

# ATTACHMENT SWITCH ACTUATOR KNX-503-72-IN



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## 1. OVERVIEW

### 1.1. FUNCTIONS

#### Switch output function:

The following functions are applicable to each output channel (see table below). The number of channels depends on the product design.

For example: 1, 2, 3 channel. The channel can set three different states:

#### Prohibition (No Active)

The channel does not work, the channel related objects are not visible in the ETS;

#### Switch (Switch)

The channel work is in the switching mode, and there are various parameters to control the processing mode of the switch.

#### Staircase (Staircase)

The channel works in the corridor lighting mode, and the difference between the switching mode and the switch mode is that the channel will be closed automatically after working to a set time.

#### General interface functions:

The following functions are applicable to all common interface channels.

Additionally, two logical functions are supported.

The corresponding functions of each channel are as follows:

##### disabled

This option indicates that the current channel has no function and does not respond to it;

##### enabled

This option represents the current channel to enable relevant functions;

#### Channels grouped

This option indicates that two adjacent channels are used as a combination;

#### Channels unique

This option indicates that two adjacent channels are used independently;

#### Overview functions:

Switch output function preview table:

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
	retriggerable on/off
Superordinate functions	blocking function
	logic functions (AND/OR)
Scenes	scene function for up to 8 scenes per channel
Status functions	feedback function
Current measurement	single current measurement of each channel
	warning and error messages adjustable
	total current measurement of the whole device
Operating hours counter	forward counter of the operating hours
	back counter to next service time

General interface function preview table:

Debounce time	10-120ms, selectable in steps
Time for keystroke long	0,1-30s, selectable in steps
Enter the internal pull	Able/Forbid
Double key dimming function	Dim
Double key shutter function	Up/Down
Double key switch function	Power on/Power off
Single key switch function	Switch function
	Toggle function
	State function
	Delay function
	Edge delay sending function
	Mandatory setting function
	Sending value function
Scene function	memory function
	Scene selection
Counter function	Edge delay detection
	Step threshold settin
Switch short/long	On-/Off-/toggle function
	short/long independent parameterize able
One button dimming	steps of dimming telegram repetiti
One button shutter	shutter function with only one button
Logic functions AND-function	switching function
	scene function
	inverting
Logic functions: OR-function	switching function
	scene function
	inverting

## 2. COMMUNICATION OBJECTS

Numl	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	Channel A	Switch On/Off			1 bit	C	-	W	-	-	switch	Low
2	Channel A	Block			1 bit	C	-	W	-	-	enable	Low
4	Channel A	Scene			1 byte	C	-	W	-	-		Low
5	Channel A	State			1 bit	C	R	-	T	-		Low
6	Channel A	Logic 1			1 bit	C	-	W	-	-	boolean	Low
7	Channel A	Logic 2			1 bit	C	-	W	-	-	boolean	Low
8	Channel A	Response operating hours			2 bytes	C	R	-	T	-		Low
9	Channel A	Reset operating hours			1 bit	C	-	W	-	-	switch	Low
19	Channel B	Staircase			1 bit	C	-	W	-	-	switch	Low
20	Channel B	Block			1 bit	C	-	W	-	-	enable	Low
23	Channel B	State			1 bit	C	R	-	T	-		Low
26	Channel B	Response operating hours			2 bytes	C	R	-	T	-		Low
27	Channel B	Reset operating hours			1 bit	C	-	W	-	-	switch	Low
78	Central function	Switch On/Off			1 bit	C	-	W	-	-	switch	Low

Communication below shows the channel generic objects, they can through the corresponding parameters can make. Each channel takes up 18 number, but not necessarily all number will allocate objects. The first channel takes up Numbers 0-17, 18-35 and so on. The second takes design engineering need to use when object allocation group address.

The following figure shows some objects of channel A and B. In which channel A is selected as the normal switch, with logic and locking function. Channel B is selected as the corridor lighting, with locking function:

The following communication objects can be shown for a channel selected as switch:

Nr.	Function	Usage	Data	
0	Switch on/off	switches the channel on/off	DPT 1.001	In, Write
2	Block	blocks the channel	DPT 1.001	In, Write
4	Scene	calls activated scenes	DPT 18.001	In, Write
5	Status	feedback function	DPT 1.001	Out, Read
6	Logic 1	only shown at activated logic function	DPT 1.001	In, Write
7	Logic 2	only shown at activated logic function	DPT 1.001	In, Write
+8	next channel			



The following communication objects can be shown for a channel selected as staircase:

Nr.	Function	Usage	Data	
1	Staircase	switches the staircase function on/off	DPT 1.001	In, Write
2	Block	blocks the channel	DPT 1.001	In, Write
5	Status	feedback function	DPT 1.001	Out, Read
+8	next channel			

## 2.1. COMMUNICATION OBJECTS CURRENT MEASUREMENT

The following communication objects are available for the current measurement and counting of the operating hours:

Nr.	Function	Usage	Data point type	
8	Response operating hours	reports counted operating hours	DPT 7.007	Out, Read
8	Time to the next service	reports time to the next service	DPT 7.007	Out, Read
9	Reset operating hours	resets counter for the operating hours	DPT 1.001	In, Write
9	Reset service	resets the counter for the service time	DPT 1.001	In, Write
10	Service required	reports required maintenance	DPT 1.001	Out, Read

## 2.2. CENTRAL COMMUNICATION OBJECT

The total control object is valid at any time. And there is only one in the whole project. The number is related to the number of channels. The communication of the total control object will be valid for all channels that enable the total control function.

Nr.	Function	Usage	Data type	
78	Central function	Open/close all channels that enable the total control function	DPT 1.001	In, Write

## 2.3. DEFAULT SETTINGS OF THE COMMUNICATION OBJECTS

The following chart shows the default settings for the communication objects:

Default settings										
NO.	Channel/Input	Function	Length	Priority	C	R	W	T	U	
0	Channel A	Switch on/off	1 Bit	Low	x		x			
1	Channel A	stairway	1 Bit	Low	x		x			
2	Channel A	Locking	1 Bit	Low	x		x			
4	Channel A	Scene	1 Bit	Low	x		x			
5	Channel A	Condition	1 Bit	Low	x	x		x		
6	Channel A	Logic 1	1 Bit	Low	x		x			
7	Channel A	Logic 2	1	Low	x		x			
8	Channel A	Working time counter	2Byte	Low	x	x		x		
8	Channel A	Next service time	2Byte	Low	x	x		x		
9	Channel A	Reset counter	1 Bit	Low	x		x			
9	Channel A	Reset the next service time	1 Bit	Low	x		x			
10	Channel A	Service request	1 Bit	Low	x	x		x		
+18	Next input									
78	Global function	on/off	1 Bit	Low	x		x			

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.

## 2.4. ONLINE STATE OBJECT

The online status object indicates that the device is running normally on the bus and actively sending the status.

Nr.	Function	Usage	Data type	
79	Online	Active sending device online status	No	Out, Read

## 2.5. THE OBJECT OF THE GENERIC INTERFACE CHANNEL

Each channel has its corresponding five object Numbers, which in turn are channel

A: 80-84; Channel B: 85-89; Channel C: 90-94; Channel D: 95-99;

The object location will be permanently occupied and will not change due to schema changes.

These are the available objects for each channel:

Nr.	Function	Usage	Data type	
80	Switch	edge control	DPT 1.001	Out, Read
80	Send forced setting	force control/switch	DPT 2.001	Out, Read
80	Shutters down/up	driving of shutters	DPT 1.008	Out, Read
80	Dimming on/off	toggling of the dimming lights	DPT 1.001	Out, Read
80	Switch on/off	two button switching	DPT 1.001	Out, Read
80	Reset counter	reset the counter value	DPT 1.001	In, Write
80	Send value	sends the parameterized value	DPT 5.001	Out, Read
80	Push button short	sends action for short keystroke	DPT 1.001	Out, Read
81	Value for toggle	edge control with toggle function	DPT 1.001	In, Write
81	Stop/Blinds open/close	driving of the blinds/ stopping movement of the shutters	DPT 1.009	Out, Read
81	Dimming	dimming	DPT 3.007	Out, Read
82	Scene	scene control	DPT 18.001	Out, Read
82	Value for change of direction	reversal of direction for shutters	DPT 1.001	Out, Read
82	Push button long	sends action for long keystroke	DPT 1.001	Out, Read
83	Counter	counting	DPT 12.001	Out, Read
84	Blocking object	blocks the related channel	DPT 1.001	In, Write
+5	Next channel			
122	LED output A	turn LED	DPT 1.001	Out, Read

## 2.6. COMMUNICATION OBJECTS LOGIC

Each device has two logical function, each logical function is equipped with two logical input object, a logic output object, and you can choose any channel to participate in the logical operation, end object Numbers from 110 to 110.

The following communication objects for the logic can be shown:

Nr.	Function	Usage	Data type	
110	Logic input 1A	Logic input	DPT 1.001	In, Write
111	Logic input 1B	Logic input	DPT 1.001	In, Write
112	Logic input 1	Logic input	DPT 1.001	Out, Read
112	Logic output 1 Scene	Logic output scene	DPT 18.001	Out, Read
112	Logic output 1 Value	Logical 1 output value	DPT 5.010	Out, Read
113	Logic input 2A	Logical 2 input A	DPT 1.001	In, Write
114	Logic input 2B	Logic 2 input B	DPT 1.001	In, Write
115	Logic output 2	Logical 2 output	DPT 1.001	Out, Read
115	Logic output 2 Scene	Logical 2 output scenario	DPT 18.001	Out, Read
115	Logic output 2 Value	Logical 2 output value	DPT 5.010	Out, Read

110	Logic	Input 1 A	1 bit	C	-	W	T	U	boolean	Low
111	Logic	Input 1 B	1 bit	C	-	W	T	U	boolean	Low
112	Logic	Output 1	1 bit	C	R	-	T	-	switch	Low
113	Logic	Input 2 A	1 bit	C	-	W	T	U	boolean	Low
114	Logic	Input 2 B	1 bit	C	-	W	T	U	boolean	Low
115	Logic	Output 2	1 bit	C	R	-	T	-	switch	Low



### 3. REFERENCE ETS — PARAMETER

#### 3.1. GENERAL SETTINGS

The following figure is the global parameter:

Startup timeout	1 s
Send "In operation" object	No
Mode of functioning of inputs	<input checked="" type="radio"/> inputs acting on switching outp. (IA->OA... <input type="radio"/> inputs acting separately on bus
Signal control of the inputs	push button (rising = TOGGLE; falling = ---)
Debounce Time [ms]	30 ms
Time for keystroke long [s]	0,8 s
Behavior of status response(Output)	after change
Inputs Type(only used to input pins)	<input type="radio"/> DisablePullup <input checked="" type="radio"/> EnablePullup
Behaviour at Bus power up(input)	<input checked="" type="radio"/> No read value for toggle <input type="radio"/> Read value for toggle

The following table parameters:

ETS-text	Dynamic range [default value]	comment
Startup timeout	1-60s [1s]	After the timeout parameter is started, after the device waits for the parameter to be set, The application function is valid.

The General Settings:

Send "In operation" object	No Send value "0" cyclic Send value "1" cyclic	Send the "In operation" object to the bus reporting device to run normally, and the periodic send value can be selected "0" or "1".
Send cycle time in s[1... 65535]	1-65535s [60]	Send the "In operation" object cycle time setting.
Mode of functioning of inputs	Inputs acting on switching outp.(IA->OA/IB->OB/IC->OC) Inputs acting separately on bus	Signal input function mode selection, optional signal input directly ACTS on the output channel (local control), or signal input ACTS as binary input on the bus
Signal control of the inputs	push button (rising = TOGGLE; falling = ---) switch (rising = ON; falling =OFF) switch (rising = TOGGLE; falling = TOGGLE)	When selecting the signal input directly acting on the output channel (local control), the control function of the input signal can be selected.
Debounce time	10-120ms [30]	Signal input buffering time, optional 10ms, 30ms, 60ms and 120ms
Time for keystroke long	0.1-30s [0.8s]	Long button determination time (longer button when the value is greater than the value), it is necessary to determine the value when the length key is distinguished.
Behavior of status response(Output)	after change always no, updated only	Output channel switching state response condition, can choose "send after change", "always send" or "do not send, only update state"
Input Type (only used to input pins)	Disable Pullup Enable Pullup	Select "no pull-up" or "enable pull-up" in the input channel.
Behavior at bus power up	No read value for toggle Read value for toggle	Whether the rollover value is read when the device is reset, default is 0.

#### INPUT PARAMETER DESCRIPTION:

Mode of functioning of inputs.

The concealed switch actuator is equipped with 3 extended inputs, whose functions depend on the parameterized configuration:

1. It can be directly applied to the switching output (local control);
2. As binary input on the EIB/KNX bus.

#### Inputs acting on switching out. (IA->OA/IB->OB/IC->OC)

In local control mode, the input A (1) on the channel output, A type B (2) on the output channel B, type C (3) the effect on the output channel C and type D (4) no effect. According to the parameter "Signal control", Signal operation can be defined. The output response of the relay is shown in the following table:

Signal edge control	The input contact	Model	Relay switching status
push button (rising = TOGGLE; falling = ---)	Close (up edge) Open (down edge)	Normally open/normally closed Normally open/normally closed	Contact toggle* No action
switch (rising = ON; falling = OFF)	Close (up edge) Open (down edge)	Normally open Normally open	Contact open Contact close
	Close (up edge) Open (down edge)	normally closed normally closed	Contact open Contact close
switch (rising=TOGGLE; falling= TOGGLE)	Close (up edge) Open (down edge)	Normally open/normally closed Normally open/normally closed	Contact toggle* Contact toggle*

\* The object value of the toggle object is flipped, the normally open contact (n.o.) is closed at "1" and opened at "0", and the normally closed contact (n.c.) is closed at "0" and opened at "1".

For direct local control, the extended input does not have its own parameters, so the input parameter record is invalid.

#### Inputs acting separately on bus

The input signal of the switch actuator is independent of the switch output and independent of the EIB/KNX bus.

According to the parameters configuration, each input can be configured "switch", "short press/long press button", "a single bond that move light", "a single bond curtain control" and "counter" and "scene" function, when choosing the "no function", then the corresponding input function have been banned.

When selecting "switch" function, extended object can be through the group address associated with the object of the switch output, therefore, switch actuator can also use your own input signal through the role to bus control actuator output (such as a few actuator control group).

#### Input Type(only used to input pins)

The switch actuator extension input can be configured to enable internal pull-up or to disable internal pull-up function. In order to be compatible with passive signal input and active signal input, it is to enable internal pull-up function by default.

#### Disable Pullup

Internal pull-up function is prohibited, input signal is high level effective, dry contact input, high level input effective range is 3.3V-24VDC;

#### Enable Pullup

Enable internal pull-up function, input signal is low level effective, dry contact input, low level input is lower than 1VDC positive level signal, and is compatible with OC gate input.



### 3.2. CHANNEL SELECTION

The following figure shows the channel selection menu:



There are three different modes to choose from. Each mode has corresponding parameters. "not active" means no pass-through, and the corresponding channel parameters will not be visible.

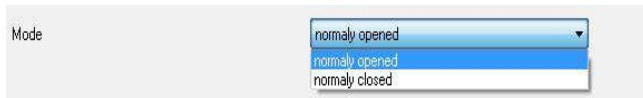
The following figure shows the optional patterns for each channel:

ETS-Name	Dynamic range [default value]	Remark
Channel A-B-C	not active Switch Staircase	Channel mode

### 3.3. GENERAL PARAMETERS

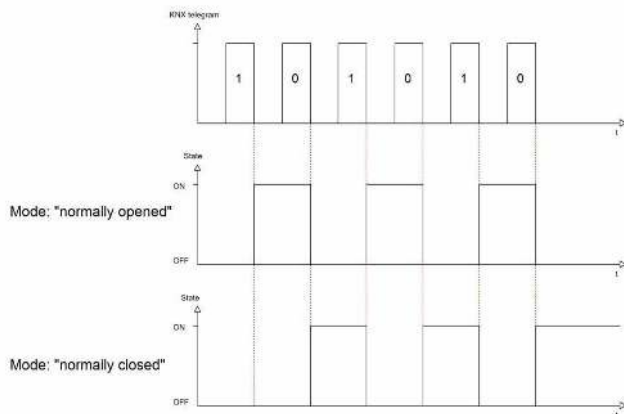
The following parameters are used for both the switching function of the channel and the stair function.

#### 3.3.1. THE WORKING MODE OF THE RELAY IS SHOWN IN THE FOLLOWING FIGURE:



ETS-Name	Dynamic range [default value]	Remark
Mode	normally opened normally closed	Relay mode, normally open mode and normally closed mode

The following figure shows the relay in normally open and normally closed mode, and the signal message is alternate 1,0.



#### 3.3.2. GENERAL CONTROL FUNCTION

The following table shows the range of global function parameters:

Name	Dynamic range [default value]	Remark
Central function	not active active	Enable/disable the corresponding channel of General control function

Each channel can be individually enabled ("active")/("not active") the general control function, when send a message to general control objects, all the function of general control channels will be switched according to the message content, and delay the time delay of parameter Settings are equally effective. The use of general control function can make engineering design more convenient, because multiple channel send a single message can response at the same time.

The following table illustrates general control objects

Number	Length	Usage
Central function	1 Bit	The number of objects under control depends on the number of channels

#### 3.3.3. LOCK/UNLOCK BEHAVIOR

Below is a screenshot of the lock and unlock options in ETS



The following table is optional for locking and unlocking parameters:

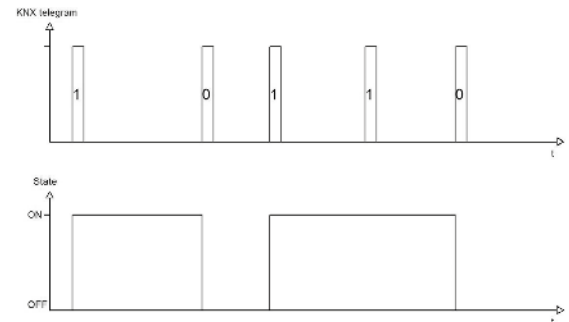
Name	Dynamic range [default value]	Remark
Behavior when locked Behavior when unlocked	On Off no change	Set blocking and nonblocking actions

Lock and unlock function can make and banned by sending a message to the appropriate object 1 or 0. Parameters "behaviors when locked" is used to define. When the channel lock relay action, the options are "on", "off", "no change". The same option applies to the parameter "behaviors when unlocked".

The following table shows the description of the lock/unlock object:

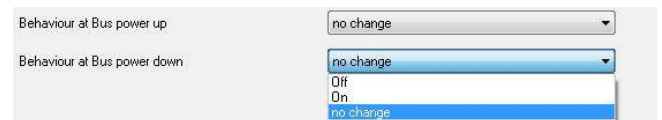
NO.	Name	Length	Use
2	Block	1 Bit	blocks the channel

The stated when the locking and unlocking relay action state, concrete action by the parameter "behaviors when locked" and "behaviors when unlocked" specified:



#### 3.3.4. POWER ON/OFF

The following figure shows the options for the power on/off parameters in ETS:



The following table shows the range of power on/off parameters:

ETS-Name	Dynamic range [default value]	Remark
Behavior at bus power up/ Behavior at bus power down	On Off no change	Set the channel behavior when the device is powered on/off

Device is powered on or power off each channel can be action to a specified state (option on and off), of course, can also maintain the current state of the same options (no change). Considering the bus cannot continues to control the channel status, when the power is set designers should think carefully about the parameter.



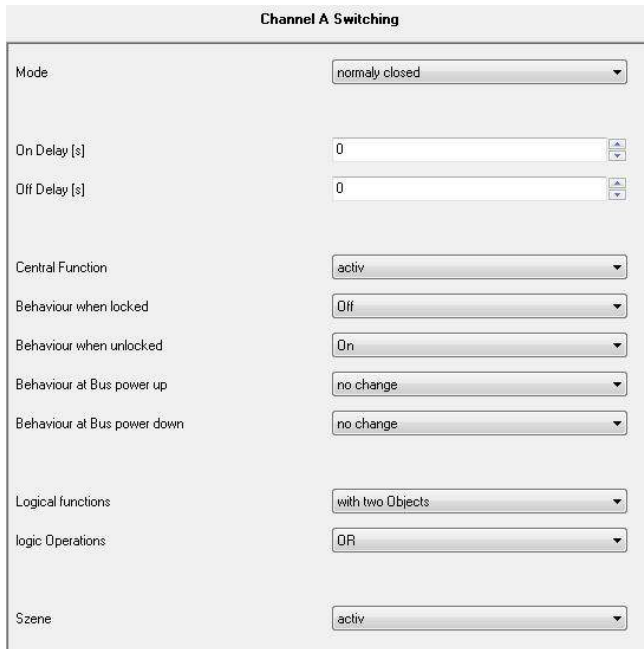
### 3.4. SWITCH OUTPUT

Some of the following parameters are available only when the channel is selected for switch mode.

#### 3.4.1. OVERVIEW

When Channel A is selected as the Switch function, A sub-menu called Channel A Switch will appear accordingly.

The following is a screenshot of the submenu:



The following table shows the parameters available for the channel as a switch function:

Name	Dynamic range [default value]	Remark
Mode	normally opened normally closed	Channel working mode.
On-Delay	0...30000 sec [0=no delay]	Wait delay before opening the relay.
Off-Delay	0...30000 sec [0=no delay]	Wait delay before closing the relay.
Central function	not active active	Activate the global control function of the channel.
Behavior when locked	Off On no change	Specifies the action when the channel is locked.
Behavior when unlocked	Off On no change	Specifies the action to unlock the channel.
Behavior at bus power down	Off On no change	Specifies the action of the bus when it loses power.
Behavior at bus power up	Off On no change	Specifies the action when the bus is energized.
Logic function	not active with one object with two objects	Enable/disable logical functions.
Logic operation	And Or	Select logical operations and/or.
Scene	not active active	Activate the scene function.

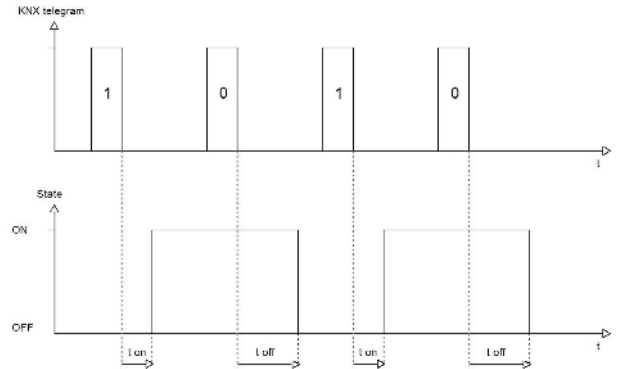
#### 3.4.2. ON/OFF DELAY

The following figure shows the Settings in ETS:



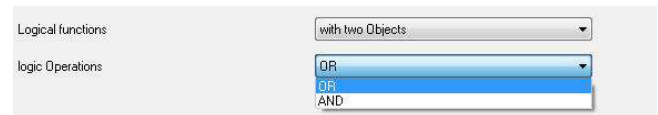
After receiving the open message, the channel will Delay the time specified by the parameter "On Delay", and then actually perform the open action.

The following figure describes the effects of two parameters:



#### 3.4.3. LOGIC FUNCTION

The following figure shows the options in ETS:



Logic functions, there are two logical objects can be enabled, and you can choose "and" or "or" operation. When enabled "and" operation, the logical value of the object to the value of the object and the channel "and" operation, the result is 1 when the opening action. When enabled "or" operation, the logical value of the object to the value of the object and the channel "or" operation, as long as there is an object value is 1, will execute open action.

The following table illustrates two logical objects:

NO.	Name	Length	Use
6	Logical objects 1	1	When only one logical object is enabled, the object is used
7	Logical objects 2	1	When enabling two logical objects, the object is used

According to enabled logical objects, only one or two logical objects are valid.

The following table illustrates the relationship between logical objects:

Logic 1	Logic 2	Is the channel open?	Logic 1	Logic 2	Is the channel open?
0	0	No	0	0	N
0	1	N	0	1	Y
1	0	N	1	0	Y
1	1	Y	1	1	Y

#### 3.4.4. SCENE FUNCTION

When have different functions (such as: turn on the light, dimmer, shutter door) need to be processed at the same time, you usually have to separate message to each of the objects to completion. But there is A scene, it can greatly simplify, usually only need to send A message to invoke A scenario can complete all of the above functions. Than, for example, scenario 1 A corresponding channels open, dimming, channel B channel C shutter door, you can simply call scenario 1 through corresponding group address. So, channel A lamp will be opened, the lamp of channel B was transferred to A brightness, channel C shutter door was transferred to A location, of course, this implies A condition, is the three channels of the scene object should be related to the same group address to achieve the above functions.

Each channel can be individually enabled/prohibited scene features, and each channel has eight scenes available. The scene also has learning function, each pass way of scenario learning function can be individually enabled/ban, if can make and call the learning function of A scene, so called scene value will be updated with the value of the current channel.

The value of the scene object is 1 byte.

The following figure shows the options for the scenario functionality in ETS:



The following table illustrates the relevant scenario objects:

NO.	Name	Length	Use
4	Scene	1 Byte	Call of the scene

For a scenario to be invoked, you simply send the scene value to the appropriate object, with the scenario number range from 1 to 64, but the actual sending value must be 0-63.

Each channel has eight scenario options, each with a scenario selection range of 1-64.

Channel A. Scene	
Save scene	enabled
Scene A	Off
Scene Number A	1
Scene B	Off
Scene Number B	2
Scene C	Off
Scene Number C	3
Scene D	Off
Scene Number D	4
Scene E	Off
Scene Number E	5
Scene F	Off
Scene Number F	6
Scene G	Off
Scene Number G	7
Scene H	Off
Scene Number H	8

The following table illustrates the value selection of the scenario:

ETS-Name	Dynamic range [default value]	Remark
Save scene	Disabled Enabled	Enable/disable learning functions
Scene A	Off On	Activate scenario A
Scene number A	1-64 [1]	Scene; Call value = scenario number-1
Scene B	Off On	Activate scenario B
Scene number B	1-64 [1]	Scene; Call value = scenario number-1
Scene C	Off On	Activate scenario C
Scene number C	1-64 [1]	Scene; Call value = scenario number-1
Scene D	Off On	Activate scenario D
Scene number D	1-64 [1]	Scene; Call value = scenario number-1
Scene E	Off On	Activate scenario E
Scene number E	1-64 [1]	Scene; Call value = scenario number-1
Scene F	Off On	Activate scenario F
Scene number F	1-64 [1]	Scene; Call value = scenario number-1
Scene G	Off On	Activate scenario G
Scene number G	1-64 [1]	Scene; Call value = scenario number-1
Scene H	Off On	Activate scenario H
Scene number H	1-64 [1]	Scene; Call value = scenario number-1





In order to invoke the scene or save the new value to the scene, you must send the call or save the command to the corresponding scene object:

Scene	Call		Save	
	hexadecima	Dez.	Hex.	Dez.
1	0	0	0x	128
2	0	1	0x	129
3	0	2	0x	130
4	0	3	0x	131
5	0	4	0x	132
6	0	5	0x	133
7	0	6	0x	134
8	0	7	0x	135
9	0	8	0x	136
10	0	9	0x	137
11	0	1	0x	138
12	0	1	0x	139
13	0	1	0x	140
14	0	1	0x	141
15	0x0E	1	0x	142
16	0x0F	15	0x	143
17	0	1	0x	144
18	0	1	0x	145
19	0	1	0x	146
20	0	1	0x	147
21	0	2	0x	148
22	0	2	0x	149
23	0	2	0x	150
24	0	2	0x	151
25	0	2	0x	152
26	0	2	0x	153
27	0	2	0x	154
28	0	2	0x	155
29	0	2	0x	156
30	0	2	0x9D	157
31	0x1E	30	0x	158
32	0x1F	31	0x	159

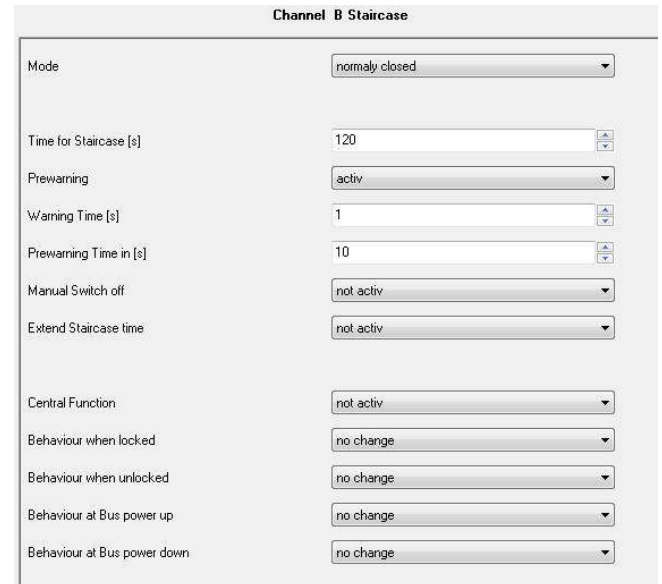
### 3.5. CORRIDOR LIGHTING

The following parameters are useful only when the channel is selected as a floor lighting function.

#### 3.5.1.OVERVIEW

When a channel is selected for the corridor lighting function, a corresponding submenu will appear to set the parameters.

The following figure shows the parameters that can be set:



The following table shows all the parameters that can be used for floor lighting:

Name	Dynamic range [default value]	Remark
Mode	normally opened normally closed	Channel mode selection
Time for staircase [s]	0...65535 sec [120 sec]	Lighting duration
Prewarning	not active active	Activate alarm function
Warning time [s]	0...65535 sec [120 sec]	Warning duration
Prewarning time [s]	0...65535 sec [120 sec]	Open the duration again
Manual switching off	not active active	Enable manual switching off of lighting
Extend staircase time	not active active	Enable lighting to last (when the light is on, if you receive the open command again, continue as specified.
Central function	not active active	Activate global control
Behavior when locked	Off On No change	Controls the action of channel locking
Behavior when unlocked	Off On No change	Controls the action when the channel is unlocked
Behavior at bus power down	Off On No change	Control the action when the power is off
Behavior at bus power up	Off On No change	Control the action of electricity





### 3.5.2. FLOOR LIGHTING TIME

The following figure shows the lighting time options:

**Channel F Staircase**

Mode: normally opened

Time for Staircase [s]: 120 [0..30000]

Prewarning: not activ

The difference between floor lighting and room lighting is that the staircase closes automatically after lighting for a period of time.

The following table shows the communication objects controlling the lighting of the building:

NO.	Name	Length	Use
1	Staircase	1	The floor control invokes the object

### 3.5.3. PRE-WARNING/CAUTION

The following figure shows the pre-warning/Caution

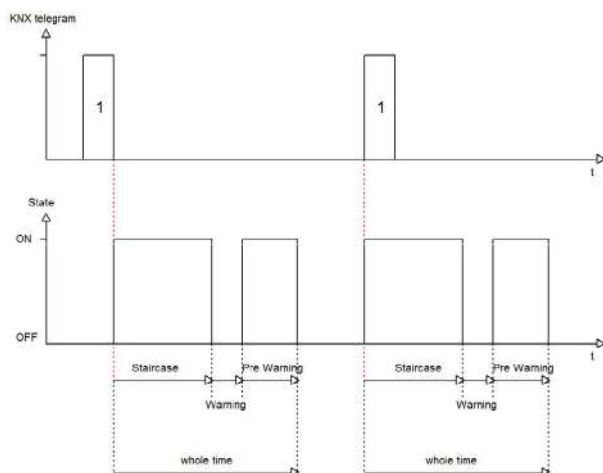
Prewarning: activ

Warning Time [s]: 1 [0..30000]

Prewarning Time in [s]: 10

Warning function can be set parameters "Pre-warning" into "active" can make. Parameters "WarningTime" set the lamp is short temporarily shut down Time, usually set to 1 to 3 seconds, temporarily close the lights can be used to inform the lamp will be closed soon. Parameters "Pre-warning set lamp is once again open to the duration of Time", then the lights will be shut down.

The entire control process of the lamp consists of three parts of time. The following figure shows its composition:



### 3.5.4. MANUAL SWITCH OFF

The following figure shows the manual switch off parameter:

Manual Switch off: not activ, not activ, activ

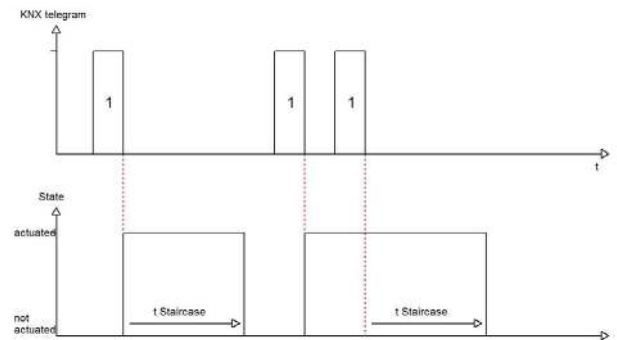
If manual switch off is used, you can close the channel manually without waiting for it to shut down automatically.

### 3.5.5. CONTINUE FUNCTION

The following figure shows the continuation parameters:

Extend Staircase time: not activ, not activ, activ

If the continuation function is activated, during the opening of the channel, if the opening operation is triggered again, the channel will be retimed; otherwise, the retrigger command is invalid. The following figure illustrates the retrigger mechanism:



### 3.6. WORKING TIME

The working timer can be used to time the cumulative time of the channel's work, and it can also be used to calculate the remaining time from the next service request.

#### 3.6.1. WORKING TIMER

The following figure shows the parameters associated with a working timer:

**Channel B Operating hours counter**

Type of operating hours counter: Operating hours counter

Count if: Relay ON

Send status of operating hours every 1 hours: 1 [0..100]

The following table illustrates the parameter selection range of the working timer:

Name	Dynamic range [default value]	Remark
Type of operating hours counter	Operating hours counter	Select timing mode
Count if	Relay ON	Selective timing condition
Send status of operating hours every... hours	0-100 [0h]	Set the time interval for automatically returning the time value of the meter. 0 is prohibited.

The timer can be set to start counting when the channel is open, or when the current is greater than a certain value.

Object "Response operating hours" returns the value of the timer, which is disabled when its parameter value is set to 0. Object "Reset operating hours" is used to reset the value of the timer.

The following table illustrates the relevant timing objects:

NO.	Name	Length	Use
8	Response operating hours	2 Byte	Sending time value
9	Reset operating hours	1 Bit	Set the timer value to 0

#### 3.6.2. COUNTDOWN TIMER

The following figure shows the parameters associated with the countdown:

**Channel B Operating hours counter**

Type of operating hours counter: Reverse counter

Count if: Relay ON

Send status of service hours every 1 [h]: 1 [0..100]

Send signal of service at 1 x10h intervals: 0



The following table illustrates the parameter setting options related to the countdown:

ETS-Name	Dynamic range [default value]	Remark
Type of operating hours counter	Reverse counter	Countdown mode
Count if	Relay ON	Timing conditions
Send status of service hours every ... [h]	0-100 [0h]	Set the sending status message cycle
Send signal of service at ...x10h intervals	0-250 [0h]	Set the service request cycle

The "Send signal of service at" parameter is used to set the interval between sending a service request and, when set to 0, to disable the function. "Send status of service hours every..." is used to set the cycle time of the sending state service. When set to 0, it is forbidden this function.

The following table shows the countdown related objects:

NO.	Function	Length	Use
8	Time to the next service	2 Byte	Send the remaining time from the next
9	Reset service	1 Bit	Reset time service set value
10	Service required	1 Bit	Request a service

### 3.7. INPUT CHANNEL CONFIGURATION

The following figure shows the channel mode selection:

Function Input Type A / B

☒ Channels unique
 ☐ Channels grouped

Function Input A

☒ disabled
 ☐ enabled

Function Input B

☒ disabled
 ☐ enabled

Function Input Type C / D

☒ Channels unique
 ☐ Channels grouped

Function Input C

☒ disabled
 ☐ enabled

Function Input D

☒ disabled
 ☐ enabled

Functional specifications:

The parameter Name	Dynamic range [default value]	Remark
Function Input Type A/B, C/D	Channels unique Channels grouped	Channel working mode: Channels unique means the channel works in independent mode. Channels grouped means that Channels work in combination mode.
Function Input A, B, C, D; Function Input A/B, C/D	disabled enabled	Disabled means the channel is not working; Enabled means the channel enabled to work;

#### 3.7.1. THE INPUT CHANNEL IS CONFIGURED WITH THE SAME PARAMETERS

##### 3.7.1.1. Blocking Object

Each channel can activate the blocking function, and each channel function has its own blocking object.

The following is the object description:

NO.	Name	Length	Use
84	Blocking object	1bit	When the value 1 is received, the channel is blocked (the channel will no longer generate any action) and the value 0 returns to normal

### 3.8. COMPOSITE PATTERN PARAMETER CONFIGURATION

The following table is the group mode parameter option:

Parameter Name	Dynamic range [default value]	Remark
Input A/B	<b>Dimming</b> Shutter Switch	Work mode selection: dimming, curtain, switch
Dimming function A/B	<b>Brighter/Darker</b> Darker/Brighter	Set the dimming mode, the former is A, the latter is B
Shutter function A/B	<b>Up/Down</b> Down/Up	Set curtain control, the former is A, the latter is B
Switch function A/B	<b>On/Off</b> Off/On	Set the switch mode, the former is A, the latter is B
Blocking Object	<b>Inactive</b> Active	Set the blocking function and disable by default

When selecting composite mode, the adjacent two channels will be configured to combine functions.

#### 3.8.1. DIMMING CONTROL

The two-key dimming function works in combination mode.

The following figure is the parameter option:

Input A / B

Input A / B

Dimming

Dimming Function A / B

Brighter/Darker

Blocking Object

Inactive

Parameters Description:

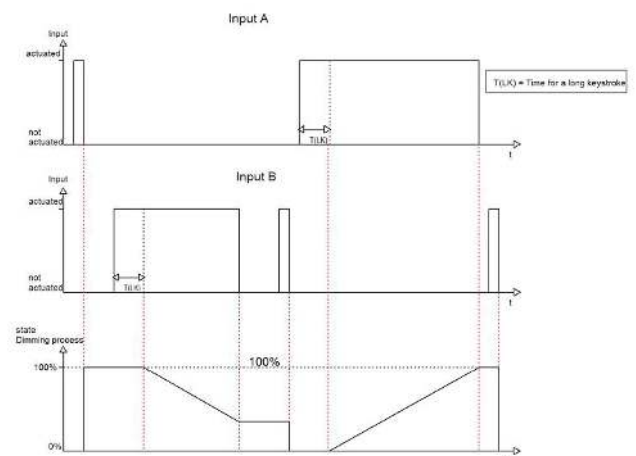
NO.	Name	Length	Use
80	Dimming on/off	1-bit	Switch function, short button effective.
81	Dimming	4-bit	Dimming function, long button effective.

When a set of channels is configured with dimming function, two objects will appear, one 1-bit object corresponding to the short button, used to control the opening and closing, and one 4-bit object corresponding to the long button, used to control the dimming.

Brighter/part or part/Brighter optional configuration, the former corresponds to the first input, the latter corresponding to the second input.

For example: A channel to be Brighter/part A/B, the channel A is the bright, channel B is dim. Short key channel A direct lights, channel B, shut the lights directly. Long keys, channel A move bright light according to the set time is slow, slow channel B dim the lights. Long keys that move light, midway at any time to loosen keystrokes, stop that move light, light to keep the current brightness, light will continue to be from when former brightness starts to adjust. The brightness will not change when the brightness reaches the maximum or minimum.

The picture below shows two channels of dimming:



Input A / B: Shutter

Shutter Function A / B: Up, Down

Operation function: Long=move / short=stop/slats

Blocking Object: Inactive

When curtain of channel A/B is configured to control, and parameter selection Up/Down, the long press A button, the device will send A signal, the curtain will move Up, long press B button, the device will send A 1 signal, the curtain will move Down. Short press A or B will be sent to stop signals. If the parameter selection Down/Up, the function of A/B swap. If the operation mode selection for short = move/long = stop/slats, the short keys that move light, long button to stop.

### 3.8.2. SWITCH CONTROL

Switch control can be realized when two channels are configured in switch mode.

Input A / B: Switch

Switch function A / B: on / off

Blocking Object: Inactive

When channel A/B is configured in combination switch mode and the parameter On/Off is selected, press A to send 1 signal and press B to send 0 signal.

## 3.9. INDEPENDENT SCHEMA PARAMETER CONFIGURATION

7 functions can be selected when the channel works:

- Switch
- Switch short/long
- One button dimming
- One button shutter
- Counter
- Scene
- LED output

Where Inactive is the channel disabled, the parameters corresponding to the channel are no longer displayed.

### 3.9.1. SWITCH

The switch function can respond to different key movements (press down, release) and delay sending function.

When a sub-option is selected, will appear more other parameter options, see the following sections for parameter description.

The switch function options are as below:

Input C: Switch

Subfunction: Toggle falling edge

Blocking Object: Inactive

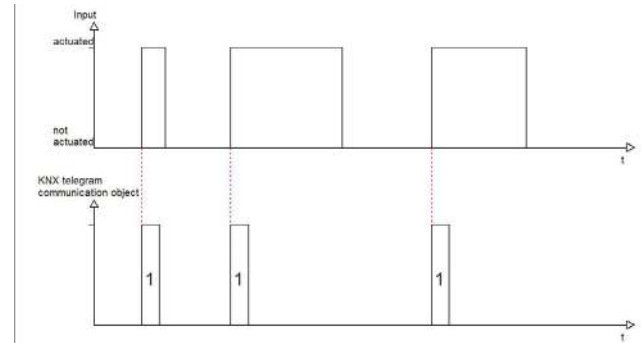
### 3.9.1.1. Switch Falling Edge/Rising Edge/Both Edge

Edge configuration parameter table:

Parameter Name	Dynamic range [default value]	Remark
Value for rising/falling edge	On Off	Open/close at will with press/release

When the channel selects the edge delay Switch rising edge or Switch falling edge, an On or Off signal is sent under the corresponding action.

The following figure shows the effect of channel configuration as Switch rising edge to send On signal:



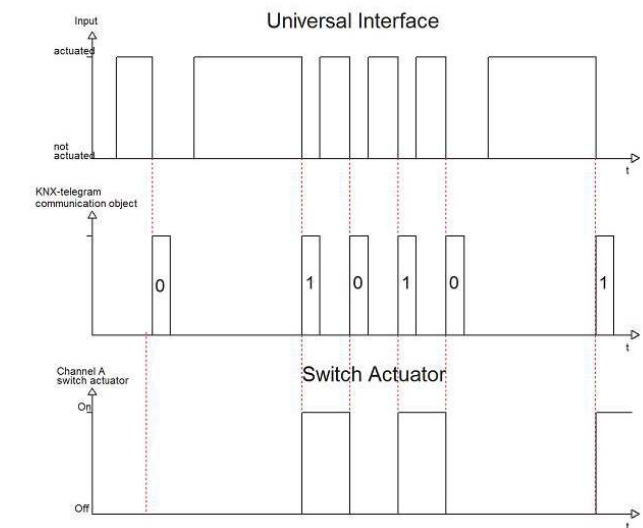
The following table is the corresponding communication object:

NO.	Name	Length	Use
80	Switch	1-bit	Press the button to send the corresponding signal, long press/short press will not affect.

### 3.9.1.2. Toggle rising/falling edge

The channel can be configured to toggle up (press down) or down (release) the toggle output. Each toggle is based on the last State feedback, which means that the Value for toggle must be associated with the target State object to work properly.

The following figure shows the channel configured with drop delay (release) and toggle function:



The following table is the corresponding communication object:

NO.	Name	Length	Use
80	Switch	1-bit	Press the button to send the corresponding signal, long press/short press will not affect.
81	Value for toggle	1-bit	Connect the status object, which reflects the current state of the target, for the toggle function.

Object Value for toggle is related to the normal implementation of the toggle function, so it must be connected to the state object of the target channel. If there is no target object, it should be connected to the Switch object of this channel.



### 3.9.1.3. Send Status

When the channel is configured as a Switch and the Send Status function, the channel can send the set value in the ascending or descending delay. The configuration diagram is shown below:

Function	Switch
Subfunction	Send Status
Value for rising edge	On
Value for falling edge	Off
Blocking Object	Inactive
Behaviour at Bus power up	send nothing
Send cyclic activ	Off

Parameter Description:

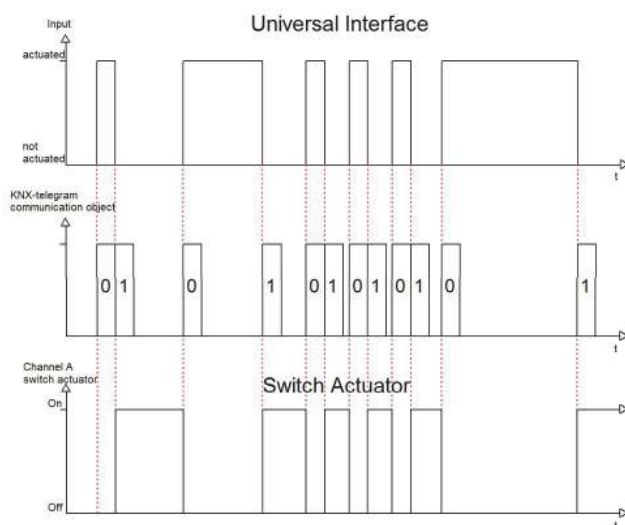
Parameter Name	Dynamic range [default value]	Remark
Value for rising edge	On Off	Send a signal when pressed
Value for falling edge	On Off	Send a signal when released
Send cycle	Off On	Send signals periodically
Time interval for send cyclic	1-3000s [1]	Interval time
Behavior at bus power up	Send nothing Send status	Is it sent or not when the bus is energized

Object Description:

NO.	Name	Length	Use
80	Switch	1-bit	Send switch value, the length of the button is no difference.

The Send Status function can be used to perform some special functions, such as detecting the closed state. For example, when the window is opened and closed, the Send Status function can be used to send the window state for monitoring when the window is installed with a transmitting point.

The following figure shows that press send 0 signal, release send 1 signal:



### 3.9.1.4. Send Value Rising/Falling/Both Edges

There are two values that can be sent, a 1 byte, and a 2 bit, depending on your choice.

Parameter:

Function	Switch
Subfunction	Send value both edges (1Byte / 2Bit)
Value (1Byte) / forced setting (2Bit)	1 Byte value
Value for rising edge	0
Value for falling edge	0
Behaviour at Bus power up	send nothing
Blocking Object	Inactive

The following table is a 1 byte value parameter:

Parameter Name	Dynamic range [default value]	Remark
Value for rising/falling edge	0-255 [0]	Sends a 1-byte value at the set margin (up, down).

For 1-byte objects, it can send any value in the range of 0-255, depending on your Settings.

The following is the object description:

NO.	Name	Length	Use
80	Send value	1-bit	Send setting value

The following table shows the 2-bit value parameters:

Parameter Name	Dynamic range [default value]	Remark
Send forced setting at rising/falling	Forced setting not active Forced setting off Forced setting on	Send a 2-bit value at the set margin (up, down).

This 2-bit object can be used for some purposes, such as human induction automatic control. The parameters are as follows:

Forced setting not active(control=0, value=0)

Forced setting off(control=1, value=0)

Forced setting on(control=1, value=1)

2-bit value object:

NO.	Name	Length	Use
80	Send forced setting	2-bit	Send setting value.

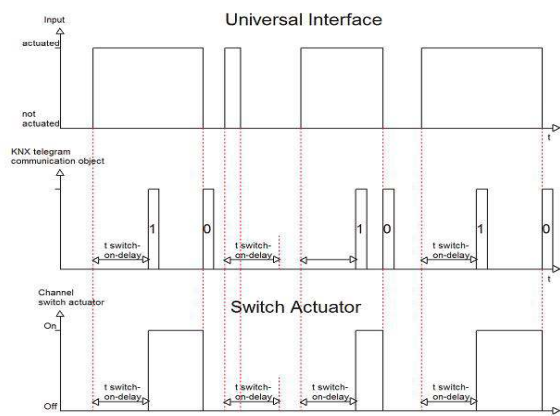
### 3.9.1.5. Send Value with On/Off Delay

The following table shows the delay sending parameter description:

Parameter Name	Dynamic range [default value]	Remark
Delay time	0-60min [1s]	Send value after time delay setting

To send sub-function value with on/off delay, is send on or off value, delay some time before we send. If prior to the completion time delay, the channel back to the previous state, the time delay end ahead of time, and do not send values. For example, channel press, send delay 3 seconds on value, and before the time arrived, channel was released, the channel delay end, no longer send on value.

The following figure shows the operation:



Parameters:

Function	Switch
Subfunction	Send Status with off-delay
Delay time	1 s
Blocking Object	Active

Object description:

NO.	Name	Length	Use
80	Switch	1-bit	Press delay to send On value, release delay to send Off value.

### 3.9.2.SCENE

Scene function can be used to control multiple channels of one or more executors to achieve a scene state. In addition, in the case of activating learning function, learning commands can be sent through long buttons.

The following figure shows the parameter configuration:

Function	Scene
Subfunction	Save
Scene Number	1
Blocking Object	Inactive

The following table shows the parameter description:

Parameter Name	Dynamic range [default value]	Remark
Saving function	No save Save	When saving is enabled, the long button can learn and save the current channel value.
Scene number	1-64 [1]	The scenario number must be configured to be the same as the executor.
Blocking object	Inactive Active	Block the object, forbidden by default.

Object description:

NO.	Name	Length	Use
82	Scene	1-bit	Send scene value.

When the short button is pressed, the set scene number is sent, and the executor scene object with the same set of addresses will receive the scene number and perform the corresponding action. When the learning function is activated, a learning command will be sent to the associated executor through the long button, and the executor will save the current channel state to the corresponding scene number.

The following table sends and saves the corresponding values for the scenario:

Scene	Send		Save	
	Hex.	Dez.	Hex.	Dez.
1	0x00	0	0x80	128
2	0x01	1	0x81	129
3	0x02	2	0x82	130
4	0x03	3	0x83	131
5	0x04	4	0x84	132
6	0x05	5	0x85	133
7	0x06	6	0x86	134
8	0x07	7	0x87	135
9	0x08	8	0x88	136

10	0x09	9	0x89	137
11	0x0A	10	0x8A	138
12	0x0B	11	0x8B	139
13	0x0C	12	0x8C	140
14	0x0D	13	0x8D	141
15	0x0E	14	0x8E	142
16	0x0F	15	0x8F	143
17	0x10	16	0x90	144
18	0x11	17	0x91	145
19	0x12	18	0x92	146
20	0x13	19	0x93	147
21	0x14	20	0x94	148
22	0x15	21	0x95	149
23	0x16	22	0x96	150
24	0x17	23	0x97	151
25	0x18	24	0x98	152
26	0x19	25	0x99	153
27	0x1A	26	0x9A	154
28	0x1B	27	0x9B	155
29	0x1C	28	0x9C	156
30	0x1D	29	0x9D	157
31	0x1E	30	0x9E	158
32	0x1F	31	0x9F	159

### 3.9.3.COUNTER

You can count the number of switches using the counter function. You can configure the up delay count, down delay count, or up and down delay count.

The following figure shows the parameter description

Function	Counter
Subfunction	Count rising and falling
Sending difference	5
Blocking Object	Inactive

The following figure shows the parameter description:

Parameter Name	Dynamic range [default value]	Remark
Sub-function	Count rising Count falling Count rising and falling	In setting the edge delay count, upper and lower delay count by default
Sending difference	0-65535 [5]	The current value is sent for each increment in the count.
Blocking object	Inactive Active	Blocking function

Object description:

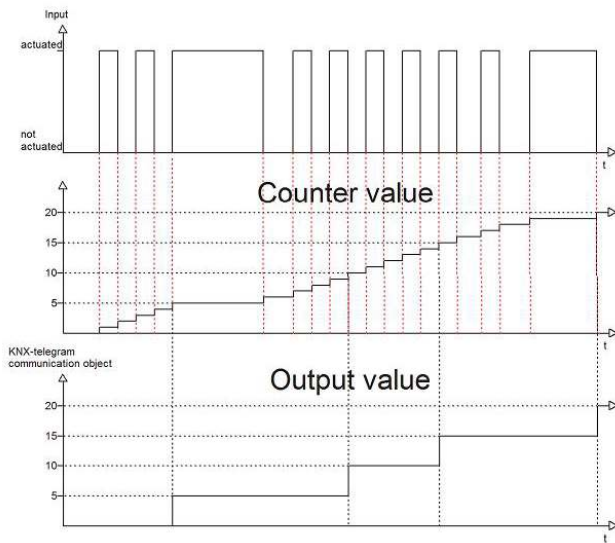
NO.	Name	Length	Use
80	Reset Counter	1-bit	Reset counter
83	Counter	4-byte	Output counter value

If the delay count is set as up/down, the sending interval is 5, then the delay count will be raised once, the delay count will be decreased once, the current count value will be sent when the count reaches 5, and the count value will be sent again when the count reaches 10, and so on.

The communication object counter reset is used to reset the counter value to 0, and the object value 0.1 is valid.



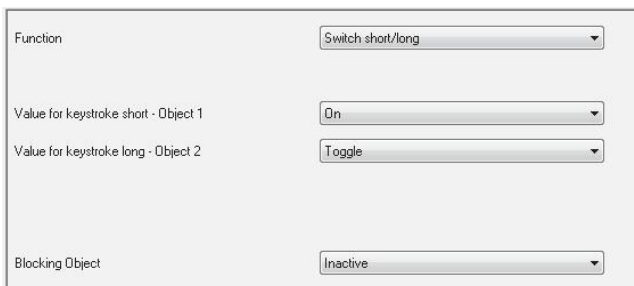
The following figure shows the up/down delay count, sending interval 5:



### 3.9.4. SWITCH SHORT/LONG

Long press/short press can be independently assigned as on/off/flip/send value, etc.

The following figure is the parameter option:



The form shows the following parameters:

- Function: Switch short/long
- Value for keystroke short - Object 1: On
- Value for keystroke long - Object 2: Toggle
- Blocking Object: Inactive

The following table shows the parameter description:

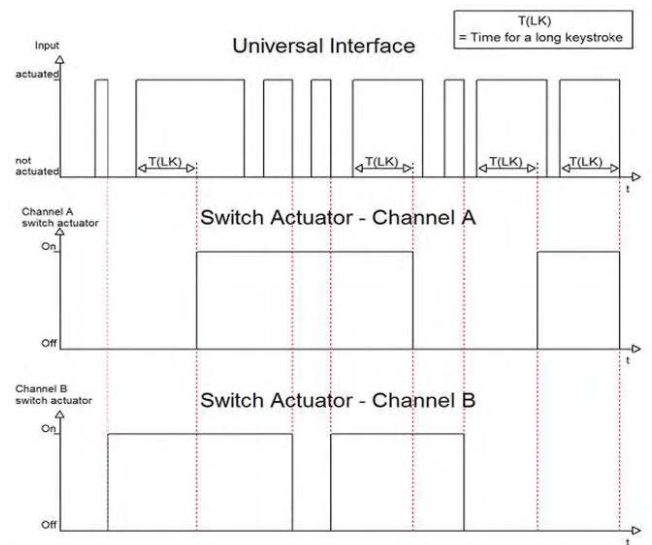
Parameter Name	Dynamic range [default value]	Remark
Value for keystroke short object 1	On Off Toggle Send value Nothing	Apply to short buttons
Value for keystroke long object 2	On Off Toggle Send value <b>Nothing</b>	Apply to long buttons
Blocking object	<b>Inactive</b> Active	

The following table is the object description:

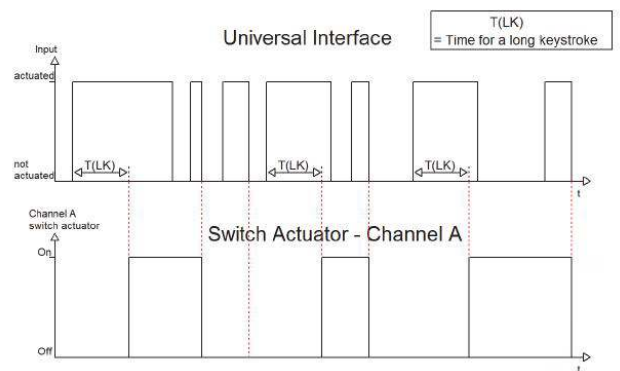
NO.	Name	Length	Use
80	Push-button short	1-bit	Object for short buttons
81	Value for toggle short	1-bit	Short button toggle value
82	Push-button long	1-bit	Object for long buttons
83	Value for toggle long	1-bit	Long button toggle value

Single bond length of the keyboard to control the two channels are available, and it can save a button. Press open or short, long press, you can also short according to toggle, long press to toggle, etc. When configured to toggle function, must be control to turn the corresponding object is connected to the channel of actuators on the state of the object, in order to realize the right turn.

As shown in the following figure, long/short press is set to toggle function, long press control executor channel A, short press control channel B:



The following picture shows the long/short press used together, long press open, short press close:



The following table shows the parameter description for selecting the function Send value:

Parameter Name	Dynamic range [default value]	Remark
Value for keystroke short/long	Send value	The sub-function is selected as the send value
Send value	1 Byte-Value[0...255] Scene number	Value selection: one is a 1-byte unsigned value, the other is a scene value.
1 Byte-Value[0...255]	0-255 [0]	A byte of unsigned values ranging from 0 to 255. It can be used for controls such as absolute dimming
Scene number	1-64 [1]	One bite scenario value, ranging from 1 to 64. It can be used for scenario control.





### 3.9.5. ONE BUTTON DIMMING

Single key to achieve dimming, on/off.

The following figure is the parameter option:

Function:

Blocking Object:

Parameter description:

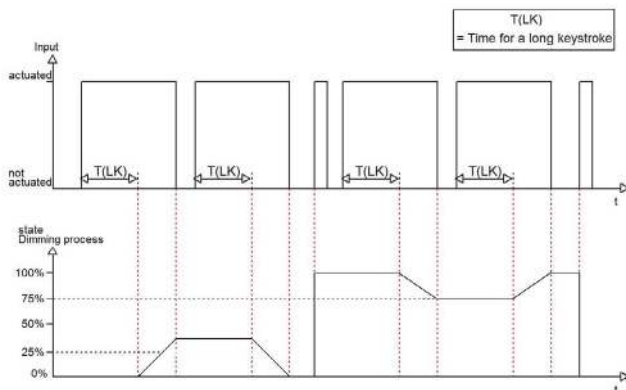
Parameter Name	Dynamic range [default value]	Remark
Blocking object	Inactive Active	Blocking function

Object description:

NO.	Name	Length	Remark
80	Dimming on/off	1-bit	With the same switch function, the short button is effective every time.
81	Dimming	4-bit	The long button is effective for light adjustment.
82	Value for toggle	1-bit	Receive channel status values.

Single bond dimmer can achieve on/off, dimming function. Short key and switch function is the same, every button to flip. Long keys to realize relatively light, reaches the maximum/minimum brightness change, no longer release button to stop the dimming. Because it is a single bond dimmer, so every time long keys that move light change direction. Assuming that the current dimmer upwards, the direction of the next move light downward. The lithography degree 100% every time.

The following figure shows the dimming instructions:



### 3.9.6. ONE BUTTON SHUTTER

Single key curtain control.

The following figure is the parameter:

Function:

Operation function:

Blocking Object:

Parameter description:

Parameter Name	Dynamic range [default value]	Remark
Blocking object	Inactive Active	Blocking function

Object description:

NO.	Name	Length	Use
80	Shutter	1-bit	The curtain moves and the long button is effective.
81	Blinds/Stop	1-bit	The curtain stops. The short button works.
82	Value for change of direction	1-bit	Indicates the current direction.

Long buttons control curtain movement, changing direction each time, assuming current upward movement, then next downward movement. Short buttons send a Stop command through the object Blinds/Stop.

## 4. LED OUTPUT

The following figure is the LED parameter configuration diagram:

Function:

LED state at objectvalue 0/1:

LED state at ON:

Behavior of LED at undefined object:

Parameter description:

Parameter Name	Dynamic range [default value]	Remark
LED state at object value 0/1	OFF/ON(normal) ON/OFF(inverted)	Indicates how the LED responds to the object value.
LED state at ON	Permanent blinking	Indicates the luminescence mode, always on/flashing.
Behavior of LED at undefined object	OFF Short flash	Define the LED state when the LED object has no valid value.

LED object:

NO.	Name	Length	Use
122	LED Output A	1-bit	Control LED output

LED output function can directly drive external LED without additional electronic components. The output voltage is 3.3v, which is integrated with 1k current limiting resistance.

The LED can normally respond to the object value (1= open,0= close), or reverse display (0= open,1= close). It can also configure the LED lighting mode, which is always on/flashing.

### 4.1. LOGIC

Device extension input contains two logical control blocks. Various input/output modes can be configured.

Parameters of the figure:

Behaviour at Bus power up: ☒ no read ext. logic objects ☐ read ext. logic objects

Settings for logic 1:

Objecttype 1:

Sending condition:

Output inverted: ☒ No ☐ Yes

Settings for logic 2:

Objecttype 2:

Sending condition:

Output inverted: ☒ No ☐ Yes





#### Parameter description:

Parameter Name	Dynamic range [default value]	Remark
Behavior at bus power up	No read ext.logic objects Read ext.logic objects	Specifies whether the logical object values are read when the device is powered on. When configured to read on, the device reads and updates the value of the external logical object, otherwise the default value is 0.

#### The following table is function selection:

Setting per logic [default value]	Dynamic range [default value]	Remark
<b>Disabled</b> And Or	<b>Switch</b> Scene 1 byte value	Logical objects can be configured as And/ Or operations, And optional functions include switch/scene/1 byte value.

#### Object description:

NO.	Name	Length	Use
110	Logic input 1A	1-bit	External logical input object, effective when activated.
111	Logic input 1B	1-bit	External logical input object, effective when activated.
112	Logic output 1	1-bit	Logical output object, activate switch function when valid.

There are two sets of logical objects in total, and the remaining sets of objects numbered 113 to 115 are functionally the same.

When a logical block is activated, a new parameter configuration box will appear. More parameters can be selected. Two external logical objects can choose whether to be activated or not, and the corresponding object can configure the group address after activation.

The following figure shows the input options, including two external logical objects and four channels:

Logical object 1 A (external)

Logical object 1 B (external)

Input A

Input B

Input C

Input D

#### 4.1.1. LOGIC OBJECT TYPE SWITCH

The following table is the parameter description:

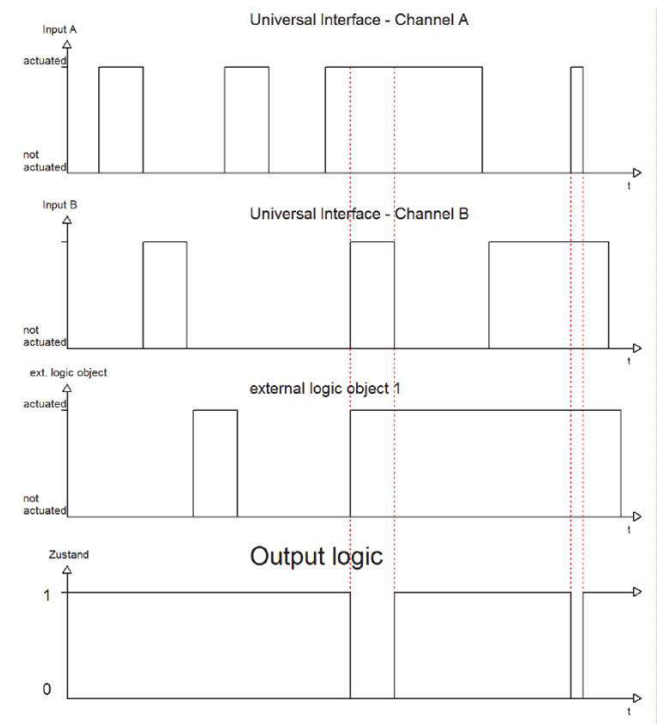
Parameter Name	Dynamic range [default value]	Remark
Send condition	<b>Not automatic</b> Change of input Change of output	Set output conditions
Output inverted	<b>No</b> Yes	Sets whether the output is reversed

For the sending condition change of input, the output state will be changed when any activated input state changes.

For the sending condition change of output, the output state will be different only when all input signals have a set logical operation and the resulting state is different from the previous one.

As for the reverse output function, it means that when the result of the logical operation is 0, output 1 is 1, and output 0 is 1.

The following figure shows the signal description. The logical function is configured with Switch, And operation, activation channel A/B, And an external logical object. The output is reversed:



In the figure above, only when all three inputs are 1, the result of And operation is 1, the output after reverse is 0, And the output at other times is 1.

#### 4.1.2. LOGIC OBJECT TYPE SCENE

After configuring the logical block into the scene function, when the logical operation result is 1, the set scene value is output, and the scene value is only output once when the logical operation result is changed from 0 to 1 each time.

The following table shows the parameter description:

Parameter Name	Dynamic range [default value]	Remark
Scene number	1-64 [2]	Scenario number Settings

#### 4.1.3. LOGIC OBJECT TYPE BYTE VALUE

The following table is byte value parameters:

Parameter Name	Dynamic range [default value]	Remark
Byte value[0...255]	0-255 [0]	Sent byte values.

As with the scenario function, as long as the logical operation results in 1, the set byte value is output once.

