User Manual

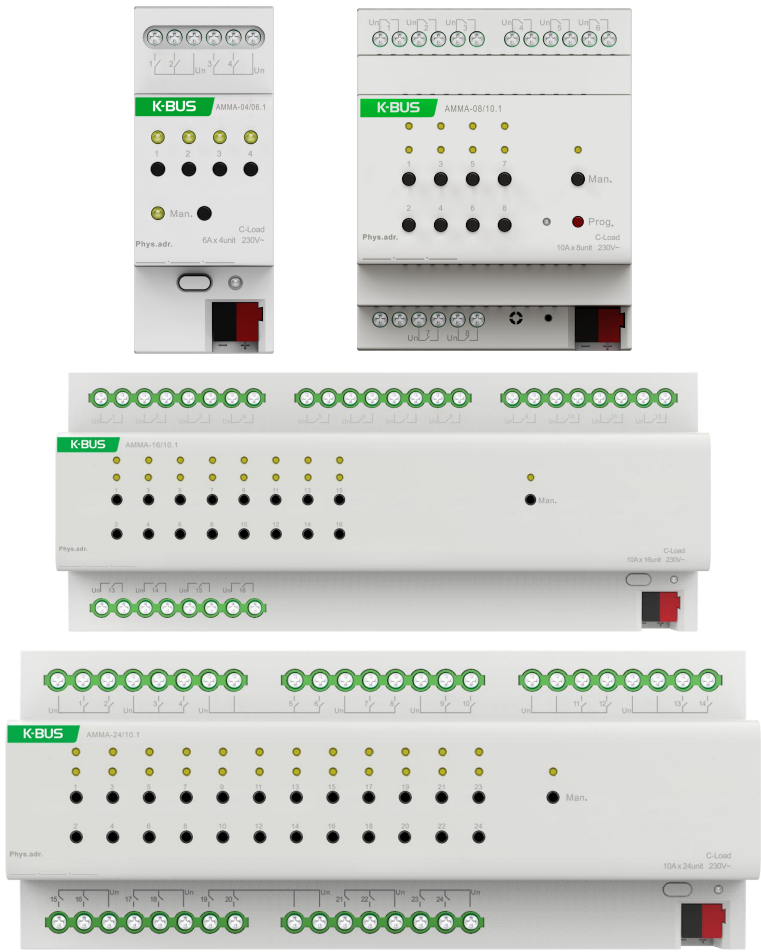
K-BUS® Multifunction Actuator, 4/8/16/24-Fold_V1.1

AMMA-04/06.1

AMMA-08/10.1

AMMA-16/10.1

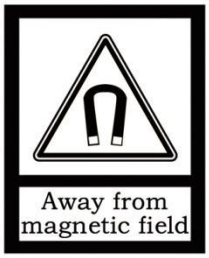
AMMA-24/10.1



KNX/EIB Home and Building Control System

Attentions

1. **Please keep devices away from strong magnetic field, high temperature, wet environment;**



2. **Do not fall the device to the ground or make them get hard impact;**

3. **Do not use wet cloth or volatile reagent to wipe the device;**

4. **Do not disassemble the devices.**

Contents

Chapter 1 General

The Multifunction Actuator is a multi-output module, integrating multiple output functions, including switch output, curtain DC/AC output, fan output and valve output. You can configure the functions of the module according to your requirement, such as a part of the output for controlling the switch, a part of the output for controlling the curtain, and a part of the output for controlling the fan.

With 4, 8, 16 and 24 outputs for selection, the output of different output channels is different. For details, please refer to the technical chapter. One relay in the device represents one output, and some functions may require multiple outputs. For example, one curtain AC output needs to occupy two relay outputs, one relay is used to control Positive rotation, and one is used to control reverse rotation, and the common switch The output needs to occupy one relay output. Therefore, in the engineering application process, the product is selected according to actual needs. And with manual operation buttons on the top of the product, it is more convenient to cope with engineering debugging.

The multi-function actuator is a modular mounting device. For easy installation in the distribution box, it can be mounted on a 35 mm D-rail according to EN 60 715. The device is screwed to the electrical connection and the bus connection is directly connected via EIB. Terminal connections, system power supply does not require an additional supply voltage other than the bus.

This manual provides detailed technical information about the Multifunction Actuator for users as well as assembly and programming details, and explains how to use the Switch Blind actuator by the application examples.

The function of the Multifunction Actuator is summarized as follows:

——**Switch output,** which can connect some electrical loads, such as lighting, sockets. There are 24 outputs, one output occupies one relay control, and each output has electronic switch control.

The module offers the following functions:

- **Switch**
- **Time function: on/off delay**
- **Time function: flashing switch, for lamps of aging test**
- **Time function: staircase lighting, for switch on the staircase lighting and after the duration time the lighting can be turned off automatically. It is better if the function is used together with motion detector.**
- **Provide 8 scenes, recall and storing via a 1byte object**

- **Logic operation: AND, OR, XOR, GATE function, up to three logic inputs**
- **Status response, for know the current output state in the visualization**
- **Forced operation, two data types: 1bit/2bit, for force action on or off, with the highest priority**
- **Set the relay contact position after bus voltage recovery**
- **Set the relay contact position after bus voltage failure**
- **Manual switch outputs**

——**Shutter AC/DC output**, which can connect with motor blinds, awnings, roller blinds, vertical blind, etc. There are 12 outputs with 230V AC 370W (4/8-Fold) or 1000W(16/24-Fold) motor or dry contact controlling motor or 6-channel DC control mode (DC motor control type). The output contacts for the directions UP and DOWN. The pause on change in direction can be set via the parameters. The curtains AC and DC are wired differently. The curtain AC occupies two relays per channel, and the curtain DC occupies four relays per channel. For the specific wiring method, please refer to the connection diagram in the third chapter, but their functions are similar.

The specific functions are summarized as follows:

- **Movement UP/DOWN**
- **Stop/Louvre adjustment**
- **Move to position 0……100%**
- **Adjustment Louvre to position 0……100%(only "Venetian Blind" working mode)**
- **Set 8 scenes, store or recall via a 1byte object**
- **Automatic sun protection**
- **Safety function**
- **Status response, query and reply the current shutter/blind position and operation mode to the bus, thereby indicating the status in the visualization device**
- **Two working mode:Venetian Blind and Shutter**

——**Fan Drive Control,** can be connected to a single-phase fan, supports up to 3 levels of wind speed adjustment, the output contacts are the same as the switch output.

The function is summarized as follows:

- **Support the fan with 1-2-3 level fan speed**
- **The fan has two operating modes: step switch and steering switch**
- **Forced operation: The wind speed is only allowed within the allowed wind speed range, with the highest priority**
- **Automatic operation: Automatically run the wind speed according to the control value. The control value is obtained by the sensing device on the bus, and the minimum running time of the wind speed can be set.**
- **Normal operation: manually control the operation of the fan, such as through the operation panel, etc.**
- **Fan with multi-level wind speed can set start-up characteristics**
- **Single-level wind speed fan can set on/off delay or minimum running time**
- **Status feedback, such as automatic operation status, fan switching status, wind speed, etc.**
- **Operational control of bus power-up or power-down behavior**

——**Valve control**, can be used to connect 2 control or 4 control coil system, refrigeration valve and heating valve respectively use separate relay output, there are three types of control: continuous (3 point, open and close), PWM switch (continuous, PWM) and 2-point switch type (2 state-ON/OFF).

The continuous type controls the opening of the valve according to the control value of the valve. It can completely open or close the valve, and can also stop the valve in an intermediate position. This type of control is suitable for driving three-wire valves.

The PWM switch type can only make the valve fully open or completely closed. The valve is cyclically operated according to the control value (1byte) and PWM cycle. The valve switch is divided into normally open or normally closed. This control type is suitable for driving two-wire system. Valve.

The 2-point switch type is similar to the PWM switch type, and can only be fully opened or completely closed. The difference is that it is directly turned on or off according to the control value

(1 bit) on the bus. It is usually suitable for the case where the switch valve is controlled according to the temperature difference. And suitable for driving two-wire valves.

The function is summarized as follows:

- **Supports three valve control types**
- **Monitor the control values on the bus to send fault status**
- **Valve characteristic curve correction (only for continuous valves)**
- **Automatic valve adjustment (for continuous valves only)**
- **Prohibit/enable heating or refrigerating valves**
- **Valve position status feedback or query**
- **Manual or automatic cleaning of the valve, sending the cleaning status**

Programmers are able to use the Engineering Tool Software ETS (ETS4 version or above) with a .knxprod file to allocate the physical address and set the parameters.

To make sure that all the programmable functions are used correctly, you must check the connection of the loads before use and note technical characteristic of loading equipment, particularly shutter driver, they refer more technical characteristics, some characteristics are inherent, if not properly set them, it is likely to cause the load device damage or not operating correctly.

Chapter 2 Technical Data

Power Supply	Bus Voltage	21~30V DC, via KNX bus
	Bus Current consumption	<12mA
	Bus charging current	<20mA
	Bus power consumption	<360mW
Connection	EIB/KNX	Via bus connection terminals，Ø 0.8 mm
	Outputs	Screw terminals
		Wire Range0.2-2.5mm^2, Torque 0.4N-m (4/8-Fold)
		Wire Range0.2-4mm^2, Torque 0.8N-m (16/24-Fold)
Operation/ Display	Programming button/ Red LED	For assignment of the physical address
	Green LED flashing	The application layer works normally
	Manual operation button	Switch output
	Output LED	Indicating output status
	Manual / auto button	Switch manual/automatic mode
	Manual / automatic LED	Indicates manual/auto mode status
Protection	IP 20, EN 60 529	
Temperature range	Operation	-5℃...+45℃
	Storage	-25℃...+55℃
	Transport	-25℃...+70℃
Ambient conditions	Rel. humidity	<93%, except dewing
Design	Modular installation device (MDRC)	
	Housing/color	Plastic, beige
	Installation	On 35mm DIN-Rail, To EN 60 715

Dimension/Weight	36mm×90mm×64mm (AMMA-04/06.1) / 0.15KG	
	72 mm×90mm×64mm (AMMA-08/10.1) / 0.2KG 216 mm×90mm×64mm (AMMA-16/10.1) / 0.6KG 216 mm×90mm×64mm (AMMA-24/10.1) / 0.7KG	
Output	Max. 24-Fold Switch Outputs / 12-Fold Shutter AC Outputs / 6-Fold Shutter DC Outputs / 6-Fold Fan Coil Outputs / 6-Fold Valve Outputs	Each Output can be configured separately
	U_n Rated Voltage	230/440V AC（50/60Hz），30V DC
	I_n Rated Current/capacity (AMMA-04/06.1)	6A/70uF（LED Max. Load 100W）
	I_n Rated Current/capacity (AMMA-08/10.1)	10A/70uF（LED Max. Load 100W）
	I_n Rated Current/capacity (AMMA-16/10.1)	10A/105uF（LED Max. Load 200W）
	I_n Rated Current/capacity (AMMA-24/10.1)	10A/105uF（LED Max. Load 200W）
	Inrush current AMMA-04/06.1 (-08/10.1)	120A/10ms
	Inrush current AMMA-16/10.1 (-24/10.1)	300A/2ms
	Max. Switching Current AMMA-04/06.1 (-08/10.1)	16A/240V AC
	Max. Switching Current AMMA-16/10.1 (-24/10.1)	20A/250V AC
	Mechanical life	> 1 x 10^6
	Electrical life	>5 x10^4
	Min. applicable load (reference value)	100mA 5V DC

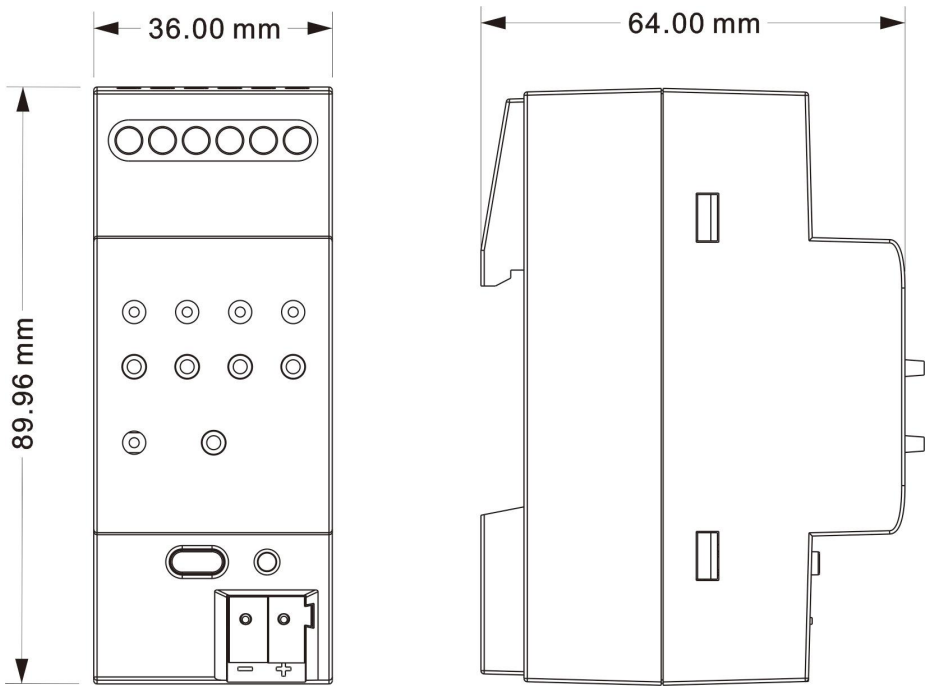
Note: For the relay parameters, the above load is only for a single lamp. When multiple lamps are connected in parallel, the load can be reduced. Although the power is constant, the instantaneous inrush current will increase, which will easily melt the relay contacts. Therefore, in normal use, based on the measured current, the measured maximum inrush current must be within the allowable range.

Application program:

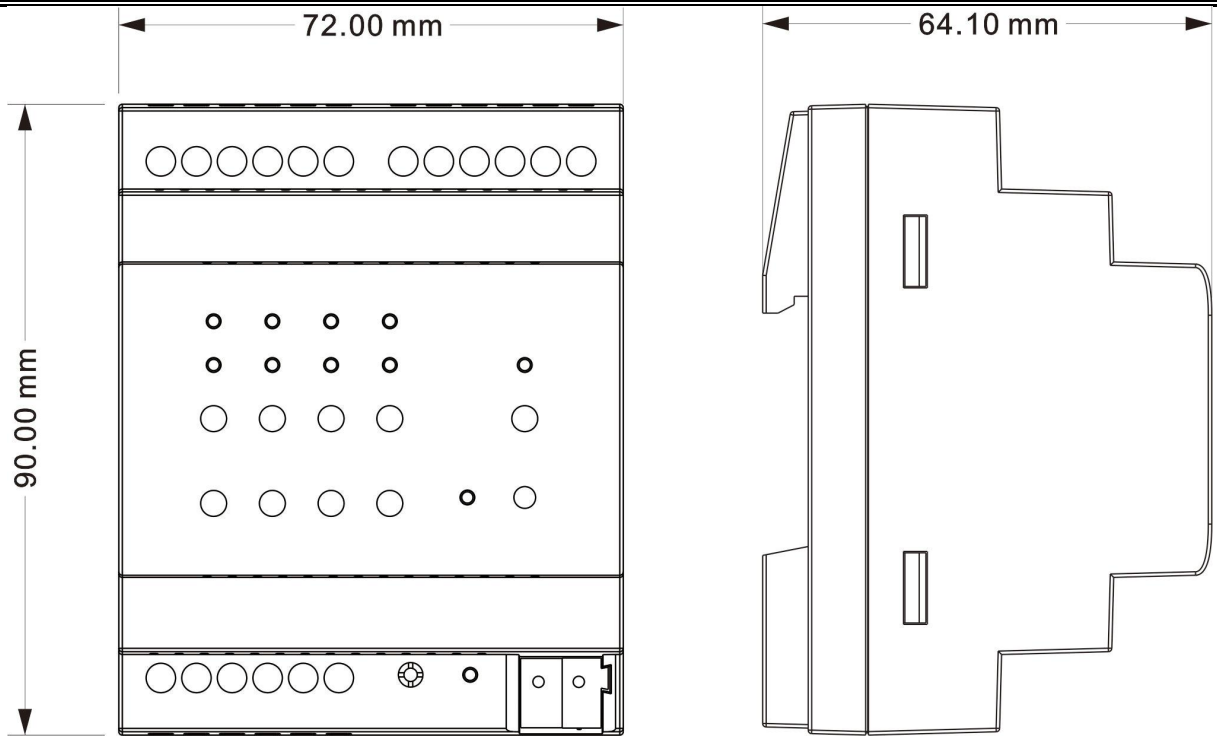
Application program	Max. number of communication objects	Max. number of group addresses	Max. number of associations
Multifunction Actuator，4/8/16/24-Fold	386	800	800

Chapter 3 Dimension and Connection Diagram

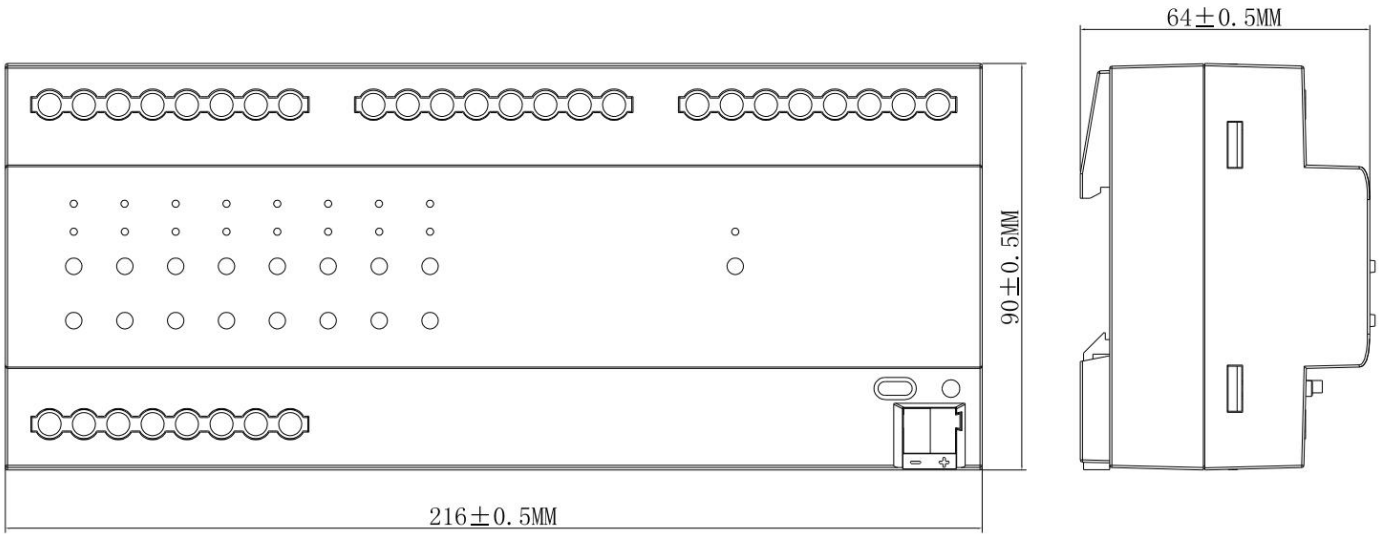
3.1 Dimension diagram



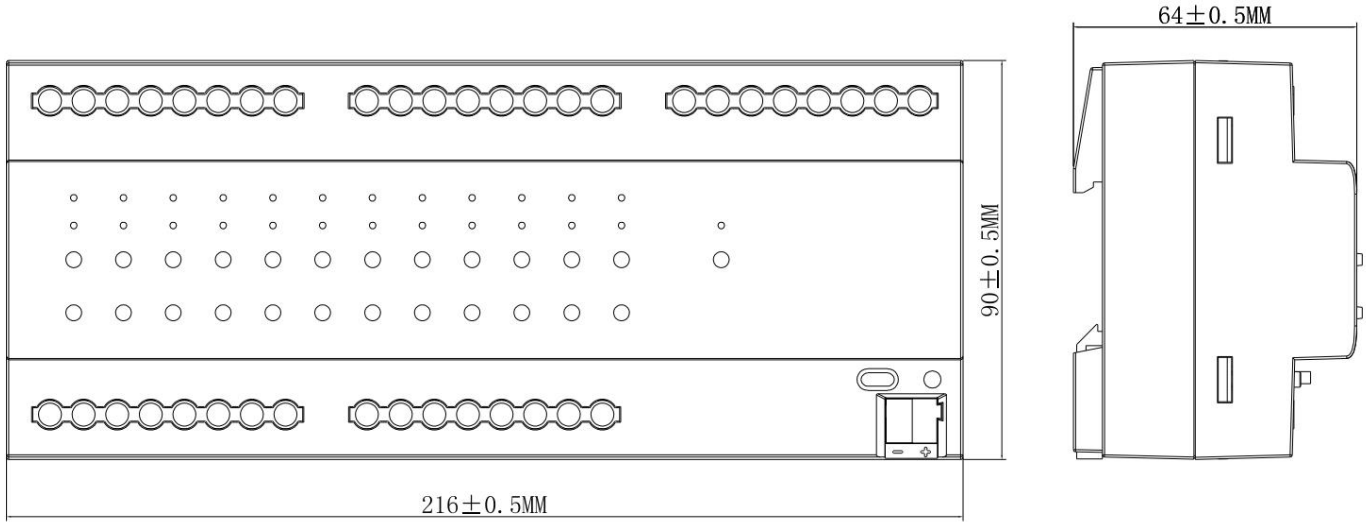
AMMA-04/06.1



AMMA-08/10.1



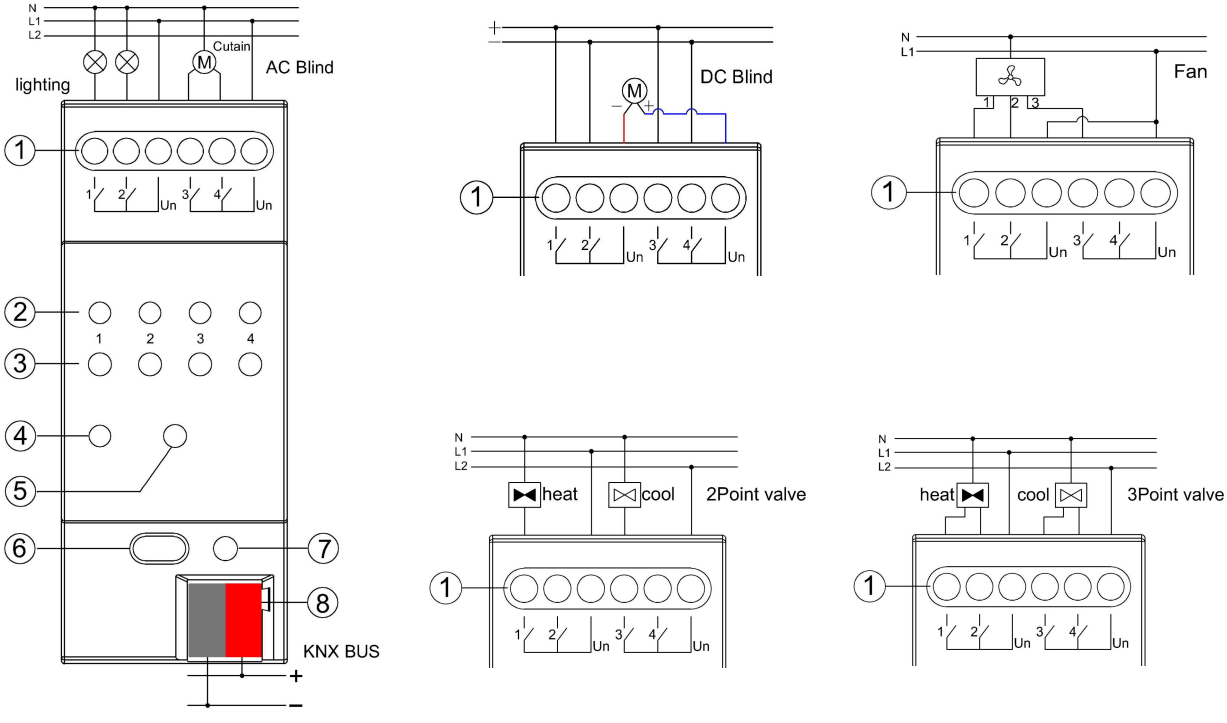
AMMA-16/10.1



AMMA-24/10.1

3.2 Connection diagram

3.2.1 AMMA-04/06.1



① **Output Terminal:**

Above Figure indicates how each control output is wired.

②③ **The manual operation button and Output indication of the channel Output:**

When the button is used to control the switch Output, each channel corresponds to 1 button and indicator light. When the light is on, there is Output, and when it is off, there is no Output.

When the button is used to control the curtain/louver (AC/DC), short press (1) up and (2) down, long press to stop moving/adjust the louver, in the curtain/blind operation, the corresponding indicator flashes when arriving In the extreme position, the indicator light is always on. (In the case of DC Output, the indicators and buttons (3) and (4) are not used.)

When the button is used to control the fan, the button (1) turns on the 1st wind speed, (2) turns the 2nd wind speed, (3) turns on the 3rd wind speed, and presses any button to close. The corresponding indicator of the button indicates the wind speed level.

When the button is used to control the valve, under the control of 2, the button and indicator light (1) are used to open/close the valve and indicate the valve on/off state (full open/closed), and (2) not used. Under the control of 4, the buttons and indicator lights (1) are used to switch the valve and status indication of the heating valve, the buttons and indicator lights (3) are used for the switching and status indication of the refrigeration valve, and (2) and (4) are not used.

④⑤ **Manual / automatic (Man.) toggle button and instructions:**

Press and hold this button to switch between manual/automatic operation, the indicator light is in manual operation mode, and the automatic operation mode is off.

⑥⑦**Programming button and LED indicator:**

Red light indicates programming physical address, green light indicates device application layer is running normally

⑧**KNX/EIB Bus connects to Terminal**

Note:

1. The above ②③ channel Output button operation and indication only in the normal running state of the application, that is, download the database into the application after the operation.

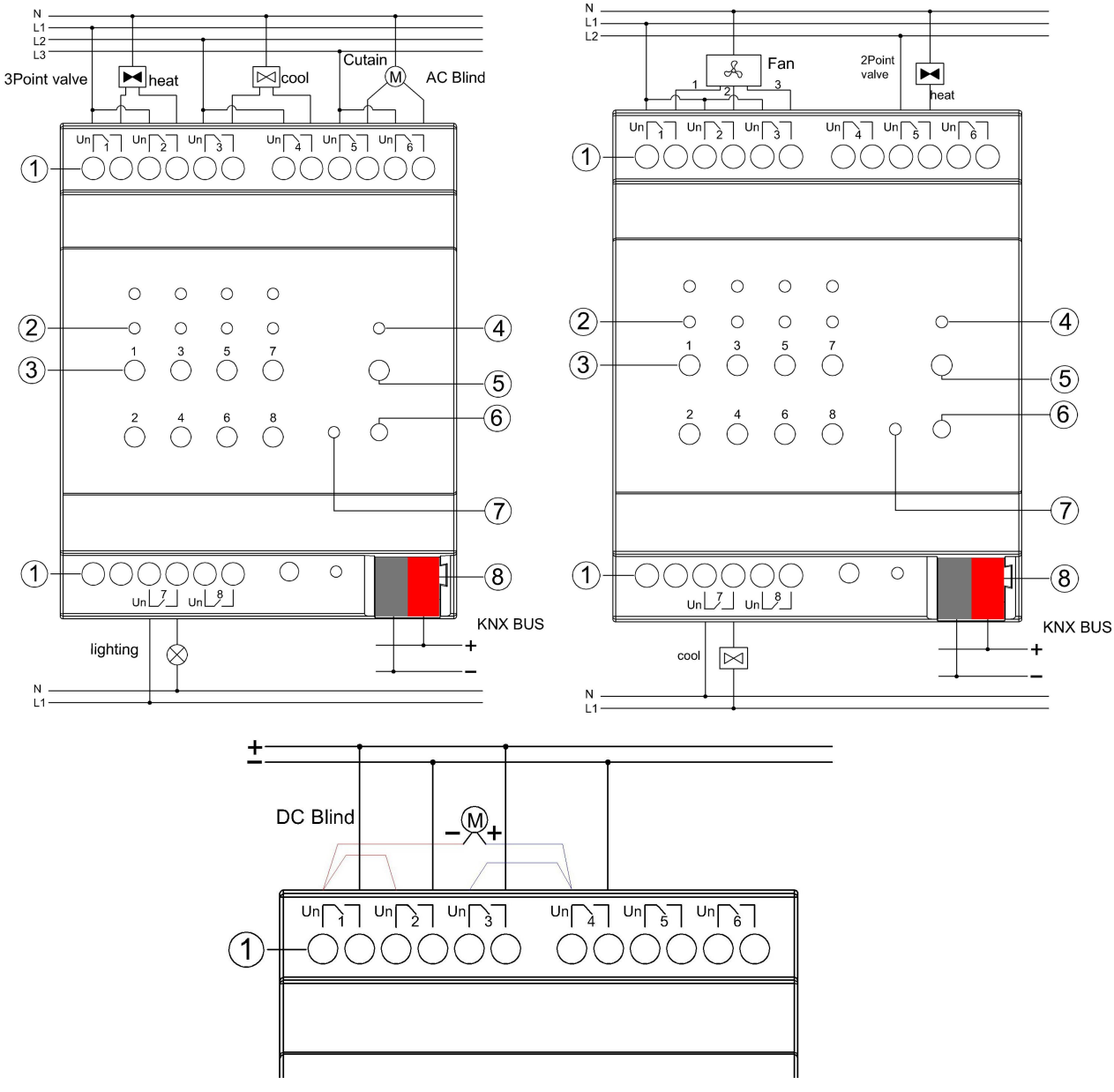
In the no-application running state, the default relay switch function is defaulted, and the interlock operation is performed at the same time, that is, the relays of adjacent channels cannot be closed at the same time. This state is only applied to engineering debugging.

2. After entering the manual operation state, the Bus control message is ignored. And after switching to the manual operation state, if the channel button operation is not performed, the

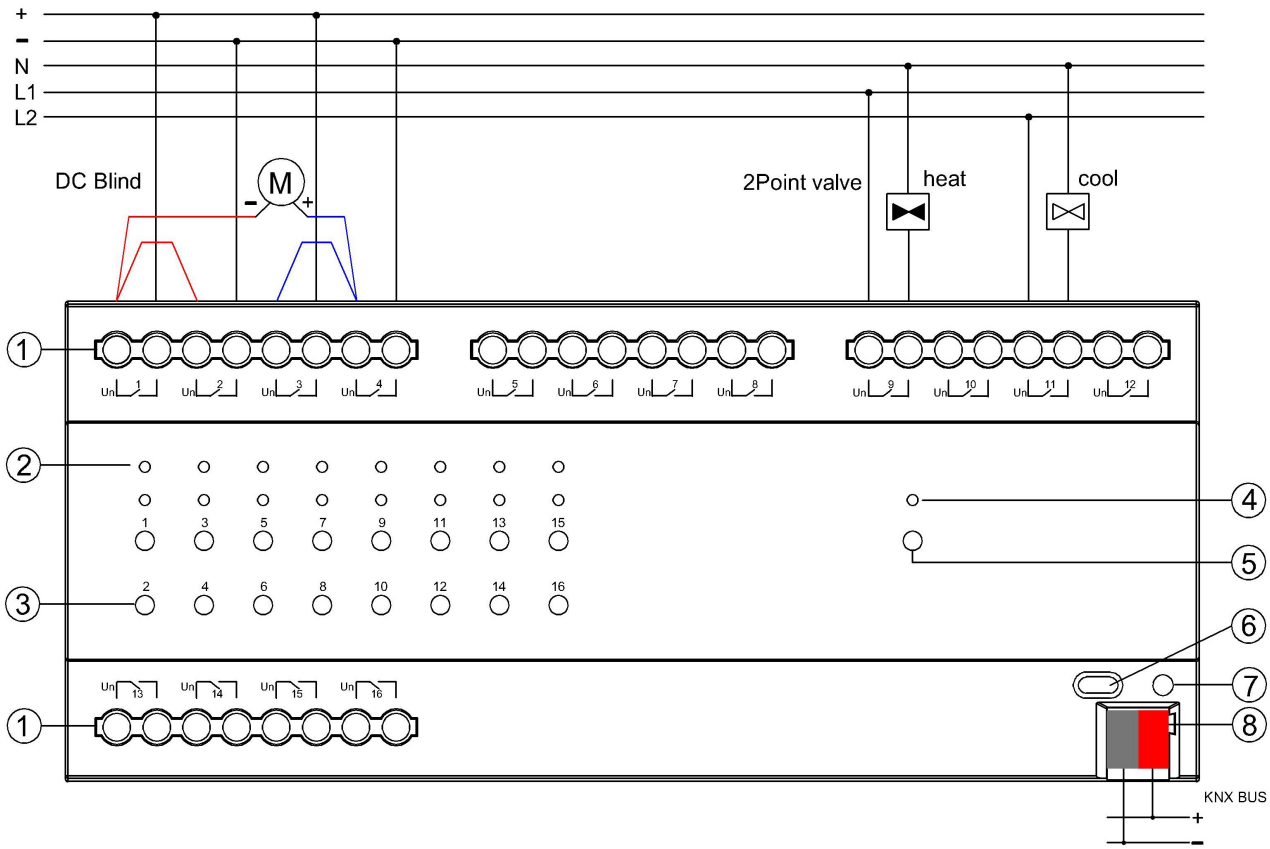
existing operation state is maintained; the manual operation instruction is executed after the channel button operation is performed; when the manual operation state is exited, the current operation state is maintained until there is reception. Go to the Bus control instruction.

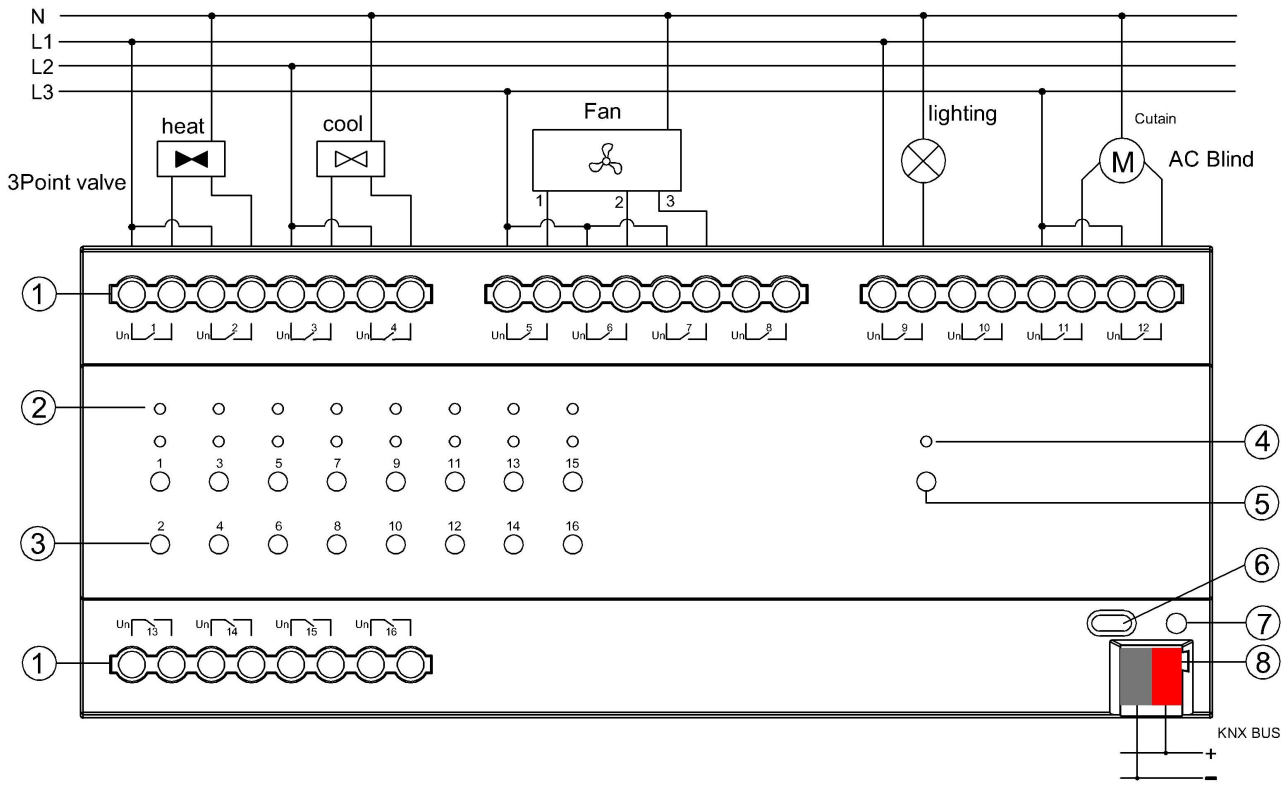
3. Refer to the 4-Fold description for the labeling instructions for the following 8-Fold, 16-Fold, and 24-Fold Multifunction Actuators. In the product database configuration, each quad-Fold relay Output is a set of control outputs, so in practical engineering applications, the load wiring must be considered in conjunction with the functional configuration of the database.

3.2.2 AMMA-08/10.1

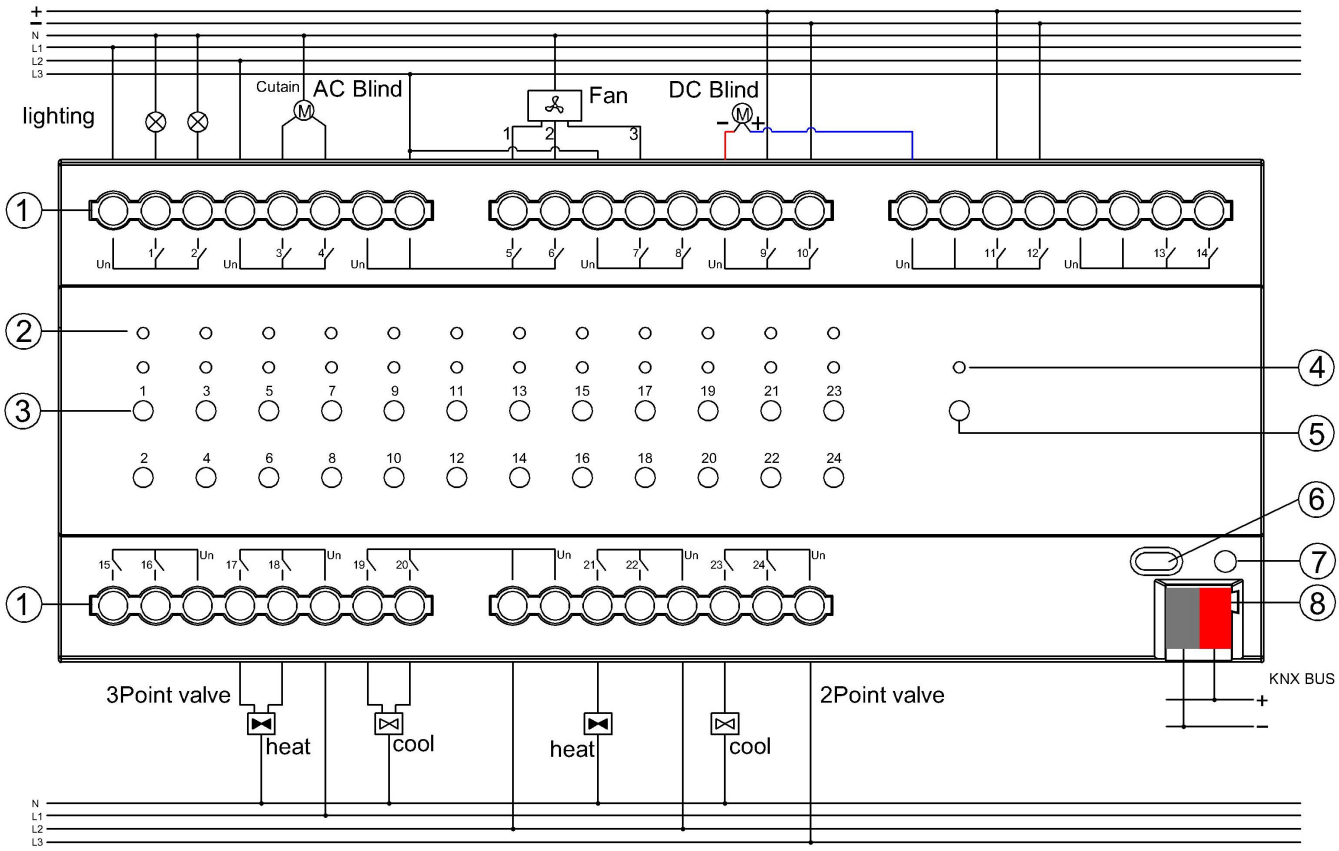


3.2.3 AMMA-16/10.1





3.2.4 AMMA-24/10.1



Chapter 4 Parameter setting description in ETS

The parameters will be described in the form of the function interfaces.

4.1 Parameter window “General”

The parameter window “General” setting interface is shown in Figure 4.1. This interface is used to set some common parameters and apply to each function block.

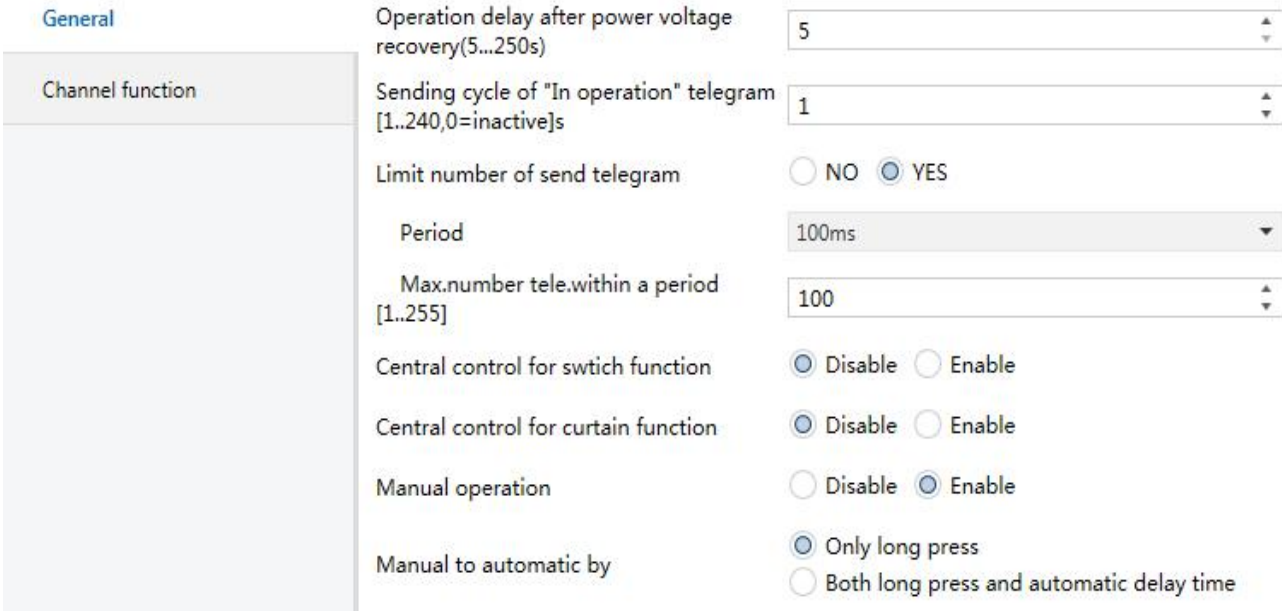


Fig. 4.1 Parameter window “General”

Parameter“Operation delay after power voltage recovery[5...250s]”

This parameter defines the time delay for the operation after the Bus power-down reset. Only when the delay is completed, the operation will be performed, and the device can send a message to the Bus. The manual operation performed during this period will be recorded, and the last triggered action will be executed after the delay time expires. During the delay period, the message received by the device from the Bus is also recorded, and is executed after the delay is completed.

This delay time does not include the initialization time of the device. After bus voltage is restored, the device startup initialization time is about 3s. This operation delay starts after the device initialization time.

Note: During the delay period, that is, during the inoperable operation of the device, the device programming light indicates that the green light is always on, and after operation, the green light flashes.

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

The Parameter sets the interval at which this module sends a message through the Bus loop to indicate that the module is operating normally. When set to "0", the object "in operation" will not send a message. If the setting is not "0", the object "in operation" will send a message with logic "1" to Bus for the set time period.Options: **0...240s, 0=Circular transmission prohibited**.

In order to reduce the Bus load as much as possible, the maximum time interval should be selected according to actual needs.

Note: The time interval starts from the time when the Bus resumes power supply, and has nothing to do with the Bus power-on delay operation.

Parameter"Limit number of send telegram"

This Parameter is used to set the number of packets sent by the device to the Bus, mainly to reduce the Bus burden. Options:

Yes

No

When selecting the "Yes" option, Parameter "Period" and Parameter "Max. Number of tele. within a period [1...255]"

-- Parameter"Period"

Set the monitoring time for limiting the sending of messages. Options:

100ms

500ms

…

10min

Bus Voltage recovery, after the device initialization time and operation delay is completed, the monitoring time starts to count and starts counting the transmitted Telegram. Once the maximum number of Telegrams allowed to be sent is reached, there will be no Telegram transmission on the Bus until the setting is completed. The monitoring time is over.

When this monitoring time is over, a new monitoring time begins and the Telegram count restarts. Telegrams that were not sent during the last monitoring period will be sent in the next monitoring period, but up to 20 Telegrams can be cached in the last monitoring period. For those duplicate Telegrams in the buffer, only one Telegram will be sent in the next cycle.

-- Parameter“Max.Number tele. within a period [1..255]”

This Parameter sets the maximum number of Telegrams that can be sent during the monitoring time. Options: **1...255**

Note: The above two parameters only affect the Telegram sent to the Bus, and do not affect the operation performed.

Parameter“Central control for switch function”

This Parameter sets the centralized control of the switch function. Options:

Disable

Enable

When enabled, the object "Central control for all of switch" is visible. All channels that have centralized control can be controlled by this object and can be controlled together.

Parameter“Central control for curtain function”

This Parameter sets the centralized control of the curtain function. Options:

Disable

Enable

When enabled, the objects "Central control for Up/Down" and "Central control for Slat/Stop" are visible. All channels that enable centralized control can be controlled by these two objects, and the position of the curtain can be adjusted together. Adjust or stop the louver angle.

Parameter“Manual operation”

This Parameter is used to set whether to enable manual operation. Options:

Disable

Enable

When enabled, the following Parameter is visible.

-- Parameter“Manual to automatic by”

This Parameter is used to set the way to restore from manual operation to automatic operation. Options:

Only long press

Both long press and automatic delay time

Only long press: Switch to manual operation by long pressing the manual/automatic toggle button, or switch back to automatic operation.

Both long press and automatic delay time: Switch to manual operation by long pressing the

manual/automatic switch button, or switch back to automatic operation, or automatically return to automatic operation state from manual operation by delay, that is, in manual operation state, if there is no manual for a period of time When the operation is performed, it automatically returns to the automatic operation state. The following Parameter is visible when this option is selected.

-- Parameter"Delay time [10...6000]s"

This Parameter is used to set the delay time from the manual operation to the automatic operation state. Options: **10..6000**

4.2 Parameter window "Channel function"

The parameter window "Channel function"setting interface is shown in Figure 4.2. This interface is used to set the product type and channel function.

Product type: 4-channel Output, 8-channel Output, 16-channel Output and 24-channel Output, product type is selected according to the product used.

Channel function: switch Output, curtain Output (distinguish AC motor and DC motor), fan output or valve Output. Different functions occupy different Output channels.

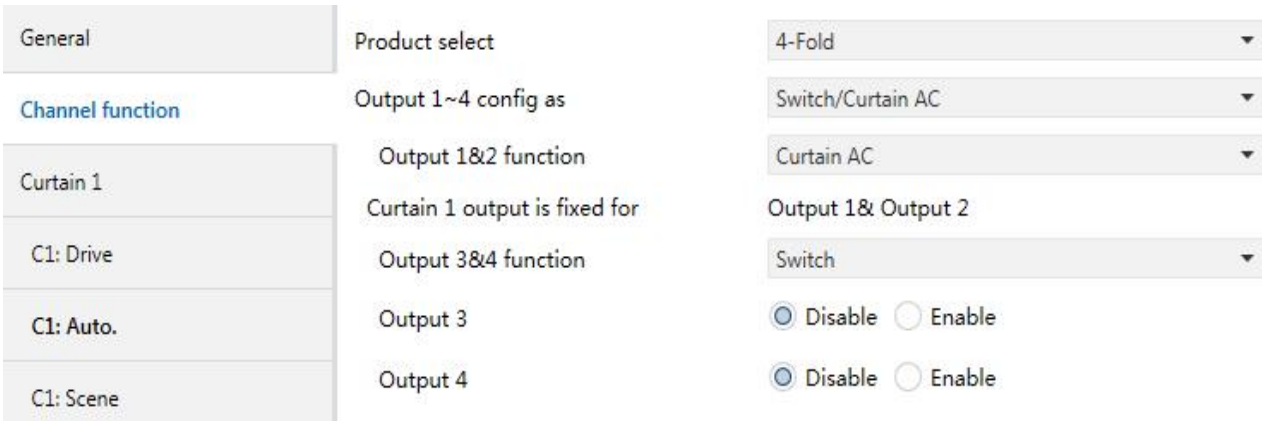


Fig. 4.2 Parameter window "Channel function"

Parameter"Product select"

This Parameter is used to select the products used. There are four product types. Options:

4-Fold

8-Fold

16-Fold

24-Fold

Parameter"Output x~y (1~4/5~8/9~12/13~16/17~20/21~24) config as"

This Parameter is used to set the channel function. Options:

Disable

Switch/Curtain AC

Curtain DC

Fan control

Valve control

The following table gives a simple Output description for each function Output with an example:

Output 1~4	**Switch/Curtain AC**		**Curtain DC**	**Fan control**	**Valve control**
	Switch	**Curtain AC**			
Output 1	Output 1	Curtain 1	Curtain DC 1	Fan 1: fan speed 1	Valve 1: Heat
Output 2	Output 2			Fan 1: fan speed 2	
Output 3	Output 3	Curtain 2		Fan 1: fan speed 3	Valve 1: Cool
Output 4	Output 4				

From the above table, it can be seen that one switch Output occupies one Output channel, one curtain Output (AC) occupies two Output channels, one curtain Output (DC) occupies four Output channels, and the fan Output determines the Output according to the level of wind speed. The number of channels, the valve Output determines the number of Output channels occupied according to the HVAC control mode.

Under Curtain AC, Fan control or Valve control functions, if some Output is not used, these Outputs can be used to switch Output, depending on the Parameter setting.

Comment Parameter Description (similar function, one of which is taken as an example):

-- Parameter"Curtain 1 output is fixed for": Output 1&Output 2

This Parameter indicates that the Output Channel with AC Motor Curtain 1 is fixed to Output 1 and Output 2 (Output 1 and 2).

-- Parameter"External DC+ input": Output 1&Output 3

-- Parameter"External DC- input": Output 2&Output 4

-- Parameter"Output Driver": Un

The three parameters indicate the wiring mode of the DC motor curtain output. The positive input of the motor is connected to Output 1 and Output 3 (Output 1 and 3), and the negative input of the motor is connected to Output 2 and Output 4 (Output 2 and 4). The drive is connected to Un.

-- Parameter"Fan 1 output is fixed for": 1level:1; 2level:1&2; 3level:1&2&3

This Parameter indicates that the fan with level 1 wind speed has an Output channel of Output 1;

For fans with 2 levels of wind speed, the Output channels are Output 1 and Output 2;

For fans with 3 wind speeds, the Output channels are Output 1, Output 2 and Output 3.

-- Parameter"If Fan 1 set to 1 or 2 level, output 3&4 as switch output":

Note: If the fan type is level 1 or level 2, Output3 and Output4 can be used as the switch Output.

-- Parameter"Heat output for valve 1 is Output 1": Output 1&2, if 3 point, open and close

This Parameter indicates that the heating Output channel of valve 1 is Output 1;

That is, for a two-wire valve, one end of the valve is connected to Output 1, and the other end is connected to Un that supplies power to the valve.

If it is a three-wire valve type, the Output channels are Output 1 and Output 2;

That is, for a three-wire valve, both ends of the valve are connected to Output 1 and Output 2, and the other end is connected to Un that supplies power to the valve.

-- Parameter"Cool output for valve 1 is Output 3": Output 3&4, if 3 point, open and close

This Parameter indicates that the cooling output channel of valve 1 is Output 3;

That is, for a two-wire valve, one end of the valve is connected to Output 3 and the other end is connected to Un that supplies power to the valve.

If it is a three-wire valve type, the Output channels are Output 3 and Output 4;

That is, a three-wire valve, the two ends of the valve are connected to Output 3 and Output 4, and the other end is connected to Un that supplies power to the valve.

-- Parameter"If 2 pipe, output for valve 1 is Output 1": Output 1&2, if 3 point, open and close

If the heating and cooling system is a 2-tube system, the valve Output channel is heated.

Regardless of the switch Output or the curtain Output, or other functions Output, the same function per Fold Output function and the Parameter object are the same, each of the following output functions are described in the form of chapters.

4.3 Switch outputs

The switch outputs have a maximum of 24-fold output channels. Since the parameter and communication object assigned to each fold output are the same, a one-fold output is taken as an example.

4.3.1 Parameter window “Channel X”

The parameter window “Channel X” setting interface is shown in Figure 4.3. The setting of this interface acts on the entire channel of the relay. In addition to setting the commonly used switching functions, it can also set the report of system power-on and switch status.

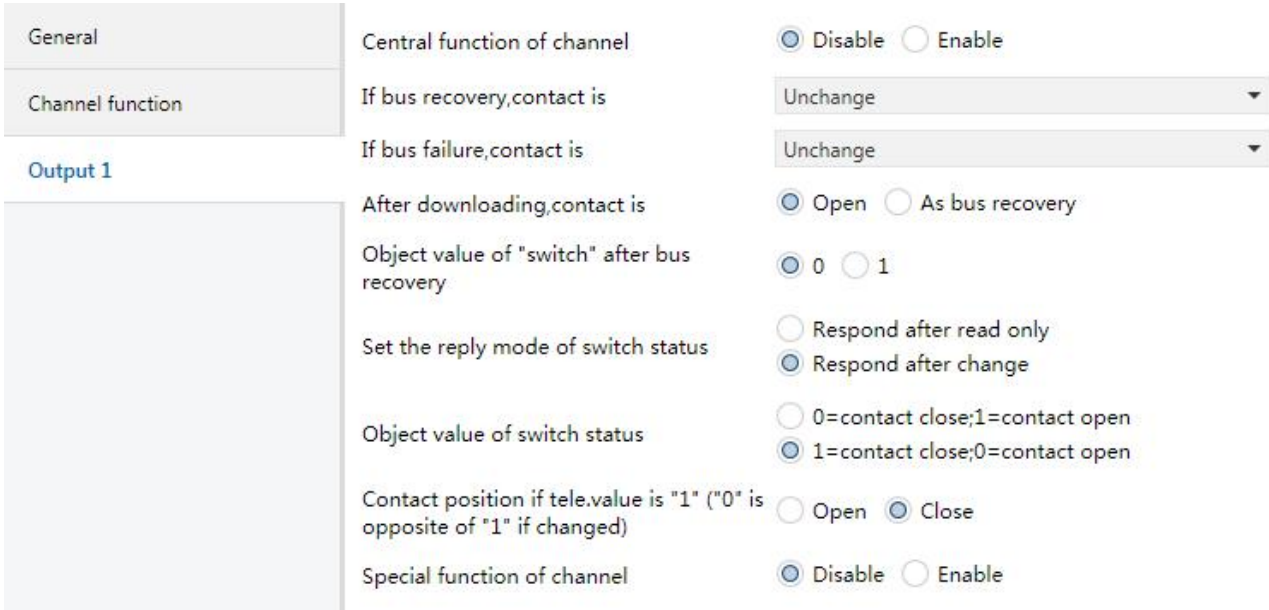


Fig. 4.3 Parameter window “Output X”

Parameter“Central function of channel”

This Parameter sets whether the centralized control of this channel is enabled. Options:

Disable

Enable

When enabled, the channel will be controlled by the central control object "Central control for all switch".

Parameter “If bus recovery, contact is”

The Parameter sets the position of the relay contacts when the device Bus is powered up. Options:

Unchange

Open

Close

As before as bus fail

When selecting “Unchange”, the contact of the relay will remain the same as the last status on the power on.

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”.

Parameter “If bus failure, 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 “After downloading, contact is”

This parameter set the contact position of the output after downloading. Options:

Open

As bus recovery

If "Open", the output is open after downloading.

If “As bus recovery”, the output adopts the defined status of the parameter “If bus recovery, contact is”

Parameter “Object Value of “ Switch” after bus recovery”

This parameter will be visible when enabling the logic function “input 0” to define the default value of the communication object “Switch” after bus voltage recovery, which can be “0” or “1”. Options:

0

1

Parameter “Set the reply mode of switch status”

This parameter defines how to respond the current switch status to the bus. There are three options to select. Options:

Respond after read only

Respond after change

If selecting "Respond after read only", the status telegram will not be sent out until receiving a read request telegrams via the object “reply switch status” from the bus.

If selecting “Respond after change”, no matter it’s reading, or there is change for the status, as long as the controlling telegram can be received, the object will send the current status to the BUS.

Parameter “Object value of switch status :”

Options:

0=contact close; 1=contact open

1=contact close; 0=contact open

It means the contact of the relay will be closed when the value of the communication object “switch status” 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 "1=contact close; 0=contact open".

Note: After programming or system reset, the switch status is determined, the object "switch status" will send status messages to the bus; if not, it will not be sent.

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

This parameter defines the contact position when switch on the switch, which will be triggered by the communication object “switch”. When enabling “input 0” in the logic function, it will use the communication object “switch” to modify the value of “input 0”, rather than triggering the switch operation. In this case, this parameter is no significance to Options:

Open

Close

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

Parameter options	“Switch” object value=1	“Switch” object value=0
Open	Contact open (OFF)	Contact close (ON)
Close	Contact close (ON)	Contact open (OFF)

Note: When the logic function input 0 enables, the object "switch" used as input of input 0, the operation of general switch will become invalid.

Parameter "Special function of channel "

This parameter defines whether enable the special functions of the switch actuator, The parameter window “X1,2:Function” will be seen with “enable”, and able to set the special functions individually in Fig.4.5. Enable or disable the special function in “X1,2:Function”.Options:

Disable

Enable

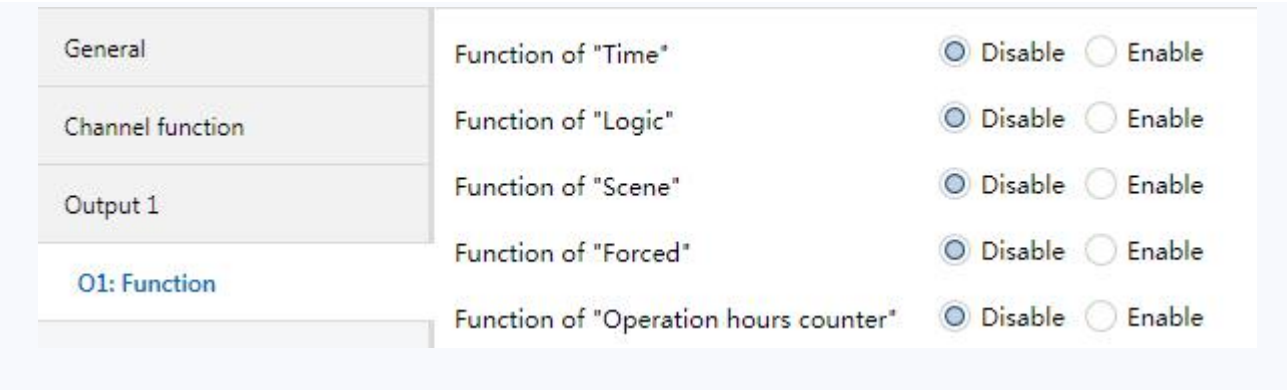


Fig. 4.4 Special function enable window "Ox:Function"

4.3.2 Parameter window “Ox: Time”

This parameter window “Ox:Time” will become visible when selecting “enable” in the parameter “Function of ‘time’ ” in the window “Ox: Function” shown in Fig. 4.4. See Fig. 4.5. And the object “enable time function” will be also visible, which is used to disable the time function. After disabled, previous operation is still carried out completely. Such as delay switch on, the function is disabled during delay, and then the switch is still switched on once the delay has been finished.

Fig. 4.5 Parameter window "Ox:Time-Delay"

Parameter "Type of time function"

The parameter defines the type of the time function, there are three options for the mode of work. Options:

Delay

Flashing

Staircase

4.3.2.1 Selection "Delay"

The parameter window "Ox:Time-Delay" setting interface in Fig.4.5 will be shown when selecting "Delay". The delay switch can be started via the object "Delay function".

Parameter "Delay for switch on: (0...240 min)/ (0...59 s)"

This parameter defines the delay time of switching on. Options:

0…240 Minutes

0…59 Seconds

After receiving the delay ON telegram, the switch is on once the delay over.

Parameter "Delay for switch off: (0...240 min) / (0...59 s)"

This parameter defines the delay time of switching off. Options:

0…240 Minutes

0…59 Seconds

After receiving the delay off telegram, the switch is off once the delay over.

If receiving the relevant telegram again during delay, the delay will be reset.

4.3.2.2 Selection "Flashing "

The parameter window "Ox:Time-Flashing" setting interface in Fig. 4.6 will be shown up when selecting "flashing" in the parameter "Type of time function". The flashing switch function is mainly used for lamp aging test.

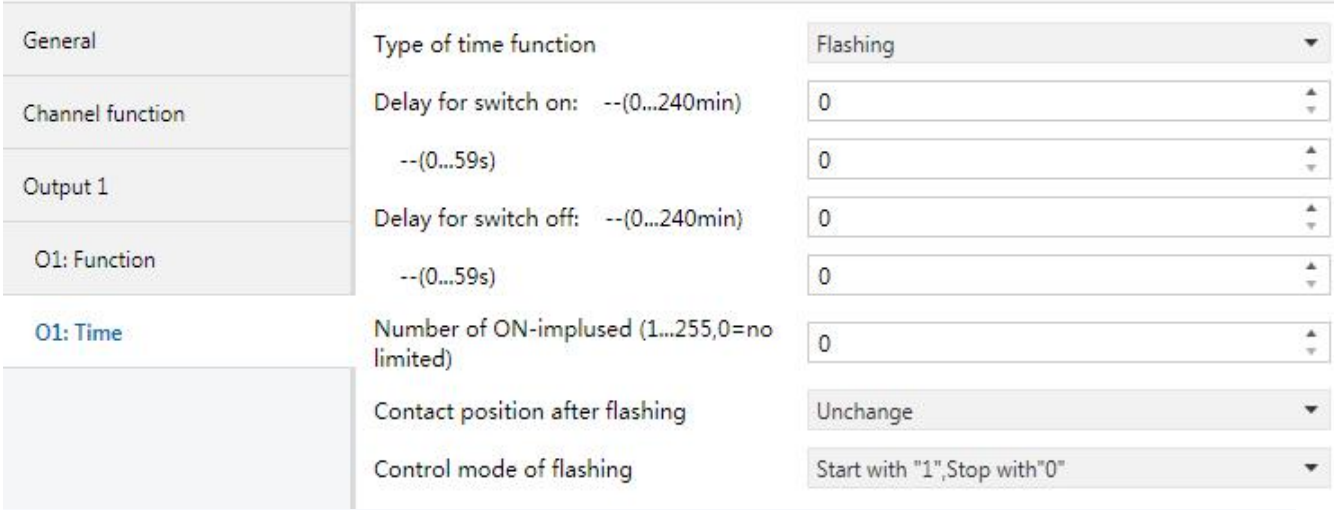


Fig. 4.6 Parameter window "Ox: Time-Flashing"

The flashing switch can be started via the object “Flashing function”. It is able to set the flashing time in “Delay for switch on” or “Delay for switch off”, which will restart the flashing when receiving the start flashing telegram, and define the contact position after flashing.

Parameter“Delay for switch on: (0...240Min) , (0...59s)”

This parameter defines the duration of the 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.

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

This parameter defines the duration that the switch is turned 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 the time delay. The same situation will happen after the bus voltage recovery.

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

This parameter sets the flashing times. 0 means no limited. A flashing includes an on and an actions. Options: **0...255**

Parameter"Contact position after flashing"

This parameter defines the relay contact position after flashing. Options:

Unchange

Open

Close

Parameter"Control mode of flashing"

This parameter is used to select the control mode of the flashing output. Options:

Start with"1", stop with "0"

Start with "0", stop with "1"

Start with "0/1", can not be stop

It will start flashing with value "1" when selecting "start with "1", stop with "0"", it will stop flashing with "0". The stop position is defined via last parameter.

It will start flashing with value "0" when selecting "start with "0", stop with "1""; it will stop flashing with "1". The stop position is defined via last parameter.

It will start flashing with either "1" or "0" when selecting "start with "1/0", can not be stopped"; under this circumstance it cannot terminate the flashing by value until operation over or it is blocked by other operation.

4.3.2.3 Selection "Staircase"

The parameter window "Ox:Time-Staircase" setting interface in Fig. 4.7 will be visible when selecting "Staircase" in the parameter "Type of time function".

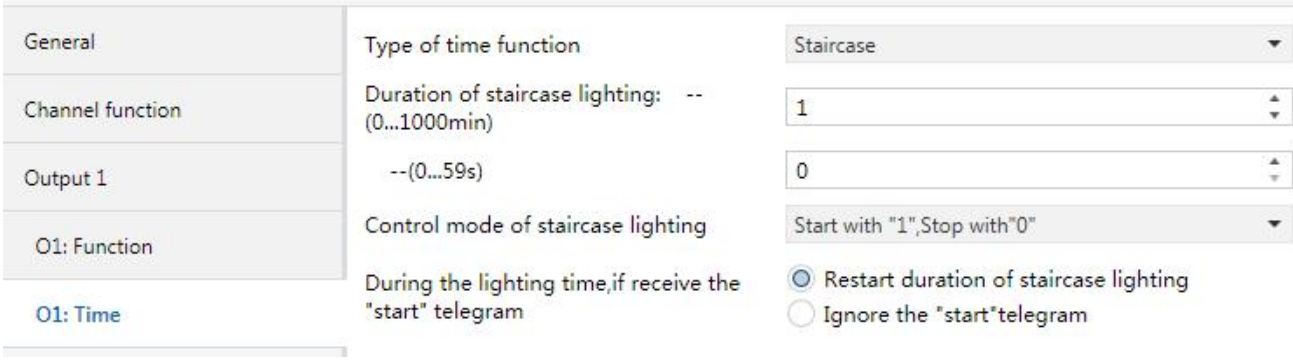


Fig. 4.7 Parameter window "Ox: Time-Staircase"

The staircase lighting can be started via the object "staircase function". The value that switches on the staircase lighting can be set via a parameter. The duration time of the lighting on is also set via a parameter.

Parameter"Duration of staircase lighting--(0...1000 min) --(0...59 s)"

This parameter describes the duration time when switching on the staircase light function. Options:

0…1000 Minutes

0…59 Seconds

Parameter"Control mode of staircase lighting "

This parameter defines the control mode on/off of the staircase lighting. Choose suitable control mode according to the needs. Options:

Start with "1"，stop with "0"

Start with "1"，no action with "0"

Start with "0/1", can not be stop

Start with "1", Off with "0"

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

When selecting "Start with '1', no action with '0'", it will switch on the staircase lights with the value "1" and no reaction with "0";

When selecting "Start with '0/1', can not be stop", it will switch on the staircase lights either with "0" or "1" but cannot stop it until the duration time finished or changed by other operation;

When selecting "Start with '1', off with '0'", it will switch on the staircase lights with the value "1", and off with "0".

Parameter"During the lighting time ,if receive the 'start' telegram"

Options:

Restart duration of staircase lighting

Ignored the "start" telegram

If selecting "restart duration of staircase lighting", if the object "Staircase function" again receive the telegram of starting staircase lighting during the duration time, then the staircase lighting will restart and the duration time will be restart.

If selecting "Ignored the 'switch on' telegram", then it will ignore the receiving telegram of the object "Staircase function" during the duration time.

4.3.3 Parameter window “Ox: Logic”

The parameter window “Ox:Logic” setting interface shown in Fig. 4.8, it will shown up in Fig.4.4 “Ox: Function” when selecting “enable” in “Function of “logic””.

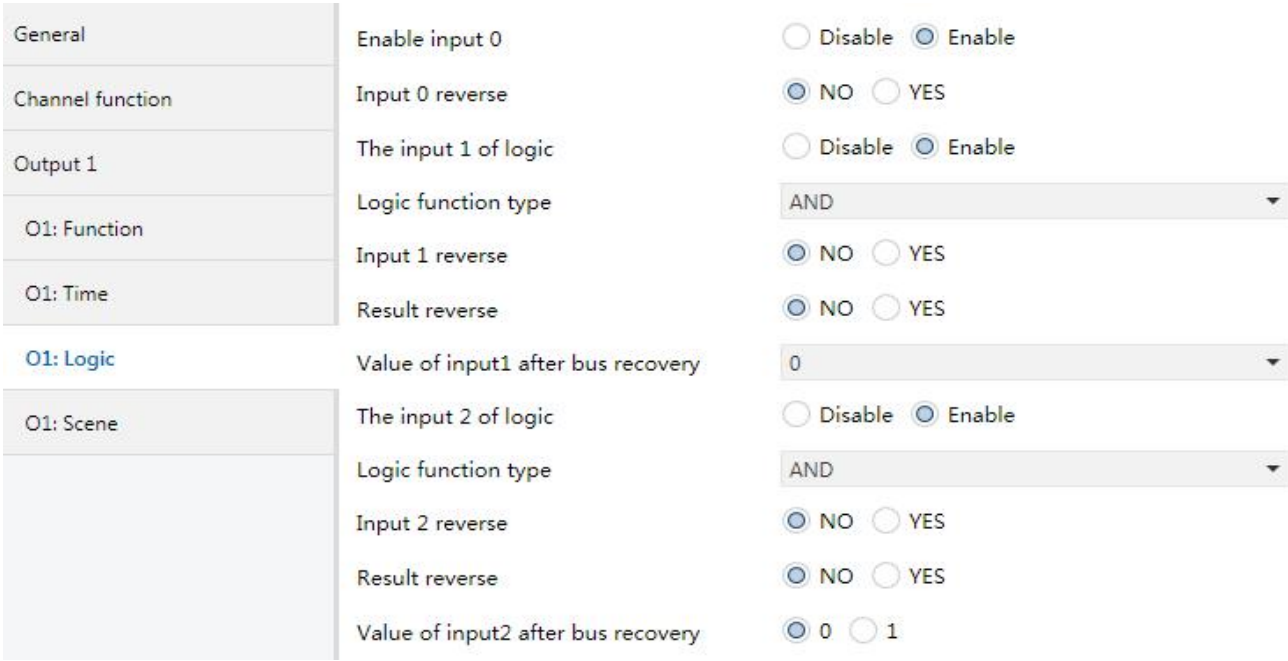


Fig. 4.8 Parameter window "Ox: Logic"

There are 2 logic communication objects to decide the status of each output, which are related to the "Switch".

It will re-operate when receiving a new object value as the final output status (close the contact with “1”, open it with “0”). The values of the communication object “Logic 1” makes logic operation with “switch” firstly, and then the result after that will makes operations with the value of “Logic 2”. This operation will ignore the objects which are unable, and continue to the next step with the ones who are enabled.

Parameter“Enable input 0”

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

Disable

Enable

In the both cases of “Input 0” enabled and not enabled, there are a little different parameters. All parameters of logic function have described in the following. If input 0 is disabled, the parameters

will be less. If there are not certain parameters in the case, then it is also not available with the function of these parameters.

Parameter "Input 0/1/2 reverse"

This parameter defines whether negate the value of Input 0/1/2. Negate it with "yes", don't with "no". Options:

No

Yes

Parameter"The input x of Logic" (x = 1, 2)"

This parameter is used to enable input 1 and input 2. If enable, their communication objects "logic 1" and "logic 2" will be also visible. Options:

Disable

Enable

Parameter"Logic function type"

This parameter set logic function type, provided three standard logic operations: AND, OR, XOR, and a GATE function. Explanation of gate function: it will use the next logic value as the enable mark of the previous logic. If the enable mark of the next logic is "1", that means it is able to use the previous logic value as the operation result. E.g. the value of input 1 is 1, that means the value of input 0 can be used as the operation result; if the value 2 is 1, that means the operation value of input 0/1 can be used as the result. Options:

AND

OR

XOR

GATE

Below result of logic operation is possible:

Logic function	Object values					Description
	Input0(Switch)	Input1	Result of Input 0/1	Input2	Output	
AND	0 0 1 1	0 1 0 1	0 0 0 1	0 1 0 1	0 0 0 1	The result is 1 if both input values are 1.
OR	0 0 1 1	0 1 0 1	0 1 1 1	0 1 0 1	0 1 1 1	The result is 1 if one of both input values is 1
XOR	0 0 1 1	0 1 0 1	0 1 1 0	0 1 0 1	0 0 1 1	The result is 1 if both input values have a different value.
GATE	0 0 1 1	Closed Open Closed Open	0 1	Closed Open Closed Open	0 1	The input 0 of value is only allowed through if the GATE (input 1 and input 2) is open. Otherwise the input0 of value is ignored.

Note:

1. The value of the communication object "Input 1" makes logic operation with “Switch” firstly, and then the result will makes operations with the value of “Input 2”, and the final operation result as the final output (close the contact with “1”, open it with “0”).

2. If an input is not enabled, the input is ignored.

3. If logical result needs to be negated, the first negated, then the next step.

4, The signal can be passed if the GATE is open, otherwise it is ignored. For example, the input 0 of value is ignored when the GATE of input 1 is closed, and the output is directly determined by thte input 2.

Parameter “Result reverse”

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 recovery”

This parameter defines the default value of the object “Logic 1”after bus voltage recovery. Options:

0

1

Value before power off

Parameter "Value of input 2 after bus recovery"

This parameter defines the default value of the communication object “Logic 2” after bus voltage recovery, “1” or “0” is optional. Options:

0

1

4.3.4 Parameter window “Ox: Scene”

The parameter window “Ox:Scene” setting interface shown in Fig.4.9 will be visible when selecting “enable” in “Function of ‘Scene’” in Fig.4.4. Here can set 8 scenes.

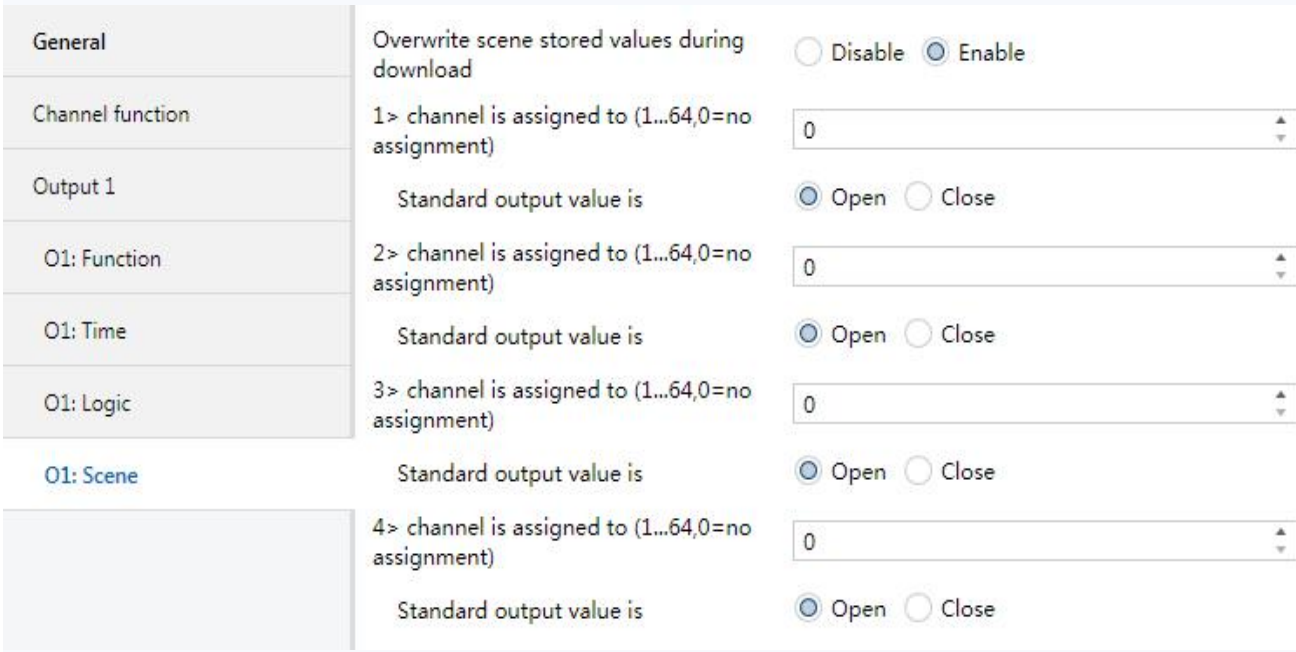


Fig. 4.9 Parameter window "Ox:Scene"

Parameter"Overwrite scene stored values during download"

This parameter sets whether to override the scene save value during application download. Options:

Disable

Enable

Disable: If selecting “Disable”, the stored values before the download can be not overwritten by the parameterized scene value. When the scene is called, the scene saved before the download is still enabled until it is replaced by the new storage scene.

Enable: If selecting “Enable’, the stored values will be overwritten by the parameterized scene value during the download. When the scene is called, the scene will be set according to the parameters until it is replaced by the new storage scene.

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

It is able to allocate 64 different scene numbers to every output. There are 8 various scenes can be set per output. Options:**Scene 1... Scene 64 ， 0=no assignment**

Note: 1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene”. If a scene is modified, the new scene will be stored when power off.

Parameter “Standard output value is”

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

Open

Close

4.3.5 Parameter window “Ox: Forced”

The parameter window “Ox: Forced” setting interface in Fig. 4.10 “Ox: Function” will be visible with “Enable” in the parameter “Function of “forced”” in Fig. 4.4.

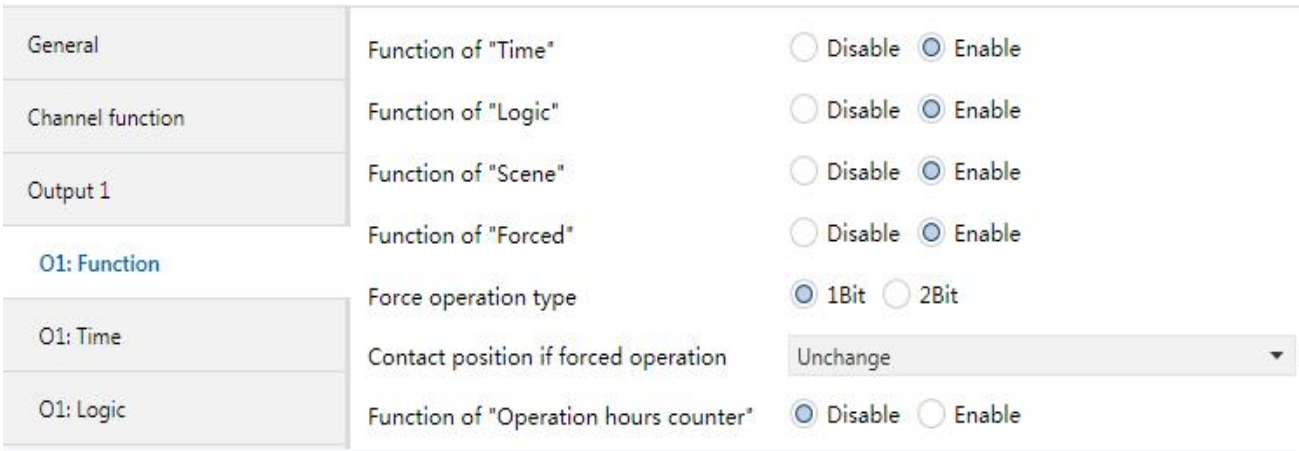


Fig. 4.10 Parameter window "Ox: Forced"

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"Force operation type"

This parameter defines the control type of force operation. Options:

1bit

2bit

If selecting "1 bit", the object "Forced output" receives the telegram "1" to activate force operation, telegram “0” to cancel the force operation.

If selecting "2bit" when the object “Forced output” receives a telegram value, the action as follow:

Value of the object "Forced output, X"	Action
00b（0），01b（1）	Cancel force operation, other operation can be performed.
10b（2）	Force switch off (OFF)
11b（3）	Force switch on（ON）

When cancel the forced operation, the position of relay contact is unchanged.

Parameter“Contact position if forced operation”

This parameter is visible if the option “1 bit” is selected via last parameter, which defines the contact position of force operation. Options:

Unchange

Open

Close

Forced operations have the highest priority, and all other operations are ignored during forced operations.

4.3.6 Parameter window “Ox: Operation hours counter”

The parameter window “Ox: Operation hours counter” setting interface in Fig. 4.11 will be visible with “enable” in the parameter “Function of “Operation hours counter”” in Fig. 4.4. The function is use for counting the time of relay on.

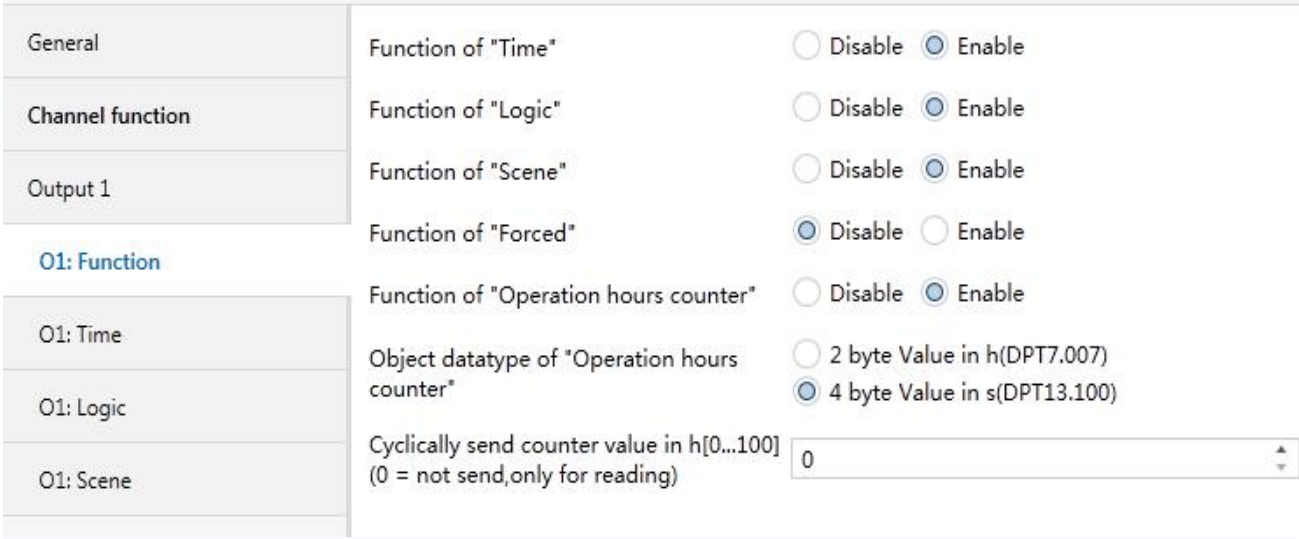


Fig. 4.11 Parameter window "Ox: Operation hours counter"

Parameter “Object datatype of “ Operation hours counter”

This parameter is used to select data type of the operation hours counter. Options:

2 byte Value (DPT 7.007)

4 byte Value (DPT 13.100)

The "2 byte Value (DPT 7.007)" option indicates that the count value is 2 bytes; the "4 byte Value (DPT 13.100)" option indicates that the count value is 4 bytes.

Parameter“Cyclically send counter value in h[0..100] (0=not send, only for reading)”

The parameter determines the time interval to send the telegram which is used for counting the time of relay on. Available options: **0-100**

“0”means do not send.“1-100”means 1 hours to 100 hours cyclically send the value. When the parameter "Object of switch and operation hours counter" is set to 2 bytes, the operation time is in hours; when it is 4 bytes, the operation time is in s.

4.4 Shutter (AC) outputs

There are max. 12 outputs. Each output can be set separately, and parameters and objects which are assigned to each output are the same. Using one of outputs as an example described.

4.4.1 Parameter window “Curtain X: Venetian Blind”

Parameter window “Curtain X:Venetian Blind” setting interface can be shown in fig.4.12. Here set the general parameters of Shutter actuator.

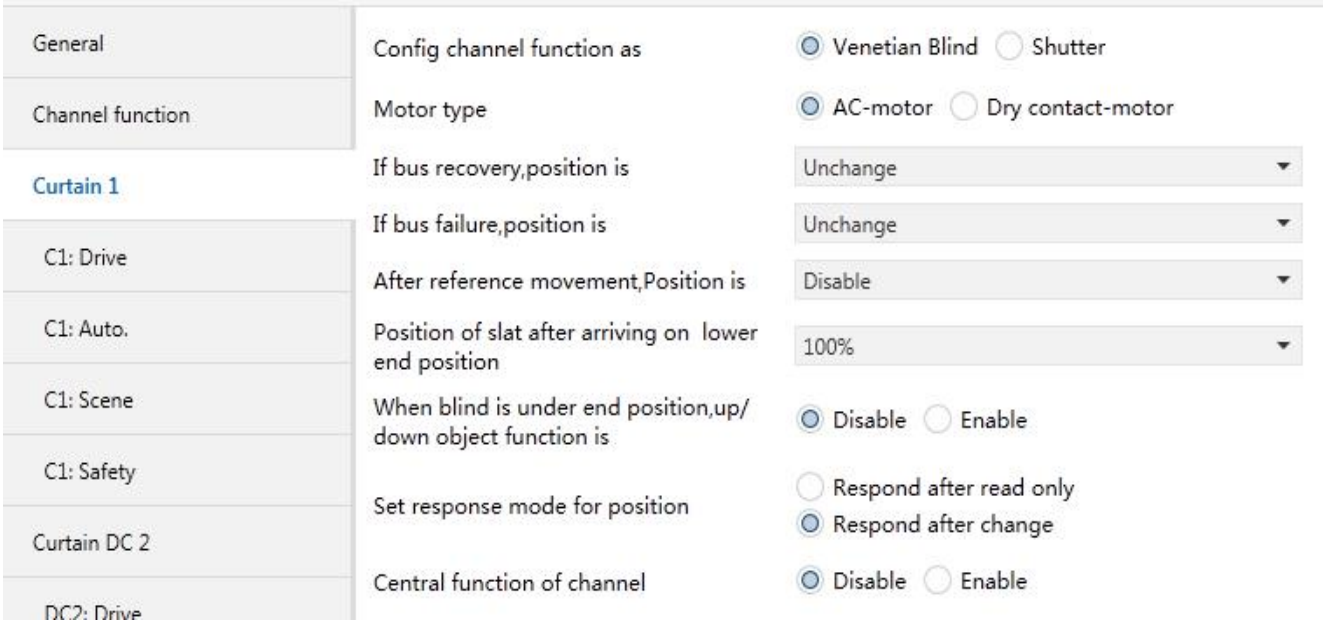


Fig. 4.12 Parameter window “Curtain X: Venetian Blind”

Parameter “Config channel function as:”

This parameter is used to define the output mode. Different output modes have different parameters and communications. Options:

Venetian Blind

Shutter

If selecting “Venetian Blind”, the output is for the Shutter operation mode, which can operate the curtain with louvres.

If selecting “Shutter”, the output is similar with the Venetian Blind operation mode, except that it

cannot adjust louvres.

The section details the parameters and communication objects for the “Venetian Blind” mode.

Parameter “Motor type”

This parameter is used to set the mode of shutter drive. Options:

AC-motor

Dry contact-motor

The option “AC-motor”, is applied to driver of AC power.

The option “Dry contact-motor”, is applied to driver of dry contact control.

Parameter “If bus recovery, position is”

The parameter is used to set the position where shutter moves, after the output on bus recovery. Options:

Unchange

Up

Down

Stop

If the option “Unchange” is set, the output contacts remain in their current position.

If the option “up” is set, the Shutter is moved to the top after bus voltage recovery.

If the option “down” is set, the Shutter is moved to the bottom after bus voltage recovery.

If the option “stop” is set, if the shutter is moving, it will be stopped after bus recovery.

All output contacts are opened after bus voltage recovery.

Note: If after programming or bus voltage recovery, the Shutter actuator does not detect the current position of the Shutter. The communication objects “Shutter position [0…100%]” and “Louvre position [0…100%]” have the default value “50%” and are not sent on the bus.

If after programming or bus voltage recovery a defined position of the Shutter is required for the first time, it is first of all raised to the top or dropped to the bottom (toward near the target location moving) to determine the current position and then into the target position. Only the Shutter finish a full running can confirm position.

Parameter “If bus failure, position is”

The parameter is used to set the position where shutter moves after on bus voltage failure. Options:

Unchange

Up

Down

Stop

If the option “Unchange” is set, the output contacts remain in their current position.

If the option “up” is set, the Shutter is moved to the top after bus voltage failure.

If the option “down” is set, the Shutter is moved to the bottom after bus voltage failure.

If the option “stop” is set, if the shutter is moving, it will be stopped after bus voltage failure.

Note: Before the power-down, the curtain is running, and in power-down it is required to perform a reverse operation, then this operation will not be implemented, but to maintain the current running state.

Parameter “After reference movement, Position is”

This parameter specifies how the Shutter actuator behaves after a reference movement.
Options:

Disable

No reaction

Move to save position

If the option “disable” is selected, the reference movement is deactivated, other option is selected, and the communication object “reference movement” appears.

If the option “no reaction” is selected, the object receives a telegram “0”, the Shutter is moved to the top; the object receives a telegram “1”, the Shutter is moved to the bottom.

If the option “move to save position” is selected, the object receives a telegram “0”, the Shutter is moved to the top, then back to its original position; the object receives a telegram “1”, the Shutter is moved to the bottom, then back to its original position.

The Shutter actuator continually determines the current position of the Shutter as well as the angle position of the slat using the duration of individual movements. Over longer periods, slight inaccuracies may occur when determining the position due to temperature variations and aging processes. Therefore the Shutter actuator uses the upper and lower limit positions to clearly define the current position of the Shutter. Each time that the Shutter is in the upper or lower limit position, the position is updated in the memory of the Shutter actuator.

If the limit positions have not been reached during normal operation, a reference movement can be triggered via a bus telegram to move the Shutter right to the top or right to the bottom. Depending

on the parameter settings, the Shutter either remains in the reference position after the reference movement or moves back into the saved position.

Parameter "Position of slat after arriving on lower end position"

The parameter can set the slat positions of slat after the lower end position is reached. Options:

0%/10%/…/90%/100%

For example, if select "40%", when the object "Shutter UP/DOWN" receives a telegram "1", the shutter will move to the lower end position, then the slat positions are adjusted to 40%.

Note: the parameter only relates to the "Down"reaction (the parameter option with"Down"), the safety operation and the percentage value control way are not affected for the parameter.

Parameter"When blind is under end position, up/down object function is"

The parameter defines whether the blind still can be moved via the object "shutter/blind up/down" when the blind is under end position. Options:

Disable

Enable

If select "Disable"，It can not be moved.

If select "Enable"，It can be moved，and the running time is the total move time.

Parameter "Set response mode for position"

The parameter defines the response mode for shutter position. Options:

Respond after read only

Respond after change

If select"Respond after read only",only when the device receive the current shutter position from other bus devices or the bus read the current shutter position,object "Shutter position status/slat position status"send the information of shutter position to the bus.

If select"Respond after change", when the shutter position changes, object "Shutter position status/slat position status"send the telegram to the bus, so as to report the shutter position.

Parameter"Central function of channel"

The parameter sets whether the central control of the channel is enabled. Options:

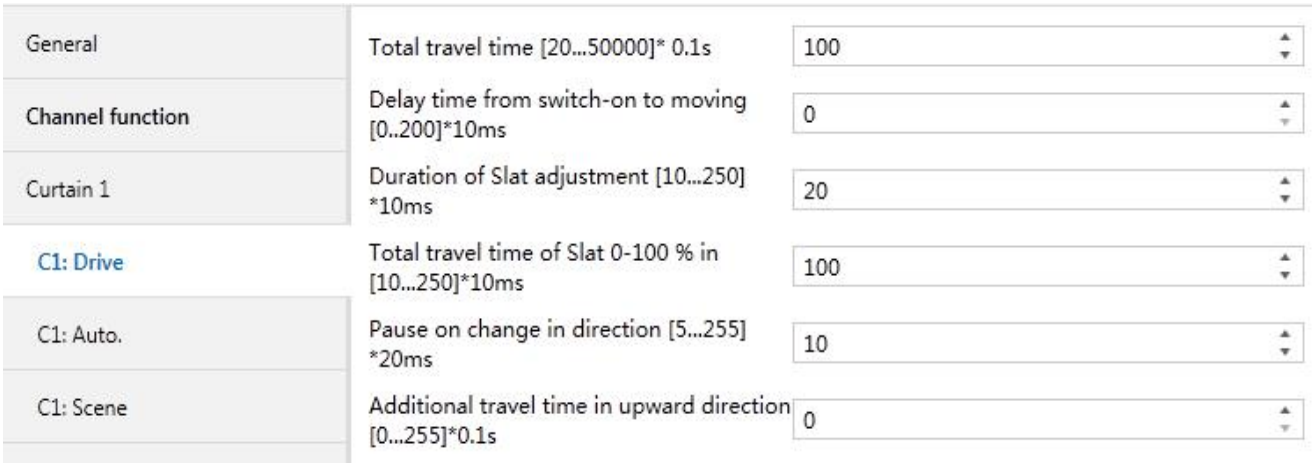
Disable

Enable

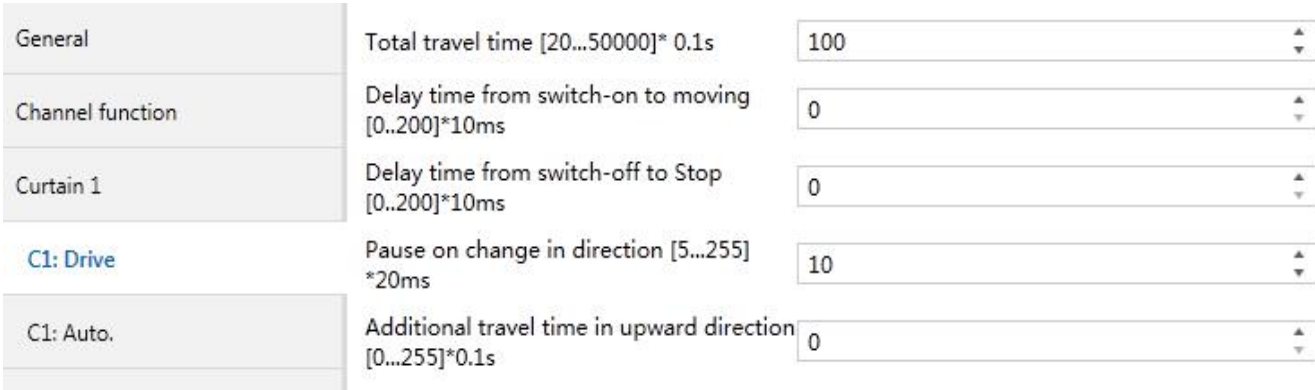
If enable，the channel can be controlled via the object "Central control for Up/Down" and "Central control for Slat/Stop".

4.4.1.1 Parameter window “Cx: Drive”

Parameter window “Cx: Drive” setting interface is shown in fig. 4.14. Here set the relevant parameters with the Shutter drive. The current position of the Shutter can be usually calculated based on the total move time. The duration of slat adjustment and total move time of slat can calculate the current position of slat. The technical data and running time are different for different Shutter. It is therefore important to know its technical data and running time before using the Shutter. It is the only way that the relevant parameters can be set precisely for the Shutter actuator.



Venetian Blind type (with louvers)



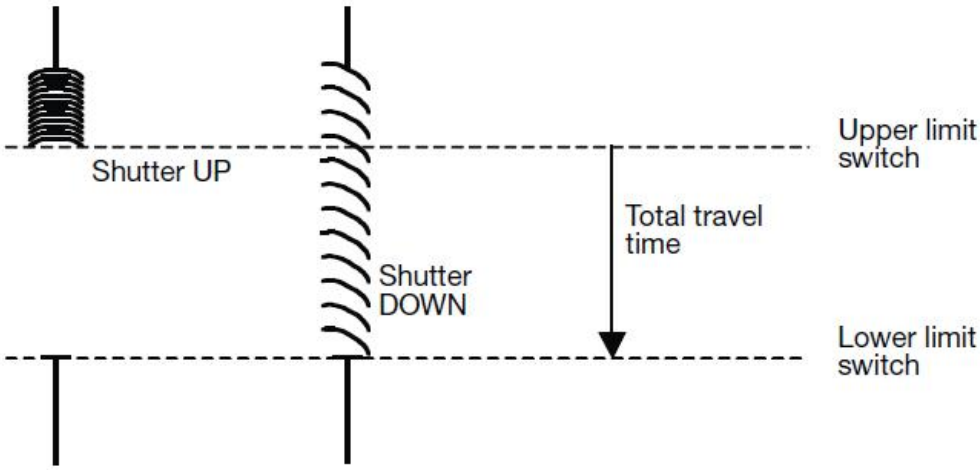
Shutter type（without louvers）

Fig. 4.13 Parameter window “Cx: Drive”

Parameter "Total travel time [20...50000]*0.1s"

This parameter sets the time required for the shutter to move the total stroke.

The total travel time is the time it takes for the blind to move from the highest position to the lowest position (as shown below). When the louver actuator receives a command to move up or down, the louver moves according to the required direction until the louver receives a command to stop moving, or until it moves to the highest or lowest position, then the louver passes through itself The limit switch turns the motor off. If the blinds are closed by the motor, the corresponding output of the connected actuator is still closed and the output connection will only be disconnected if the set total travel time has elapsed.



Note: The current position of the blinds during operation is estimated by the total travel time of the movement, so it is important to measure and set the total travel time as accurately as possible, especially in the "mobile positioning" and "state response". In this case, the only way to accurately calculate the current position of the blinds is.

Parameter "Delay time from switch-on to moving [0..200]*10ms"

This parameter sets the delay time for the curtain/louver to start running, that is, after receiving the control command, after the relay contact is closed, the curtain will start to slide, that is, the start buffer time of the motor. Options: **0..200**

The setting of this parameter needs to be considered in conjunction with the starting technical characteristics of the curtain.

Parameter "Delay time from switch-off to Stop [0..200]*10ms"

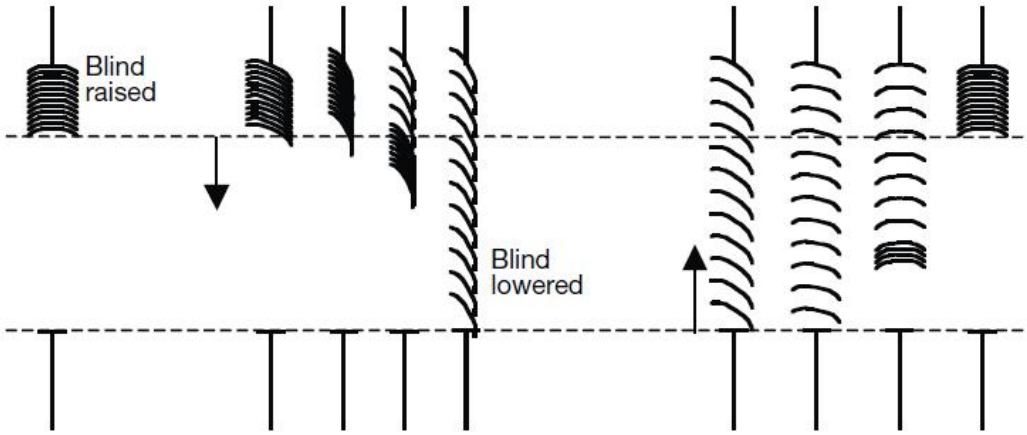
This parameter is only visible in the "Shutter" type. It sets the delay time for the curtain to stop. It is the inertia time that the curtain will still slide after the relay contact is disconnected, that is, the motor is powered off. Options: **0..200**

The setting of this parameter needs to be considered in conjunction with the technical characteristics of the curtain.

Parameter "Duration of slat adjustments [10…250]*10ms"

This parameter sets the Shutter angle adjustment time, that is, the time when the louver angle is adjusted when a command to adjust the angle up or down is received. The shorter the time, the more accurate the angle is adjusted.

After the shutter moves up, the shutter angle is usually open. If the shutter is lowered now, the louver angle is first closed and then the shutter moves downward. If the blinds are now rising again, the louver angle first opens and then rises. (As shown below)



Parameter "Total travel time of slat 0…100% in [10…250]*10ms"

Here shutter angle adjustment is provided from the fully closed state to the fully opened state of the overall travel time required, the current position of the shutter during angular adjustment is determined by this parameter. Therefore, it is very important to measure and set the total travel time of the shutter adjustment as accurately as possible. Especially in the case of "shutter angle positioning" and "state recovery", the only way to accurately calculate the current position of the louver is.

When the louver angle is adjusted by the object "Slat adj./Stop", the maximum number of times the louver angle needs to be adjusted from the fully closed state to the fully open state = the total travel time of the louver angle adjustment / the one adjustment time. The adjustment time of one time is set by the previous parameter. The shorter the set time, the more the adjustment will be, and the more accurate the angle.

Parameter "Pause on change in direction [5…255]*20ms"

This parameter is used to set the time to pause when the direction of movement or angle adjustment is changed. The pause time when the direction is changed needs to be considered in

conjunction with the technical data provided by the manufacturer of the drive unit to obtain an appropriate value. Steering can prevent the blind drive from damaging when it suddenly changes direction, extending the life of the drive.

Parameter "Additional travel time in upward direction [0..255]*0.1s"

This parameter is used to set an additional movement time when the curtain is moved up to the limit position. If the position does not reach the top, the travel time does not increase. In another case, after reaching the limit position of 0%, the steering is performed and moved to the target position (such as shifting), and the moving travel time is also increased.

Note: The extreme position here means that the curtain position is 0%, as long as it reaches this position, it will increase the moving travel time of the upward movement.

4.4.1.2 Parameter window "Cx: Auto."

The parameter window "Cx: Auto." setting interface is shown in Figure 4.14. Here, the automatic function and sun protection operation are mainly set. The louver actuator positions the louver based on the intensity of the light sensed by the illuminance sensor. For example, when the sun is very weak or there is no light coming through the window, the blinds/curtains can be raised to allow as much light as possible to enter the room. If there is strong sunlight outside the window, you can lower the blinds/curtains and adjust the louver angle so that direct light does not penetrate into the room, while the shutters are partially open to allow some diffuse light to enter the room.

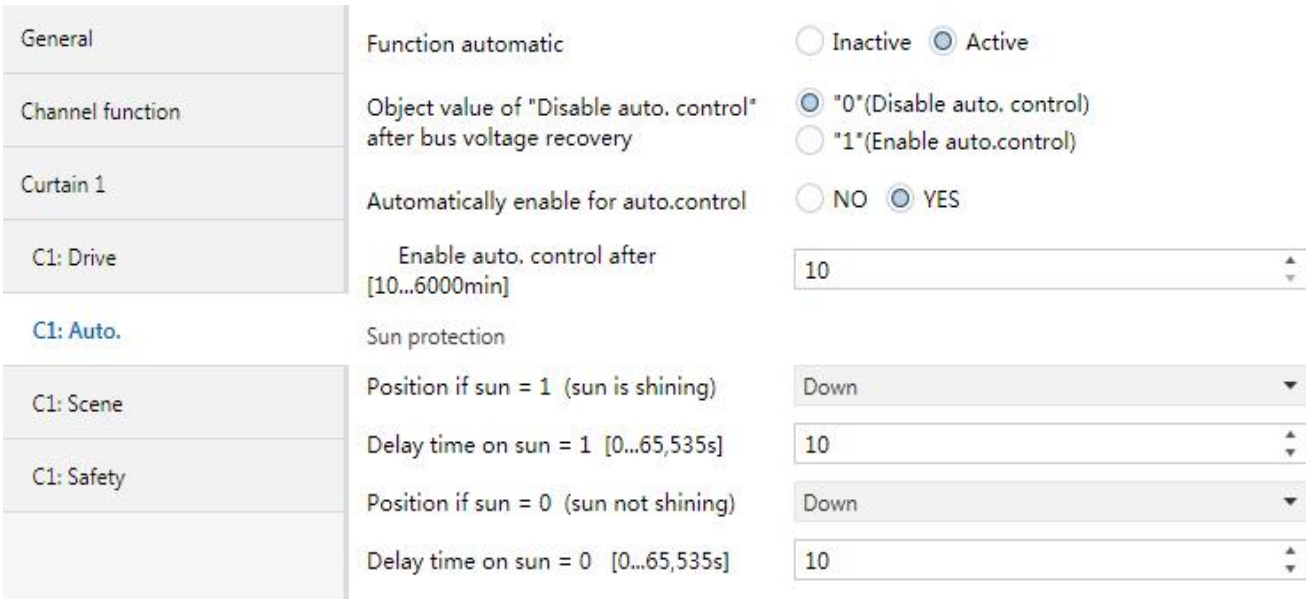


Fig. 4.14 Parameter window "Cx: Auto."

Parameter " Function automatic"

Set whether to activate the automatic control operation, that is, the automatic sun protection function. Options:

Inactive

Active

When the option is "Active", the following parameters are visible, the objects "Enable auto. control", "Sun operation", "Sun: Shutter position [0...100%]" and "Sun: slat adj.[0...100 %]"visible.

When the object "Enable auto. control" receives the message "1", the operation of the blinds switches to automatic operation; when the object "Enable auto. control" receives the message "0" or the user sends a direct move command (such as Up/down, moving to a certain position, etc. These commands cause the blinds to move; if the scene is saved, these commands that are not directly moved will not cause the operation state to exit the automatic operation), and the operation state exits the automatic operation. Switch to normal operation. The priority of normal operation and automatic operation is the same, but they cannot happen at the same time.

Note: After the automatic operation exits, the message "1" must be received again via the object "Enable auto. Control" or the duration of the automatic activation has elapsed (see the parameter "Enable auto. Control after [10...6000min]" below for details). Description), in order to enter the automatic operation again.

Parameter"Object value of 'Disable auto. control' after bus voltage recovery"

This parameter defines the initial value of the object "Enable auto. Control" after a bus reset. Options:

“0” (Disable auto. control)

“1” (Enable auto. control)

When the option is "0", the initial value of the object "Enable auto. Control" is 0, indicating that automatic operation is not enabled after the bus reset;

When the option is "1", the initial value of the object "Enable auto. Control" is 1, indicating that automatic operation is enabled after the bus reset.

Parameter"Automatically Enable for auto. control"

This parameter defines whether automatic reactivation can be performed after the automatic operation exits via normal operation or the object "Dis. Auto. control". Options:

No

Yes

Select "yes" and the following parameters are visible.

-- Parameter"Enable auto. Control after [10…6000min]"

This parameter defines the duration of the automatic activation of the automatic operation, that is, when the automatic operation is exited by a normal operation or an object, the automatic operation is activated again after the preset time of this parameter has elapsed.

If the automatic operation is interrupted by the object "Enable auto. Control" or normal operation during this time, the duration of the automatic activation is re-timed.

Note: The safe operation has the highest priority. In the case of safe operation activation, the automatic operation cannot be activated automatically. The automatic activation duration will not start until the safety operation is canceled.

Parameter "Sun protection:"

-- Parameter"Position if sun= 1 (Sun is shining) "

In the case where the sun is set here, the position of the louver, that is, the position at which the louver is moved when the object "Sun operation" receives the message "1", activates the sun protection. Options:

No reaction

Up

Down

Stop

Receive 1 byte value

If the option is "no reaction", the object "Sun operation" will maintain the current running state when it receives the message "1". If it is not running yet, it will not run. If there is currently running, it will continue to run.

If the option is "Receive 1 byte value" and the object "Sun operation" receives the message "1", the position of the blind is determined by the object "Sun: Shutter position [0...100%]" and "Sun: slat adj. [0 ...100%]" The received value determines that after the bus reset or programming, the values of these two objects are undefined, the default value is "130" (51%), only when they receive the value, can be determined The location, and any operational status, the values they receive are saved, including in the higher priority protection operation state.

-- Parameter"Delay time on sun= 1 [0…65535s]"

This parameter is used to set the delay time, that is, when the object "Sun operation" receives the message "1", the time when the shutter actuator delays the execution of the action is mainly to prevent the shutter actuator from frequently moving due to the fluctuation of the illumination. Make

the device easy to damage and affect the life of the blind motor. Options: **0...65535 s**

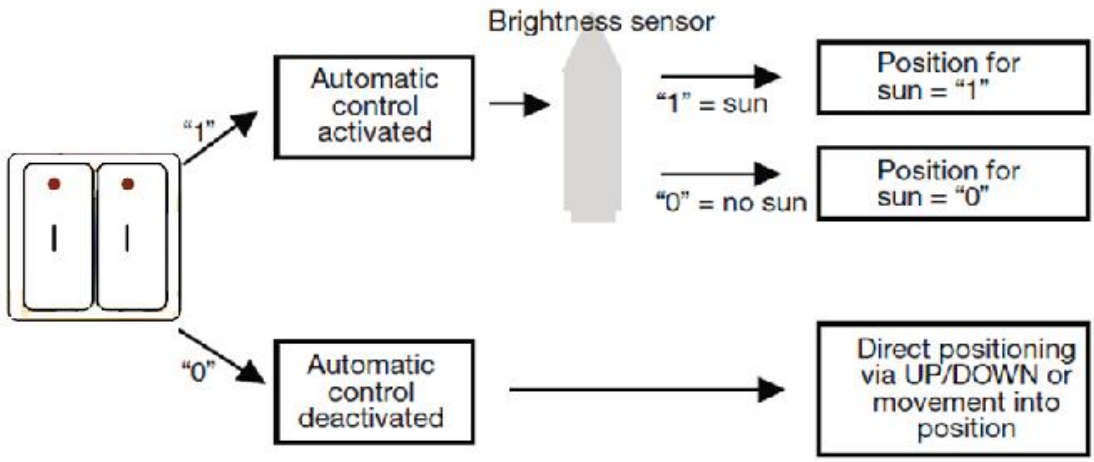
-- Parameter“Position if sun= 0 (Sun not shining) ”

This parameter is similar to the previous one. The difference is that the location of the blinds when the object "Sun operation" receives the message "0" and the sun protection are canceled.

-- Parameter“Delay time on sun= 0 [0…65535s]”

This parameter is used to set the delay time, that is, when the object "Sun operation" receives the message "0", the time when the shutter actuator delays the execution of the action is mainly to prevent the shutter actuator from frequently moving due to the fluctuation of the illumination. Make the device easy to damage and affect the life of the blind motor. Options: **0...65535 s**

Here's a simple automatic sun protection system:



The illuminance sensor senses the intensity of the external light, the button can be switched on, or other control switches on the bus can be used.

Through the second switch of the button, the user can specify whether to enable the automatic sun protection function, or by manually controlling the blinds, if the automatic sun protection is activated by the switch, the blinds will automatically move until the automatic sun protection is disabled through the same switch, or the user sends a direct movement The command (up/down, or move to a location), the auto function is therefore disabled.

The shutter actuator receives information from the illuminance sensor to indicate if there is direct illumination outside the window. Once the adjustable delay has elapsed, the actuator will adjust the blinds according to the set position.

4.4.1.3 Parameter window “Cx: Scene”

The parameter window “Cx: Scene” setting interface is shown in Figure 4.15. The main setting scene is here. Each scene can be set with 8 scenes at the same time. Different scenes can define different louver positions and louver angles.

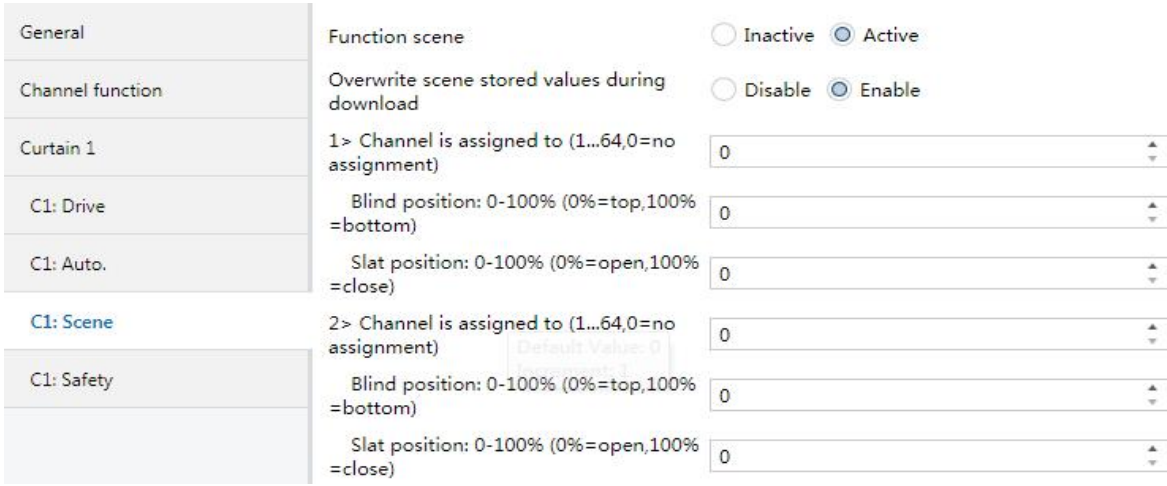


Fig. 4.15 Parameter window “Cx: Scene”

Parameter "Overwrite scene stored values during download"

This parameter sets whether to override the scene save value during application download. Options:

Disable

Enable

Disable: Disabled. During the application download, the saved scene values are not overwritten by the parameter setting scene. When the scene is called, the scene saved before the download is still enabled until it is replaced by the new storage scene.

Enable: Enable. During the application download, the saved scene values will be overwritten by the parameter setting scene. When the scene is called, the scene will be set according to the parameters until it is replaced by the new storage scene.

Parameter "Channel is assigned to (1...64 ,0= no assignment)"

The shutter actuator can be assigned 64 different scene numbers per output. Each output can be set to 8 different scenes at the same time. Options: **Scene 1... Scene 64 , 0=no assignment**

Note: The effective scene number in the parameter setting option is 1~64, and the corresponding message is 0~63. When the bus is powered off, the new scene will be saved and when it is powered up again, the new scene will be called.

--Parameter “Shutter position: 0…100%(0%=top,100%=bottom)”

This parameter sets the position of the blind when the scene is called: **0…100%，0%=top, 100%=bottom**

--Parameter “Slat position: 0…100%(0%=opened,100%=closed)”

This parameter sets the angular position of the louver when the scene is called: **0…100%，0%=opened, 100%=close**

4.4.1.4 Parameter window “Cx: Safety”

The parameter window “Cx: Safety” setting interface is shown in Figure 4.16. Here, the safety operation function of the blinds is mainly set.

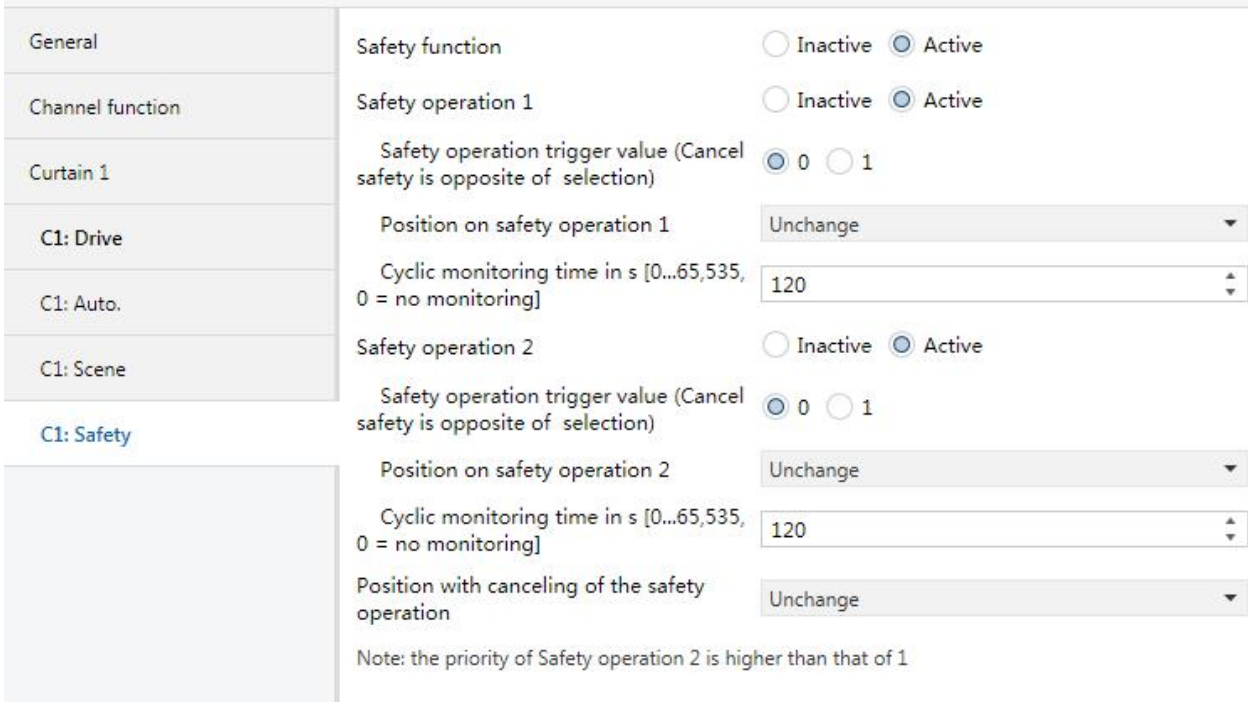


Fig. 4.16 Parameter window “Cx: Safety”

In this interface, the action that the blinds should perform after the safe operation function of each output is triggered is set. The settings for each channel are relatively independent and do not affect each other.

Parameter "Safety operation 1/2 "

This parameter is used to set whether to activate the safe operation function of the blinds. Options:

Inactive

Active

When "Inactive" is selected, the security operation function will not be activated;

If "Active" is selected, the safety operation function is activated, the following parameters will be visible, the trigger condition can be set for the safety operation function, and the corresponding communication object "Safety operation 1/2" will be enabled.

Parameter "Safety operation trigger value (Cancel safety is opposite of selection)"

This parameter is used to set the trigger value for the safe operation function of the blinds. Options:

0

1

When set to “0”, if the communication object “Safety operation 1/2” receives a message with a logic value of “0”, the security operation will be triggered. When the message “1” is received, the security operation will be canceled. At this time, the monitoring period of the safe operation function is reset;

When set to "1", if the communication object "Safety operation 1/2" receives a message with a logic value of "1", a security operation will be triggered. When the message "0" is received, the security operation is canceled. At this time, the monitoring period of the safety operation function is reset.

Parameter “position on safety operation 1/2”

This parameter sets the action that the blinds perform after the safe action is triggered. Options:

Unchanged

Up

Down

Stop

Parameter "Cyclic monitoring time in s[0..65535, 0=no monitoring]"

This parameter sets the monitoring period of the safety operation function, and the monitoring period should be at least twice as large as the cyclic transmission message period of the sensor. In order to prevent the missing sensing signal when the bus is busy, the blinds/curtains are moved to the safe operation position. . If the value of this parameter is set to "0", it means that the monitoring of the safe operation is not activated, and it can be directly controlled by the object of the safe operation.

During the set monitoring time, the object "Safety operation 1/2" does not receive the message to cancel the safety operation, it will trigger the safe operation function of the blinds/curtains, and the blinds/curtains will perform the action after the safety operation is triggered.

Parameter "Position with canceling of the safety operation"

This parameter sets the action that the blinds perform after the safe operation is canceled. Options:

Unchanged

Up

Down

Stop

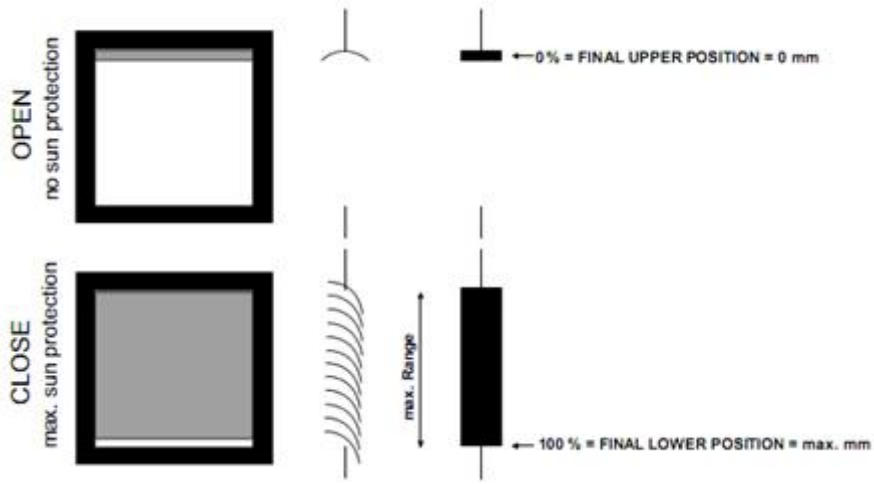
This action will only be performed if a safe operation is performed, a cancel command is executed, and all security operations on this channel are canceled, otherwise it is not executed.

The safety function of the blinds/curtains has a higher priority than other functions. If the safe operation function of a certain output is activated, the other operations of this output will be prohibited, and the safety 2 priority is higher than safety 1.

4.4.2 Parameter “Curtain X: Shutter”

The parameter window "Curtain X:Shutter" mode of operation of the shutter actuator is similar to the parameters and communication objects of the "Venetian Blind" mode of operation, and the functions are similar. The difference is that there is no function to adjust the louver angle in the "Shutter" mode. The "Shutter" mode only involves the movement of the curtains and does not have louvers.

The difference between "Shutter" and "Venetian Blind" is as follows:



Venetian Blind Shutter

The "Shutter" working mode is not introduced here. The function can refer to the "Venetian Blind" working mode (except for the louver adjustment function).

4.5 Shutter (DC) outputs

The curtain (DC) output has a maximum of 6 output channels, since the parameters and communication objects assigned to each output are the same as those of the curtain (AC) output, except that the parameters are not selected by the "Motor type" drive type. The parameter interface is shown in Figure 4.17.

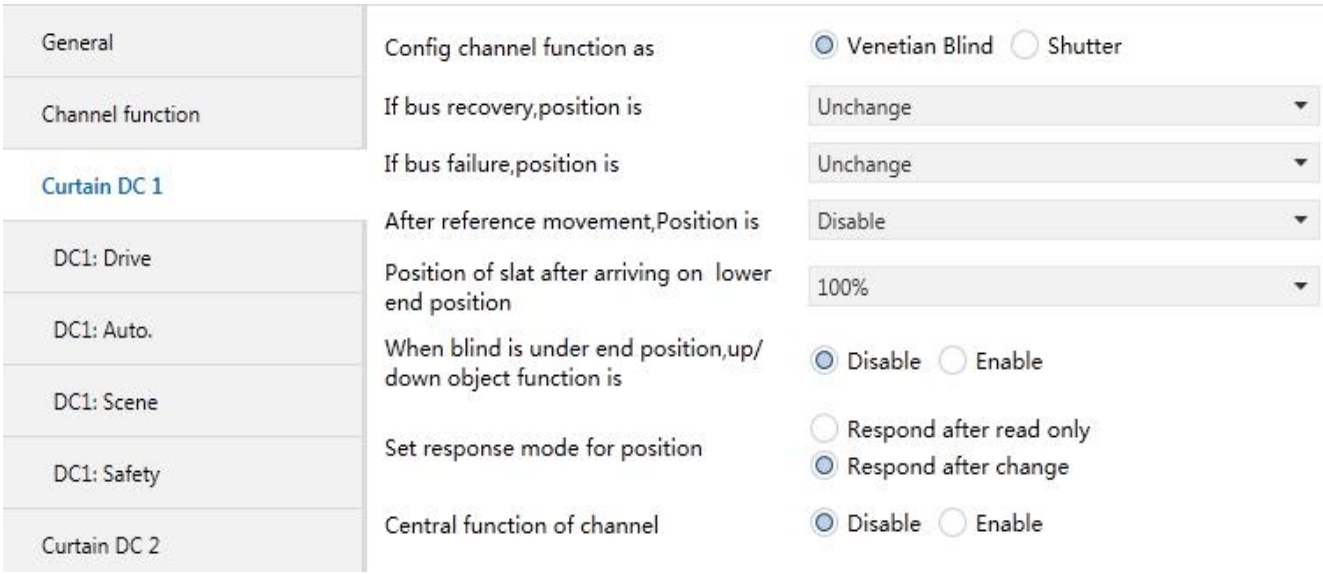


Fig. 4.17 Parameter window “Curtain DC X”

The parameter function of the curtain (DC) output is no longer introduced here. The parameter function can be referred to the curtain (AC) output.

4.6 Fan coil outputs

The fan output has a maximum of 6 output channels. Since the parameters and communication objects assigned to each output are the same, an output is taken as an example.

4.6.1 Parameter window “Fan type -- One level”

The parameter window “Fan type -- One level” setting interface is shown in Figure 4.18. Here, the parameters of the level 1 fan are set. The parameter settings are as follows:

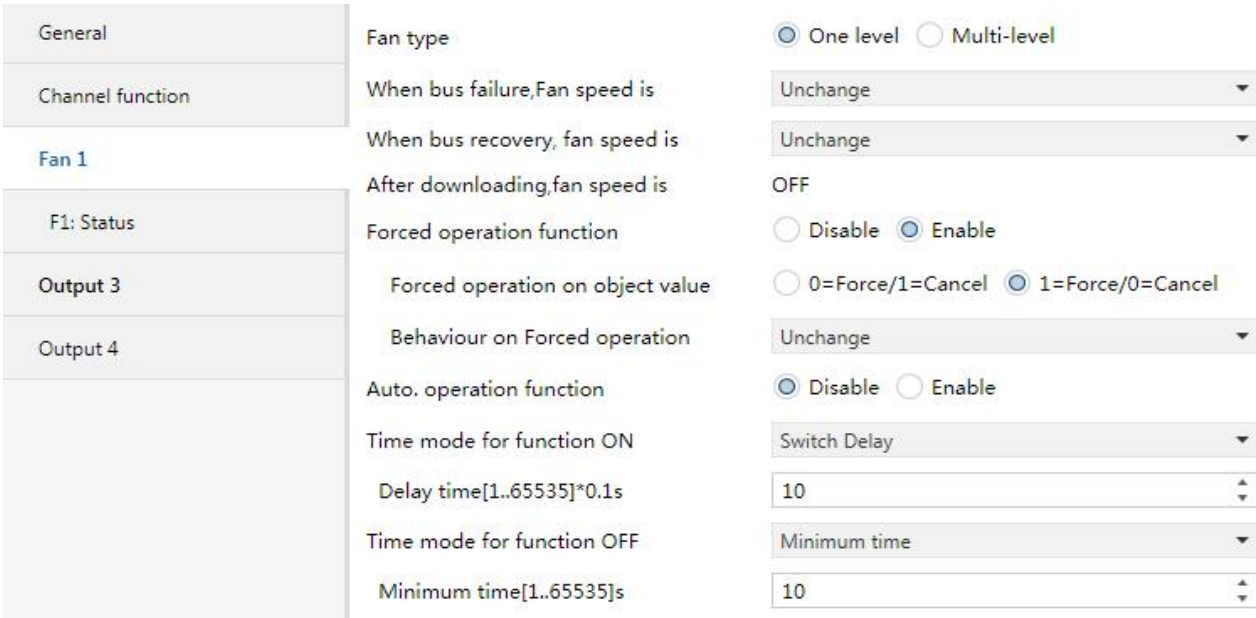


Fig. 4.18 Parameter window “Fan type -- One level”

Parameter“Fan type”

This parameter defines the type of fan to be controlled. Options:

One level

Multi-level

One level: can control the fan with 1 wind speed;

Multi-level: A fan that can control wind speeds of up to 3 levels, optional 2 or 3.

Parameter“When bus failure, Fan speed is”

This parameter sets the action of the fan when the bus is powered down. Options:

Unchange

OFF

ON

Parameter"When bus recovery, Fan speed is"

This parameter defines the action of the fan after the bus voltage is restored. Options:

Unchange

OFF

ON

As before as bus fail

Unchange: The status does not change;

OFF: The fan is turned off;

ON: The fan is turned on;

As before as bus fail: The state before the bus was powered down.

Note: Before connecting the fan, in order to obtain a defined fan switch status, it is recommended to connect the bus voltage first to avoid the possibility of fan damage due to incorrect connection.

Parameter"After downloading, fan speed is"

This parameter notes that the fan will be turned off after the application programming is complete.

Parameter"Force operation function"

This parameter is used to enable forced operation. Options:

Disable

Enable

Select "Enable", the 1-bit communication object "Forced operation" is visible, the following two parameters are also visible, used to set the activation value of the forced operation and the action of the forced operation.

-- Parameter"Forced operation on object value "

This parameter sets the value of the message used to activate the forced operation. Options:

0=Force/1=Cancel

1=Force/0=Cancel

0=Force/1=Cancel: When the object "Forced operation" receives the message value "0", the forced operation is activated. When "1" is received, the forced operation is canceled.

1=Force/0=Cancel: When the object "Fan Forced operation" receives the message value "1", the forced operation is activated. When "0" is received, the forced operation is canceled.

-- Parameter“Behaviour on Force operation ”

This parameter defines how the fan behaves when a forced operation is performed. Options:

Unchange

OFF

ON

Unchange: The wind speed of the fan remains unchanged

OFF: Turn off the fan;

ON: Turn on the fan.

The forced operation has the second highest priority, but is also affected by the minimum run time and delay switch set by the parameters below.

Parameter“Auto. operation function ”

This parameter is used to enable automatic operation of the fan. Options:

Disable

Enable

Enable: The parameter interface 4.19 is visible. At the same time, the following parameters will also affect the actions of automatic operation, such as delay switch and minimum running time.

Parameter“Time mode for function ON”

This parameter defines the run time of the fan. Options:

None

Switch delay

Minimum time

None: Execute immediately after receiving the control command of the blower;；

Switch delay: Delayed opening of the fan, ON action after reset, will also be delayed to open, the delay time is set by the following parameter "Delay time [1...65535] * 0.1s". If the fan object "Fan speed" receives the message "1" multiple times in succession, the delay time is timed according to the actual situation, instead of counting from the last received message time;

Note: The ON action after resetting also needs to consider this delay time. After the delay is completed, turn on the fan.

Minimum time: The minimum running time of the fan can only be turned off after this running time has elapsed. The minimum running time is set by the parameter "Minimum time [1...65535]s". If a message to turn off the fan is received during the minimum running time, then it is necessary to wait until the period has passed before the action of turning off the fan is performed.

-- Parameter“Delay time [1…65535]*0.1s”

This parameter defines the time at which the fan is turned on after a delay. Options: **1...65535**

-- Parameter“Minimum time [1…65535]s”

This parameter defines the minimum run time after the fan is turned on. Options: **1...65535**

Parameter “Time mode for function OFF”

This parameter defines the off time of the fan. Options:

None

Switching delay

Minimum time

None: Execute immediately after receiving the control command to turn off the fan;

Switch delay: Delay off the fan, the OFF action after reset, will also be turned off after the delay, the delay time is set by the following parameter "Delay time [1...65535] * 0.1s";

Minimum time: The wind is removed for the shortest time. Only after this time can the fan be turned on again. The minimum closing time is set by the parameter "Minimum time[1...65535]s". If a message of the blower is received during the shortest off time, then it is necessary to wait until the period has passed before the blower is executed. Note that the OFF action after reset is also the shortest time to consider.

-- Parameter“Delay time [1…65535]*0.1s”

This parameter defines the time for the fan to be turned off. Options: **1...65535**

-- Parameter“Minimum time [1…65535]s”

This parameter defines the minimum time that the fan is off. Options: **1...65535**

4.6.1.1 Parameter window “Fx: Auto.”

When the parameter window "Fx: Auto." setting interface in Figure 4.18 selects "Enable", the interface for automatic operation is visible. The interface of Figure 4.19 is used to set the automatic operation of level 1 wind speed, and the threshold can be defined. Automatically, the control value of the wind speed comes from the bus, and one control value or two control values can be set in the function parameters. For example, in the fan coil control system, only heating or cooling, at this time, the fan control only needs to set a control value. If there is heating in the system and there is cooling, then the fan control setting two control values will be more appropriate.

Normal operation and automatic operation cannot occur at the same time, that is, after the automatic operation is activated by the object "Automatic function", if there are other operations (such as normal operation, forced operation), the automatic operation will exit by itself, and the object "Automatic function" is required. Activated again, the object "Status Automatic" reports whether the automatic operating status is active.

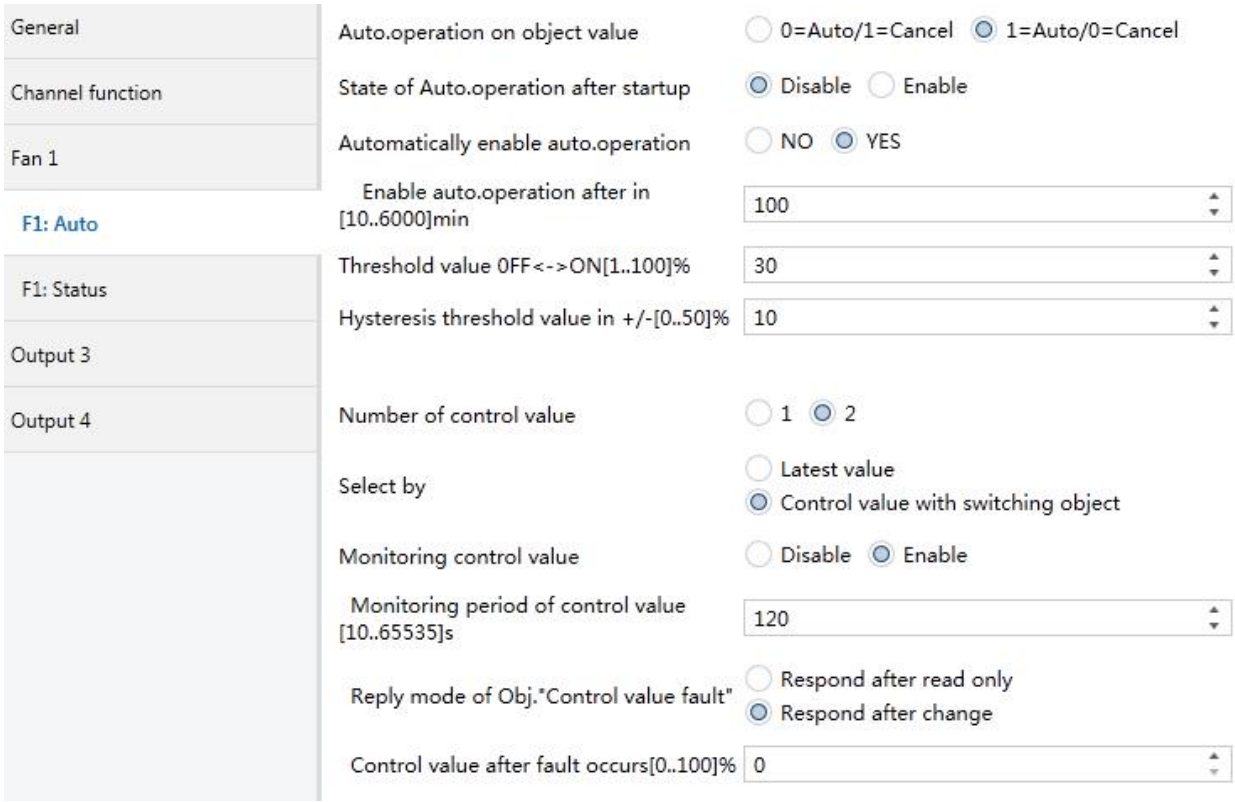


Fig. 4.19 Parameter window "Fx: Auto."

Parameter"Auto. Operation on object value"

This parameter sets the value of the message used to activate the automatic operation. Options:

0=Auto/1=Cancel

1=Auto/0=Cancel

0=Auto/1=Cancel: When the object “Automatic function” receives the message value “0”, it activates the automatic operation. When it receives “1”, it exits the automatic operation;

1=Auto/0=Cancel: When the object “Automatic function” receives the message value “1”, it activates the automatic operation. When it receives “0”, it exits the automatic operation.

Parameter"State of Auto. operation after startup"

This parameter sets whether automatic operation is enabled when the device starts up. Options:

Disable

Enable

Disable: After the device is started, the automatic operation is disabled by default.

Enable: After the device is started, the automatic operation is enabled by default.

Parameter"Automatically enable auto. operation"

This parameter sets whether the auto-enable feature of automatic operation is enabled. Options:

No

Yes

Yes: When enabled, the next parameter is visible.

When the normal operation exits the automatic operation, in the absence of any operation, the automatic setting returns to the automatic operation after the time set by the next parameter is reached.

-- Parameter "Enable auto. Operation after in[10..6000]min"

This parameter sets the time from automatic return to automatic operation from normal operation. Options: **10..6000**

Parameter "Threshold value OFF<->ON [1...100]%"

This parameter defines the threshold. The fan can automatically change its operating state according to the threshold range in which the control value is located. The control value is determined by the object "Control value". Options: **1...100**

If the control value is greater than or equal to the threshold set by the parameter, the fan is turned on;

If the control value is less than this threshold, the fan is turned off.

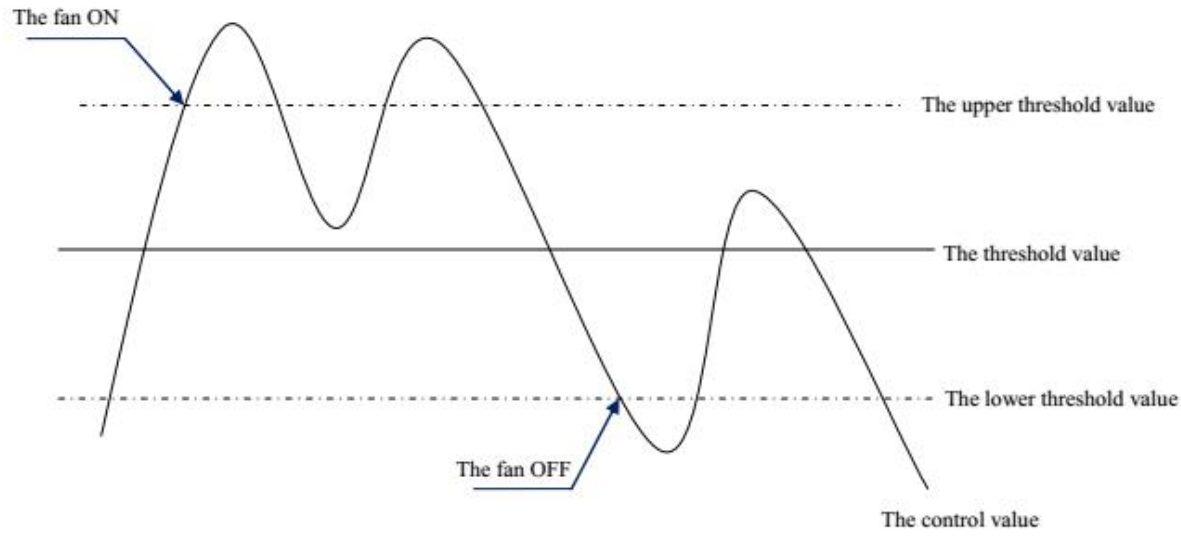
Parameter "Hysteresis threshold value in +/- [0...50]%"

This parameter sets the hysteresis value of the threshold. The hysteresis can avoid unnecessary action of the fan when the control value fluctuates near the threshold. Options: **0 ... 50**

If it is 0, there is no hysteresis. Once the control value crosses the threshold, the fan will switch immediately;

Assuming a lag value of 10 and a threshold of 50, there will be an upper threshold of 60 (threshold + lag value) and a lower threshold of 40 (threshold - lag value), then when the control value is between 40 and 60, it will not cause The action of the fan still maintains its previous state.

Only less than 40 will turn off the fan, and more than 60 will open the fan as shown below:



The following parameters in this subsection are descriptions of wind speed control values.

Parameter"Number of control value"

To set the number of automatic wind speed control values. Options:

1

2

1 control value: Only one control value can control the wind speed. Generally suitable for only heating, cooling, or 2 pipes fan coil control systems;

2 control values: There are two control values to control the wind speed. It is usually used in fan coil control systems that support both heating and cooling.

-- Parameter"Select by"

This parameter is visible when 2 control values are selected in the previous parameter, it is used to set the switching mode of the control value. Options:

Latest value

Control value with switching object

Latest value: The fan coil actuator will control the wind speed based on the latest control value received from the bus;

Control value with switching object: After selecting this option, the object "Switching control value1/2" is visible to switch the control value of wind speed, message 0 corresponds to control value 1, and message 1 corresponds to control value 2.

Note: When this option is selected, after the automatic operation is activated, it is necessary to enable the control value to be 1 or 2 first, then the received control value is valid. It does not respond to the received control value until it is clarified. The value received by the object "Switching control value1/2" is also logged when the automatic operation is not activated. However, the control value is valid only when it's received under automatic operation.

Parameter"Monitoring control value"

To set whether to enable monitoring of external control values. Options:

No

Yes

When "Yes" is selected, the following parameters are visible.

-- Parameter"Monitoring period of control value[10..65535]s

To set the monitoring period of external control value. If the control value is not received within this time, the device will consider the external controller error and the fan coil will output according to the control value set by the next parameter. Options: **10...65535s**

--Parameter"Reply mode of Obj. "Control value fault"1bit function"

To define the feedback method when the external control value is incorrect. Options:

Respond after read only

Respond after change

Respond after read only: The object "Control value fault" sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the fault status changes or the device receives a request to read the status, the object "Control value fault" immediately sends a message to the bus to report the current status.

-- Parameter"Control value after fault occurs [0..100]%"

When an error occurs in the external controller, the fan coil will output the wind speed according to the control value set by this parameter. Options: **0...100 %**

4.6.1.2 Parameter window “Fx: Status”

The parameter window “Fx: Status” setting interface is shown in Figure 4.20. This interface is used to set the status information of the fan operation.

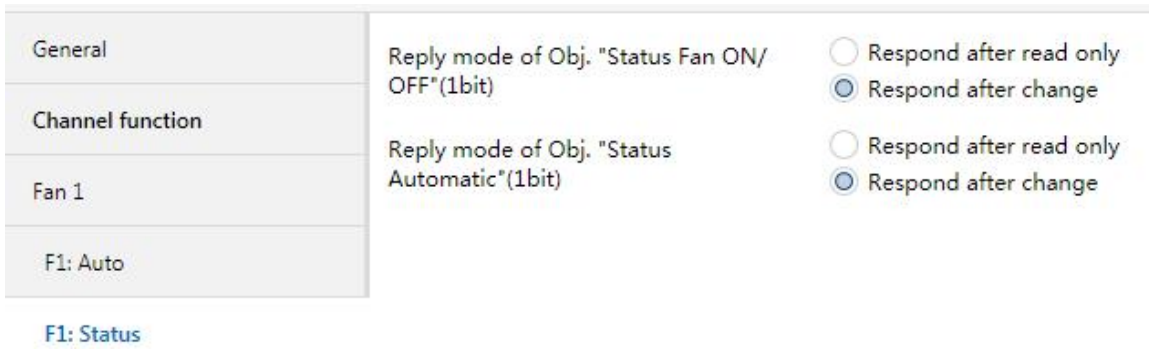


Fig. 4.20 Parameter window “Fx: Status”

Parameter “Reply mode of Obj. “Status Fan ON/OFF” (1bit)”

To define reply mode for the fan's operating status. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status Fan ON/OFF" sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the fan coil operation status changes or the device receives a request to read the status, the object "Status Fan ON/OFF" immediately sends a message to the bus to report the current status.

Parameter“Reply mode of Obj. “status Automatic”(1bit)”

This parameter is visible when the automatic operation is enabled, and defines the reply mode of the automatic operation status.

The object "Status Automatic" sends a message "1" to indicate that the automatic operation is activated, and "0" to indicate that the automatic operation is exited. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status Automatic" sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the automatic operation status changes or the device receives a request to read the status, the object "Status Automatic" immediately sends a message to the bus to report the current status.

4.6.2 Parameter window “Fan type -- Multi-level”

The parameter window “Fan type -- Multi-level” setting interface is shown in Figure 4.21. The parameter settings are as follows:

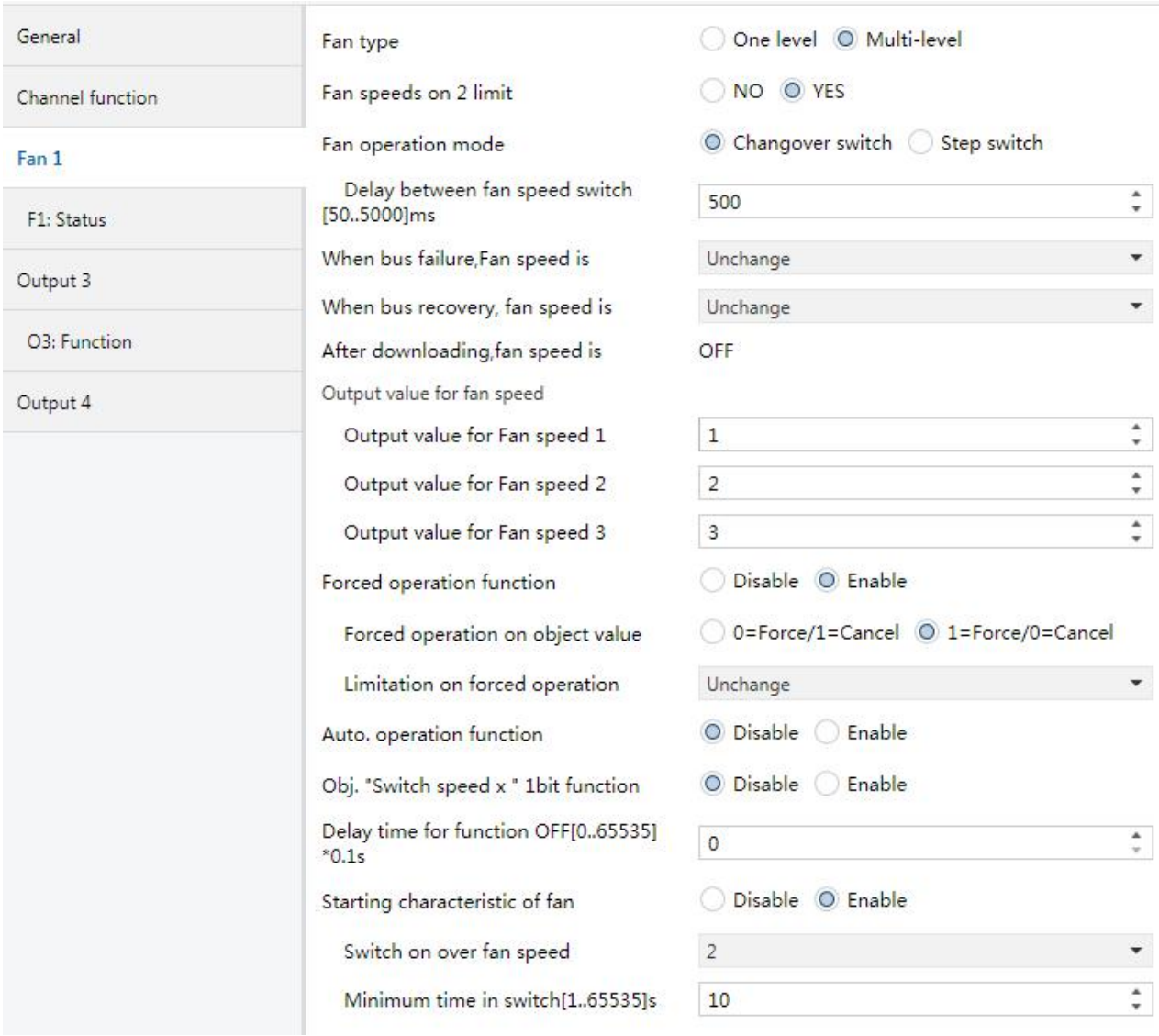


Fig. 4.21 Parameter window “Fan-two/three level”

The fan coil parameters of 2 level wind speed and 3 level wind speed are the same. When the wind speed is set to 3, the output wind speed is the same as 2.

Since there is no fan with only 1 wind speed as described in the previous section, there is no need to consider too many technical parameters. In the case of multiple wind speeds, not only the starting characteristics of the fan but also the operating mode of the fan like changeover switch or step switch etc. must be considered. Only when you know the technical characteristics of the fan, the parameters can be properly set.

Parameter "Fan speeds on 2 limit"

This parameter is only visible when the fan type is selected as"Multi level". It is used to determine whether to enable the 2 level wind speed or the 3 level wind speed. Options:

No

Yes

No: fan can control three level wind speeds;

Yes:The fan can control 2 level wind speed, the maximum wind speed can only reach 2, even if the parameter sets the 3 level wind speed. The communication object of wind speed 3 will be ignored.

Note: When the wind speed is limited to level 2, if the wind speed after power failure or reset is set to 3, it will not be executed, that is, the current state will be maintained.

Parameter "Fan operation mode"

This parameter defines the operating mode of the fan and needs to be considered in conjunction with the technical characteristics of the fan. Options:

Changeover switch

Step switch

Changeover switch: If it is a changeover switch, only the specified wind speed can be turned on, and the delay time and minimum dwell time of the switching wind speed can be set by parameters.

The minimum dwell time can only be set in the automatic mode. This type of control can switch the wind speed to any level, such as directly switching from the first level wind speed to the third stage wind speed, but in any case, the three channels have only one output.

Step switch: If it is a step switch, a single wind speed can be activated continuously until the desired wind speed is obtained, that is, the specified wind speed cannot be directly turned on. The minimum dwell time is also set only in the auto mode. Under this control type, the 3rd-level wind speed is equivalent to the superposition of three single-stage wind speeds. For example, when the 3rd-level wind speed is used, all three channels output simultaneously (such as Output 1&2&3). When the 2nd-level wind speed is used, 2 channels output at the same time (such as Output 1&2).).

Note: This parameter must be considered in conjunction with the technical parameters of the fan.

-- Parameter "Delay between fan speed switch [50…5000]ms"

This parameter is visible when the operating mode is selected as "changeover switch" and is used to define the conversion delay, which is a specific element of the fan and should be considered in all cases. Available options: **50...5000**

When a wind speed converted message is received, the wind speed conversion will be performed after the delay has elapsed. At the same time, to open the fan does not need to delay, but to close the fan needs to be delayed.

Parameter "When bus failure, Fan speed is"

This parameter notes the action of the fan when the bus is powered down. Options:

Unchange

OFF

1

2

3

OFF: Turn off the fan;

1, 2 or 3: The fan is turned on to wind speed 1, 2 or 3.

Note: If the wind speed is limited to 2, while the parameter selects 3, the wind speed after power failure will maintain the wind speed before power failure.

Parameter "When bus recovery, fan speed is"

This parameter defines the action of the fan after the bus voltage is recovered. Options:

Unchange

OFF

1

2

3

As before as bus fail

OFF: Turn off the fan.

1, 2 or 3: The fan is turned on to wind speed 1, 2 or 3.

As before as bus fail: The wind speed is the same as the speed before the bus is powered down.

Note: Before connecting the fan, in order to obtain a defined fan switch status, it is recommended to connect the bus voltage first to avoid the possibility of damage to the fan due to incorrect connections. If the parameter 3 is selected in the case of limiting the 2nd wind speed, the wind speed after the reset does not change.

Parameter "After downloading, fan speed is"

This parameter indicates to turn off the fan after the application is programmed.

Object value for fan speed

-- Parameter"Object value for Fan speed 1/2/3"

To define the object value to switch to each wind speed, that is, the value of the communication object "Fan speed--1byte". Options: 1..255

The object value "0" defaults to wind speed off.

Parameter" Force operation function"

To enable forced operation. Options:

Disable

Enable

Select "Enable", the 1-bit communication object "Forced Operation" is visible, and the following two parameters are also visible. It is used to set the activation value of the forced operation and the action that can be performed under the forced operation.

-- Parameter"Forced operation on object value "

To set the telegram value to activate the forced operation. Options:

0=Force/1=Cancel

1=Force/0=Cancel

0=Force/1=Cancel: When the object "Forced Operation" receives the message value "0", the forced operation is activated. When "1" is received, the forced operation is cancelled.

1=Force/0=Cancel: When the object "Forced Operation" receives the message value "1", it activates the forced operation. When it receives "0", it cancels the forced operation.

Note: During forced operation, the minimum operating time of wind speed for automatic operation still needs to be considered, except for the starting wind speed, as it has its own minimum running time.

Forced operation is not activated by default after bus reset or after programming.

-- Parameter“Limitation on force operation ”

To define the limitation fan speed under forced operation. Options:

Unchange

1

1, off

2

2, 1

2, 1, off

3

3, 2

3, 2, 1

Off

Unchange: The wind speed of the fan remains unchanged and maintains the current operating state;

1: Only wind speed 1 is operated;

1, off: Only wind speed 1 and shut down the fan can be operated;

2: Only wind speed 2 can be operated;

2, 1: Only wind speeds 1 and 2 can be operated;

2, 1, off: Only wind speed 1, 2 and shut down the fan can be operated;

3: Only wind speed 3 can be operated;

3, 2: Only wind speed 3, 2 can be operated;

3, 2, 1: Only wind speed 1, 2 and 3 can be operated;

Off: Only shut down the fan can be operated;

Note: In the case of forced operation activation, if the current wind speed is not within the allowable range, the wind speed will switch to the nearest allowable current wind speed. For example, the current wind speed is 1, and the allowed wind speed is 2 3, then when the forced operation is activated, the wind speed will automatically switch to 2, if the wind speed is adjusted to 1 by manual mode, the running wind speed will also be 2.

In another case, if the current wind speed is 0, the allowed wind speed is 1, 2, 3, and the starting wind speed is 3. When the forced operation is activated, the fan starts at wind speed 3 and then automatically switches to wind speed 1; if the current wind speed is 2, the allowed

wind speed is 1, 2, when a forced operation is activated, a wind speed 0 message is received, then the wind speed will switch to 1.In this case, the wind speed switches to the win speed near the target wind speed.

Parameter"Auto. operation function"

This parameter is used to enable automatic operation of the fan. Options:

Disable

Enable

Enable:The parameter interface 4.22 will be visible.

– Paeameter"Obj. 'Switch speed x' 1bit function"

Options:

Disable

Enable

Enable: Three 1-bit objects "Fan speed 1", "Fan speed 2" and "Fan speed 3" are visible.

When the object receives the message "1", the wind speed is turned on. When any object of the three objects receives the message "0", the fan is turned off.

If three objects continuously receive multiple ON/OFF messages in a short time, the fan speed will be controlled with the message value received by the last object.

Note: In normal operation mode, the minimum dwell time set by the parameter in automatic mode is ignored. Therefore, the response of the direct operation can be detected in time.

In order to protect the fan, the delay time of the wind speed switching is still valid. At the same time, when the forced operation is activated, it is necessary to consider the wind speed that can be operated under the force operation.

Parameter "Delay time for function OFF[0...65535]*0.1s"

This parameter defines the delay off time of the fan. For example, if the wind speed of the current fan is speed1 and the control message of the fan OFF is received, and the fan will maintain the current wind speed and start the delay counting. After the time defined by the parameter, the OFF operation will be executed.

Note: When the fan is running in automatic mode, this parameter is evaluated and executed only if the parameter "Minimum time in fan speed [0...65535]s" is 0.

Parameter "Starting characteristic of fan"

This parameter defines the starting characteristics of the fan, which is also a technical feature of the fan. Usually to ensure the safe start of the fan motor, it is better to start the fan motor at a higher wind speed when the fan is turned on, so that the fan motor obtains a higher torque during the starting phase. For example, the fans and floor fans used in our lives are usually started from the second-stage wind speed when the fan is turned on, and then switched to the minimum wind speed. Some fans start up similarly. Options:

Disable

Enable

Enable: The following two parameters are visible.

Note:

Since the startup feature is a technical feature of the fan, so the startup behavior has a higher priority than the forced operation.

If the fan itself has no starting characteristics, you can ignore the parameters related to the characteristic, just select "No".

For example, the starting wind speed is 3, the wind speed allowed for the forced operation is 2, and is currently in the OFF state. When a control message with a wind speed of 1 is received, the fan will be turned on at wind speed 3 and then turned to wind speed 2. The needed wind speed 1 will not run due to mandatory operating restrictions.

For the step switch type of fan, the starting characteristics are different. The step switch type fan is usually the continuous opening wind speed, and the changeover switch type fan is the direct opening wind speed. Therefore, when defining the parameters of the start-up characteristics, it is also necessary to consider the switch type of the fan.

The minimum dwell time for wind speed switching in automatic mode is only considered after the start-up phase, which is inactive during the start-up phase. The minimum dwell time for the wind speed on during the start-up phase can be set additionally, see the parameters below.

– Parameter "Switch on over fan speed"

This parameter sets the wind speed used by the fan when starts from the OFF state. Options:

1/2/3

When controlling the fan with 2-level wind speed, if the starting wind speed is set 3, the wind speed 2 is automatically applied.

However, in order to ensure the normal operation of the fan, when setting these parameters related to the characteristics of the fan, it is best to first understand these characteristics, and then set the parameters properly to avoid damage to the fan.

-- Parameter "Minimum time in switch[1..65535]s"

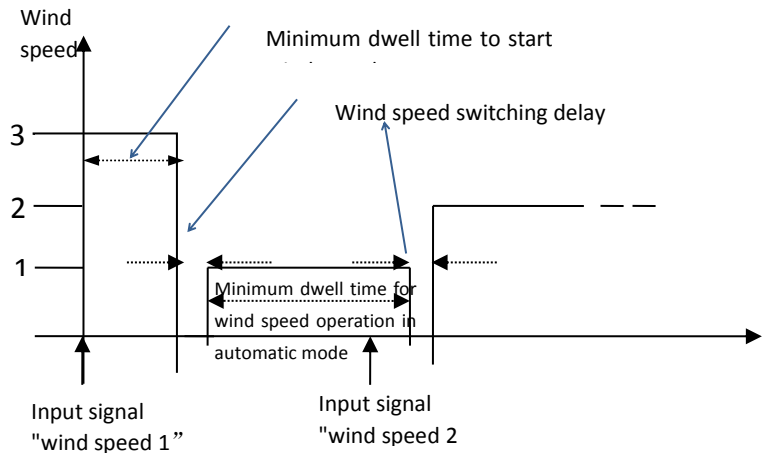
This parameter defines the minimum dwell time at which a certain wind speed is turned on during the start-up phase. Options: **1...65535**

When the fan is turned on, it starts at the starting wind speed first, and then switch to the target wind speed after the minimum dwell time expires. This target wind speed may be the wind speed of the fan after resetting or the wind speed triggered by other operations.

During the start-up phase, the delay time between the two wind speeds must also be considered.

Example: Starting characteristics of a fan with 3 wind speeds

Assume that the current state of the fan is off, the starting wind speed is level 3, the target wind speed is level 1, and the final wind speed is level 2, as shown in the following figure:



The above figure shows that if the fan is currently in the off state, when it receives a message of “Wind Speed 1”, it will start “Wind Speed 3”. After the minimum dwell time of the start wind speed is over, it switches the wind speed. The wind speed switching needs a delay time (this is a technical parameter of the fan, which is conducive to protect the fan), After the delay time expires, the fan switches to the target wind speed "wind speed 1", in the "wind speed 1" operation, if the fan receives a "wind speed 2" message, then you need to consider whether the automatic mode is activated. If the automatic mode is activated, you need to consider the minimum dwell time of the wind speed operation. If it is direct operation, you do not need to consider dwell time of the wind speed operation. After the delay time has elapsed, the fan runs at "Wind Speed 2".

4.6.2.1 Parameter window “Fx: Auto.”

When the parameter "Auto. operation function" in Figure 4.21 is selected as "Enable", the parameter interface of Figure 4.22 is visible.

This interface is used to set the automatic operation of multi-level wind speed, and the threshold can be defined. Under automatic operation, the wind speed control value comes from the bus, and the wind speed is determined according to the threshold range in which the control value is located.

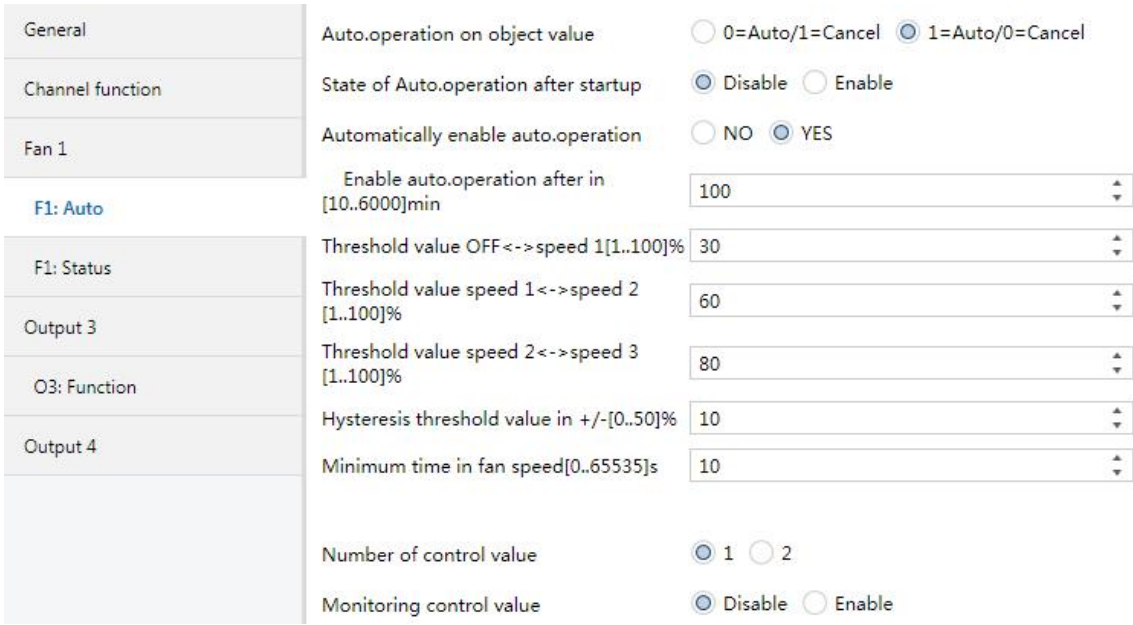


Fig. 4.22 Parameter window “Fx: Auto.”

Parameter “Auto. operation on object value ”

This parameter sets the value of the message used to activate the automatic operation. Options:

0=Auto/1=Cancel

1=Auto/0=Cancel

0=Auto/1=Cancel: When the object “Fan Automatic ON/OFF” receives the message value “0”, the automatic operation is activated. When “1” is received, the automatic operation is canceled.

1=Auto/0=Cancel: When the object "Fan Automatic ON/OFF" receives the message value "1", the automatic operation is activated. When "0" is received, the automatic operation is canceled.

Parameter “State of Auto. operation after startup”

This parameter sets whether automatic operation is enabled when the device starts up. Options:

Disable

Enable

Disable: After the device is started, the automatic operation is disabled by default.

Enable: After the device is started, the automatic operation is enabled by default.

Parameter "Automatically enable auto. operation"

This parameter sets whether the auto-enable feature of automatic operation is enabled. Options:

No

Yes

Yes: When enabled, the next parameter is visible.

When the normal operation exits the automatic operation, in the absence of any operation, the fan returns to the automatic operation after the time set by the next parameter is reached.

Parameter "Enable auto. Operation after [10..6000]min"

This parameter sets the time when returns to automatic operation from normal operation. Options: **10..6000**

Parameter "Threshold value OFF<–>speed 1 [1…100]%"

This parameter defines the threshold for turning off the fan and speed 1, options: 1...100%

If the control value is larger than or equal to the threshold set by the parameter, the running speed 1;

If the control value is less than this threshold, the fan is turned off.

Note: The fan determines the switch or wind speed of the fan based on the threshold range in which the control value is located. The following two parameters are similar.

Parameter "Threshold value speed 1<–>speed 2 [1…100]%"

This parameter defines the threshold for switching the wind speed to speed 2, and if the control value is greater than or equal to the threshold set by the parameter, then speed 2 is operated. Options: **1...255**

Parameter "Threshold value speed 2<–>speed 3 [1…100]%"

This parameter defines the threshold for switching the wind speed to speed 3, and if the control value is greater than or equal to the threshold set by the parameter, then speed 3 is operated.Options: **1...255**

Note: The controller evaluates these thresholds in ascending order, that is, first checks the threshold of OFF <-> wind speed 1, then wind speed 1 <-> wind speed 2, then wind speed 2 <-> wind speed 3. The correctness of function execution is only guaranteed in this case: OFF <-> wind speed 1 threshold is less than wind speed 1 <-> wind speed 2 threshold, wind speed 1 <-> wind speed 2 threshold is less than wind speed 2 <-> wind speed 3 Threshold.

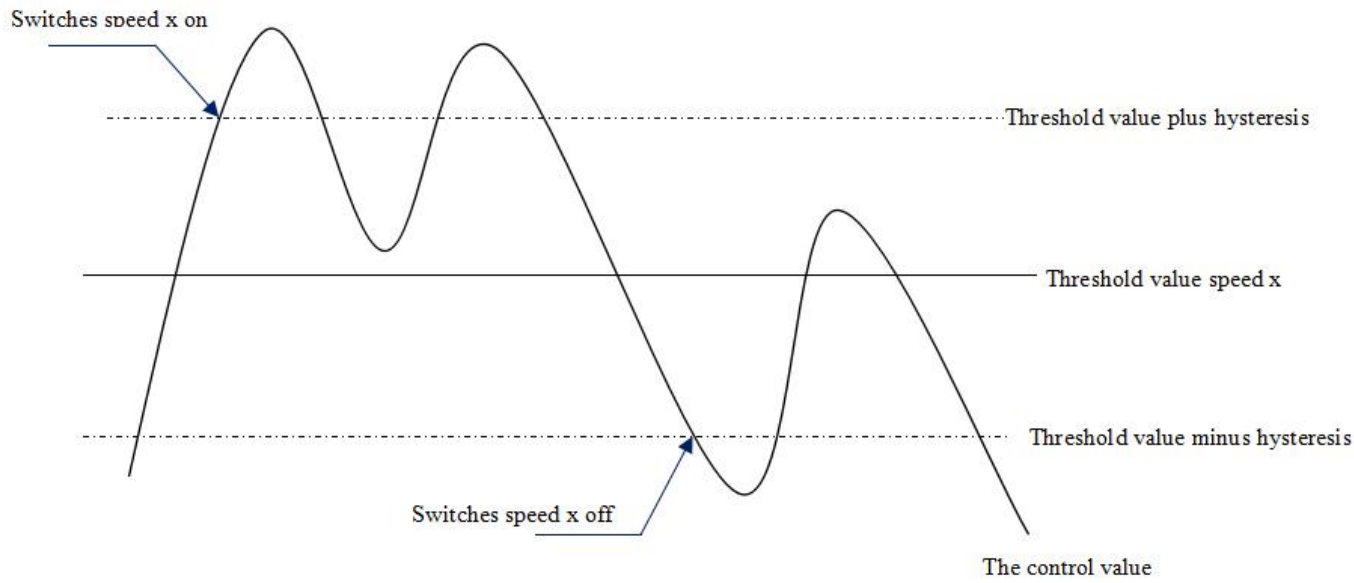
-- Parameter "Hysteresis threshold value in +/- [0...50]%"

This parameter sets the hysteresis value of the threshold. The hysteresis can avoid unnecessary action of the fan when the control value fluctuates near the threshold. Available options: **0...50**

If it is 0, there is no hysteresis. Once the control value is greater than the threshold, the fan will switch the wind speed immediately;

Assuming a lag value of 10 and a threshold of 50, there will be an upper threshold of 60 (threshold + lag value) and a lower threshold of 40 (threshold - lag value), then when the control value is between 40 and 60, it will not cause the action of the fan and still maintains its previous state.

Only less than 40 or greater than (or equal to) 60 will change the operating state of the fan. As shown below:



Note:

In the case of hysteresis enabled, if threshold overlap occurs, the action of the fan is specified as follows:

1) The hysteresis determines the control point at which the wind speed transition occurs;

2) If the wind speed transition occurs, this new wind speed is determined by the control value and the threshold, without considering the hysteresis;

For example (1):

OFF <-> wind speed 1 threshold is 10%

Wind speed 1 <-> wind speed 2 threshold is 20%

Wind speed 2 <-> wind speed 3 threshold is 30%

Lag is 15%

The behavior of the fan when the wind speed rises from OFF:

The fan's OFF state will change at a control value of 25% (≥10%+15%), and the new wind speed will be 2 (because 25% is between 20% and 30%, no need to consider hysteresis), so wind speed 1 is ignored ;

The behavior of the fan when the wind speed drops from 3:

The wind speed 3 of the fan will change at a control value of 14% (<30%-15%), and the new wind speed will be 1 (because 14% is between 10% and 20%, no need to consider hysteresis), so wind speed 2 is ignored. .

For example (2):

OFF <-> wind speed 1 threshold is 10%

Wind speed 1 <-> wind speed 2 threshold is 40%

Wind speed 2 <-> wind speed 3 threshold is 70%

Lag is 5%

The behavior of the fan when the wind speed rises from OFF:

The OFF state of the fan will change at a control value of 15% (≥10%+5%).

If the received control value is 41%, the new wind speed will be 2 (because 41% is between 40% and 70%, no need to consider hysteresis), so wind speed 1 is ignored;

If the control value received is 39%, the new wind speed will be 1 (since 39% is between

10% and 40%, no need to consider hysteresis).

The behavior of the fan when the wind speed drops from 3:

The wind speed 3 of the fan will change at a control value of 64% (<70%-5%).

If the received control value is 39%, the new wind speed will be 1 (because 39% is between 10% and 40%, no need to consider hysteresis), so wind speed 2 is ignored.

3) In any case, when the control value is 0, the fan will be turned off.

——Parameter "Minimum time in fan speed [0...65535]s"

This parameter defines the dwell time before the fan switches from the current wind speed to a higher wind speed or a lower wind speed, that is, the minimum time for a wind speed operation.

If you want to switch to another wind speed, you need to wait for this period of time before switching. If the current wind speed has been running for a long enough time, the wind speed can be switched quickly. Available options: **0...65535**

0: means no delay switching.

Note:

The dwell time set by this parameter is only enabled in automatic mode.

The minimum running time is required for each wind speed (including off) in the automatic mode, and the wind speed under automatic operation is changed step by step.

For example, if the current wind speed is 1, and the target wind speed is 3, then the wind speed will first change from 1 to 2, then to 3, and each wind speed operation will change after the minimum running time.

Starting the wind speed does not need to consider the minimum running time, since the starting wind speed has its own minimum running time.

The description of the wind speed control value is not described in this chapter. For details, please refer to section 4.6.1.1.

4.6.2.2 Parameter window “Fx: Status”

The parameter window “Fx: Status” setting interface is shown in Figure 4.23. This interface is used to set the running status information of the fan with multi-level wind speed.

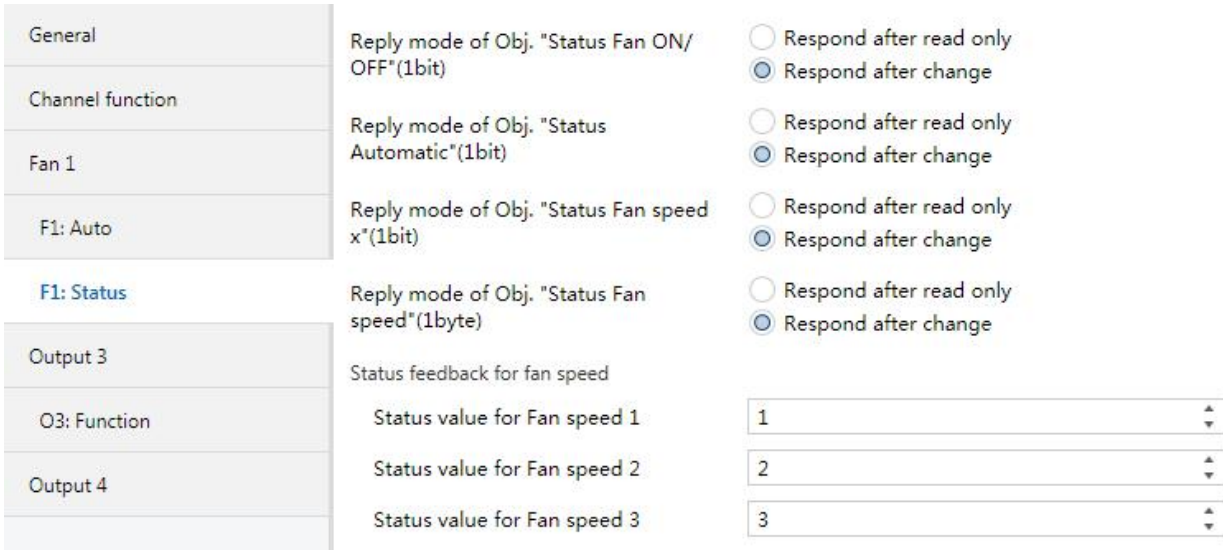


Fig. 4.23 Parameter window “Fx: Status”

Parameter “Reply mode of Obj. “Status Fan ON/OFF”(1bit)”

This parameter defines the reply mode of the fan switch status. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status Fan ON/OFF" sends the current state of the fan to the bus only when the device receives the read fan ON/OFF status from other bus device or bus.

Respond after change: When the fan on/off status changes or the device receives a request to read the status, the object "Status Fan ON/OFF" immediately sends a message to the bus to report the current status.

Parameter “Reply mode of Obj. “Status Automatic”(1bit)”

This parameter is visible when the automatic operation is enabled, and defines the reply mode of the automatic operation status.

The object "Status Automatic" sends a message "1" to indicate that the automatic operation is activated, and the message "0" to indicate that the automatic operation is canceled. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status Automatic" sends the current state of automatic

operation to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the automatic operation status changes or the device receives a request to read the status, the object "Status Automatic" immediately sends a message to the bus to report the current status.

Parameter "Reply mode of Obj."status fan speed x"(1bit)"

This parameter defines the reply method for the wind speed status. Three 1-bit objects "Status Fan speed 1", "Status Fan speed 2" and "Status Fan speed 3" are used to reply the status of each level of wind speed. Options:

Respond after read only

Respond after change

Respond after read only: The object sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the status changes or the device receives a request to read the status, the object immediately sends a message to the bus to report the current status.

Parameter "Reply mode of Obj."Status fan speed "(1byte)"

This parameter sets the reply mode of the current running wind speed state. The object is "Status fan speed" and is of 1 byte type. The status value of each stage wind speed output is defined by the next parameter. Options:

Respond after read only

Respond after change

Respond after read only: The object sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the status changes or the device receives a request to read the status, the object immediately sends a message to the bus to report the current status.

Status feedback for fan speed

-- Parameter "Status value for Fan speed 1/2/3 [1..255]"

This parameter sets the status feedback value for each wind speed. Options: **1..255, the state value of OFF is specified as 0.**

4.7 Valve Control

The valve output has a maximum of 6 output channels. Since the parameters and communication objects assigned to each output are the same, here we only take one output as example.

The following are the general parameter settings for the valve.

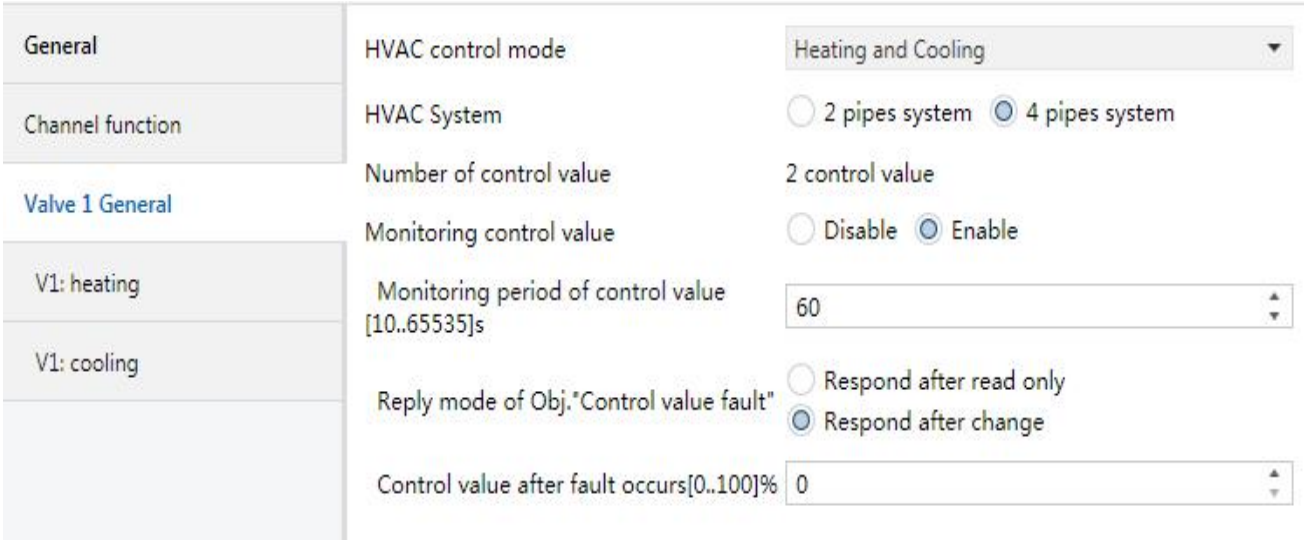


Fig. 4.24 Parameter window “Valve X General”

Parameter“HVAC Control mode”

This parameter is used to set the HVAC control mode. Options are:

Heating

Cooling

Heating and Cooling

Heating: The fan coil can only achieve heating function;

Cooling: The fan coil can only achieve cooling function;

Heating and cooling can be achieved, and the fan coil controller automatically outputs whether it is heating or cooling depending on the difference between the set temperature and the actual temperature and the dead zone temperature.

Parameter“HVAC System”

This parameter is visible when the previous parameter selects “Heating and Cooling” and is used to set the HVAC system, i.e. the type of pipe in which the fan coil enters and exits the water. Options:

2 pipes system

4 pipes system

2 pipes system: Two-pipe system, using one inlet and outlet pipe for heating and cooling, that is, hot water and cold water share a valve control;

4 pipes system: Four-pipe system, which has its own inlet and outlet pipes for heating and cooling, and requires two valves to control the ingress and egress of hot and cold water.

Parameter "Number of control value"

This parameter is visible when the previous parameter selects "4 pipes system". It is used to indicate that there are two control values under 4 pipes system, one for controlling the heating valve and the other controlling the cooling valve.

Parameter"Monitoring control value"

This parameter sets whether to enable monitoring the control value. Options:

Disable

Enable

Enable: The following parameters are visible.

-- Parameter"Monitoring period of control value[10..65535]s

This parameter sets the time period for monitoring the control value. If the control value has not been received within this time, the device will consider the external controller error and the valve will output according to the control value set by the next parameter. Available options: **10...65535s**

-- Parameter"Reply mode of Obj. "Control value fault""

This parameter defines the reply mode when the external control value is incorrect. Options:

Respond after read only

Respond after change

Respond after read only: The object "Control value fault" sends the current state to the bus only when the device receives the read status from other bus device or bus.

Respond after change: When the status changes or the device receives a request to read the status, the object "Control value fault" immediately sends a message to the bus to report the current status.

-- Parameter “Control value after fault occurs [0..100]%”

When an error occurs in the external controller, the device will output the valve according to the control value set by this parameter. Options: **0...100 %**

The following is a supplementary description of the piping system (this product is suitable for 2 and 4 pipe systems):

In daily life, the fan coil system can be divided into 2-pipe, 3-pipe and 4-pipe systems according to the inlet and outlet pipes of hot and cold water.

The two-pipe system is a set of inlet and outlet water systems for cold/hot water. When the water pipes are cold water, they are cooling. When the water pipes are hot water, they are heating. Therefore, cooling and heating cannot be performed at the same time.

Two-pipe system wiring: only one valve is needed to control the flow of hot or cold water.

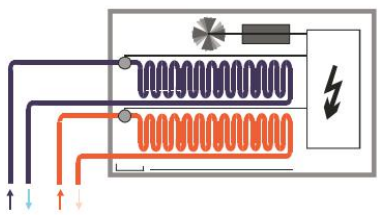
In many applications, two-tube systems are mostly used for cooling, and heating needs to be achieved by other commonly used heaters.

The four-tube system is somewhat similar. The three-tube system has separate pipe input system for each of the cold/hot water pipes, but shares one pipe output, so heating and cooling cannot be performed simultaneously.

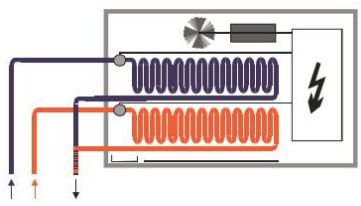
The four-tube system has two inlet and outlet systems that provide both cold and hot water.

However, there is a single-pole single-switch in the fan, and only one can be applied at the same time for heating and cooling.

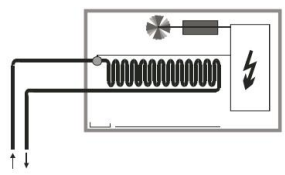
The wiring method of the four-tube system: the valve is connected to the cooling/heating valve connection output end of the device to control the flow of the hot and cold water.



4-pipe fan coil



3-pipe fan coil



2-pipe fan coil

4.7.1 Parameter window “Vx: Heating/Cooling”

The parameter window “Vx:Heating” and “Vx: Cooling” setting interface are shown in Figures 4.25 and 4.26. These two interfaces are mainly used to set the control mode and related parameters of the heating and cooling valve. Different valve types are applicable to different control modes. Therefore, when setting the control mode, it needs to be considered in combination with the valve type.

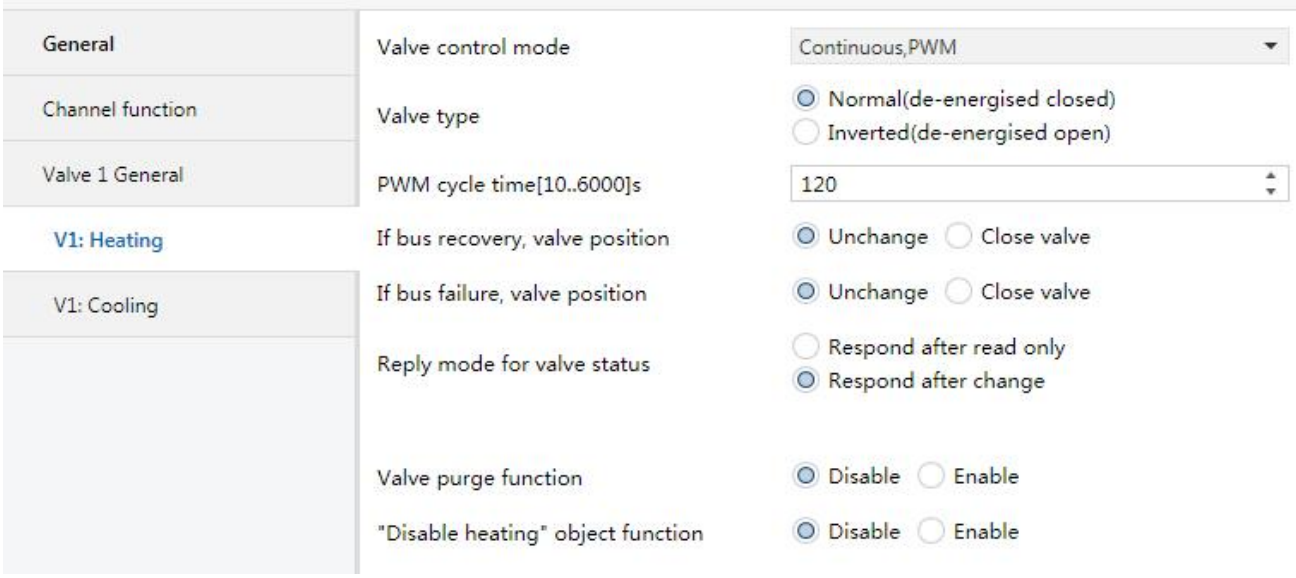


Fig. 4.25 Parameter window “Vx: Heating”

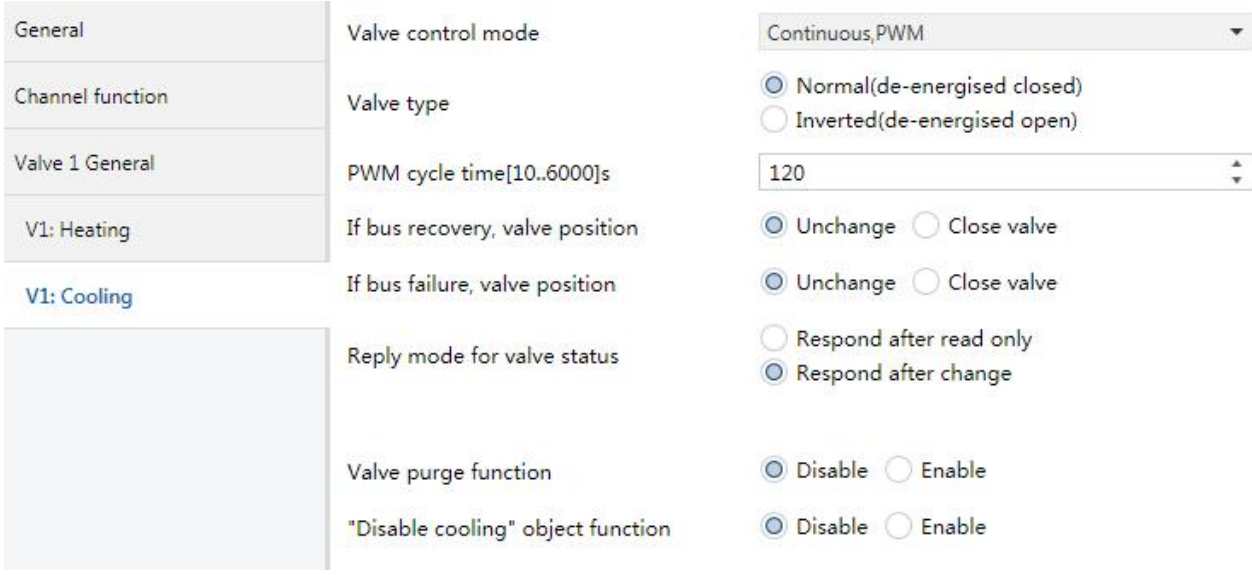


Fig. 4.26 Parameter window “Vx: Cooling”

Parameter“Valve control mode”

This parameter is used to set the type of valve to be controlled. Options:

2 state-ON/OFF

Continuous, PWM

3 point, open and close

2 state-ON/OFF: Two-point switch control mode, suitable for ordinary on-off valve, the valve is based on the received switch control value switch output;

Continuous, PWM: PWM continuous control mode, the valve performs periodic switching output according to the control value received by the object.;

3 point, open and close: The control type is suitable for driving three-wire valves, and the valve opening is controlled according to the control value of the valve.

The following takes the heating valve parameter interface as an example to illustrate the parameter settings of three different modes, and the refrigeration valve is similar.

4.7.1.1 Parameter window “2 state-ON/OFF”

The parameter window “2 state-ON/OFF”setting interface is shown in Figure 4.27.

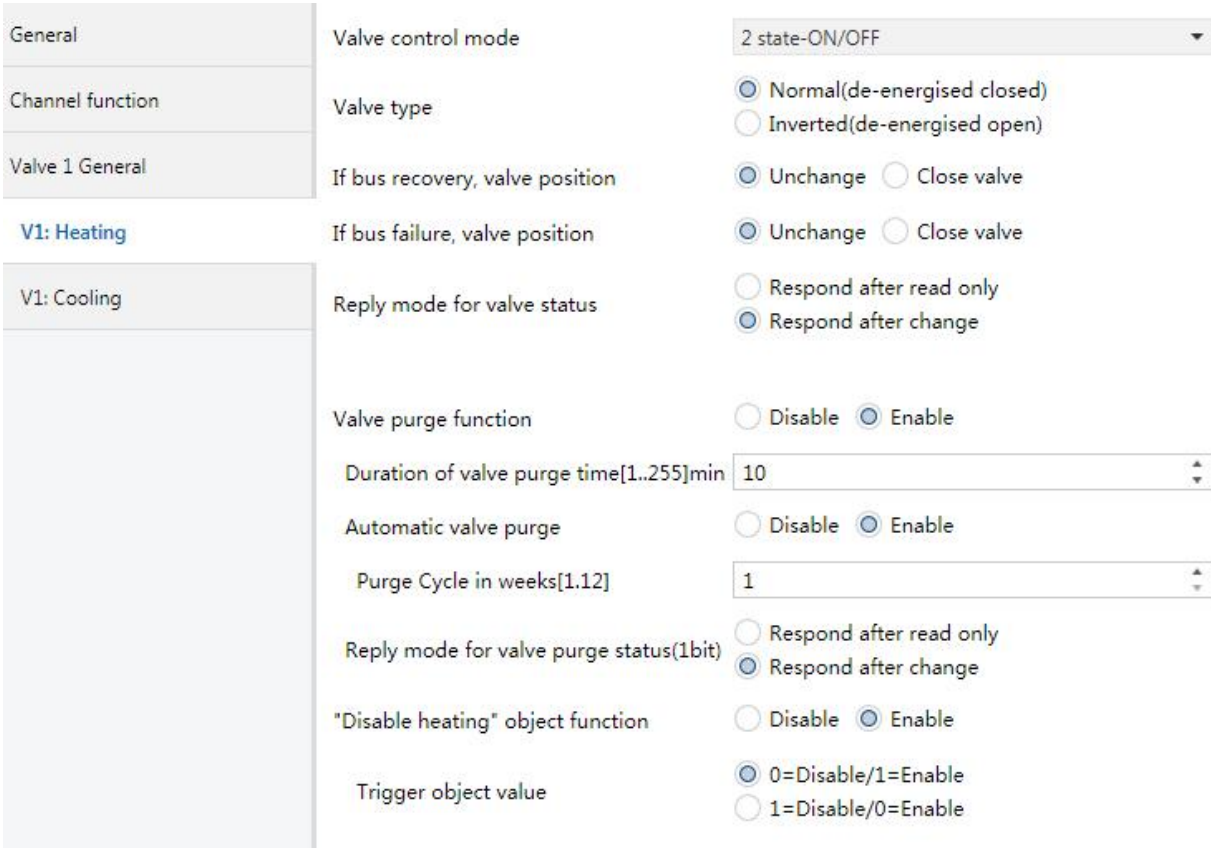


Fig. 4.27 Parameter window "2 state-ON/OFF"

Parameter"Valve type"

This parameter sets the direction of the valve switch. Options:

Normal(de-energised closed)

Inverted(de-energised open)

For on-off valves, "Normal (de-energised closed)" is suitable for normally closed switching valves, and "Inverted (de-energised open)" is suitable for always opening switching valves.

Parameter"If bus recovery,valve position"

This parameter sets the position of the valve after the bus voltage is reset. Options:

Unchange

Close valve

Unchange: After the bus voltage is powered down, the valve status remains unchanged.;

Close valve: Valve closed.

Parameter"If bus failure,valve position"

This parameter sets the position of the valve after the bus voltage is powered down. Options:

Unchange

Close valve

Unchange: After the bus voltage is powered down, the valve status remains unchanged.;

Close valve: valve closed.

Parameter"Reply mode for valve status(1bit)"

This parameter defines how the valve status responds. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status of valve position" sends the current status to the bus only when the device receives a status read from another bus device or bus.

Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve position" immediately sends a message to the bus to report the current status.

Parameter"Valve purge function"

Options:

Disable

Enable

Enable: A 1-bit communication object "Trigger valve purge" is visible for triggering the valve cleaning operation while the following parameters are visible.

-- Parameter"Duration of valve purge time[1...255]min"

This parameter sets the duration of the valve cleaning. During this time, the valve is fully open. When this time passes, the state before cleaning is re-established. Options: **1…255min**

If the heating/cooling operation is prohibited during the cleaning, the cleaning will continue.

-- Parameter"Automatic valve purge"

Visible when the valve cleaning function is enabled. Options:

Disable

Enable

Enable: Enable automatic valve cleaning function, the following parameters can be seen.

-- Parameter"Purge Cycle in weeks[1...12]"

This parameter defines the period of automatic valve cleaning. In weeks, the time starts from the power-on of the device, and the cleaning operation is triggered after timing.

Once the cleaning is completed, the time is reset, whether it is done by automatic cleaning or by object-triggered cleaning, which is reset.Options: **1…12**

Note: The manual operation has the highest priority and the cleaning priority is the second highest. If the cleaning time has not expired, the cleaning process is manually interrupted. At the end of this cleaning, the manual exit will not continue the last cleaning.

-- Parameter"Reply mode for valve purge status (1bit)"

This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives a status read from another bus device or bus;

Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately sends a message to the bus to report the current status.

Parameter""Disable heating/cooling" object function"

Options:

Disable

Enable

Enable: A 1-bit communication object "Disable, heating" is visible and can be used to disable heating/cooling operations while the following parameters are visible.

– Parameter"Trigger object value"

This parameter sets the value of the message used to disable the heating/cooling operation. Options:

0=Disable/1=Enable

1=Disable/0=Enable

0=Disable/1=Enable: When the object "Disable, heating/cooling" receives the message value "0", the heating/cooling operation is prohibited, and when "1" is received, it is reactivated;

1=Disable/0=Enable: When the object "Disable, heating/cooling" receives the message value "1", the heating/cooling operation is prohibited, and when "0" is received, it is reactivated.

Note: When the operation is disabled, the valve position is immediately adjusted back to the off state. When enabled again, the current state is maintained until a new control value is received. During the prohibition period, the received message is invalid (except for cleaning, the cleaning operation can be performed during the prohibition period).

The cleaning function and the function of prohibiting the valve control are similar in each control mode. The following two control modes will not be repeated.

4.7.1.2 Parameter window “Continuous, PWM”

The parameter window”Continuous,PWM” setting interface is shown in Figure 4.28.

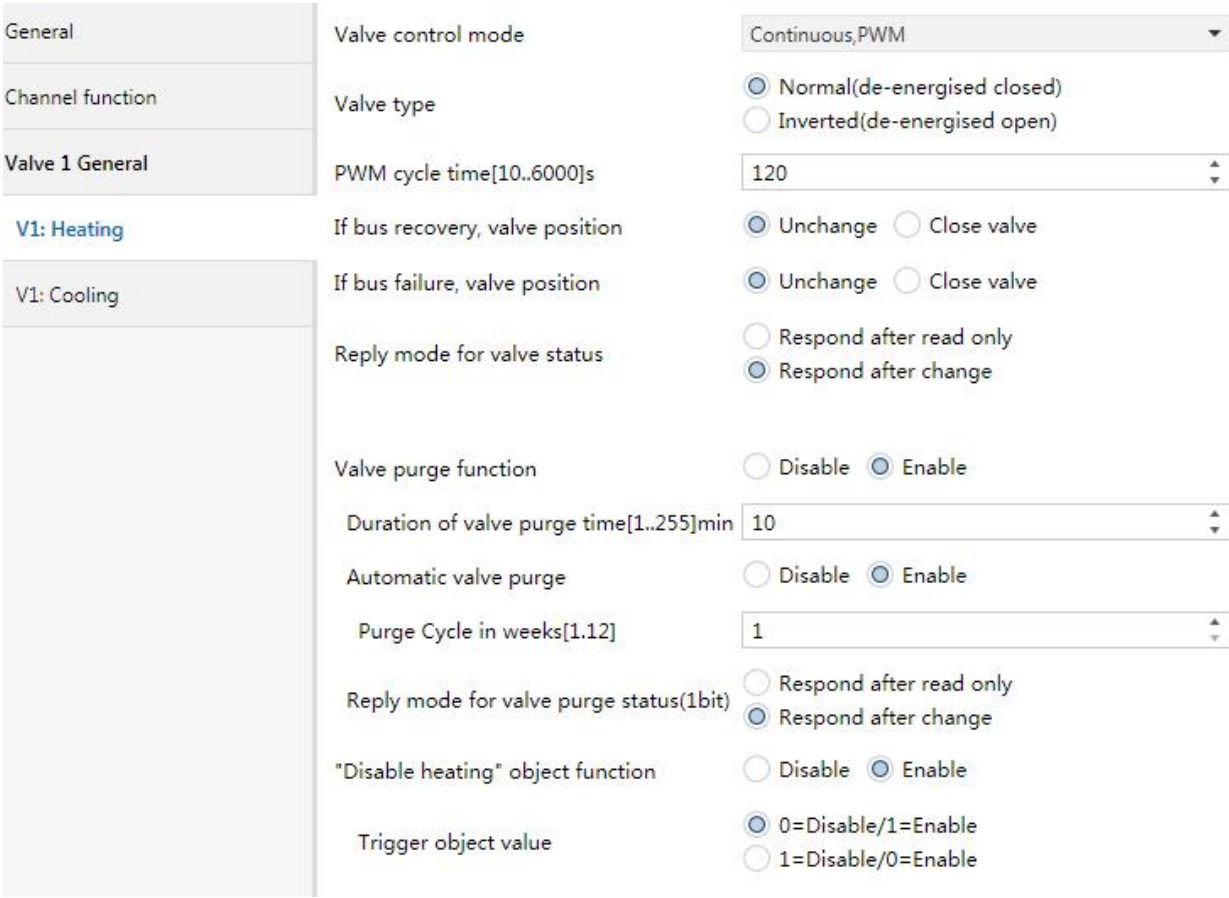
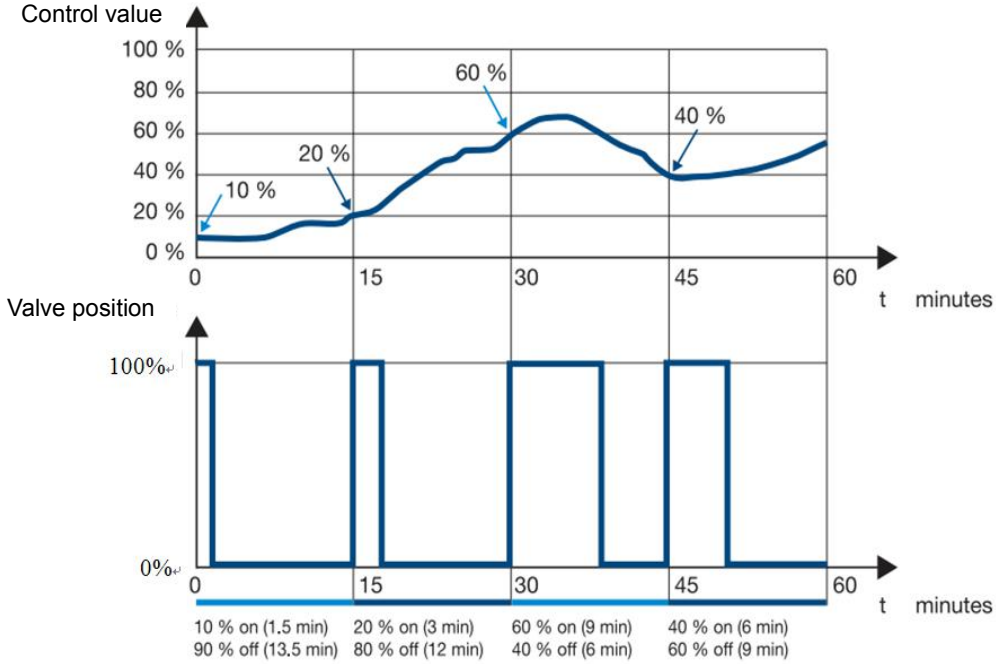


Fig. 4.28 Parameter window “Continuous, PWM”

This control mode is suitable for driving two-wire valves.

This control mode has only two states "fully open" and "completely closed". The valve performs cyclic switching operation according to the control value and PWM cycle. For example, the control value is 20%, the PWM period is 15min, then the valve will open for 3min, close for 12min, control When the value is 60%, then the valve will open for 9min, off for 6min, the control value is evaluated by the temperature controller or sensor device to the current temperature and set temperature, and then sent to the device.The valve adjustment diagram is as follows:



This control mode enables relatively accurate temperature control without temperature overshoot. Simple, low-cost control valves can be used. For example, it can be used in conjunction with an electric valve actuator. The switching frequency of the control valve is relatively high.

This control mode parameter interface is similar to "2state-ON/OFF", and the description of the same parameters will not be repeated here.The difference is that the PWM switching period can be set as follows:

Parameter"PWM cycle time [60…3000]s"

This parameter is used to set the time period of PWM control. The larger the value, the smaller the valve switching frequency. Conversely, the smaller the value, the more frequent the valve switch. Options: **60…3000s**

Note: For Continuous, PWM valves, different switches, status feedback information is as follows:

Valve switch type	Description
Normal (de-energised closed)	When the valve is relayed, the object "Status of valve position" sends the message "0"; when there is current (relay closed), the message "1" is sent.
Inverted (de-energised open)	When the valve has a current (relay closed), the object "Status of valve position" sends a message "0"; when there is no current (relay opened), the message "1" is sent.

4.7.1.3 Parameter window “3 point, open and close”

The parameter window ”3 point,open and close” setting interface is as shown in Figure 4.29.

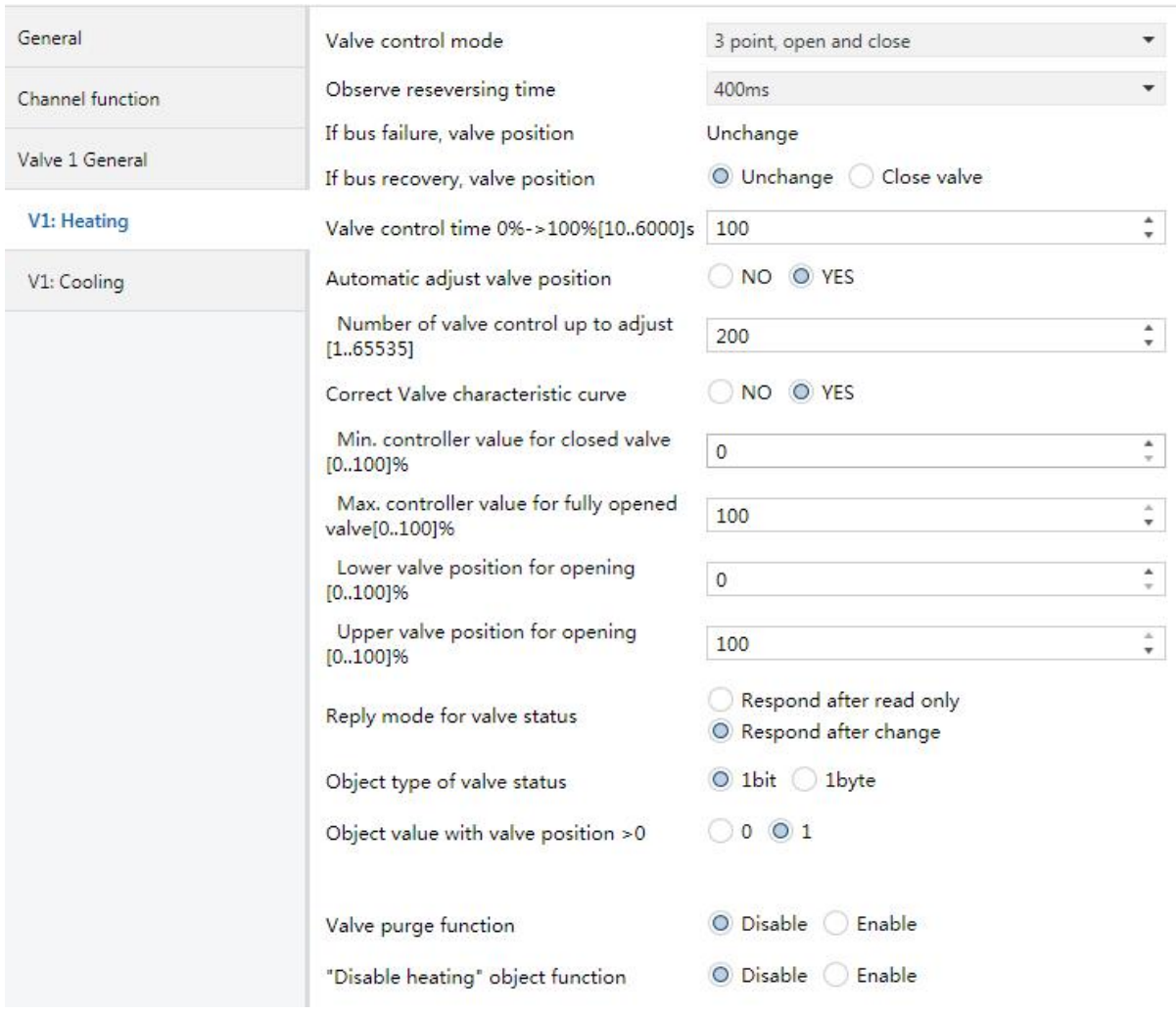
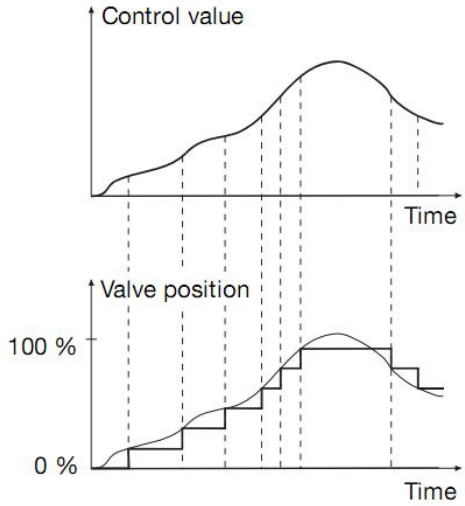


Fig. 4.29 Parameter window "3 point, open and close"

This control mode is suitable for driving three-wire valves. It controls the opening of the valve according to the control value received by the object. It can realize “completely open”, “completely close” or open the valve to a certain position. This control mode is the most accurate. Control method, while the switching frequency of the valve is also very low. For example, if the control value is 20%, then the valve will stop output when it is 20% open. The valve adjustment diagram is as follows:



The parameter functions of this control mode are described below:

Parameter“Observe reversing time”

This parameter sets the time the valve will pause while running the steering, which helps protect the valve. Options: **0/100ms/200ms/…/1s/1.2s/1.5s**

The steering pause time is a technical feature of the valve and should be considered in any operation. When setting this parameter, refer to the technical characteristics of the valve.

Parameter“If bus failure, valve position”

This parameter annotates the state before the valve is held after the system voltage is powered down.

Parameter“If bus recovery, valve position”

This parameter sets the position of the valve after the system voltage is reset. Options:

Unchanged

Close valve

Unchanged: The default state of power-on after the system voltage is restored.

Close valve: Valve closed.

Note: The parameter download is not processed as a system reset, and the valve position is adjusted to 0%. Only when it is adjusted to 0%, the valve position can be determined and the next step is performed.

In this control mode, the timing of the automatic cleaning function is counted from the position of the valve.

Parameter"Valve control time 0%→100% [10…6000]s"

This parameter sets the time required for the valve to go from fully closed to fully open, the total travel time. Options: **10…6000s**

Assuming that the travel time set by this parameter is 180s, the current valve position is 20%, and the target position is 60%, then the valve takes 20s from 20% → 60% of the travel time.

The setting of this parameter requires reference to the technical characteristics of the valve.

Parameter"Automatic adjust valve position"

This parameter sets whether the automatic adjustment function of the valve is enabled. Options:

Yes

No

Yes: he following parameters are visible.

The automatic valve adjustment function mainly plays the role of correcting the position of the valve,Because the valve has undergone many adjustments, due to various reasons, such as temperature, aging of the device, etc, There is a phenomenon that the valve cannot be completely closed or fully opened, so it needs to be re-positioned by this function.

-- Parameter"Number of valve controls up to adjust[1…65535]"

This parameter sets how many times the valve has been adjusted, and performs an automatic adjustment, that is, the valve position is adjusted to 0%, re-positioning, but only requires a longer travel time. Options: **1…65535**

Assume 100 times, when the valve has been adjusted 100 times, that is, at the 101st adjustment, If the valve is adjusted in the opening direction, no automatic adjustment is made, If the valve is adjusted in the closing direction, an automatic adjustment will be made, Adjust the valve to 0% position and then adjust to the target position. For example, the 100th valve position is 50%, and the 101st is 60%, The valve will not be automatically adjusted until a reverse adjustment command is received; If the 101st is 40%, then the valve is automatically adjusted, running to 0%, and then

running to the target position 40%. The time of automatic adjustment is extended by 5% of the total travel time, that is, travel time + total travel time × 5%,The total travel time × 5% must be less than or equal to 1 min. When it is greater than 1 min, take 1 min.

When the automatic adjustment is performed, the number is counted again. When the valve adjustment stops, the count increases once（The positioning adjustment when the parameter download is completed is not counted in the number of times）. In the process of performing automatic adjustment, If the control value is received, it will wait until the automatic adjustment is completed., If there is a higher priority operation, then the high priority operation ends and then execute.

The setting of this parameter requires reference to the technical characteristics of the valve.

Parameter"Correct Valve characteristic curve"

This parameter sets whether the valve characteristic adjustment is enabled. Options:

Yes

No

Yes:The following parameters can be seen.

-- parameter"Min. controller value for closed valve[0..100]%"

-- parameter"Max. controller value for fully opened valve[0...100]%"

-- parameter"Lower valve position for opening[0...100]%"

-- parameter"Upper valve position for opening[0...100]%"

Characteristic curve for setting the valve output.Options: **0...100 [%]**

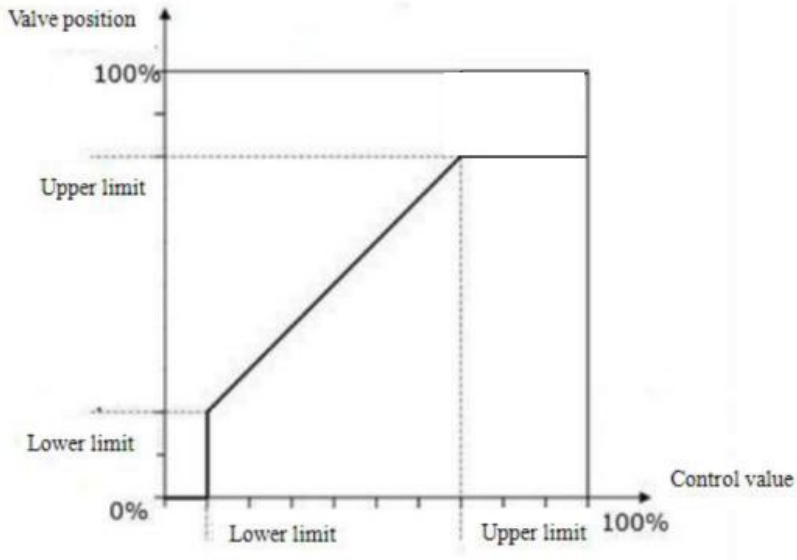
Min. controller value for closed valve: Lower limit control value of valve characteristic curve;

Max. controller value for fully opened valve: Upper limit control value of valve characteristic curve;

Lower valve position for opening: Lower limit of valve position;

Upper valve position for opening: Upper limit of valve position.

Take the valve with the valve interface as the relay as an example, Assuming the lower limit of the control value is set to 10%, the lower limit of the valve is set to 20%, the upper limit of the control value is set to 70%, and the upper limit of the valve is set to 80%, there is an output characteristic curve as shown below:



Parameter"Reply mode for valve status(1bit)"

This parameter defines how the valve status responds. Options:

Respond after read only

Respond after change

Respond after read only: The object "Status of valve position" sends the current status to the bus only when the device receives a status read from another bus device or bus.

Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve position" immediately sends a message to the bus to report the current status.

Parameter"Object type of valve status "

Set the object type for valve position status feedback. Options:

1bit

1byte

1bit: The next parameter is visible, and a 1-bit object "Status of valve position, heating/cooling" is visible for feedback valve switching status.

1byte: A 1byte object "Status of valve position, heating/cooling" is visible for feedback valve position status.

– Parameter"Object value with valve position >0"

Options:

0

1

When the valve position is greater than 0, the object "Status of valve position, heating/cooling" sends the message "1"; When the valve position is 0, the message "0" is sent.

Chapter 5 Communication Object Description

The communication object is the medium through which the device communicates with other devices on the bus, that is, only the communication object can perform bus communication.

The function of each communication object of each function block is described in detail below.

Note: "C" in the property bar of the table below represents the communication function of the communication object;

"W" represents the value of the communication object can be rewritten by the bus;

"R" represents the value of the communication object can be read through the bus;

"T" stands for communication object with transmission function;

"U" means that the value of the communication object can be updated.

5.1 Communication object description of switch output

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Central control for all switch			1 bit	C	-	W	-	-	switch	Low
2	Output 1	Switch			1 bit	C	-	W	-	-	switch	Low
3	Output 1	Switch status			1 bit	C	R	-	T	-	switch	Low
4	Output 1	Enable time function			1 bit	C	-	W	-	-	enable	Low
5	Output 1	Delay function			1 bit	C	-	W	-	-	switch	Low
6	Output 1	Operation hours counter			2 bytes	C	R	W	T	U	time (h)	Low
7	Output 1	Scene			1 byte	C	-	W	-	-	scene control	Low
8	Output 1	Forced output			1 bit	C	-	W	-	-	enable	Low
9	Output 1	Logic 1			1 bit	C	-	W	-	-	boolean	Low
10	Output 1	Logic 2			1 bit	C	-	W	-	-	boolean	Low
218	General	In operation			1 bit	C	-	-	T	-	switch	Low

Fig. 5.1 Communication object of switch output

No.	Name	Object function	Type	Flags	DPT
218	**General**	**In operation**	**1bit**	**C,T**	**1.001 DPT_Switch**

This communication object is used to periodically send a message "1" to the bus to indicate that the device is functioning properly. This communication object is always enabled.

1	**General**	**Central control for all switch**	**1bit**	**C,W**	**1.001 DPT_Switch**

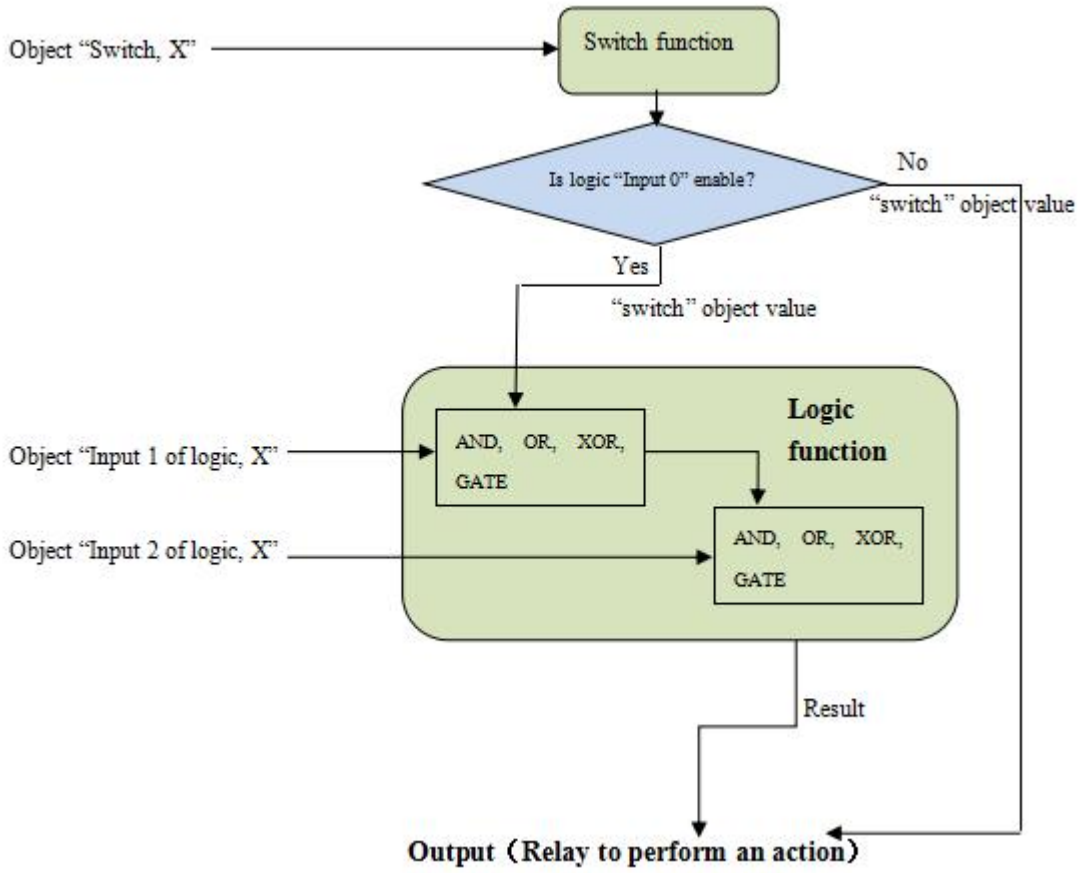
This communication object is used for centralized control of the switch output. Only the switch output channel with centralized control can be used for centralized control through this object.

0 —— off
1 —— on

2	**Output X**	**Switch**	**1bit**	**C,W**	**1.001 DPT_Switch**

This communication object is used to trigger the switch operation.

When "input 0" in the logic function is enabled, The communication object "switch, X" is not directly used to trigger the switch operation., the action of the switch will be affected by the logic function. Please refer to the following flow chart for details:



3	**Output X**	**Switch status**	**1bit**	**C,R,T**	**1.001 DPT_Switch**
The value of this communication object（Specifically set in the parameter "Object value of switch status:" in Figure 4.3 "Output X"）Can directly indicate the status of the relay contacts. If you choose "Respond after read only", only when the device receives a request from the bus to read the status of the channel switch，this object sends the current switch state to the bus; If you choose “Respond after change”，when the switching state of the channel changes，This object immediately sends the current switch state to the bus.					
4	**Output X**	**Enable time function**	**1bit**	**C,W**	**1.003 DPT_Enable**
The communication object is enabled when the time function is enabled.，Time function can be prohibited by this communication object, When the communication object receives a message with a logical value of "1", the time function is enabled；When the message of "0" is received, the time function is disabled, but the operation before the disabling will continue to be completed. When the time function is turned on, the time function is enabled by default when the bus resumes power supply.					
5	**Output X**	**Delay function**	**1bit**	**C,W**	**1.001 DPT_Switch**
The communication object is enabled when the parameter "Type of time function" is selected as "Delay", and the delay switch is turned on by this communication object.					
5	**Output X**	**Flashing function**	**1bit**	**C,W**	**1.001 DPT_Switch**
The communication object is enabled when "Flashing" is selected in the parameter "Type of time function", and the flashing switch is turned on by this communication object.					
5	**Output X**	**Staircase function**	**1bit**	**C,W**	**1.001 DPT_Switch**
The communication object is enabled when the parameter "Type of time function" is selected as "Staircase", and the stair light function is activated by this communication object.					
6	**Output X**	**Operation hours counter**	**2byte 4byte**	**C,R,W,T,U**	**7.007DPT_TimePeriodHrs/ 13.100DPT_LongDeltaTimeSec**
This communication object is used to report the time when the load of this loop is powered on,Displayed when "Enable" is selected in the parameter "Function of "Operation hours counter"", data type can be selected by "Object datatype of "Operation hours counter"", the unit of 2byte type is hour, and the unit of 4byte is second.					
7	**Output X**	**Scene**	**1byte**	**C,W**	**18.001 DPT_SceneControl**
The scene can be called or stored by sending an 8-bit instruction through this communication object. This communication object is enabled as long as the scene function is enabled. The meaning of the 8-bit instruction is explained in detail below.					

Set an 8-bit instruction to (binary code): FXNNNNNN

F: “0” is the calling scene; “1” is the storage scene;

X: 0；

NNNNNN: Scene no.（0…63）。

The parameter setting option is 1~64. In fact, the scene message received by the communication object "Scene" corresponds to 0~63. If scene 1 is set in the parameter, the communication object "Scene" should receive the scene message 0. As follows:

Object message value	Description
0	recall scene1
1	recall scene2
2	recall scene3
…	…
63	recall scene64
128	storage scene1
129	storage scene2
130	storage scene3
…	…
191	storage scene64

8	**Output X**	**Forced output**	**1bit/2bit**	**C,W**	**1.003 DPT_Enable /2.001 DPT_Switch**

This communication object is enabled after the enforcement function is enabled.

In 1 bit, when the message value "1" is received, the enforcement mode is enabled. At this time, the device ignores other actions except for enforcement. When the message value "0" is received, the forced execution mode is ended, and the position of the contact at the time of forced operation is set by the parameter.

At 2bit, the contact is forcibly closed when the message value "3" is received； The contact is forcibly disconnected when the message value "2" is received; the enforcement mode is canceled when the message value "1" or "0" is received.

9	**Output X**	**Logic 1**	**1bit**	**C,W**	**1.002 DPT_Bool**

This communication object is enabled when the parameter "enable" is selected in the parameter "The input 1 of logic" for the logic input of input1.

10	**Output X**	**Logic 2**	**1bit**	**C,W**	**1.002 DPT_Bool**

This communication object is enabled when the parameter "enable" is selected in the parameter "The input 2 of logic" for the logic input of input2.

Table 5.1 Communication object table of switch output

5.2 Communication object description of curtain (AC/DC) output

The communication object of the curtain AC and the curtain DC output is basically similar. Therefore, the object of the curtain AC output is taken as an example here.

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
2	Curtain 1	Move UP/DOWN			1 bit	C	-	W	-	-	up/down	Low
3	Curtain 1	Slat adj/stop			1 bit	C	-	W	-	-	step	Low
4	Curtain 1	Reference movement			1 bit	C	-	W	-	-	up/down	Low
5	Curtain 1	Move to position 0..100%			1 byte	C	-	W	-	-	percentage (0..100%)	Low
6	Curtain 1	Slat position 0..100%			1 byte	C	-	W	-	-	percentage (0..100%)	Low
7	Curtain 1	Scene			1 byte	C	-	W	-	-	scene control	Low
8	Curtain 1	Position status 0..100%			1 byte	C	R	-	T	-	percentage (0..100%)	Low
9	Curtain 1	Slat status 0..100%			1 byte	C	R	-	T	-	percentage (0..100%)	Low
10	Curtain 1	Sun operation			1 bit	C	-	W	-	-	switch	Low
11	Curtain 1	Enable auto.control			1 bit	C	-	W	-	-	enable	Low
12	Curtain 1	Sun:blind position 0..100%			1 byte	C	-	W	-	-	percentage (0..100%)	Low
13	Curtain 1	Sun:slat adj.[0...100%]			1 byte	C	-	W	-	-	percentage (0..100%)	Low
14	Curtain 1	Safety operation 1			1 bit	C	-	W	-	-	alarm	Low
15	Curtain 1	Safety operation 2			1 bit	C	-	W	-	-	alarm	Low
16	Curtain 1	Status of operation			1 byte	C	R	-	T	-		Low
L												
387	General	Central control for Up/Down			1 bit	C	-	W	-	-	up/down	Low
388	General	Central control for Slat/Stop			1 bit	C	-	W	-	-	step	Low

Fig. 5.2 Communication objects of curtain (AC) output

No.	Name	Object function	Type	Flags	DPT
387	**General**	**Central control for Up/Down**	**1bit**	**C,W**	**1.008 DPT_UpDown**
This communication object is used for centralized control of the curtain position. Only the curtain output channel that enables centralized control can be centrally controlled by this object. Telegram value: 0 —— the blinds move up / the curtains open 1 —— the blinds moving down / curtains closed					
388	**General**	**Central control for Slat/Stop**	**1bit**	**C,W**	**1.007 DPT_Step**
This communication object is used to stop the curtain movement or adjust the centralized control of the louver angle. Only the curtain output channel with centralized control can be used for centralized control through this object. Telegram value: 0 —— stop / adjust the louver upwards 1 —— stop/down adjust louver					
2	**Curtain X**	**Move UP/DOWN**	**1bit**	**C,W**	**1.008 DPT_UpDown**
If the communication object receives a message of "0", the blinds/curtains move up；If the object receives the message "1", the blinds/curtains move down. Telegram value: 0 —— the blinds move up / the curtains open 1 —— the blinds moving down / curtains closed					

3	Curtain X	Slat adj. / Stop	1bit	C,W	1.007 DPT_Step

If the blind is in the mobile operation, when the communication object receives a message of “0” or “1”, the operation stops. Venetian Blind operated mode: If the blind is not running, the communication object adjusts the louver upward when receiving the message “0”, and adjusts the louver downward when receiving the message “1”.

Shutter operation mode: If the curtain is not running, the communication object will not perform any action when receiving any message. Telegram value:

0 —— stop / adjust the louver upwards
1 —— stop/down adjust louver

When the louver is adjusted to the limit position, the adjustment message will be ignored when the adjustment is continued.

4	Curtain X	Reference movement	1bit	C,W	1.008 DPT_UpDown

When the parameter "After reference movement, Position is" is not "disable", this object is enabled， The object is used to make a reference movement of the blinds/curtains to ensure accurate positioning of the blinds/curtains. Etailed description in the parameters section. Telegram value:

0 —— the blinds/curtains run to the top and then run to the target position
1 —— the blinds/curtains run to the bottom and then run to the target position

5	Curtain X	Move to position 0…100%	1byte	C,W	5.001 DPT_Scaling

If the communication object receives a message value, the blinds/curtains move to the position corresponding to this value. In the "Venetian Blind" operating mode, the position of the louver does not change, after moving to the target position, the position of the louver is adjusted to the previous position, unless the communication object "Slat position 0...100%" receives a message value, The position of the louver will be positioned accordingly based on this message value. Telegram value:

0% —— move to the top
……—— middle position
100%—— move to the bottom

6	Curtain X	Slat position 0…100%	1byte	C,W	5.001 DPT_Scaling

The communication object is only visible in the "Venetian Blind" mode of operation. If the communication object receives a message value, the louver performs corresponding positioning according to the message value. Telegram value:

0%—— the louver is fully open
……—— middle position
100% —— louvers are completely closed

7	Curtain X	Scene	1byte	C,W	18.001 DPT_SceneControl

The scene of the shutter actuator can be called or stored by sending an 8-bit instruction via this communication object. The meaning of the 8-bit instruction is explained in detail below.

Set an 8bit instruction to (binary code): FXNNNNNN

F: Calling the scene for '0'; storing the scene for '1';

X: 0;

NNNNNN: Scenes no.（0…63）。

The parameter setting option is 1~64. In fact, the scene message received by the communication object "Scene" corresponds to 0~63. If the scene is set in the parameter 1, the communication object "Scene" receives the scene as 0. as follows:

Object message value	Description
0	Recall scene 1
1	Recall scene 2
2	Recall scene 3
…	…
63	Recall scene 64
128	Storage scence 1
129	Storage scence 2
130	Storage scence 3
…	…
191	Storage scence 64

8	Curtain X	Position status 0..100%	1byte	C,R,T	5.001 DPT_Scaling

The communication object is used to send the position of the blinds/curtains, and when the blinds/curtains run to the target position, the location is immediately sent to the bus. Telegram value:

0% —— at the top

……—— middle position

100%—— at the bottom

9	Curtain X	Slat status 0..100%	1byte	C,R,T	5.001 DPT_Scaling

The communication object is only visible in the "Venetian Blind" mode of operation and is used to transmit the position of the louver. When the louver runs to the target position, the louver position is immediately sent to the bus. Telegram value:

0%—— the louver is fully open

……—— middle position

100% —— louvers are completely closed

10	Curtain X	Sun operation	1bit	C,W	1.001 DPT_Switch

When the communication object receives the message “0” or “1”, the blinds move to the predefined position, as described in the parameter section.

11	Curtain X	Enable auto. control	1bit	C,W	1.003 DPT_Enable

This communication object is used to disable and enable automatic operation. It receives the message “0” and exits the automatic operation; it receives the message “1” and enables automatic operation. Telegram value:

0 —— exit automatic operation
1 —— enable automatic operation

12	Curtain X	Sun:blind/shutter position[0…100%]	1byte	C,W	5.001 DPT_Scaling

Under automatic operation, if the communication object receives a message value, the blinds/curtains move to the position corresponding to this value. In the "Venetian Blind" operating mode, the position of the louver does not change unless the communication object "Sun:slat adj. 0...100%" receives a message value, and the position of the louver is positioned accordingly according to the value of the message. Telegram value:

0% —— move to the top
……—— middle position
100%—— move to the bottom

13	Curtain X	Sun: slat adj. 0…100%	1byte	C,W	5.001 DPT_Scaling

Under automatic operation, this communication object is only visible in the "Venetian Blind" operation mode. If the communication object receives a message value, the louver performs corresponding positioning according to the message value. Telegram value:

0%—— the louver is fully open
……—— middle position
100% —— louvers completely closed

14/15	Curtain X	Safety operation1/2	1bit	C,W	1.005 DPT_Alarm

This communication object is used to receive messages sent from the sensor cyclically (0 or 1, depending on the parameter settings)，If the value of the cancel security operation is "1", the object can receive the message "1" from the sensor during the monitoring period.，indicates that no abnormality has occurred at this time, monitoring continues, and the monitoring period is reset.。If the object does not receive this message during the monitoring period, the actuator will consider the sensor to be faulty，once the monitoring cycle is over and the security operation is performed immediately，move the blinds to a safe location.

Safe operation 2 has priority over safe operation 1.

16	Curtain X	Status of operation	1byte	C,R,T	No DPT

This object is used to send the current operating state of the blind/curtain output, and only one operation can be activated at a time. This object sends a message when the operation changes. The definition of the 8-bit instruction is described in detail below:

Message "0" - normal operation

Message "1" - manual operation (button operation)

Message "2" - automatic operation (sun protection)

Message "3" - safe operation 1

Message "4" - safe operation 2

Other values not used

Table 5.2 Communication Object Table for Curtain (AC) Output

5.3 Communication object description of fan control

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
219	Fan speed	Fan 1			1 byte	C	-	W	-	-	percentage (0..100%)	Low
220	Fan speed 1	Fan 1			1 bit	C	-	W	-	-	switch	Low
221	Fan speed 2	Fan 1			1 bit	C	-	W	-	-	switch	Low
222	Fan speed 3	Fan 1			1 bit	C	-	W	-	-	switch	Low
223	Status Fan ON/OFF	Fan 1			1 bit	C	R	-	T	-	switch	Low
224	Status Fan speed	Fan 1			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
225	Status Fan speed 1	Fan 1			1 bit	C	R	-	T	-	switch	Low
226	Status Fan speed 2	Fan 1			1 bit	C	R	-	T	-	switch	Low
227	Status Fan speed 3	Fan 1			1 bit	C	R	-	T	-	switch	Low
228	Automatic function	Fan 1			1 bit	C	-	W	-	-	enable	Low
229	Status Automatic	Fan 1			1 bit	C	R	-	T	-	enable	Low
230	Forced operation	Fan 1			1 bit	C	-	W	-	-	enable	Low
231	Control value 1	Fan 1			1 byte	C	-	W	-	-	percentage (0..100%)	Low
232	Control value 2	Fan 1			1 byte	C	-	W	-	-	percentage (0..100%)	Low
233	Switching control value 1/2	Fan 1			1 bit	C	-	W	-	-	switch	Low
234	Control value fault	Fan 1			1 bit	C	R	-	T	-	alarm	Low
219	Fan speed	Fan 1			1 bit	C	-	W	-	-		Low

Fig. 5.3 Communication object description of fan control

No.	Name	Object function	Type	Flags	DPT
219	**Fan X**	**Fan speed**	**1bit** **1byte**	**C,W**	**1.001 DPT_Switch** **5.001 DPT_Scaling**
For single-stage wind speed fans, the object is a 1-bit type for switching fans. Telegram value: 0 ——Fan off 1 ——Fan on For multi-level wind speed fans, the object is 1byte type，it is used to switch the wind speed of each fan. At the same time, only one wind speed is open.，at the same time, when opening a new wind speed, you need to consider the starting characteristics of the wind speed.. The object value corresponding to each wind speed is defined by a parameter, and the message value is 1..255,0 is the Fan off.					
220	**Fan X**	**Fan speed 1**	**1bit**	**C,W**	**1.001 DPT_Switch**
This object is available under multi-level wind speed fans. It is used to turn on the fan speed 1. If the communication object of the fan speed 1~3 receives several ON messages continuously in a short time, the speed of the fan is turned on based on the last received message. In the communication object with fan speed 1~3, as long as one of the messages receives OFF, the fan will be turned off. Telegram value: 0 ——Fan off 1 —— Turn on the fan speed 1					
221	**Fan X**	**Fan speed 2**	**1Bit**	**C,W**	**1.001 DPT_Switch**
Refer 220					
222	**Fan X**	**Fan speed 3**	**1Bit**	**C,W**	**1.001 DPT_Switch**
Refer 220					
223	**Fan X**	**Status Fan ON/OFF**	**1bit**	**C,R,T**	**1.001 DPT_Switch**
This object is used to send the switch status of the fan to the bus. As long as there is wind speed, the fan is on. Telegram value: 0 ——Fan off 1 ——Fan on					
224	**Fan X**	**Status Fan speed**	**1byte**	**C,R,T**	**5.010 DPT_Counter pulses**
This object is available under multi-level wind speed fans. Used to send the current running wind speed to the bus. The message value corresponding to each level of wind speed is specified by the parameter "Status value for Fan speed 1/2/3 [1..255]", and the message "0": wind mechanism.					

225	Fan X	Status Fan speed 1	1bit	C,R,T	1.001 DPT_Switch

This object is available under multi-level wind speed fans.

Used to send the operating state of wind speed 1 to the bus. Telegram value:

0 ——off the wind speed 1

1 ——turn on wind speed 1

226	Fan X	Status Fan speed 2	1bit	C,R,T	1.001 DPT_Switch

Refer 225

227	Fan X	Status Fan speed 3	1bit	C,R,T	1.001 DPT_Switch

Refer 225

228	Fan X	Automatic function	1bit	C,W	1.003 DPT_Enable

This object is used to activate automatic operations.

After the bus is reset or programmed, whether the automatic operation is activated depends on the parameters. Normal operation can exit the automatic operation.

Under automatic operation, if the forced operation is activated, the automatic operation is still active，only the state of the fan that is allowed to operate is determined by the forced operation, following the wind speed allowed under the forced operation.

Parameter option "0=Auto/1=Cancel":

Message "0"—— activate automatic operation

Message "1" ——exit automatic operation

Parameter option "1=Auto/0=Cancel:

Message "0" —— exit automatic operation

Message "1" —— activate automatic operation

Normal operations are actions that are triggered by the following objects:

Object 219: Fan X--Fan speed

Object 220-222: Fan X-- Fan speed x (x=1, 2, 3,)

229	Fan X	Status Automatic	1bit	C,R,T	1.003 DPT_Enable

This object is used to send the status of automatic operations to the bus.

Message "0" - automatic operation is not activated

Message "1" - automatic operation is activated

230	**Fan X**	**Forced Operation**	**1bit**	**C,W**	**1.003 DPT_Enable**
This object is used to activate a forced action. When the forced operation is activated, the wind speed at which the fan can operate is set by the parameter "Limitation on forced operation". Parameter option "0=Force/1=Cancel": Message "0"—— activate forced operation Message "1" —— cancel the mandatory operation Parameter option "1=Force/0=Cancel": Message "1" —— activate forced operation Message "0" —— cancel the forced operation					
231	**Fan X**	**Control value/Control value 1**	**1byte**	**C,W**	**5.001 DPT_Scaling**
232	**Fan X**	**Control value 2**	**1byte**	**C,W**	**5.001 DPT_Scaling**
Under automatic operation, when the control value of the wind speed is set to 1, the Control value is visible; when the control value is set to 2, the Control value 1/2 is visible. These three objects are used to receive control values from the bus, and the fan output will output wind speed based on the threshold range in which the control values are located.					
233	**Fan X**	**Switch control value 1/2**	**1bit**	**C,W**	**1.001 DPT_Switch**
When the wind speed control value is set to 2, this object is visible and is used to select the control value. Telegram value: 0 ——Control value 1 1 ——Control value 2					
234	**Fan X**	**Control value fault**	**1bit**	**C,R,T**	**1.005 DPT_Alarm**
During the monitoring time, when the device does not receive the control value from the external controller, this object will report a control value error. Once the control value is received, the error status is released. Telegram value: 0 ——no error 1 ——an error occurred					

Table 5.3 Communication control table of fan control

5.4 Communication object description of valve output

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
315	Heating/Cooling mode status	Valve 1			1 bit	C	R	-	T	-	cooling/heating	Low
316	Control value fault	Valve 1			1 bit	C	R	-	T	-	alarm	Low
317	Disable,heating	Valve 1			1 bit	C	-	W	-	-	enable	Low
318	Control value, heating	Valve 1			1 byte	C	-	W	-	-	percentage (0..100%)	Low
319	Status of valve position, heating	Valve 1			1 byte	C	R	-	T	-	percentage (0..100%)	Low
320	Trigger valve purge, heating	Valve 1			1 bit	C	-	W	-	-	enable	Low
321	Status of valve purge, heating	Valve 1			1 bit	C	R	-	T	-	enable	Low
322	Disable,cooling	Valve 1			1 bit	C	-	W	-	-	enable	Low
323	Control value, cooling	Valve 1			1 bit	C	-	W	-	-	switch	Low
324	Status of valve position, cooling	Valve 1			1 bit	C	R	-	T	-	switch	Low
325	Trigger valve purge, cooling	Valve 1			1 bit	C	-	W	-	-	enable	Low
326	Status of valve purge, cooling	Valve 1			1 bit	C	R	-	T	-	enable	Low

Fig. 5.4 Communication object description of valve output

No.	Name	Object function	Type	Flags	DPT
315	**Valve X**	**Heating/Cooling mode status**	**1bit**	**C,R,T**	**1.100 DPT_Heat/Cool**
This object is used to feed back the heating/cooling status of the current valve output and is sent to the bus when changing. Telegram value: 0 ——cooling 1 ——heating					
316	**Valve X**	**Control value fault**	**1bit**	**C,R,T**	**1.005 DPT_Alarm**
This object will report a control value error when the device cannot receive a control value from the external controller during the monitoring time. Once the control value is received, the error status is released. Telegram value: 0 ——no error 1 ——an error occurred					
317/322	**Valve X**	**Disable, heating/cooling**	**1bit**	**C,W**	**1.003 DPT_Enable**
Through this communication object, the heating/refrigeration valve can be disabled or enabled.When disabled, the valve position is immediately adjusted back to 0% (off state), and when enabled again, the valve action is controlled based on the current control value.					
318/323	**Valve X**	**Control value, heating/cooling**	**1byte 1bit**	**C,W**	**5.001 DPT_Scaling 1.001 DPT_Switch**
This communication object is used to receive valve control values from other controllers. Under the 2-tube system, the heating valve and the refrigeration valve share an object (318) to receive the valve control value. This control value can be 1 bit or 1 byte, depending on the valve control mode type.					
319/324	**Valve X**	**Status of valve position, heating/cooling**	**1byte/1bit**	**C,R,T**	**5.001 DPT_Scaling/1.001 DPT_Switch**
This object is used to indicate the switch status or position status of the valve. The object type is determined by the parameter settings.					

320/325	**Valve X**	**Trigger valve purge, heating/cooling**	**1bit**	**C,W**	**1.003 DPT_Enable**
This communication object is used to trigger the cleaning function of the valve. When cleaning, the valve is fully opened. Telegram value: 0 ——end purge 1 ——trigger purge					
321/326	**Valve X**	**Status of valve purge, heating/cooling**	**1bit**	**C,R,T**	**1.003 DPT_Enable**
This communication object is used to indicate the cleaning status of the valve. Once the cleaning function is activated, its status is immediately indicated. Telegram value: 0 ——purge function is not activated 1 ——purge function activated					

Table 5.4 Communication object table of valve output