



KAA-8R Universal Actuator Instruction manual

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1. Overview

1.1 Overview devices

The manual refers to the following devices: (Order Code respectively printed in bold type):

- **KAA-8R-10** Universal Actuator 8-fold, 230V AC, 10A.
 - ⊙ 4 Channels for shutter motors up to 600W, Manual control or 8 Channels for switching outputs for ohmic loads up to 2300W.
 - ⊙ Any supposable mixed form of switching outputs and shutter output possible.
- **KAA-8R** Universal Actuator 8-fold, 230V AC, 16A.
 - ⊙ 4 Channels for shutter motors up to 600W, Manual control or 8 Channels for switching outputs for ohmic loads up to 3680W.
 - ⊙ Any supposable mixed form of switching outputs and shutter output possible.

1.2 Usage & possible applications

The universal actuator has its field of applications always if you ask flexibility. It can be parameterized as well as an adequate switching actuator.

Further, there is the possibility of embedding the channel into automatic blocks and activate different scenes. At activation of the automatic function, absolute position can be approached via 1 Bit object. This function is e.g. very suitable for the start-up of sunblind positions, which are called via a brightness sensor. Additional weather alarms are parameterize able, which can call determined functions at the universal actuator.

Additional a manual control of the shutter/blinds can be switched on or off.

Parameterized as switching actuator, the settings switching output and staircase are available. At the configuration switch, all settings are available which are necessary for a comprehensive parameterization. As well On-/Off-delay, normally opened mode or normally closed mode, cyclic sending, central function, logical functions as scene function are adjustable. Additional the reset behavior and the blocking behavior can be set.

Via the staircase function an automatic switch off after a determined time can be adjusted.

1.3 Exemplary Circuit diagrams

1.3.1 Switching actuator

Parameterized as switching actuator, the actuator is connected in the following way:

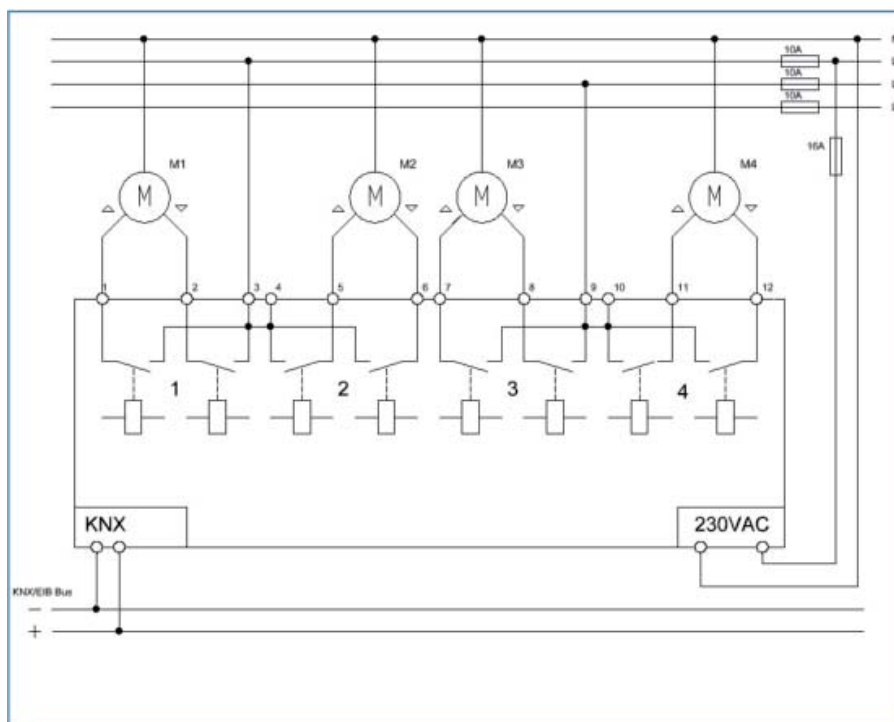


Illustration 3: Exemplary circuit diagram as 8-fold switching actuator

1.3.2 Mixed mode

Also arbitrary mixed modes are possible, e.g. in the following way:

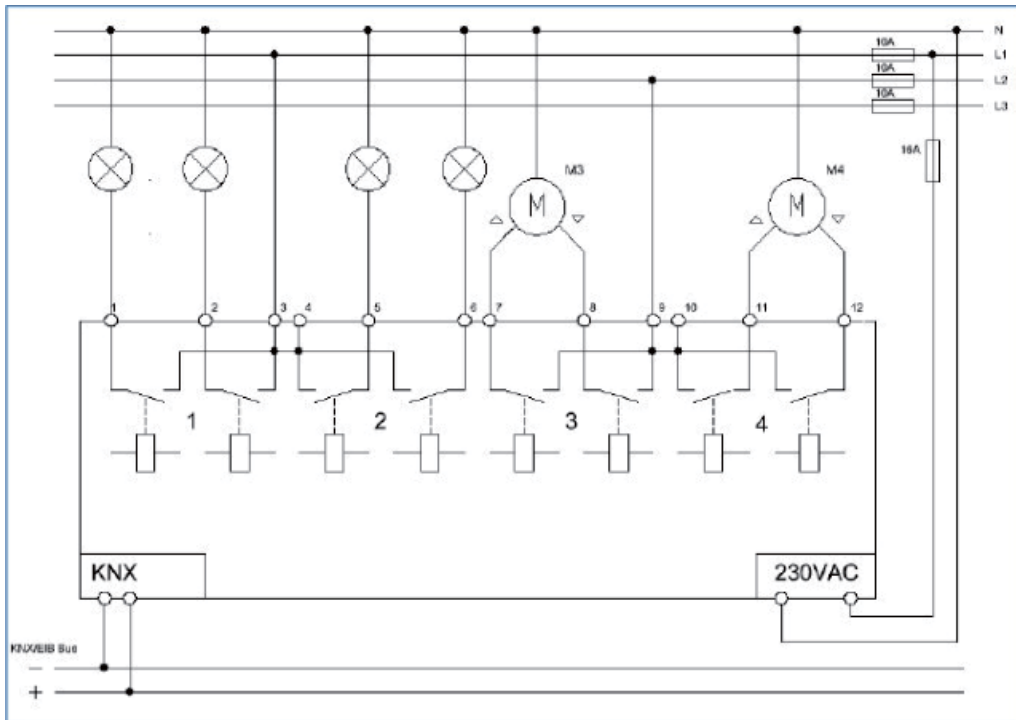


Illustration 4: Exemplary circuit diagram as switching and shutter actuator

1.4 Structure & Handling

The universal actuator (KAA-8) contains of a programming button as well as a programming-LED, which shows a activated programming button. The universal actuator works with 230V AC. Every channel of the MRDC device contains of a status-LEDs. The status-LEDs show an active run-up or an active run-down command. With the buttons left/right you can chose the channel and with the buttons up/down you can move the channel down or up. The following illustration shows a 8-fold universal actuator:

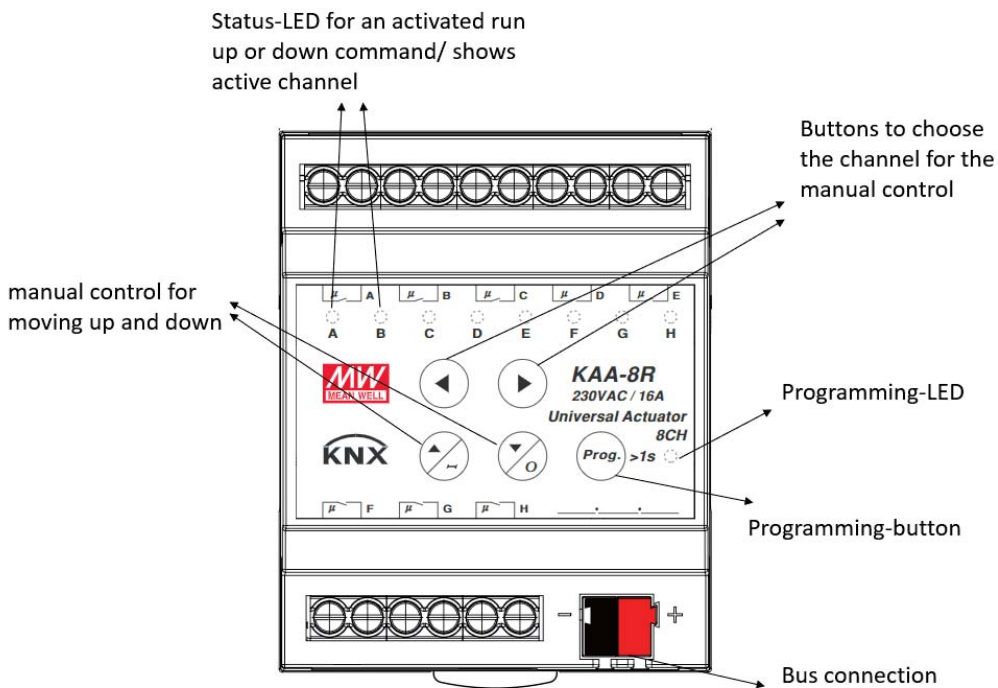


Illustration 5: Overview hardware module (KAA-8R)

1.5 Functions

The functionality is the same for all channels. Depending on the hardware module the device contains of up to eight channels. At the first step, every channel can be selected as not active, Switch/Staircase/switch impulse, heating control with PWM

• not active

The channel becomes no more functions allocated. There are no more opportunities to parameterize the channel.

• Switch, Staircase, switch impulse, heating control with PWM

Every channel of the pair of channels can be selected individually as switch or staircase, switch impulse...etc. at the next step.

If the channel is selected as switch, different switching actions can be parameterized. Additional actions, like logic functions and scene functions, can be parameterized.

If the channel is selected as staircase, a staircase function, which causes an automatic cutout after an adjusted time, can be parameterized. Additional settings for the adjustment of the staircase function are available. Like switch, staircase function, you can find corresponding setting when selecting "switch impulse" or "heating control with PWM". Please find detail information in Later chapter.

1.5.1 Overview at general setting and functions

	Parameter	Descriptions
General settings	Channel selection	<ul style="list-style-type: none"> • not active • switching • staircase light • switch impulse • heating control with PWM
	Startup Timeout	After the device is powered on, the delay of relay closed/separated.
	Manual Operation	Whether to allow manual operation of the panel
	Eco Mode, switch LED's off after	Eco mode
	send "operation" cyclic (0=not active)	Use to periodically report device status

Chart 1: Overview general setting and functions

1.5.2 Overview functions at the switch/staircase mode/switch impulse/heating

Control with PWM

Group of functions	Functions
Group addresses	number of objects/connections=dynamic (freely assignable of the user)
Reset behavior	behavior at bus power breakdown
	behavior at bus power up
	startup timeout
Relay mode	normally closed/ normally opened
Switch functions	switching
	central switching function
Time functions	on-delay
	off-delay
Staircase light functions	time for staircase
	pre-warning (with adjustable warning and pre-warning time)
	manual off
	Extend time on/off
Forced control /priority functions	locking function
	logic functions (AND/ OR)

Group of functions	Functions
Scenes	scene function for up to 8 scenes per channel
State functions	feedback function
Switch impulse functions	Impulse time
	locking function
Heating control with PWM	PWM function
	Emergency mode

Chart 2: Overview functions for switch, staircase mode

1.6 Settings at the ETS-Software

Selection at the product database:

Manufacturer: MEANWELL Enterprises Co. Ltd

Product family: Output

Product type: Universal actuator

Product name: addicted to the used type, e.g.: KAA-8R universal actuator 8-fold, 16A

Order number: addicted to the used type, e.g.: KAA-8R

1.7 Starting up

After wiring, the allocation of the physical address and the parameterization of every channel follow:

- (1) Connect the interface with the bus, e.g. MEANWELL USB interface KSI-01U
- (2) Switching the power supply
- (3) Set bus power up
- (4) Press the programming button at the device(red programming LED lights)
- (5) Loading of the physical address out of the ETS-Software by using the interface(red LED goes out, as well this process was completed successful)
- (6) Loading of the application, with requested parameterization
- (7) If the device is enabled you can test the requested functions(also possible by using the ETS-Software)

2. Communication Objects

2.1 Global communication objects

The central communication objects are standardly shown. They contain as well the communication objects, which are only valid for corresponding functions.

2.2 Default settings of the central communication objects

The following chart shows the default settings of the global communication objects:

Default settings								
Nr.	Object Function	Length	Priority	C	R	W	T	U
1	Manual Control	1 Bit	Low	X		X		
2	Switch On/Off	1 Bit	Low	X		X		
3	Operation	1 Bit	Low	X	XX			

Chart 3: Default settings of the central communication objects

You can see the default values for the communication objects from the upper chart. According to requirements the priority of the particular communication objects as well as the flags can be adjusted by the user. The flags allocates the function of the objects in the programming thereby stands C for communication, R for Read, W for write, T for transmit and U for update.

2.3 Default settings of the communication objects for each functions

The following chart shows the default settings of the communication objects, if the pair of channels is selected as shutter/blinds:

Default settings									
Nr.	Name	Object Function	Length	Priority	C	R	W	T	U
6	Channel A	Switch On/Off	1 Bit	Low	X		X		
7	Channel A	Lock	1 Bit	Low	X		X		
8	Channel A	State	1 Bit	Low	X	X		X	
9	Channel A	Inverted State	1 Bit	Low	X	X		X	
10	Channel A	Forced Control	2 Bit	Low	X		X		
10	Channel A	Priority ON/ Priority OFF	1 Bit	Low	X		X		
11	Channel A	Scene\scene number	1 Byte	Low	X		X		
11	Channel A	Scene\scene control	1 Byte	Low	X		X		
12	Channel A	Logic1	1 Bit	Low	X		X		
13	Channel A	Logic2	1 Bit	Low	X		X		
14	Channel A	Threshold switch\percentage	1 Byte	Low	X		X		
14	Channel A	Threshold switch\ratio	1 Byte	Low	X		X		
14	Channel A	Threshold switch\pulses	2 Byte	Low	X		X		
14	Channel A	Threshold switch\temperatur	2 Byte	Low	X		X		
14	Channel A	Threshold switch\lux	2 Byte	Low	X		X		
15	Channel A	Service required	1 Bit	Low	X	X		X	
16	Channel A	Response operating hours\ time lag(s)	4 Byte	Low	X	X		X	
16	Channel A	Response operating hours \time(h)	2 Byte	Low	X	X		X	
16	Channel A	Time to next service\ time lag(s)	4 Byte	Low	X	X		X	
16	Channel A	Time to next service\ time(h)	2 Byte	Low	X	X		X	
17	Channel A	Reset Operation hours	1 Bit	Low	X		X		
17	Channel A	Reset Service	1 Bit	Low	X		X		

Default settings									
Nr.	Name	Object Function	Length	Priority	C	R	W	T	U
18	Channel A	Staircase light	1 Bit	Low	X		X		
19	Channel A	Staircase light with time	1 Byte	Low	X		X		
20	Channel A	Prewarning	1 Bit	Low	X		X		
21	Channel A	Switch impulse	1 Bit	Low	X		X		
22	Channel A	State Emergency Mode	1 Bit	Low	X	X		X	
23	Channel A	Control Value	1 Byte	Low	X		X		
+18	next pair of channels								

Chart 4: Default settings of the communication objects for each function

3. Reference ETS-Parameter – Switch for different application

3.1 General setting

The following illustration shows the menu of General setting.

1.1.2 KAA-8R Universal Actuator, 8-fold, 16A, MDRC > General setting

General setting	Startup timeout	2 s
Channel selection	Manual operation	active
	Eco Mode, switch LED's off after	not active
	Send "operation" cyclic (0=not active)	0 min

Parameter	Value	Description
Startup Timeout	2 ~ 60s	After the device is powered on, the delay of relay closed/separated. The manual operation allows the relay to be normally controlled during the delay wait. If there is Object Communication, it will be recorded first and will not respond. The delay ends and the corresponding action is executed.
Manual Operation	<ul style="list-style-type: none"> • active • disable • lockable over object 	Whether to allow manual operation of the panel. Lockable over object: means to enable or disable the Manual Operation via Object.
Eco Mode, switch LED's off after	<ul style="list-style-type: none"> • not active • 30S • 1min • 2min • 5min • 10min • 20min • 30min • 40min • 50min • 60min 	Power saving mode. After the set time delay, turn off the LED on the panel.
send "Operation" cyclic (0=not active)	0 ~ 30000min	Use to periodically report device status. It is independent Operation Object

3.2 Channel selection

To operate the universal actuator as switching actuator, at first the each channel, e.g. Channel A, must be selected as “switching”, “staircase light”, “Switch impulse”...etc. At the next step, for each channel can be selected if the channel shall operate as switch for different application.

The following illustration shows the submenu channel selection:

1.1.1 KAA-8R Universal Actuator,8-fold,16A,MDRC > Channel selection		
General setting	Function Channel A	not active
Channel selection	Function Channel B	switching
Channel B: Switch	Function Channel C	staircase light
Channel C: Staircase light	Function Channel D	switch impulse
Scenes	Function Channel E	heating control with PWM
Channel D: Switch impulse	Function Channel F	not active
Channel E: Heating Control wit...	Function Channel G	not active
	Function Channel H	not active

Illustration 6: Channel selection

The following chart shows the available settings for the channel selection:

ETS-text	Dynamic range [default value]	comment
Channel A	<ul style="list-style-type: none"> • not active • switching • staircase light • switch impulse • heating control with PWM 	<p>Selection, if a pair of channels shall operate as switching actuator or as shutter actuator.</p> <p>Not active deactivates the pair of channels.</p>
Channel A	<ul style="list-style-type: none"> • switching 	<p>At the switching/staircase light/switch impulse mode/heating control with PWM. These settings are available.</p>
•	<ul style="list-style-type: none"> • staircase light 	
•	<ul style="list-style-type: none"> • switch impulse 	
Channel H	<ul style="list-style-type: none"> • heating control with PWM 	

Chart 6: Available settings channel selection for switch/staircase

Each channel can operate as switch.

At the chapter 4, the switching actuator mode is described. Each channel can be parameterized as well as switching output or as its described function

3.3 Identical parameter

The following parameters is available at channels selected as switch as at channels selected as switch.

3.3.1 Relay operating mode

The following illustration shows the setting options for this parameter:

Output mode	<input checked="" type="radio"/> normally open <input type="radio"/> normally closed
On delay	<input type="text" value="0"/> s
Off delay	<input type="text" value="0"/> s

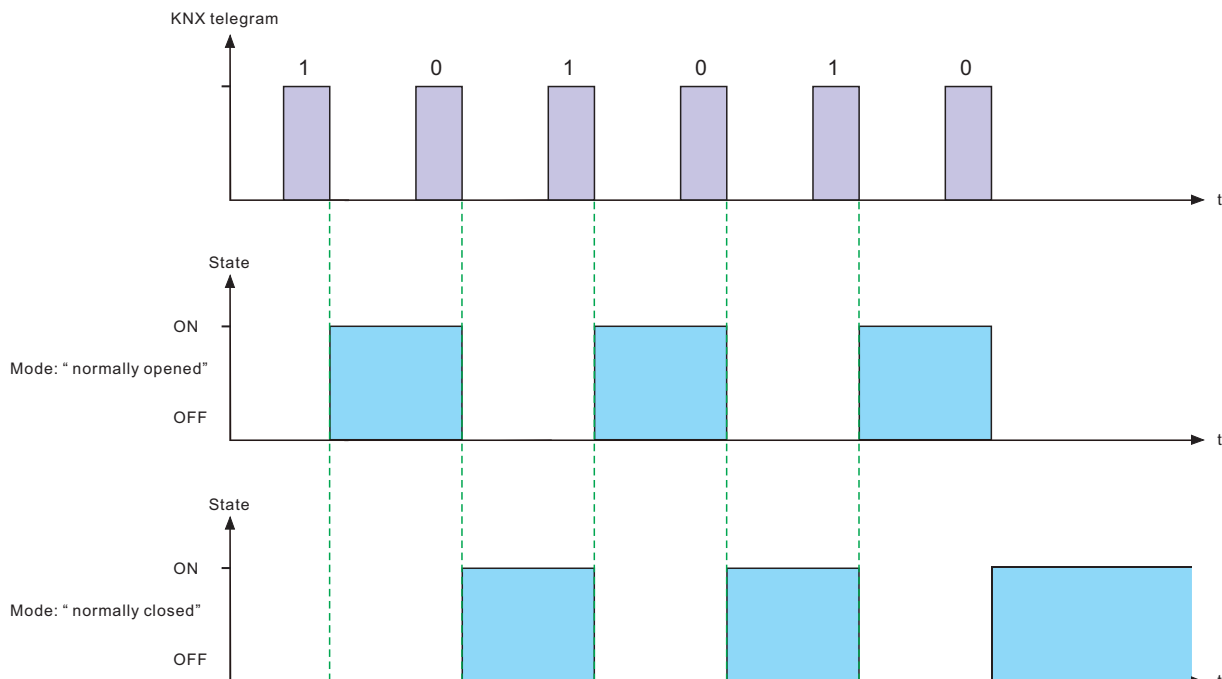
illustration 7: Operating mode

The following chart shows the dynamic range for this parameter:

ETS-text	Dynamic range [default value]	comment
Mode	<ul style="list-style-type: none"> • normally opened • normally closed 	Relay operating mode of the channel
On delay	0-3000s	<p>When the channel output is in the Off state, the message information of ON is received, and it takes a delay of n seconds to switch On.</p> <p>If the received message is also to switch on the output during the waiting period, it will be ignored.</p> <p>Note: The "On Delay" time here is not overlapped with the "Startup Timeout" time in the "General Setting" above.</p>
Off delay	0-3000s	<p>When the channel output is in the On state, the message information of Off is received, and it takes a delay of n seconds to switch to the Off output.</p> <p>Note: The "Off Delay" time here is not overlapped with the "Startup Timeout" time in the "General Setting" above.</p>

Chart 7: Operating mode

The following diagram shows the behavior of the relay operating mode normally closed and normally opened. The input for the channels is a KNX-telegram, which sends alternating 0-signals and 1-signals:



3.3.2 Central function

The following illustration shows the setting options at the ETS-Software:

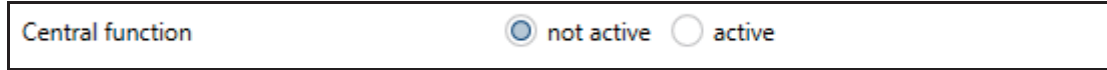


Illustration 8: Central function

The following chart shows the dynamic range for this parameter:

ETS-text	Dynamic range [default value]	comment
Central function	<ul style="list-style-type: none"> • not active • active 	switches the central function on/off for this channel

Chart 8: Central function

The central function can be switched on/off for every channel. For switching on this function, you have to choose the option "active". By calling the central communication object, all channels with an activated central function are switched on with their current parameterization. So switch-on delays or staircase functions are still kept.

The following chart shows the associated communication object:

Number	Name	Length	Usage
2	Central function	1 Bit	central switching of the channels

Chart 9: Communication object central function

3.3.3 Behavior at locking /unlocking

The following illustration shows the setting options at the ETS-Software:

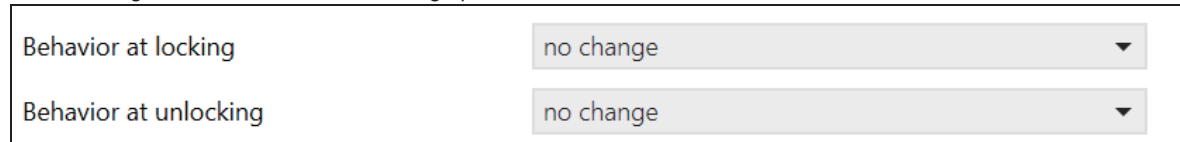


Illustration 9: locking function

The following chart shows the dynamic range for this parameter:

ETS-text	Dynamic range [default value]	comment
Behavior at locking	<ul style="list-style-type: none"> • On • Off • no change 	Behavior to a locking/unlocking process
Behavior at unlocking	<ul style="list-style-type: none"> • On • Off • no change • previous state, catch up on Switching • previous state 	Behavior to unlocking process

Chart 10: Behavior at locking/unlocking

The locking function gets active, when the corresponding communication object becomes a logical "1". By sending a logical "0", the locking function can be deactivated again.

The parameter "Behavior at locking" defines an action for the output at activating the locking process.

There are the setting on, off and no change available.

When the output channel is at the locking state, the manual button operation is invalid.

Note: Locking has the highest priority

The unlocking function gets active, when the corresponding communication object becomes a logical "0". By sending a logical "1", the unlocking function can be deactivated again.

The parameter "Behavior at unlocking" defines an action for the output at activating the unlocking. There are the setting on, off, no change available, previous state, catch up on Switching and previous state.

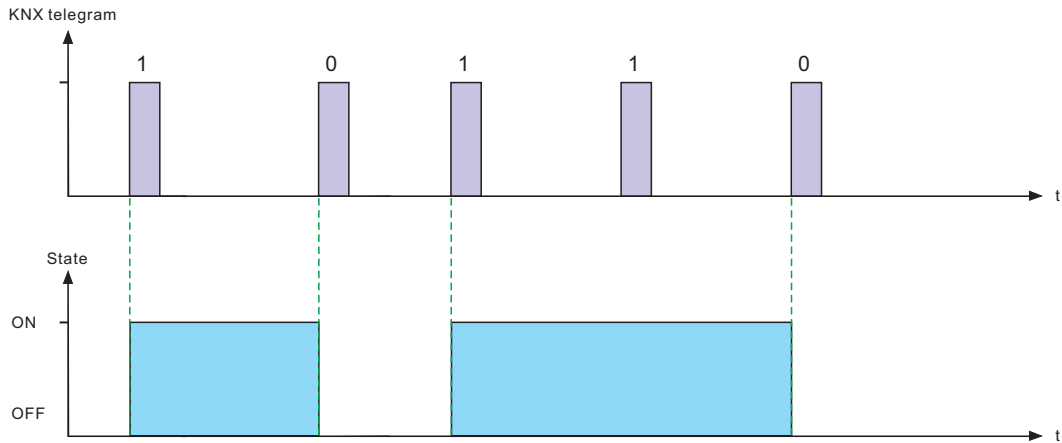
Regarding the parameter "previous state, catch up on Switching", If the actuator receives a message of type "Switch" during locking, it will record it. After unlocking, the corresponding action will be executed on the output channel according

The following chart shows the corresponding communication object:

Number	Name	Length	Usage
7	lock	1 Bit	locks the channel

Chart 11: Communication object locking function

The following diagram describes the blocking process. For the "Behavior at locking", the action on was parameterized and for the "Behavior at unlocking" the action off was parameterized:



The KNX telegram shows which values are send to the locking object. By sending a logical "1", the locking function is activated and the channel is switched on. The locking function is deactivated again by sending a logical "0". so the channel is switched off.

3.3.4 Behavior at bus power up/down

The following illustration shows the setting options at the ETS-Software:

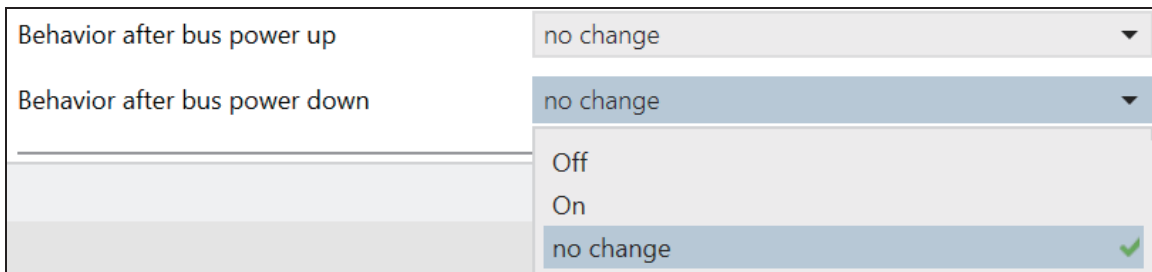


Illustration 10: Behavior at bus power up/down

The following chart shows the dynamic range for this parameter:

ETS-text	Dynamic range [default value]	comment
Behavior at bus power up/Behavior at bus power down	<ul style="list-style-type: none"> • On • Off • no change 	Adjustment, how the channel shall react in case of a bus power breakdown/return

Chart 12: Behavior at bus power up/down

Every channel can occupy a certain state as well in case of a bus power breakdown as in case of a bus power return. The channel can be switched off or on, but also stay in its current state by choosing the parameter "no change".

To avoid problems in case of a bus power breakdown, you should adjust this parameter very conscientious. Because there is no controlling possible as long as the bus power is down.

3.4 Switching output

The following parameters, which are described at the headings 5.3.x, are only available at channels selected as switch.

3.4.1 Overview

By choosing a channel as switch, a sub menu, called Channel A Switching, appears for this channel at the left drop down menu.

fold,16A,MDRC > Channel A: Switch

Output mode	<input checked="" type="radio"/> normally open <input type="radio"/> normally closed
On delay	<input type="text" value="0"/> s
Off delay	<input type="text" value="0"/> s
Central function	<input checked="" type="radio"/> not active <input type="radio"/> active
Send state	at change
Send state cyclic(0=not active)	<input type="text" value="0"/> s
Additional inverted state	<input checked="" type="radio"/> not active <input type="radio"/> active
<hr/>	
Behavior at locking	no change
Behavior at unlocking	no change
Priority/Forced control	not active
Behavior after bus power up	no change
Behavior after bus power down	no change
<hr/>	
Logic function	<input checked="" type="radio"/> not active <input type="radio"/> active
Scenes	<input checked="" type="radio"/> not active <input type="radio"/> active
Threshold switch	<input checked="" type="radio"/> not active <input type="radio"/> active
Operation hours counter	<input checked="" type="radio"/> not active <input type="radio"/> active

Illustration 28: Switching output

The chart shows the possible settings for switching outputs:

ETS-text	Dynamic range [default value]	comment
Mode	<ul style="list-style-type: none"> • normally opened • normally closed 	Operation mode of the channel
On-Delay	0...30000 sec [0=nodelay]	Switch on delay of the channel in seconds
Off-Delay	0...30000 sec [0=no delay]]	Switch off delay of the channel in seconds
Central function	<ul style="list-style-type: none"> • not active • active 	Activates the central function for this channel
Send state	<ul style="list-style-type: none"> • no send • at change • at change and lock • always at input of telegram 	<p>Set whether to send the telegram of "Status"</p> <p>No send: do not send</p> <p>At change: sent when the current output status changes</p> <p>At change and lock: sent when the current state changes or during the lock state</p> <p>Note1: When the channel is locked, if the locking/unlocking behavior is set to no change, the locking/unlocking will not send the "State" because the status will not change; but if the switch telegram is sent during the locking period, Upload the current actual "State" (although the output status has not changed)</p> <p>Note2: During the channel locking =>unlocking if there is no change on output state , "State" is not uploaded; if there is a state change, "State" needs to be uploaded.</p> <p>Note3: During the channel unlocking=>locking, if if there is no change on output state, "State" is not uploaded; if there is a state change, "State" needs to be uploaded.</p> <p>Always at input of telegram: As long as the message of the "Switch" type is received, it will be sent regardless of the output status, even if it is in the locking state.</p>
Send state cyclic (0=not active)	0~30000s	Set whether to send "State" telegram periodically.
	<p>Additional inverted state</p> <ul style="list-style-type: none"> • not active • active 	<p>If the Additional inverted state is activated, the "Inverted State" message is sent.</p> <p>This activation will add an "Inverted State" Object that coexists with the "State" Object.</p> <p>Not active, "Inverted State" Object does not appear.</p>
Behavior at locking	<ul style="list-style-type: none"> • Off • On • no change 	<p>Action for activating the locking process.</p> <p>Note: Locking has the highest priority</p>

ETS-text	Dynamic range [default value]	comment
Behavior at unlocking	<ul style="list-style-type: none"> • Off • On • no change • previous state, catch up on switching • previous state 	Action for deactivating the unlocking process
Priority/Forced control	<ul style="list-style-type: none"> • not active • 2 Bit force control • 1 Bit Priority on • 1 Bit Priority off 	Priority control Not active: not active 2 bit force control: 00/01 No Control, "10"-priority, Off; "11"-priority, On 1 bit Priority On: "1" - enabled; "0" - released 1 bit Priority Off: "1" - enabled; "0" - released
	Release time for forced control (0=not active) : 0-600min	0: indicates that the forced control is always valid unless an Object message is received to release the command; 1-600min: Forced control maintains the setting range of time. When time is up, the forced control is automatically released.
	Behavior after forced control: <ul style="list-style-type: none"> • Off • On • no change • previous state, catch up on switching • previous state 	Previous state, catch up on Switching: If the actuator receives "Switch" type telegram during the forced control, it will record it. After forced control remove, the corresponding action will be performed on the output channel according to the latest set of "Switch" type telegram values received previously. Previous state: After the forced control ends, the relay output channel will restore the state value before the forced control.
Behavior after bus power up	<ul style="list-style-type: none"> • no change • off • on 	Action for a bus power return. If the actuator receives "Switch" type telegram during waiting the power up. After the bus power up, the value of the Switch type telegram is used and the bus power up setting is ignored.
Behavior after bus power down	<ul style="list-style-type: none"> • no change • off • on 	Action for a bus power breakdown
Logic function	<ul style="list-style-type: none"> • not active • active 	Whether the logic function is enabled or not
Scenes	<ul style="list-style-type: none"> • not active • active 	Whether the scene function is enabled or not
Threshold switch	<ul style="list-style-type: none"> • not active • active 	Whether the threshold control function is enabled or not
Operation hours counter	<ul style="list-style-type: none"> • not active • active 	Whether the operation time statistics function is enabled or not

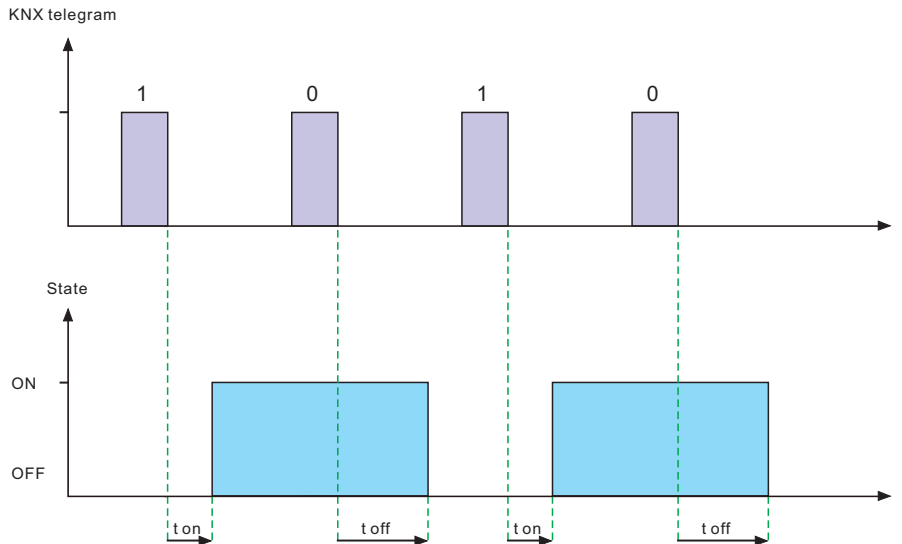
Chart 38: Switching output

3.4.2 On/Off delay

On delay	<input type="text" value="0"/>	s
Off delay	<input type="text" value="0"/>	s

The following illustration shows the setting options at the ETS-Software:

The on-delay causes a delayed switch of the channel. At sending an on-signal to the channel, first the adjusted on delay time expires and afterwards the channel will be switched on.
 The off delay works on the same principle. At sending an off-signal, first the adjusted off delay time expires and afterwards the channel will be switched off.
 Both functions work as well alone as combined. By adjusting "0 seconds" for a delay the function is switched off.
 The following diagram describes the combination of on and off delay:



3.4.3 Logic function

The following illustration shows the setting options at the ETS-Software:

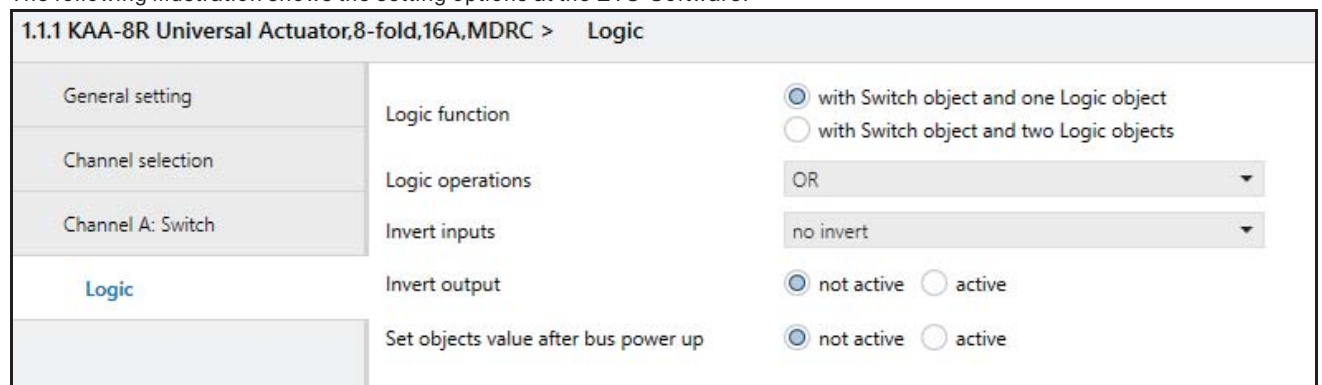


Illustration 30: Logic function

The logic function can be activated with one or two objects. The objects are the inputs of the logic block. Furthermore you can choose between an AND-function and an OR-function.
 When you have activated the logic function, the logic block has to be satisfied before switching the channel. As long as the logic function is not satisfied, the channel does not react to any signal.

The chart shows the possible settings for Logic function:

ETS-text	Dynamic range [default value]	Comment
Logic function	<ul style="list-style-type: none"> • with Switch object and one Logic object • with Switch object and two Logic objects 	<p>With Switch object and one Logic object</p> <p>The calculated result of the switch object and logic1 object as the executing value of the output channel.</p> <p>With Switch object and two Logic object</p> <p>The calculated result of the switch object and logic1,logic2 object as the executing value of the output channel.</p> <p>Note: The Switch object mentioned here is not limited to the "Switch On/Off" Object. It is also included for the Switch brought by Object such as "Scene" and "Threshold switch".</p>
Logic operations	<ul style="list-style-type: none"> • OR • AND • XOR • gate opened with Logic object=0 • gate opened with Logic object=1 	<p>OR : At least one input is active (=1)</p> <p>AND : All inputs are active (=1)</p> <p>XOR : Only one input is active (=1)</p> <p>gate opened with Logic object=0 : The output can be switched via the switching object if all logic objects have the value 0</p> <p>gate opened with Logic object=1 : The output can be switched via the switching object if all logic objects have the value 1</p>
Invert inputs (with Switch object and one Logic object)	<ul style="list-style-type: none"> • no invert • invert object Switching • invert Logic object1 • invert object Switching & Logic object1 	<p>Whether to invert the input of the objects such as switch, logic1, etc. (in the case of one logic Object)</p> <p>Note: Invert object Switching is not only limited to the "Switch On/Off" Object. It also works on "Switch" brought by Objects such as "Scene" and "Threshold switch".</p>
Invert inputs: (with Switch object and two Logic object)	<ul style="list-style-type: none"> • no invert • invert object Switching • invert Logic object1 • invert Logic object2 • invert object Switching & Logic object1 • invert object Switching & Logic object2 • invert Logic object1 & Logic object2 • invert object Switching & Logic object1 & Logic object2 	<p>Whether to invert the input of the objects such as switch, logic1, logic2, etc. (in the case of two Logic Objects)</p>
Invert output	<ul style="list-style-type: none"> • no invert • invert 	<p>Whether to invert the calculated results of the output</p>
Set objects value after bus power up	<ul style="list-style-type: none"> • not active • active 	<p>It is used to set the initial values of three objects: switch, Logic1, and logic2 after the actuator is powered on.</p> <ul style="list-style-type: none"> • If the setting is not activated, the default value of the three objects is "0", and the Logic operation is not executed after power-on. • If the setting is activated, a Logic operation is executed and output after power-on.

The following chart shows the relevant communication objects:

Number	Name	Length	Usage
12	Logic 1	1 Bit	Logic object 1, is the first input for the logic block
13	Logic 2	1 Bit	Logic object 2, is the second input for the logic block

Chart 39: Communication objects logic

According to the chosen logic operation only one or both objects have to become a 1-signal. The following chart shows the both logic operations with two objects:

AND-Connection			OR-Connection		
Logic 1	Logic 2	Channel switchable?	Logic 1	Logic 2	Channel switchable?
0	0	No	0	0	No
0	1	No	0	1	Yes
1	0	No	1	0	Yes
1	1	Yes	1	1	Yes

Chart 40: Logic operations

3.4.4 Scene function

When functions of different groups (e.g. light, heating) shall be changed simultaneously with only one keystroke, it is practical to use the scene function. By calling a scene, you can switch the lights to a specific value, drive the shutter to an absolute position, switch the heating to the day mode and switch the power supply of the sockets on. The telegrams of these functions can have as well different formats as different values with different meaning (e.g. "0" for switch the lights off and open the shutters). If there were no scene function, you would have to send a single telegram for every actuator to get the same function.

The scene function of the switch actuator enables you to connect the channels of the switch actuator to a scene control. For that, you have to assign the value to the appropriated space (scene A..H). It is possible to program up to 8 scenes per switching output. When you activate the scene function at the switching output, a new sub menu for the scenes appears at the left drop down menu. There are settings to activate single scenes, set values and scene numbers and switch the memory function on/off at this sub menu.

Scenes are activated by receiving their scene numbers at the communication object for the scenes. If the memory function of the scenes is activated, the current value of the channel will be saved at the called scene number.

The communication objects of the scenes have always the length of 1 byte.

The following illustration shows the setting options at the ETS-Software for activating the scene function:

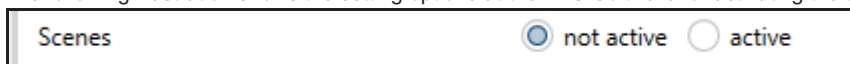


Illustration 31: Scene function

The following chart shows the relevant communication object:

Number	Name	Length	Usage
11	Scene	1 Byte	Call of the scene

Chart 41: Communication object scene

For calling a certain scene, you have to send the value for the scene to the communication object. The value of the scene number is always one number less than the adjusted scene number. For calling scene 1, you have to send a "0". The scene numbers have the numbers from 1 to 64, but the values for the scenes only from 0 to 63.

If you want to call scenes by a binary input or another KNX device, you have to set the same number at the calling device as at the receiving device. The calling device, e.g. a binary input, sends automatically the right value for calling the scene.

There are up to 8 storage options for scenes at every channel.

Learn scene not active active

Scene A not active active

Scene number

Behavior of scene

Scene B not active active

Scene C not active active

Scene D not active active

Scene E not active active

Scene F not active active

Scene G not active active

Scene H not active active

These 8 storage options can get any of the possible 64 scene numbers.

Illustration 32: Sub function scene

The chart shows the possible settings for scenes, which are identical for all channels. The settings are available at the sub menu for the scenes:

ETS-text	Dynamic range [default value]	Comment
Learn scene	<ul style="list-style-type: none"> • not active • active 	not active : The Learn scene function is not enabled Object Value corresponds to DPT17.001 scene number. active : Enable the Learn scene feature. Object Value corresponds to DPT 18.001 scene control.
Scene A	<ul style="list-style-type: none"> • not active • active 	Whether to enable the setting of scene A
	<ul style="list-style-type: none"> • Scene number : 1-64 • Behavior of scene : off / on / lock / unlock 	Note about the behavior of scene: Behavior of scene = unlock · When the corresponding Scene number is received, the channel is at lock state (locked by the lock object), then the Scene Object can release the lock state of the channel.

ETS-text	Dynamic range [default value]	Comment
Scene H	<ul style="list-style-type: none"> • not active • active 	<p>Whether to enable the setting of scene H.</p> <p>Supports up to 8 scene settings at every channel.</p>
	<ul style="list-style-type: none"> • Scene number : 1-64 • Behavior of scene : off / on / lock / unlock 	

3.4.5 Threshold switch

The following illustration shows the setting options at the ETS-Software:

Value setting	1Byte percent value (0-100%) ▼
Behavior of Channel at lower deviation	not active ▼
Behavior of Channel at exceedance	not active ▼

The chart shows all possible settings operation hours counter function:

ETS-text	Dynamic range [default value]	Comment
Value setting	<ul style="list-style-type: none"> • 1 Byte percent value(0-100%) • 1 Byte value(0-255) • 2 Byte value(0-65500) • 2 Byte temperature value(-100-250) • 2 Byte brightness value(0-100000Lux) 	Threshold setting, 5 types of threshold
Behavior of Channel at lower deviation	<ul style="list-style-type: none"> • not active • off • on 	Behavior of Channel at lower threshold
	<p>Lower threshold < :</p> <ul style="list-style-type: none"> • 0-100% • 0-255 • 0-65500 • -100~250°C • 0-100000 Lux 	<p>Threshold setting: five threshold ranges correspond to the above five threshold types</p> <p>Threshold comparison: compare to the value sent by the "Threshold switch" Object.</p> <p>If the value sent by the "Threshold switch" Object is less than the threshold, the action set by "Behavior of Channel at lower deviation" is executed.</p>
Behavior of Channel at exceedance	<ul style="list-style-type: none"> • not active • off • on 	Behavior of Channel at higher threshold

ETS-text	Dynamic range [default value]	Comment
	Upper threshold> : <ul style="list-style-type: none"> • 0-100% • 0-255 • 0-65500 • -100~250°C • 0-100000 Lux 	Threshold setting: five threshold ranges correspond to the above five threshold types Threshold comparison: compare to the value sent by the "Threshold switch" Object. If the value sent by the "Threshold switch" Object is less than the threshold, the action set by "Behavior of Channel at exceedance" is executed.

3.4.6 Operation hours counter function

The following illustration shows the setting options at the ETS-Software:

Type of operation hours counter operation hours counter
 reverse counter to the service

Select data type 4Byte value in s (DPT 13.100)
 2Byte value in h (DPT 7.007)

Send status of operation hours every(0=not active) h

Send operation hours smaller cyclic

The chart shows all possible settings Operation hours counter function:

ETS-text	Dynamic range [default value]	Comment
Type of operation hours counter	<ul style="list-style-type: none"> • operation hours counter • reverse counter to the service 	There are 2 type of operation hours counter <u>operation hours counter</u> : The operation hours counter counts up the operation hours when the relay is closed. Note: After the output channel is set to the ON state, the counting operation time is started. When the output channel is turned OFF, the timing is paused, but the timing is not cleared. After the OFF state, although the timer is paused, the count value is still reported at regular intervals, which is equivalent to the same timer value for each report. ° <u>reverse counter to the service</u> : The reverse counter to service counts from the adjusted service interval to zero when the relay is closed and reports a service message at zero. Note: During countdown, the countdown starts after the output channel is turned ON. When the output channel is turned OFF, the countdown is suspended. When the countdown reaches zero, a service telegram is generated. Please refer to the Database Object Description table.

ETS-text	Dynamic range [default value]	Comment
Select data type	<ul style="list-style-type: none"> • 4Byte value in s(DPT13.100) • 2Byte value in h(DPT7.007) 	Set the data type of the uploaded telegram
operation hours counter	Send status of operation hours every (0=not active): 0 -10000 h	Upload "operation hours counter" counting value regularly in "hours" time units
	Send operation hours small cyclic: <ul style="list-style-type: none"> • not active • 10min • 20min • 30min 	Upload operation hours counting value regularly in smaller time units
reverse counter to the service	Send status of Service hours every (0=not active) : 0-10000h	Upload the count down the remaining time value of "reverse counter to the service" regularly in "hours" time units
	Send service status at intervals: 0-60000h	Start value of Countdown

3.5 Staircase

The following parameters, which are described at the headings 4.5.x, are only available at channels selected as staircase.

3.5.1 Overview

By choosing a channel as staircase, a sub menu, called Channel A Staircase, appears for this channel at the left drop down menu.

The sub menu is shown at the following illustration:

Output mode normally open normally closed

Additional switching object not active active

Time of staircase light s

Prewarning

Manual switching off not active active

Extend time staircase light

Time factor for object "Staircase light with time"

Central function not active active

Send state

Send state cyclic(0=not active) s

Additional inverted state not active active

Behavior at locking

Behavior at unlocking Off start time of staircase light

Priority/Forced control

Behavior after bus power up

Behavior after bus power down

Scenes not active active

Illustration 34: Staircase

The chart shows all possible settings for staircase outputs:

ETS-text	Dynamic range [default value]	Comment
Output mode	<ul style="list-style-type: none"> • normally open • normally closed 	Operation mode of the channel
Additional switching object	<ul style="list-style-type: none"> • not active • active 	The Switch Object can controls the On/Off of the Channel and has no staircase time limit.
Time of staircase light	1-30000s	Duration of the switching process
Prewarning	<ul style="list-style-type: none"> • not active • Light on-off • prewarning object • Light on/off and prewarning object 	<p>Prewarning mode setting before the stair light is turned off</p> <p>Note: If set to "prewarning object" or Light on/off and prewarning object" "prewarning object" will send Value=1 after "Time of staircase light "ends. After the Prewarning is over, the "prewarning object" will send Value=0. Declare the end of a complete staircase light action.</p>
	<p>Light on-off</p> <p>Prewarning duration :0 - 30000s</p>	This parameter will be shown when Prewarning is set to the Light on-off and Light on/off and prewarning mode. When stair light operating time is end, it enters a short time to turn off the light. This parameter corresponds to: Light-Off time.
	<p>Light on-off</p> <p>Prewarning time : 0 - 30000s</p>	<p>This parameter will be shown when Prewarning is set to the Light on-off and Light on/off and prewarning mode.</p> <p>After the above Light-Off time is over, Light-On will be restarted. This parameter corresponds to: Light-On time. After the Light-On operating time is over, Output is OFF and the entire process ends.</p>
Manual switching off	<ul style="list-style-type: none"> • not active • active 	Activation of the manual turn off of the staircase
Extend time staircase light	<ul style="list-style-type: none"> • no extend time • restart time • add time 	<p>During the stair light operating time, the stair light is triggered again, the processing mode for time.</p> <p>No extend time: no longer expands the time, it is equivalent to ignore the new trigger.</p> <p>Restart time: restart counting time</p> <p>Add time: superimpose the remaining Light On time to the new stair light on time.</p>
Time factor for object "Staircase light with time"	<ul style="list-style-type: none"> • 1s • 10s • 1min 	The time value sent by the Object "Staircase light with time", the time unit corresponding to it. For example, if Object Value=10 and Time factor is set to "0s" it means that the lighting time of Staircase light is 10*10=100s.
Central function	<ul style="list-style-type: none"> • notactive • active 	Set whether this channel is responsive to central function's unified control

ETS-text	Dynamic range [default value]	Comment
Send state	<ul style="list-style-type: none"> • no send • at change • at change and lock • always at input of telegram 	Set whether to send the telegram of "Status" no send : at change : Sent when the current output status changes at change and lock : Sent when the current state changes or during lock For related explanations, refer to the previous Switch mode.
Send state cyclic (0=not active)	0~30000s	Set whether to send "Status" telegram periodically.
	Additional inverted state : <ul style="list-style-type: none"> • not active • active 	If the Additional inverted state is activated, the message "inverted state" is sent.
Behavior at locking	<ul style="list-style-type: none"> • off • on • no change 	Action for activating the blocking process.
Behavior at unlocking	<ul style="list-style-type: none"> • off • start time of staircase light 	Action for deactivating the blocking process
Priority/Forced control	<ul style="list-style-type: none"> • not active • 2 Bit force control • 1Bit priority On • 1Bit priority Off 	2 bit force control : 00/01 No Control , "10"priority , Off ; "11"-priority , On 1 bit Priority On : "1"enabled ; "0"removed 1 bit Priority Off : "1"enabled ; "0"removed For related explanations, refer to the previous Switch mode.
	Release time for forced control (0=not active) : 0-600min	0 : indicates that the forced control is always valid unless an Object message is received to release the command; 1-600min : Forced control maintains the setting range of time. When the time is end, the forced control is automatically removed. For related explanations, refer to the previous Switch mode.
	Behavior after forced control: <ul style="list-style-type: none"> • off • Start time of Staircase Light 	OFF : Output channel is set to OFF state Start time of Staircase Light : After the forced control is over, the output channel will execute a complete Staircase Light process.

ETS-text	Dynamic range [default value]	Comment
Behavior after bus power up	<ul style="list-style-type: none"> • off • start time of staircase light • state before bus power down 	<p>bus power up, the actuator will execute the corresponding action type on the relay output channel Off : Output channel is set to OFF state</p> <p>start time of staircase light : Start stair light output</p> <p>state before bus power down : Restore the state before power down. If the staircase light output=ON state before power failure, the complete output flow of the staircase light will be executed after power-on; if the staircase light output=OFF state before power failure, the action will not be performed after power-on, only report it. State.</p>
Behavior after bus power down	<ul style="list-style-type: none"> • off • on • no change 	<p>If bus power down is detected, the actuator will perform the corresponding action on the relay output.</p>
Scenes	<ul style="list-style-type: none"> • not active • active 	<p>Whether to activate the scene function.</p> <p>The scene function settings of Staircase Light are the same as those of Switch mode.</p> <p>The difference is:</p> <p>"On" \ "Off" in Behavior of Scene</p> <p>"On" means to start the Staircase Light process "Off" means to turn off the Staircase Light output (Manual switching off is required to be Active)</p>

3.5.2 Staircase time

The following illustration shows the setting options at the ETS-Software:

Illustration 35: Staircase time

The staircase function is activated by choosing a channel as staircase. This function enables an automatic turn off of the channel after an adjusted time, called "time for staircase". The time for staircase can be parameterized freely. By sending an "on-signal" at the communication object, the channel is switched on and the time runs out. After the time is ran out, the channel is switched off automatically. There are a lot of further functions to adjust the staircase function. These functions are described at the following segments.

The following chart shows the relevant communication object:

Number	Name	Length	Usage
18	Staircase	1 Bit	Calling of the staircase function

Chart 45: Communication object staircase

3.5.3 Scenes (Staircase Light)

ETS-text	Dynamic range [default value]	Comment
Learn scene	<ul style="list-style-type: none"> • not active • active 	<p>not active : The Learn scene function is not enabled Object Value corresponds to DPT17.001 scene number.</p> <p>active : Enable the Learn scene feature. Object Value corresponds to DPT 18.001 scene control.</p>
Scene A	<ul style="list-style-type: none"> • not active • active 	Whether to enable the setting of scene A
	<ul style="list-style-type: none"> • Scene number : 1-64 • Behavior of scene : off / on / lock / unlock 	<p>Note about the behavior of scene: Behavior of scene = unlock · When the corresponding Scene number is received, the channel is at lock state (locked by the lock object), then the Scene Object can release the lock state of the channel.</p> <p>Note: When Behavior of scene = ON, the function is to trigger the Staircase light to start. When the Behavior of scene = OFF, you need to set "Manual switching off" to Active to close the Staircase light process.</p>

Scene H	<ul style="list-style-type: none"> • not active • active 	Whether to enable the setting of scene H. Supports up to 8 scene settings at every channel.
	<ul style="list-style-type: none"> • Scene number : 1-64 • Behavior of scene : off / on / lock / unlock 	

3.6 Switch impulse

The following illustration shows the setting options at the ETS-Software:

Output mode normally open normally closed

Impulse time

Repeat impulse signal once not active active

Behavior at locking Off no change

Behavior at unlocking Off switch impulse

There are some functions to adjust the Switch impulse function. These functions are described at the following segments.

ETS-text	Dynamic range [default value]	Comment
Output mode	<ul style="list-style-type: none"> • normally open • normally closed 	<p>Normally open : relay contact is normally open. Impulse is relay contact closure</p> <p>Normally closed : relay contact is normally closed. Impulse is relay contact open</p>
Impulse time	<ul style="list-style-type: none"> • 300ms • 400ms • 500ms • 750ms • 1s • 1.5s • 2s • 3s • 5s • 7.5s • 10s • 15s • 20s • 25s • 30s 	<p>Impulse pulse width, it means the time of the relay contacts are closed (or separated)</p> <p>If the output mode set as normally open, this time is the relay contact closure time.</p> <p>If the output mode set as normally closed, this time is the relay contact separation time.</p>
Repeat impulse signal once	<ul style="list-style-type: none"> • not active • active 	Set whether to activate the function of repeat impulse signal output once.
	<p>Time to the next impulse:</p> <ul style="list-style-type: none"> • 0.5s • 0.75s • 1s • 1.5s • 2s • 3s • 5s • 7.5s • 10s • 15s • 20s • 25s • 30s 	After the current Impulse output ends, the interval of the next Impulse which is repeated
Behavior at locking	<ul style="list-style-type: none"> • off • no change 	<p>Set the action of the output channel to enter the "locking" state</p> <p>Off: The output channel turns OFF. If impulse is being output, it will be interrupted;</p> <p>no change: the output channel is locked in the current output state</p>
Behavior at unlocking	<ul style="list-style-type: none"> • off • switch impulse 	<p>Set the action when the output channel returns to the "unlocking" state.</p> <p>Off: the output channel becomes OFF;</p> <p>switch impulse : output channel executes an impulse output process</p>

3.7 Heating Control with PWM

The following illustration shows the setting options at the ETS-Software:

Valve type not energized closed not energized opened

PWM cycle min

Emergency mode monitoring time

There are several functions to adjust the Heating Control with PWM function. These functions are described at the following segments.

ETS-text	Dynamic range [default value]	Comment
Valve type	<ul style="list-style-type: none"> • not energized closed • not energized opened 	<p>not energized closed : corresponding to Output On for relay contact</p> <p>not energized opened : corresponds to Output On for relay contact separation</p>
PWM cycle	0-255min	<p>Set the cycle of the PWM. The value of the Object "Control Value" is as the PWM duty cycle and it the time of output On.</p> <p>For example: When set cycle=10min and Object "Control Value"=75%,The Output On time is 7.5min, Switch Off is 2.5min</p>
Emergency mode monitoring time	<ul style="list-style-type: none"> • not active • 10min · 20min · 30min • 1h · 2h · 3h · 4h 	<p>Monitoring time setting for emergency mode. In normal conditions, the Object "Control Value" needs to send to the actuator periodically. When the system fails to receive the Object "Control Value" periodically, the "Emergency mode" can play a protective function.</p> <p>When "Emergency mode" is active, the setting value here is the monitoring time. If the Object "Control Value" is not received beyond the monitoring time, it will automatically enter "Emergency mode". At this time, the duty cycle value of the PWM output is determined by the following one.</p> <p>Note: If the setting value of "Emergency mode monitoring time" is larger than the setting value of "PWM cycle", the actuator will not send "State Emergency Mode" Object.</p> <p>For example: PWM cycle=9min, Emergency mode monitoring time=10min.</p>
	control value for emergency mode:0%-100%	<p>The duty cycle value of the PWM output after entering "Emergency mode".</p> <p>For example: PWM cycle=10min, where is set 20%, after entering "Emergency mode", the duty ratio of PWM output is $10 \times 20\% = 2\text{min}$.</p>

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