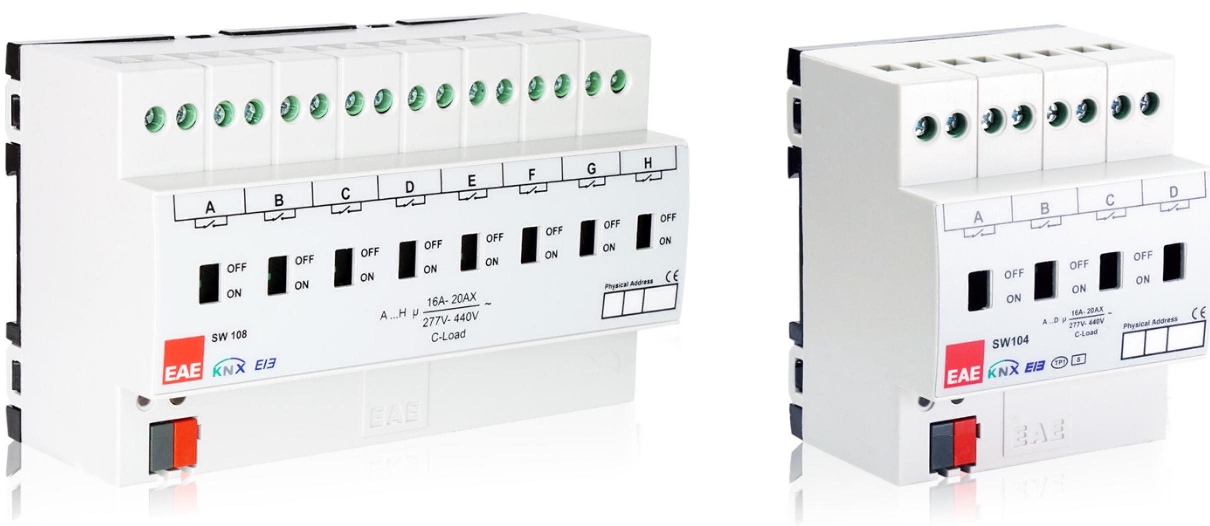
EAE KNX Switch Actuator

Product Manual SW104 and SW108

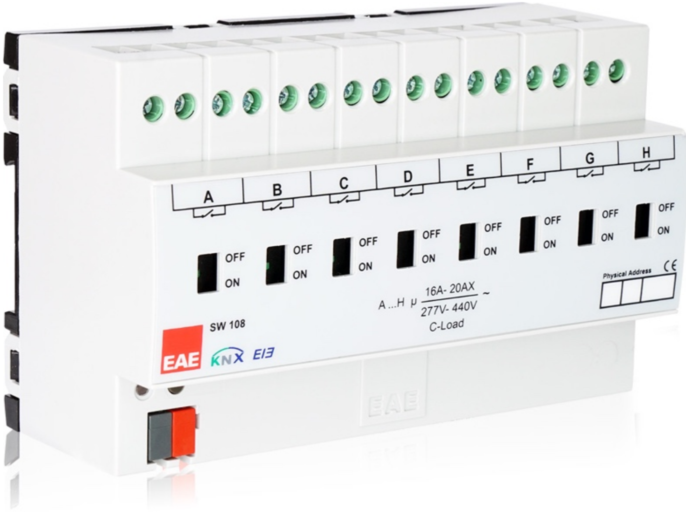


Order Number: 48002

Content

1 General

EAE KNX Switch Actuator has eight channels which can be configured with ETS3/ETS4 or higher version. Each channel is independent of another. It has a separate bistable switching relay. SW108 / SW104 has been designed especially for loads with high surge currents. It has 16A/20AX (C-Load) relays inside channels. C-Load feature enables a convenient control of fluorescent lambs. Also device has a manual operating feature. The relay can be switched on or off with slide switches.



The following function list provides;

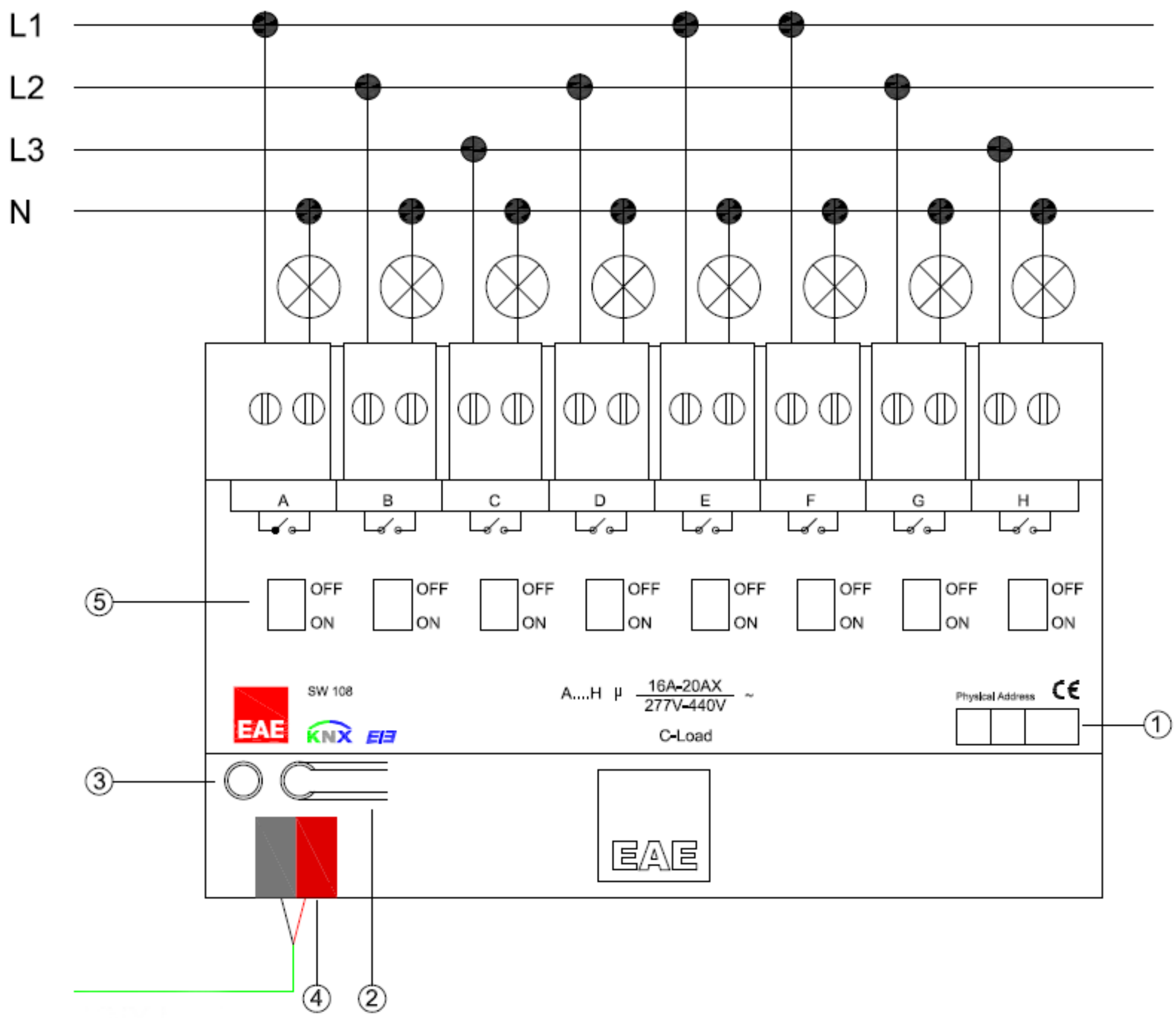
- Staircase
- External logic
- Internal logic
- Priority
- Threshold
- Operating hour
- Sweep

Each channel of devices can choose any of these functions. The outputs are parameterized individually via ETS3/4. After bus voltage failure or voltage return the relay position is selected on dependence on the parameterization. In "ETS reset", device parameters are return download configuration.

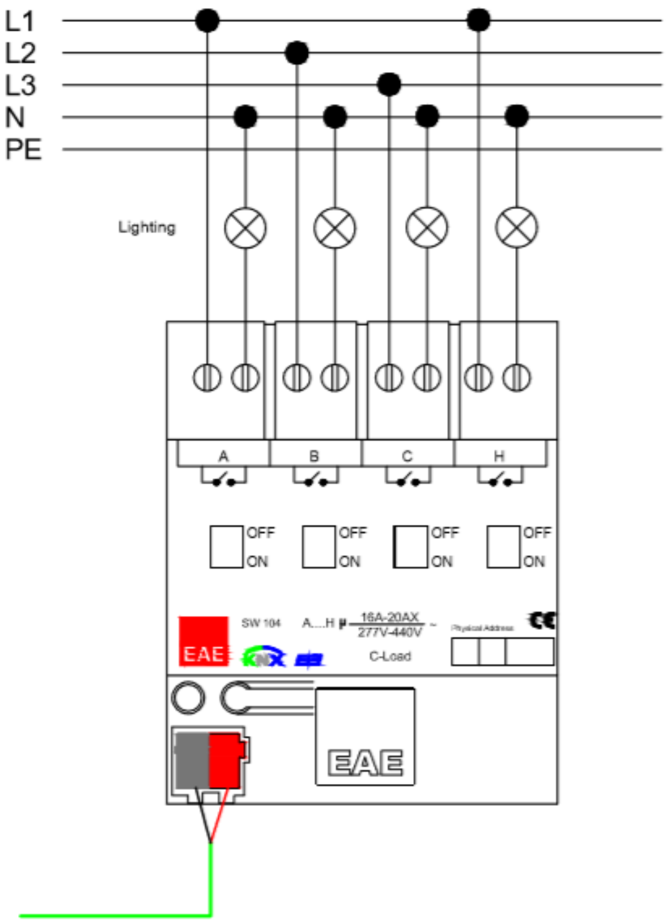
NOTE: Each channel is uniform. Device factory default physical address is 15.15.255.

2 Device Technology

2.1 Connection Diagram



Connection Diagram



1. Physical Address Label
2. Programming Button
3. Red Programming LED
4. KNX Connection Terminal
5. Switch Position Display and ON/OFF Manual Actuation

2.2 Technical Data

Type of protection	IP 20	EN 60 529	
Safety class	II	EN 61 140	
Power supply :	- Voltage	21V… 30V DC, SELV	
	- Current consumption	< 10 mA	
External supply	---		
Connections	- Screw terminals	0,5…4 mm² solid and stranded wire 0,5…2,5mm² stranded wire with ferrule	
	- Max tightening torque	0.8 Nm	
	- KNX	Bus connect terminal	
Output	- Number	4 output – SW104 8 output – SW108	
	- Switching voltage	277/440V AC; 50/60 Hz	
	- Switching capacity 277 V AC	16A / AC 1	
	- Fluorescent lighting load to EN 60 669-1	16 AX/250 VAC	
Output life	- Mechanical life	> 3 x 10^6	
Type of contact	- potential-free, bistable		
Installation	- 35mm mounting rail	EN 60 715	
Operating elements	- LED (red) and button	For physical address	
Temperature range	- Ambient	-5° C + 45° C	
	- Storage	-25° C + 55° C	
	- Transport	-25° C + 70° C	
Humidity	- max. air humidity	95 % no moisture condensation	
Dimensions	SW108 - 65,5 x 143 x 89mm SW104 – 65,5 x 72 x 89 mm		
Weight	SW108 0.45 kg SW104 0.15 kg		
Box	Plastic, polycarbonate, colour grey		
CE	In accordance with the EMC guideline and low voltage		
Application program	Communications objects	Number of addresses(max)	Number of assignments(max)
	122	253	253

NOTE: Device default physical address is 15.15.255. In order to configure switch actuator, ETS application file ".knxprod" is needed. It's possible to download the file on EAE website. ETS is required for programming the device. Parameter settings and related group addresses can be changed by ETS. Learn more by reading ETS help file.

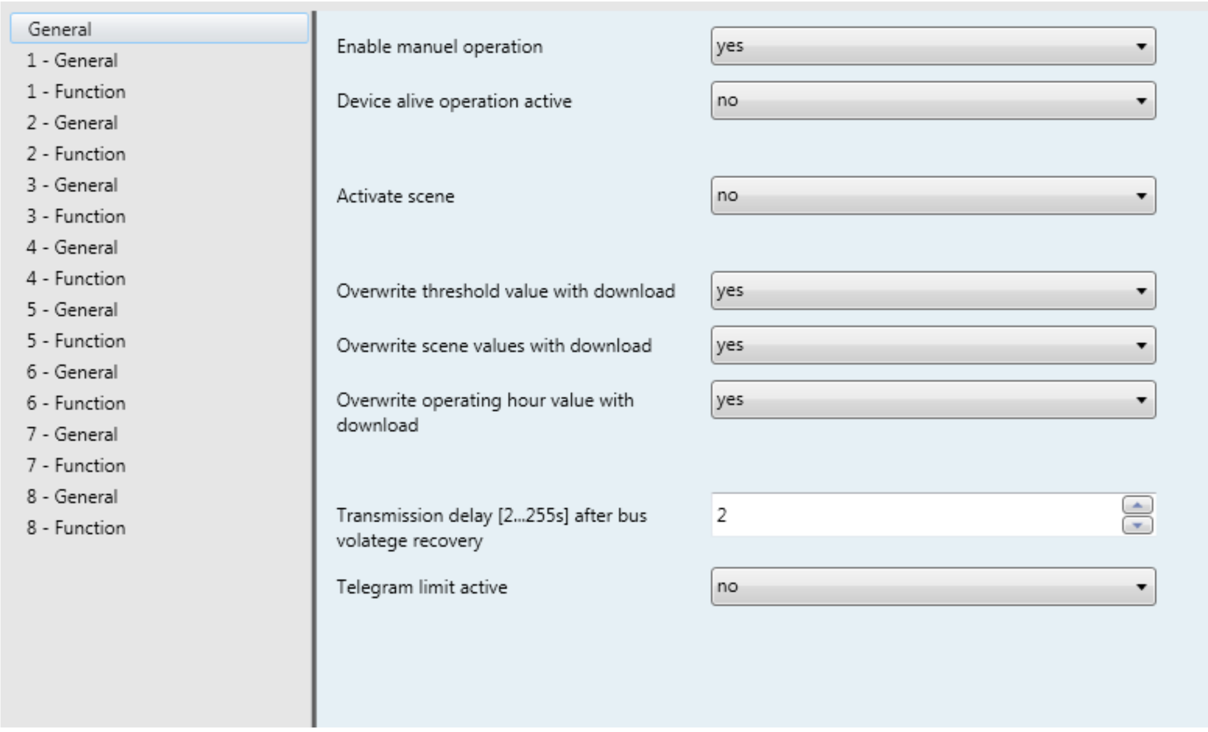
3 Communication Object Table

The following 122 communication objects are available in the SW108 and SW104.

No	Object name	Function	DTP Type	Number of bits	Flags
0	General, In operation	true / false	DTP_Bool 1.002	1 bit	CWT
1	General Scene 8-bit	recall / save	DPT_Scene 18.001	1 byte	CW
2, 17, 32, 47, 62, 77, 92, 107	Output 1, Switch	on / off	DPT_Switch 1.001	1 bit	CW
3, 18, 33, 48 63, 78, 93, 108	Output 1,Status Switch	on / off	DPT_Switch 1.001	1 bit	CRT
4, 19, 34, 49, 64, 79, 94, 109	Output 1,Enable staircase function	enable / disable	DPT_Enable 1.003	1 bit	CRW
5, 20, 35, 50, 65, 80, 95, 110	Output 1,Staircase lighting duration	0h … 65535h	DPT_TimePeriodHrs 7.007	2 byte	CRW
6, 21, 36, 51, 66, 81, 96, 111	Output 1,Permanent ON	on / off	DPT_Switch 1.001	1 bit	CW
7, 22, 37, 52, 67, 82, 97, 112	Output 1,External logic input	on / off	DPT_Switch 1.001	1 bit	CW
8, 23, 38, 53, 68, 83, 98, 113	Output 1,Forced positioning	on / off	DPT_Switch_Control 2.001	2 bit	CW
9, 24, 39, 54, 69, 84, 99, 114	Output 1,Start value of operating hour	0h … 65535 hour	DPT_TimePeriodHrs 7.007	2 byte	CW
	Output 1,Limit value of operating hour	0h … 65535 hour	DPT_TimePeriodHrs 7.007	2 byte	CW
10, 25, 40, 55, 70, 85, 100, 115	Output 1,Counter reset of opr. hour	No action/reset trig	DPT_Reset 1.015	1 bit	CW
11, 26, 41, 56, 71, 86, 101, 116	Output 1,Current value of opr. hour	0h … 65535h	DPT_TimePeriodHrs 7.007	2 byte	CR(T)
12, 27, 42, 57, 72, 87, 102, 117	Output 1,Operating hour runout	true / false	DPT_Bool 1.002	1 bit	CT
13, 28, 43, 58, 73, 88, 103, 118	Output 1,Threshold input	Value 0…65535	DPT_Value_2Ucount 7.001	2 byte	CW
	Output 1,Threshold input	Value 0…255	DPT_Value_1Ucount 5.010	1 byte	CW
14, 29, 44, 59, 74, 89, 104, 119	Output 1,Threshold value	Value 0…65535	DPT_Value_2Ucount 7.001	2 byte	CW
	Output 1,Threshold value	Value 0…255	DPT_Value_1Ucount 5.010	1 byte	CW
15, 30, 45, 60, 75, 90, 105, 120	Output 1,Threshold status	true / false	DTP_Bool 1.002	1 bit	CRT
16, 31, 46, 61, 76, 91, 106, 121	Output 1,Sweep	trigger	DPT_Trigger 1.017	1 bit	CW

4 Parameters

4.1 Main General



General Parameters

Enable manual Operation	****yes*** *no*

The switch actuator can be switched on or off with slide switches. This parameter determines the position of relays can be modified manually or not.

- Set the parameter to “yes”.
  Each relay can be operated manually.
- Set the parameter to “no”.
  It is still possible to change relays position but relay return its old position in a maximum of 16 seconds.

Device alive operation active	*yes* ****no***

This object is used to report that device is still alive and connected the KNX line. Telegram value can be selected ON/OFF. If a telegram is not received, device may be defective or KNX cable can be disconnected. If the parameter selected yes;

In operation value	**_*send value '0'_** _send value '1'_

Telegram data can be selected.

Operation send interval [min]	_1…***15**…255_

Here the time interval which in operation communication object cyclically sends to KNX line.

Activate scene	_yes_ **_*no_**

If the parameter select 'yes', scene screen open on the main window. You can find scene information under the scene function title.

Overwrite threshold value with download	**_*yes_** _no_

During storage of a threshold, the threshold values are stored permanently in the device. As an alternative, the original values can be reloaded into the device during each programming run of the ETS.

- Set the parameter to "yes"

User threshold values store in the device. This means threshold communication object will be overwrite threshold values but ETS download can't write on it.

- Set the parameter to "no"

Threshold values stored in the device with a storage function will be maintained. If no threshold values have been stored, the threshold values last programmed in the ETS remain valid.

Overwrite scene values with download	**_*yes_** _no_

During storage of a scene, the scene values are stored permanently in the device. As an alternative, the original values can be reloaded into the device during each programming run of the ETS.

- Set the parameter to "yes"

Scenes values stored in the device. This means scene communication object will be overwrite scene values but ETS download can't write on it.

- Set the parameter to "no"

Scene values stored in the device with a storage function will be maintained. If no scene values have been stored, the scene values last programmed in the ETS remain valid.

Overwrite operating hour values with download	**_*yes_** _no_

During storage of an operating hour, the operating hour values are stored permanently in the device. As an alternative, the original values can be reloaded into the device during each programming run of the ETS.

- Set the parameter to “yes”

Operating hour values stored in the device. This means operating hour communication object will be overwrite operating hour values but ETS download can’t write on it.

- Set the parameter to “no”

Operating hour values stored in the device with a storage function will be maintained. If no operating hour values have been stored, the operating hour values last programmed in the ETS remain valid.

Transmission delay [2…255s] after bus voltage recovery	*****2***…255*

The parameter defines the behaviour of the switch actuator at a bus power return. The transmission delay time determines the period between bus voltage recovery and the point after which telegrams can be sent.

Telegram limit active	*yes* ****no***

Parameter selects “yes”;

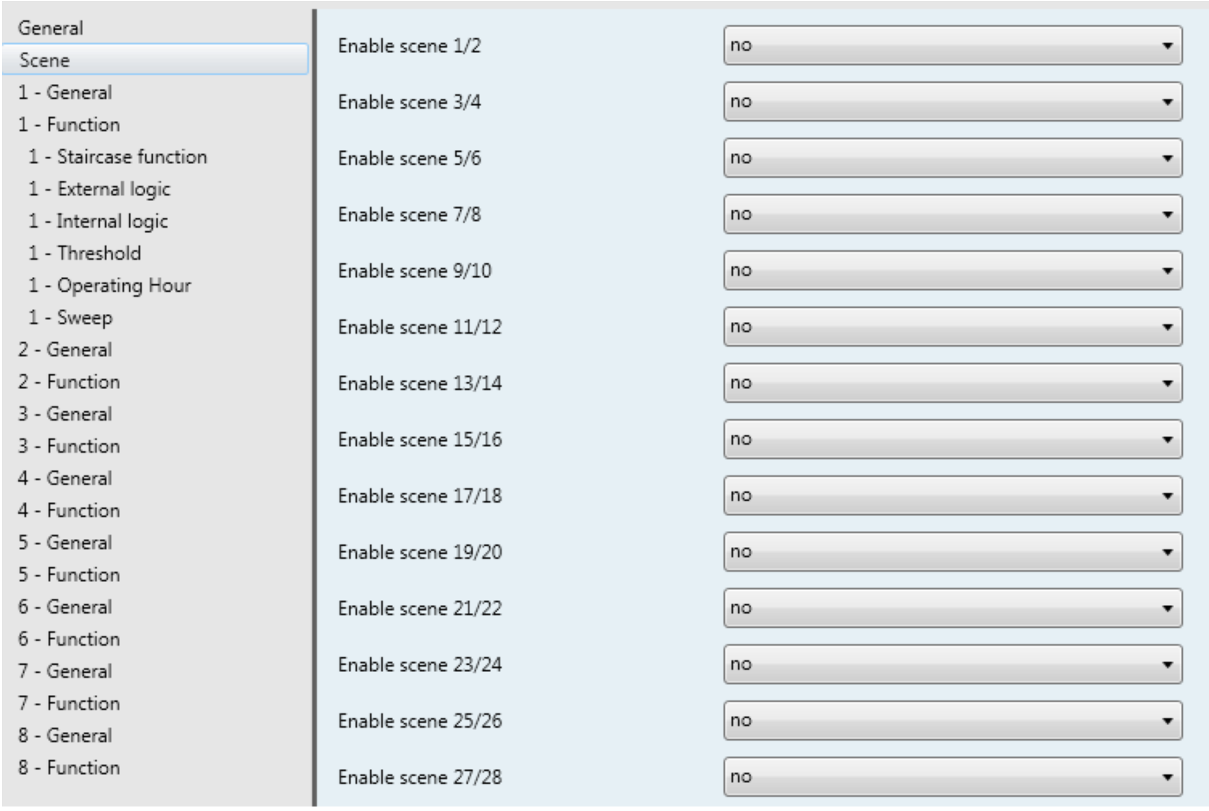
Telegram limit period	50ms…***10s**…1min

The limit period can be adjusted via this parameter.

Max. number of transmitted telegrams within a period	1…**20**…255

Max number of telegrams per period, can be sent freely.

4.2 Scene



Scene Parameters

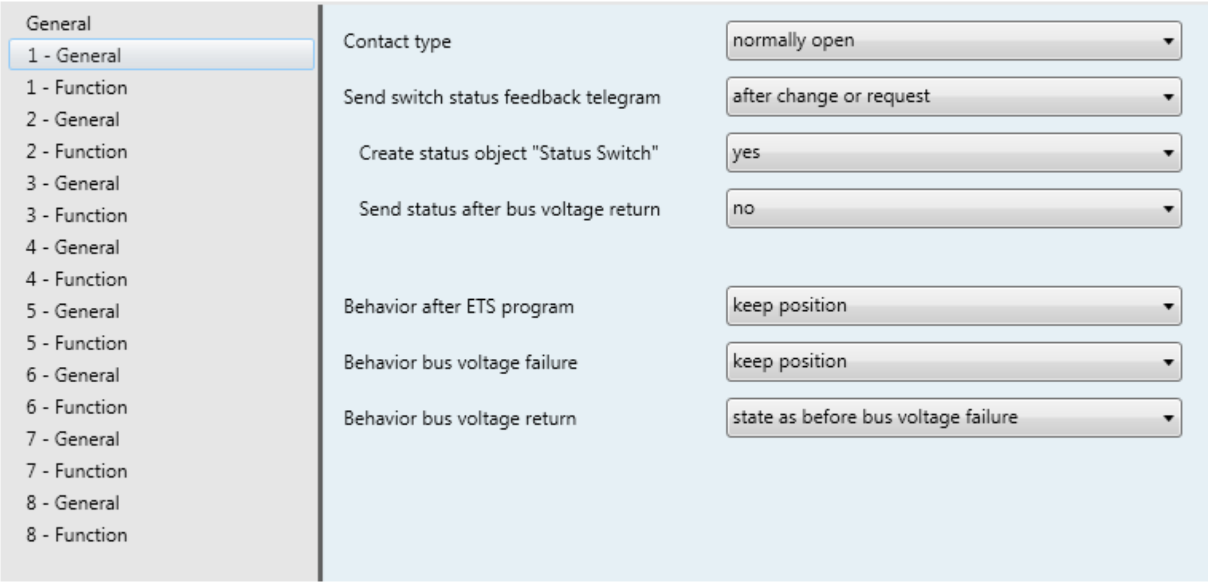
The scene function of the switch actuator has an 8 bit scene object. It is possible to define for each 64 scene with parameter window. 8 independent values can be stored for each relay. The scene can be specified that the relay 'open contact' (off), 'close contact' (on) or 'keep position' its state.

A scene is activated when it receives its scene number at the scene object. The storing of the current channel values is carried out using the scene object.

For example;

Scene	recall		save	
	Hex.	Des.	Hex.	Des.
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
…	…	…	…	…
63	0x3E	62	0xE2	190
64	0x3F	63	0xE3	191

4.3 Channel General



Channel General Parameters

Contact type	*normally closed* ***normally open**

The relays of a switching output can be parameterized as normally closed or normally open. This feature offers the possibility of inversion the switching state. Important: This state is only valid for switch communication object. Other relay function always works normally.

Normally closed contact

Switch state = off (0) → relay contact closed
Switch state = on (1) → relay contact open

Normally open contact

Switch state = off (0) → relay contact open
Switch state = on (1) → relay contact closed

Send switch status feedback telegram	*no* *after change* *after request* ***after change or request**

The switch status feedback can be used as an active or passive communication object. Active message object, the switch status telegram is transmitted to the bus automatically when a relay state changes. Passive status object, there is no telegram transmission after relay state changes. If you want to learn switch status, you must read communication object. Communication object flags are automatically set by ETS.

NOTE: Switching state changes by manual operation are not detected.

Create status object "Status Switch"	****yes*** no

If this parameter select 'yes', ETS create another communication object for use only status switch. The status object can be used to display the current output switching status on a display.

Send status after bus voltage return	*yes* ***no**

You can use this parameter to send the switching state in the event of bus voltage recovery.

Behaviour after ETS program	****keep position*** *open contact* close contact

After ETS programming, relay position set the wanted switching position.

- Set the parameter to "keep position"

  In this setting, the relay remains in the current state. Any manual operation occurs in the meantime the switch actuator return its old position. The device doesn't know the status of the relay.

- Set the parameter to "open contact" or "close contact"

  The relay contact open or close after bus voltage return.

Behaviour bus voltage failure	****keep position*** *open contact* close contact

When the bus voltage fails, the device set the wanted switching state of the output. The relay can be open, close or keep position it occupied prior to the failure. At the same time, the current switching position of the relay is stored in the devices.

Behaviour bus voltage return	*keep position* *open contact* *close contact* ***state as before bus voltage failure**

When the bus voltage returns, the device set the wanted switching state of the output.

- Set the parameter to "keep position"

  In this setting, the relay remains in the current state. Any manual operation occurs in the meantime the switch actuator return its old position. The device doesn't know the status of the relay.

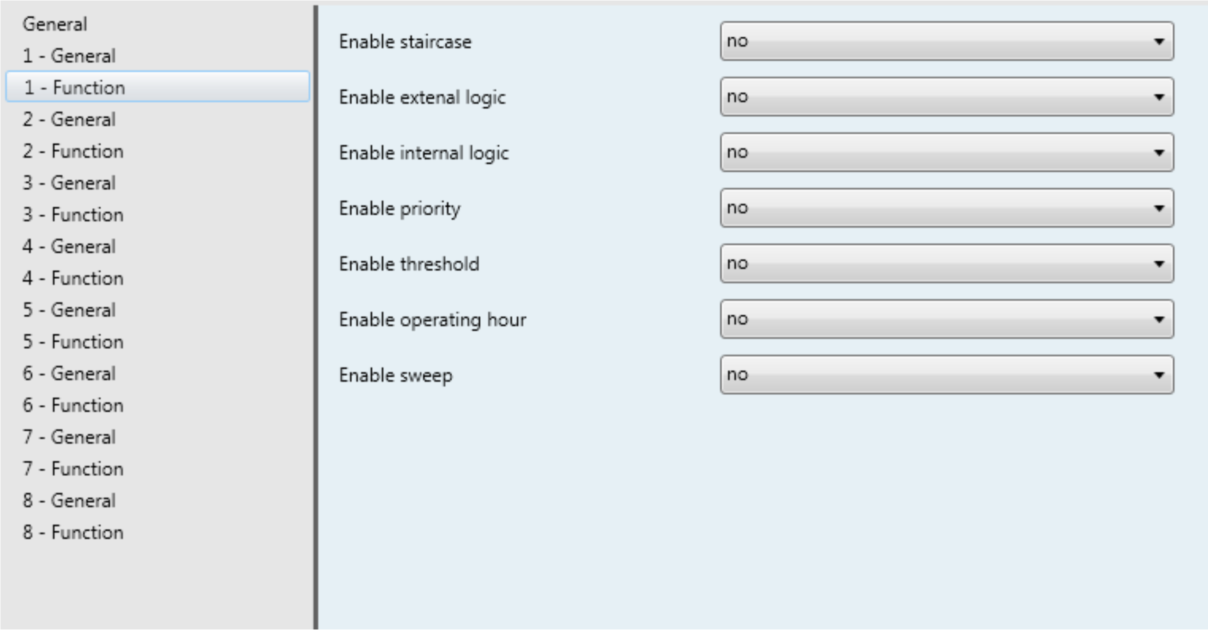
- Set the parameter to "open contact" or "close contact"

  The relay contact open or close after bus voltage return.

- Set the parameter to "state as before bus voltage failure"

  If the parameter set to "state as before bus voltage failure", then the relay is set to the value. The value stored at the time of the bus voltage failure.

4.4 Function



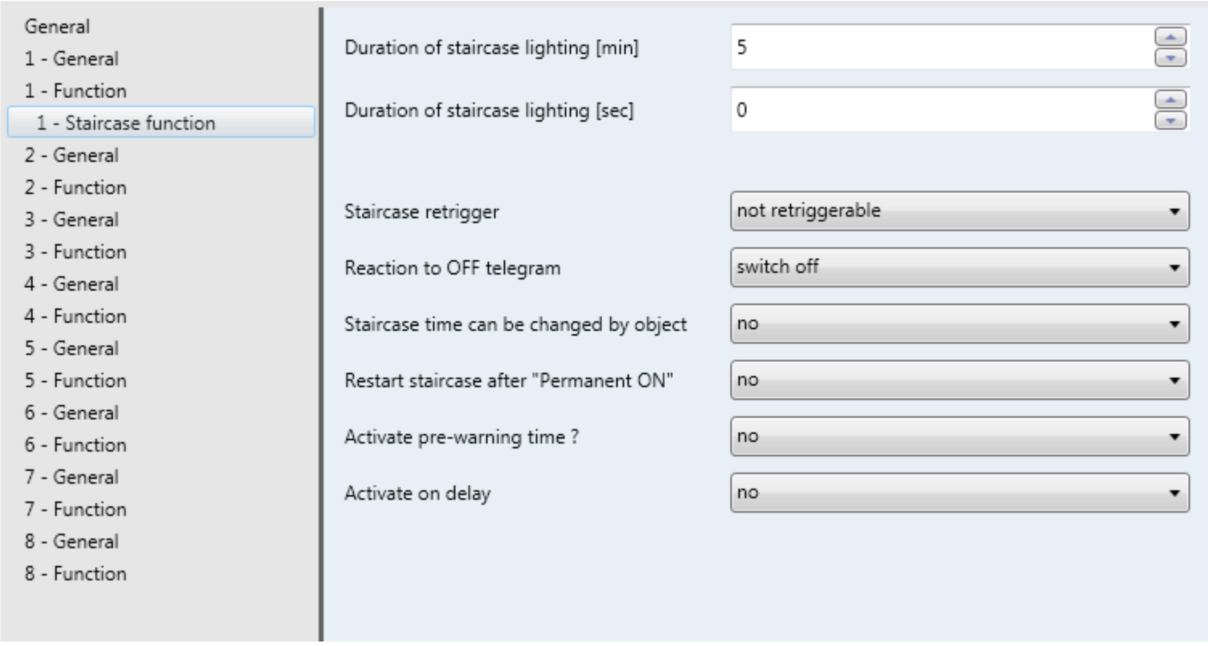
Function Parameters

Above function parameters can be set for each channel. These functions;

I. Staircase
II. External logic
III. Internal logic
IV. Priority
V. Threshold
VI. Operating hour
VII. Sweep

Please find description of these functions below.

4.4.1 Staircase Function



Staircase Function Parameters

In order to use staircase function, 'Staircase' should be enabled on the function window. Than required parameters and communication objects will be visible. The staircase function can be parameterized for each channel.

Staircase function has got a three communication object. These are "Enable staircase function", "Staircase lighting duration" and "Permanent ON".

Duration of staircase lighting [min]/ [sec]	*0…****5***…240[min]* *****0***…59 [sec]*

Staircase function on time is calculated by "duration of staircase lighting". Staircase lighting time is defined by this parameter. At the end of the on time, the relay off or active the staircase warning functions.

Staircase retrigger	****not retriggerable*** *yes retriggerable* *up to staircase lighting time 2x* *up to staircase lighting time 3x* *up to staircase lighting time 4x* *up to staircase lighting time 5x*

This parameter defines whether the staircase on time can be retrigger able or not so the on time can be extended by 'Enable staircase function'. You can repeat retrigger function until the repeater count reached the maximum value (2x, 3x, 4x, 5x). If the parameter selects 'not retriggerable', staircase on time doesn't extend.

Reaction to OFF telegram	****switch off*** *Ignore*

After this parameter selected 'switching off', ignored 'Enable staircase function' communication object 'disable' command.

Staircase time can be changed by object	*yes* ***no***

'Staircase lighting duration' communication object is visible if a 'Staircase time can be changed by object' parameter selects 'yes'. This communication object is 2 byte. The value defines the staircase on time in second.

NOTE: After a bus voltage fails, staircase on time returns default value (Duration of staircase lighting).

Restart staircase after "Permanent ON"	*yes* **no**

If this parameter is selected 'yes', receive 'Permanent ON' communication object after restart staircase function.

Activate pre-warning time?	*yes* ***no***

The warning function can be activated by this parameter select 'yes'. Then, you can adjust pre-warning time, number of pre-warning and time for pre-warning interval. The warning function is for warning that the staircase lighting time run out and the lights are switched off soon. In the warning, lights short turn off. Switch status is ON until finish warning time.

Pre-warning time Minutes (0…59) ***Second (0…59)***	**0…59* *0…***30**…59*

How long the lights shall be switched on in the period.

Number of pre-warning (1…10)	*1…***2**…10*

Enter the number of how many blink doing in the warning.

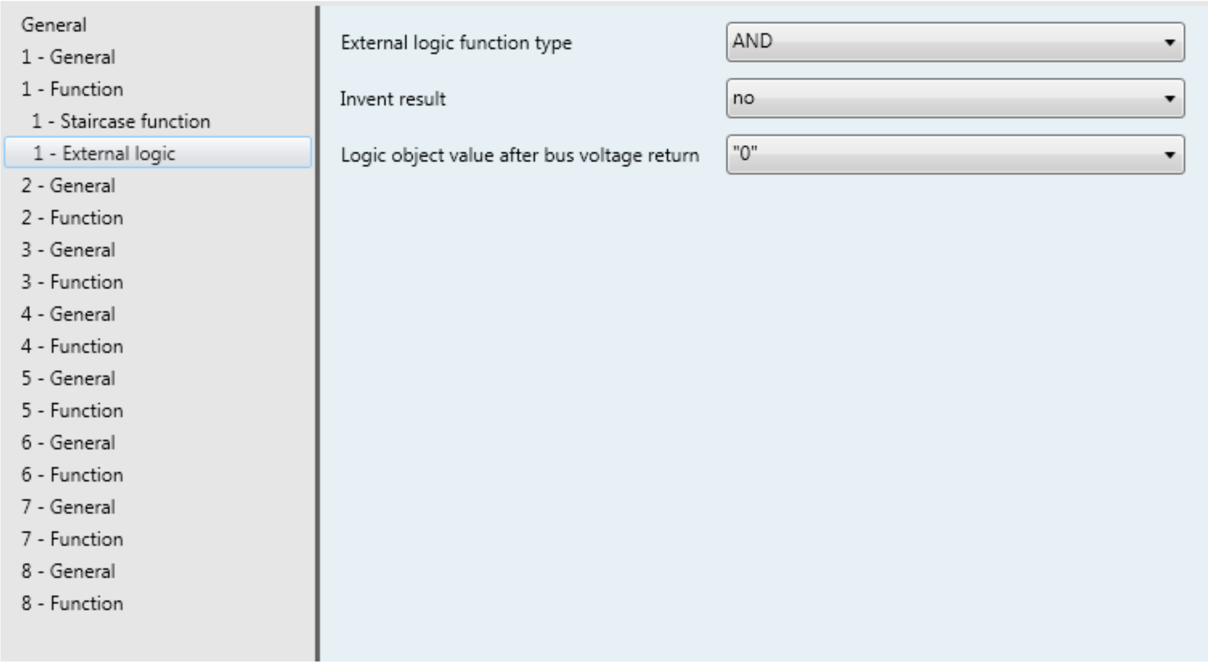
Time for pre-warning intervals ***Seconds (0…59)***	*0…***3**…59*

How long the lights shall be switched off in the period.

Activate on delay	*yes* ***no***

This parameter is used to delay switch off position before staircase start.

4.4.2 External Logic Function



External Logic Parameters

Logic function can be used independently for each output. With this function, the 'Switch' object can be logically linked with the 'External logic input'. Channel relay switch a result of the logic operation. For example 'Switch' object value 1 and 'External logic input' object value 0 relay switch as a result of 1 & 0 operation.

External logic function type	****AND*** *OR* *XOR*

This parameter selects the type of logic function between 'Switch' and 'External logic input' objects.

Invert result	*yes* ****no***

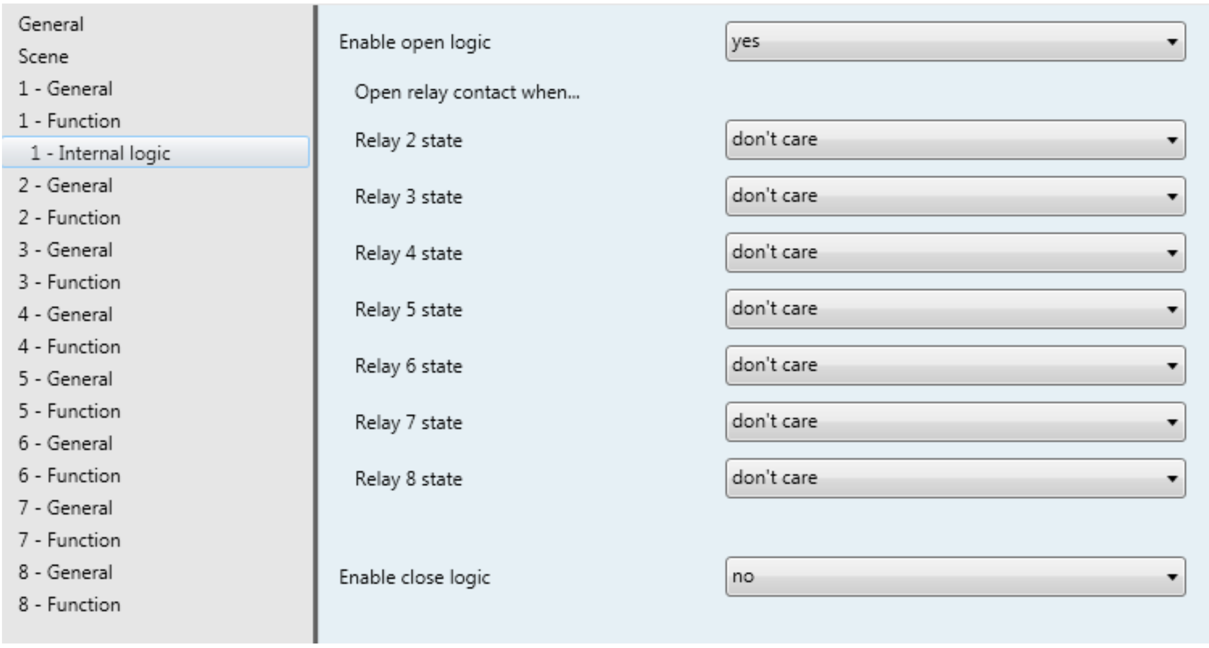
If you want to inverted logic function result, you should select 'yes'.

Logic object value after bus voltage return	*"1"* ****"0"***

This parameter defines the value of the 'External logic input' object after bus voltage return.

NOTE: The values of the 'External logic' communication objects doesn't store at the bus voltage failure.

4.4.3 Internal Logic Function



Internal Logic Parameters

You can enter the opening or closing scenario of the channel. In this function, each relay can be switched only one time because this reaction protects the devices from infinite loop. An internal logic function can be parameterized separately for each output. The relay of the channel doesn't participate to the scenario.

Relay 1…8 state	****don't care*** *off* ***on***

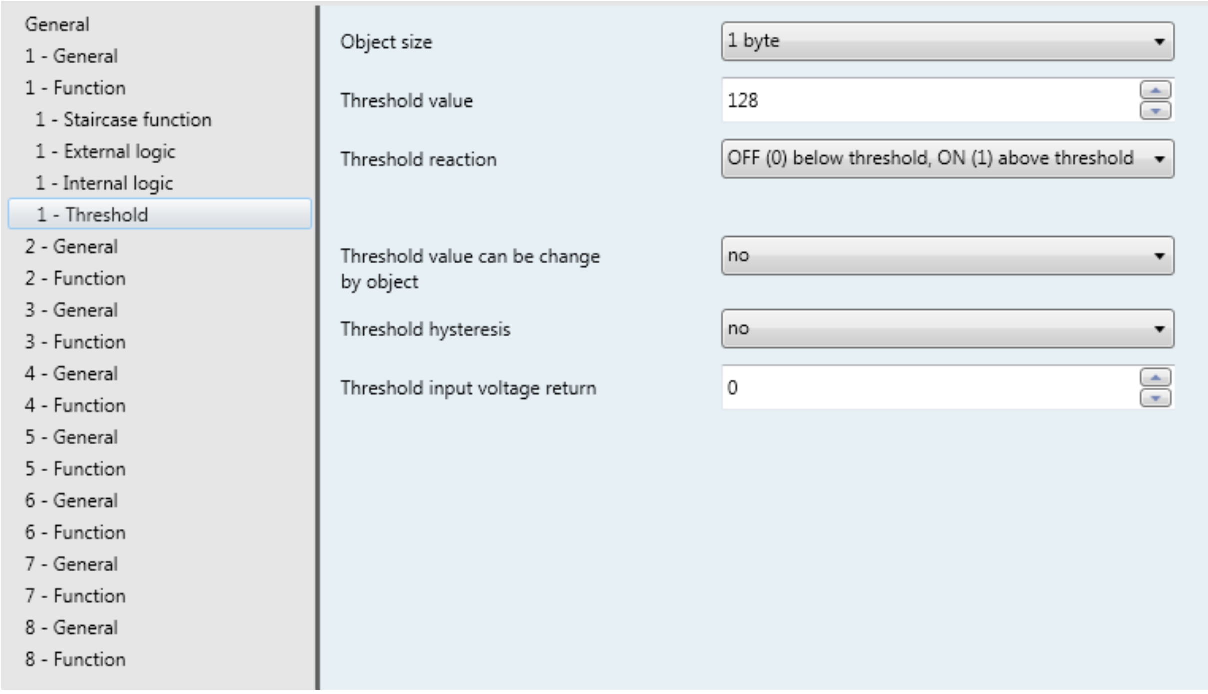
To create scenario to open or close channel relay, positions of other channels of the switch actuator are set with these parameters. The channels that doesn't need to participate this scenario should be left don't care.

4.4.4 Priority Function

If the priority function is enabled, 'Forced positioning' communication object is visible. It hasn't got any parameter. This is the standard forced position working.

Bit 1	Bit 0	Function
0	0	forced positioning not active – normal control
0	1	forced positioning not active – normal control
1	0	Forced positioning active – switch off
1	1	Forced positioning active – switch on

4.4.5 Threshold Function



Threshold Parameters

The function can be configured 1 byte or 2 byte. The value of Threshold input communication object falls below or exceeds a limit of threshold value. Then the relay position can be changed by this way.

Object size	****1 byte*** *2 byte*

The threshold value function data type determined here. All of the parameters associated with it which will change.

Threshold value	*0…***128**…255 (for 1 byte)* *0…***20000**…65535 (for 2 byte)*

Threshold limit value enters here. This parameter is dependent 'Object size' parameter.

Threshold reaction	****OFF (0) below threshold, ON (1) above threshold*** *ON (1) below threshold, OFF (0) above threshold*

This parameter determines the switch state. If the value of the 'Threshold input' communication object value bellows or above the threshold limit value, the relay switched on or off position.

Threshold value can be changed by object	*yes* ****no***

If the parameter selects 'yes', 'Threshold value' communication object is visible. Threshold value can be changed by this object.

Threshold hysteresis	*yes* ****no***

Hysteresis is dependence of a system not only its current value but also on its past value.

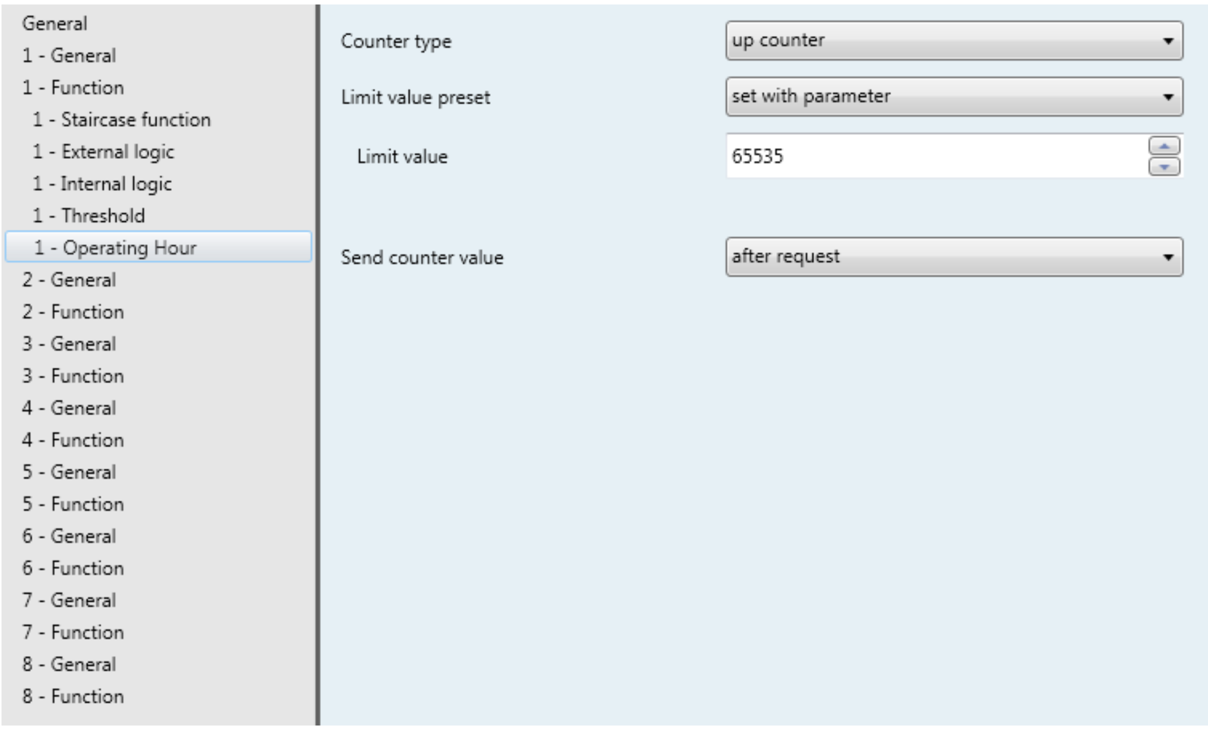
If the parameter selects 'yes';

Hysteresis percentage (1…10)	*%1…***%5**…%11*

For example: Hysteresis percentage parameter selected %10. You can see this state below graphic. Threshold hysteresis value measure formula 100 * 10 / 100 = 10 and threshold high and low limit 100 +- 10.

Threshold Graphic

4.4.6 Operating Hour Function



Operating Hour Parameters

The operating hours count the relay on time. The operating hours sums up to determine on time. The accumulated operating hours are stored in the 2 byte counter. The counter value sends to bus cyclically or after request. If the voltage fails or ETS programming, all operating hour counter stored in the devices. After the bus voltage returns, the device updates communication object value.

NOTE: User changed relay position by hand; device cannot detect it so operating hour doesn’t start the counting.

Counter type	****up counter*** *down counter*

Up counter: The operating hours start the count from ’0’. The maximum counting value is 65535 hours. When the operating hour reached limit value, ‘Operating hour runout’ telegram sends to bus. Then the operating hours counter stop.

Down counter: The operating hours preset value counting down. When the counter reached ‘0’, the counting status is reported to the bus via ‘Operating hour runout’.

Limit value preset	*no preset* ****set with parameter*** *set with object*

The start or limit value preset here. A limit value can be preset as an option.

- No preset

For up/down counter the limit value set to 65535. This is the maximum value both of operating hour.

- Set with parameter

This parameter selects; 'Limit value/Counter start' parameter is visible. This parameter is used for setting limit value of up counter, start value of down counter.

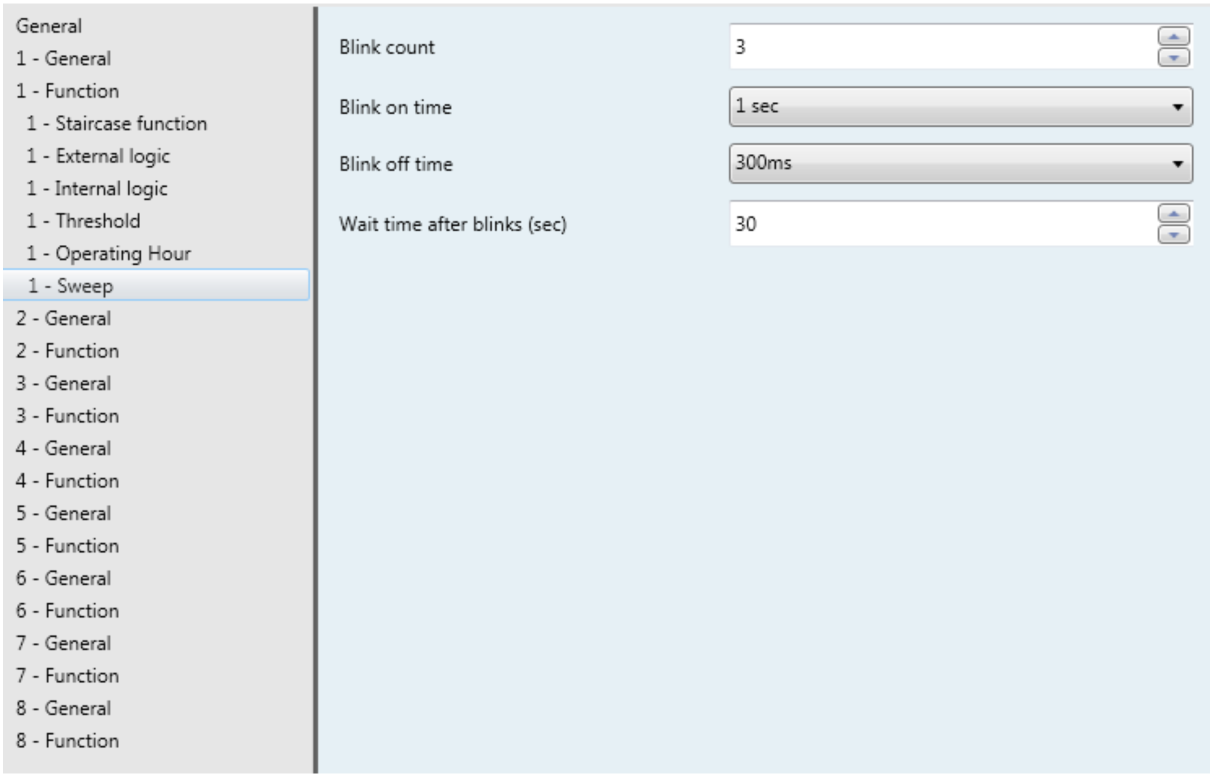
- Set with object

This parameter defines whether the start/limit value can be individually adapted from the bus.

Send counter value	*cyclic sending* ***after request** *cyclic sending and after request*

The current count of the operating hours can be learned three way 'cyclic sending', 'after request' and 'cyclic sending and after request'.

4.4.7 Sweep Function



Sweep Parameters

Sweep function only starts to operate if the relay is switched ON. It's an alternative way for turning off the relay with pre-warning. The sweep function is desired to warn a person that lights will go out shortly.

Send counter value	*1...****3****...10*

The lamps connected to the relay will then be switched off as many times. Enter the number of how many blink doing in the warning.

Blink on time	*0,5sec...****1sec****...5sec*

How long the lights shall be switched on in the period.

Blink off time	****300ms**…1sec*

How long the lights shall be switched off in the period.

Wait time after blinks (sec)	*0…*****30**…255*

How long the lights shall be switched on after sweep blink finished.

5 Process Priority Table