmits the dimming commands with a dimming step width of 100 %. A stop telegram is transmitted at the end of the dimming operation (releasing the button).

4.2.4.2.3 Blind function

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

The status LEDs can be configured independently (see page 28).

For the control of Venetian blind, roller shutter, awning or similar drives, the push-button supports the operation concept "Long - short or short", in which the telegrams are transmitted in different time sequences. The push button can therefore be used to operate a wide variety of drive configurations.

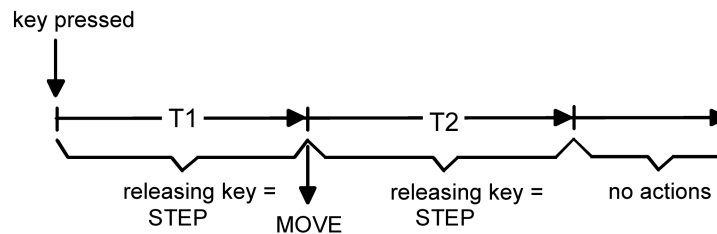


Figure 7: Operation concept "long – short or short"

Operation concept "long – short or short":

In this operation concept, the push-button shows the following behaviour:

- Immediately on pressing the button, the push button sensor starts time T1 ("time between short and long time command") and waits. If the button is released again before T1 has elapsed, the push button sensor transmits a short time telegram. This telegram can be used to stop a running drive. A stationary drive rotates the slats by one level.
- If the button is kept depressed after T1 has elapsed, the push button sensor transmits a long time telegram and starts time T2 ("slat adjusting time").
- If the button is released within T2, the push button sensor sends another short time telegram. This function is used for adjusting the slats of a blind. The function permits stopping the slats in any position during their rotation. The "slat adjusting time" should be chosen as required by the drive for a complete rotation of the slats. If the "slat adjusting time" is selected longer than the complete running time of the drive, a push button function is possible as well. This means that the drive is active only when the button is kept depressed.
- If the button is kept depressed longer than T2, the push button sensor transmits no further telegram. The drive remains on until the end position is reached.

As a rocker, the device is preprogrammed for double-surface actuation for the blind function. This means that the pushbutton sensor, e.g. with a press of the left button, transmits a telegram for an upward movement and, after a press of the right button, a telegram for a downward movement.

With single-area operation, the push-button alternates between the directions of the long-time telegram (TOGGLE) on each long actuation. Several short time telegrams in succession have the same direction.

The parameter "Command on pressing the rocker switch" defines the single-surface or double-surface operation principle for the venetian blind function.

If the controlled actuator can be contacted from several sensors, a faultless single-surface actuation requires that the long-time objects of the push button sensors are interlinked. The push button sensor would otherwise not be able to detect that the actuator has been addressed from another sensor, in which case it would have to be actuated twice during the next use in order to produce the desired reaction.

4.2.4.2.4 Value transmitter function

For each rocker switch, whose function is set to "1-byte value transmitter", the ETS indicates a 1-byte object. On pressing a button, the configured value is transmitted to the bus. Different values can be configured for the two buttons of a rocker switch.

The status LEDs can be configured independently (see page 28).

The "Function" parameter determines the value range used by the push button. The push-button can optionally transmit integers from 0...255 or relative values within a range of 0...100 % (e.g. as dimming value transmitter).

4.2.4.2.5 Scene extension function

For each rocker with the function set to "scene extension unit" the ETS indicates 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 push button sensor transmits a preset scene number (1...64) via a separate communication object to the bus after a button-press. 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. If the status LED is configured as button-press display, it will be switched on for the configured ON time. A long button-press has no further or additional effect.

In the setting "Scene extension with storage function", the push-button 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. If the status LED is configured as button-press display, it will be switched on for the configured ON time. After a button-press of more than five seconds, the push button sensor generates a storage instruction. In so doing, a storage telegram is transmitted to the bus. An operation lasting between one and five seconds will be discarded as invalid.

The parameter "Scene number..." specifies separately, for each button of the rocker switch, which of the maximum of 64 external scenes is to be used after a button-press.

The status LEDs can be configured independently (see page 28).

4.2.4.3 Status LED

The Standard push-button modules have one red status LED for each rocker switch. The following functions are configurable for each status LED, irrespective of the set button or rocker function...

- always OFF,
- always ON,
- Control via separate LED object,
- Button-press display.

Status LED function "always OFF" or "always ON"

With this parameterisation, a status LED remains permanently switched on or off.

Function of the status LED "Button-press display"

A status LED used as button-press display is switched on by the sensor each time the corresponding rocker or button is pressed. The parameter "ON time of status LEDs as actuation indicators" on the parameter page "General" specifies for how long the LED is switched on in common for all status LEDs. The status LED lights up when the rocker or button is pressed even if the telegram is transmitted by the sensor only when the button or rocker is released.

Function of the status LED "Control via separate LED object"

Each status LED can indicate the status of a separate LED communication object independently of the rocker or pushbutton configuration. Here the LED can be switched on or off statically via the 1-bit object value received, or also activated as flashing. It is possible to indicate or evaluate the inverted object value.

- i** After a reset or after ETS programming, the value of the LED object is always "0".

4.2.4.4 Energy saving mode

The device has an energy-saving mode to save electrical energy during operation. If the function is used, the device switches to the energy saving mode after a preset time without operation or switches to a separate object controlled by an external telegram (see "Activating energy saving mode"). In the energy saving mode, essential operation and display functions of the device are switched off. The Status LED and operation LED are then without any function. The energy saving mode can be deactivated through an operation or by a special telegram (see "Deactivating energy saving mode"). Afterwards, the device is fully functional again.

Activating energy saving mode

The device has two different activation options for switching the pushbutton sensor to the energy saving mode. These can either be combined together or used separately. Firstly, the device can be set to the energy saving mode by a group telegram via a communication object designated for this purpose. To do this, the telegram polarity that triggers the activation of the energy saving mode must be defined in the ETS.

Secondly, it is possible to switch to the energy saving mode automatically if no operation occurs on the device within a defined time period. The time for this case is defined in the ETS. Each operation restarts the time for activating the energy saving mode.

When energy-saving mode is active, no telegram evaluations or transmissions take place via the communication objects of the device (exception: "TSM/TSEM - energy-saving mode" object). In consequence, no state changes can be added for operation and display functions, for as long as energy-saving mode is activated.

If the energy saving mode is to be activated via the communication object and an operation takes place on the device at this time, the activation of the energy saving mode is then delayed until the end of the control operation. This ensures that the operating functions are still executed properly until the end and all necessary telegrams are transmitted to the bus.

Energy-saving mode is never activated while programming mode is active.

- i** On activation of energy-saving mode, all the LEDs of the device are switched off under forced control. Display functions for Status LEDs, which were active before energy-saving mode (e.g. status displays), are first executed unchanged when energy-saving operation is deactivated. New control of the objects of the display functions must then take place for the Status LEDs to signal a current status, or possibly a different one.
- i** The communication object of the energy saving mode can either be used just for activation, or alternatively just for deactivation, or if required, for the combined activation and deactivation, too. In all cases, the telegram polarity can be configured in the ETS. Only different polarities can ever be configured (e.g. "0" = mode inactive / "1" = mode active) for the combined activation and deactivation.
- i** Any activation attempts of the energy saving mode are ignored while the programming mode of the device is active. The device stores the activation attempt and executes the energy saving mode once the programming mode is terminated. If the device is programmed by the ETS (physical address and/or application program) in an active programming mode, the device does not then execute the energy saving mode automatically at the end of the programming operation.

Deactivating energy saving mode

The device has two different options for deactivation of energy-saving mode, which can be optionally combined. Firstly, it is always possible to deactivate energy-saving mode automatically, as soon as the device is operated. On the other hand, deactivation can also take place by a group telegram via the communication object designated for this purpose. For this purpose, the telegram polarity that triggers the deactivation of the energy saving mode must be defined in the ETS.

If an operation deactivates the energy saving mode, the device always executes the configured operating function immediately as well (e.g. switching, dimming, etc.).

- i** The communication object of the energy saving mode can either be used just for activation, or alternatively just for deactivation, or if required, for the combined activation and deactivation, too. In all cases, the telegram polarity can be configured in the ETS. Only different polarities can ever be configured (e.g. "0" = mode inactive / "1" = mode active) for the combined activation and deactivation.
- i** If the transmission flag is set, then other devices can be informed of the deactivation of energy-saving mode through operation on the local device, causing them also to leave energy-saving mode (precondition: all the devices are linked to the same group address and the deactivation via an object must be possible in the parameterisation of the other devices). When energy-saving mode is deactivated when the transmission flag is set, the device sends an "Energy-saving mode deactivated" telegram to the bus, according to the inverted activated telegram polarity.
- i** Programming connections to the device and broadcast telegrams cause energy-saving mode to be deactivated automatically.

4.2.4.5 Delivery state

For as long as the device has not yet been programmed with application data by means of the ETS, the operation LED (Colour: blue) flashes at a slow rate (approx. 0.75 Hz). When any of the buttons are pressed, the appropriate status LED lights up for the duration the button is pressed (button-press display).

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

By slow flashing of its operation LED (Colour: blue) (approx. 0.75 Hz), the device can also indicate that a wrong application has been programmed into its memory. Applications are non run-capable if they are not intended for use with the device in the ETS product database.

The operation LED flashes slowly also if the application program of the touch sensor has been removed from the device by the ETS.

In both cases, the pushbutton sensor is not operational.

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 all status LEDs whose function is set to "Button-press display".
Function of operation LED	always OFF always ON	This parameter defines the function of the operation LED. The operation LED can be switched permanently on or off.
Colour of the operation LED	red green blue	The colour of the operation LED is selected at this point. This parameter is only visible when the operation LED is switched-on. i When programming mode is active, or a device is discharged, the operation LED is always blue.
□↳ Operation concept		
Operation concept of buttons 1 and 2 (The same parameters are available for the other control surfaces / button pairs.)	Rocker function (rocker 1) Button function	For each respectively opposing buttons, it can be set whether they are to be used combined as a rocker switch with a common basic function or as two buttons with separate functions. Depending on this setting, the ETS displays different communication objects and parameter pages.
□↳ Rocker switch 1 (buttons 1 / 2) (for operation concept "Rocker switch")		
Function	Switching Dimming Venetian blind Value transmitter 1-byte Scene extension	This parameter is used to define the basic function of the rocker. Depending on this choice, the ETS displays different communication objects and parameters for this rocker.
Only for "Switching":		
Command on pressing left rocker	no reaction ON OFF TOGGLE	These parameters specify the reaction when the left rocker is pressed.

Command on pressing right rocker	no reaction ON OFF TOGGLE	These parameters specify the reaction when the right rocker is pressed.
Only for "Dimming":		
Command on pressing left rocker	Brighter (ON) Darker (OFF)	This parameter defines the reaction when the left rocker is pressed.
Command on pressing right rocker	Brighter (ON) Darker (OFF)	This parameter defines the reaction when the right rocker is pressed.
Time between switching and dimming, left rocker (100 ... 50000 x 1 ms)	100 ... 400 ... 50000	This parameter defines how long the left rocker must be pressed for the push button sensor to send a dimming telegram.
Time between switching and dimming, right rocker (100 ... 50000 x 1 ms)	100 ... 400 ... 50000	This parameter defines how long the right rocker must be pressed for the push button sensor to send a dimming telegram.
Only for "Venetian blind":		
Command on pressing rocker	Left rocker: UP / Right rocker: DOWN Left rocker: DOWN / Right rocker: UP Left rocker: TOGGLE / Right rocker: TOGGLE	This parameter defines the running direction of a drive after a button-press. If the setting is "TOGGLE", the direction is changed after each long time command. If several push buttons are to control the same drive, the long time objects of the push buttons must be interlinked for a correct change of the running direction.
Operation concept	long – short or short	On the Standard push-button module, the Venetian blind operation concept is permanently set to "Long - short or short".
Time between short and long time command, left rocker (1 ... 3000 x 100 ms)	1 ... 4 ... 3000	This parameter sets the time after which the long-time operation will be evaluated on pressing the left button of the rocker.

Time between short and long time command, right rocker (1 ... 3000 x 100 ms)	1 ... 4 ... 3000	This parameter sets the time after which the long-time operation will be evaluated on pressing the right button of the rocker.
Slat adjusting time, left rocker (0 ... 3000 x 100 ms)	0 ... 5 ... 3000	Time during which a transmitted long time telegram can be terminated by releasing the left button of the rocker (short time). This function serves to adjust the slats of a blind.
Slat adjusting time, right rocker (0 ... 3000 x 100 ms)	0 ... 5 ... 3000	Time during which a transmitted long time telegram can be terminated by releasing the right button of the rocker (short time). This function serves to adjust the slats of a blind.
Only for "Value transmitter 1-byte":		
Function	Value transmitter 0...255 Value transmitter 0...100 %	At this point, it is possible to select whether the values to be transmitted are interpreted as integers from 0 to 255 or as a percentage from 0 % to 100 %. The following parameters and their settings depend on this distinction.
Value, left rocker (0...255)	0...255	This parameter defines the object value when the left rocker is pressed. Visible only if "Function = 0...255"!
Value, right rocker (0...255)	0...255	This parameter defines the object value when the right rocker is pressed. Visible only if "Function = 0...255"!
Value, left rocker (0...100 %)	0...100	This parameter defines the object value when the left rocker is pressed. Visible only if "Function = 0...100 %"!
Value, right rocker (0...100 %)	0...100	This parameter defines the object value when the right rocker is pressed. Visible only if "Function = 0...100 %"!
Only for "Scene extension":		
Function	Scene extension without storage function	This parameter defines the functionality of the extension. If the push button

	Scene extension with storage function	sensor is used as a scene extension, the scenes can either be stored in one or in several external KNX devices (e.g. light scene push button sensor). During a scene recall or in a storage function, the push button sensor transmits a telegram with the respective scene number via the extension object of the rocker.
Scene number (1 ... 64) Left rocker	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 a left button is pressed.
Scene number (1 ... 64) Right rocker	2...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 a right button is pressed.
<p><input type="checkbox"/> For rocker 2...4 see rocker 1. The number of available rockers depends on the device variant.</p> <p><input type="checkbox"/> Button 1 (for "Button" operation concept)</p>		
Function	no function Switching	This parameter defines the basic function of the button. Depending on this setting, the ETS displays different communication objects and parameters for this button.
<p>Only for "Switching":</p>		
Command on pressing the button	no reaction ON OFF TOGGLE	These parameters specify the reaction when the button is pressed or released.
Command on releasing the button	no reaction ON OFF TOGGLE	
<p><input type="checkbox"/> Button 2...8, see button 1! The number of available buttons depends on the device variant.</p>		

R1 - Status LED

B1/B2 - Status LED

Function of status LED	always OFF	Irrespective of the pushbutton or rocker function, the status LED is switched off permanently.
	always ON	Irrespective of the pushbutton or rocker function, the status LED is switched on permanently.
	Button-press display	The status LED indicates a button actuation. The ON time is set on the parameter page "General" in common for all status LEDs that are configured as actuation displays.
	Control via separate LED object	The status LED indicates the state of its own, separate 1-bit LED object. This setting causes the additional parameter "Control of the status LED via object value" to be shown.

Control of the status LED via object value	1 = LED static ON / 0 = LED static OFF 1 = LED static OFF / 0 = LED static ON 1 = LED flashes / 0 = LED static OFF 1 = LED static OFF / 0 = LED flashes	If the "Function of status LED ..." is set to "Control via separate LED object", then the telegram polarity of the 1-bit object "Status LED" can be specified at this point. The LED can be switched on or off statically. In addition, the received switching telegram can be evaluated in such a way that the LED flashes.
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W2...4 - Status LED, see Status LED of rocker switch 1!

T3...8 - Status LED, see Status LED of buttons 1/2!

Energy saving mode

Energy saving mode	disabled enabled	The device has an energy saving mode to save electrical energy during operation. If the energy-saving mode is used, the signalling function of the device is switched off after a preset time without operation or by an external telegram. Energy-saving mode has the same effect on the basic push-button module and on a connected extension module. This parameter enables the energy saving mode so that it can be used.
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Activating energy saving mode	by object automatically by time	The device has two different activation options for switching the pushbutton sensor to the energy saving mode.
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	<p>automatically by time or by object</p>	<p>These can either be combined together or used separately. Firstly, the pushbutton sensor can be set to the energy saving mode by a group telegram via a communication object designated for this purpose. Secondly, it is possible to switch to the energy saving mode automatically if no operation occurs within a defined time period.</p>
<p>Deactivating energy saving mode</p>	<p>automatically on operation</p> <p>automatically on operation or via object</p>	<p>The device also has two different options for the deactivation of the energy saving mode. Firstly, it is always possible to deactivate energy-saving mode automatically, as soon as the push-button module is operated. If an operation of the device deactivates the energy saving mode, the device always executes the configured operating function immediately as well (e.g. switching, dimming, etc.). Secondly, the energy saving mode can be deactivated by a group telegram via a communication object designated for this purpose. However, this possibility can only be combined with the automatic deactivation on operation.</p>
<p>Polarity object "energy saving mode"</p>	<p>"0" = --- / "1" = mode active</p> <p>"0" = mode active / "1" = ---</p> <p>"0" = mode inactive / "1" = mode active</p> <p>"0" = mode active / "1" = mode inactive</p> <p>"0" = mode inactive / "1" = ---</p> <p>"0" = --- / "1" = mode inactive</p>	<p>This parameter defines the telegram polarity for the object for activating or deactivating the energy saving mode. The options and thus standard setting of this parameter depend on whether the energy saving mode can only be activated, only deactivated or activated as well as deactivated via the object.</p>
<p>Time for energy saving mode Minutes (1...59)</p>	<p>1...59</p>	<p>This parameter defines the time that must elapse after an operation so that the device activates the energy saving mode. Each operation restarts the time. Setting the delay time minutes. This parameter is only visible when the energy saving mode is to be activated automatically by time.</p>

5 Appendix

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ALBRECHT JUNG GMBH & CO. KG
Volmestraße 1
58579 Schalksmühle

Telefon: +49.23 55.8 06-0
Telefax: +49.23 55.8 06-2 04
kundencenter@jung.de
www.jung.de

Service Center
Kupferstr. 17-19
44532 Lünen
Germany