Switching actuator module with current detection

User's Manual-Ver1.0

MI0316

MI0416

MI0816

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catalogs

1 Summary

This manual provides you with detailed technical information on the Switch Actuator Module with Current Detection, including installation and programming details, and explains how to use the Switch Actuator Module with Current Detection on the basis of examples of practical use. For easy installation into distribution boxes, the Switching Actuator Module with Current Detection is designed as a modular mounting device, capable of being mounted on a 35 mm DIN rail.

Switching actuator modules with current detection are used to control switching loads such as lighting, signaling equipment, etc., which can be switched on or off manually, with their switching status all visible.

Installed as a system with other loads via the EIB/ KNX bus.

Set up and operate the entire system using the engineering design tool software ETS.

2 Product and Function Overview

Switching actuator modules with current detection are mainly used in building control systems and are installed as a system with other bus devices via the EIB/ KNX bus. They are mainly used for controlling switching loads, using the engineering design tool ETS software (version ETS4.0 or higher) for the assignment of physical addresses and the setting of parameters.

The maximum load current of each switching actuator module with current detection is 16A, including 3, 4, 8 and 12 relays, and each circuit can independently control the switching of 3300W lamps and lanterns, the above is only for resistive load lamps and lanterns, and it will be more appropriate to drive resistive loads according to the 80% of the power when it is used in practice. For inductive loads and capacitive loads, especially in the case of parallel connection of many lamps and lanterns, the load will be reduced, although the power remains unchanged, but the instantaneous inrush current will increase, easy to make the relay contacts melt, so for inductive loads and capacitive loads, it is generally appropriate to use 1/5 or 1/6 of the maximum current, and even some poor-quality LED lamp loads need to be used to the maximum current of 1/8.

Functional Description:

(1) Individual control of 3/4/8/12 circuits of lamps/loads

(2) With manual strong cut dial and relay with magnetic hold function;

(3) Delayed on/off function, timed off and cycling on/off function;

(4) Status value query response (feedback) function

(5) Selection function of relay switching state during bus power failure and after voltage recovery;

(6) With scene combination control function;

(7) It has a logical operation function, which can realize the two-level operation of logical and and logical or;

(8) It has a strategy control function, which sends out an alarm signal to the relay according to the current threshold set by the channel;

(9) Used in combination with voltage detection data, the following functions can be realized:

(A) Automatically calculates and outputs the effective power of each circuit by configuring the device;

(B) Configure the device to automatically calculate and output the power consumption of each circuit based on the time of use.

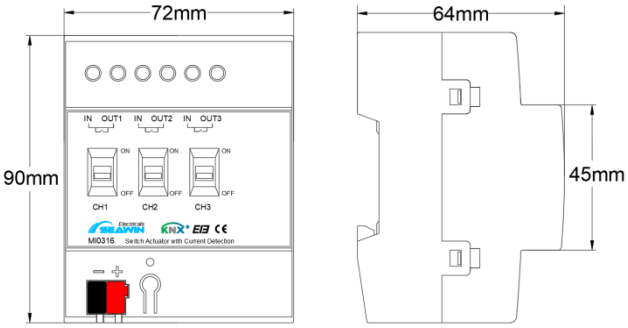
3 Detailed Parameters

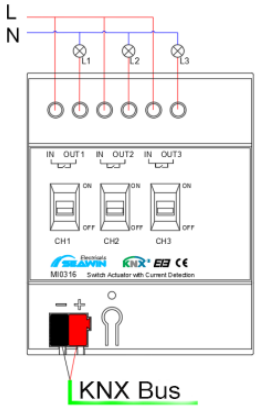
bus voltage	21-30 VDC via KNX bus
quiescent current	≤ 12mA
Charging Current	≤ 20mA
Static power consumption	≤360mW
Charging power consumption	≤ 600mW
primary output	3/4 /8/12 circuit design, 250VAC (50/60Hz) per circuit, Max 16A (resistive load)
Current detection range	50mA~16A
Current detection accuracy	±5 and ±20mA
Dimensions (Lx W x H)	72mm x 90mm x 64mm (3-way), 72mm x 90mm x 64mm (4-way), 145mm x 90mm x 64mm (8-way), 218mm x 90mm x 64mm (12-way)
Weight (approx.)	0.20KG (3-way), 0.25KG (4-way), 0.35KG (6-way), 0.46KG (8-way), 0.67KG (12-way)
Shell material	PA66
Installation	DIN rail mounting
operating temperature	-5°C...+45°C
Storage temperature	-25°C...+55°C
transport temperature	-25°C...+70°C
relative humidity	max 90%

4 Dimensional and wiring diagrams

4.1 MI0316

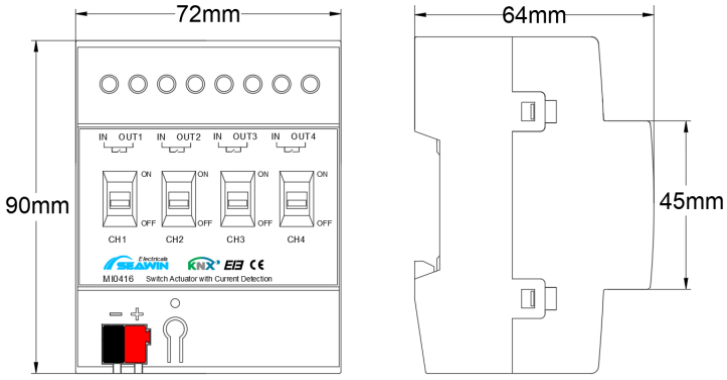
Dimensional drawings Wiring diagrams

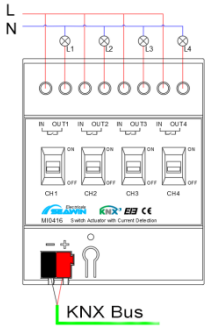




4.2 MI0416

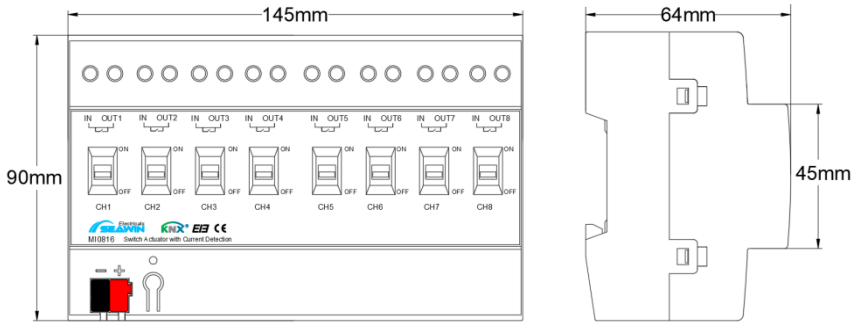
Dimensional drawings Wiring diagrams

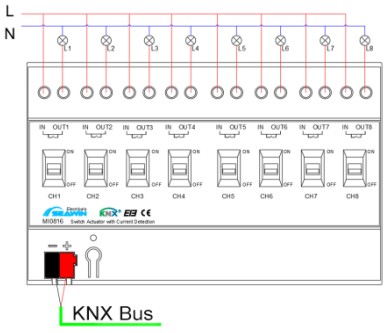




4.3 MI0816

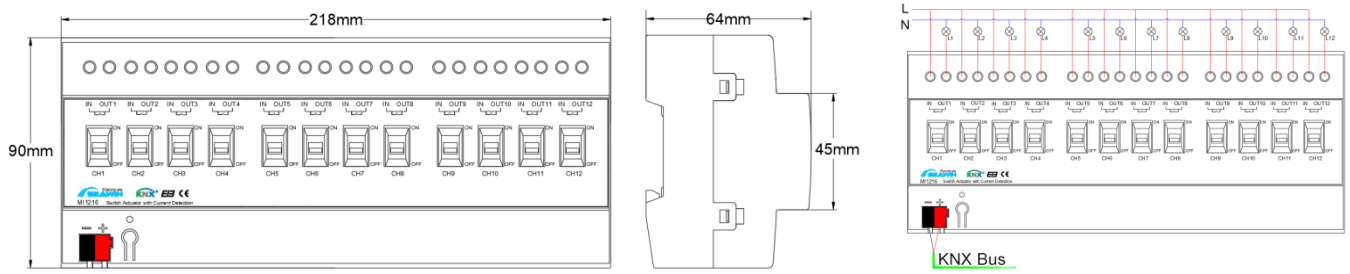
Dimensional drawings Wiring diagrams





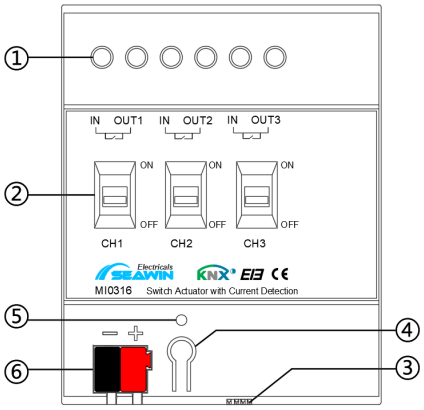
4.4 MI1216

Dimensional drawings Wiring diagrams



5 Product Operating Instructions

5.1 MI0316



①Description: Relay output terminal: adopts one-in-one-out method, and the aperture can connect φ4 wire;

②Description: For each circuit control dial, it is ON when the relay dial is hit up and OFF when the relay dial is hit down;

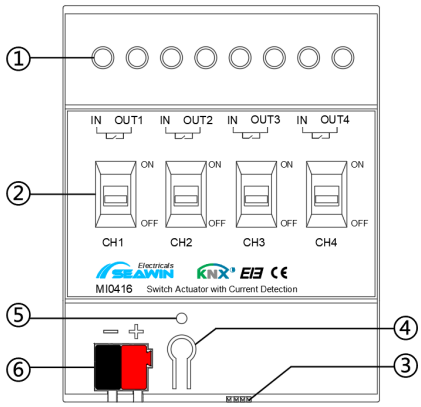
③ Description: Dry contact input terminal;

④ Description: Programming button, short press the button to enter programming mode;

⑤ Explanation: Programming indicator, when the indicator is red, the device is in the programming state, when the device is programmed or working normally, the indicator will flash blue; ⑤ Explanation: Programming indicator, when the indicator is red, the device is in the programming state.

⑥Description: KNX terminal, KNX bus access, red line to "+", black line to "-";

5.2 MI0416



①Description: Relay output terminal: adopts one-in-one-out method, and the aperture can connect φ4 wire;

②Description: For each circuit control dial, it is ON when the relay dial is hit up and OFF when the relay dial is hit down;

③ Description: Dry contact input terminal;

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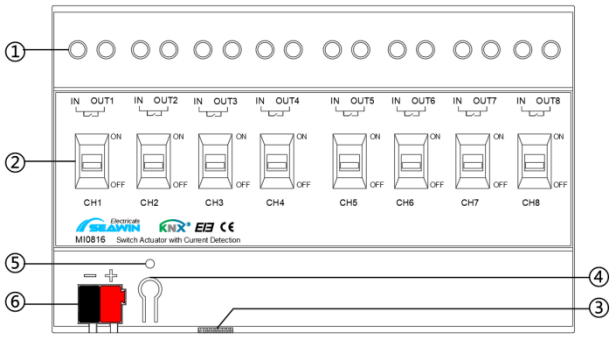
⑤ Explanation: Programming indicator, when the indicator is red, the device is in the programming state, when the device is programmed or working normally, the indicator will flash blue; ⑤ Explanation: Programming indicator, when the indicator is red, the device is in the programming state, when the device is programmed or working normally, the indicator will flash blue

⑥Description: KNX terminal, KNX bus access, red line to "+", black line to "-";

5.3 MI0816



①Description: Relay output terminal: adopts one-in-one-out method, and the aperture can connect φ4 wire;

②Description: For each circuit control dial, the relay dial is ON when it is punched up and OFF when it is punched down;

③ Description: Dry contact input terminal;

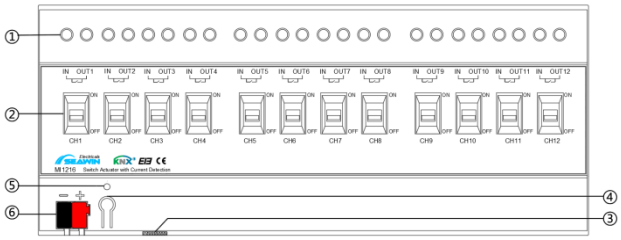
④ Description: Programming button, short press the button to enter programming mode;

⑤Description: Programming indicator, when the indicator is red, the device is in the programming state, when the

device is finished programming or working normally, the indicator will flash blue.

⑥Description: KNX terminal, KNX bus access, red line to "+", black line to "-";

5.4 MI1216



①Description: Relay output terminal: adopts one-in-one-out method, and the aperture can connect φ4 wire;

②Description: For each circuit control dial, it is ON when the relay dial is hit up and OFF when the relay dial is hit down;

③ Description: Dry contact input terminal;

④ Description: Programming button, short press the button to enter programming mode;

⑤Description: Programming indicator, when the indicator is red, the device is in the programming state, when the device is programmed or working normally, the indicator will flash blue; ⑤Description: Programming indicator, when the indicator is red, the device is in the programming state.

⑥Description: KNX terminal, KNX bus access, red line to "+", black line to "-";

6 Description of parameter settings

6.1 Setting of switch function parameters

The following is an example of setting parameters in ETS5.

(1) Open the parameter setting interface of the actuator module with current detection in ETS5, as shown in Fig. 6.1.1. The parameter "Channel X" indicates the output of the corresponding channel.

If it is a 4-channel actuator with current detection switch, select "Enabled" in Channel 1- Channel 4 and "Disabledd" for other options; if it is an 8-channel actuator with current detection switch, select "Enabled" in Channel 1- Channel 8 and "Disabledd" for other options. If it is an 8-channel actuator with current detecting switch, select "Enabled" for Channel 1- Channel 8, and select "Disabledd" for other options. (Take 8-channel actuator module with current detection switch as an example)

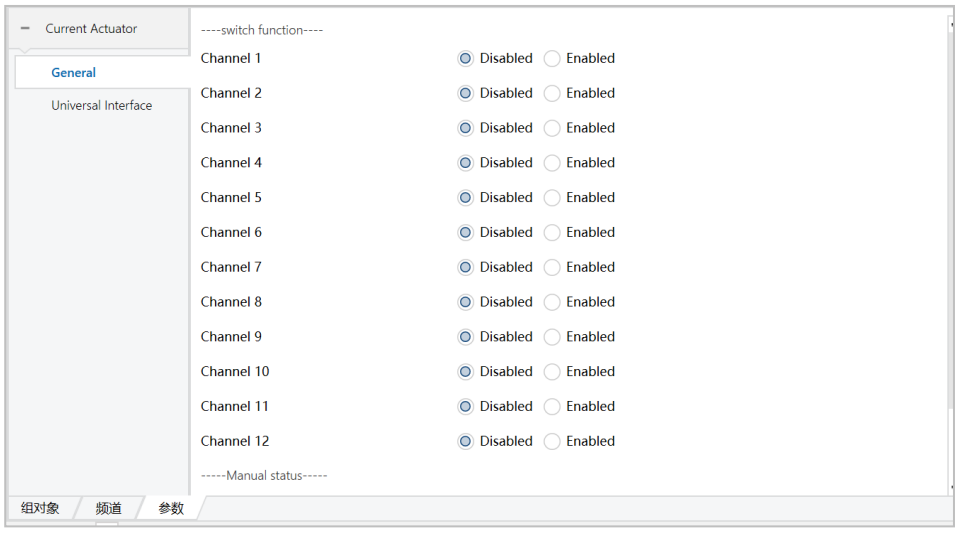


Figure 6.1.1

2) After the setting is completed, the interface is shown in Figure 6.1.2, and the eight options in the red box as shown appear.

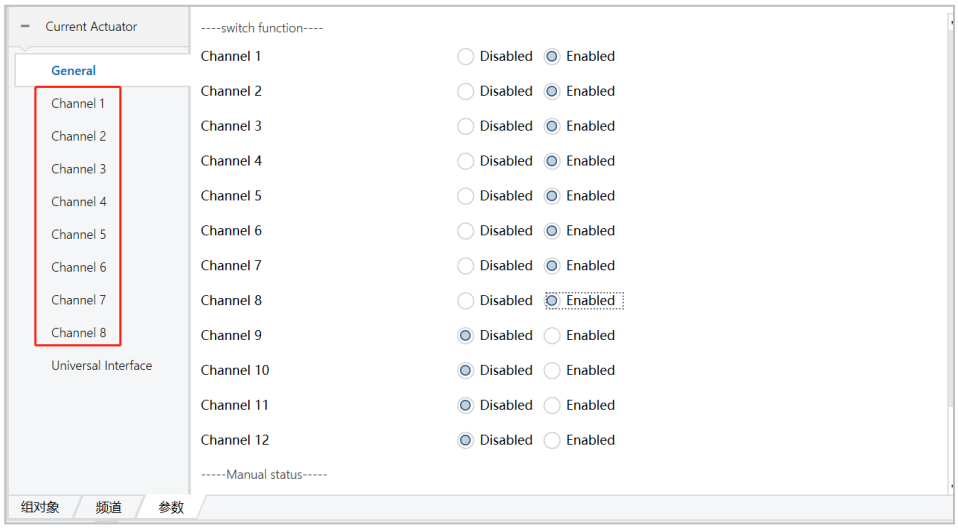


Figure 6.1.2

(3) Click the options in the red box above, set the parameters of each circuit, the following Channel 1 as an example, as shown in Figure 6.1.3

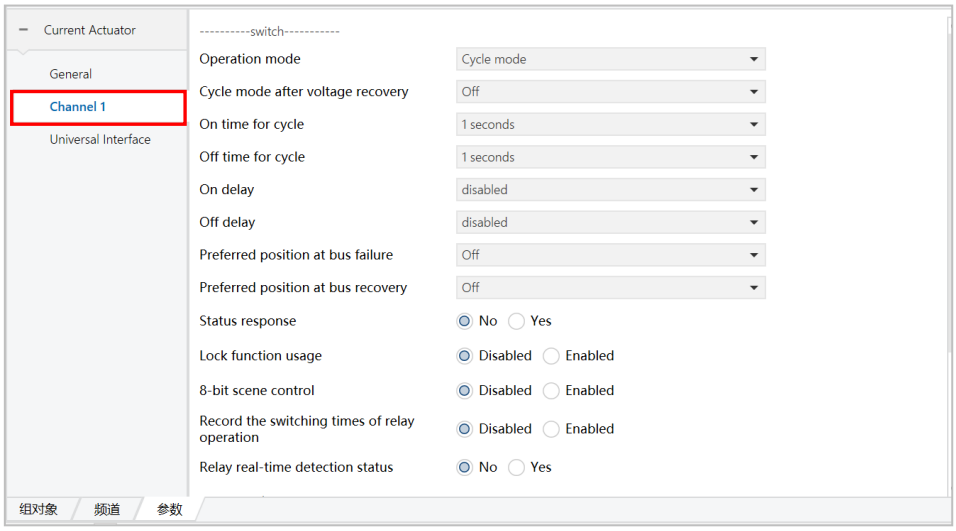


Figure 6.1.3

4) Switch

The parameter "Operating mode" is divided into three modes: Normal mode, Time mode and Cycle mode.

6.1.1 Normal mode (Normal mode)

parameters	descriptive
Logic operation 1	Logical operation 1, optional: No logic operation , AND function (with the function, a logical operation, that two or more conditions are satisfied at the same time the result is true), OR function (or function, a logical operation, that one of the conditions is true then the result is true)
Logic operation 2	Logic operation 2, optional: No logic operation , AND function (with the function, a logical operation, that two or more conditions are satisfied at the same time the result is true), OR function (or function, a logical operation, that one of the conditions is true then the result is true)
On delay	Relay delayed open (options: Disabledd, 1, 2... .15 seconds); e.g. when "5 seconds" is selected, the corresponding circuit will be opened after 5s when "ON" is sent. .15 seconds); e.g.: select "5 seconds", when sending "ON" command, the corresponding circuit will be opened after 5s.
Off delay	Relay off delay (options: Disabledd, 1, 2...15 seconds); e.g. when the command "5 seconds" is sent, the corresponding circuit will be switched off after 5s. .15 seconds); e.g.: select "5 seconds", when sending "OFF" command, the corresponding circuit will

	execute the relay off after 5s.
preferred position at bus failure	Status of the corresponding circuit of the relay after power failure, options: Off, On, unchanged.
Preferred position at bus recovery	State of the corresponding circuit of the relay after voltage recovery, options: Off, On, unchanged;
Status response	Status Feedback, options: No (no feedback), Yes (feedback), the following parameter configuration is enabled when selecting "Yes": 1. "Transmission of status" indicates the way of status transmission, with the following options: using read request only (status feedback is available only when a read-only request is issued), on change in status (status feedback is available immediately when the status changes), The options are: using read request only, on change in status, always on operation; 2、"Invert status feedback" indicates the function of feedback reversal, optional: No, Yes, when selecting "Yes", the feedback will be off when the relay is on, and on when it is off;
Lock function usage	The channel lock function is used to lock the corresponding channel relay in the on/off state, so that its control on the bus is invalidated. Options: Enabled (activated), Disabled (deactivated), the following parameter configurations are enabled when "Enabled" is selected: 1、"The polarity of the lock " , option：Lock with "1", UnIock with "0"("1 "lock, "0 Lock with "1", UnIock with "0" ("1" locks, "0" unlocks), Lock with "0", UnIock with "1" ("0" locks, "1" unlocks); 2、"Lock start position" indicates the start position of the lock, options: No reaction (no action), On (open), Off (closed); 3、Lock end position" indicates the end position of the lock, options: No reaction (no action), On (open), Off (closed);
8-bit scene control	Scene control function, options: Enabled (start), Disabled (deactivate), when selecting "Enabled", the left side of the interface will show "Enabled", "Disabled", "Disabled", "Disabled", "Disabled", "Disabled", "Disabled".

	The "scene" option appears in the channel corresponding to the edge, click "scene" and the interface switches to the one shown in Figure 6.1.4. The parameters in the interface are configured as follows: 1、"Overwrite values stored in the device during ETS download "option：①Overwrite、②Not parameter Overwrite, ② parameter Not rewrite; 2、"Delay time before operation" indicates the delay time before operation, optionally "1-127" seconds; 3、"Scene assignment 1-64" indicates the setting of the scene number, and the scene number can be set to 1-64; 4、"Output Value" indicates the output value of the corresponding channel operation of the scene number, with the following options: On (on), Off (off); 5、"Storage value for Scene assignment X" indicates the scene learning function of scene number X, (X:1~64), options: No (off), Yes (on), (e.g.: Channel 1 and Channel 2 in the parameter) Select "1" for "Scene assignment 1[1-64]", "Storage value for Scene assignment 1" select "Yes". When "Yes" is selected for the parameter "Scene assignment 1[1-64]" and "Storage value for Scene assignment 1", the communication object takes the group address 3/1/1 as an example, and after the data download is completed, the hand-control operation of CH1 and CH2 on the actuator module will be On, and the "Diagnostic" function will be entered at the "Diagnostic" function on the ETS. At the "Diagnostic" of ETS, input the group address 3/1/1, then select "Learn" in "Value", and choose "1" for the scene number, and send it out on the bus, then the scene number will be "1". (If you send it out on the bus, scene No. "1" is used to learn the status of actuators CH1 and CH2 On).
Record the switching times of relay operation	Records the number of relay switching operations, options: Enabled (activated), Disabled (deactivated), when "Enabled" is selected, the following parameter configuration is enabled: 1、"Overwrite the switching times during ETS download" indicates the function of resetting the switching times during ETS data download, and the switching times will be reset to zero after the download is completed, with the following options: No (off),

	Yes (on); 2、"Reset the switching times of relay operation" indicates the function of resetting the switching times of relay operation, available options: No (off), Yes (on); 3、"Send switching times in cycle" indicates the function of sending switching times in cycle, options: Enabled (start), Disabled (Disabled), select "Enabled" to enable the parameter configuration "The time in cycles" for the cycle period, options: 1 Second, 2 Second120 minutes. When "Enabled" is selected, the parameter "The time in cycles" is configured as cycle times, options: 1 Second, 2 Second.....120 minutes; 4、"Send switching times on change" indicates the function of sending switching operations on the bus when the switching times change, options: Enabled (start), Disabled (Disabled), select " Enabled" to enable the parameter configuration. When "Enabled" is selected, the parameter configuration "The value on change" indicates the value of the switching times of the relay, how many operations can be met before a switching operation is sent on the bus, options: 0, 1, 2 .... The options are: 0, 1, 2 ...255;
Relay real-time detection status	Relay real-time detection status, options: No (off), Yes (on), when Yes is selected, the following parameter configuration appears: 1、"Relay turn off the current output is zero" indicates that when the relay is turned off the output is zero, optional: No (off), Yes (on);

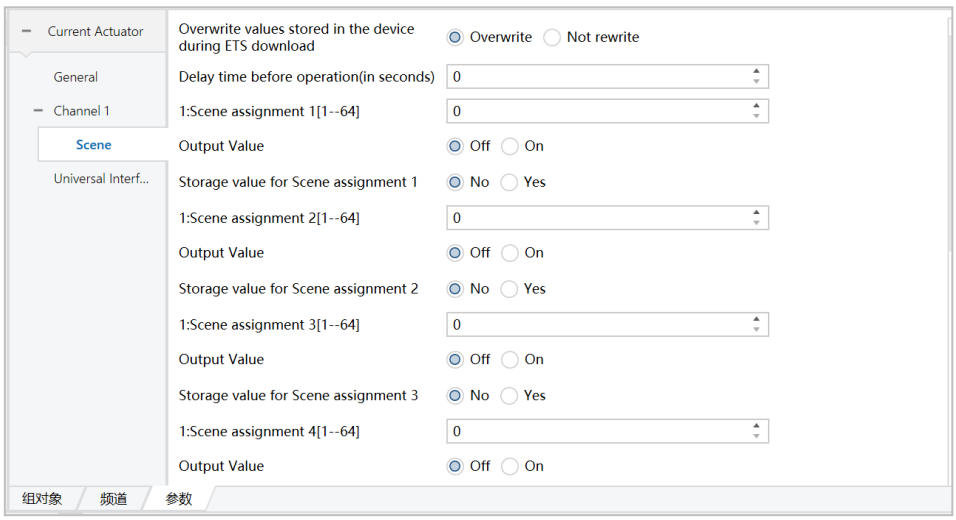


Figure 6.1.4

6.1.2 Timing mode (Time mode)

parameters	descriptive
Time mode after voltage recovery	Time mode after voltage recovery, options: Off, On, as before voltage failure
On time	Relay open duration (options: 1 seconds, 2 seconds... 120 minutes); for example: select "10seconds", the relay is "open" and will close automatically after 10s. .120 minutes); e.g.: select "10seconds", the relay is "open" and will close automatically after 10s.
On delay	Relay delayed open (options: Disabledd, 1, 2... .15 seconds); e.g. when "5 seconds" is selected, the corresponding circuit will be opened after 5s when "ON" is sent. .15 seconds); e.g.: select "5 seconds", when sending "ON" command, the corresponding circuit will be opened after 5s.
Off delay	Relay off delay (options: Disabledd, 1, 2...15 seconds); e.g. when the command "5 seconds" is sent, the corresponding circuit will be switched off after 5s. .15 seconds); e.g.: select "5 seconds", when sending "OFF" command, the corresponding circuit will execute the relay off after 5s.
preferred position at bus failure	Status of the corresponding circuit of the relay after power failure, options: Off, On, unchanged.
Preferred position at bus recovery	State of the corresponding circuit of the relay after voltage restoration, options: Off, On, unchanged.
Status response	Status Feedback, options: No (no feedback), Yes (feedback), the following configurations are enabled when "Yes" is selected: 1. "Transmission of status" indicates the way of status transmission, with the following options: using read request only (status feedback is available only when a read-only request is issued), on change in status (status feedback is available immediately when the status changes), The options are: using read request only, on change in status, always on operation; 2、"Invert status feedback" indicates the function of feedback reversal, optional: No, Yes, when selecting "Yes", the feedback will be off when the relay is on, and on when it is off;
Lock function usage	The channel lock function is used to lock the corresponding channel relay in the on/off state, so that its control on the bus is invalidated. Options: Enabled (activated), Disabled

	(deactivated), the following parameter configurations are enabled when "Enabled" is selected: 1、"The polarity of the lock " ,option :Lock with "1", UnIock with "0"("1 "lock, "0 Lock with "1", UnIock with "0" ("1" locks, "0" unlocks), Lock with "0", UnIock with "1" ("0" locks, "1" unlocks); 2、"Lock start position" indicates the start position of the lock, options: No reaction (no action), On (open), Off (closed); 3、Lock end position" indicates the end position of the lock, options: No reaction (no action), On (open), Off (close)
8-bit scene control	Scene control function, options: Enabled (start), Disabledd (deactivate), when selecting "Enabled", the left side of the interface will show "Enabled", "Disabledd", "Disabledd", "Disabledd", "Disabledd", "Disabledd". The "scene" option appears in the channel corresponding to the edge, click "scene" and the interface switches to the one shown in Fig. 6.1.4. The functions in the interface are configured as follows: 1、"Overwrite values stored in the device during ETS download "option：①Overwrite、②Not parameter Overwrite, ② parameter Not rewrite; 2、"Delay time before operation" indicates the delay time before operation, optionally "1-127" seconds; 3、"Scene assignment 1-64" indicates the setting of the scene number, and the scene number can be set to 1-64; 4、"Output Value" indicates the output value of the corresponding channel operation of the scene number, with the following options: On (on), Off (off); 5、"Storage value for Scene assignment X" indicates the scene learning function of scene number X, (X:1~64), options: No (off), Yes (on), (e.g.: Channel 1 and Channel 2 in the parameter) Select "1" for "Scene assignment 1[1-64]", "Storage value for Scene assignment 1" select "Yes". When "Yes" is selected for the parameter "Scene assignment 1[1-64]" and "Storage value for Scene assignment 1", the communication object takes the group address 3/1/1 as an example, and after the data download is completed, the

	hand-control operation CH1 and CH2 on the actuator module will be On, and the "Diagnostic" function will be entered at the "Diagnostic" function on the ETS. At "Diagnostic" on ETS, input group address 3/1/1, then select "Learn" in "Value" and "1" for scene number. (If you send it out on the bus, scene No. "1" is used to learn the status of actuators CH1 and CH2 On).
Record the switching times of relay operation	Records the number of relay switching operations, options: Enabled (activated), Disabled (deactivated), when "Enabled" is selected, the following parameter configuration is enabled: 1、"Overwrite the switching times during ETS download" is a function to reset the switching times during ETS data download, and the switching times will be reset to zero after the download is completed, with the following options: No (off), Yes (on); 2、"Reset the switching times of relay operation" is the function to reset the switching times of relay operation, options: No (off), Yes (on); 3、"Send switching times in cycle" is the function of sending switching times in cycle, options: Enabled (start), Disabled (Disabled), select "Enabled" to enable parameter configuration. When "Enabled" is selected, the parameter configuration "The time in cycles" is the cycle period, options: 1 Second, 2 Second.....120 minutes; 4、"Send switching times on change" indicates the function of sending switching operations on the bus when the switching times change, options: Enabled (start), Disabled (Disabled), select " Enabled" to enable the parameter configuration. When "Enabled" is selected, the parameter configuration "The value on change" indicates the value of the switching times of the relay, how many operations can be met before a switching operation is sent on the bus, options: 0, 1, 2 .... The options are: 0, 1, 2 ...255;
Relay real-time detection status	Indicates the relay real-time detection status, available options: No (off), Yes (on), when Yes is selected, the following parameter configuration appears: 1、"Relay turn off the current output is zero "option：No、Yes

6.1.3 Cycle mode

parameters	descriptive

Cycle mode after voltage recovery	Cycle mode after voltage recovery, options: options: Off, On, As before voltage failure
On time for cycle	The amount of time the relay remains open during the cycle (options: 10seconds, 15seconds.... ...120minutes)
Off time for cycle	Time for the relay to remain off during the cycle (options: 10seconds, 15seconds.... . 120minutes)
On delay	Relay delayed open (options: Disabledd, 1, 2... .15 seconds); e.g. when "5 seconds" is selected, the corresponding circuit will be opened after 5s when "ON" is sent. .15 seconds); e.g.: select "5 seconds", when sending "ON" command, the corresponding circuit will be opened after 5s.
Off delay	Relay off delay (options: Disabledd, 1, 2...15 seconds); e.g. when the command "5 seconds" is sent, the corresponding circuit will be switched off after 5s. .15 seconds); e.g.: select "5 seconds", when sending "OFF" command, the corresponding circuit will execute the relay off after 5s.
preferred position at bus failure	Status of the corresponding circuit of the relay after power failure, options: Off, On, unchanged.
Preferred position at bus recovery	State of the corresponding circuit of the relay after voltage restoration, options: Off, On, unchanged.
Status response	Status Feedback, options: No (no feedback), Yes (feedback), the following configuration is enabled when Yes is selected: 1. "Transmission of status" indicates the way of status transmission, with the following options: using read request only (status feedback is available only when a read-only request is issued), on change in status (status feedback is available immediately when the status changes), The options are: using read request only, on change in status, always on operation; 2、"Invert status feedback" indicates the function of feedback reversal, optional: No, Yes, select "Yes", the feedback is off when the relay is on, and on when it is off.
Lock function usage	The channel lock function is used to lock the corresponding channel relay in the on/off state, so that its control on the bus is invalidated. Options: Enabled (activated), Disabled

	(deactivated), the following parameter configurations are enabled when "Enabled" is selected: 1、"The polarity of the lock" is the polarity of the lock, options: Lock with "1", UnIock with "0" ("1" lock, "0" unlock), Lock with "0", UnIock with "1" ("0" lock, "1" unlock). Lock with "1", UnIock with "0" ("1" locks, "0" unlocks), Lock with "0", UnIock with "1" ("0" locks, "1" unlocks); 2、"Lock start position" for the lock start position, options: No reaction (no action), On (open), Off (closed); 3, Lock end position "for the end position of the lock, options: No reaction (no action), On (open), Off (off)
8-bit scene control	Scene control function, options: Enabled (start), Disabled (deactivate), when selecting "Enabled", the left side of the interface will show "Enabled", "Disabled", "Disabled", "Disabled", "Disabled", "Disabled", "Disabled". The "scene" option appears in the channel corresponding to the edge, click "scene" and the interface switches to the one shown in Figure 6.1.4. The parameters in the interface are configured as follows: 1、"Overwrite values stored in the device during ETS download " , option：①Overwrite、②Not parameter Overwrite, ② parameter Not rewrite; 2、"Delay time before operation" indicates the delay time before operation, optionally "1-127" seconds; 3、"Scene assignment 1-64" indicates the setting of the scene number, and the scene number can be set to 1-64; 4、"Output Value" indicates the output value of the corresponding channel operation of the scene number, with the following options: On (on), Off (off); 5、"Storage value for Scene assignment X" indicates the scene learning function of scene number X, (X:1~64), options: No (off), Yes (on), (e.g.: Channel 1 and Channel 2 in the parameter) Select "1" for "Scene assignment 1[1-64]", "Storage value for Scene assignment 1" select "Yes". When "Yes" is selected for the parameter "Scene assignment 1[1-64]" and "Storage value for Scene assignment 1", the communication object takes

	the group address 3/1/1 as an example, and after the data download is completed, the hand-control operation of CH1 and CH2 on the actuator module will be On, and the "Diagnostic" function will be entered at the "Diagnostic" function on the ETS. At the "Diagnostic" of ETS, input the group address 3/1/1, then select "Learn" in "Value", and choose "1" for the scene number, and send it out on the bus, then the scene number will be "1". (If you send it out on the bus, scene No. "1" is used to learn the status of actuators CH1 and CH2 On).
Record the switching times of relay operation	Records the number of relay switching operations, options: Enabled (activated), Disabled (deactivated), when "Enabled" is selected, the following parameter configuration is enabled: 1、"Overwrite the switching times during ETS download" indicates the function of resetting the switching times during ETS data download, and the switching times will be reset to zero after the download is completed, with the following options: No (off), Yes (on); 2、"Reset the switching times of relay operation" indicates the function of resetting the switching times of relay operation, available options: No (off), Yes (on); 3、"Send switching times in cycle" indicates the function of sending switching times in cycle, options: Enabled (start), Disabled (Disabled), select "Enabled" to enable the parameter configuration "The time in cycles" for the cycle period, options: 1 Second, 2 Second120 minutes. When "Enabled" is selected, the parameter "The time in cycles" is configured as cycle times, options: 1 Second, 2 Second.....120 minutes; 4、"Send switching times on change" indicates the function of sending switching operations on the bus when the switching times change, options: Enabled (start), Disabled (Disabled), select " Enabled" to enable the parameter configuration. When "Enabled" is selected, the parameter configuration "The value on change" indicates the value of the switching times of the relay, how many operations can be met before a switching operation is sent on the bus, options: 0, 1, 2 .... The options are: 0, 1, 2 ...255;
Relay real-time detection status	Relay real-time detection status, options: No (off), Yes (on), when Yes is selected, the following parameter configuration appears:

	1、"Relay turn off the current output is zero " option：No、Yes

6.2 Setting of energy management parameters

6.2.1 Current detection

(1) The parameter "current detection" means current detection, when selecting "Enabled", the interface will appear as shown in Fig. 6.2.1, and the options in the red box will appear as shown in Fig. 6.2.1.

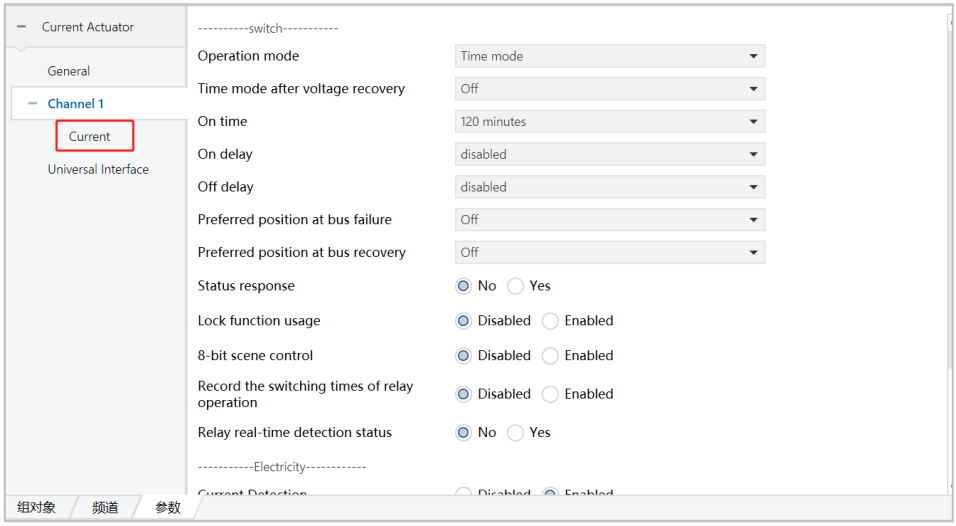


Figure 6.2.1

(2) Click the option in the red box above, set the parameters, the following Channel 1 as an example, as shown in Figure 6.2.2

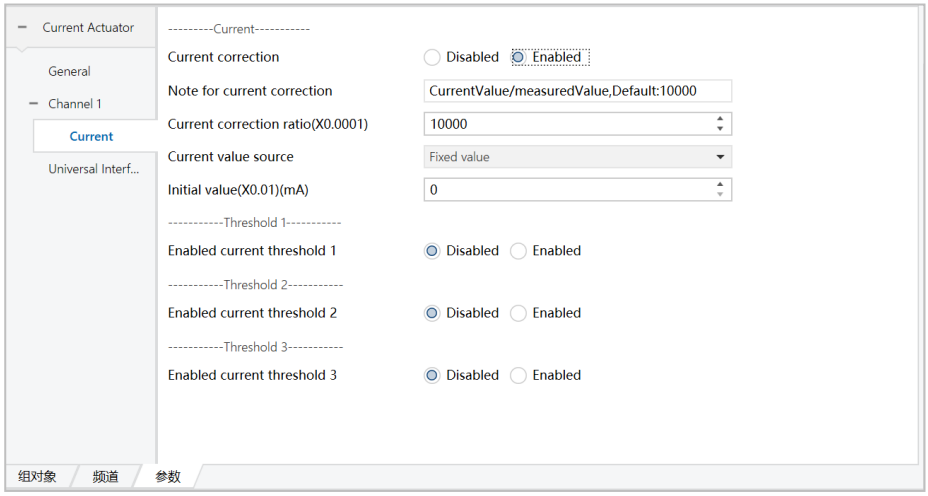


Figure 6.2.2

(1) "Current" current function configuration section

parameters	descriptive

Current correction	Current Correction, Options: Enabled, Disabled, When Enabled is selected, the following parameter configuration is enabled: 1、"Note for current correction" means current correction note, optional: "CurrentValue/measuredValue,Default:10000 "CurrentValue/measuredValue,Default:10000 2、"Current correction ratio(X0.0001)"indicates the current correction ratio (multiplied by 0.0001), which can be filled in: 8000....12000
Current value source	Current value source, options: Fixed value, Internal current value, External current value 1. When "Internal current value" is selected, the following parameters are enabled: (1) "Send current value on change" indicates that the current value changes to a certain value when sending data, options: Disabled (deactivated), Change>=1mA (current value change is greater than or equal to 1mA)... ..... Change>=2000mA (current value change greater than or equal to 2000mA). (2) "The time in cycles" indicates the cycle time, options: 1seconds (1 second) ..... 120minutes. (3) "Datapoint for current" indicates the unit of measurement for the current current current data, with the following options: Value in mA (DPT 7.012) (unit of milliampere (DPT 7.012)), Value in A (DPT 14.019) (unit of ampere (DPT 14.019)), Value in A (DPT 14.019) (unit of ampere (DPT 14.019)) and Value in A (unit of ampere (DPT 14.019)). 14.019)) 2, select "Internal current value" to enable the parameter configuration "Datapoint for current" represents the current current current data measurement unit, options: Value in A (DPT 7.012) (unit milliamps (DPT 7.012)), Value in A (DPT 14.019) (unit milliamps (DPT 14.019)). DPT 7.012) (unit milliamps (DPT 7.012)), Value in A (DPT 14.019) (unit milliamps (DPT 14.019))
Initial value(X0.01)(mA)	Initial value (X0.01) (mA), fillable: 0.....65535; (Note: not enabled when current value source is selected internally)

(2) The parameter "Enabled current threshold 1" indicates startup current threshold 1; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Evaluation of threshold1	Evaluation threshold, options: "always", "only with open contact", "only with closed contact", " only with closed contact" (current value evaluated with closed contact (i.e. relay open)).
Scaling current of threshold 1	Current threshold unit, optionally "10mA" (10 milliamps), "100mA" (100 milliamps)
Current threshold 1 (X scaling current)	Current threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Current tolerance of threshold 1	Current threshold error, options: "0mA", "5mA", "10mA" ..... "200mA"
Threshold 1 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

(3) The parameter "Enabled current threshold 2" indicates start-up current threshold 2; when "Enabled" is selected, the

following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Evaluation of threshold2	Evaluation threshold, options: "always", "only with open contact", "only with closed contact", " only with closed contact" (current value evaluated with closed contact (i.e. relay open)).
Scaling current of threshold 2	Current threshold unit, optionally "10mA" (10 milliamps), "100mA" (100 milliamps)
Current threshold 2 (X scaling current)	Current threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Triggerable condition, options: "lower than threshold value", "higher than threshold value"
Current tolerance of threshold 2	Current threshold error, options: "0mA", "5mA", "10mA" ..... "200mA"
Threshold 2 warning	Threshold alarms, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 2 warning" threshold warning value, optional: "send warning value "0" " (send warning value 0), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 2 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second" (1 second), "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

(4) The parameter "Enabled current threshold 3" indicates startup current threshold 3; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Evaluation of threshold3	Evaluation threshold, options: "always", "only with open contact", "only with closed contact", " only with closed contact".
Scaling current of threshold 3	Current threshold unit, optionally "10mA" (10 milliamps), "100mA" (100 milliamps)
Current threshold 3 (X scaling current)	Current threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Triggerable condition, options: "lower than threshold value", "higher than threshold value"
Current tolerance of threshold 3	Current threshold error, options: "0mA", "5mA", "10mA" ..... "200mA"
Threshold 3 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 3 warning" indicates the threshold warning value, with the following options: "send warning value "0"" (send warning value 0), "send warning value "1"" (send warning value 1); "the value of threshold 3 warning" indicates the threshold warning value. (send warning value "0"), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 3 warning" indicates the threshold warning value, with the following options: "send warning value "0"" (send warning value 0), "send warning value "1"" (send warning value 1); "the value of threshold 3 warning" indicates the threshold warning value. (send warning value "0"), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120

	minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

6.2.2 Voltage detection

(1) The parameter "voltage detection" means voltage detection, when you select "Enabled", the interface will appear as shown in Fig. 6.2.3, and the options in the red box will appear as shown in Fig. 6.2.3.

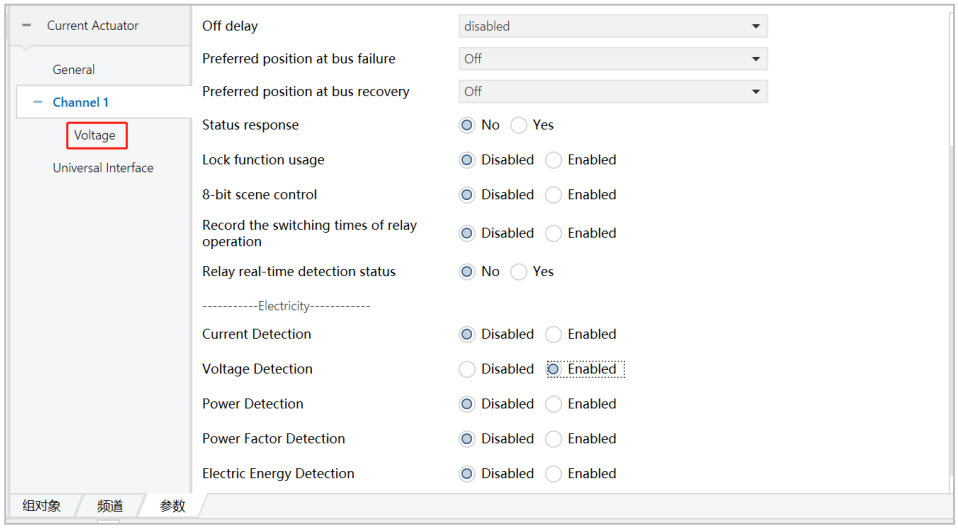


Figure 6.2.3

(2) Click the option in the red box above, set the parameters, the following Channel 1 as an example, as shown in Figure 6.2.4

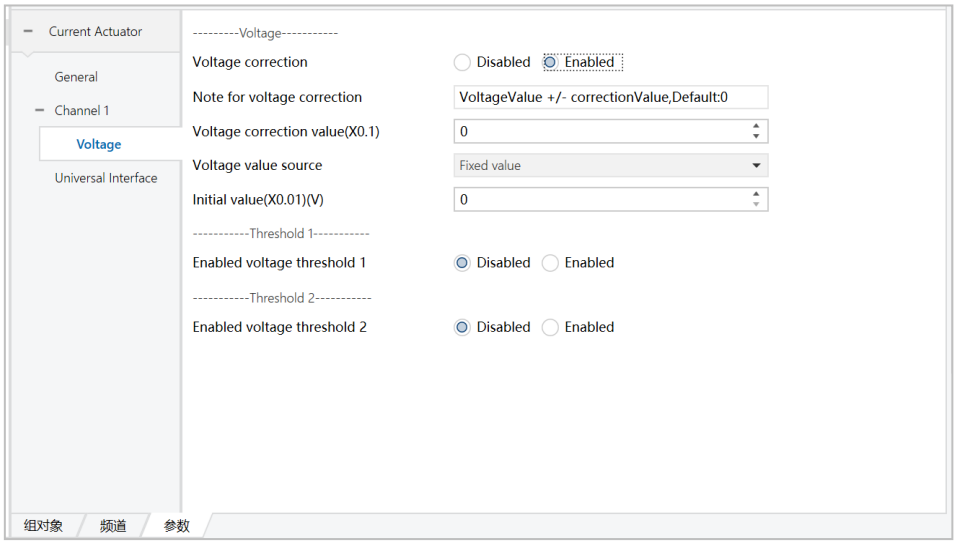


Figure 6.2.4

(1) "Voltage" voltage function configuration section

parameters	descriptive

Voltage correction	Voltage Correction, Options: Enabled, Disabled, When Enabled is selected, the following parameter configuration is enabled: 1、"Note for voltage correction" means current correction note, optional: "voltageValue/correctionValue, Default:0 "VoltageValue/correctionValue,Default:0" means voltage value/measurement value,Default:0 2、"Voltage correction value(x0.1)" indicates the voltage adjustment ratio (multiplied by 0.1), which can be filled in: -120.....120
Voltage value source	Voltage value source, options: Fixed value, Internal current value, External current value 1. When Internal voltage value is selected, the following parameter configuration is enabled: (1) "Send voltage value on change" indicates that the voltage value changes to a certain value when sending data, options: Disabled (deactivated), Change>=1V (voltage change is greater than or equal to 1 Volt) ... . Change>=100V (voltage change greater than or equal to 2000 mA). (2) "The time in cycles" indicates the value of the voltage sent in cycles, options: 1seconds (1 second) 120minutes
Initial value (X0.01)(V)	Indicates the initial value (X0.01)(V), can be filled in: 0.....65535; (Note: not enabled when the voltage value source is selected internally)

(2) The parameter "Enabled voltage threshold 1" indicates startup voltage threshold 1; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling voltage of threshold1	Voltage threshold unit, optional: "1V", "2V"
Voltage threshold 1 (X scaling voltage)	Voltage threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Trigger condition, optional: "lower than threshold value", "higher than threshold value"
Voltage tolerance of	Threshold error, optional: "0V", "1V", "2V" ..... "8V"

threshold 1	
Threshold 1 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

(3) The parameter "Enabled voltage threshold 2" indicates startup voltage threshold 2; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling voltage of threshold2	Voltage threshold unit, optional: "1V", "2V"
Voltage threshold 2 (X scaling voltage)	Voltage threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Trigger condition, optional: "lower than threshold value", "higher than threshold value"
Voltage tolerance of threshold 2	Voltage threshold error, options: "0V", "1V", "2V" ..... "8V"
Threshold 2 warning	Threshold alarms, options: no sending, one-time transmission, cyclic transmission

	1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

6.2.3 Effective power detection

(1) The parameter "Power Detection" indicates the effective power detection, when selecting "Enabled", the interface will appear as shown in Fig. 6.2.5, and the options in the red box will appear as shown in Fig. 6.2.5.

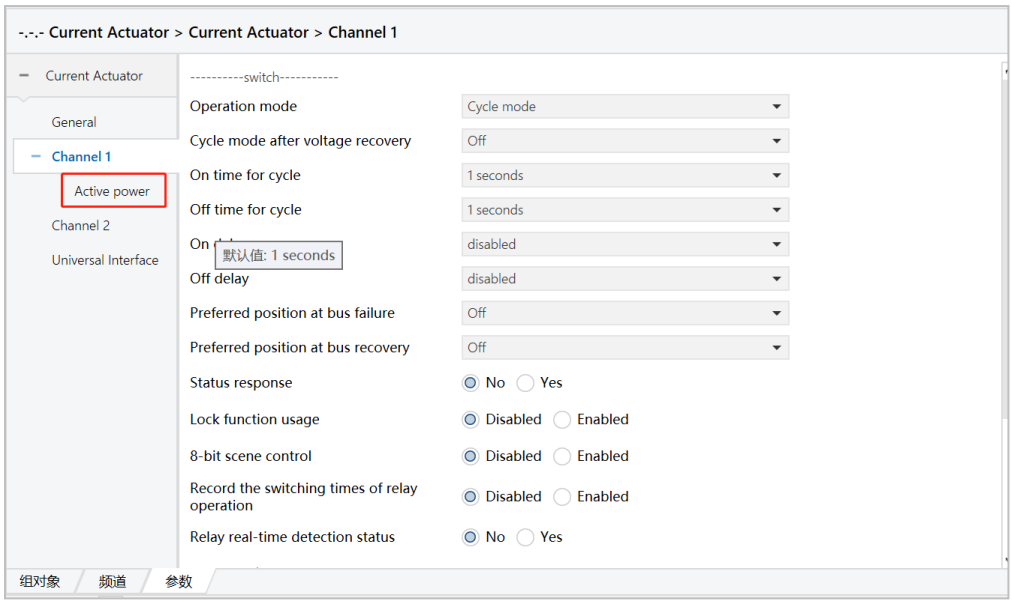


Figure 6.2.5

(2) Click the option in the red box above, set the parameters, the following Channel 1 as an example, as shown in

Figure 6.2.6

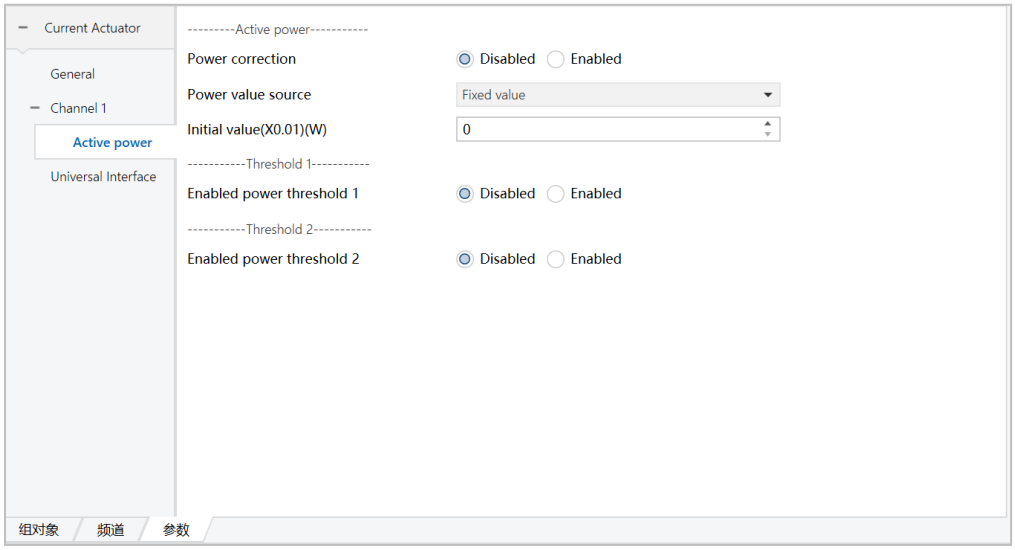


Figure 6.2.6

(1) "Active power" function configuration section

parameters	descriptive
Power correction	Power Correction, options: Disabled (enabled), Enabled (Disabledd), the following configuration is enabled when Enabled is selected: 1、"Note for power correction "Power Value/measured Value,Default:10000 /measured Value,Default:10000 2、"Power correction radio (X0.0001)" indicates the power adjustment ratio (multiplied by 0.0001), which can be filled in: 8000-12000.
Power value source	Indicates the power value source, options: Fixed value, Internal power value, External power value. 1. When Internal power value is selected, the following parameter configuration is enabled: (1) "Send power value on change" indicates that the power value changes to a certain value when sending data, options: Disabled (deactivated), Change>=1W (power value change is greater than or equal to 1 watt)... ..... Change>=200W (power value change greater than or equal to 200W). (2) "The time in cycles" indicates the power value sent in cycles, options: Disabled (Disabledd), 1seconds (1 second) ..... 120minutes.

Initial value(X0.01)(V)	Indicates the initial value (X0.01)(V), can be filled in: 0.....65535; (Note: not enabled when the power value source is selected internally)

(2) The parameter "Enabled power threshold 1" indicates the activation power threshold 1; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling power of threshold 1	Power threshold unit, optional: "10W", "20W"
Power threshold 1 (X scaling power)	Power threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Power tolerance of threshold 1	Power threshold error, options: "0W", "1W", "2W" ..... "100W"
Threshold 1 warning	Threshold alarms, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1) 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

(4) The parameter "Enabled power threshold 2" indicates the activation power threshold 2; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling power of threshold 2	Power threshold unit, optional: "10W", "20W"
Power threshold 2 (X scaling power)	Power threshold scaling (multiplier), fillable 1.....255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Power tolerance of threshold 2	Power threshold error, options: "1W", "2W", "3W" ..... "100W"
Threshold 2 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 2 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second" (1 second), "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

6.2.4 Power factor detection

(1) The parameter "Power Factor Detection" means power factor detection, when you select "Enabled", the interface will appear as shown in Fig. 6.2.7, and the options in the red box will appear as shown in Fig. 6.2.7.

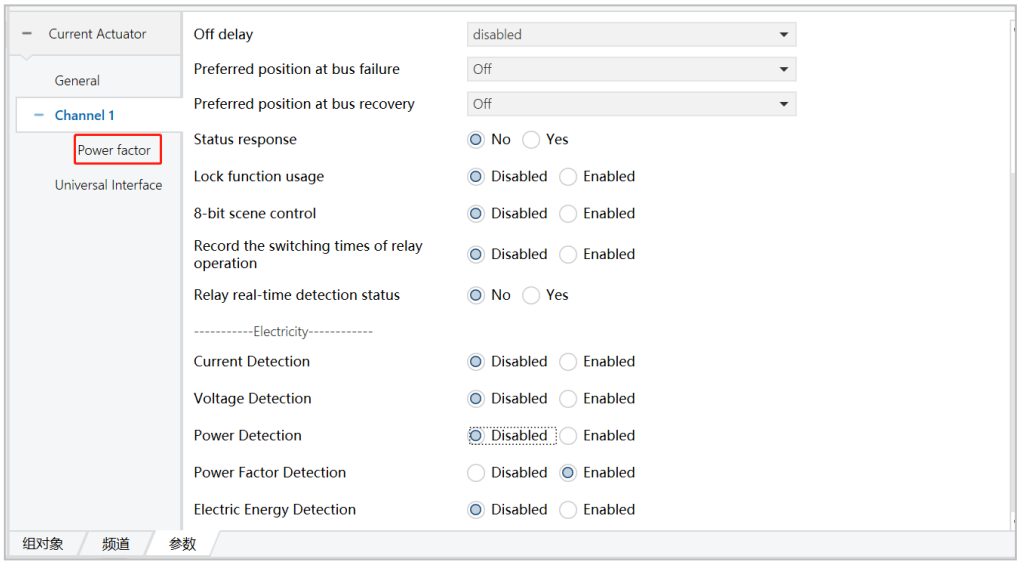


Figure 6.2.7

(2) Click the option in the red box above, set the parameters, the following Channel 1 as an example, as shown in Figure 6.2.8

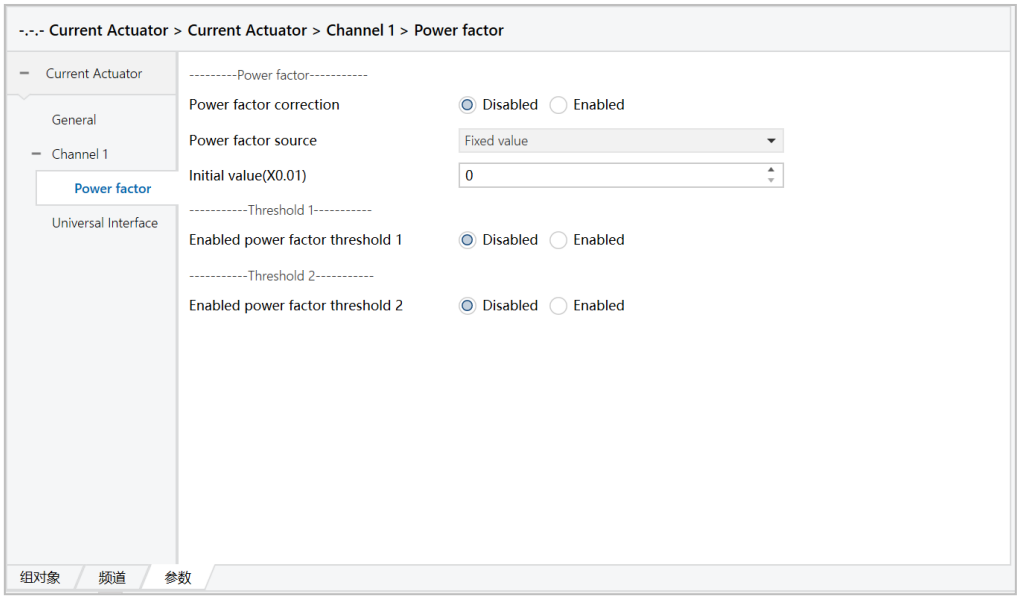


Figure 6.2.8

(1) "Power factor" function configuration section

parameters	descriptive

Power factor correction	Power Factor Correction, Optional: Indicates power correction, Optional: Disabled (enabled), Enabled (Disabledd), the following parameter configuration is enabled when Enabled is selected: 1、"Note for power factor correction " Oprion: "Powerfactor+/-correctionValue,Default:0 "Powerfactor+/-correctionValue,Default:0". 2、"Power factor correction value (X0. 01)" indicates the proportion of power factor adjustment (multiplied by 0. 01), which can be filled in: -30.....30
Power factor source	Indicates the power factor source, options: Fixed value, Internal Power factor, External Power factor. 1. When Internal power factor is selected, enable the following parameter configuration: (1) "Send Power factor on change" means to send data when the power factor value changes to a certain value, options: Disabled (deactivated), "change>=0.01" (power factor change greater than or equal to 0.01), "change>=0.02" (power factor change greater than or equal to 0.02) ". " (power factor change greater than or equal to 0.01), "change>=0.02" (power factor change greater than or equal to 0.02) ....." change>=0.50" (power factor change greater than or equal to 0.50) (2) "The time in cycles" indicates that the power factor change value is sent in cycles, with the following options: Disabled (deactivated), 1seconds (1 second) ..... 120minutes (120 minutes).
Initial value (x0.01)	Initial value (X0.01), fillable: 0.....65535; Note: not enabled when power factor value source is selected internally

(2) The parameter "Enabled power factor threshold 1" means that the power factor threshold 1 is activated; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Power factor threshold 1 (X 0.01)	Power factor threshold scaling (multiply by 0.01), fillable 1.....255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"

Power factor tolerance	Power factor threshold error, options: "0.00", "0.01", "0.02"... ... "0.30"
Threshold 1 warning	Threshold alarms, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1) 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

(4) The parameter "Enabled power factor threshold 2" means that the power factor threshold 2 is activated; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Power factor threshold 2 (X 0.01)	Power factor threshold scaling (multiply by 0.01), fillable 1.....255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Power factor tolerance	Power factor threshold error, options: "0.00", "0.01", "0.02"... ... "0.30"
Threshold 2 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the

	following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 2 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second" (1 second), "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

6.2.5 Electrical energy detection

(1) The parameter "Electric energy Detection" indicates the detection of electric energy. When "Enabled" is selected, the interface will appear as shown in Fig. 6.2.9, and the options in the red box will appear as shown in Fig. 6.2.9.

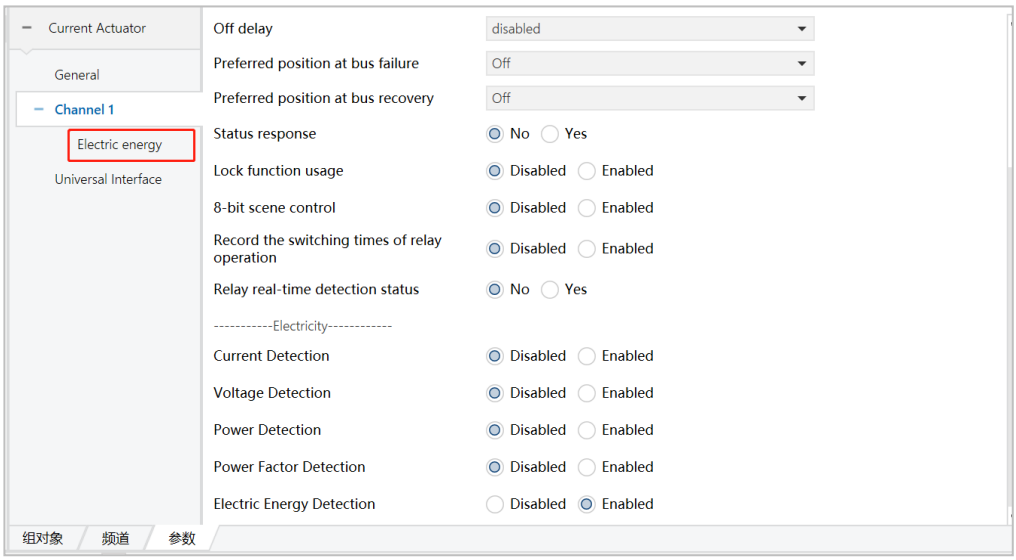
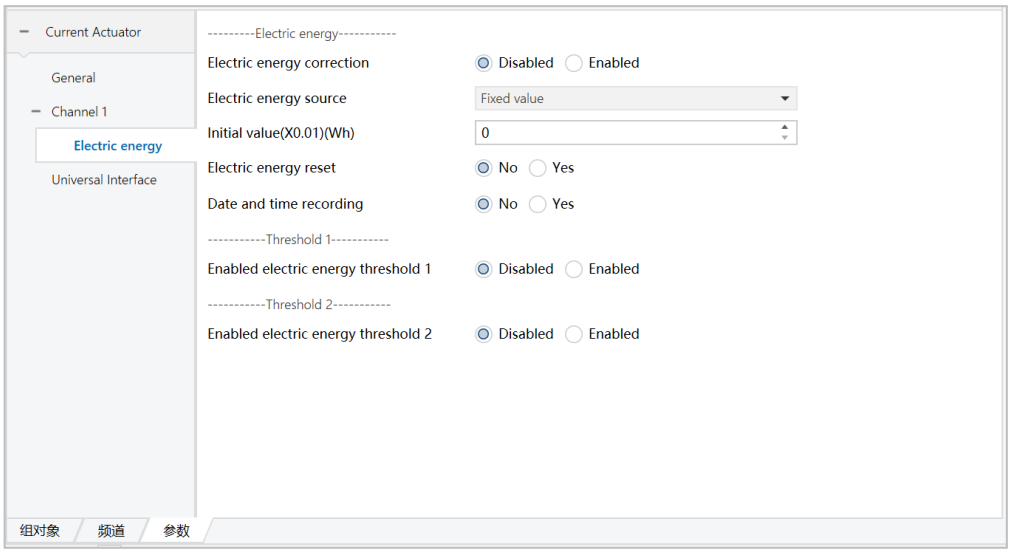


Figure 6.2.9

(2) Click the option in the red box above, set the parameters, the following Channel 1 as an example, as shown in Figure 6.2.10



6.2.10

(1) "Electric energy correction" indicates the electric energy function configuration section.

parameters	descriptive
electric energy correction	Power Correction, options: Disabled (enabled), Enabled (Disabled), the following configuration is enabled when Enabled is selected: 1、"Note for electric energy correction："Electric Energy/measured Value,Default:10000 "Electric Energy/measured Value,Default:10000 2、"Electric energy correction ratio (X0.0001)" indicates the ratio of electric energy correction (multiplied by 0.0001), which can be filled in: 8000.....12000
electric energy source	Source of electric energy, options: Fixed value, Internal electric energy, External electric energy. 1. When Internal electric energy is selected, the following parameter configuration is enabled: (1) "send electric energy on change" means to send data when the value of electric energy changes to a certain value, options: "change>=1Wh" (when the value of electric energy changes more than or equal to 1W), "change>=2Wh" (when the value of electric energy changes more than or equal to 2W) "change>=2000Wh" (when the value of electric energy changes more than or equal to 2W)), "change>=2Wh" (when the value of electric energy changes more than or equal to 2W) ..... "change>=2000Wh" (when the value of electric energy changes more than or equal to 2000W). change>=2000Wh" (power value change greater than or equal to 2000Wh);

	(2) "The time in cycles" indicates the value of cyclic transmission of electrical energy, options: Disabled (deactivated), 1seconds (1 second)..... 120minutes. (3) "Datapoint for electric energy" indicates the unit of measurement for the current electric energy datapoint, with the following options: Value in Wh (DPT 13.010) (unit watt-hour (DPT 13.010)), Value in kWh (DPT 13.013) (in kWh (DPT 13.013)). 2. Enable the following parameter configuration when selecting External electric energy: (1) "Datapoint for electric energy" indicates the unit of measure for the current electric energy datapoint, with the following options: Value in Wh (DPT 13.010) (unit watt-hour (DPT 13.010)), Value in kWh (DPT 13.013) (in kWh (DPT 13.013));
Initial value(x0.01)(Wh)	Initial value (X0.01) (watt-hours), fillable: 0.....65535 Note: Not enabled when internal is selected for the electrical energy value source
Electric energy reset	Power reset, options: No (yes), Yes (yes)
Data and time recording	Indicates the logging data and time, options: No (Yes), Yes (Yes), the following parameter configuration is enabled when Yes is selected: 1、"Cycle time for reminding to record date and time " option "1seconds"(1seconds), "2seconds" (2 seconds) .....120minutes (120 minutes)

(5) The parameter "Enabled electric energy threshold 1" indicates the start-up electric energy threshold 1; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling electric energy of threshold 1	Adjustment of the electrical energy threshold, options: "1000Wh" (1000 watt-hours), "10000Wh" (10000 watt-hours)
Electric energy threshold 1 (X scaling energy)	Electrical energy threshold scaling (multiplied by the electrical energy adjustment value), fillable 1 255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Threshold 1 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission:

	(1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission: (1) "the value of threshold 1 warning" indicates the threshold warning value, with the following options: "send warning value "0" "(send warning value 0), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 1 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second", "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction" (no action)

(6) The parameter "electric energy threshold 2" indicates the startup electric energy threshold 2; when "Enabled" is selected, the following parameter appears:

parameters	descriptive
Evaluation delay (0--255s)	Evaluation delay, can be filled in 0--255s
Scaling electric energy of threshold 2	Adjustment of the electrical energy threshold, options: "1000Wh" (1000 watt-hours), "10000Wh" (10000 watt-hours)
Electric energy threshold 2 (X scaling energy)	Electrical energy threshold scaling (multiplied by the electrical energy adjustment value), fillable 1 ..... .255
Triggering condtion	Trigger condition, options: "lower than threshold value", "higher than threshold value"
Threshold 2 warning	Threshold alarm, options: no sending, one-time transmission, cyclic transmission 1. Enable the following parameter configuration when you select one-time transmission: (1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); 2. Enable the following parameter configuration when you select cyclic transmission:

	(1) "the value of threshold 2 warning" indicates the threshold warning value, with the following options: "send warning value "0" (send warning value "0"), "send warning value "1"" (send warning value 1); (2) "the time in cycles of threshold 2 warning" indicates the time in cycles of threshold warning intervals, optionally: "1second" (1 second), "2second" (2 seconds) ..... "120 minutes" (120 minutes)
Contact position when matching condition	The position of the contacts when the conditions match. Options: "switch OFF until next switch operation", "switch ON until next switch operation " (relay ON until next switch operation), "no reaction"

7 Description of communication recipients

The communication object is the medium through which the device communicates with other devices on the bus, i.e. only the communication object can carry out bus communication. The following is a detailed description of the role of the communication object for each function module. There are a total of 402 objects for this switching actuator module with current detection, (take the first channel of each function module as an example).

Note: In the table properties column below, "C" means that the communication function of the communication object is enabled, "W" means that the value of the communication object can be rewritten via the bus, "R" means that the value of the communication object can be read via the bus, "T" means that the value of the communication object has the transmission function, and "U" means that the value of the communication object can be updated as shown in Figure 7.1.1. W" means that the value of the communication object can be rewritten via the bus, "R" means that the value of the communication object can be read via the bus, "T" means that the communication object has the function of transmission, and "U" means that the value of the communication object can be updated, as shown in Figure 7.1.1.

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T
0	Switch, Channel A	On / Off			1 bit	C	R	W	T
2	Cycle mode, Channel A	On / Off			1 bit	C	R	W	T
3	Scene, Channel A	Recall / Program			1 byte	C	R	W	T
4	Status, Channel A	On / Off			1 bit	C	R	-	T
5	A:Current	Current value(mA)			2 bytes	C	R	-	T
6	A:Current	Threshold 1 warning			1 bit	C	R	-	T
7	A:Current	Threshold 2 warning			1 bit	C	R	-	T
8	A:Current	Threshold 3 warning			1 bit	C	R	-	T
9	A:Voltage	Voltage value(V)			4 bytes	C	R	-	T
10	A:Voltage	Threshold 1 warning			1 bit	C	R	-	T
11	A:Voltage	Threshold 2 warning			1 bit	C	R	-	T
12	A:Active power	Active power(W)			4 bytes	C	R	-	T
13	A:Active power	Threshold 1 warning			1 bit	C	R	-	T
14	A:Active power	Threshold 2 warning			1 bit	C	R	-	T
15	A:Power factor	Power factor			4 bytes	C	R	-	T
16	A:Power factor	Threshold 1 warning			1 bit	C	R	-	T
17	A:Power factor	Threshold 2 warning			1 bit	C	R	-	T
18	A:Electric energy	Meter total(Wh)			4 bytes	C	R	-	T
19	A:Electric energy	Threshold 1 warning			1 bit	C	R	-	T
20	A:Electric energy	Threshold 2 warning			1 bit	C	R	-	T
21	A:Electric energy	Reset meters			1 bit	C	R	W	T
22	A:Electric energy	Recording date			3 bytes	C	R	W	T

组对象 Channels 参数

Figure 7.1.1

7.1 Description of switching function objects

serial number	name (of a thing)	Communication Object Functions	data type	causality
1	Manual status	On/Off	1bit	C,R,W,T
This communication object is enabled when "Enabled" is selected in the "Manual status" parameter configuration and is used to read the manual status of the switch.				
2	Device status	On/Off	1bit	C,R,T
The communication object is enabled when "Enabled" is selected in the "Manual status" parameter configuration. This object is used to read the switching status of the device. When the communication object receives a message with the value "01", the device is in the state of "on" and the device is normal; when the communication object sends a message with the value "00", the device is in the state of "off" and the device is abnormal. When the communication object sends a message with the value "00", the device is in the "off" state and the device is abnormal.				
3	Switch, Channel X	On/Off	1 bit	C,R,W,T
The communication object is enabled when "Enabled" is selected for "Channel X". When the communication object receives the value "1", the channel operates "On" according to the set mode. When the value "1" is received				

from the communication object, the channel operates in the set mode as "On"; when the value "0" is received from the communication object, the channel operates in the set mode as "Off".				
4	Logic operation 1, Channel X	On/Off	1 bit	C,R,W
This communication object is activated when "AND function" or "OR function" is selected for the parameter "Logic operation 1" in "Channel X". This communication object is enabled when "OR function" is selected in the "Logic operation 1" parameter configuration in "Channel X" and is used to determine the switching logic to be sent to the bus.				
5	Logic operation 2, Channel X	On/Off	1 bit	C,R,W
This communication object is activated when "AND function" or "OR function" is selected for the parameter "Logic operation 2" in "Channel X". This communication object is enabled when "OR function" is selected in the "Logic operation 2" parameter configuration in "Channel X" and is used to determine the switching logic to be sent to the bus.				
6	Time mode, Channel X	On/Off	1 bit	C,R,W,T
The communication object is activated when "Time mode" is selected for "Operating mode" in the "Switch" parameter configuration in "Channel X". The communication object is enabled when "Time mode" is selected in the parameter configuration of "Switch" in "Channel X". When the communication object receives the value "1", the timing mode is turned on, and the channel relay will be turned off automatically at the set time after it is turned on; when the communication object receives the value "0", the timing mode is turned off. When the communication object receives the value "1", the time mode is turned on and the channel relay is turned on and automatically turned off at the set time.				
7	Cycle mode, Channel X	On/Off	1 bit	C,R,W,T
The communication object is enabled when "Cycle mode" is selected for the "Operating mode" parameter in "Channel X". When the communication object receives the value "1", then control 1, the channel relay carries out the operation of cyclic opening and closing according to the set opening and closing time; when the communication object receives the value "0", the cyclic mode is closed.				
8	Lock, Channel X	Lock/Unlock	1 bit	C,R,W
The communication object is enabled when "Enabled" is selected for the parameter "Lock function usage" in "Channel X". When the communication object receives a message with the value "1", the channel operates in the set mode "On"; when the communication object receives a message with the value "0", the channel operates in the set				

mode "Off". When the communication object receives a message value of "0", the channel operates "off" according to the corresponding mode set.				
9	Scene, Channel X	Recall/program	1 Byte	C,R,W,T
This communication object is enabled when "Enabled" is selected for the parameter "8-bit scene control" in "Channel X". If you send a 1byte command via this communication object, you can call the operation set for the corresponding scene number. The parameter setting option is 1~64, in fact, the scene message received by communication object Scene,Channel X corresponds to 0~63. For example, if the parameter setting is Scene 1, the communication object Scene,Channel X receives scene 0.				
10	Status, Channel X	On/Off	1 bit	C,R,T
This communication object is enabled when "Yes" is selected for the parameter "Status respone" in "Channel X". The value of this communication object directly indicates the switching status of the channel X relay.				
11	Reset the switching times,Channel X	Reset	1bit	C,R,W,T
The communication object is enabled when "Enabled" is selected for the parameter "Reset the switching times of relay operation" in "Channel X". This communication object is enabled when the parameter "Record the switching times of relay operation" in "Channel X" selects "Enabled" and the parameter "Reset the switching times of relay operation" selects "Yes". This object is used to reset the switching times of relay operation. If the communication object receives a message with the value "00", no action is taken, and if it receives a message with the value "01", the number of times the relay has been reset to zero.				
12	Record the switching times,Channel X	Statistics	4byte	C,R,T
This communication object is enabled when the parameter "Record the switching times of relay operation" is selected in "Channel X". This communication object is enabled in the parameter configuration "Record the switching times of relay operation" in "Channel X" when "Enabled" is selected.				

7.2 Description of current detection function objects

serial number	name (of a thing)	Communication Object Functions	data type	causality
13	X:Current	Current value (mA)	2 bytes	c,r ,t,/c,r,w,t
The communication object is enabled when "Internal current value" or "External current value" is selected in the "Current" parameter configuration of "Current" in "Channel X". The "Datapoint for current" parameter is enabled				

when "Internal current value" or "External current value" is selected in the "Current" parameter configuration of "Channel X". The "Datapoint for current" parameter is enabled when the "Value in mA (DPT 7.012)" parameter is selected in the "Current value source" parameter configuration. This communication object is used to send the unit of measurement selected for the current value, and the current value detected is sent to the bus via this communication object. "This communication object is used to send the unit of measurement selected for the current value.				
14	X:Current	Current value (A)	4 bytes	c,r ,t,/c,r,w,t
The communication object is enabled when "Internal current value" or "External current value" is selected in the "Current" parameter configuration of "Current" in "Channel X". The "Datapoint for current" parameter configuration is enabled when "Internal current value" or "External current value" is selected in the "Current" parameter configuration of "Channel X". The "Datapoint for current" parameter configuration is enabled when the "Value in A (DPT 14.019)" parameter is selected. This communication object is used to send the unit of measurement selected for the current value, and the detected current value is sent to the bus via this communication object. "This communication object is used to send the unit of measurement selected for the current value.				
15	X: Current	Threshold 1 warning	1bit	C,R,T.
The communication object enables the "Threshold 1 warning" parameter when "Enabled" is selected for the "Current" parameter "Enabled current threshold 1" in "Channel X". This communication object is enabled when "Enabled" is selected for the "Current" parameter configuration "Enabled current threshold 1" in "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for the parameter configuration "Enabled current threshold 1" in "Current" in "Channel X". The "Threshold 1 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected. If the current value is higher or lower than the set value, an alarm is sent to the bus via this communication object.				
16	X: Current	Threshold 2 warning	1bit	C,R,T.
The communication object enables the "Threshold 2 warning" parameter when "Enabled" is selected for the "Current" parameter "Enabled current threshold 2" in "Channel X". This communication object is enabled when "Enabled" is selected for the "Current" parameter configuration "Enabled current threshold 2" in "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for the parameter configuration "Enabled current threshold 2" in "Channel X". The "Threshold 2 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected. If the current value is higher or lower than the set value, an alarm is sent				

to the bus via this communication object.				
17	X: Current	Threshold 3 warning	1bit	C,R,T.
The communication object enables the "Threshold 3 warning" parameter when "Enabled" is selected for the "Current" parameter "Enabled current threshold 3" in "Channel X". This communication object is enabled when "Enabled" is selected for the "Current" parameter configuration "Enabled current threshold 3" in "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for the parameter configuration "Enabled current threshold 3" in "Channel X". The "Threshold 3 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected. If the current value is higher or lower than the set value, an alarm is sent to the bus via this communication object.				

7.3 Description of the voltage detection function object

serial number	name (of a thing)	Communication Object Functions	data type	causality
18	X: Voltage	Voltage value (V)	4bytes	c,r ,t,/c,r,w,t
This communication object is enabled when the "Internal Voltage value" or "External Voltage value" parameter is selected in the "Voltage" parameter configuration of "Channel X". This communication object is enabled when the "Internal Voltage value" or "External Voltage value" parameter is selected in the "Voltage" parameter configuration of "Channel X" and is used to send voltage values. This communication object is used to send voltage values, and the detected voltage values are sent to the bus via this communication object with a writable attribute when "EXternal voltage value" is selected.				
19	X: Voltage	Threshold 1 warning	1bit	C,R,T.
This communication object enables "Threshold 1 warning" when "Enabled" is selected for "Enabled voltage threshold 1" in the "Voltage" parameter configuration of "Channel X". This communication object is enabled when "Enabled voltage threshold 1" is selected for "Enabled" in the "Voltage" parameter configuration of "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for the parameter configuration of "One-time transmission" or "Cyclic transmission". The "Threshold 1 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected. If the voltage value is greater or less than the set value, an alarm is sent to the bus via this communication object.				
20	X: Voltage	Threshold 2 warning	1bit	C,R,T.

The communication object enables the "Threshold 2 warning" parameter when "Enabled" is selected for the "Voltage" parameter "Enabled voltage threshold 2" in "Channel X". This communication object is enabled when "Enabled" is selected for "Enabled voltage threshold 2" in the "Voltage" parameter configuration of "Channel X", and when "One-time transmission" or "Cyclic transmission" is selected for this configuration. The "Threshold 2 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected. If the voltage value is greater or less than the set value, an alarm is sent to the bus via this communication object.

7.4 Power detection function object description

serial number	name (of a thing)	Communication Object Functions	data type	causality
21	X: Active power	Active power (W)	4bytes	c,r ,t,/c,r,w,t
This communication object is activated when the "Internal power value" or "External power value" parameter is selected in the "Power value source" parameter of the "Active power" parameter configuration in "Channel X". This communication object is enabled when the "Internal power value" or "External power value" parameter is selected in the "Power value source" parameter configuration of "Active power" in "Channel X". This communication object is used to send the effective power value, and the detected effective power value is sent to the bus via this communication object with the writable attribute when the "External power value" parameter is selected.				
22	X: Active power	Threshold 1 warning	1bit	C,R,T
The communication object enables the "Threshold 1 warning" parameter when "Enabled" is selected in the "Enabled power threshold 1" parameter configuration for "Active power" in "Channel X". This communication object is enabled when "Enabled" is selected for the parameter "Threshold 1 warning" in the parameter configuration "Active power" in "Channel X" and "One-time transmission" or "Cyclic transmission" is selected for the parameter configuration "Threshold 1 warning". The "Threshold 1 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected, and this communication object is used to send warnings about the effective power threshold. This communication object sends an alarm to the bus when the power is higher or lower than the set value.				
23	X: Active power	Threshold 2 warning	1bit	C,R,T
The communication object enables the "Threshold 2 warning" parameter when "Enabled" is selected in the "Enabled power threshold 2" parameter configuration for "Active power" in "Channel X". This communication object				

is enabled when "Enabled" is selected for the parameter "Threshold 2 warning" in the "Active power" configuration of "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for this configuration. The "Threshold 2 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected, and this communication object is used to send warnings about the effective power threshold. If the power is higher or lower than the set value, an alarm is sent to the bus via this communication object.

7.5 Power factor detection function object description

serial number	name (of a thing)	Communication Object Functions	data type	causality
24	X: Power factor	Power factor	4bytes	c,r ,t,/c,r,w,t
This communication object is activated when the "Internal power factor" or "External power factor" parameter is selected in the "Power factor source" parameter configuration for "Power factor" in "Channel X". This communication object is enabled when the "Internal power factor" or "External power factor" parameter is selected in the "Power factor source" parameter configuration in "Channel X" and is used to send valid power factor values to the bus. This communication object is used to send valid power factor values and the detected valid power factor values are sent to the bus via this communication object with the writable attribute when the "External power factor" parameter is selected.				
25	X: Power factor	Threshold 1 warning	1bit	C,R,T.
The communication object enables the "Threshold 1 warning" parameter when "Enabled power factor threshold 1" is selected for the "Power factor" parameter in "Channel X". This communication object is enabled when "Enabled" is selected for the parameter "Threshold 1 warning" in the "Power factor" configuration of "Channel X", and "One-time transmission" or "Cyclic transmission" is selected for this configuration. The "Threshold 1 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected, and this communication object is used to send power factor threshold warnings. This communication object sends an alarm to the bus when the power factor value is higher or lower than the set value.				
26	X: Power factor	Threshold 2 warning	1bit	C,R,T,U
The communication object enables the "Threshold 2 warning" parameter when "Enabled" is selected for the "Power factor" parameter "Enabled power factor threshold 2" in "Channel X". This communication object is enabled when "Enabled" is selected for the parameter "Threshold 2 warning" in the "Power factor" configuration of "Channel				

X", and "One-time transmission" or "Cyclic transmission" is selected for this configuration. The "Threshold 2 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected, and this communication object is used to send power factor threshold warnings. This communication object sends an alarm to the bus when the power factor value is higher or lower than the set value.

7.6 Explanation of electrical energy detection function objects

serial number	name (of a thing)	Communication Object Functions	data type	causality
27	X: Electric energy	Meter total (Wh)	4bytes	c,r ,t,/c,r,w,t
The communication object is enabled when the "Electric energy source" parameter is selected in the "Electric energy" parameter configuration of "Channel X". The communication object is enabled if the "Internal electric energy" or "External electric energy" parameter is selected in the "Electric energy" parameter configuration of "Channel X". In the parameter configuration "Datapoint for electric energy", which is enabled when "Value in Wh (DPT 13.010)" is selected, this communication object is used to send the selected unit of measurement for the value of the electric energy. This communication object is used to send the unit of measurement selected for the value of the electrical energy, and the detected value of the electrical energy is sent to the bus via this communication object. This communication object is enabled for sending the unit of measurement selected for the electric energy value and sends the detected electric energy value to the bus via this communication object.				
28	X: Electric energy	Meter total (kWh)	4bytes	c,r ,t,/c,r,w,t
The communication object is enabled when the "Electric energy source" parameter is selected in the "Electric energy" parameter configuration of "Channel X". The communication object is enabled if the "Internal electric energy" or "External electric energy" parameter is selected in the "Electric energy" parameter configuration of "Channel X". The "Datapoint for electric energy" parameter configuration is enabled when the "Value in Wh (DPT 13.013)" parameter is selected in the "Electric energy source" parameter configuration, this communication object is used to send the selected unit of measurement for the value of the electric energy. This communication object is used to send the unit of measurement selected for the value of the electrical energy, and the detected value of the electrical energy is sent to the bus via this communication object. This communication object is enabled for sending the unit of measurement selected for the electric energy value and sends the detected electric energy value to the bus via this communication object.				

29	X: Electric energy	Threshold 1 warning	1bit	C,R,T
The communication object enables the "Threshold 1 warning" parameter by selecting "Enabled" in the "Enabled electric energy threshold 1" parameter configuration for "Electric energy" in "Channel X". 1" in "Channel X", the parameter "Threshold 1 warning" is enabled by selecting "Enabled" for the "Electric energy" parameter configuration, which selects "One-time transmission" or "Cyclic transmission". The "Threshold 1 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected, and this communication object is used to send threshold warnings. This communication object sends an alarm to the bus when the energy value is higher or lower than the set value.				
30	X: Electric energy	Threshold 2 warning	1bit	C,R,T
The communication object enables the "Threshold 2 warning" parameter in the "Enabled electric energy threshold 2" parameter configuration for "Electric energy" in "Channel X". This communication object is enabled when "Enabled" is selected for the parameter "Threshold 2 warning" in the "Electric energy" parameter configuration of "Channel X", which selects "One-time transmission" or "Cyclic transmission". The "Threshold 2 warning" parameter is enabled when the "One-time transmission" or "Cyclic transmission" parameter is selected and this communication object is used for sending threshold warnings. This communication object sends an alarm to the bus when the energy value is higher or lower than the set value.				
31	X: Electric energy	Reset meters	1bit	C,R,W,T
This communication object is enabled when "Yes" is selected in the "Electric energy reset" parameter configuration for "Electric energy" in "Channel X". This communication object is enabled when "Yes" is selected for the parameter "Electric energy reset" in "Channel X".				
32	X: Electric energy	Recording date	3byte	C,R,W,T
This communication object is enabled when "Yes" is selected for the "Date and time recording" parameter of "Electric energy" in "Channel X". This communication object is enabled when "Yes" is selected in the "Date and time recording" parameter configuration of "Electric energy" in "Channel X".				
33	X: Electric energy	Recording time	3byte	C,R,W,T
This communication object is enabled when "Yes" is selected for "Date and time recording" in the parameter "Electric energy" in "Channel X". This communication object is enabled when "Yes" is selected for "Date and time recording" in the "Electric energy" parameter configuration in "Channel X".				

8 Safe use and maintenance

(1) Read all instructions in detail before use.

(2) A well-ventilated environment should be established.

(3) In the process of use, pay attention to moisture-proof, shock-proof and dust-proof.

(4) Strictly prohibit rain, contact with other liquids or corrosive gases.

(5) If damp or attacked by liquid, it should be dried promptly.

(6) When the machine malfunctions, please contact the professional maintenance personnel or our company.

9 Contact

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