



SWITCH ACTUATOR

SAS

User Manual:

SAS-04.16

SAS-08.16

SAS-12.16

SAS-20.16

Application Program: ver. 1.0

User Manual: ver. 1.0

module-electronic.ru

CONTENT

Content	2
1 Basic information	3
1.1 Specification	4
1.2 Appearance	5
1.3 Installation and connection	6
2 How to choose a device version	7
3 Settings.....	8
3.1 Channel activity.....	9
3.2 Relay type.....	9
3.3 Mode	9
3.3.1 Switch.....	10
3.3.1.1 «ON» delay.....	10
3.3.1.2 «OFF» delay.....	10
3.3.2 Staircase Mode.....	11
3.3.2.1 «ON» delay.....	11
3.3.2.2 Timer value	11
3.3.3 Blinking.....	12
3.3.3.1 «OFF» phase	12
3.3.3.2 «ON» phase	12
3.4 Send actual output state periodically	13
3.5 Send actual state on change.....	13
3.6 Channel locking.....	13
3.6.1 Locking object inversion	13
3.6.2 Action when locking)	13
3.6.3 Action when unlocking	13
3.7 «OFF» warning	14
3.7.1 Prolongation time	14
3.7.2 Numbers of blinks	14
3.8 Logic function	14
3.8.1 Logic object inversion	14
3.8.2 Logic function.....	15
3.9 Scenes	16
3.9.1 Scene number to react.....	16
3.9.2 Scene reaction	16
4 Communication objects	17
4.1 Switch (On/Off)	17
4.2 Current state	17
4.3 Logic value.....	17
4.4 Channel locking.....	18
4.5 Scene	18
4.6 Switches counter.....	18
5 Description of behavior of the device after programming	18
6 Description of behavior of the device after loss and return of KNX bus voltage	19

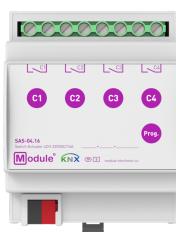
1 BASIC INFORMATION

The switch actuator receives KNX telegrams and switches up to 20 independent loads. Each output has a bistable relay, which can be manually controlled.

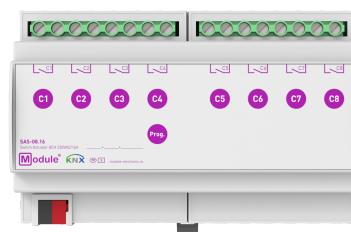
The device is available in four versions which differ by the number of independent channels:

- SAS-04.16 (4 channels);
- SAS-08.16 (8 channels);
- SAS-12.16 (12 channels);
- SAS-20.16 (20 channels).

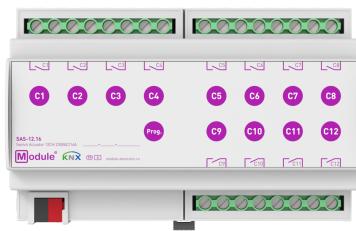
- Independent channels for a maximum capacitive load of 140µF
- Ability to connect outputs to different phases
- Manual control of outputs using front panel buttons
- LED indication of output status
- Extended logic and scenario functions for each output
- Ability to select output mode (NO or NC)
- Saving settings during a KNX power failure
- Power supply via KNX bus
- DIN rail 35mm mounting



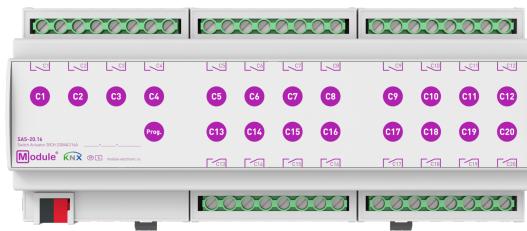
SAS-04.16



SAS-08.16



SAS-12.16



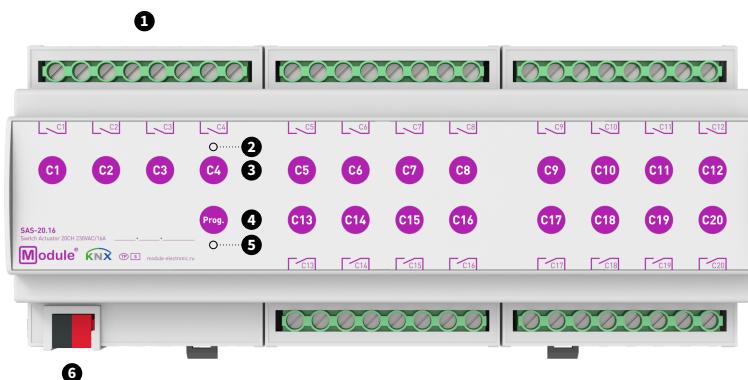
SAS-20.16

1.1 SPECIFICATIONS

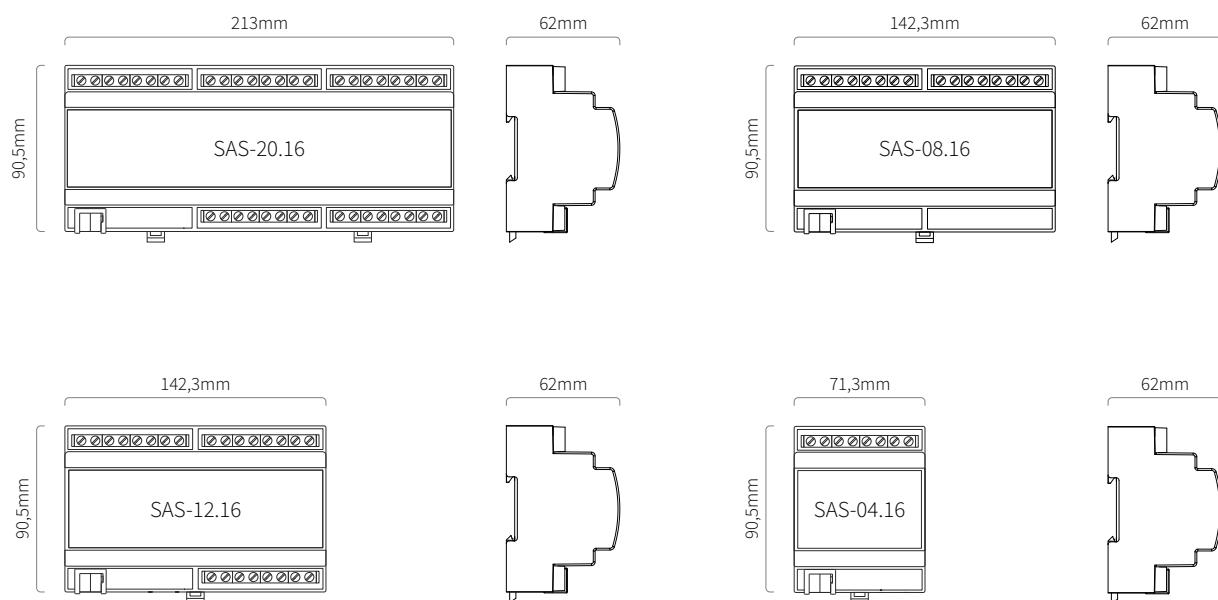
Device model	SAS-04.16	SAS-08.16	SAS-12.16	SAS-20.16
Outputs (control channels)				
Number of outputs	4	8	12	20
Output type / Disconnection type	Potential-free outputs-bistable relay with tungsten pre-make contact / Micro-disconnection			
Rated current per output	16A/230V AC, 16A/24V DC			
Capacitive load	140µF			
Maximum switching voltage	400V AC, 300V DC			
Maximum load (resistive / inductive)	4000W / 1500W			
Maximum inrush current	165A/20ms 800A/200µs			
Maximum relay response time	10ms			
Maximum load per output				
Incandescent lamps	2500W			
Halogen lamp 230V	2500W			
Halogen lamp, electronic transformer	1500W			
Fluorescent lamp not compensated	2300W			
Fluorescent lamp parallel compensated	1500W			
Maximum number of electronic transformers	20			
Cross-section of the connected wire to the screw terminals	1 x (0,5-4mm ²) 2 x (0,5-2,5mm ²)			
Mechanical lifetime of the relay (cycles, minimum)	3.000.000			
KNX interface				
Specification	TP-256			
Available application software	ETS 5			
KNX connector	4-wire EIB connector (PUSH WIRE spring clips) for standard cable TP1 0,8MM Ø			
Power supply	via KNX bus			
Consumption on the KNX bus (29V DC)	< 5mA < 150mW	< 5mA < 150mW	< 5mA < 150mW	< 7mA < 210mW
Operation temperature	от 0 до + 45°C			
Operation humidity	от 5 до 95% (no condensation)			
Degree of protection	IP 20, clean environment			
Mounting type	DIN rail 35mm			
Dimensions	71,3 x 90,5 x 62mm (8TE)	142,3 x 90,5 x 62mm (8TE)	142,3 x 90,5 x 62mm (8TE)	213 x 90,5 x 62mm (12TE)
Weight	185g	340g	415g	645g

1.2 APPEARANCE

The appearance of the actuator using the example of the SAS-20.16 model (other versions differ only in the number of channels (outputs)).



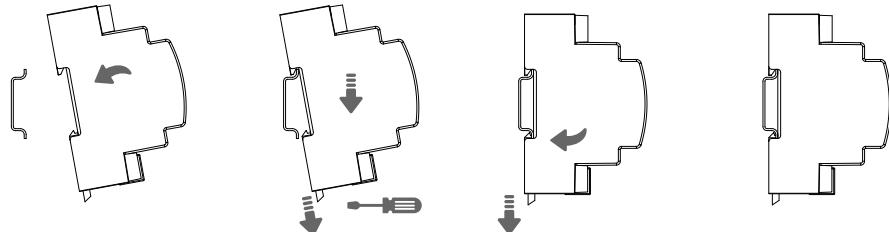
1. Outputs 2. Output status indicator LED 3. Output control button
4. Programming button 5. Programming LED 6. KNX connector



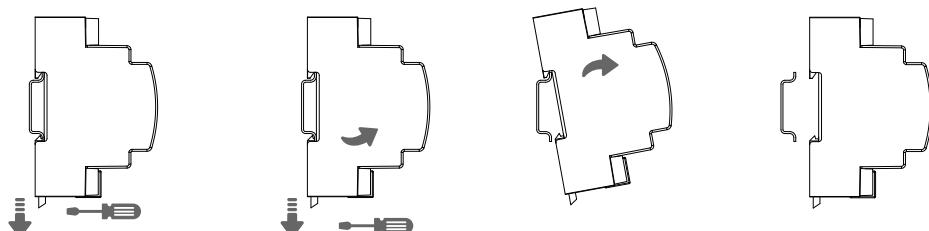
1.3 INSTALLATION AND CONNECTION

INSTALLATION

Attaching to DIN rail

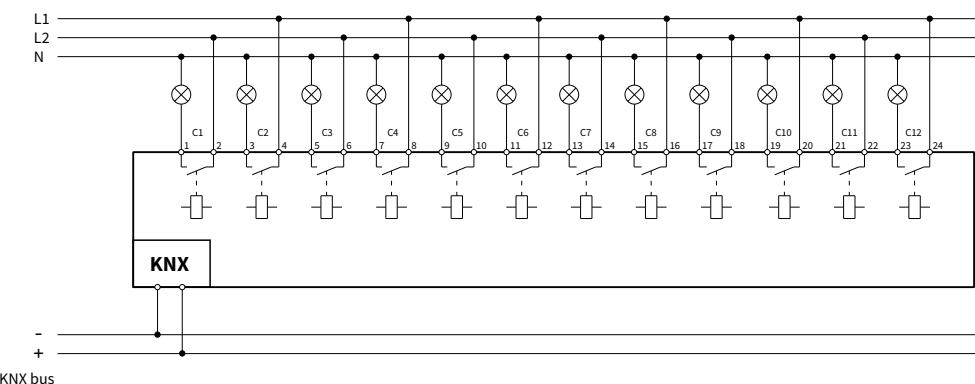


Removing from DIN rail



WIRING DIAGRAMS

Wiring example SAS-12.16 (other versions are connected in the same way)



ATTENTION! Installation and connection of the device to the mains must only be carried out by qualified personnel! There is a risk of electric shock! Be sure to turn off the power before installing or removing the device! Even when the device is turned off, the output terminals can be live! Do not connect to the outputs a load that exceeds the recommended values! The design of the device meets the requirements of electrical safety according to GOST 12.2.007.0-75.

2 HOW TO CHOOSE A DEVICE VERSION

The menu for selecting a version consists of a drop-down list «Device Model».

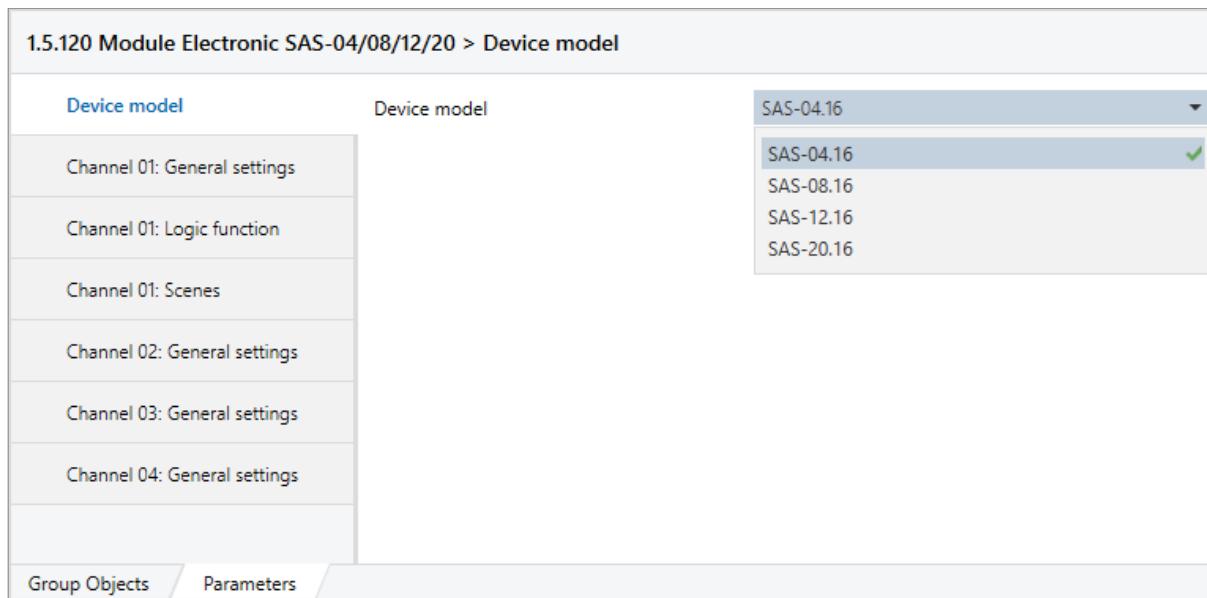


Figure 1. Tab «Device model»

Depending on the selected version, the corresponding number of tabs for each of the channels available in the selected version is displayed in the settings menu.

3 SETTINGS

The device settings menu consists of individual tabs for each channel.

1.5.120 Module Electronic SAS-04/08/12/20 > Channel 1: General settings

Device model	Channel activity	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Channel 1: General settings	Relay type	<input checked="" type="radio"/> Normally open <input type="radio"/> Normally closed
Channel 1: Logic function	Mode	Blinking
Channel 1: Scenes	"OFF" phase	
seconds	5	<input type="button" value="▼"/>
minutes	0	<input type="button" value="▼"/>
Channel 2: General settings	"ON" phase	
seconds	3	<input type="button" value="▼"/>
minutes	0	<input type="button" value="▼"/>
Channel 3: General settings	Send actual output state periodically every (minutes, 0 - don't send)	0
Channel 4: General settings	Send actual state on change	<input type="radio"/> Don't send <input checked="" type="radio"/> Send
	Channel locking	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Locking object inversion	<input checked="" type="radio"/> Normal <input type="radio"/> Inverted
	Action when locking	Stay unchanged
	Action when unlocking	Stay unchanged
	"OFF" warning	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Prolongation time (seconds)	10
	Number of blinks	twice
	Logic function	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Scenes	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
Group Objects	Parameters	

Figure 2. Tab «Channel 1: General settings»

3.1 CHANNEL ACTIVITY

The parameter turns the channel off («Inactive») or on («Active»). In the «Active» position, the remaining channel settings are displayed

3.2 RELAY TYPE

The parameter sets the type of the relay contact group: «normally open» or «normally closed».

3.3 MODE

The parameter allows to choose one of the three main channel operation modes: «Switch», «Staircase», or «Blinking».

3.3.1 SWITCH

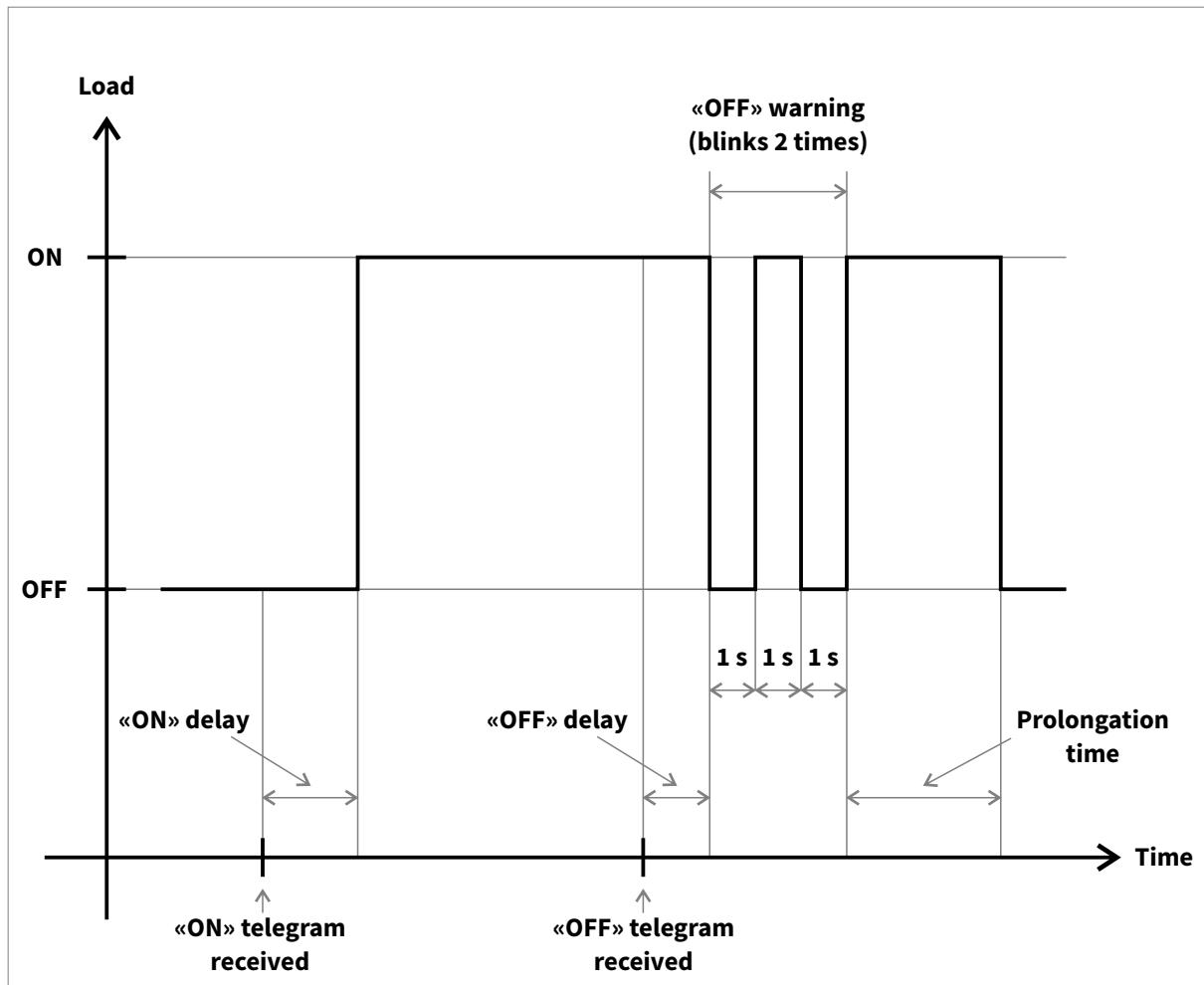


Figure 3. The operation algorithm in the «Switch» mode

3.3.1.1 «ON» DELAY

The parameter sets the delay between the receipt of the telegram «ON» and switching off of the load. The delay is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.3.1.2 «OFF» DELAY

The parameter sets the delay between the receipt of the telegram «OFF» and switching off of the load. The delay is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.3.2 STAIRCASE MODE

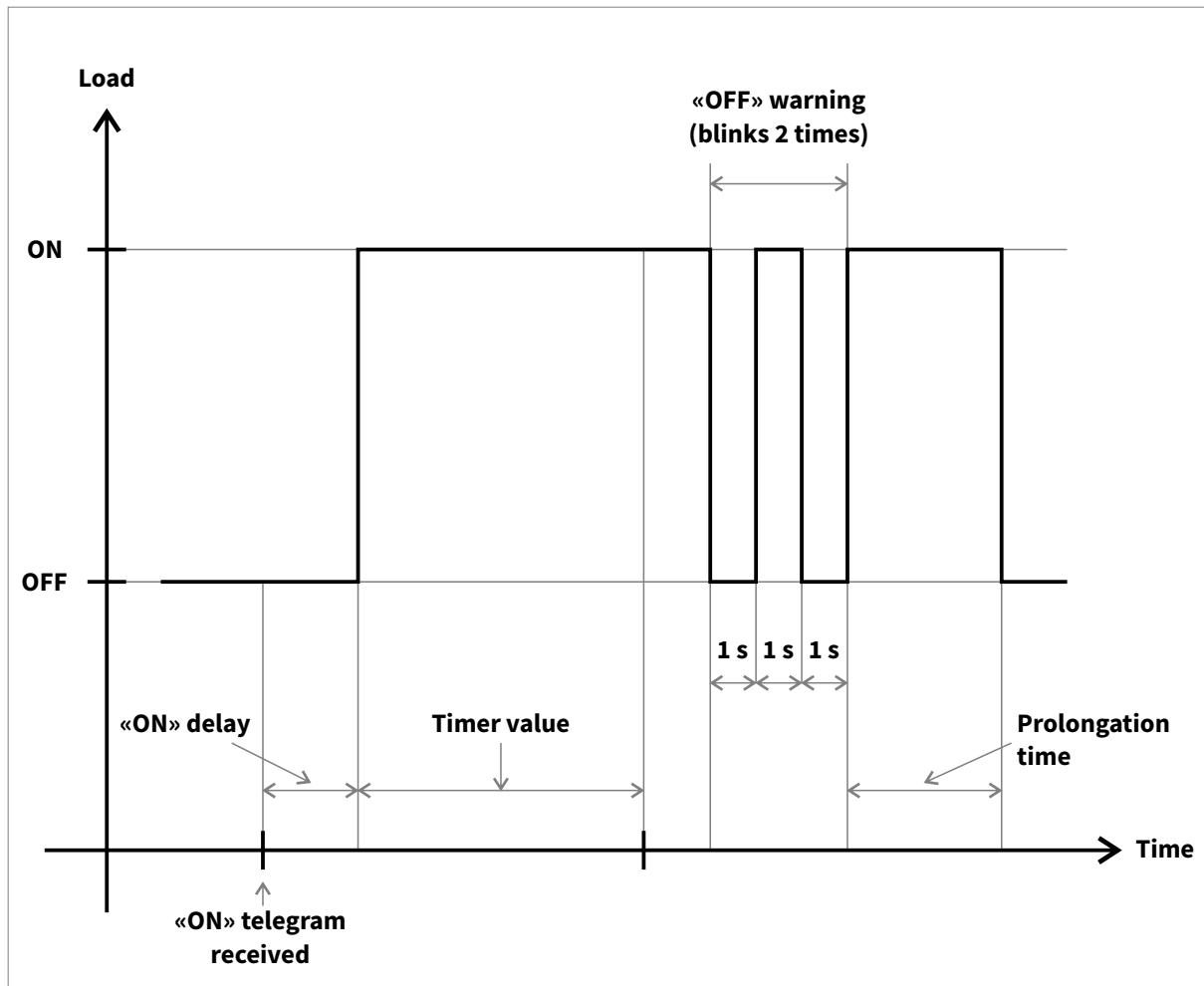


Figure 4. The operation algorithm in the «Staircase» mode.

3.3.2.1 «ON» DELAY

The parameter sets the delay between the receipt of the telegram «ON» and switching on of staircase lighting. The delay is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.3.2.2 «ON» DELAY

The parameter sets the duration of the staircase lighting. The duration is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.3.3 BLINKING

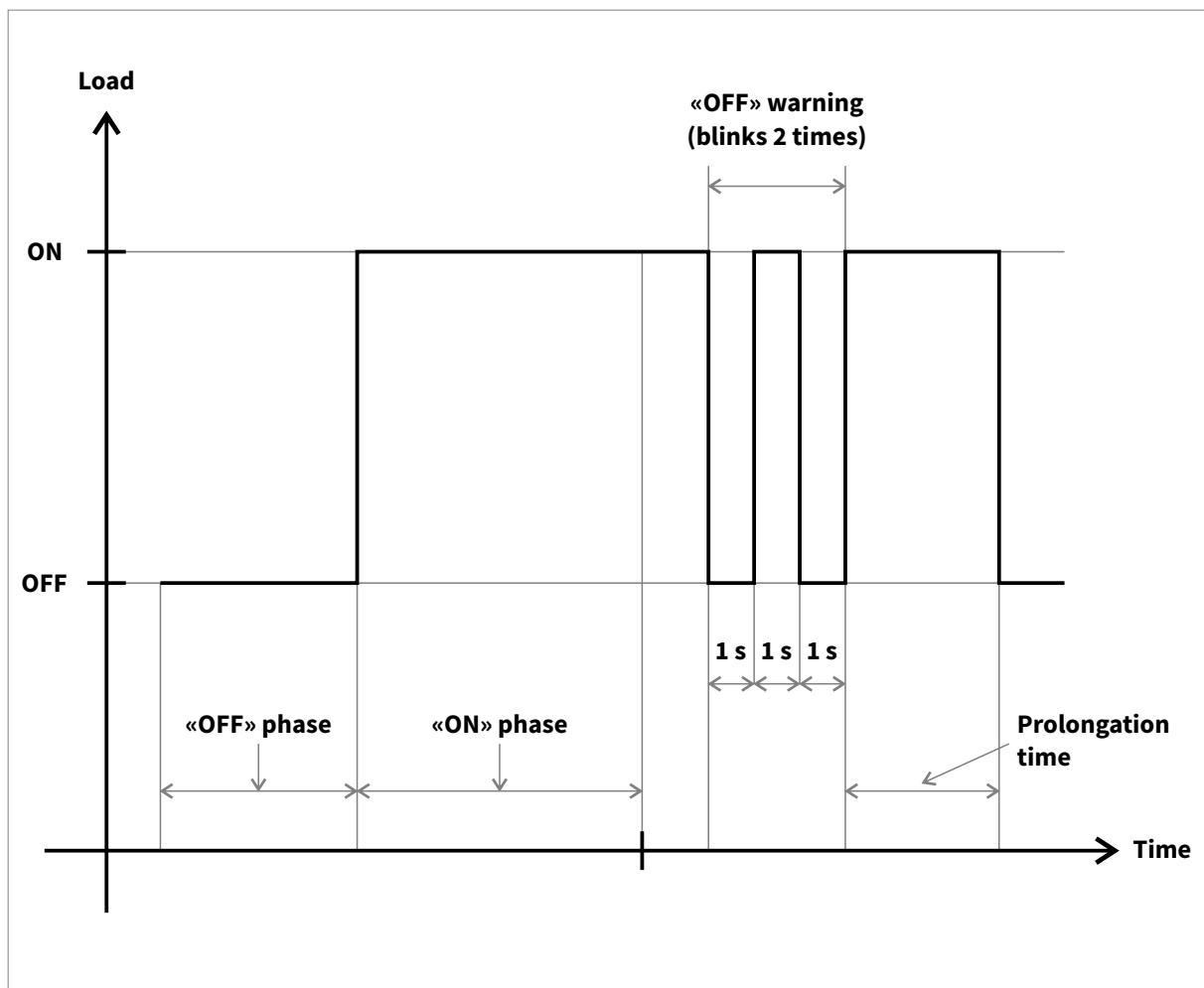


Figure 5. The operation algorithm in the «Blinking» mode

In this mode, a periodic sequence of switching on/off the load with the specified time parameters is automatically generated on the output.

3.3.3.1 «OFF» PHASE

The parameter sets the duration of the «Off» state. The duration is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.3.3.2 «ON» PHASE

The parameter sets the duration of the «On» state. The duration is set in minutes and seconds in the range from 0 to 255 minutes 59 seconds.

3.4 SEND ACTUAL OUTPUT STATE PERIODICALLY

The parameter allows to configure periodic sending of the current channel status. The period is indicated in minutes, the allowable values are from 0 to 60 minutes (with a zero value periodic sending is not done).

3.5 SEND ACTUAL STATE ON CHANGE

The parameter allows to configure sending the current state of the channel when it changes («Send»). If «Don't send» is selected, nothing will be sent at its change.

3.6 CHANNEL LOCKING

The parameter allows to enable channel lock. When «Disabled» is selected, locking is disabled. When «Enabled» is selected, the «Channel locking» communication object becomes available and several additional settings appear. When the lock is enabled and activated, the channel does not respond to control telegrams.

3.6.1 LOCKING OBJECT INVERSION

«Normal» - the channel is blocked when the object of blocking is active, and unlocked - when passive.
«Inverted» works in the opposite mode.

3.6.2 ACTION WHEN LOCKING

The parameter defines the action when the lock is set:

- «Switch off» - disable the channel;
- «Switch on» - enable the channel;
- «Stay unchanged» - do not change the state of the channel.

3.6.3 ACTION WHEN UNLOCKING

The parameter defines the action when unlocking:

- «Switch off» - disable the channel;
- «Switch on» - enable the channel;
- «Stay unchanged» - do not change the state of the channel.

3.7 «OFF» WARNING

The parameter allows to enable a warning about the channel shutdown. In the «Disabled» position, warning is not allowed. In the «Enabled» position, the warning is activated and additional settings become available. Warning is performed through blinking the channel state with a frequency of 1 Hertz.

3.7.1 PROLONGATION TIME

Sets the increase in the channel switch on time after the warning about switch off. 0 to 255 seconds.

3.7.2 NUMBER OF BLINKS

Sets the number of warning blinks (1 to 4).

3.8 LOGIC FUNCTION

The parameter allows to enable a logical function. If «Enabled» is selected, the «Logic» communication object is activated, and an additional settings tab «Channel 1: logical function» appears.

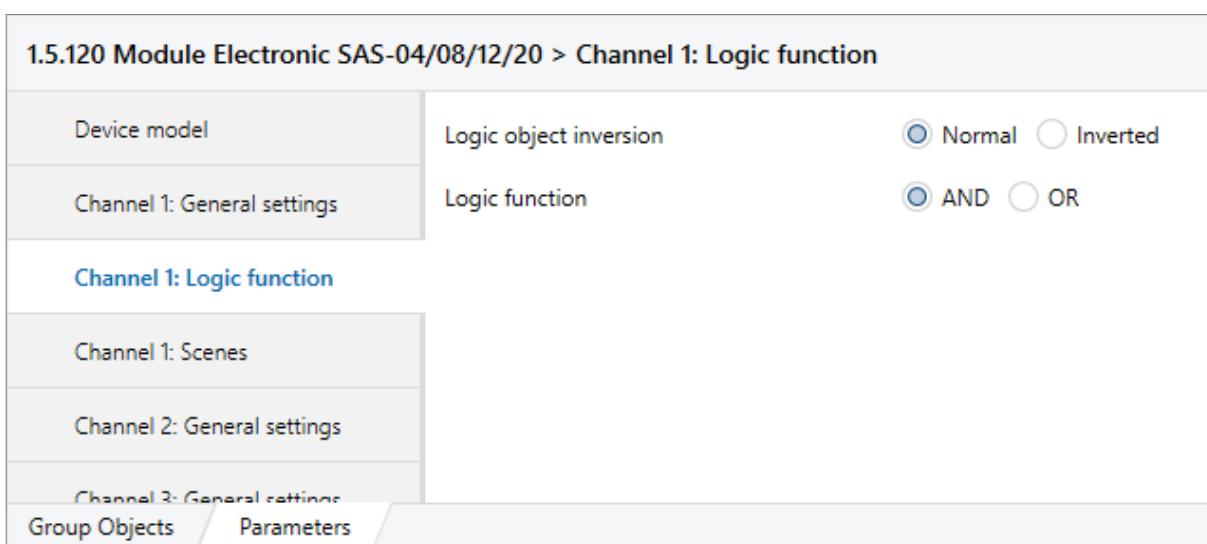


Figure 6. Tab «Channel I: Logic function»

3.8.1 LOGIC OBJECT INVERSION

3.8.2 LOGIC FUNCTION

These parameters define the channel behavior at different combinations of states of the logic object and the algorithm of the channel, in accordance with «Table 1».

«Logic object inversion» parameter value	«Logic object function» parameter value	Logic object state	Channel status based on its operation algorithm	Resulting channel state
Normal	AND	False	Off	Off
		False	On	Off
		True	Off	Off
		True	On	On
Normal	OR	False	Off	Off
		False	On	On
		True	Off	On
		True	On	On
Inverted	AND	False	Off	Off
		False	On	On
		True	Off	Off
		True	On	Off
Inverted	AND	False	Off	On
		False	On	On
		True	Off	Off
		True	On	On

Table 1. Table of trueness of a logical function

3.9 SCENES

The parameter allows to enable scene processing. If «Enabled» is selected, the «Scene» communication object is activated, and an additional tab for the parameters «Channel 1: Scenes» appears.

The device supports processing of up to four scenes per channel. Saving scenes («Learn») is also supported.

1.5.120 Module Electronic SAS-04/08/12/20 > Channel 1: Scenes

Device model	Scene number "A" to react (0 - no reaction)	1
Channel 1: General settings	Scene "A" reaction	<input checked="" type="radio"/> switch off <input type="radio"/> switch on
Channel 1: Logic function	Scene number "B" to react (0 - no reaction)	2
Channel 1: Scenes	Scene "B" reaction	<input type="radio"/> switch off <input checked="" type="radio"/> switch on
Channel 2: General settings	Scene number "C" to react (0 - no reaction)	3
Channel 3: General settings	Scene "C" reaction	<input checked="" type="radio"/> switch off <input type="radio"/> switch on
Channel 4: General settings	Scene number "D" to react (0 - no reaction)	4
	Scene "D" reaction	<input type="radio"/> switch off <input checked="" type="radio"/> switch on
Group Objects Parameters		

Figure 7. Tab «Channel 1: scenes»

3.9.1 SCENE NUMBER TO REACT

The parameter sets the number of the scene to which the reaction is required (1 to 64, if set to «0» - no reaction is required).

3.9.2 SCENE REACTION

The parameter sets the reaction to the scene: if «Switch off» is indicated, the channel is disabled, if «Switch on» is indicated, the channel is enabled.

4 COMMUNICATION OBJECTS

Depending on the settings, the device activates and supports up to 6 independent CommObjects for each channel.

Number ^	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	Channel 01	Switch (On/Off)			1 bit	C -	W -	U	switch		Low	
21	Channel 01	Current state			1 bit	C R -	T -	switch			Low	
41	Channel 01	Logic value			1 bit	C -	W -	U	boolean		Low	
61	Channel 01	Channel locking			1 bit	C -	W -	U	switch		Low	
81	Channel 01	Scene			1 byte	C -	W -	U	scene control		Low	
101	Channel 01	Switches counter			2 bytes	C R -	T -	pulses			Low	

Group Objects

Parameters

Figure 8. Communication objects of channel 1

4.1 SWITCH (ON/OFF)

Available, if parameter 3.1 «Channel activity» is set to «Active». Allows to control the channel through telegrams of the 1.001 «Switch» type. The object is write-only.

4.2 CURRENT STATE

Available, if parameter 3.1 «Channel activity» is set to «Active». Allows to read the current state of the channel using telegrams of the 1.001 «Switch» type. The object is read-only. Using parameters 3.4 «Send actual output state periodically» and 3.5 «Send actual state on change», automatic sending of the current state can be arranged.

4.3 LOGIC VALUE

Available, if parameter 3.1 «Channel activity» is set to «Active», and parameter 3.8 «Logic function» is set to «Enabled». Allows to implement additional channel control using a logical function. The type of communication object is 1.002 «Boolean». The object is write-only. The influence of the logical variable on the channel can be configured using parameters 3.8.1 «Logic object inversion» and 3.8.2 «Logic function».

4.4 CHANNEL LOCKING

Available, if parameter 3.1 «Channel activity» is set to «Active», and parameter 3.6 «Channel locking» is set to «Enabled». Allows to lock the channel. The type of communication object is 1.001 «Switch». The object is write-only. The channel's response to locking can be configured using parameters 3.6.1 «Locking object inversion», 3.6.2 «Action when locking», and 3.6.3 «Action when unlocking».

4.5 SCENE

Available, if parameter 3.1 «Channel activity» is set to «Active», and parameter 3.9 «Scenes» is set to «Enabled». Allows to control the channel using scenes, as well as remember scenes. The type of communication object is 18.001 «Scene control». The object is write-only. Work with scenes can be configured using the parameters described in sections 3.9.1 «Scene number to react» and 3.9.2 «Scene reaction». Up to 4 scene numbers can be configured.

4.6 SWITCHES COUNTER

Available, if parameter 3.1 «Channel activity» is set to «Active». Allows to read the number of relay operations and control the resource of its contact group. The type of communication object is 7.001 «Two-byte unsigned integer». The object is read-only.

5 DESCRIPTION OF BEHAVIOR OF THE DEVICE AFTER PROGRAMMING

After the initial loading of the software application the device is in the following state:

- relay contact groups of all channels: disabled;
- all channels are inactive (parameters 3.1 «Channel activity» of all channels: in the «Inactive» position);
- all settings: default values.

6 DESCRIPTION OF BEHAVIOR OF THE DEVICE AFTER LOSS AND RETURN OF BUS VOLTAGE

In case of loss of communication with the KNX bus (when the voltage in the bus drops below the permissible level), the device stores the state of the relay of all channels in non-volatile memory.

After communication with the KNX bus is restored (after the voltage in the bus returns to the acceptable range), the relay states of all channels correspond to their states before loss of communication with the bus.