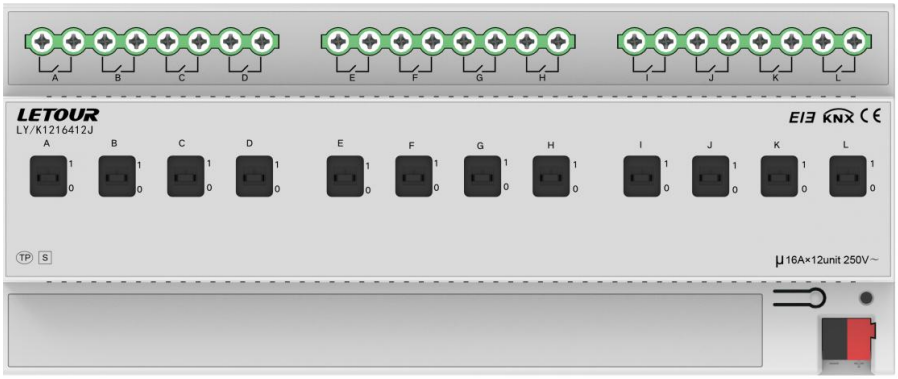
Switch Actuator

User Manual

LY/K0416412J
LY/K0816412J
LY/K1216412J



KNX/EIB Home and Building Control System

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Chapter 1 Summary

This manual provides you the detailed technical information about the Switch Actuators, not only the installation and programming details, but also the usage explanation in actual application. They can be installed in the distribution boards on 35mm mounting rails according to EN60715.

These switch actuators can be used to control the switch loads, such as:

——Lighting

——Heat control

——Signal device

It can be installed as a system together with other loads via EIB/KNX bus.

Engineering design tool software ETS can be used and operated on this system.

1.1 Product and function overview

The switch actuators are the modular installation devices, with 4, 8 and 12 outputs for selection, using KNX BUS connection terminals to connect to the system. The switch actuators are connected to the AC power supply directly instead of an extra voltage supply. Physical address allocation and parameter setting can be done using the engineering design tool software ETS (version ETS2 v1.3 or above) with VD2/VD3 files.

The switch actuators can switch 4 to 12 independent electrical AC loads or three-phase loads. The maximum load current of each switch actuator output is 16 A and can be opened or closed manually. The switch status is visible.

The following functions can be adjusted individually, as each channel has the same application:：

- time function: on/off delay
- staircase function with the warning and adjustable staircase lighting time
- scene, preset control: 8bit/1bit
- logic operation: AND, OR, XOR, gate function
- status response
- forced operation and safe function
- threshold function setup
- control of electric thermal valve function
- selection of preferred status after bus voltage failure and recovery

Chapter 2 Technical Data & Dimension and Connection Diagram

2.1 Technical data

The switch actuators are modular installation devices in proM design, which are easy to be installed in the distribution boards on 35mm mounting rails via bus connection terminal to connect to KNX system.

The actuator can switch up to 12 independent output channels by increasing the number of channels used. The load is connected to the actuator using a screw power connector in a set of two interfaces. Each output is controlled individually by the EIB / KNX system.

The device is suitable for switching resistive, inductive and capacitive loads.

2.1.1 LETOUR-4/24

Power supply	Operation voltage	21...30 V DC，via the KNX bus
	Current consumption, bus	< 12 mA
	Power consumption, bus	Max. 360 mW
Output	Number of contacts	4/8/12
	Un rated voltage	250VAC(50~60Hz)
	In rated current	16A（KA/R xx16.1）
		20A（KA/R xx20.1）
	Max. switching current	20A/250V AC（KA/R xx16.1）
		40A/250V AC（KA/R xx20.1）
	Power loss per device at max. load	2W/4W/8W
Output life expectancy	Mechanical endurance	$>10^6$
	Electrical endurance	$>10^4$
Output switching times	Operation period per output	55ms
	Delay times after switching on	30ms
	Delay times after switching off	25ms
Connections	EIB / KNX	Bus connection terminal (0.8mmΦ)
	Load output connection terminal	Screw terminal
Operation and display	Red Led and button	For assignment of the physical address
	Green LED flashing	Indicate the application layer running normally
	Indication of the contact position	Close means the output is on
		Open means the output is off
Protection	IP 20	To EN60529

Safety class	II	To EN61140
Temperature	Operation	- 5 ° C ... + 45 ° C
	Storage	- 25 ° C ... + 55 ° C
	Transport	- 25 ° C ... + 70 ° C
Ambient	Humidity	<93%,except dewing
Design	DIN Rail Module Assemblies	35mm Din rail, modular installation
	Dimension	As shown

Electrical life	100000 cycles	30000 cycles
Incandescent lamp	1250W	2500 W
Uncompensated fluorescent lamp	1200W	2500W
Parallel compensation fluorescent lamp	650W/70μF	1300W/140μF
Double tube fluorescent lamp	2x1200W	2x2500W
230VAC Iodine tungsten lamp/halogen lamp	1200W	2500W
Low voltage halogen lamp with inductor transformer	1000W	2000W
Low voltage halogen lamp with electronic transformer	500VA	500VA
Uncompensated mercury/sodium lamp	1000W	2000W
Parallel compensation mercury lamp/sodium lamp	1000W/70μF	2000W/140μF
Uncompensated alkyd lamps	800W	1600W
Parallel Compensated Alkyd Lamps	560W/70μF	1100 W/140μF

Note: The above load is only for a single lamp. When multiple lamps are connected in parallel, the load will be reduced. Although the power remains unchanged, the instantaneous impact current will increase, which can easily melt the relay contacts. In normal use, the maximum output current is based on 10A, not 16A. It will be lower for inductive and capacitive loads.

Application program：

Model	Max. number of communication objects	Max. number of group addresses	Max. number of associations
LY/0416412J	59	85	85
LY/0816412J	115	160	160
LY/1216412J	171	250	250

2.1.2 LY/0816412J

Power supply	Operation voltage	21...30 V DC，via the KNX bus
	Current consumption, bus	< 12 mA
	Power consumption, bus	Max. 360 mW
Output	Number of contacts	8
	Un rated voltage	230VAC(50~60Hz)
	In rated current	10A/230 VAC
	Minimum applicable load	100mA5V DC
Output life expectancy	Mechanical endurance	$>10^6$
	Electrical endurance	$>10^4$
Connections	EIB / KNX	Bus connection terminal (0.8mmΦ)
	Load output connection terminal	Screw terminal
Operation and display	Red Led and button	For assignment of the physical address
	Green LED flashing	Indicate the application layer running normally
	Indication of the contact position	LED ON—output on
		LED OFF—output off
Protection	IP 20	To EN60529

Safety class	II	To EN61140
Temperature	Operation	- 5 ° C ... + 45 ° C
	Storage	- 25 ° C ... + 55 ° C
	Transport	- 25 ° C ... + 70 ° C
Ambient	Humidity	5~85%, except dewing
Design	DIN Rail Module Assemblies	35mm Din rail, modular installation
	Dimension	As shown
Weight	0.3kg	

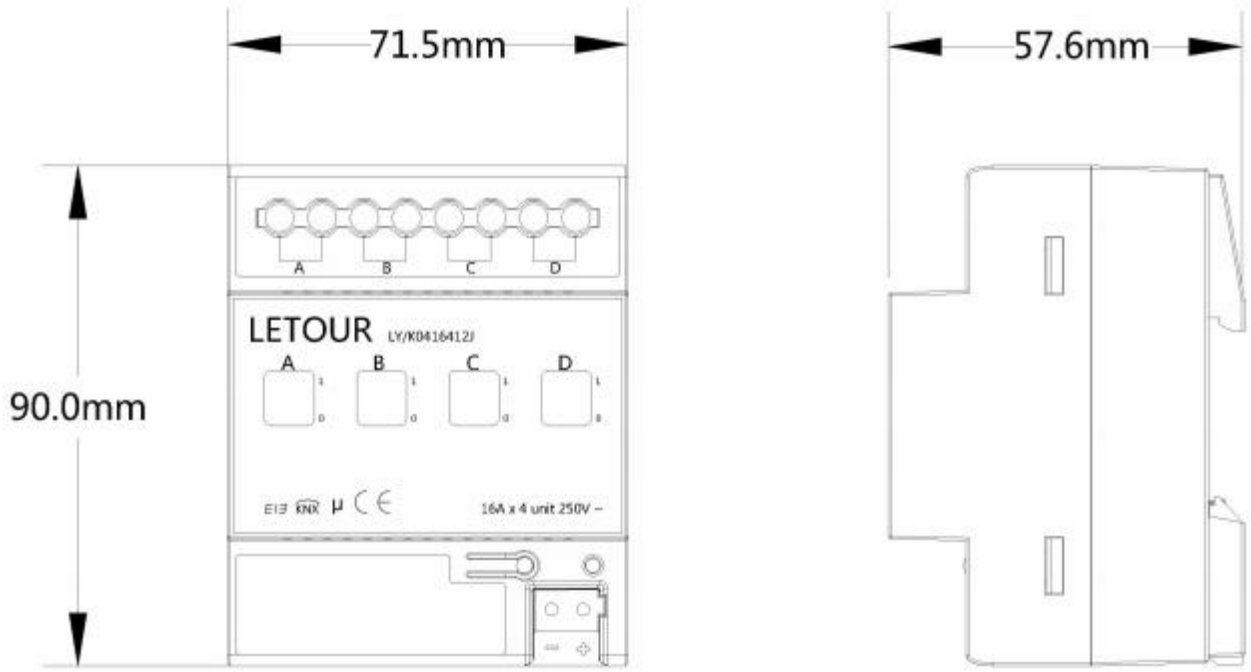
Lamp load prediction

Electrical life	30000 cycles
Incandescent lamp	1200 W
Parallel compensation fluorescent lamp	1200W
230VAC Iodine tungsten lamp/halogen lamp	1200W
Low voltage halogen lamp with inductor transformer	800W
Low voltage halogen lamp with electronic transformer	500VA
Parallel compensation mercury lamp/sodium lamp	1200W
Parallel Compensated Alkyd Lamps	1000 W
Resistive load	2400W

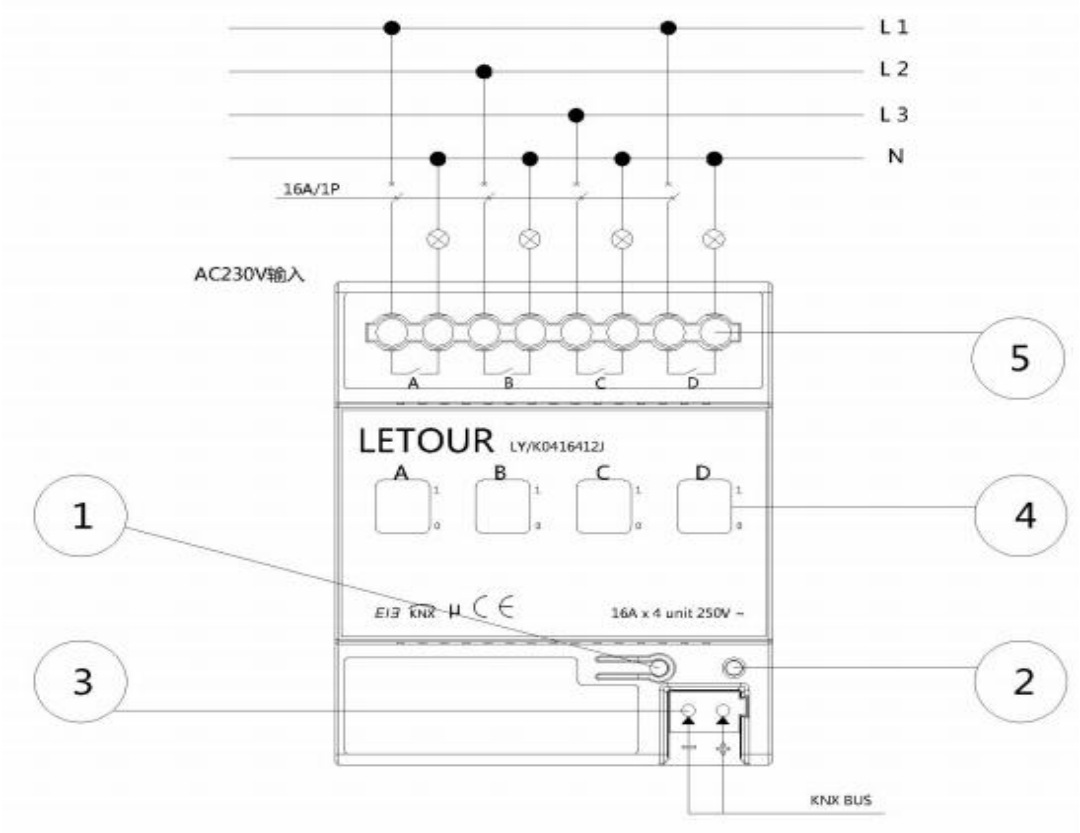
Note: The above load is only for a single lamp. When multiple lamps are connected in parallel, the load will be reduced. Although the power remains unchanged, the instantaneous impact current will increase, which may easily melt the relay contacts. In normal use, the maximum output current is based on 10A, which will be lower for inductive and capacitive loads.

2.2 Dimension and Connection Diagram

2.2.1 Dimension drawing - LY/0416412J



2.2.2 Connection Diagram - LY/0416412J



① Programming button

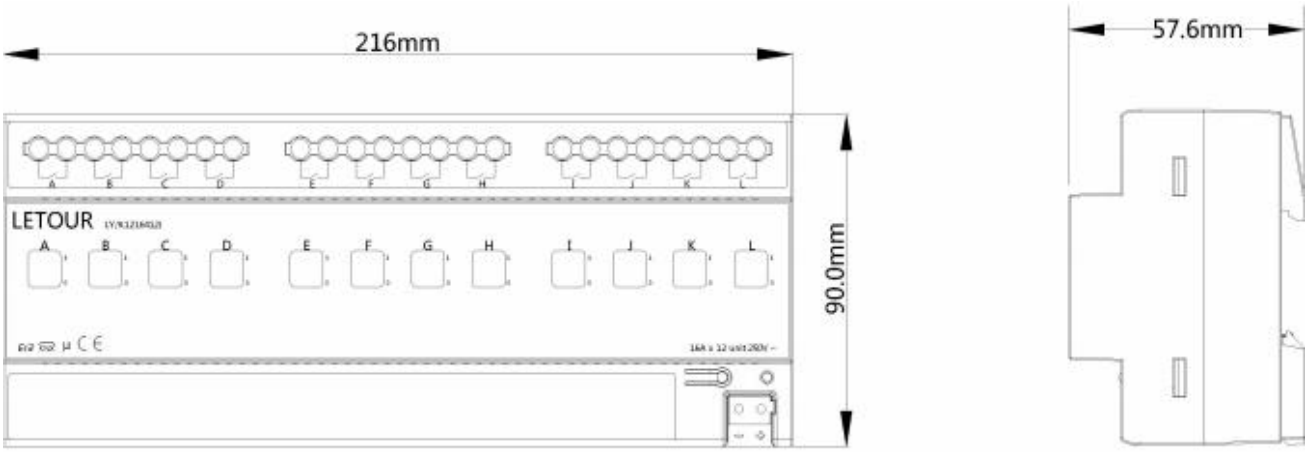
② Red LED for entering the physical address, Green LED flashing for application layer running normally

③ KNX bus connection terminal

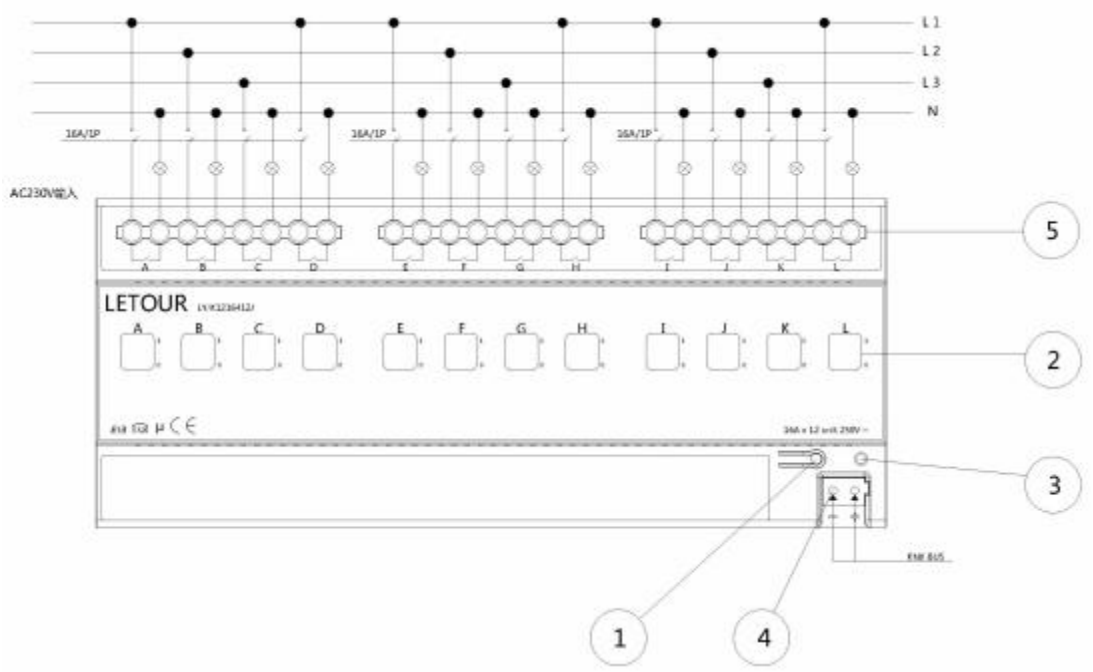
④ Manual operation, switch on/off the outputs via manual button

⑤ Output or load terminal

2.2.3 Dimension drawing LY/1216412J



2.2.4 Connection Diagram



① Programming button

② Manual operation, switch on/off the outputs via manual button

③ Red LED for entering the physical address, Green LED flashing for application layer running normally

④ KNX bus connection terminal

⑤ Output or load terminal

Chapter 3 Commissioning

3.1 Overview

Every output has two operation modes (main function)：

1. Switch actuator

It is used for normal switching, for instance, lighting control, which uses the object “Switch” to control the output directly. Lots of additional functions such as timing, logical, safety functions are available to use. Application description can be found in below text.

2. Dynamic regulating Actuator

In this function, the output is used to control the cooling/heating temperature. The room thermostat sends a control value, which is output to control the switch as a 2-step control.. Application description can be found in below text

3.2 Parameter window “All General”

The parameter window “All General” will be shown in Fig. 2.1, which applies to every output.

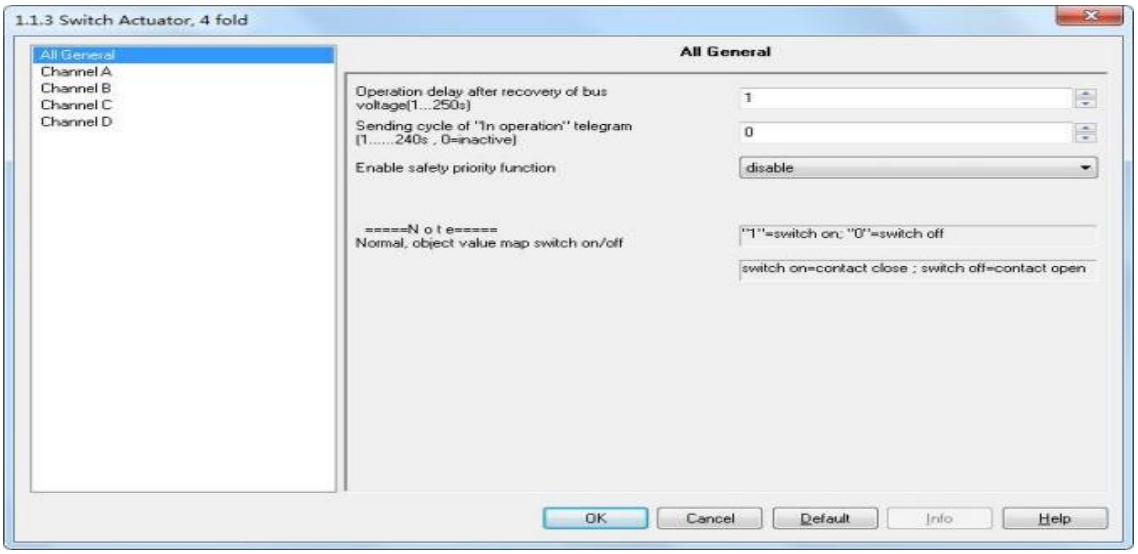


Fig. 2.1 parameter window “All General”

Note: “Switch on” mentioned below means the contact of the switch actuator is closed(output is on); “Switch off” means the contact of the switch actuator is open (output is off)!

Parameter “Operation delay after recovery of bus voltage (1...250s)”

The parameter determines the delay time to react after the bus voltage recovery (the delay time after electrified) to avoid the malfunction of the bus and 220V AC caused by the simultaneously working of various relays, excluding the initialization time (approx. 2 seconds)of the device. Options: **1-250 seconds**

If there are other devices (e.g. monitor) require to read the communication target value of the relay during the delay time after power on, then this requirement will be recorded, and then reacted after the delay time is finished(if necessary)

If the delay time is long enough, all contacts of the relay can work simultaneously

Note: After bus voltage recovery the minimum time of delay operation is specified as: 5s for 4fold-switch, 10s for 8fold and 12fold-switch. If the setting parameter value is less than the min. time, the operation delay will be the min. time , otherwise, the delay is for the parameter value.

And considering that it will generate damage to the power system and bus if a lot of devices operate simultaneously after re-power, so it is suggested to set the different delay time to each device.

Parameter “Sending cycle of “in operation telegram” (1...240s, 0 = inactive):”

The parameter determines the time interval to send the telegram which shows the actuator is working normally. With the setting “0”, the actuator doesn’t send the telegram; if the setting is not “0”, a telegram with the value “1” will be sent cyclically according to the setting to the bus.**Options: 0…240s, 0=cyclical send inactive.**

It is suggested to select the maximum time interval according to the application to keep the bus load as low as possible.

Note: it is starting to count the time after power up, instead of the operation delay after recovery of bus voltage

Parameter “ Enable Safety priority function”

The parameter is used to set the enable status of the function “Safety priority”.Options:

Enable

Disable

If “Disable” is selected, it will not activate the function “Safety priority”; if “Enable ” is selected, 2 “Safety priority” will be activated, whose parameter window can be shown in Fig. 2.2.

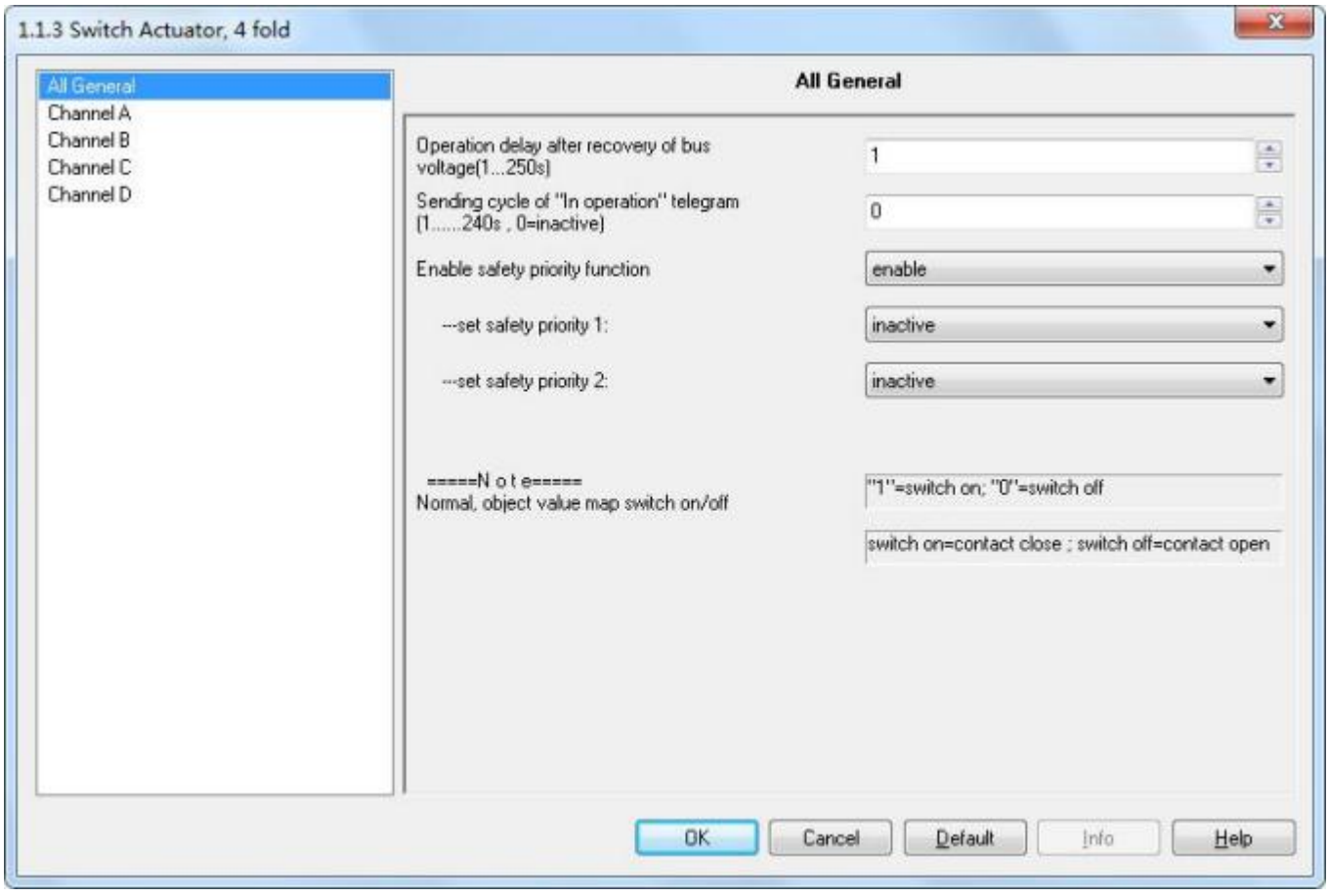


Fig. 2.2 parameter window “Safety priority”

Parameter “set safety priority x：”, x = 1, 2

There are 2 safety priorities for selecting. It is available to define the trigger condition to each “Safety priority”, and also enable the correspondent communication object “Safety Priority x” (x=1, 2). These objects are important to the entire relay when under the working mode “Switch Actuator” and “Dynamic regulating actuator”, but each output can react differently depending on the received telegrams, whose reactions can be defined in the parameter window “X: Safety”.Options:

Inactive

Enable be safe by Object value “0”

Enable be safe by Object value “1

If the communication object “Safety Priority x” receives “0”, the “Control period” of “the Safety Priority x” will be initiated with “enable be safe by Object value “0” ”; if the communication object “Safety Priority x” receives “1”, the “Control period” of “the Safety Priority x” will be initiated with “enable be safe by Object value “1” ”. This means, during the “Control period”, if the object “Safety Priority x” receives no corresponding telegram, it will trigger “Safety Priority”, and then the correspondent action will be initiated, which will be defined in the parameter window “X: Safety”. When the setting is “inactive”, it will not initiate any “Safety Priority”

Parameter“Control period of safety priority X,X=1,2(1...240s, 0 = inactive”

It will not be visible unless the parameter “set safety priority x: (x= 1，2)” is activated. If there is no telegram received from the object “Safety Priority x (x=1，2)” during the “Control period”, this “Safety Priority x” will be initiated.

It will end the trigger of “Safety Priority x” when the object “Safety Priority x (x=1, 2)” receives the telegram again, and the “Control period” of “Safety Priority x” will be reset at the same time.Option: **0...240s.**

It will not activate any “Safety Priority x” when selecting “0”.

The monitoring time of “Safety priority” should be more than double as long as the cyclical sent time of the sensor to avoid the alarming in case some individual signal is neglected.

3.3 Parameter window“Channel X ”—Switch actuator

The parameter window “Channel X” is shown in Fig. 2.3. It works for all the outputs. “Channel X” or “X” mentioned below means any output of the switch actuator, which has the same parameter setup interface and communication objects.The following uses one of them as a representative.

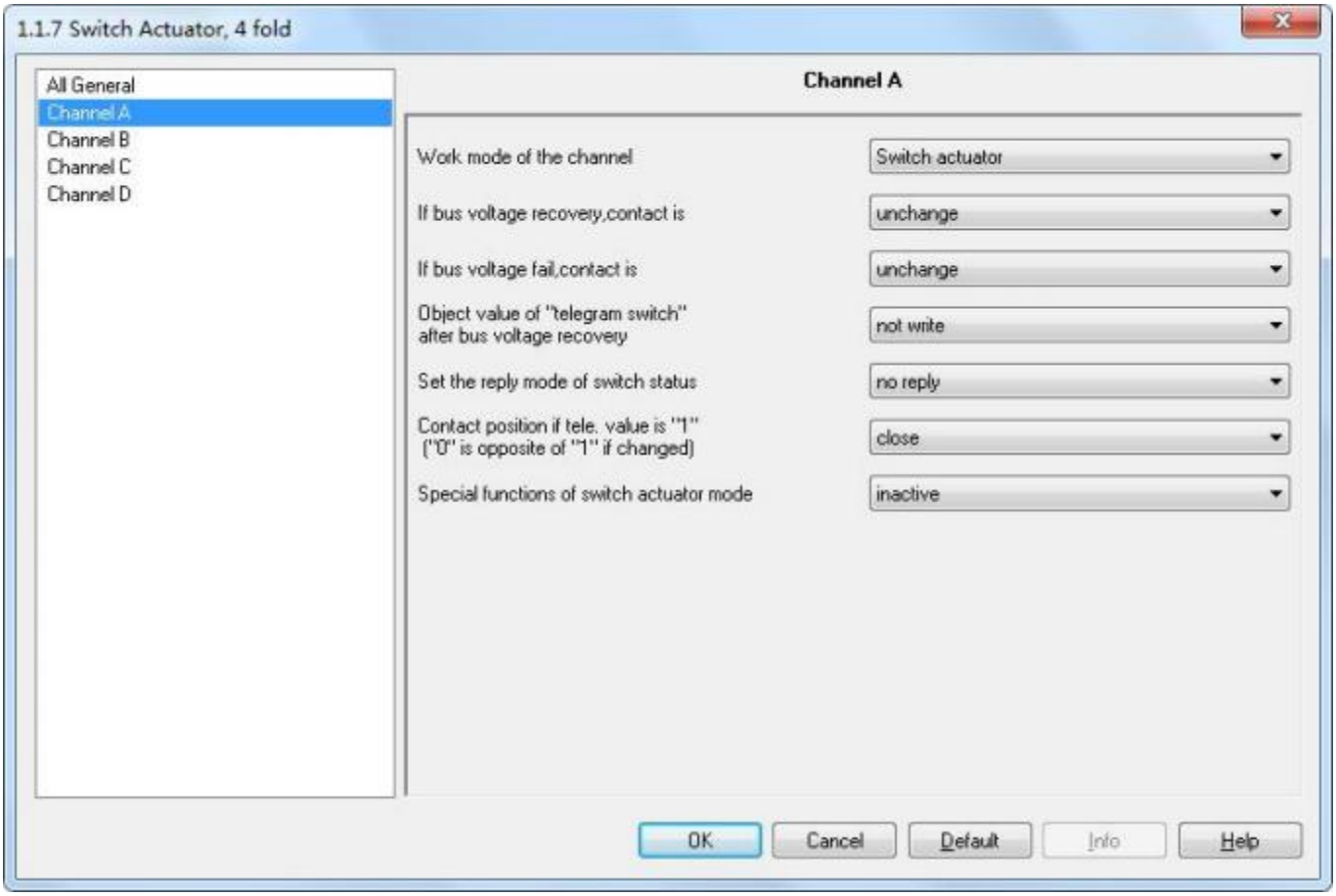


Fig. 2.3 parameter window “channel: X”

An operating mode and various functions can be selected for each output of the relay and each function can be activated independently. In one relay, two operating modes and the corresponding functions are linked.

Parameter “Work mode of the channel”

This parameter is used to define the output mode.Options:

Switch Actuator

Dynamic regulating actuator

“Switch Actuator” is used in the normal switch control such as lighting. The outputs are controlled by various functions such as logic operation, timing function and safe function. More details can be found below.

Parameter “If bus voltage recovery，contact is”

The output can adopt a defined status on bus voltage recovery via this parameter.Options:

Unchange

Open

Close

As before bus voltage fail

When selecting “unchange”, the contact of the relay will remain the same as the last status before power off; when selecting “open”, the contact will be open; while it is closed when selecting “close”. The contact position after voltage recovery is the same as that before power off with “as before bus voltage fail”.

Note: After finished application programming, all output channels will perform a disconnect action.

Parameter “If bus voltage fail，contact is”

The output can adopt a defined status after the bus voltage failure via this parameter.Options:

Unchange

Open

Close

When selecting “Unchange”, the contact of the relay will remain the same as the last status before power off; when selecting “Open”, the contact will be open; while it is closed when selecting “close”

Parameter “object Value of “Telegram Switch” after bus voltage recovery”

This parameter will be visible when enabling the logic function “input 0” to define the default value of the communication object “Switch, X” after bus voltage recovery, which can be “0” or “1”. If selecting “not write”, the value “0” is written into the object “Switch” and remains until this value is changed via the bus. Options:

Not write

To write with 0

To write with 1

Parameter “Set the reply mode of switch status”

This parameter defines the status of the current switch status when the telegram is sent.Options:

No reply

Always respond, after read only

Transmit after change

If selecting “no reply”, there is no telegram to send out; if selecting “always respond, after read only”, the status telegram will not be sent out until receiving the status telegrams from other devices; if selecting “Transmit after change”, it will send the status automatically when there is any changes on the output. The value (“0” or “1”) of the communication object “reply the switch status, x” and “send the switch status, X” defines the current status of the relay, which can be set in the parameter “Object value of switch status:” (when selecting “always respond, after read only” or “Transmit after change”).

Parameter “Object value of switch status”

Options:

0=contact close ; 1=contact open

0=contact open ; 1=contact close

This parameter will be visible when selecting “always respond, after read only” or “Transmit after change” in “Set the reply mode of switch status”. It means the contact of the relay will be closed when the value of the communication object “reply the switch status, x” and “send the switch status, X” is 0 when setting “0=contact close; 1=contact open”, while it is open when the value is “1”. It means the opposite with setting “0=contact open; 1=contact close”.

Parameter “Contact position if tele. Value is ‘ 1’ (‘0’ is opposite of ‘ 1’ if changed) ”

This parameter defines the contact position when starting the switch, which will be triggered by the communication object “switch, X”. When enabling “input 0” in the logic function, it will use the communication object “switch, X” to modify the value of “input 0”, rather than triggering the switch operation. The setting of this parameter is meaningless at this time.Options:

Unchange

Open

Close

The contact position stays the same with “Unchange”; it will be off with “Open”, and on with “Close”. When ending the operation, position will be reversed if it is changed after starting (for instant, selecting “Open” or “Close”), otherwise, it will remain the same.

Note: The parameter only works after receiving object “Switch x”, and defines the direction of the contact after receiving it. More details can be found in the below form:

Parameter	Switch X value=1	Switch X value=0
Unchange	Unchange	Unchange
Open	Contact open(OFF)	Contact close (ON)
close	Contact close (ON)	Contact open (OFF)

Parameter “Special functions of switch actuator mode”

This parameter defines whether enable the special functions of the switch actuator. The parameter window “X: Function” will be seen with “active”, and able to set the special functions individually in Fig. 2.4. Enable or disable the special function in “X: Function”, seen in Fig. 2.5.Options:

Active

Inactive

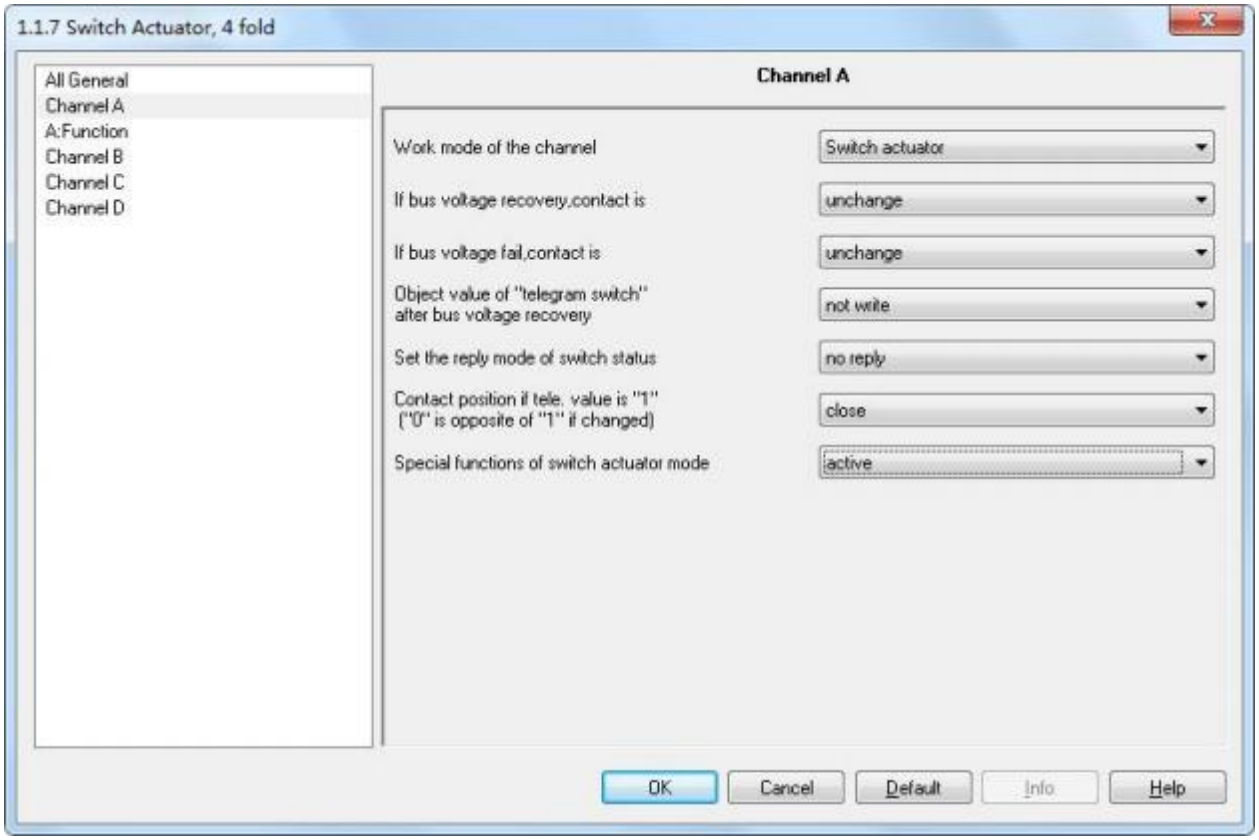


Fig.2.4 starting setup window “X: Function”

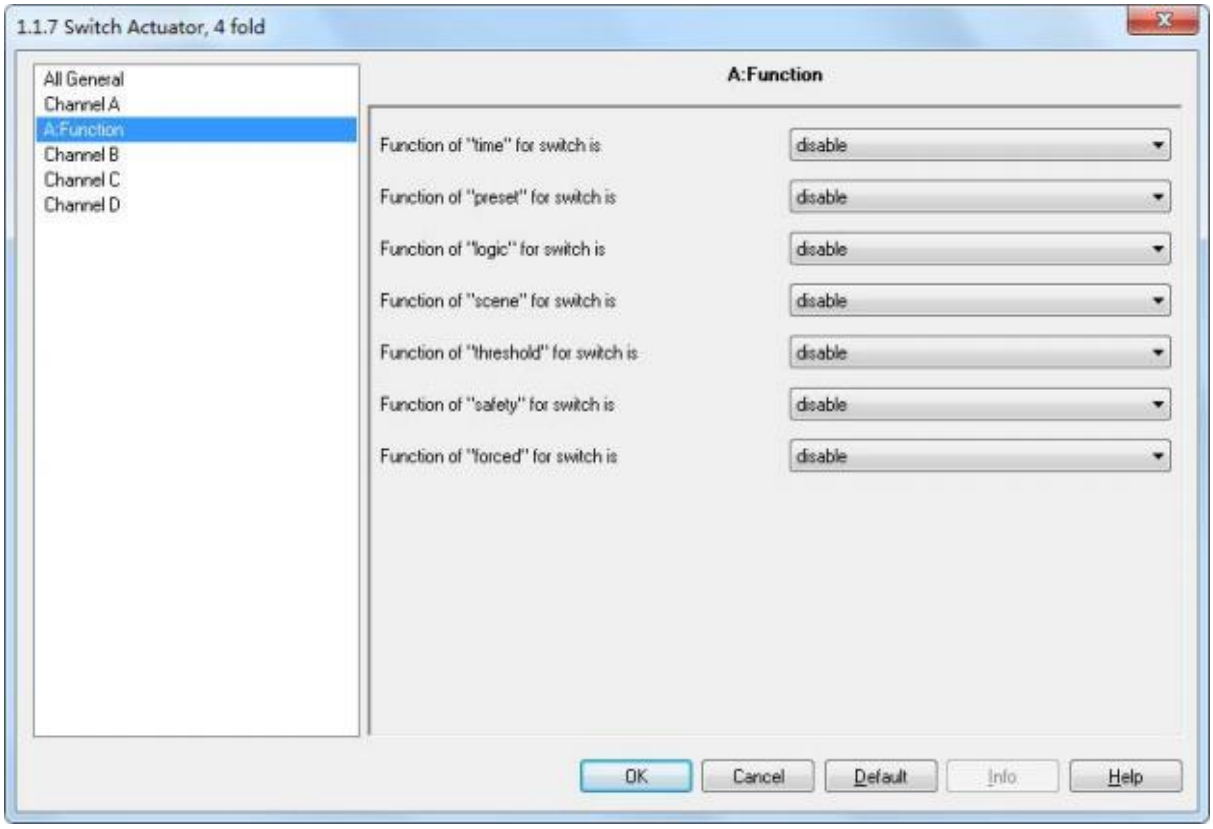


Fig. 2.5 setup window “X: Function”

3.3.1 Parameter window “X: Time”

This parameter window will become visible when selecting “enable” in the parameter “Function of‘time’ for switch is” in the setup window “X:Function”. See Fig. 2.6.

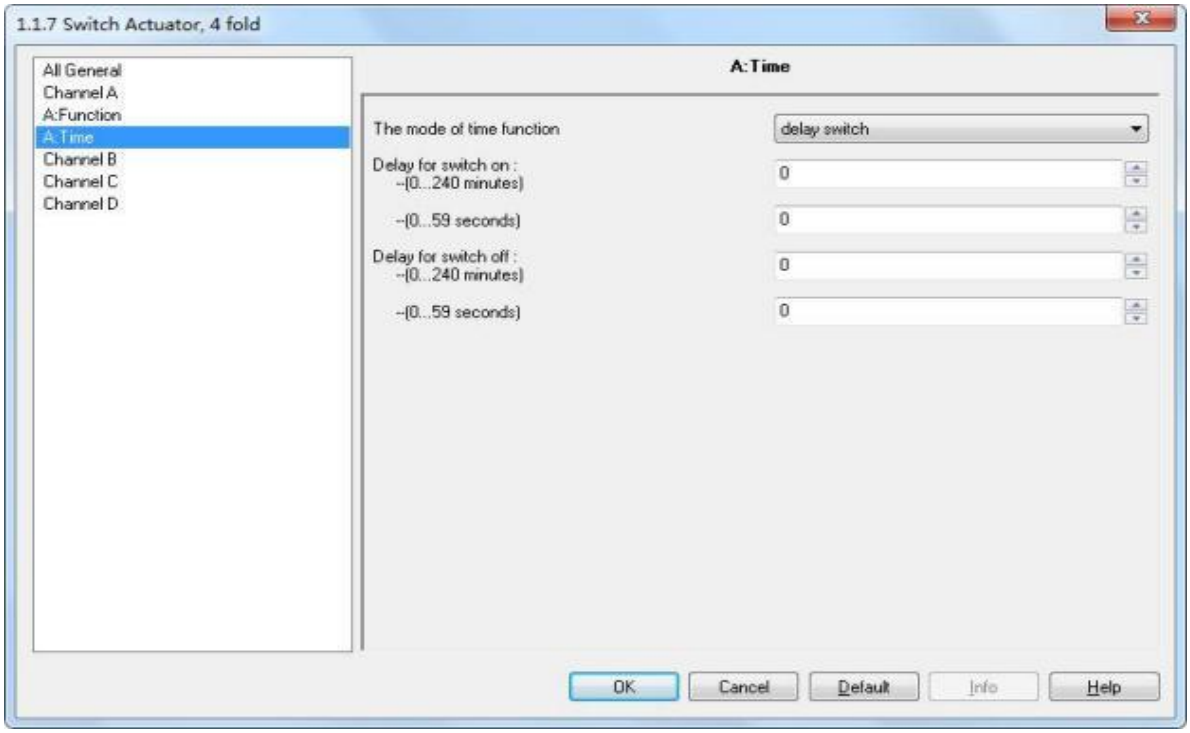


Fig. 2.6 setup window “X: Time”

Parameter "The Mode Of Time function"

The parameter defines the type of the timing function setup.Options:

Delay switch

Staircase lighting

Flashing switch

3.3.1.1 Selection "Delay switch"

The parameter window of the time function in Fig. 2.6 will be shown when selecting "Delay switch"

Parameter " Delay for switching on: (0...240 minutes)"

This parameter defines the stating time of the switch delay: minutes.Options: **0…240**

Parameter " Delay for switching on: (0...59 seconds)"

This parameter defines the starting time of the switch delay: seconds.Options: **0…59**

Parameter " Delay for switching off: (0...240 minutes)"

This parameter defines the closing time of the switch delay: minutes.Options: **0…240**

Parameter " Delay for switching off ： (0...59 seconds)"

This parameter defines the closing time of the switch delay: seconds.Options:**0…59**

3.3.1.2 Selection "Staircase lighting function"

The parameter window of the staircase lighting function in Fig. 2.7 will be visible when selecting "Staircase lighting function" in the parameter "The mode of time function".

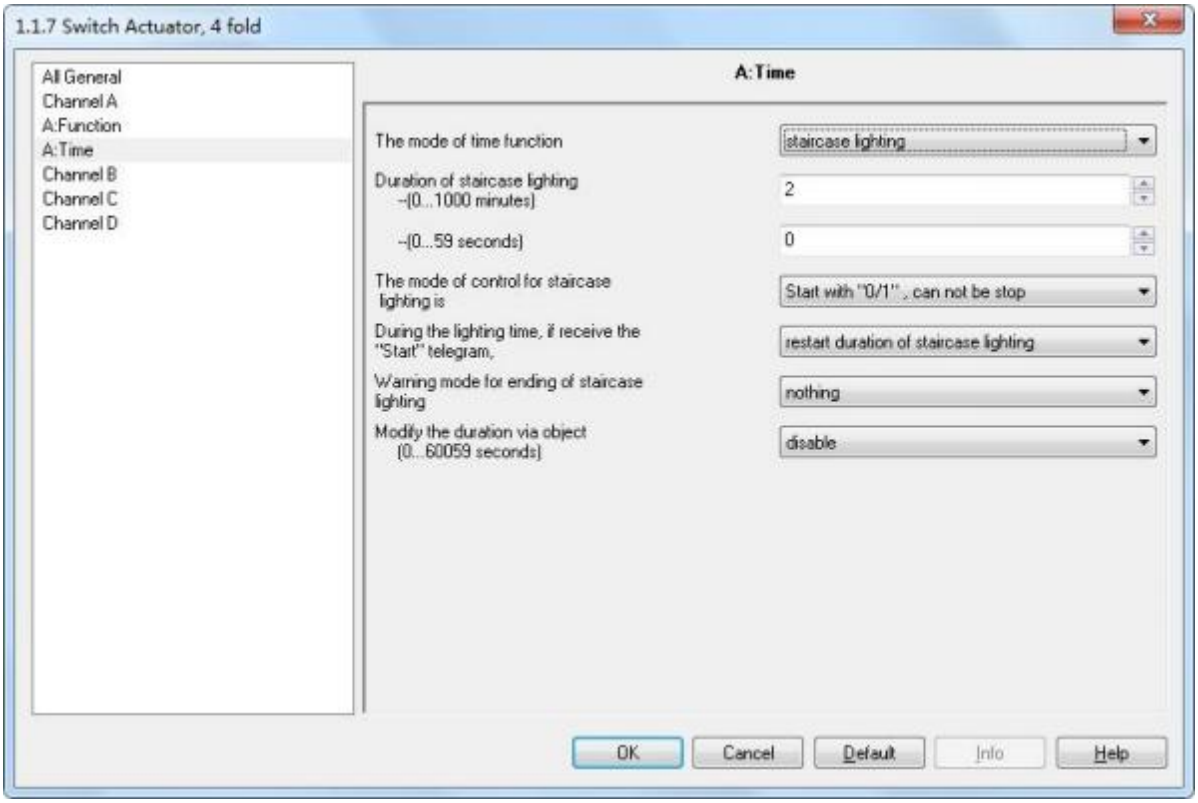


Fig. 2.7 parameter window “X: Time-Staircase lighting”

The staircase lighting of each channel is turned on through the communication object "Output of staircase lighting" of the corresponding channel. And also it is available to program the value of “Output of staircase lighting”. The staircase lighting time starts when it is switched on and will be switched off immediately after the set time when there is no prealarm setting.

Parameter “ Duration of staircase lighting--(0...1000 minutes)”

This parameter describes the duration time when switching on the staircase light function: minutes.Options: **0…1000**

Parameter “ Duration of staircase lighting--(0...59 second)”

This parameter describes the duration time when switching off the staircase light function: seconds.Options: **0…59**

Parameter “The mode of control for Staircase lighting is”

This parameter defines the mode of controlling on/of of the staircase lighting function.Options:

Start with “1”, stop with “0”

Start with “1”, no action with “0”

Start with “0/1”, cannot be stopped

When selecting “Start with “1”, stop with “0””, it will switch on the staircase lights with the value“1”received by the object “Output of staircase lighting”; it will stop the time counting operation and don't change the contact position until changed by other operations with “0”

When selecting “Start with “1”, no action with “0””, it will switch on the staircase lights with the value “1” received by the object “Output of staircase lighting” and no reaction with “0”.

When selecting “Start with “0/1”, cannot be stopped”, it will switch on the staircase lights either with “0” or “1” received by the object “Output of staircase lighting” but cannot end it by the object.

Parameter “ During the lighting time ,if receive the start telegram”

Options:

Restart duration of staircase lighting

Ignored the start telegram

It will restart the staircase lights to redo the timing if receive the telegram of the object “Output of staircase lighting” when selecting “restart duration of staircase lighting” during the staircase lighting; while it will ignore the telegram with “Ignored the ‘switch on’ telegram”.

Parameter “Warning mode for ending of staircase lighting”

The parameter points out the alarm type when terminating the staircase lights, which will start the prealarm notice before switching off. This prealarm time is not included in the starting time of the staircase. There will be no alarm if selecting “nothing”, as well as the lights is off before the prealarm time.Options:

nothing

via object

flashing the channel output with OFF/ON

via object & flashing the channel

2 types of prealarm are provided:

-by the communication object: set the value of the object “Warning of staircase” as “1” when starting alarming and then send it to the bus;

-by the lights flashing: control the output flashing (a short switch), and the duration is 1 second.

These 2 types can be used independently or together. It will be the type of “by the communication object” when it is “via object”, or the type of “by the lights flashing” with “flashing the channel output with OFF/ON”; as well as mixed type with “via object & flashing the channel output”.

Parameter “The warning time for ending of staircase lighting(0...59 s)”

The parameter is visible after selecting a prealarm type, and the duration of the prealarm: second. Options: **0…59**

Parameter “ Modify the duration via object (0...60059 seconds)”

It will activate the object “Duration of staircase” with 2 bytes when selecting “Enable” to modify the staircase lighting time, however it cannot modify the time with “Disable”.Options:

Disable

Enable

3.3.1.3 Selection “ Flashing”

The parameter window in Fig. 2.8 “X: Time-flashing switch” will be shown up when selecting“flashing switch” in “The mode of time function”.

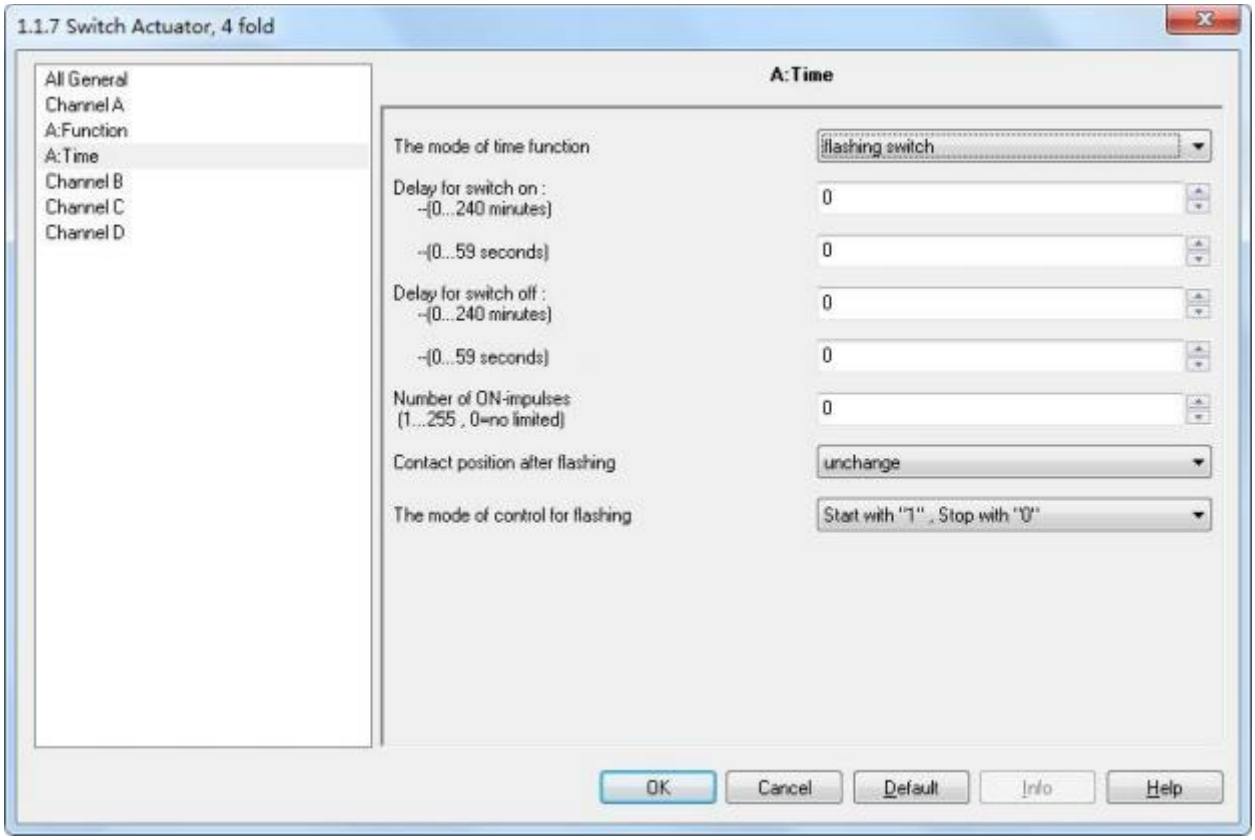


Fig. 2.8 parameter window “X: Time-flashing switch”

When the flashing function is activated, the system will start the flashing output when the corresponding message is received. The flashing switch time interval can be set in the parameters "Delay for switch on" and "Delay for switch off". When the communication object "Switch out with flashing" receives a new corresponding message (which can turn on the flashing output), the flashing output will restart. The contact position after the channel flashing output is completed can be set by parameters.

Parameter “ Delay for switch ON: Min. (0...240), Sec. (0...59)”

The parameter defines the delayed time to switch on the output when flashing.Options:

0…240 minutes

0...59 seconds

Note: it will not be executed unless the time is lower than the relay threshold switch frequency.Since there will be not sufficient energy to do it because of the frequent relay switching, and it may cause the time delay. The same situation will happen after the bus voltage recovery. In order for the device to work properly, the delay time here should be at least 2s.

Parameter “ Delay for switch off : Min. (0...240), Sec. (0...59)”

The parameter defines the delayed time to switch off the output when flashing.Options:

0…240 minutes

0...59 seconds

Note: it will not be executed unless the time is lower than the relay threshold switch frequency.Since there will be not sufficient energy to do it because of the frequent relay switching, and it may cause time delay. The same situation will happen after the bus voltage recovery. In order for the device to work properly, the delay time here should be at least 2s.

Parameter “ Number of ON-impulses (1...255，0=no limited)”

This parameter points out the flashing times. Options: **0...255**

Note: 0 means no limited!

Parameter “Contact position after flashing”

This parameter points out the relay contact position after flashing.Options:

Unchange

Open

Close

Parameter “The mode of control flashing”

The parameter states the mode of the flashing output.Options:

star with“1”,stop with “0”

star with “0”, stop with “1”

star with “1/0”, can not be stopped

It will start flashing with “1” received by the object “Switch” when selecting “star with ‘1’, stop with ‘0’”; it will stop flashing with “0”.

It will start flashing with “0” received by the object “Switch” when selecting “star with ‘0’, stop with‘1’”; it will stop flashing with “1”.

It will start flashing with either “1” or “0” received by the object “Switch” when selecting“star with‘1/0’，can not be stopped”; under this circumstance it cannot terminate the flashing by sending the telegram until the preset ending time.

3.3.2 Parameter window “X: Preset”

This parameter window in Fig. 2.9 will burst out when selecting “enable” in the parameter “Function of ‘preset’ for switch is”.

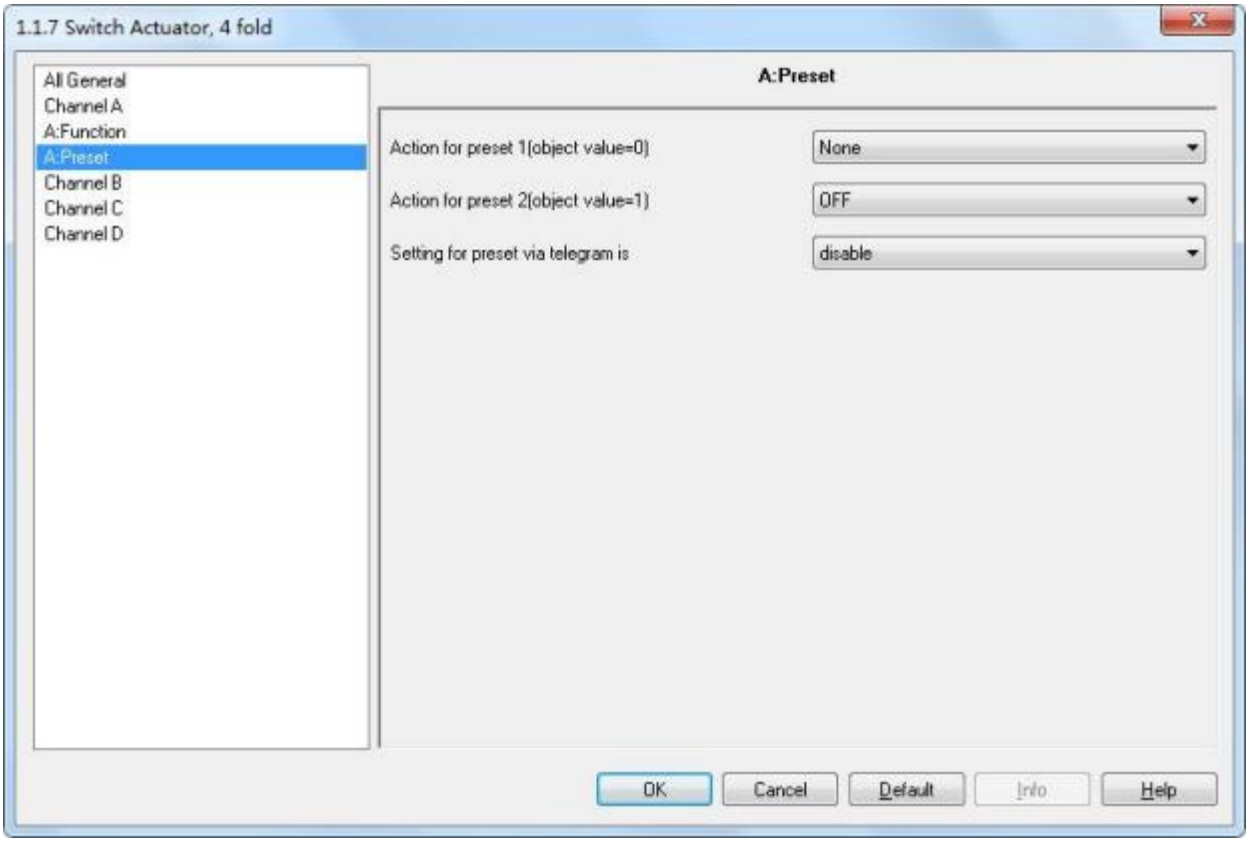


Fig. 2.9 setup window “X: Preset”

It is able to not only invocate the preset value, but also save the new value of the current switch status by the bus.

There are 2 objects to invocate and save the preset value, and 2 optional preset values(preset 1and preset 2). It means “preset 1” with “0”, and “preset 2” with “1”.

Parameter “Action for preset 1 (object value = 0)”

This parameter defines the relay status when invocating the preset value 1 (that is when the object “Call preset 1/2” receives the telegram “0”) by setting the communication object “Call preset1/2”.Options:

None

ON

Off

Parameter “Action for preset 2 (object value＝1)”

This parameter defines the relay status when invocating the preset value 2 (that is when the object “Call preset 1/2” receives the telegram “1”) by setting the communication object “Call preset1/2”.Options:

ON

OFF

Last position of contact

Setting of preset 1

When the action triggered by Preset 2 selects “last position of contact”, it will be recovered to the last switch status every time recalling preset 2.

When the action triggered by Preset 2 selects “setting of preset 1”, it will carry out the set parameters of the action triggered by preset 1 every time recalling preset 2.

Parameter “Setting for preset via telegram is”

It is used to set whether changing the preset value by the bus. It is allowable to change the value and enable the object “Set preset 1/2” at the same time when selecting “enable”, which can save the current status as the new preset value. The current value is saved as new preset 1 when receiving the telegram “0”; as new preset 2 when “1”.

The current status will be saved in the new preset value if selecting “None” in “Action for preset 1 (object value 0)” and “Last value of channel” or “restore parameterized value of preset 1” in “Action for preset2 (object value 1)”.Options:

Enable

Disable

Note: it will save the new preset value after bus voltage recovery

3.3.3 Parameter window “X: Logic”

It will show up Fig. 2.10 when selecting “enable” in “Function of ‘logic’ for switch is” in Fig. 2.5

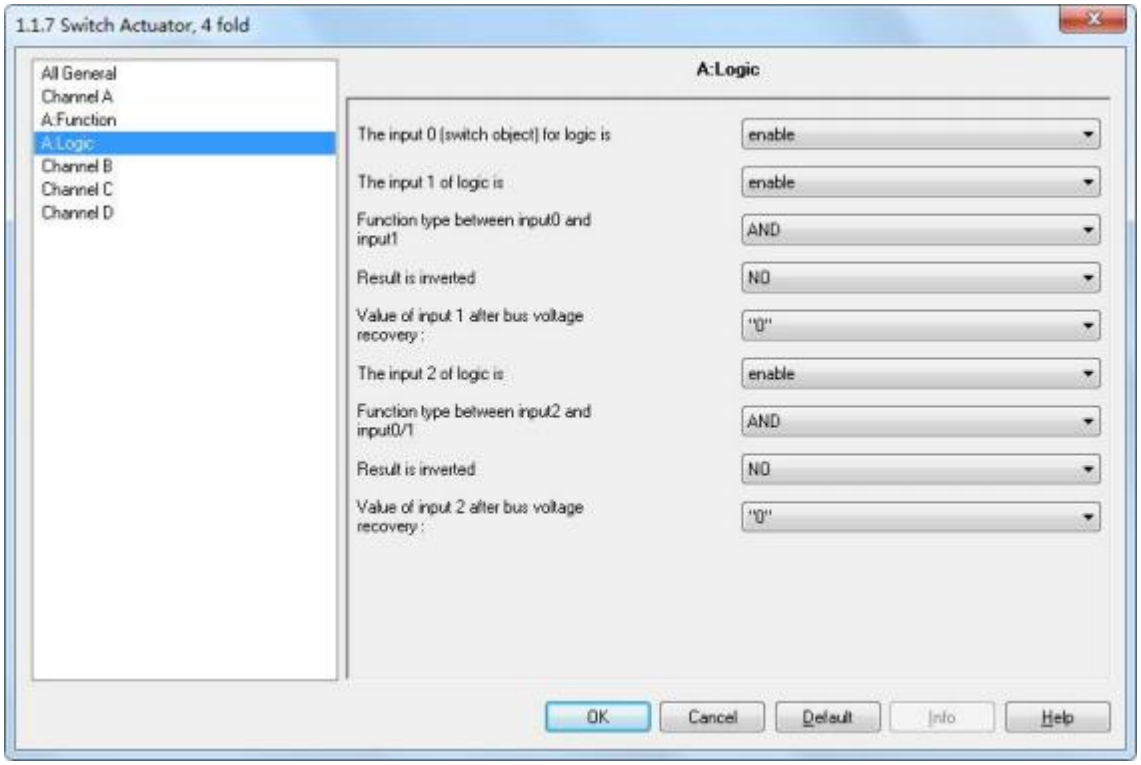


Fig. 2.10 setup window “X: Logic”

There are 2 logic communication objects to decide the status of individual output, which are related to the “Switch, X”.

After receiving the value of a logic communication object, the logic operation function will perform a logic operation again and use the result of the logic operation as the switch state output (close the contact with “1”, open it with “0”). The values of the communication object “Input 1 of logic” makes logic operation with “Switch, X” firstly, and then the result after that will makes operations with the value of“Input 2 of logic”. This operation will ignore the objects which are unable, and continue to the next step with the ones who are enabled.

Parameter “The input 0 (switch object) for logic is”

This parameter is used to enable the function of logic operation of “input 0”, whose values are wrote by the object “Switch, X”.Options:

Disable

Enable

Parameter “The input x of Logical” (x = 1, 2)”

This parameter enables the communication object "Input 1 of logic" or "Input 2 of logic" for logic operation.Options:

Disable

Enable

Parameter “Function type between input 0 and input 1/（input 2 and input 0/1）”

This parameter introduces the logical relationship of the logic operation, providing 3 standard logical operations (AND, OR, XOR) and a gate function. Explanation of gate function: it will use the previous logic value as the enable mark of the next logic. If the enable mark of the previous logic is “1”, that means it is able to use the next logic value as the operation result. For example, the value of input 0 is 1, that means the value of input 1 can be used as the operation result; if the value of input 1 is 1, that means the value of input 2 can be used as the result too. Options:

AND

OR

XOR

Gate function

Parameter “Result is inverted”

This parameter defines whether negate the logical operation results. Negate it with “Yes”, don’t with “No”.Options:

No

Yes

Parameter “Value of input 1 after bus voltage recovery”

This parameter defines the default value of the object “Input x of logic (x=1, 2)” after bus voltage recovery. Options:

0

1

Value before power off

The value will be the one before power off after bus voltage recovery when selecting “value before power off”.

Parameter “Value of input 2 after bus voltage recovery”

This parameter defines the default value of the object “Input x of logic (x=1, 2)” after bus voltage recovery. **Options:**

0

1

Unchange

The default logic value is unsure when selecting “Unchanged”.

3.3.4 Parameter window“X: Scene”

The parameter window shown in Fig. 2.11 will burst out when selecting “enable” in “Function of‘scene’ for switch is” in Fig. 2.5.

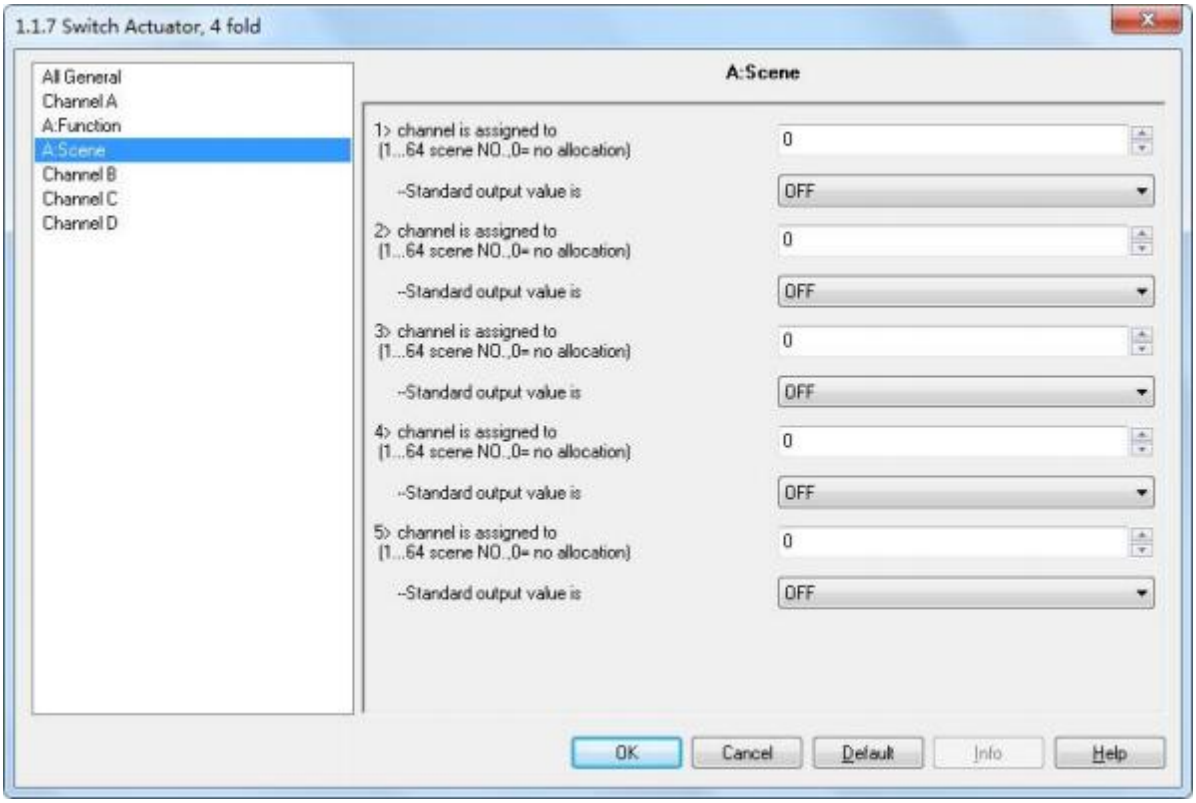


Fig. 2.11 parameter window “X: Scene”

Parameter “channel is assigned to (1...64 scene NO.,0= no allocation)”

It is able to allocate 64 different scene numbers to every output. There are 5 various scenes can be set per output. Options: : **Scene 1...Scene 64, 0=no allocation**

Parameter “Standard output value is”

This parameter defines the switch output status when invocating the scene.Options:

ON

OFF

3.3.5 Parameter window “X: Threshold”

The window in Fig. 2.12 will be shown up when selecting “enable” in the parameter “Function of‘threshold’ for switch is” in Fig. 2.5.

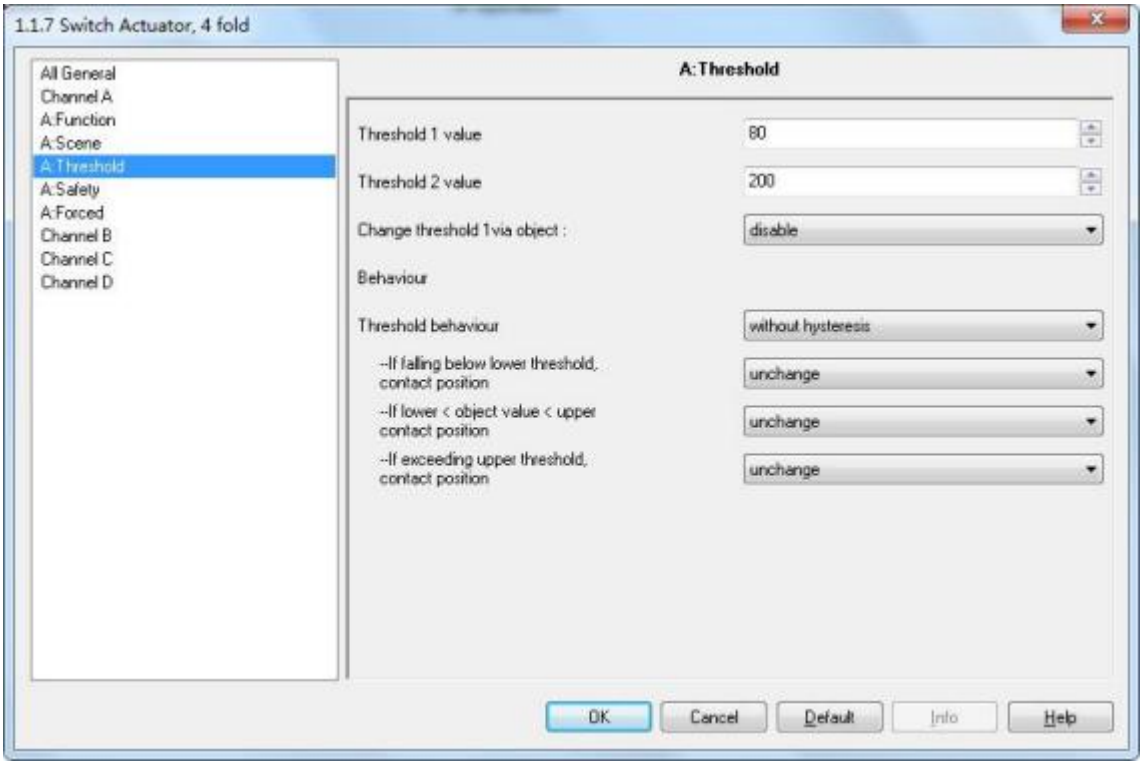


Fig.2.12 setup window “X: Threshold”

The object “Threshold input” of 1Byte is enabled when activating the threshold function. It will trigger the switch to make one operation if the value of the object “Threshold input” is lower or more than the default threshold. There are 2 individual thresholds are ready to use always and the “threshold1 value” is set by the bus.

Parameter “Threshold 1 value” / “Threshold 2 value”

This parameter defines the value of threshold 1 and threshold 2. Options:

0...255, for threshold 1

0...255, for threshold 2

Parameter “Change threshold 1 via object :”

This parameter defines whether change the threshold value by bus or not.Options:

Disable

Enable

It is able to start the object “Change Threshold value 1” by selecting “enable”, and change the threshold 1 value by the bus; on the other hand, it cannot change the value with “disable”. However, it is not allowable to change the “threshold 2 value” by the bus.

Parameter “Threshold behaviour ”

This parameter sets whether threshold 1 value and threshold 2 value require hysteresis. Options:

Without hysteresis

With hysteresis

The delay can avoid the unnecessary behaviour caused by the input value if its value is between 2 threshold values.

Parameter “If falling below lower threshold,contact position” / “If exceeding upper threshold contact position”

These parameters will be seen with “with hysteresis” in the parameter “Threshold behavior”, which defines the action when the value of the object “Threshold input” is lower than the lowest threshold value or higher than the highest value.Options:

Unchange

Open

Close

Parameter “If falling below lower threshold,contact position”、 “If exceeding upper threshold contact position ”、“ If lower < object value < upper , contact position”

These parameters are visible with “without hysteresis” in the parameter “Threshold behavior”, which defines the relay action in the object “Threshold input”. Options:

Unchange

Open

Close

3.3.6 Parameter window “X : Safety”

The window shown in Fig. 2.13 will be seen when selecting “enable” in the parameter “Function of ‘safety’ for switch is” in Fig. 2.5.

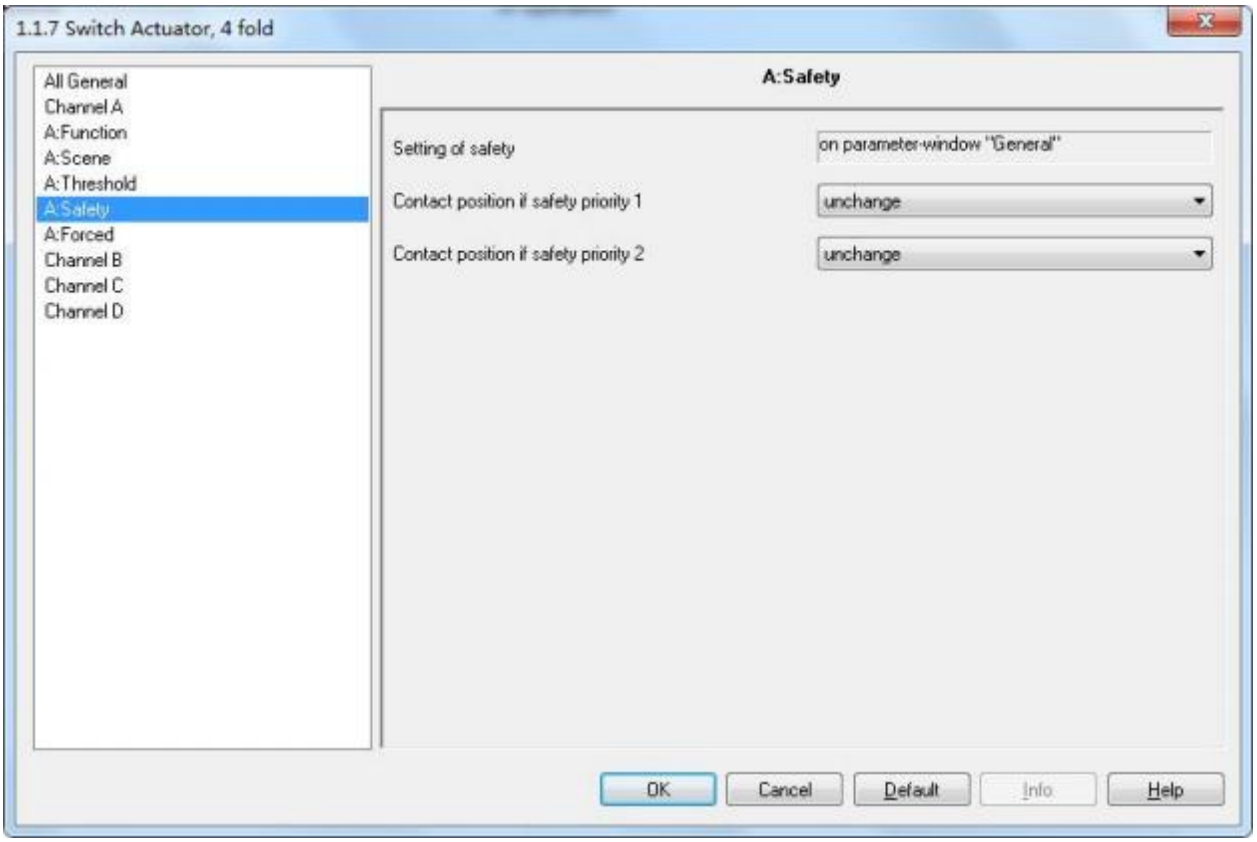


Fig. 2.13 setup window “X: Safety

Enable 2 “Safety Priority” (x=1, 2) in the parameter window “All General”, which define the relay’s contact position for every output individually. There are 2 safety priorities for every output and also the“Safety Priority 2” is prior to “Safety Priority 1”. It means when these 2 priorities are triggered at the same time, the contact position will follow the setup of “Safety Priority 2”.

Parameter “Contact position if Safety Priority x” (x=1,2)

It defines the contact position after triggering “Safety Priority x” (x=1, 2). Options:

Unchange

Open

Close

3.3.7 Parameter window “X：Forced

The window of the function “forced” in Fig.2.14 will be visible with “enable” in the parameter “Function of ‘forced’ for switch is” in Fig. 2.5

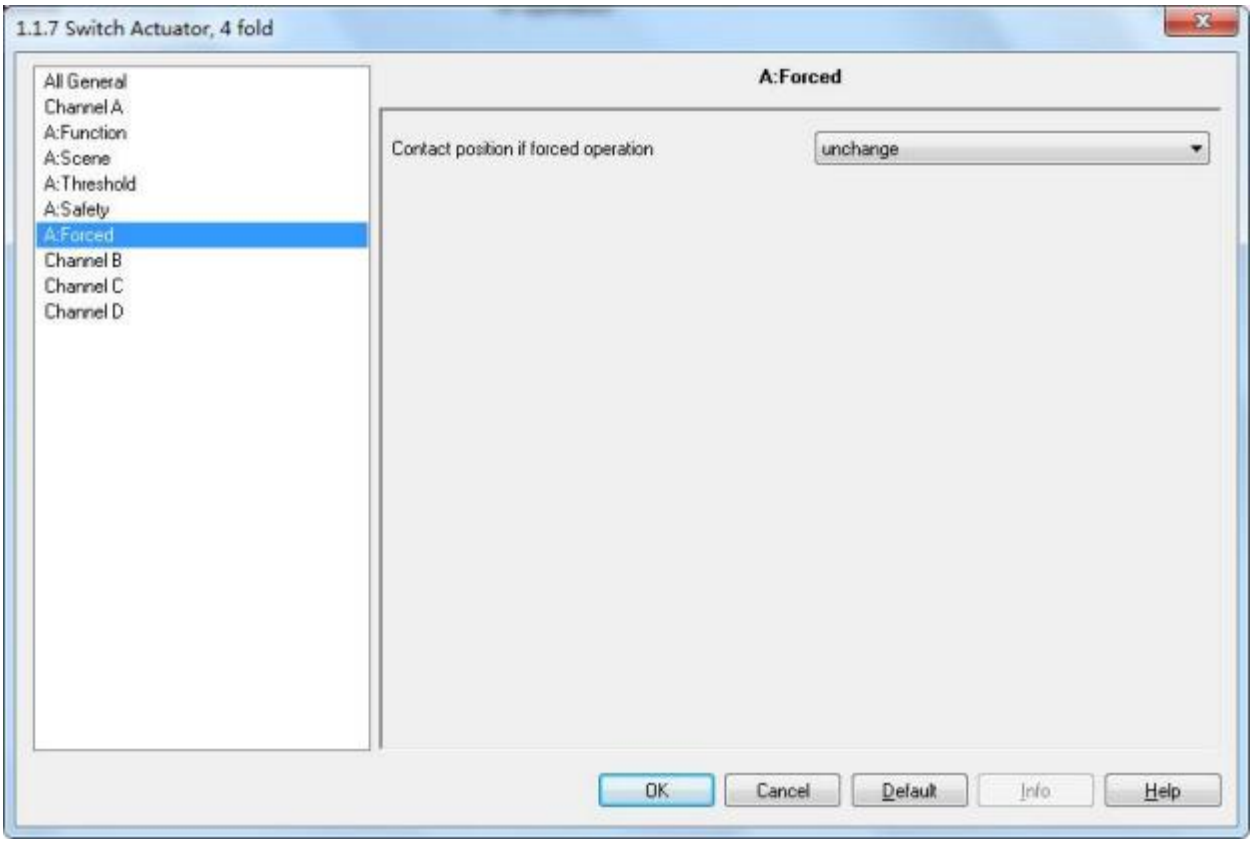


Fig.2.14 parameter window “X: Forced”

This function will be used in some special situation such as emergency, and are activated by the object “Forced output” with the highest priority in the system, which means only “forced operation” are valid in this case.

Parameter “Contact position if forced operation”

This parameter defines the contact position of the “forced operation”.Options:

Unchange

Open

Close

3.4 Parameter window “Channel X” – Dynamic regulating Actuator

The window of “Channel X-Dynamic regulating Actuator” in Fig. 2.15 will be visible with “Dynamic regulating Actuator” in “Work mode of the channel”.

In the running mode of “Dynamic regulating Actuator”, it is used to control the solenoid valves by a thermostatic controller or temperature sensor to realize the temperature constancy in the room.

There are 2 options of control mode for every output: 1 bit control and 1 byte control. Under the 1bit mode, it will receive 1 bit command by the communication object “on-off of regulating”; under the 1byte mode, it will receive 1 byte command by the communication object “continuous of regulating”.

“0” means the valve is off, while “100%” is on. And 0~100% means during a cycle period, the valve will be on for x% of the period while off for the rest time.

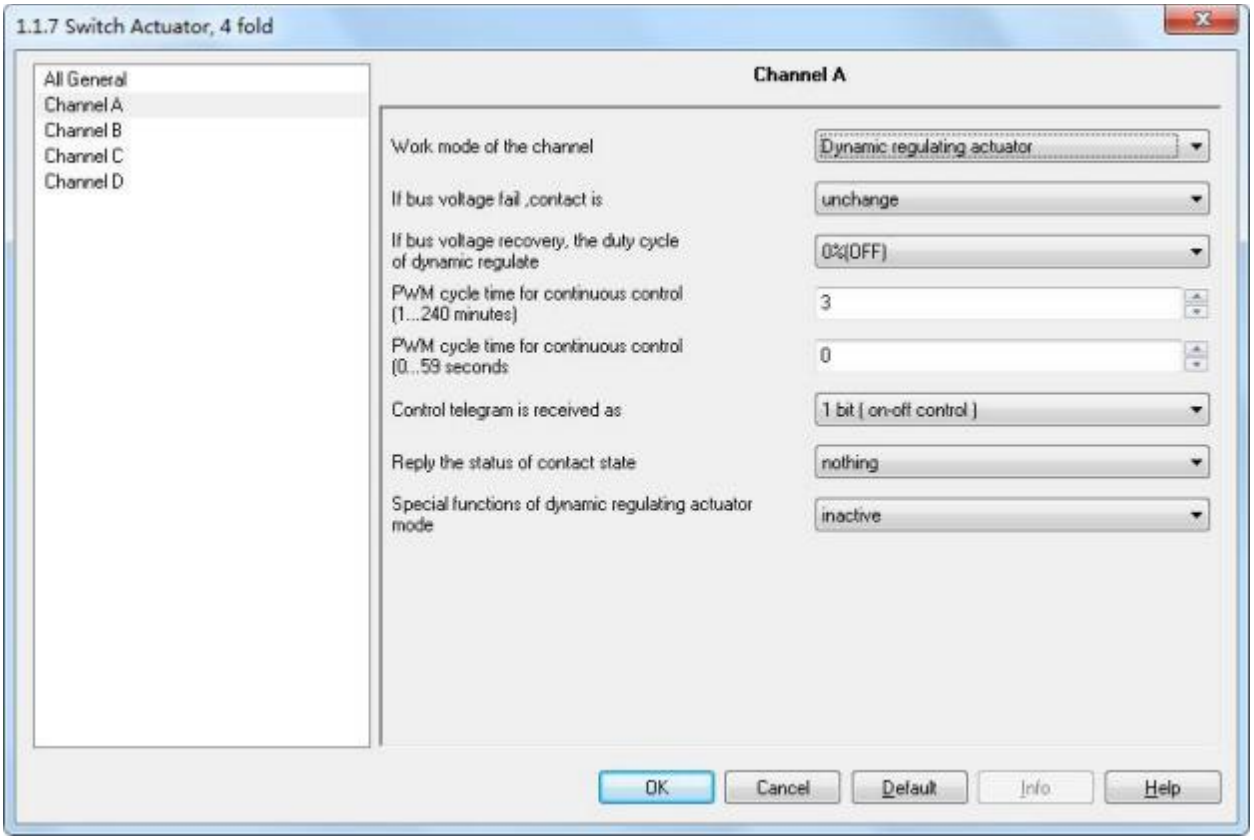


Fig. 2.15 setup window “channel: X-Dynamic regulating Actuator”

Parameter “If bus voltage fail ,contact is”

This parameter defines the contact position when the bus power off. Options:

Unchange

Open

Close

The above setting will be valid only when the relay has sufficient energy after the bus voltage off.

Parameter “If bus voltage recovery, the duty cycle of dynamic regulate”

This parameter defines the status of the switch actuator when the bus power is on, which will last until receiving the control command or into a failure mode.Options:

0%(OFF)

10% (26)

…

100% (ON)

Parameter “ PWM cycle time for continuous control (1...240 minutes)”和“ PWM cycle time for continuous control (0...59 seconds)”

It is able to set the period of the pulse width control (PWM) in this parameter, and whose unit is minute and second.Options:

0...59 seconds

1...240 minutes

Note: it is suggestive to set longer period in the parameter to protect the relays and the controlled devices.

Under the 1bit control mode, the pulse width control (PWM) is only valid in the malfunction, force operation mode, safe operation mode and after voltage recover

Parameter “Control telegram is received as”

This parameter defines the control mode of the output as a dynamic regulating actuator. Options:

1 bit (on-off control)

1 byte (continuous)

In the control mode of “1bit”, the function of the dynamic regulating actuator is as the same as the common switch actuator: the thermostatic room controller control the output by the common switch command. When the controller goes out of order and the relay receives no control signal, the relay will action automatically by using PWM with duty cycle of 50%.

In the control mode of “1 byte”, the sending value of the room thermostatic controller is from 0 to 255 (corresponding from 0% to 100%), which is so called “continuous-action control”. 0% means switch off the valve, and 100% to switch it on. It will adjust the output control by the duty cycle of the pulse.

Note: in the function of dynamic regulating actuator, it will recalculate the duty factor of the pulse every time receiving the telegram of continuous regulating. And it will recalculate the time by switching the contact to the opposite position.

Parameter “reply the status of channel for continuous control ”

It is visible when selecting “1 byte (continuous)” in the parameter “Control telegram is received as”, which is used to report the status of the controlled valve gate, with 2 options according to the type of the controlled devices: 1 bit and 1 Byte. Options:

Nothing

Yes, 0% =“0”, otherwise “1”(1 bit)

Yes, 0% =“1”, otherwise “0”(1 bit)

Yes, continuous control value (1 byte)

Parameter “ Reply the status of contact state”

It will send the switch status out when receiving the telegram that the channel status is read by other devices. Options:

Nothing

Yes, “1”=contact close, “0”=contact open

Yes, “0”=contact close, “1”=contact open

Under the selecting of “Yes, ‘1’=contact close, ‘0’=contact open”, when there is some request from other devices, the object “Reply status of contact” will send “1” to other devices if the contact is closed; While if it is open, it will send “0” to the other devices.

It is quite the contrary when selecting “Yes, ‘0’=contact close, ‘1’=contact open”.

3.4.1 Parameter window “X: Function” –Dynamic regulating Actuator

This window in Fig. 2.16 will pop out when selecting “active” in the parameter “Special functions of dynamic regulating actuator mode ”, and it decides whether enable the function of dynamic regulating actuator

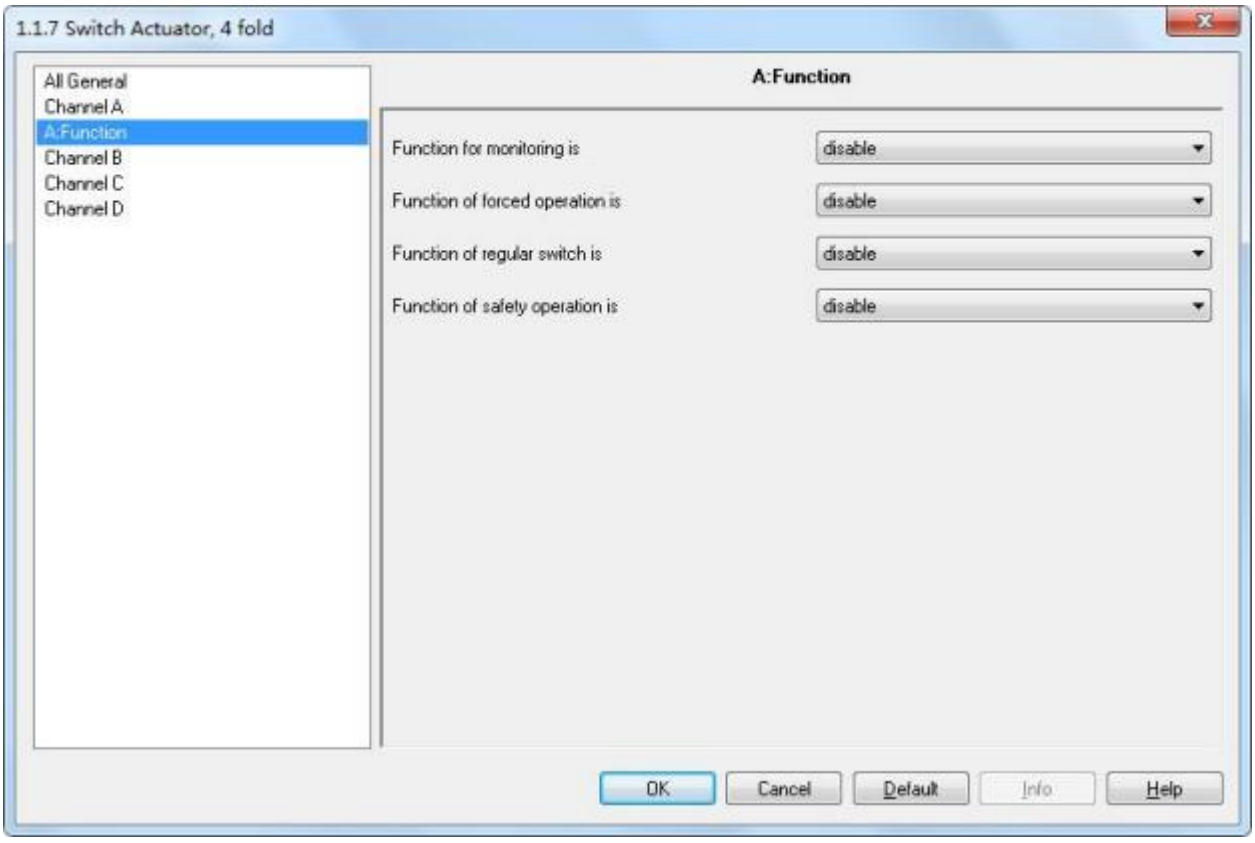


Fig. 2.16 setup window “X: Function”

Parameter “function for monitoring is”、“function of forced operation is”、“function of regular switch is”、“function of safety operation is”

Options:

Enable

Disable

The relevant setup interface will appear when selecting “Enable”

3.4.2 Parameter window “X：Monitoring”

The monitor function in Fig.2.17 “X: Monitoring” will be shown when selecting “enable” in the function “Function for monitoring is”

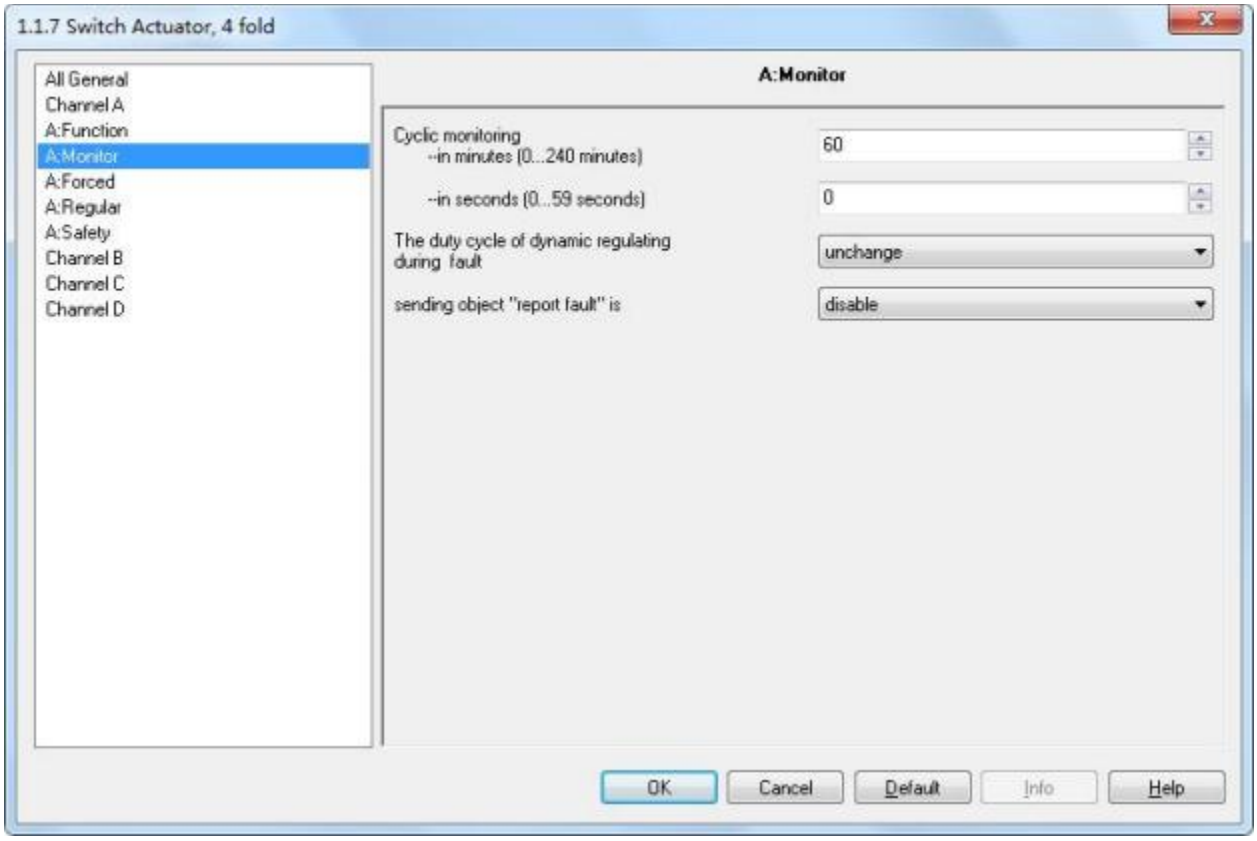


Fig. 2.17 setup window “X: Function”

Parameter “Cyclic monitoring---in minutes (0...240 minutes)

---in seconds (0...59 seconds)”

This parameter defines the time that the relay monitors the telegram. Generally speaking, the room thermostatic controller will send the control telegram to the bus in a certain time. If the bus cannot receive the telegram in that time, it will be judged that the controller goes out of order. During the set time, the bus cannot receive the telegram for the controller, the relay will start the failure mode automatically until receiving a new telegram. The monitor time will be recounted when receiving a new control telegram. Options:

0. ..240 minutes

0. ..59 seconds

Note: if the function is activated, the controller must send the telegram periodically out, and the monitoring time must be longer than the internal time of the control

Parameter “The duty cycle of dynamic regulating during fault ”

This parameter defines the duty cycle of the PWM under the failure mode, that is the dynamic action under the failure mode. Options:

Unchange

0 % (OFF)

10 % (26)

... 90 % (230)

100 % (ON)

Unchange Explanation of the option “Unchange”: the dynamic action of PWM remains the same as before

Parameter “sending object ‘ report fault’ is”

This parameter defines whether to send the report out in the failure mode. When enabling it, it will send the failure report out if there is no action during the monitoring time and then carry out the dynamic action under the failure mode until it is interrupted by other operation. It will restart the timing when carrying out the new action. Options:

Disable

Enable

The object “report fault” will be activated when selecting “enable”. The relay will be in the failure mode with “1”, while not with “0”.

Note: it will not send the report out with non-low-priority level. And monitor belongs to the low-priority level

3.4.3 Parameter window “X: Forced”

The function “X: Forced” in Fig. 2.18 will be visible if selecting “enable” in the function “Function for force is”

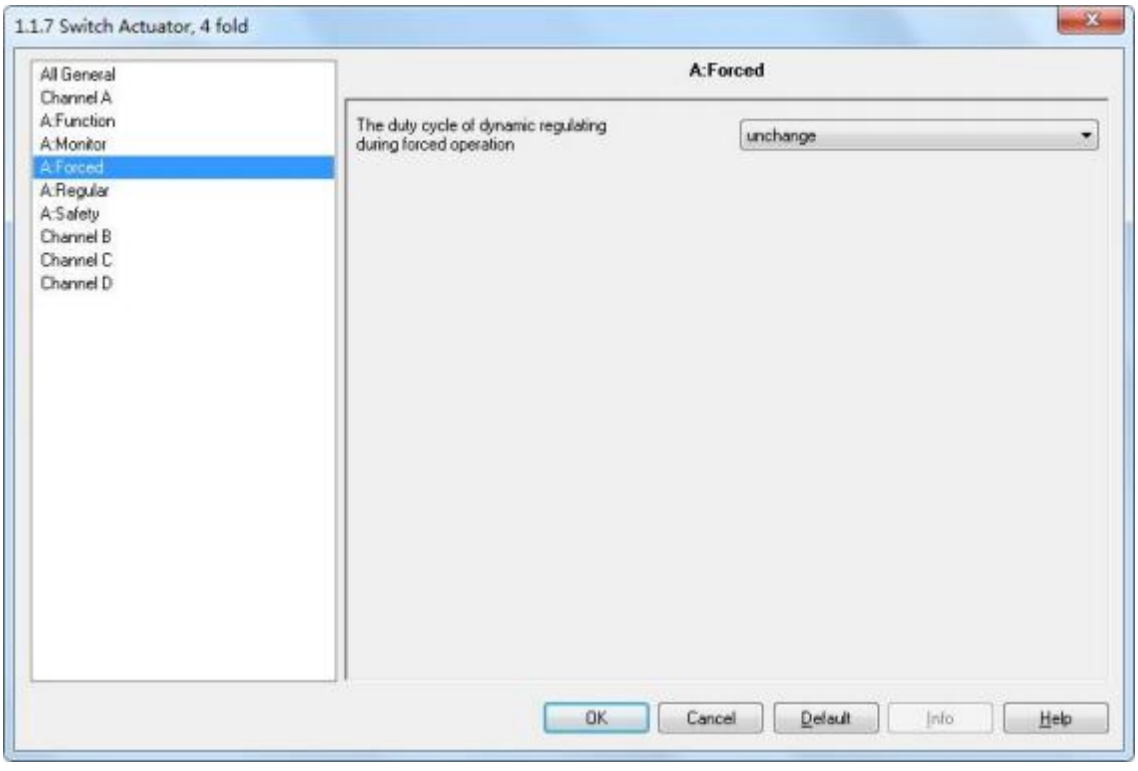


Fig. 2.18 parameter window “X: Forced”

In this mode, the output will be forced to switch to the set position, and it has the highest priority. The other operations will be ignored in this forced mode, which will be activated when the object “forced operation，regulating”=1 and ends with 0.

Parameter “The duty cycle of dynamic regulating during forced operation”

This parameter defines the value of PWM in forced mode. Options:

Unchange

0 % (OFF)

10 % (26)

... 90 % (230)

100 % (ON)

It will not change the PWM action of the forced operation with “Unchange”, that is the duty cycle of PWM will retain the same current value.

When it is going back to the normal operation mode from the forced mode that is the forced mode is finished, the relay will carry out the same dynamic action as in the forced mode until it is change by the other operation.

3.4.4 Parameter window “X：Regular ”

The window of “X: Regular” in 2.19 will pot out when selecting “enable” in the parameter “Function for regular switch is”.

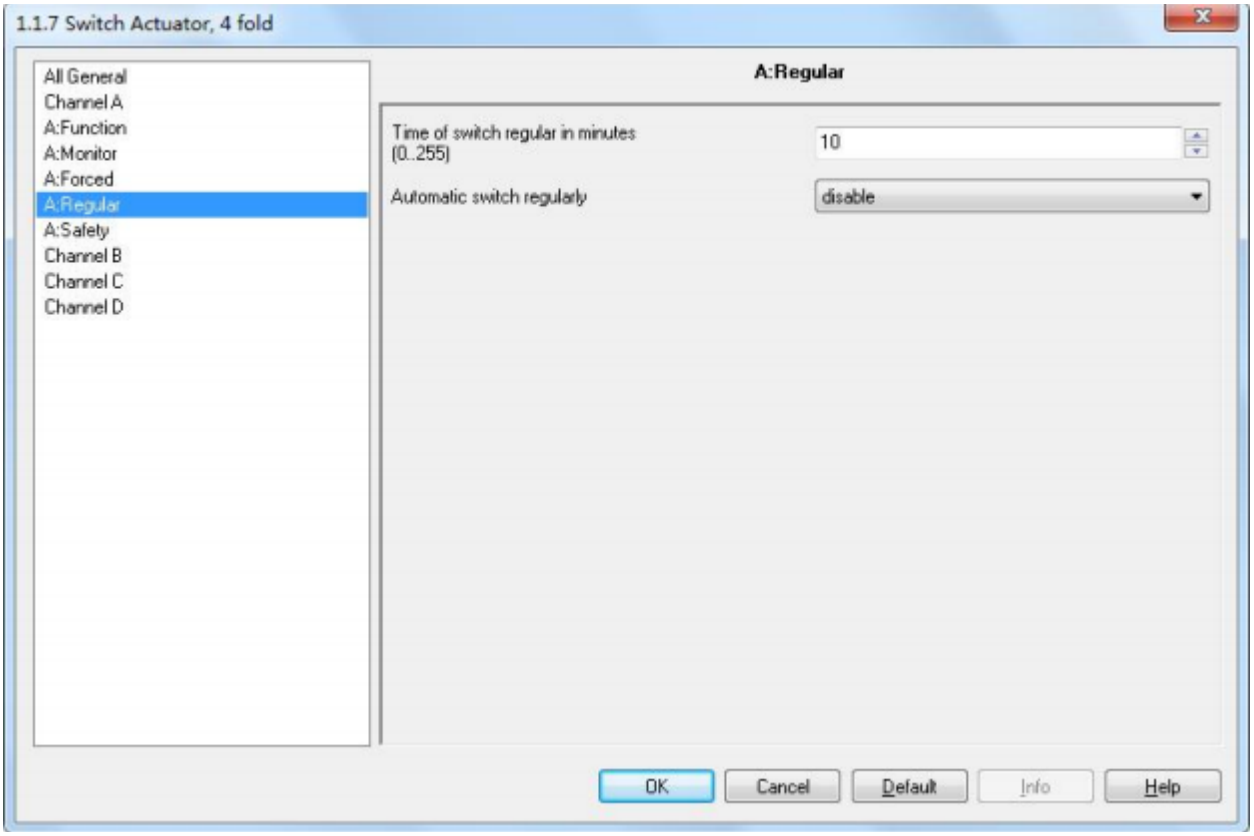


Fig. 2.19 parameter window “X:Regular”

This function can be used to avoid the device’s malfunction because of the dust deposits in the valve area, which plays a very important role when in the long unchange switch status. This function can be started by the object “Trigger switch regularly”

Parameter “Time of switch regular in minutes (0...255)”

This parameter defines the time span when the regular switch carry out one action, and whose unit is minute. Options: **0...255**

Parameter “Automatic switch regularly”

This parameter defines the time interval of starting the automatic regular switching. Options:

Disable

One times per day

One times per week

One times per month

It will start the time counting of the automatic regular switch function if there is no operation on the relays, and recount as long as the relays

3.4.5 Parameter window “X: Safety”

The parameter window “X: Safety” in Fig. 2.20 will pop out when selecting “enable” in the parameter “Function of safety operation is” in Fig. 2.16.

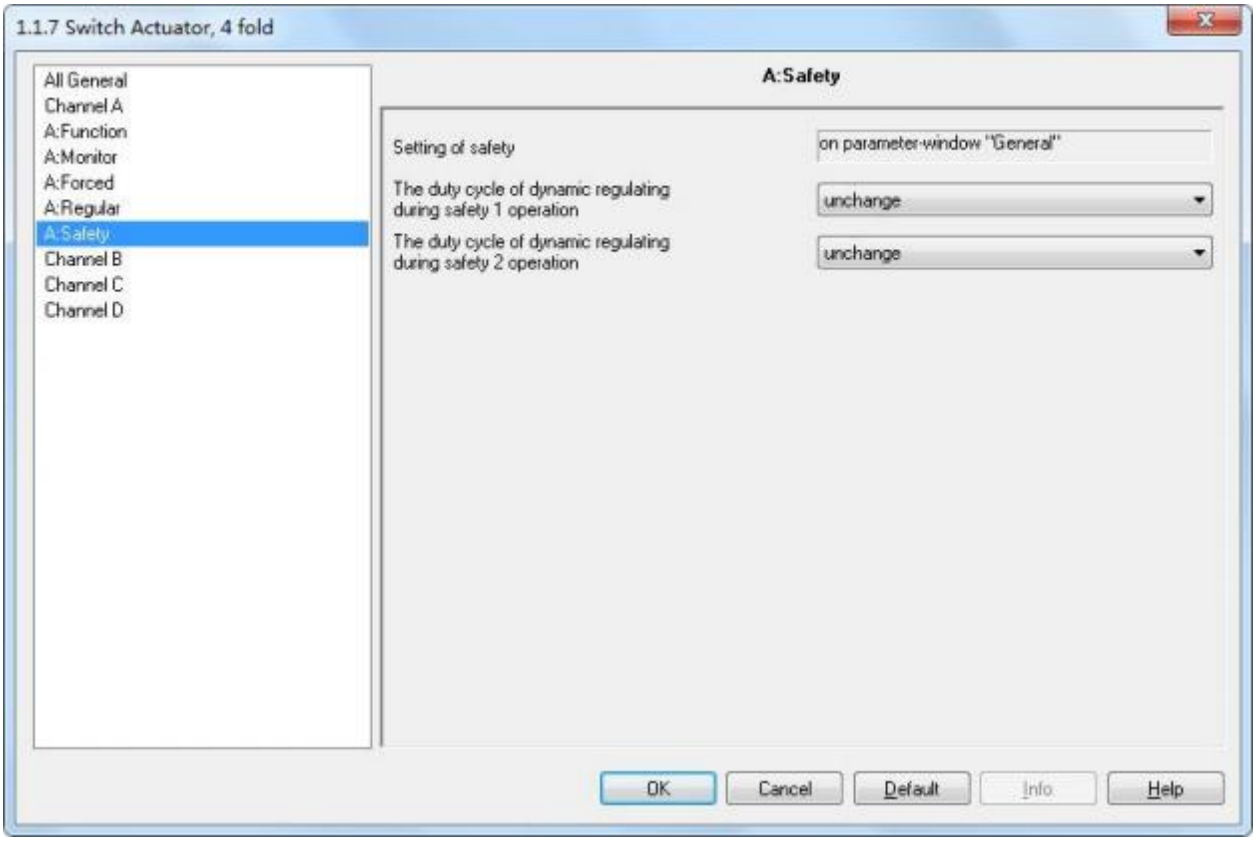


Fig. 2.20 Parameter window “X: Safety”

There are 2 “Safety Priority x” (x=1,2) in the parameter window “All General”. The parameter defines the dynamic action of the triggered relay per output. There are 2 individual “Safety Priority x” (x=1,2) for every output, and “Safety Priority 2” is prior to “Safety Priority 1”. That is even if “Safety Priority 1” is triggered at the same time with “Safety Priority 2”, the contact position will follow the instruction of “Safety Priority 2”. The priority of the safe operation function is only lower to the forced operation function in the system.

Parameter “ The duty cycle of dynamic regulating during safety X operation ” (x=1,2)

This parameter defines the duty cycle of PWM in the safe operation mode. Options:

0 % (ON)

10 %(26)

...

90 %(230)

100% (OFF)

Unchange

Explanation of the option “Unchange”: It will stay the same dynamic action of the PWM when carrying out the safe mode, that is the duty cycle of PWM remains current status.

During the monitoring time of safe mode (can be set in the parameter window Fig.2.2), it will restart to count the time from the second cycle when it is interrupted by force. And then enter into the safe operation mode after the safe operation monitoring time in this cycle.

When it is going back to the normal operation mode from the safe operation mode (that is the safe operation mode finishes), the relay will keep the dynamic action under the safe operation, that is the duty cycle of PWM stays the same until interrupted by other operations.

3.5 Communication object “Switch Actuator ”

The communication object is a media that the bus talks to the other devices, that means only communication object can have the right to communicate to the bus. More details will be described below.

3.5.1 Communication object “All General”

There are 3 objects in “All General”, which plays important role in the regular switch actuator and the dynamic regulating switch. See in Fig. 2.21 and functions are shown in Table 2.1

	Object name	no.	C	R	W	T	U	Group addresses	Function	Type
	General	0	✓	✓		✓			In operation	1 Bit
	General	1	✓		✓		✓		safety priority 1	1 Bit
	General	2	✓		✓		✓		safety priority 2	1 Bit

Fig. 2.21 communication object “All General”

Note: “C” in “Flag” column in the below table means that the object has a normal link to the bus; “W” means the object value can be modified via the bus; “R” means the value of the object can be read via the bus; “T” means that a telegram is transmitted; “U” means that the value of the communication object can be updated

No.	Function	Object name	Data type	Flags
0	**In operation**	**General**	**1bit**	**C,R,T**
This object is always enabled, used to send telegram “1” to the bus periodically to proof the device is under normal working condition.				
1	**Safety Priority 1**	**General**	**1bit**	**W,C,U**
It is able to receive the 1bit telegram from the other devices (such as sensors and controllers and so on) and modify the running condition of the other devices by this object. The other devices will be judged as malfunction if this object doesn’t receive the relevant telegram for a certain time (which will be defined in the window “All General”), and then it will trigger the set action of “Safety Priority 1” in “X: Safety”. The priority of “Safety Priority 1” is lower only to “Forced operation” and “Safety Priority 2				
2	**Safety Priority 2**	**General**	**1bit**	**W,C,U**
This object has the same function as “Safety Priority 1”, but its priority level is secondary only to “force”.				

Table 2.1 communication object table “All General”

3.5.2 General object “Switch Actuator”

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U	Parent value
	send the switch status ,channel A	3	send the switch status, A	1 Bit	Low			✓	✓		
	Communication object	**Number**	**Function**	**Object Type**	**Priority**	**R**	**W**	**C**	**T**	**U**	**Parent value**
	reply the switch status ,channel A	3	reply the switch status, A	1 Bit	Low	✓		✓			
	Communication object	**Number**	**Function**	**Object Type**	**Priority**	**R**	**W**	**C**	**T**	**U**	**Parent value**
	Output A	4	Switch actuator, A	1 Bit	Low		✓	✓			

Fig. 2.22 general communication object per output

No.	Function	Object name	Data type	Flags
3	send the switch status, X	Output X	1bit	C,T
This object will be enabled when selecting “Transmit after change” in the parameter “Set the reply mode of switch status”, which will indicate the contact status (details will be defined by parameter “Object value of switch status” in “Channel X”)				
3	reply the switch status, X	Output X	1bit	R,C,T
This object will be enabled when selecting “always respond, after read only” in the parameter “Set the reply mode of switch status”, which will indicate the contact status (details will be defined by parameter “Object value of switch status” in “Channel X”).				
4	Switch，X	Output X	1bit	W,C
This object is used to trigger the switch operation. It will start the switch operation with “1”, and end with “0”. When enabling “input 0” in the logic function, the object “Switch, X” is used to modify the logic value of “input 0”, rather than trigger the switch operation.				

Table 3.2 general communication table per output

3.5.3 Timing function object “Switch Actuator ”

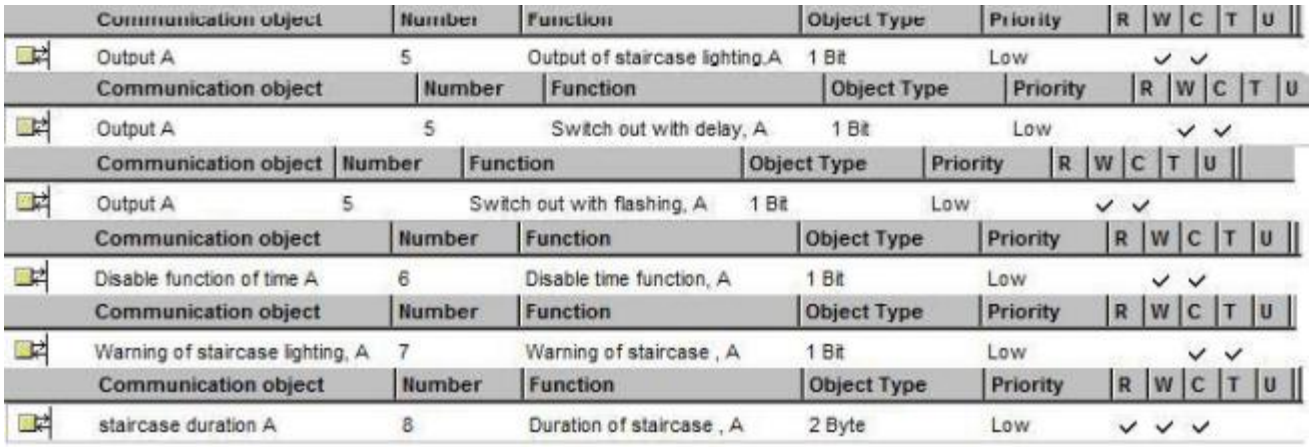


Fig. 2.23 “Switch Actuator” timing communication

No.	Function	Object name	Data type	Flags
5	**Output of staircase lighting , X**	**Output X**	**1bit**	**W,C**
It is used to switch on the staircase lighting by this object, which will be enabled when selecting “staircase lighting” in the parameter “The mode of time function”.				
5	**Switch out with delay, X**	**Output X**	**1bit**	**W,C**
It is used to switch on the time delay by this object, which will be enabled when selecting “delay switch” in the parameter “The mode of time function”.				
5	**Switch out with flashing, X**	**Output X**	**1bit**	**W,C**
It is used to switch on the flash output by this object, which will be enabled when selecting “flashing switch” in the parameter “The mode of time function”				
6	**Switch time function, X**	**Output X**	**1bit**	**W,C**

This object will be started only when enabling the time function which can be disabled by this object. It will enable the timing function when receiving the value “1”; will disable it when receiving “0”. It will not carry out the controlled telegram sent by the time function during disabled time until enable the time function and restart the time counting function. Enable is a default setting after bus voltage recovery				
7	**Warning of staircase , X**	**Output X**	**1bit**	**C,T**
It will be enable while selecting warning by this object in the parameter “Warning mode for ending of staircase”. It will send “1” to the bus when the alarm is starting.				
8	**Duration of staircase , X**	**Output X**	**2Byte**	**R,W,C**
This object will be enabled when selecting “enable” in the parameter “Modify the duration via object (0...60059 seconds)” to modify the duration of the staircase lighting				

Table 2.3 timing function communication table

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Output A	9	Call preset 1/2 , A	1 Bit	Low		✓	✓		
	Communication object	**Number**	**Function**	**Object Type**	**Priority**	**R**	**W**	**C**	**T**	**U**
	Store preset 1/2, A	10	Store preset 1/2, A	1 Bit	Low		✓	✓		

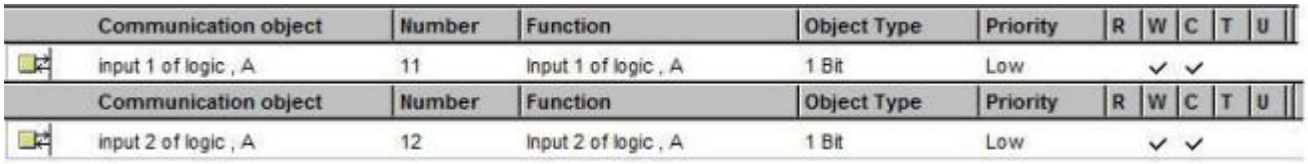
Fig. 2.24 preset function communication object for every output of “Switch Actuator”

3.5.4 Preset function object of “Switch Actuator ”

o.	Function	Object name	Data type	Flags
9	**Call preset 1/2 , X**	**Output X**	**1bit**	**W,C**
This object is used to call the preset value; call 1 with “0” and 2 with “1”				
10	**Store preset 1/2, X**	**Output X**	**1bit**	**W,C**
It can be used to save the current switch status as the new preset value; save the new preset value 1 with “0” and 2 with “1”				

Table 2.4 preset communication objects

3.5.5 Logic function object of “Switch Actuator



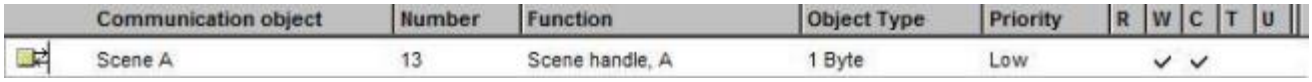
	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	input 1 of logic , A	11	Input 1 of logic , A	1 Bit	Low		✓	✓		
	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	input 2 of logic , A	12	Input 2 of logic , A	1 Bit	Low		✓	✓		

Fig. 2.25 logic function communication object for every output of “Switch Actuator”

No.	Function	Object name	Data type	Flags
11	**Input 1 of logic , X**	**Output X**	**1bit**	**W,C**
This object will be enabled when selecting “enable” in the parameter “The input 1 of logic is”				
12	**Input 2 of logic , X**	**Output X**	**1bit**	**W,C**
This object will be enabled when selecting “enable” in the parameter “The input 2 of logic is”				

Table 2.5 logic function communication objects

3.5.6 Scene function object of “Switch Actuator”



	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Scene A	13	Scene handle, A	1 Byte	Low		✓	✓		

No.	Function	Object name	Data type	Flags
13	Scene handle, X	Output X	1Byte	W,C

It is able to recall or save the scene when sending an 8-bit command by this object, which will be enabled when enabling the scene function. The definition of the 8-bit command will be described below:

Assuming an 8-bit command (binary coding) as:

FXNNNNNN

F: recall the scene with “0”; save the scene with “1”;

X: 0

NNNNNN: scene number (0-63).

1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene handle”. For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Scene handle”.

Table 2.6 scene function communication object “Switch Actuator

3.5.7 Threshold function object of “Switch Actuator

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Threshold 1 change , A	14	Change threshold 1, A	1 Byte	Low		✓	✓		
	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Threshold input , A	15	Threshold input , A	1 Byte	Low		✓	✓		

Fig. 2.27 threshold function communication object “Switch Actuator”

No.	Function	Object name	Data type	Flags
14	Change threshold 1, X	Output X	1Byte	W,C
This object is used to change the value of the threshold 1.				
15	Threshold input , X	Output X	1Byte	W,C
This object is used to receive the threshold sent by other devices.				

Table 2.7 threshold function communication object

3.5.8 Forced function object “Switch Actuator”

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Forced output , A	16	Forced output , A	1 Bit	Low		✓	✓		

Fig.2.28 forced function communication object “Switch Actuator

No.	Function	Object name	Data type	Flags
16	Forced output , X	Output X	1bit	W,C
This object will be started after enabling the forced function. Enable the forced function with “1”, and the other behaviors will be ignored except the forced function; enable the forced function with “0”				

Table 2.8 forced function communication objects

3.6 Communication Object “ Dynamic Regulating Actuator ”

3.6.1 General object “Dynamic Regulating Actuator

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Output A	14	continuous of regulating , A	1 Byte	Low		✓	✓		
	Output A	4	on-off of regulating , A	1 Bit	Low		✓	✓		
	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	reply status (continuous),1 byte...	13	Status (continuous),1 byte, A	1 Byte	Low	✓		✓		
	reply status (continuous),1 bit , A	5	Status (continuous),1 bit , A	1 Bit	Low	✓		✓		
	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	Reply status of contact , A	3	Reply status of contact , A	1 Bit	Low	✓		✓		

Fig. 3.29 general communication object “Dynamic Regulating

No.	Function	Object name	Data type	Flags
14	**continuous of regulating , X**	**Output X**	**1Byte**	**W,C**
This object will be enabled when selecting “1byte (continues)” in the parameter “Control telegram is received as”, is used to receive the control command of 1Byte, with range from 0 to 255: the valve will be off with “0”, on with “255”.				
4	**on-off of regulating , X**	**Output X**	**1bit**	**W,C**
This object will be enabled when selecting “1bit on-off control” in the parameter “Control telegram is received as”, to receive the command of 1bit: off with “0”; on with “1”				
13	**Status (continuous),1 byte, X**	**Output X**	**1Byte**	**R,C,T**
This object will be enabled when selecting “yes, continues control value (1byte)” in the parameter “Reply the status of channel for continuous control”, indicating the running status of the current valve and the duty of PWM				
5	**Status (continuous),1 bit , X**	**Output X**	**1bit**	**R,C,T**

This object will be enabled when selecting “yes, 0% = ‘0’, otherwise ‘1’ (1 bit)” or “yes, 0% = ‘1’, otherwise ‘0’ (1 bit)” in the parameter “Reply the status of channel for continuous control”, indicating the running status of the current valve.

When selecting “yes, 0% = ‘0’, otherwise ‘1’ (1 bit)”, the valve will be off with “0”, others with “1”; selecting “yes, 0% = ‘1’, otherwise ‘0’ (1 bit)”, the valve will be off with “1”, others with “0”

3	**Reply status of contact , X**	**Output X**	**1bit**	**C,R,T**

This object will be enabled when selecting “ ‘1’ = contact close; ‘0’ =contact open ” or “ yes, ‘0’ = contact close; ‘1’ =contact open ” in the parameter “ Reply the status of contact state”; indicating the contact position

Table 2.9 general communication objects “Dynamic

3.6.2 Monitoring function object of “Dynamic Regulating Actuator”

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	report fault, A	7	report fault, regulating , A	1 Bit	Low	✓		✓	✓	

Fig. 3.30 monitoring function communication object “Dynamic Regulating Actuator

No.	Function	Object name	Data type	Flags
7	**report fault, regulating , X**	**Output X**	**1bit**	**R,C,T**

This object is enabled when selecting “enable” in the parameter “sending object ‘report fault’ is”, used to check whether the room thermostat is under malfunction or not. It will go into the fault mode with “1”.

Table 2.10 monitoring communication objects “Dynamic Regulating Actuator”

3.6.3 Forced function object “Dynamic Regulating Actuator”

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	forced operation , A	16	forced operation,regulating, A	1 Bit	Low		✓	✓		

Fig. 3.31 forced function communication object “Dynamic Regulating Actuator”

No.	Function	Object name	Data type	Flags
16	**Forced operation , regulating , X**	**Output X**	**1bit**	**W,C**
This object will be started when enabling the forced function. Start the forced mode with “1” and the other behaviors will be ignored; end the mode with “0”.				

Table 2.11 forced function communication object “Dynamic Regulating Actuator”

3.6.4 Regular switch function object“Dynamic Regulating Actuator”

	Communication object	Number	Function	Object Type	Priority	R	W	C	T	U
	switch regularly , A	10	Trigger switch regularly , A	1 Bit	Low		✓	✓		

Fig. 3.32 regular switch function communication object “Dynamic Regulating Actuator”

No.	Function	Object name	Data type	Flags
10	**Trigger switch regularly , X**	**Output X**	**1bit**	**W,C**
This object will be started when enabling the timing function to trigger the timing. Start the timing function with “1”, and stop until time is up with “0”				

Table 2.12 regular switch function communication objects “Dynamic Regulating Act

Chapter 4 Priority level description

There are 5 priority levels for the whole system:

Switch actuator function: Forced > Safety Priority 2 > Safety Priority 1> common switch/time/preset/ logic/scene/threshold (from highest priority to lowest)

Dynamic regulating switch function: Forced > Safety Priority 2 > Safety Priority 1 > monitor/PWM/continue/on-off/switch regularly (from highest priority to lowest)

Only the higher priority behavior can interrupt the lower priority behavior