

KNX

Product documentation

Standard push-button module with BCU, 3-gang Art.-No.: 4073 TSM



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Content

<u>1</u>	Product definition	<u> 3</u>
	1.1 Product catalogue1.2 Function	3 3
<u>2</u>	Installation, electrical connection and operation	<u> 4</u>
	 2.1 Safety instructions 2.2 Device components 2.3 Fitting and electrical connection 2.4 Commissioning 2.5 Operation 	4 5 6 8 10
<u>3</u>	Technical data	<u>11</u>
<u>4</u>	Software description	<u>12</u>
	 4.1 Software specification 4.2 Software "Switching 109Ax1" 4.2.1 Scope of functions 4.2.2 Object table 4.2.3 Parameters 4.3 Software "Dimming 109Ax2" 4.3.1 Scope of functions 4.3.2 Object table 4.3.3 Parameters 4.4 Software "Blind 109Ax3" 4.4.1 Scope of functions 4.4.2 Object table 4.3 Parameters 4.4 Software "Unctions 4.5 Software "Value transmitter, scene extension 109Ax4" 4.5.1 Scope of functions 4.5.2 Object table 4.5.3 Parameters 	12 13 14 16 18 19 20 21 22 23 24 25 27
<u>5</u>	Appendix	<u>29</u>
	5.1 Index	29



1 Product definition

1.1 Product catalogue

Product name: Standard push-button module, 3-gang

Use: Sensor Design: UP (flush-mounting type)

Art.-No.: 4073 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 triple Standard TSM push button sensor consists of three 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 a buttonpress 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 triple Standard TSM push button sensor



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

- (1) 3 control surfaces configurable as a rocker 1...3 or as buttons 1...6 (buttons only for "Switching" application).
- (2) 3 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!

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.

Λ

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

- 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 (5) on the supporting ring.
- Connect the push button module (7) with KNW 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. 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 placed 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 (13) 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 key actuation must be at least 200 ms. Pressing both keys simultaneously (time between first and second key-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 triple Standard TSM push button sensor consists of three 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

IP 20
KNX
-5 +45 °C
-25 +70 °C

KNX / EIB supply KNX medium

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



4 Software description

4.1 Software specification

ETS search paths: P	Push-button / Push-button, 3-gang / Standard push-button mod- ile, 3-gang
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BAU used:	ASIC FZE 1065 + μC
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 109A01	0.1 for ETS 2 and ETS 3.0a…c	705
		Switching 109A11	1.1 from ETS3.0 from Version d	705
2	Touch sensor application to send dim- ming telegrams.	Dimming 109A02	0.2 for ETS 2 and ETS 3.0a…c	705
		Dimming 109A12	1.2 from ETS 3 from Version d	705
3	Touch sensor application to send blind telegrams.	Shutter 109A03	0.3 for ETS 2 and ETS 3.0a…c	705
		Shutter 109A13	1.3 from ETS 3 from Version d	705
4	Touch sensor application to send value or scene telegrams.	Value transmitter, scene extension 109A04	0.4 for ETS 2 and ETS 3.0a…c	705
		Value transmitter, scene extension 109A14	1.4 from ETS 3 from Version d	705



4.2 Software "Switching 109Ax1"

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

4.2.2 Obje					
Number of c	communication objects:	6			
Number of a	addresses (max):	100			
Number of a	assignments (max):	100			
Dynamic tat	ole management:	No			
Maximum ta	ble length:				
Objects for I	rocker function:				
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Rocker 1	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	ission of switching te	legrams	(ON, OFF	-).
Eunction:	Switching				
Object	Switching	Namo	Tupo	DP type	Elaa
	Switching	Rocker 2	1 ype 1 hit		гау С W Т
└┙	Switching		1 Dit	1.	0, 10, 1
Description	1-bit object for the transm	ission of switching te	legrams	S (ON, OFF	-).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Rocker 3	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	ission of switching te	legrams	(ON, OFF	-).
Objects for I	outton function:				
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Button 1	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	ission of switching te	legrams	6 (ON, OFF	⁻).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	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	Туре	DP type	Flag
	Switching	Button 3	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	nission of switching te	legrams	s (ON, OFI	-).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
□₊ 3	Switching	Button 4	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	nission of switching te	legrams	s (ON, OFI	=).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Button 5	1 bit	1.xxx	C, W, T
Description	1-bit object for the transm	iission of switching te	legrams	s (ON, OFI	=).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
□∢ ⁵	Switching	Button 6	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 in- dicator	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	Always OFF	Specifies the state of the operation LED.
	Always ON	
□-I Rocker 1		
Function	No function	This parameter is used to define the ba- sic function of the rocker
	Switching	i "No function" = Rocker 1 deactiv- ated.
Rocker or button	Button	Here you can specify whether the rock-
	Pocker	er is to be used with a common basic function or as two different buttons with
	NOCKEI	independent objects. Depending on this choice, the ETS dis- plays different communication objects and parameters.
Function of status LED	Always OFF	Specifies the control of the status LED.
	Always ON	i Only with rocker function.
	Button-press indicator	
	Status display (of the switching object)	
	Inverted status display (of the switching display)	
Function of status LED	Always OFF	Specifies the control of the status LED.
	Always ON	i Only for button function.
	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)	



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

□- For rocker 2...3 see rocker 1.



4.3 Software "Dimming 109Ax2"

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 c	communication objects:	6			
Number of a	addresses (max):	100			
Number of assignments (max): Dynamic table management:		100			
		No			
Maximum ta	able length:				
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Rocker 1	1 bit	1.xxx	C, W, T
Description	1-bit object for the tran	nsmission of switchin	ig telegrams	(ON, OFF	⁻).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Rocker 2	1 bit	1.xxx	C, W, T
Description	1-bit object for the tran	nsmission of switchin	ig telegrams	(ON, OFF	=).
Function:	Switching				
Object	Function	Name	Туре	DP type	Flag
	Switching	Rocker 3	1 bit	1.xxx	C, W, T
Description	1-bit object for the tran	nsmission of switchin	ig telegrams	(ON, OFF	=).
Function:	Dimming				
Object	Function	Name	Туре	DP type	Flag
	Dimming	Rocker 1	4 bit	3.007	C, W, T
Description	4-bit object for relative	brightness adjustme	ent between	0% and 1	00 %.
Function:	Dimming				
Object	Function	Name	Туре	DP type	Flag
	Dimming	Rocker 2	4 bit	3.007	C, W, T
Description	4-bit object for relative	brightness adjustme	ent between	0% and 1	00 %.
Function:	Dimming				
Object	Function	Name	Туре	DP type	Flag
	Dimming	Rocker 3	4 bit	3.007	C, W, T
Description	4-bit object for relative	brightness adjustme	ent between	0% and 1	00 %.



4.3.3 Parameters

Description	Values	Comment		
□- General				
Light period of status LED for button-press in- dicator	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	Always OFF	Specifies the state of the operation LED.		
	Always ON			
□-I Rocker 1				
Function	No function	This parameter is used to define the ba- sic function of the rocker.		
	Dimming	i "No function" = Rocker 1 deactive ated.		
Function of status LED	Always OFF	Specifies the control of the status LED		
	Always ON			
	Button-press indicator			
	Status display (of the switching object)			
	Inverted status display (of the switching display)			
Command on pressing rocker	Up brighter (ON), down darker (OFF)	Defines the command when the rocker button is pressed.		
	Down darker (OFF), up brighter (ON)			
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.		

 \Box + For rocker 2...3 see rocker 1.



4.4 Software "Blind 109Ax3"

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 c	communication objects:	6			
Number of a	addresses (max):	100			
Number of a	assignments (max):	100			
Dynamic tat	ole management:	No			
Maximum table length:					
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
	Short-time operation	Rocker 1	1 bit	1.007	C, -, T
Description	1-bit object for short-ti	me operation of a bli	ind or roller s	shutter.	
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
	Short-time operation	Rocker 2	1 bit	1.007	C, -, T
Description 1-bit object for shor		me operation of a bli	ind or roller s	shutter.	
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
	Short-time operation	Rocker 3	1 bit	1.007	C, -, T
Description	1-bit object for short-ti	me operation of a bli	ind or roller s	shutter.	
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
□⊷ 8	Long-time operation	Rocker 1	1 bit	1.008	C, -, T
Description	1-bit object for long-tin	ne operation of a blir	nd or roller s	hutter.	
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
	Long-time operation	Rocker 2	1 bit	1.008	С, -, Т
Description	1-bit object for long-tin	ne operation of a blir	nd or roller s	hutter.	
Function:	Blind				
Object	Function	Name	Туре	DP type	Flag
	Long-time operation	Rocker 3	1 bit	1.008	C, -, T
Description 1-bit object for long-		ne operation of a blir	nd or roller s	hutter.	



4.4.3 Parameters

Description	Values	Comment
□- General		
Light period of status LED for button-press in- dicator	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	Always OFF	Specifies the state of the operation LED.
LED	Always ON	
□- Rocker 1		
Function	No function	This parameter is used to define the ba- sic function of the rocker.
	Blind	i "No function" = Rocker 1 deactiv- ated.
Function of status LED	Always OFF	Specifies the control of the status LED
	Always ON	
	Button-press indicator	
Command on pressing rocker	Rocker up: UP / Rocker down: DOWN	Defines the command when the rocker button is pressed.
	Rocker up: DOWN / Rocker down: UP	
Time between the short- time and long-time com- mand	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.

 \Box + For rocker 2...3 see rocker 1.



4.5 Software "Value transmitter, scene extension 109Ax4"

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:	3
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	Туре	DP type	Flag
	Value	Rocker 1	1 byte	5.xxx	C, -, T
Description	1-byte object fo	r the transmission of values from	m 0 to 2	255 (0 1	00 %).
Function:	Value transmitter				
Object	Function	Name	Туре	DP type	Flag
	Value Rocker 2 1 5.xxx C, -, T byte			C, -, T	
Description	1-byte object fo	r the transmission of values from	m 0 to 2	255 (0 1	00 %).
Function:	Value transmitter				
Object	Function	Name	Туре	DP type	Flag
	Value	Rocker 3	1 byte	5.xxx	C, -, T
Description	1-byte object fo	r the transmission of values from	m 0 to 2	255 (0 1	00 %).
Objects for t	the "Scene extension"	' function:			
Function:	Scene extension				
Object	Function	Name	Туре	DP type	Flag
	Scene extension	Rocker 1	1 byte	18.001	C, -, T
Description	1-byte object fo	r recalling or for storing a scene	.		
Function:	Scene extension				
Object	Function	Name	Туре	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.				



Function:	Scene extension				
Object	Function	Name	Туре	DP type	Flag
	Scene extension	Rocker 3	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 in- dicator	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.		
	No. for a time			
Function	No function	sic function of the rocker.		
	Value transmitter	i "No function" = Rocker 1 deactiv-		
	Scene extension	ated.		
Function of status LED	Always OFF	Specifies the control of the status LED		
	Always ON			
	Button-press indicator			
Parameters for the "Value transmitter" func- tion:				
Command on pressing	Value transmitter 0255	A button configured as "Value transmit-		
ГОСКЕГ	Value transmitter 0100 %	to be transmitted are interpreted as in- tegers from 0 to 255 or as a percentage from 0 % to 100 %. The following para- meters and their settings depend on this distinction.		
Value top rocker (0255)	0 255	Defines the value when the rocker but- ton is pressed up.		
		i Only for "Command on pressing the rocker = Value transmitter 0255"!		
Value bottom rocker (0255)	0 255	Defines the value when the rocker but- ton is pressed down.		
		i Only for "Command on pressing the rocker = Value transmitter 0255"!		
Value top rocker (0100 %)	0 100	Defines the value when the rocker but- ton is pressed up.		



 \Box For rocker 2...3 see rocker 1.

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5 Appendix

5.1 Index

С

Connection
D Device components5
E ETS search paths:12
F Fitting the control surfaces9
l Installation6
S Snapping on the adapter frame6





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