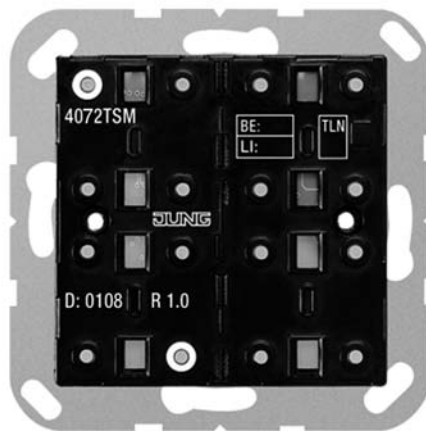




Product documentation

Standard push-button module with BCU, 2-gang
Art.-No.: 4072 TSM



ALBRECHT JUNG GMBH & CO. KG
Volmestraße 1
D-58579 Schalksmühle

Telefon: +49.23 55.8 06-0
Telefax: +49.23 55.8 06-1 89
E-mail: mail.info@jung.de
Internet: www.jung.de
www.jung-katalog.de

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Content

1	<u>Product definition</u>	<u>3</u>
1.1	Product catalogue	3
1.2	Function	3
2	<u>Installation, electrical connection and operation</u>	<u>4</u>
2.1	Safety instructions	4
2.2	Device components	5
2.3	Fitting and electrical connection	6
2.4	Commissioning	8
2.5	Operation	10
3	<u>Technical data</u>	<u>11</u>
4	<u>Software description</u>	<u>12</u>
4.1	Software specification	12
4.2	Software "Switching 1099x1"	13
4.2.1	Scope of functions	13
4.2.2	Object table	14
4.2.3	Parameters	16
4.3	Software "Dimming 1099x2"	18
4.3.1	Scope of functions	18
4.3.2	Object table	19
4.3.3	Parameters	20
4.4	Software "Blind 1099x3"	21
4.4.1	Scope of functions	21
4.4.2	Object table	22
4.4.3	Parameters	23
4.5	Software "Value transmitter, scene extension 1099x4"	24
4.5.1	Scope of functions	24
4.5.2	Object table	25
4.5.3	Parameters	26
5	<u>Appendix</u>	<u>28</u>
5.1	Index	28

1 Product definition

1.1 Product catalogue

Product name: Standard push-button module, 2-gang

Use: Sensor

Design: UP (flush-mounting type)

Art.-No.: 4072 TSM

1.2 Function

When a button is pressed, and depending on the loaded application and the parameters programmed, the push button sensor Standard TSM transmits telegrams to the KNX / EIB. These can be, for instance, telegrams for switching or momentary-contact control, for dimming or for shutter control. It is also possible to program value transmitter functions such as dimming value transmitters or light scene extensions.

The double Standard TSM push button sensor consists of two control surfaces. In the "Switching" application of the ETS, the control concept of one control surface can be configured as a rocker function or as a button function. The control concept is defined as a rocker in the "Dimming", "Blind" and "Value transmitter, scene extension" applications. With the rocker function, one control surface is divided into two actuation pressure points with the same basic function. With the button function, one control surface is evaluated as two functionally-different actuation pressure points (two buttons).

The Standard TSM push button sensor is equipped with one status LED per control surface. One status LED can optionally either be permanently on or off, or otherwise act as an button-press or status indicator for a button or a rocker.

If necessary, an operation LED can optionally serve as an orientation light. If the push button is in Programming mode, the operation LED flashes with a frequency of about 8 Hz. If there is no (suitable) application loaded in the push button, the operation LED flashes to indicate an error at a frequency of approx. 0.75 Hz and the push button sensor does not work.

A BCU is already permanently integrated in the Standard TSM push button sensor, allowing the device to be connected directly to the bus cable during commissioning.

2 Installation, electrical connection and operation

2.1 Safety instructions

Electrical equipment must be installed and fitted by qualified electricians. The applicable accident prevention regulations must be observed.

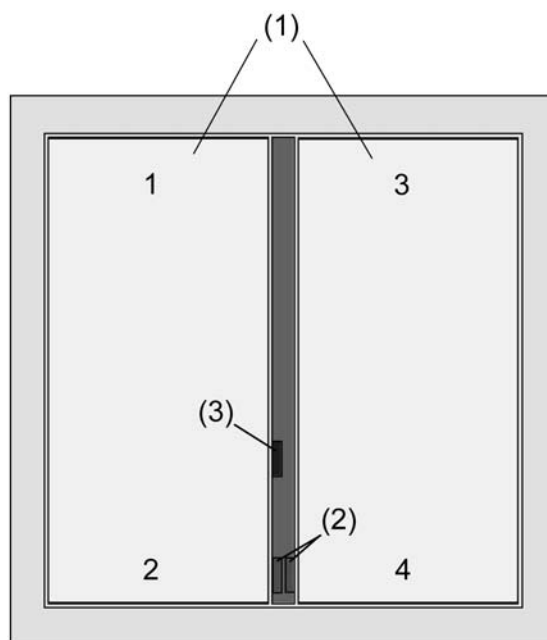
Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

During installation, adequate insulation between the mains voltage and the bus must be ensured! 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

Device components of the double Standard TSM push button sensor



picture 1: Device arrangement of the double Standard TSM push button sensor

- (1) 2 control surfaces configurable as a rocker 1...2 or as buttons 1...4 (buttons only for "Switching" application).
- (2) 2 status LEDs (red)
- (3) 1 operation LED (blue)

Dimensions of the Standard TSM push button sensor:

Width (W): 55 mm / Height (H): 55 mm / Depth (D): 20 mm

Dimensions without decorative frame and covers, without supporting plate.

2.3 Fitting and electrical connection



DANGER!

Electrical shock on contact with live parts in the fitting environment.

Electrical shocks can be fatal.

Before working on the device, disconnect the supply voltage and cover up live parts in the working environment.



DANGER!

Danger of electrical shock!

When installing with 230 V socket outlets under a common cover there is a danger of electrical shocks in the event of a fault!

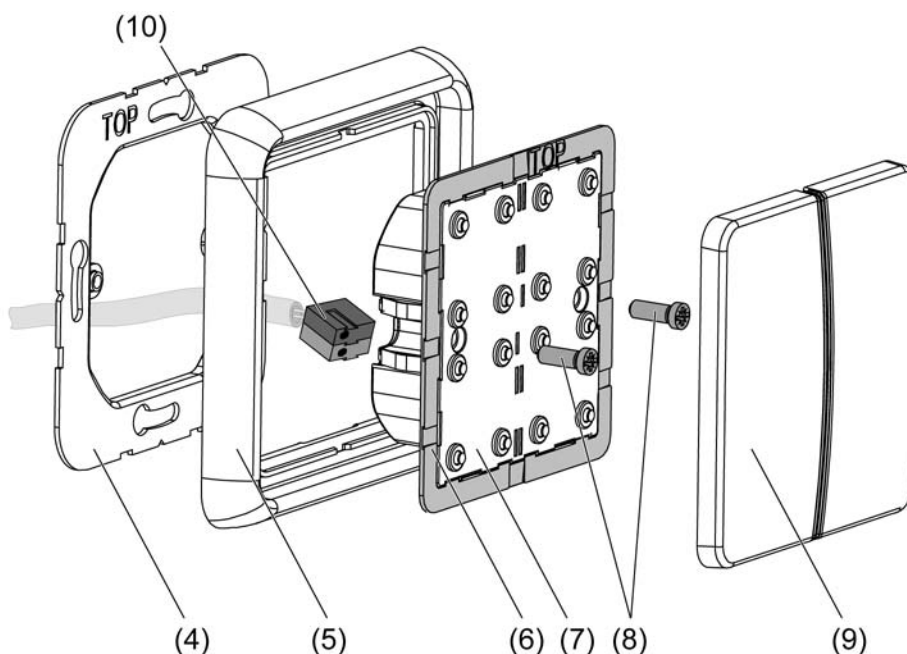
Use only the supplied plastic screws for fixing to the supporting ring.

Snapping on the adapter frame

An adapter frame is required for the CD design. The adapter frame must be snapped onto the push button sensor module, before the push button sensor is connected and fastened to the wall.

- With the adapter frame (6) in the right orientation, snap it from the front onto the push button module (7) (see chapter 2.4. Commissioning). Note marking **TOP** = top/front.

Installing the push button sensor and connecting it



picture 2: Installation of the push button sensor

- (4) Supporting ring
- (5) Decorative frame
- (6) Adapter frame (only for the CD design)
- (7) Push button module
- (8) Fastening screws

(9) Decorative control surfaces

(10) KNX connection terminal

- i** The installation of the support ring depends on the design used.
Supporting ring side "A" from the front for switch design range "FD-Design" (frame height 6 mm).
Supporting ring side "B" from the front for switch design range "CD-Design" and "A-Design" (frame height 11 mm).

- Mount supporting ring (4) in the right orientation on an appliance box. Note marking **TOP**; marking "**A**" or "**B**" in front. Use the supplied box screws.
- Position the decorative frame (2) on the supporting ring.
- Connect the push button module (7) with KNX connection terminal (10), which is connected to the KNX bus cable, to 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.
- Push the push button module (7) onto the supporting ring (4).
- Fasten the push button module (7) to supporting ring using the supplied plastic screws (8). Tighten the plastic screws only lightly.
- Before mounting the control surfaces (9), load the physical address into the device (see chapter 2.4. Commissioning).

2.4 Commissioning

After connecting the standard push button sensor TSM to the bus and mounting it on the wall, it can be put into operation. The start-up procedure is basically confined to programming with the ETS and attaching the decorative operating areas.

Assignment of the physical address



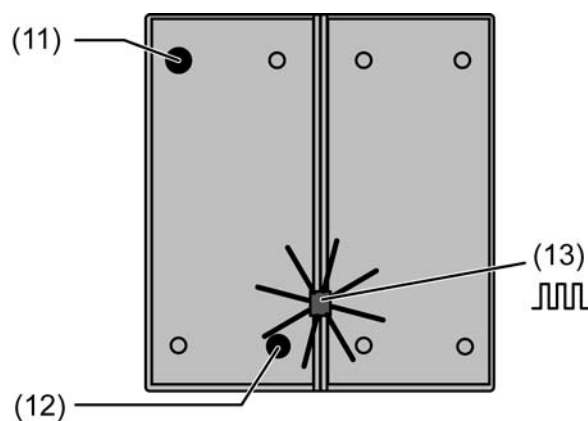
DANGER!

Electrical shock when live parts are touched.

Electrical shocks can be fatal.

Before working on the device, disconnect the supply voltage and cover up live parts in the working environment.

The standard push button sensor TSM is equipped with an integrated BCU. The push button sensor has no separate programming button or LED. The programming mode is activated by a defined and time-delayed press on the first rocker and signalled by the operation LED. To program the physical address, the decorative operating areas must not be in place on the device. The physical address is programmed as described below...



picture 3: Buttons for activating Programming mode

- Activate Programming mode. Press button at the top left (11) and keep it depressed (see picture 3). Then push the second button of rocker 1 at the bottom right (12). Programming mode is activated. The operation LED (12) 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 button-press < 200 ms) will not result in an activation of Programming mode.
- i** In Programming mode, the flashing rate remains the same until the 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 the application into the device with the help of the ETS. The ETS3.0 from version "d" onwards detects automatically whether a valid application has already been programmed into the device before. To reduce the programming time, the ETS3 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.

Depending on the programming command, the ETS2 programs the application for the push button sensor either completely or partially for parameters and group addresses. The time-optimised download procedure of the ETS3.0d is not available in this version.

For start-up purposes, it is recommended to use the ETS3.0 from version "d" onwards.

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 symbols.

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

The physical address of the push button sensor must be programmed in the device in advance.

- Place control surfaces on the push button sensor in the right orientation and snap in with a short push. Note marking **TOP**.
- i** To simplify installation, a complete set of buttons is fitted with a mounting spider at the factory. This mounting spider is not essential for installing the decorative control surfaces, meaning that it is not required when adding symbol buttons to the button panel.

2.5 Operation

Control surfaces

The double Standard TSM push button sensor consists of two control surfaces. In the "Switching" application of the ETS, the control concept of one control surface can be configured as a rocker function or as a button function. The control concept is defined as a rocker in the "Dimming", "Blind" and "Value transmitter, scene extension" applications. With the rocker function, one control surface is divided into two actuation pressure points with the same basic function. With the button function, the control surface is evaluated in two functionally-different actuation pressure points (two buttons).

The buttons are always arranged "vertically" on a control surface (pressure points at top and bottom).

Next to each control surface, there is a red LED, which can be connected to the control function, according to the function of the rocker or buttons. However, it can also be switched permanently on or off.

The operating LED of the push button sensor can be switched permanently on or off. Besides functions programmed in the ETS, the operation LED also indicates that the push button sensor is in Programming mode for commissioning or diagnosis purposes.

3 Technical data

Technical data

General

Protection class	IP 20
Safety class	III
Mark of approval	KNX
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 V ... 32 V SELV
Power consumption KNX	typ. 150 mW
Connection mode KNX	Terminal

4 Software description

4.1 Software specification

ETS search paths:	Push-button / Push-button, 2-gang / Standard push-button module, 2-gang
BAU used:	ASIC FZE 1065 + μ C
KNX/EIB type class:	3b device with cert. physical layer + stack
Configuration:	S mode standard
PEI type:	"00" _{Hex} / "0" _{Dec}
PEI connection:	No connector

Applications:

No.	Short description	Name	Version	from screen version
1	Touch sensor application to send switching telegrams.	Switching 109901	0.1 for ETS 2 and ETS 3.0a...c	705
		Switching 109911	1.1 for ETS 3 version d on- wards	705
2	Touch sensor application to send dimming telegrams.	Dimming 109902	0.2 for ETS 2 and ETS 3.0a...c	705
		Dimming 109912	1.2 for ETS 3 version d on- wards	705
3	Touch sensor application to send blind telegrams.	Blind 109903	0.3 for ETS 2 and ETS 3.0a...c	705
		Blind 109913	1.3 for ETS 3 version d on- wards	705
4	Touch sensor application to send value or scene telegrams.	Value transmitter, scene extension 109904	0.4 for ETS 2 and ETS 3.0a...c	705
		Value transmitter, scene extension 109914	1.4 for ETS 3 version d on- wards	705

4.2 Software "Switching 1099x1"

4.2.1 Scope of functions

Scope of functions


- Function of operation LED and status LED configurable
- Rocker or button function.
- Command on actuating the buttons configurable (ON, OFF, TOGGLE).

4.2.2 Object table

Number of communication objects:	4
Number of addresses (max):	100
Number of assignments (max):	100
Dynamic table management:	No
Maximum table length:	---


Objects for rocker function:

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ⁰	Switching	Rocker 1	1 bit	1.xxx	C, W, T

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


Function: Switching

Object	Function	Name	Type	DP type	Flag
 ²	Switching	Rocker 2	1 bit	1.xxx	C, W, T

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


Objects for button function:

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ⁰	Switching	Button 1	1 bit	1.xxx	C, W, T


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

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ¹	Switching	Button 2	1 bit	1.xxx	C, W, T


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

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ²	Switching	Button 3	1 bit	1.xxx	C, W, T

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







Function: Switching

Object	Function	Name	Type	DP type	Flag
 ³	Switching	Button 4	1 bit	1.xxx	C, W, T

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

4.2.3 Parameters

Description	Values	Comment
□ General		
Light period of status LED for button-press indicator	1 s 2 s 3 s 4 s 5 s	This parameter defines the time the status LED is lit up to indicate actuation. The setting concerns all status LEDs whose function is set to "Actuation indicator".
Function of operation LED	Always OFF Always ON	Specifies the state of the operation LED.
□ Rocker 1		
Function	No function Switching	This parameter is used to define the basic function of the rocker. i "No function" = Rocker 1 deactivated.
Rocker or button	Button Rocker	Here, you can specify whether the rocker is to be used with a common basic function or as two different buttons with independent objects. Depending on this choice, the ETS displays different communication objects and parameters.
Function of status LED	Always OFF Always ON Button-press indicator Status display (of the switching object) Inverted status display (of the switching display)	Specifies the control of the status LED. i Only with rocker function.
Function of status LED	Always OFF Always ON Button-press indicator Status display (of the switching object 0) Inverted status display (of the switching display 0) Status display (of the switching object 1) Inverted status display (of the switching display 1)	Specifies the control of the status LED. i Only for button function.

Command on pressing the top rocker	No function ON OFF TOGGLE	Defines the command when the rocker button is pressed at the top.  Only with rocker function.
Command on pressing the bottom rocker	No function ON OFF TOGGLE	Defines the command when the rocker button is pressed at the bottom.  Only for button function.
Command on pressing the top button	No function ON OFF TOGGLE	Defines the command on pressing the top button.  Only for button function.
Command on releasing the top button	No function ON OFF TOGGLE	Defines the command on releasing the top button.  Only for button function.
Command on pressing the bottom button	No function ON OFF TOGGLE	Defines the command on pressing the bottom button.  Only for button function.
Command on releasing the bottom button	No function ON OFF TOGGLE	Defines the command on releasing the bottom button.  Only for button function.

☐↵ For rocker 2 see rocker 1.

4.3 Software "Dimming 1099x2"

4.3.1 Scope of functions


Scope of functions

- Function of operation LED and status LED configurable
- Rocker function
- Command on actuating the rocker configurable (lighter - ON, darker - OFF).
- Time between switching and dimming can be set.

4.3.2 Object table


Number of communication objects:	4
Number of addresses (max):	100
Number of assignments (max):	100
Dynamic table management:	No
Maximum table length:	---

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ⁰	Switching	Rocker 1	1 bit	1.xxx	C, W, T


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

Function: Switching

Object	Function	Name	Type	DP type	Flag
 ²	Switching	Rocker 2	1 bit	1.xxx	C, W, T


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

Function: Dimming

Object	Function	Name	Type	DP type	Flag
 ⁸	Dimming	Rocker 1	4 bit	3.007	C, W, T

Description 4-bit object for relative brightness adjustment between 0% and 100 %.

Function: Dimming

Object	Function	Name	Type	DP type	Flag
 ¹⁰	Dimming	Rocker 2	4 bit	3.007	C, W, T

Description 4-bit object for relative brightness adjustment between 0% and 100 %.

4.3.3 Parameters

Description	Values	Comment
☐ General		
Light period of status LED for button-press indicator	1 s 2 s 3 s 4 s 5 s	This parameter defines the time the status LED is lit up to indicate actuation. The setting concerns all status LEDs whose function is set to "Actuation indicator".
Function of operation LED	Always OFF Always ON	Specifies the state of the operation LED.
☐ Rocker 1		
Function	No function Dimming	This parameter is used to define the basic function of the rocker. i "No function" = Rocker 1 deactivated.
Function of status LED	Always OFF Always ON Button-press indicator Status display (of the switching object) Inverted status display (of the switching display)	Specifies the control of the status LED
Command on pressing rocker	Up brighter (ON), down darker (OFF) Down darker (OFF), up brighter (ON)	Defines the command when the rocker button is pressed.
Time between switching and dimming	0.3 s 0.4 s 0.5 s 0.7 s 1.0 s	Defines the time between between a switching and a dimming telegram.
☐ For rocker 2 see rocker 1.		

4.4 Software "Blind 1099x3"

4.4.1 Scope of functions


Scope of functions

- Function of operation LED and status LED configurable
- Rocker function
- Command on actuating the rocker configurable (UP, DOWN).
- Time between short-time and long-time commands can be set.

4.4.2 Object table


Number of communication objects:	4
Number of addresses (max):	100
Number of assignments (max):	100
Dynamic table management:	No
Maximum table length:	---

Function: Blind

Object	Function	Name	Type	DP type	Flag
 ⁰	Short-time operation	Rocker 1	1 bit	1.007	C, -, T


Description 1-bit object for short-time operation of a blind or roller shutter.

Function: Blind

Object	Function	Name	Type	DP type	Flag
 ²	Short-time operation	Rocker 2	1 bit	1.007	C, -, T


Description 1-bit object for short-time operation of a blind or roller shutter.

Function: Blind

Object	Function	Name	Type	DP type	Flag
 ⁸	Long-time operation	Rocker 1	1 bit	1.008	C, -, T

Description 1-bit object for long-time operation of a blind or roller shutter.

Function: Blind

Object	Function	Name	Type	DP type	Flag
 ¹⁰	Long-time operation	Rocker 2	1 bit	1.008	C, -, T

Description 1-bit object for long-time operation of a blind or roller shutter.

4.4.3 Parameters

Description	Values	Comment
☐ General		
Light period of status LED for button-press indicator	1 s 2 s 3 s 4 s 5 s	This parameter defines the time the status LED is lit up to indicate actuation. The setting concerns all status LEDs whose function is set to "Actuation indicator".
Function of operation LED	Always OFF Always ON	Specifies the state of the operation LED.
☐ Rocker 1		
Function	No function Blind	This parameter is used to define the basic function of the rocker. i "No function" = Rocker 1 deactivated.
Function of status LED	Always OFF Always ON Button-press indicator	Specifies the control of the status LED
Command on pressing rocker	Rocker up: UP / Rocker down: DOWN Rocker up: DOWN / Rocker down: UP	Defines the command when the rocker button is pressed.
Time between the short-time and long-time command	0.3 s 0.4 s 0.5 s 0.7 s 1.0 s	Defines the time between a short-time and a long-time telegram.
☐ For rocker 2 see rocker 1.		

4.5 Software "Value transmitter, scene extension 1099x4"

4.5.1 Scope of functions

Scope of functions


- Function of operation LED and status LED configurable.
- Rocker function
- Command on pressing the rocker configurable (values 0...255 / 0...100 % or scene numbers).

4.5.2 Object table

Number of communication objects:	2
Number of addresses (max):	100
Number of assignments (max):	100
Dynamic table management:	No
Maximum table length:	---


Objects for the "Value transmitter" function:

Function: Value transmitter

Object	Function	Name	Type	DP type	Flag
 ⁰	Value	Rocker 1	1 byte	5.xxx	C, -, T

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


Function: Value transmitter

Object	Function	Name	Type	DP type	Flag
 ²	Value	Rocker 2	1 byte	5.xxx	C, -, T

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


Objects for the "Scene extension" function:

Function: Scene extension

Object	Function	Name	Type	DP type	Flag
 ⁰	Scene extension	Rocker 1	1 byte	18.001	C, -, T

Description 1-byte object for recalling or for storing a scene.

Function: Scene extension

Object	Function	Name	Type	DP type	Flag
 ²	Scene extension	Rocker 2	1 byte	18.001	C, -, T

Description 1-byte object for recalling or for storing a scene.

4.5.3 Parameters

Description	Values	Comment
☐ General		
Light period of status LED for button-press indicator	1 s 2 s 3 s 4 s 5 s	This parameter defines the time the status LED is lit up to indicate actuation. The setting concerns all status LEDs whose function is set to "Actuation indicator".
Function of operation LED	Always OFF Always ON	Specifies the state of the operation LED.
☐ Rocker 1		
Function	No function Value transmitter Scene extension	This parameter is used to define the basic function of the rocker. i "No function" = Rocker 1 deactivated.
Function of status LED	Always OFF Always ON Button-press indicator	Specifies the control of the status LED
Parameters for the "Value transmitter" function:		
Command on pressing rocker	Value transmitter 0...255 Value transmitter 0...100 %	A button configured as "Value transmitter" permits selecting 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 top rocker (0...255)	0...255	Defines the value when the rocker button is pressed up. i Only for "Command on pressing the rocker = Value transmitter 0...255"!
Value bottom rocker (0...255)	0...255	Defines the value when the rocker button is pressed down. i Only for "Command on pressing the rocker = Value transmitter 0...255"!
Value top rocker (0...100 %)	0...100	Defines the value when the rocker button is pressed up.

i Only for "Command on pressing the rocker = Value transmitter 0...100 %"!

Value bottom rocker (0...100 %) **0...100**

Defines the value when the rocker button is pressed down.

i Only for "Command on pressing the rocker = Value transmitter 0...100 %"!

Parameters for the "Scene extension" function:

Command on pressing rocker

Scene extension without storage function

With a rocker configured as a "Scene extension", there is the option of choosing whether only scenes are loaded or whether a storage function is possible.

Scene extension with storage function

Scene number top rocker (1...64) **1...64**

Defines the scene number when the rocker button is pressed up.

Scene number bottom rocker (1...64) **1...2...64**

Defines the scene number when the rocker button is pressed down.

☐ For rocker 2 see rocker 1.

5 Appendix

5.1 Index

C	
Connection.....	6
Control surfaces.....	10
D	
Device components.....	5
E	
ETS search paths:.....	12
F	
Fitting the control surfaces.....	9
I	
Installation.....	6
S	
Snapping on the adapter frame.....	6

ALBRECHT JUNG GMBH & CO. KG

Volmestraße 1
D-58579 Schalksmühle

Telefon: +49.23 55.8 06-0

Telefax: +49.23 55.8 06-1 89

E-mail: mail.info@jung.de

Internet: www.jung.de
www.jung-katalog.de