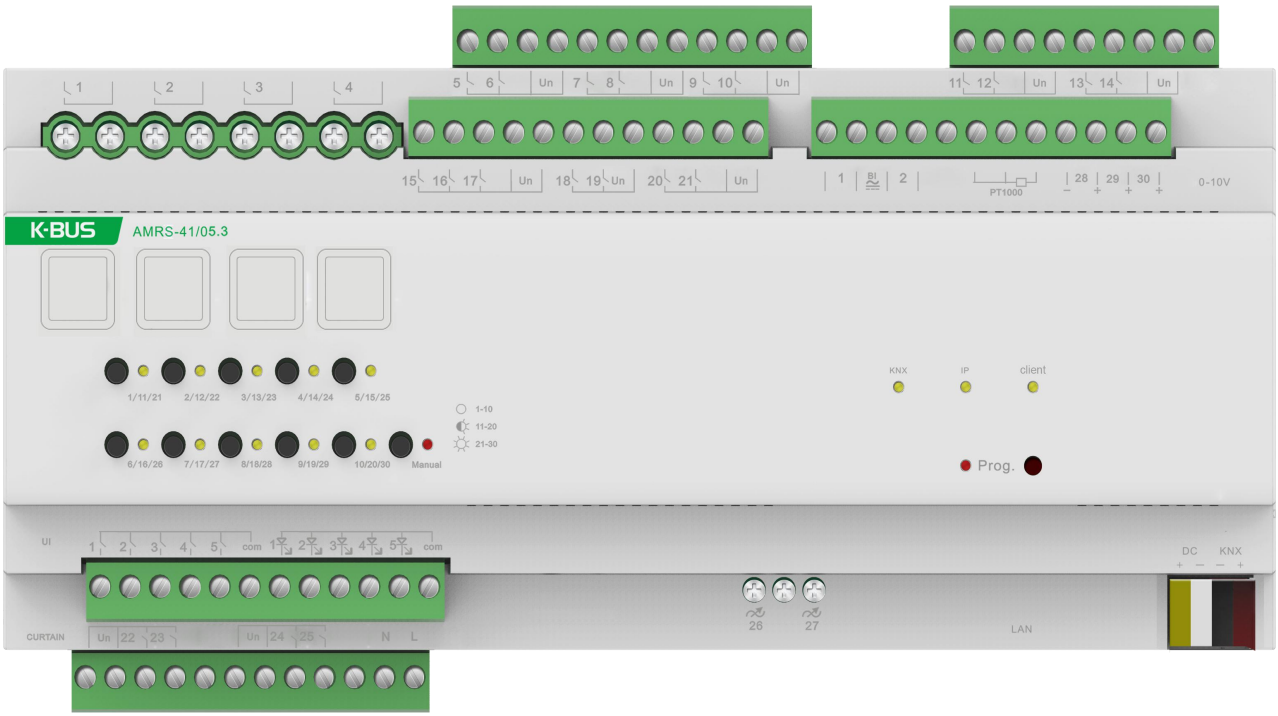
User Manual

K-BUS® Room Controller Smart_V3.1

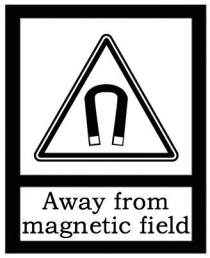
AMRS-41/05.3



KNX/EIB Intelligent Installation Systems

Attentions

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



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

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

4. **Please do not disassemble the devices.**

Contents

Chapter 1 General

The Room Controller Premium is a simple, low-cost solution for the hotel rooms, which can be used to achieve a single room control, such as heating, cooling, ventilation, lighting, water/fire alarm, emergency buttons and the blinds etc. But also can be used in apartments, hospitals, office buildings, assisted living facilities etc.

The Room Controller Premium's compact design covers most requirements of the electrical installation of the residential and building control systems and integrating most inputs and output interfaces for a single room's automatic control as well as covers all standard functions for a single room control. Besides, it's also able to connect with external protocols, for example KNXnet/IP protocol. Generally the functions are as follows:

- **Lighting Control**
- **Heating/cooling Control**
- **Fan coil Control**
- **Blinds or shutter Control**
- **Switching of electrical sockets and loads**
- **KNXnet/IP Tunnel convert**

In addition to these basic functions, further automation functions can be implemented by a combination with various detectors, such as a presence detector, motion detector. The integration into a hotel management system enables the efficient management and provision of rooms, for example, when a guest checks out, the room is automatically set to standby mode. Meanwhile the hotel manager will know the status of the room at any time and the service needs etc.

This manual provides detailed technical information about the Room Controller Premium for users as well as assembly and programming details, and explains how to use the Room Controller Premium by the application examples.

1.1 Product and functional overview

The Room Controller Premium is a modular installation device for fast installation in the distribution board on 35 mm mounting rails to DIN EN 60 715. The electrical connection is implemented by using screw terminals (most of them are pluggable). The connection to the KNX/EIB bus is implemented using the supplied bus connection terminal, with the system power input of 24-30V DC.

The Room Controller Premium provides a number of input/output interfaces for a variety of function applications. The input interfaces can be used to connect switches, button, smoke detectors, door contact and other passive switch module. The output interfaces can be used to connect fan coil unit, lighting, curtains and other load equipment. The Room Controller Premium has 13 major functional modules, and each functional module is summarized as follows:

① **Dry contact input**

which can connect with a variety of passive switch module, such as general switch panel, doorbell push button, door contact, etc.,

which can be used to switch lighting, open/close curtain, activate Do Not Disturb and room service as well as emergency signal transmission, etc. There are 5 passive inputs, and each input offers the following functions:

- Switching function, for switching the lighting by control dimmer and switch actuator.
- Dimming function, for dimming the lighting by control dimmer.
- Control of blinds and shutter, for up/down travel of a blinds or a shutter, and lamella adjustment/stop travel. There are a variety of operation types, according to actual use to select them.
- Sending of values e.g. temperature value, time etc.
- Control and storing of light scenes, the function can be set in the value/force output.

② **Binary input**

Used as an interface in the EIB/KNX operating system (via conventional buttons/switches), or as a binary signal coupler (signal contact, such as 24V~230V input), with the same dry contact input, the difference is that the binary is the active input. The dry contact is a passive input.

③ **LED indication**

Supports 10 levels of brightness display. The number of LED channels corresponds to the number of dry contact input channels, and a total of five LED indications can be set.

The LED function can be configured separately. In many cases, the LED indicator is used in conjunction with the dry contact input, and the LED acts as an indicator for the dry contact input. With a common anode connection, the drive voltage is 12V.

④ **Switch output**

Connect some electrical loads, such as lighting, sockets. The switch actuator has 25 channels with different load sections, including 4 x 230 V AC 16A, 21 x 230 V AC 6A with electronic switch control output, and some channels are multiplexed with curtains and fan coils. The function is summarized as follows:

- Provide 8 scenes, recall and storing via a 1byte object
- Switch status feedback
- Set the relay contact position after power voltage recovery
- Output type selection: normally open and normally closed

⑤ **Shutter control output**

Which can connect with motor blinds, awnings, roller blinds, vertical blind, etc. There are two outputs with 230V AC 6A motor or dry contact controlling motor.

The output contacts for the directions UP and DOWN. The pause on change in direction can be set via the parameters.

The curtain output is used for the switch output and can be used as a switch output when the curtain output is not enabled.

The curtain output channel 1 multiplexes the switch output channels 22 and 23, and the curtain output channel 2 multiplexes the switch output channels 24 and 25. The curtain output function is summarized as follows:

- Movement UP/DOWN
- Stop/Louvre adjustment
- Move to position 0……100%
- Adjustment louvre to position 0……100%(only “Shutter” working mode)
- Set 8 scenes, store or recall via a 1byte object
- Forced operation
- Curtain position status feedback
- Power-down reset function to define the position of the curtain after reset

- Output type selection: AC motor and dry contact motor
- Reference move
- Two working mode: Blind and Shutter

⑥ **Dimming output**

Connects to some dimmable lighting devices and provides 5 channels, two of which are TRIAC dimming outputs and three channels are 0-10V dimming outputs. The 0-10V dimming output of the three channels is multiplexed with the fan coil. The dimming output function is summarized as follows:

- Switch lighting
- Relative dimming, regulation lighting brightness via increase or decrease brightness values.
- Absolute dimming, regulation lighting brightness via a brightness value.
- Switch status and brightness status feedback.
- Provide 8 scene controls, which can be called or stored by 1byte object.
- Power recovery function, a brightness value can be defined after power voltage recovery.

⑦ **Fan control**

It can be connected to a single-phase fan and supports up to 3 levels of wind speed adjustment. The fan output is used for the switch output or 0-10V dimming output. When the fan output is not enabled, or the switch output or dimming output is not used, the switch output or dimming output is available.

The fan output channel multiplexes the switch output channels 15, 16, and 17, or multiplexes the 0-10V dimming output channel 28. The fan output function is summarized as follows::

- Support the fan with 1-2-3 level fan speed
- Forced operation: the fan speed is only allowed to run in set fan speed range, and the force operation has the highest priority.
- Auto. Operation: the desired speed is run automatically according the control value that is received from the sensor device, and the auto. Operation can be set four limits and the minimum dwell period of fan speed
- Direct operation: control the fan speeds via a manual operation, as via operating a panel
- The fan with multi-level speeds can set its starting characteristic

- The fan with single-level speed can set on/off delay or on/off minimum time
- Status response, as the current operation, fan on/off status, speed status
- Power-down reset function to define the wind speed after reset

⑧ **Coil control**

Can be used to connect 2 or 4-pipe fan coils, and the refrigeration and heating valves can be relay output or 0-10V output.

The heating valve output channel can be reused for the switch output channel 18 or the 0-10V dimming output channel 29;

The refrigeration valve output channel can be reused for the switch output channel 19 or the 0-10V dimming output channel 30.

The switch output or dimming output is only available when the valve output is not enabled, or when the switch output, dimming output is not used. The function is summarized as follows:

- Ordinary on/off valve control and PWM continuous valve control supporting two/four tube control
- Built-in PID algorithm to support local / bus control valves
- Prohibit/enable heating or refrigerating valves
- Valve switch status feedback
- Manual or automatic cleaning of the valve to send cleaning status
- Provides 8 scene functions for joint control of fan and coil status, call or store via 1byte object
- Local control supports standby, comfort, night and protection modes of operation and status feedback

⑨ **Temperature detection**

With temperature acquisition function, input external three-wire PT1000 temperature sensor can collect local actual temperature.

Or use other temperature sensor devices on the bus for detection.

⑩ **KNXnet/IP protocol docking**

It can be used to communicate with some mobile terminal software based on KNXnet/IP protocol through the network, and can connect up to 5 clients. It also supports the KNXnet IP Router packet-compatible protocol. You can configure the filtering of eight group address segments by parameters.

There are three additional features at the same time:

——Logical function—Supports four logical functions of AND, OR, XOR, and data type conversion. AND, OR, XOR provides 8 logic inputs, and data type conversion supports conversion between 10 different data types.

——Time function——Supports 4 time delays, flicker and other time control functions, such as delay transmission of triggering on/off value; flashing switch function, which is convenient for aging of lamps; used to trigger stair lighting, after opening staircase lighting, Turn off the illumination automatically for a while.

—— Scene group function - Supports 4 scene group functions. Each group supports up to 8 scene functions. Each scene can output 8 different types of values, and the time interval for each output can be configured. The data type and send time of each output are uniformly set in the group.

The assignment of the physical address and the setting of the parameters can be done using the engineering tool software ETS (version ETS4 or higher) with the knxprod file.

In order to ensure that all functions of this product are used correctly, it is necessary to check whether there is any problem with the wiring before use. At the same time, attention should be paid to the technical characteristics of the load device when setting the parameters, especially the curtain drive, fan coil, and many technical features involved. Some technical characteristics are inherent to the device. If the settings are not appropriate, it may cause damage to the load device or may not operate properly.

Chapter 2 Technical Data

Power Supply	Bus Voltage，EIB	21~30V DC, from EIB bus
	Current consumption, EIB	<12mA
	Power consumption, EIB	<360mW
	Auxiliary power supply	24~30V DC
	Auxiliary power supply working current	<200mA
	Auxiliary power consumption	<6W
	Power consumption, Output 16A	<1.5W
	Power consumption, Output 6A	<1W
Connection	EIB/KNX	Via bus connection terminals（red/black），Ø0.8 mm
	Output, 16A	Screw terminals Wire Range0.5-4mm^2 Torque 0.8N-m
	Middle, lower Input/ Output (except 16A output terminal)	Pluggable screw terminals Wire Range 0.5-1.5mm^2 Torque0.5N-m
Operation/ display	Manual operation and status indication Programming	button and LED light programming physical address
	Green LED flashing	The application layer works normally
Housing	IP 20, EN 60 529	
Temperature range	Operation	-5℃……+45℃
	Storage	-25℃……+55℃
	Transport	-25℃……+70℃
Ambient conditions	Max. air humidity	<93%，except dewing
Design	Modular installation device (MDRC)	
Housing/color	Plastic housing, white	
Installation	On 35mm DIN-Rail	To EN 60 715
Dimension	216mm ×90 mm ×64mm	
Weight	0.7KG	
Input	5 channels	Can be individually set (all COM are internally connected)

		Output scanning voltage 12V DC
		Output scanning current 0.4mA
		Cable length ≤10m
	1 PT1000 input	
	1 network port input	
	2 binary input	Input voltage range Un 0...265V AC/DC
		Signal level is 0 signal 0...3V AC/DC
		Signal level is 1 signal 9...265V AC/DC
		Allowable cable length ≤100 m (1.5mm2 cross section)
		Input current In Max.2mA
0-10V Output	3 channels (dimming and fan coil multiplexing)	
	Output Voltage	0~10V
	Max. Output Current	50mA
LED Ouput	5 channels	each channel can be configured separately
	LED output voltage	12V
	LED output current	up to 10mA, common anode connection
TRIAC dimming	2 channels	
	Load capacity	100W
Output, 16A	4 channels	Can be individually set
	U_n rated voltage	250/440 V AC（50/60Hz）
	I_n rated current capacity	16A/140uF
	Max. switching current	20A/250V AC
	Electrical life	$>1\times10^5$
	Max. DC current switching capacity (resistive load)	16A/24V DC
Output, 6A	21 channels	Each channel can be configured separately (some switch outputs are multiplexed with curtains and fan coils)
	U_n rated voltage	240/400V AC（50/60Hz）
	I_n rated current capacity	6A/70uF
	Max. switching current	6A/240V AC
	Mechanical endurance	$> 2 \times 10^6$
	Electrical endurance	$>5 \times 10^4$
	Max. DC current switching capacity (resistive load)	6A/30V DC

Note:

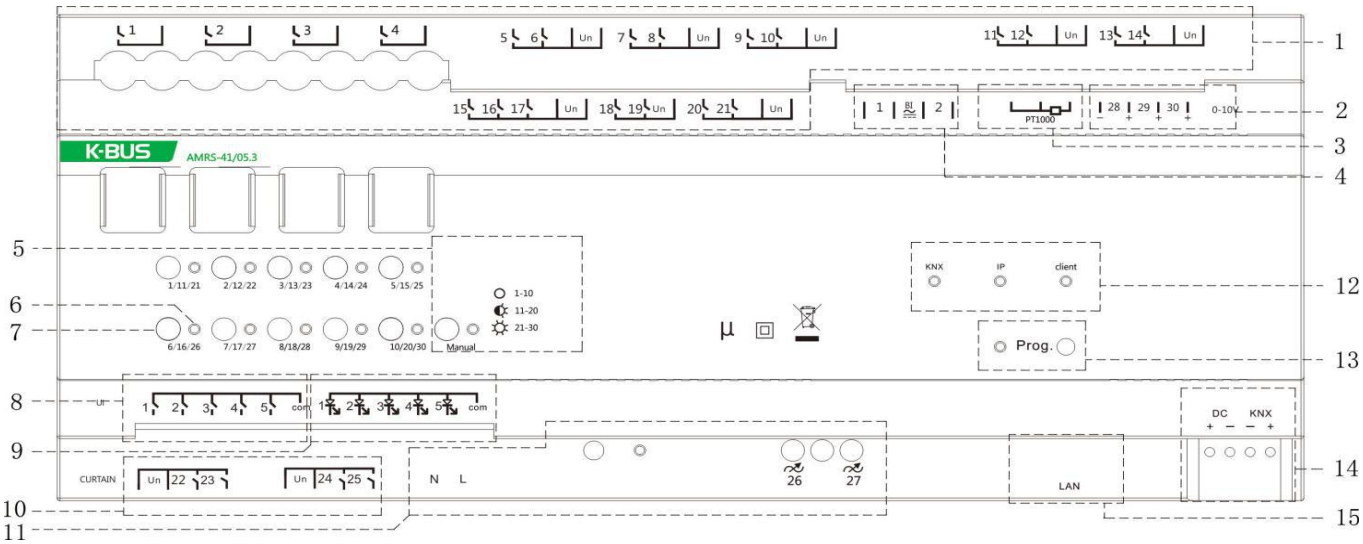
The above load is only for single lamps. In the case of several lamps in parallel, the load will be reduced, although the power is unchanged, but the instantaneous impact of current will increase, and easy to make the relay contacts melted. So, in normal use, subject to the measured current, the measured maximum inrush current must be within the allowable range.

Application program：

Model	Max. number of communication objects	Max. number of group addresses	Max. number of associations
AMRS-41/05.3	275	512	512

Chapter 3 Functional, Dimension and Connection Diagram

3.1 Functional diagram



1、Relay output terminals, among which 15, 16, and 17 can be used as fan output, and 18 and 19 can be used as coil output.

2、3 channel 0-10V output connection terminal.

3、Three-Wires PT1000 temperature sensor.

4、Binary input terminal.

5、Function group switch button and LED indication:

When it is off, the button and indicator next to it act on the first function group, and control and indicate the status of 1-10 channels;

When flashing, the button and indicator next to it act on the second function group, controlling and indicating the 11-20 channel status;

When it is always on, the button and indicator next to it act on the third function group, controlling and indicating the status of 21-30 channels.

6、The output status indication of various functions. When the indicator is on, it indicates that this output is activated.

7、Manual operation buttons for various output functions.

8、Dry contact input terminal, 5 channels, 1 common

9、LED control output connected to the input terminal 5 channels, a common terminal, LED common anode.

10、Relay output terminal, which can be used as 2 curtain control output.

11、L, N line input terminal, dimming output terminal.

12、Communication interface status indicator LED:

KNX: When the light is on, the bus link is normal; when blinking: there is a message sent and received.

IP: When the network is steady on, the network link is normal. When blinking: Packets are sent and received.

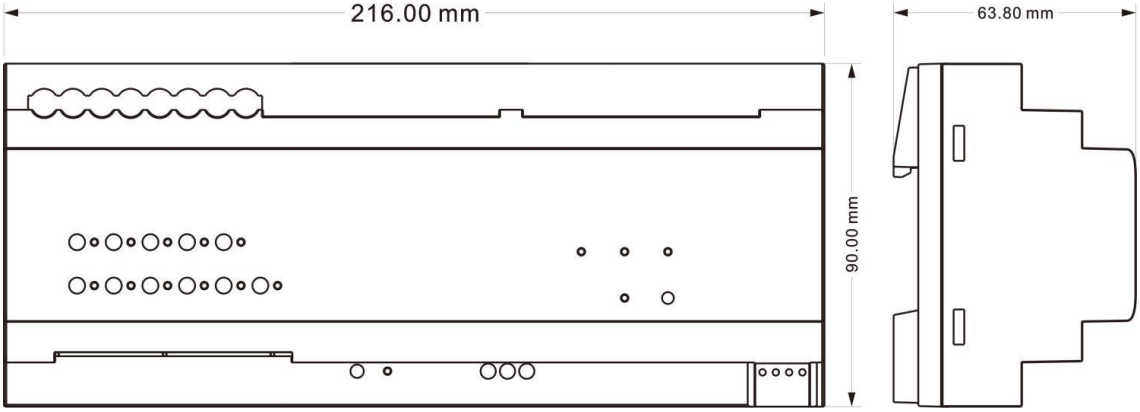
Client: When the port is steady on, the KNXnet IP client is connected normally. When it blinks: Packets are sent and received.

13、Programming button and LED indicator: The red light indicates the programmed physical address, and the green light indicates that the application layer of the device is operating normally.

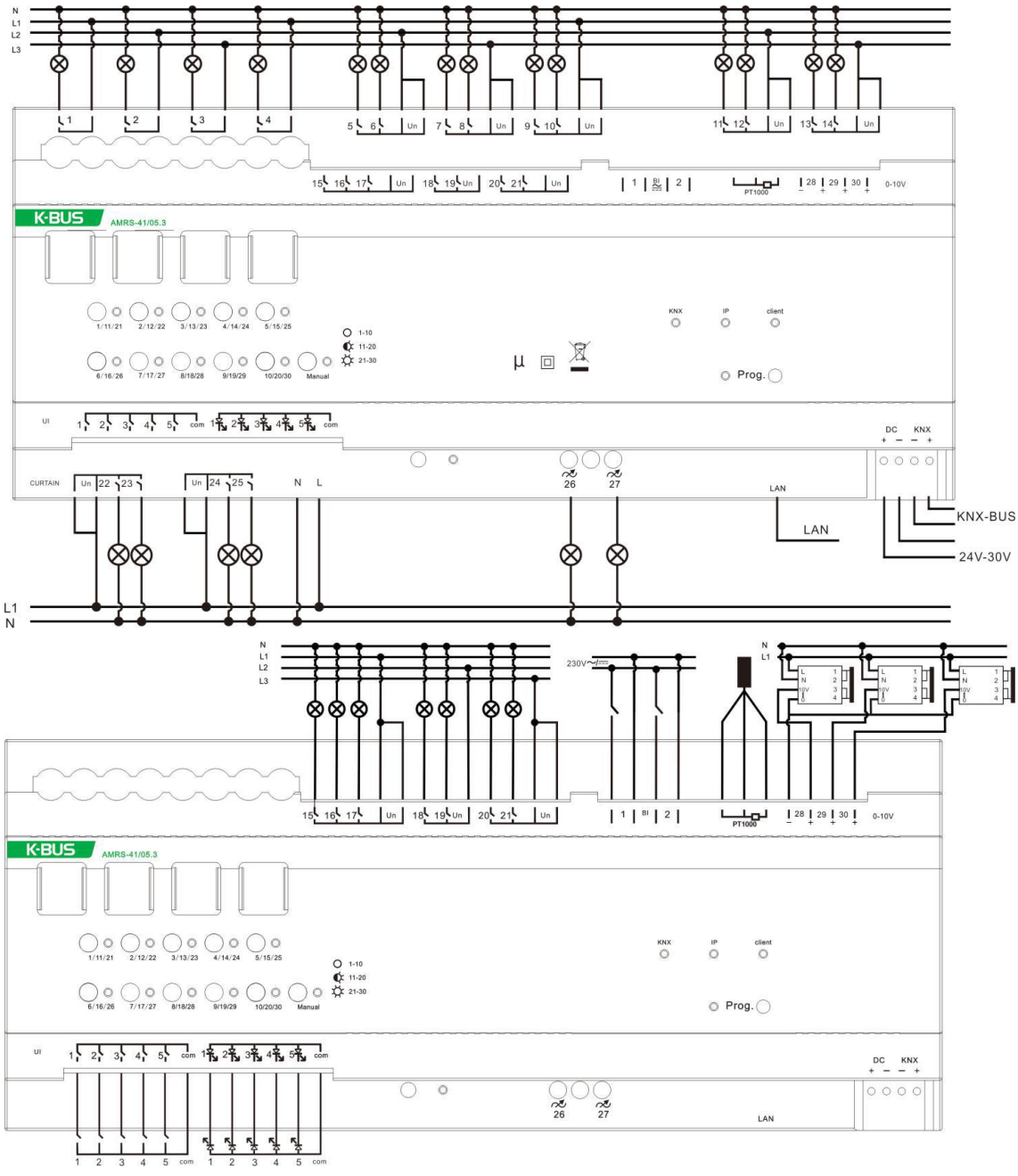
14、EIB/KNX bus and auxiliary power supply connection terminals.

15、Network connection port.

3.2 Dimension diagram

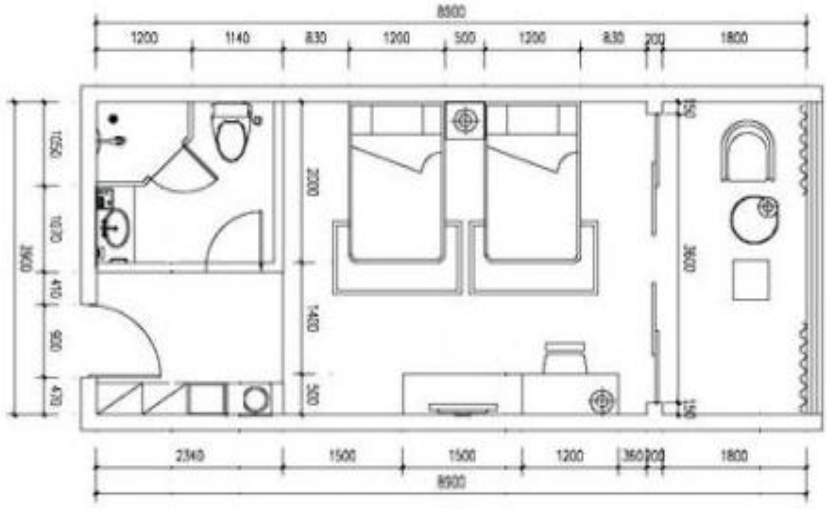


3.3 Connection diagram



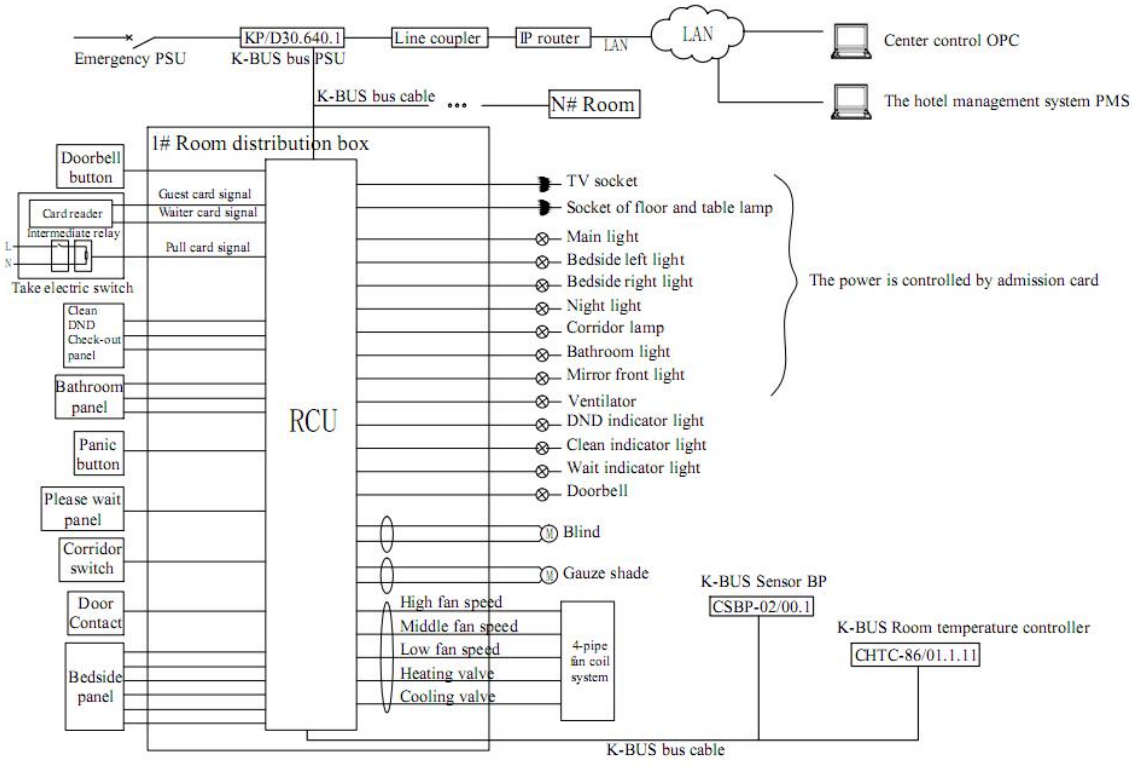
Chapter 4 Project design and application

The application of the Room Controller for the hotel rooms is summarized as follows:



The standard room plan

4.1 Distribution system diagram



RCU: Room Controller Premium Unit (**AMRS-41/05.3**)

4.2 Functional overview

1) Basic functions: lighting switch, air conditioning local control, air conditioning network control, electric curtains, socket control, room status monitoring.

2) Do not disturb and please clean, doorbell interlock, etc.

3) Realize linkage with the card to take power, and realize different kinds of scene linkage according to the administrator card and the guest card.

4) The intelligent temperature control panel can realize the local control of the fan coil and remote control by the central control system. The ordinary panel switch can be connected to the dry contact input port to intelligently control the lights and curtains, and realize independent control of the lights and scenes. In addition, the panel with indicator light is selected to control the night light to distinguish it from other panels. The function is quite simple and easy to use.

5) In conjunction with the hotel management system, the card is connected to the power. When the guest checks in, the air conditioner of the corresponding room enters the comfortable mode. When the card is inserted for power, the light is automatically adjusted to the welcome mode; when the administrator inserts the card, the light is adjusted to the clean mode. After checking out, the central control system initializes the temperature control panel of the corresponding room and the air conditioner is turned off.

6) Room control system. In order to improve the response time and accuracy of room service,the computer in the room management department can display in real time whether each room has emergency or cleaning request. the computer at the front desk can display the running status of each room controlled device and the temperature of the air conditioner; The above linkage function can be achievable through data interaction with the hotel management system and the OPC interface.

Chapter 5 Parameter setting description in ETS

The description of the parameter settings in the ETS system is described in the form of function blocks, which are not described in the order of the parameters in the database to prevent duplication. The parameters are consistent with same function block.

5.1 Parameter “Input &. LED&IP General”

This section focuses on common settings for input, LED, and IP interface functions.

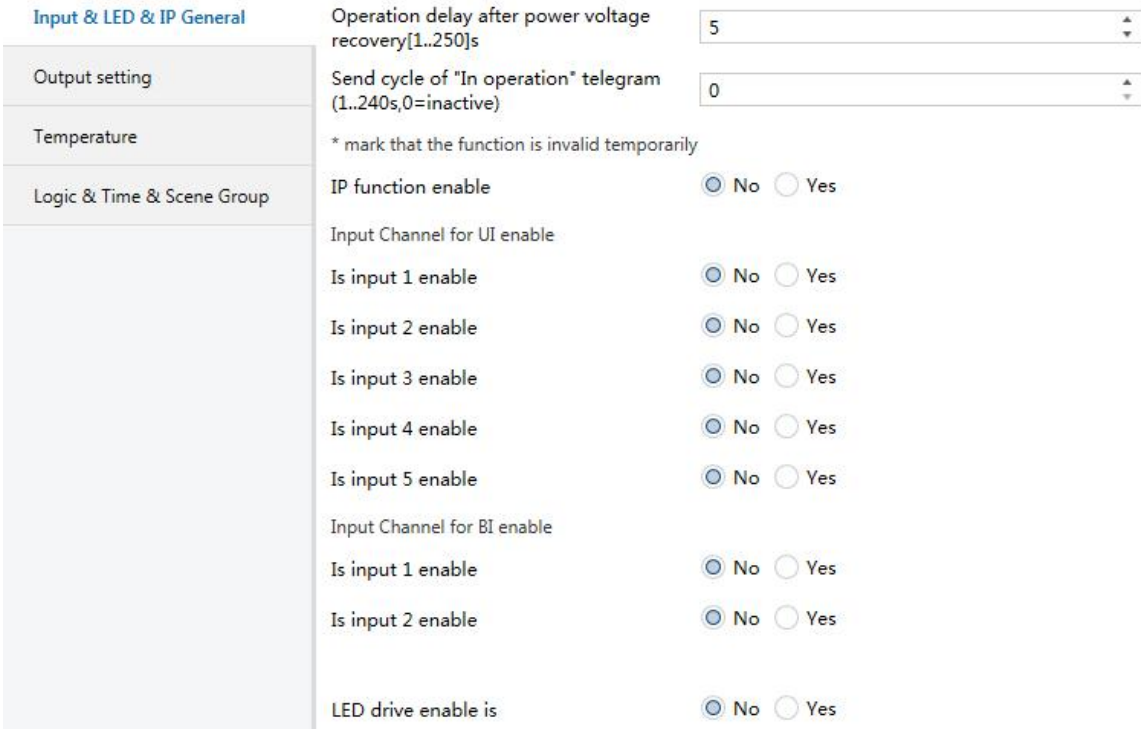


Figure 5.1 Parameter Setting Interface“Input&LED&IP General”

Parameter“Operation delay after power voltage recovery[1...250s]”

This parameter defines the delay time of the operation after the device power voltage recovery.

The actions are only executed or the telegrams are only sent when the delay is completed.

This delay time does not include the initialization time of the device. After the power supply voltage is restored, the initialization time of the device startup is about 3 s. It means the delay time starts after the device initialization.

Parameter“Send cycle of “In operation”telegram (1...240s, 0 = inactive)”

This parameter sets the interval time this module cyclically sends telegram through the bus to indicate the normal operation of this module.

When it is set as “o”, the object "in operation" will not send a telegram.

If the setting is not "0", the object "in operation" will send a telegram with logic "1" to the bus according to the set time period.

Options: 0.....240s,0=cyclic transmission prohibited

In order to reduce the bus load as much as possible, the maximum time interval should be selected

according to actual needs.

** mark that the function is invalid temporarily for the product.*

Parameter"IP function enable"

This parameter is used to activate the function of the IP interface. When activated, the IP related parameters can be set, such as IP address and IP address allocation mode.

The IP interface function can be used to control each other through the network with some mobile terminal software based on KNXnet/IP protocol communication, and can connect up to 5 clients. It also supports the KnxNet IP Router protocol, which can be configured to filter the eight group address segments.

Input Channel for UI enable

Parameter"Is input x(x=1..5) enable"

To set whether to enable dry contact input channel X (X=1..5).

The dry contact input has a total of 5 inputs. Since the parameters and communication objects assigned to each input are the same, the A input is taken as an example.

Input Channel for BI enable

Parameter"Is input x(x=1..2) enable"

To set whether to enable binary input channel X (X=1..2).

The parameters and the communication object of the dry contact and the binary input are similar, except that the input source is different.

The dry contact input is connected to the passive input and the binary input is the active input.

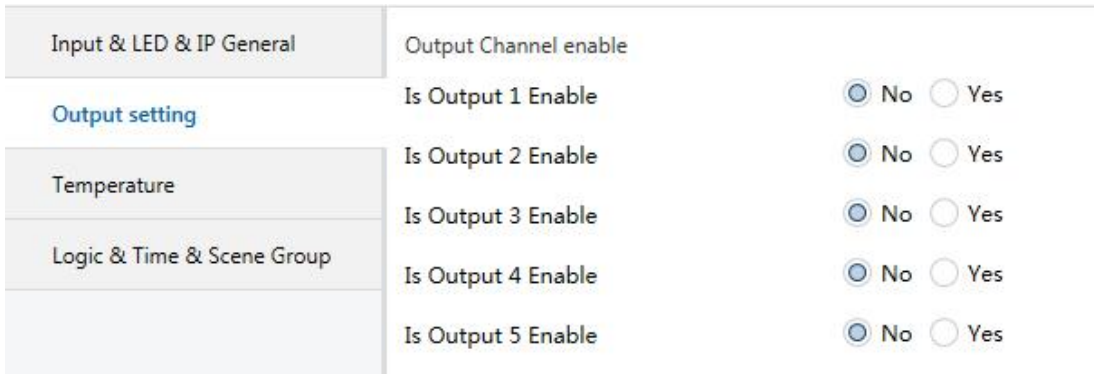
Parameter"LED drive enable is"

To set whether to enable the LED indication function.

The number of LED indication channels corresponds to the number of dry contact input channels, and 5 channels can be set.

5.2 Parameter "Output General"

This section mainly describes the general settings of the output function.



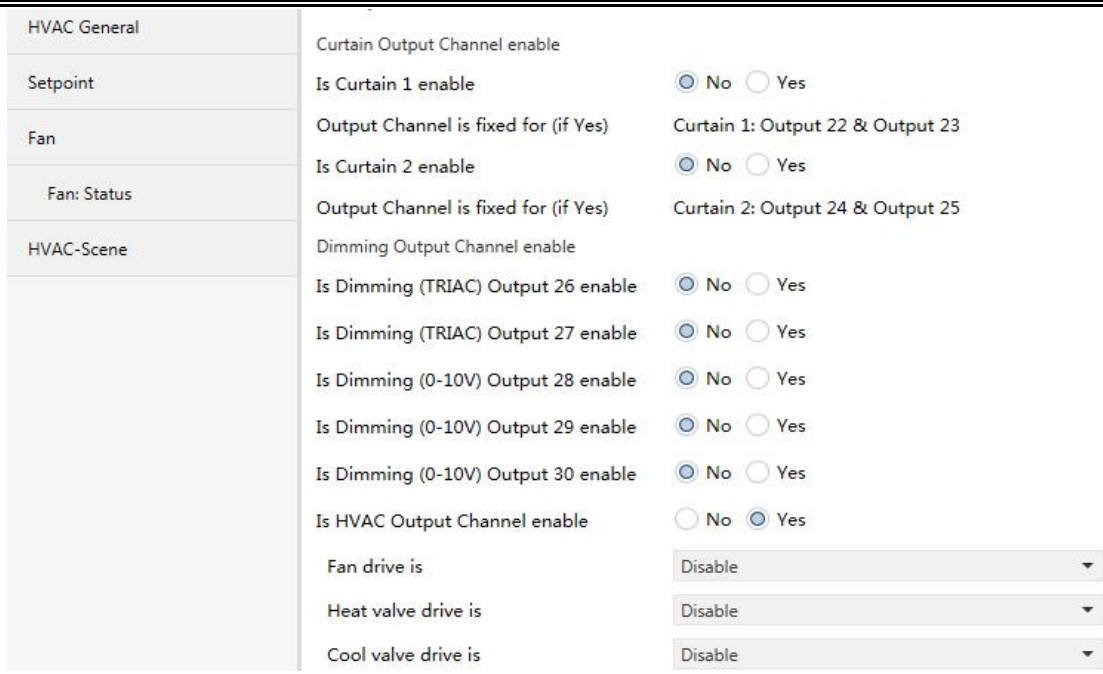


Figure 5.2 Parameter Setting Interface"Output General"

Output Channel enable

Parameter "Is Output X(X=1..25) enable"

To set whether to enable the switch output channel X (X=1..25).

Curtain Output Channel enable

Parameter "Is Curtain X(X=1..2) enable"

To set whether to enable the curtain output channel X (X=1..2).

Output Channel is fixed for (if Yes) : Curtain 1: Output 22& Output 23

Output Channel is fixed for (if Yes) : Curtain 2: Output 24& Output 25

Note: the curtain output channel 1 and the switch output channels 22 and 23 are multiplexed, and the curtain output channel 2 and the switch output channels 24 and 25 are multiplexed.

When the curtain output is enabled, the corresponding switch output will not be available.

Dimming Output Channel enable

Parameter "Is Dimming (TRIAC) Output X(X=26,27) enable"

To set whether to enable the dimming output channel X (X=26, 27), which uses traic dimming.

Parameter"Is Dimming (0-10V) Output X(X=28, 29, 30) enable"

To set whether to enable the 0-10V dimming output channel X (X=28, 29, 30).

Parameter"Is HVAC Output Channel enable"

To set whether to enable the HVAC output. When it's enabled, the following parameters are visible.

Parameter "Fan drive is"

This parameter is used to select the drive type of the fan wind speed. Available options:

Disable

Output 28 (0-10V)

Output 15&16&17 (Relay)

Parameter "Output voltage for fan speed 1/2/3[1..20]"

When the drive type of the wind speed of the fan is 0-10V, this parameter is visible. It is used to set the voltage value that drives the output of each wind speed. Options: 1..20

When the fan drive selects 0-10V output, it is multiplexed with the dimming output channel 28, and the corresponding dimming output will not be available.

Fan output is fixed for (if relay): 1 level:15; 2 level:15&16; 3 level: 15&16&17

Remark:

When the fan drive type is a relay, the fan output channel will be multiplexed with the switch output channel.

Level 1 wind speed and switch output 15 are multiplexed;

Level 2 wind speed and switch output 15 and 16 are multiplexed;

Level 3 wind speed is multiplexed with the switch outputs 15, 16 and 17.

When the fan drives are selected as relay, the corresponding switch output will not be available.

Parameter"Heat valve drive is"

This parameter is used to select the type of drive for the heating valve. Options:

Disable

Output 29 (0-10V)

Output 18 (Relay)

When the valve drive selects 0-10V output, it is multiplexed with dimming output channel 29, and the corresponding dimming output will not be available.

When the valve drives the selection relay output, it is multiplexed with the switch output channel 18 and the corresponding switch output will be unavailable.

Parameter "Cool valve drive is"

This parameter is used to select the drive type of the cool valve. Options:

Disable

Output 30 (0-10V)

Output 19 (Relay)

When the valve drive selects 0-10V output, it is multiplexed with the dimming output channel 30, and the

corresponding dimming output will not be available.

When the valve drive selects the relay output, it is multiplexed with the switch output channel 19, and the corresponding switch output will be unavailable.

5.3 Parameter “Temperature”

The “Temperature” parameter setting interface is shown in Figure 5.3. The relevant parameters for temperature detection are set under this interface.

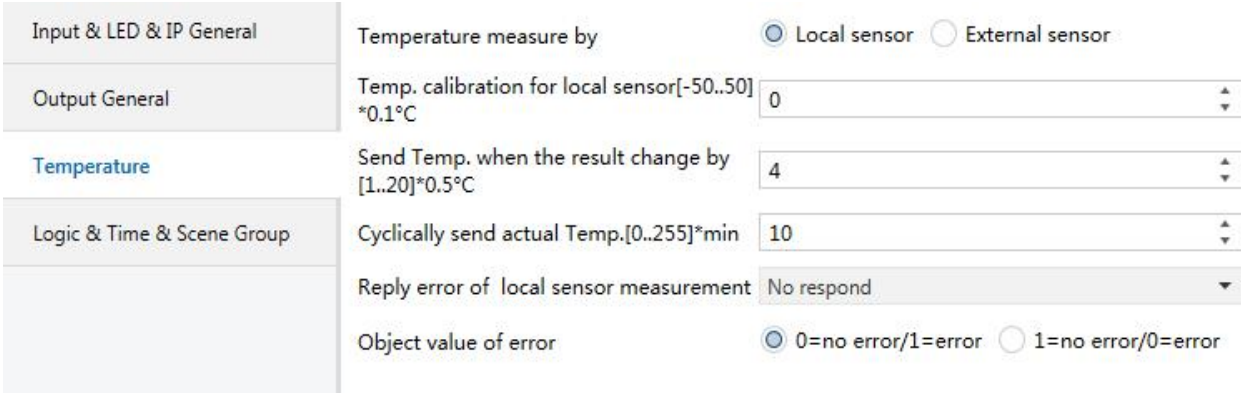


Figure 5.3 Parameter Setting Interface“Temperature ”

Parameter“Temperature measure by”

Options：

Local sensor

External sensor

The temperature value measured by the temperature sensor of this device is sent or read to the bus by the object "Actual temperature output"; when the temperature sensor is faulty, the temperature value will be 0.

The temperature value is measured by other temperature control devices on the bus and is received by the object "External sensor".

Parameter“Temp. calibration for local sensor [-50..50]*0.1℃”

Options：-50..50

This parameter is used to set the temperature correction value of the temperature sensor of the device, that is, the measured value of the temperature sensor is corrected to be closer to the current ambient temperature.

Parameter“Send Temp. when the result change by[1..20]*0.5℃”

This parameter sets the current temperature value to the bus when the temperature changes by a certain amount. Options: 1...20

Parameter"Cyclically send actual Temp.[0..255]min"

This parameter sets the time that the actual temperature value cyclically sent to the bus. Options: 0..255min

The timing starts from the time of programming completion or reset, and the current temperature value will be reported to the bus when the timing period expires.

Parameter"Reply error of local sensor measurement"

This parameter defines the feedback method for the error of the temperature sensor of this device. Options:

Respond after read only

Respond after change

Respond after read only：The object "Local sensor error output" 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 error status changes or the device receives a request to read the status, the object "Local sensor error output" immediately sends a message to the bus to report the current status.

Parameter"Object value of error"

This parameter defines the object value of the device's temperature sensor error. Options:

0＝no error/1=error

1＝no error/0=error

0=no error/1=error: When there is no error in temperature detection, the object "Local sensor error output" sends the message "0". When an error occurs, the object sends the message "1"; vice versa.

Parameter"Time period for request external sensor [0..255]min"

This parameter is visible when the sensor type selects “External sensor” and is used to set the time period during which the device sends a read request to the external temperature sensor. Available options: 0...255

The following parameter sections are described in the form of function blocks, which can be divided into ten functional modules: IP interface, dry contact/binary input, LED indication, switch output, blind control output, dimming output, fan coil output, logic function, time function and scene group control.

5.4 Parameter “IP setting”

Activate the IP interface function in the 5.1 interface. The following interface is visible. It is used to set related parameters of the IP interface function.

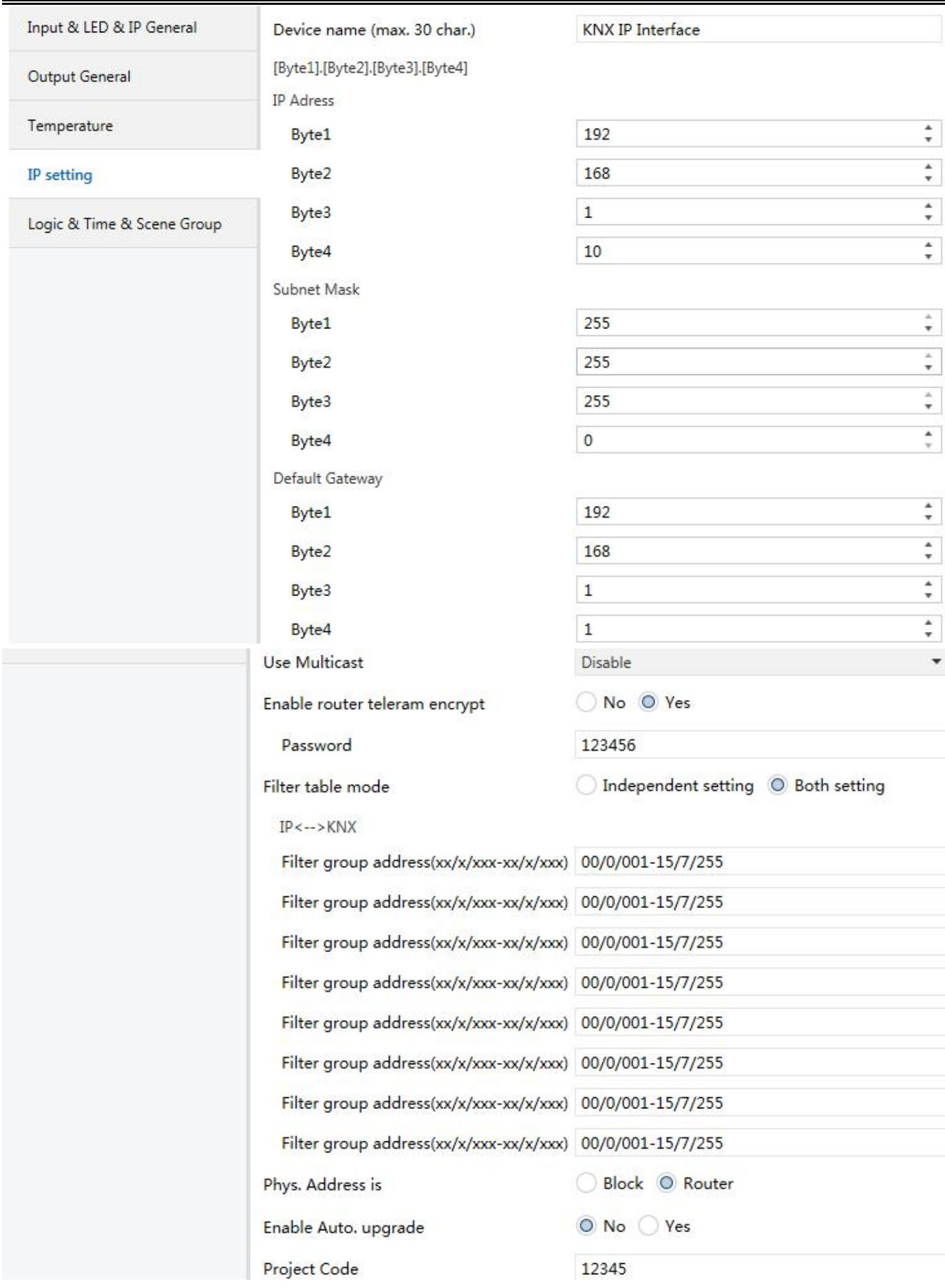


Figure 5.4 Parameter Setting Interface"IP setting"

Parameter"Device name (max. 30 char.)"

This parameter sets the device name so that it can be recognized on the LAN, up to 30 characters.

[Byte1].[Byte2].[Byte3].[Byte4]

Parameter"IP address"

This parameter defines the IP address of the device. This IP address is unique in the LAN. Otherwise, it will cause conflicts between IPs.

Options：Byte x：0…255

The IP address is input as follows: (Example: 192.168.1.10)

Byte1： 192

Byte2： 168

Byte3： 1

Byte4： 10

Parameter"Subnet mask"

Define the subnet mask of the device. The subnet mask must be set to reflect the structure and number of subnets. Available options: Byte x:0...255

The subnet mask is input as follows: (take the simplest small network subnet mask 255.255.255.0 as an example)

Byte1： 255

Byte2： 255

Byte3： 255

Byte4： 0

Parameter"Default gateway"

Define the default gateway of the device. The default gateway must be in the same network segment as the IP address.

Available options: Byte x:0...255

The default gateway input method is as follows: (Example: 192.168.1.1)

Byte1： 192

Byte2： 168

Byte3： 1

Byte4： 1

Parameter"Use Multicast"

To set whether to enable multicast on the IP interface. Options:

Disable

System Multicast

User define

System Multicast: The system multicast address defined by KNXnet/IP is 224.0.23.12, as defined by the KNX Association along with IANA.

For existing networks, change this address only when necessary.

User define: Users can customize the physical multicast address. When this option is selected, the following parameters for customizing the multicast address are visible.

Byte1： 239 fixed setting to "239"

Byte2： 0 This parameter can be parameterized

Byte3： 23 This parameter can be parameterized

Byte4： 12 This parameter can be parameterized

Tip:

During commissioning, in order to achieve all KNX IP devices communicate with each other over IP, the same IP routing multicast address must be used.

Parameter "Enable router telegram encrypt"

To set whether to enable the router telegrams encrypt. Options:

No

Yes

Parameter "Password"

This parameter is visible when the router telegrams encrypt is enabled and is used to set the password. Max. Allowable option is 32 bytes chars .

Parameter "Filter table mode"

This parameter is set the filter table mode. Options:

Independent setting

Both setting

Independent setting: The filter table for both KNX -->IP and IP -->KNX can be set separately.

Both setting: The filter table for both KNX -->IP and IP -->KNX (IP<-->KNX) can be set together.

Parameter"Filter group address (xx/x/xxx-xx/x/xxx)"

Set the start and end group addresses in the filter table. A total of 8 filter group addresses can be set.

Only group addresses within the set range can be routed.

Be sure that the end group address value is larger than the start group address value, otherwise problems may occur.

Group address segment format: xx/x/xxx (start address) - xx/x/xxx (end address)

Parameter “Phys. Address is”

To set whether the physical address is routed. Options：

Block

Router

Parameter “Enable Auto. upgrade”

To set whether to enable the firmware upgrade automatically. If enabled, when the device accesses the network server, the device will update it automatically if the server has a new version of firmware. Options：

No

Yes

Parameter “Project Code”

To set the customer’s project code. You can update specific firmware for the device based on the project code.

5.5 Dry Contact/Binary Input

There are 5 inputs for dry contact input and 2 inputs for binary input. Their parameters and communication objects are similar, except that the input source is different.

The dry contact input is connected to the passive input and the binary input is the active input.

When the function settings are described below, one of them will be used as an example.

The dry contact and binary inputs are tested for input status of each contact after a brownout reset or programming.

If the contact is in the closed state, it is determined that there is an input and the corresponding object value is sent.

If the contact is off, no processing is required unless there is a parameter to set the system to enable transmission after a power-on reset.

The enable of the input channel is set in interface 5.1. When enabled, the interface shown in Figure 5.5 is visible.

5.5.1 Parameter“UI/BI input x- Switch sensor”

The parameter setting of “Switch sensor”is shown as Figure 5.5 and Figure 5.6

The long/short operation is not distinguished in Figure 5.5, and the long/short operation is distinguished in Figure 5.6.

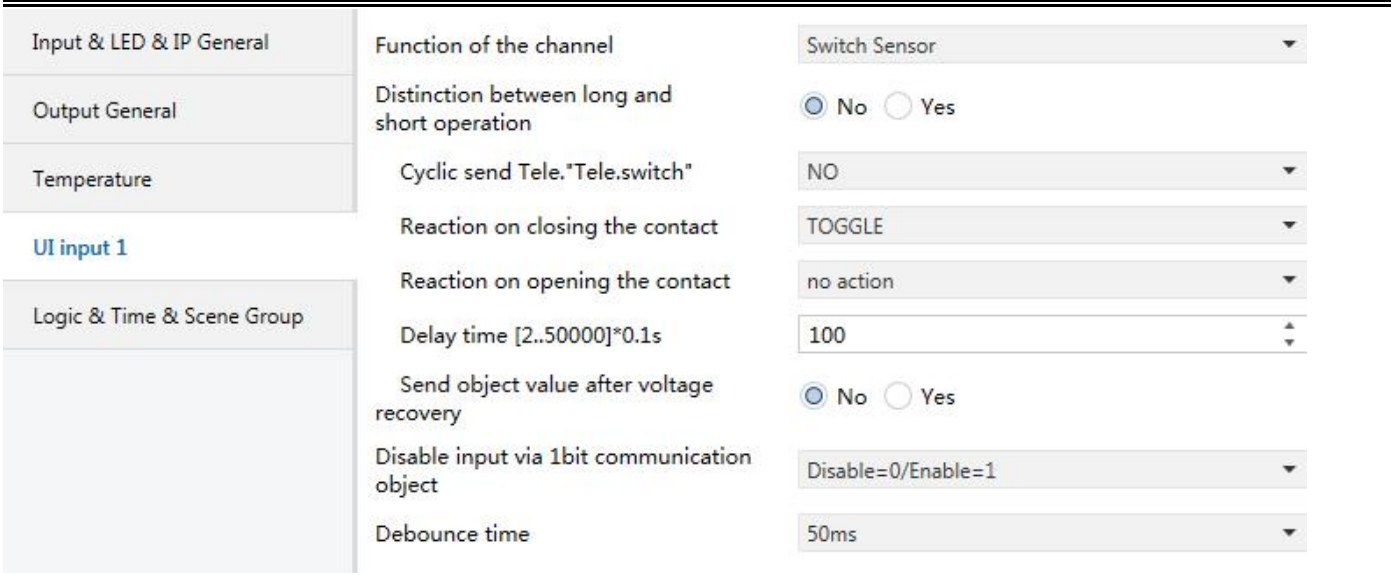


Figure 5.5 Parameter Setting Interface"Switch sensor"（no distinguish between long/short operation）

Parameter"Function of the channel"

This parameter sets the function options of the channel. The current option is the "switch sensor" function.

If the option is "No Function", the channel is not enabled. Options:

Switch sensor

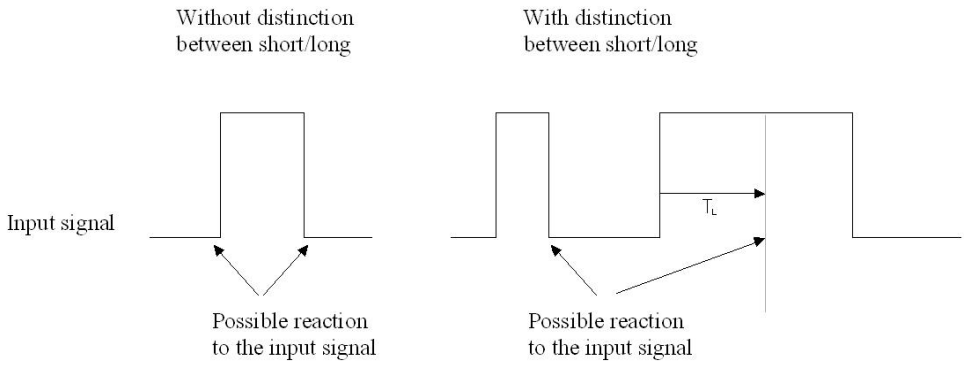
Switch/Dimming

Value/Forced output

Shutter Control

Parameter"Distinction between long and short operation"

This parameter sets whether the contact input distinguishes between long/short operations. If the "yes" option is selected, the input will execute set operation only when the operation can be recognized as a long operation or a short operation when the input has elapsed for a certain period of time. The long operation process is as shown:



Options：

yes

No

Note:

The long operation processing of the following chapters is the same as here.

TL refers to the time of long operation, that is, the time required to determine an input operation as a long operation.

Parameter"Cyclic send Tele. "Tele. switch""

This parameter is visible when the long/short operation is not distinguished. It is to set whether to cyclic send the current switch value of the object "Switch" to the bus. Options:

No

If switch OFF

If switch ON

Always

When the parameter option is set to "If switch off" or "If switch on", it means the telegram will only be sent cyclically if the option corresponds to the current switch value of the object.

When the parameter option "Always" is selected, regardless of whether the current value of the object "switch operation" is 0 or 1, the current switch value is cyclically sent to the bus.

Parameter"Reaction on closing the contact"/"Reaction on opening the contact"

This parameter is visible when the long/short operation is not distinguished. It is to set the switch value sent by the object "Switch" when the contact is closed and opened when the action is performed. Options：

No action

OFF

ON

TOGGLE

Stop cyclic send

Delay mode

Toggle: The reverse operation is performed, that is, the current switch value is inverted, for example, the current execution is an "On" operation, and after the reverse is performed, an "Off" operation is performed.

Stop cyclic send: If there is a cyclic transmission of the message, performing this operation will stop the cyclic transmission of the message until a new input value is sent.

Delay mode: When the cyclic transmission is not enabled, it is displayed. When the operation is performed, the first packet is triggered. After a delay, the second packet is automatically triggered. This feature can be used for the control of stair lights. When this option is selected, the following parameters are visible and are used to set the triggered message.

——Parameter "Value send mode"

This parameter sets the value transmission mode, which telegram is sent first, and which telegram is sent later. Options:

0/1

1/0

——Parameter “Delay time [2...50000]*0.1s”

This parameter is visible when cyclic transmission is not enabled and is used to set the delay time. Options: 2..50000

Parameter“Interval of Tele. cyclic send [2..50000]*0.1s”

When the cyclic transmission is enabled, this parameter is visible and to set the interval for cyclically sending telegram. Options: 2..50000

Parameter“Send object value after voltage recovery”

It can be set whether to send the value of the object “switch” on the bus after voltage recovery, this parameter is visible if there is no distinction between a short and long operation. Options:

No

Yes

If “Yes” is selected, the object value “switch” will be sent on the bus after bus voltage recovery.

If “No action” or “Stop cyclic send” is selected, there is no values are sent on the bus either.

Parameter “Disable input via 1bit communication object”

This parameter is used to disable/enable the input of the x channel. Options:

No

Disable=0/enable=1

Disable=1/enable=0

When the option is "Disable=0/enable=1", the input of X channel will be prohibited by object “Enable communication” when the message “0”is received and enabled when the message is “1”. And vice versa.

The input of this channel is enabled by default after the power recovery.

Parameter“Debounce time”

It can set the debounce time to prevent unwanted multiple operation by bouncing of contacts in debounce time, which means the minimum effective time of the contact input.

Options:

10ms

20ms

……

150ms

Note:

The disable function and debounce time of other functions of input channel x are the same, here will not be repeated below.

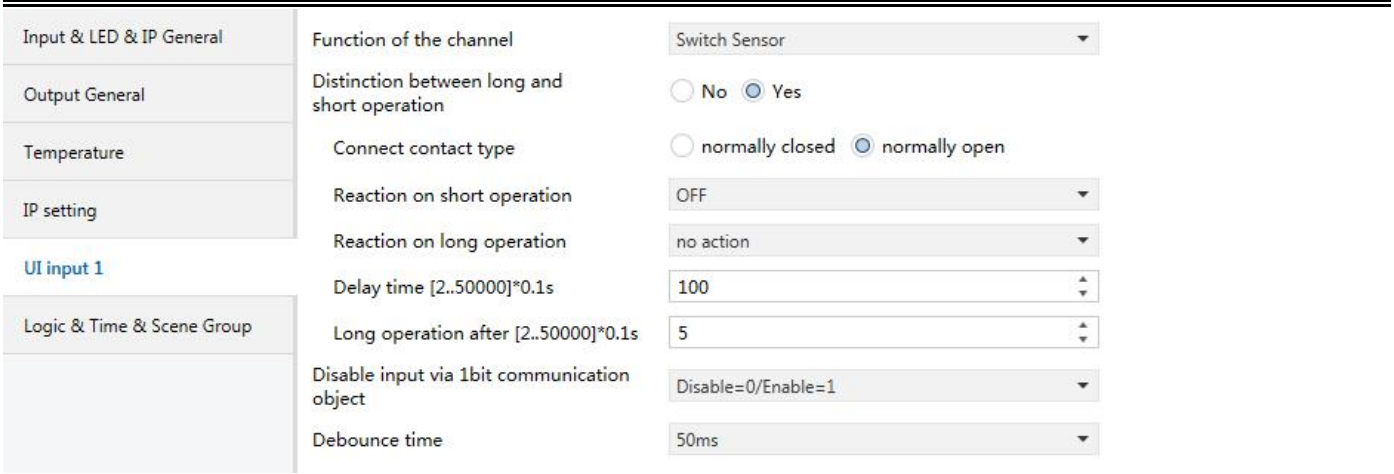


Figure 5.6 Parameter window "Switch sensor" (Distinction long/short operation)

Parameter"Connect contact type"

This parameter is visible when there is distinction between long/short operation. It is used to set whether the input contact is a normally closed or normally open contact.

Options:

Normally closed

Normally open

The parameters that are described in this chapter are based on normally open connect type as example, the normally closed connect type is just opposite.

Parameter"Reaction on short operation" or "Reaction on long operation"

The parameter is visible when there is distinction between long/short operation. Here you can set the reaction when there is execution of long/short operation.

When the input is determined as long operation or short operation, the object value will be updated at once.

Options:

No action

OFF

ON

TOGGLE

Delay mode

——Parameter "Value send mode"

This parameter is visible when "Delay mode" is selected in the previous parameter. Setting value send mode, which will be sent first, and which will be sent later. Options:

0/1

1/0

——Parameter "Delay time [2...50000]*0.1s"

Setting delay time. Options: 2..50000

Parameter"Long operation after [2..50000]*0.1s"

The parameter is visible when there is distinction between long/short operation, here you can set the effective time for long operations.

When the connection time of input contact over the setting time here, the operation is determined as long operation, otherwise it is a short operation. Available options: 2..50000

5.5.2 Parameter setting interface“UI/BI input x- Switch/Dimming”

The Switch/Dimming parameter window is shown in Figure 5.7 and is visible when the channel function “Switch/Dimming” option is selected.

Enable this function to dim and switch the dimmable device with one input.

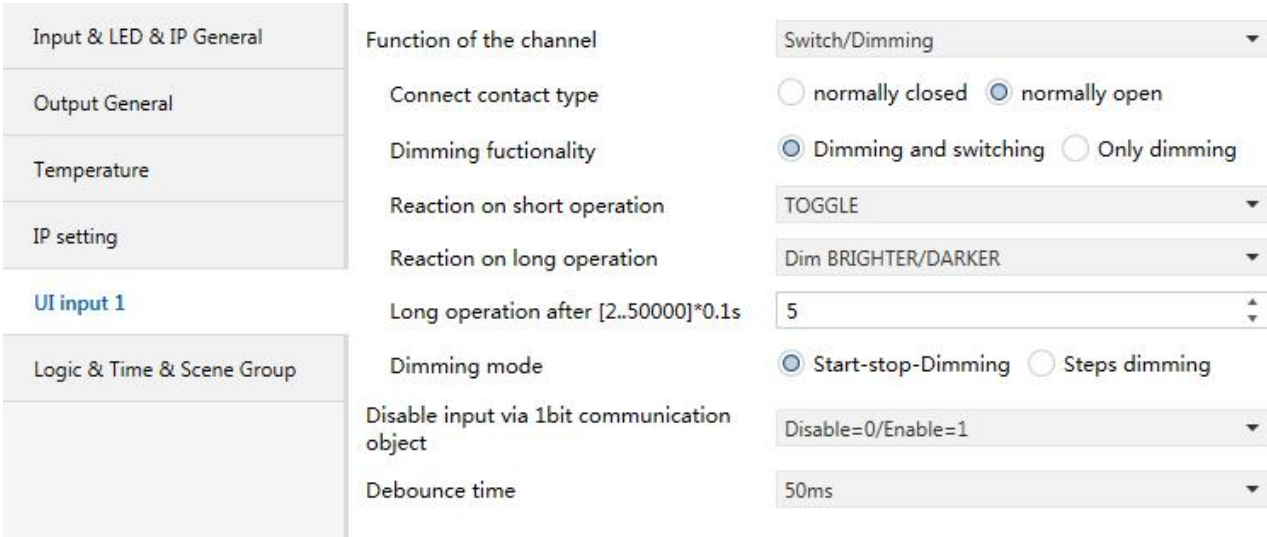


Figure 5.7 parameter window "Switch / Dimming"

Parameter"Connect contact type"

This parameter is used to set whether the input contact is a normally closed or normally open contact.

Options:

Normally closed

Normally open

Note:

The parameters that are described in this chapter are based on normally open connect type as example, the normally closed connect type is just opposite.

Parameter"Dimming functionality"

This parameter is used to define whether the lighting can only be dimmed or whether it also should be permitted switching.

Options:

Dimming and switching

Only dimming

If “Dimming and switching” is selected, it will distinguish the operation is a short or long operation. In this case, the lighting is dimmed via a long operation and switched via a short operation.

If “Only dimming” is selected, there is no distinction between a short and long operation. Therefore the dimming is carried out immediately after an operation action; there is not required to determine whether the operation is long or short.

Parameter“Reaction on short operation”

The parameter is visible if the option “dimming and switching” has been selected with the parameter“dimming functionality”.

It is used to set if the value of object “Switch” is ON, OFF, TOGGLE, or if no action should be occur with short operation.

Options:

No action

OFF

ON

TOGGLE

Parameter“Reaction on long operation”

The parameter is visible if the option “dimming and switching” has been selected with the parameter“dimming functionality”.

It is used to set if the object “dimming” sends a brighter or darker telegram with long operation.

When the operation is over, the object will send a stop dimming telegram.Options:

Dimming BRIGHTER

Dimming DARKER

Dim BRIGHTER / DARKER

The option "Dim BRIGHTER / DARKER" indicates that the contact input is dimming brighter/darker alternately when long operation.

Parameter“Long operation after [2..50000]*0.1s”

The parameter is visible if the option “dimming and switching” has been selected with the parameter“dimming functionality”

This parameter is used to set the effective time with long operation.

The contact input is determined as long operation when input timing over this setting time.

Available options: 2..50000

Parameter“Reaction on operation”

The parameter is visible if the option “only dimming” has been selected with the parameter “dimming functionality”.The contact does not distinguish between long and short operations. The operation is same as the parameter “Reaction on long operation”, the dimming device will be relatively adjusted, brighter or darker.

Options:

Dimming BRIGHTER

Dimming DARKER

Dim BRIGHTER / DARKER

Parameter"Dimming mode"

The parameter sets whether the dimming mode is start-stop dimming or steps dimming.

Options:

Start-stop dimming

Steps dimming

If the option start-stop dimming is selected, it will start the dimming mode with a bright or darker telegram and end the dimming mode with a stop dimming telegram at the end of operation. The dimming telegram need not be cyclically sent in start-stop dimming mode.

If the option step dimming is selected, the dimming telegram is sent cyclically when the relative dimming mode is steps dimming. The stop telegram ends the dimming process at the end of operation.

Parameter"Brightness change on every sent"

The parameter is visible if the option step dimming has been selected with the parameter dimming mode. It is used to set the change brightness (in percent) which is cyclically sent with every dim telegram.

Options:

100%

50%

……

1.56%

Parameter"Interval of Tele. Cyclic send [2..50000]*0.1s"

The parameter is visible if the option step dimming has been selected with the parameter dimming mode. It is used to set the interval time between two telegrams that are sent cyclically during a long operation.

Options: 2..50000

5.5.3 Parameter setting interface"UI/BI input x- Value/Forced output"

Parameter window "Value/Forced output" can be shown in Fig. 5.8. It is visible when Function of the channel "Value/Forced output" is selected.

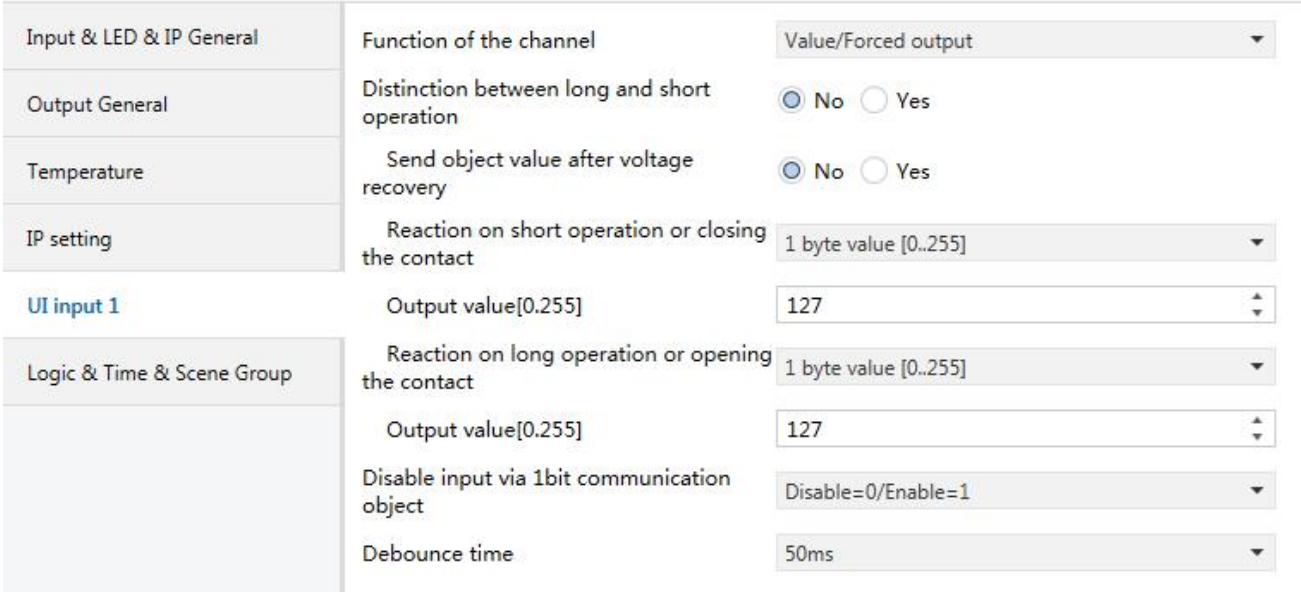


Figure 5.8_1 Parameter window "Value / Force output" (does not distinction between long/short operation)

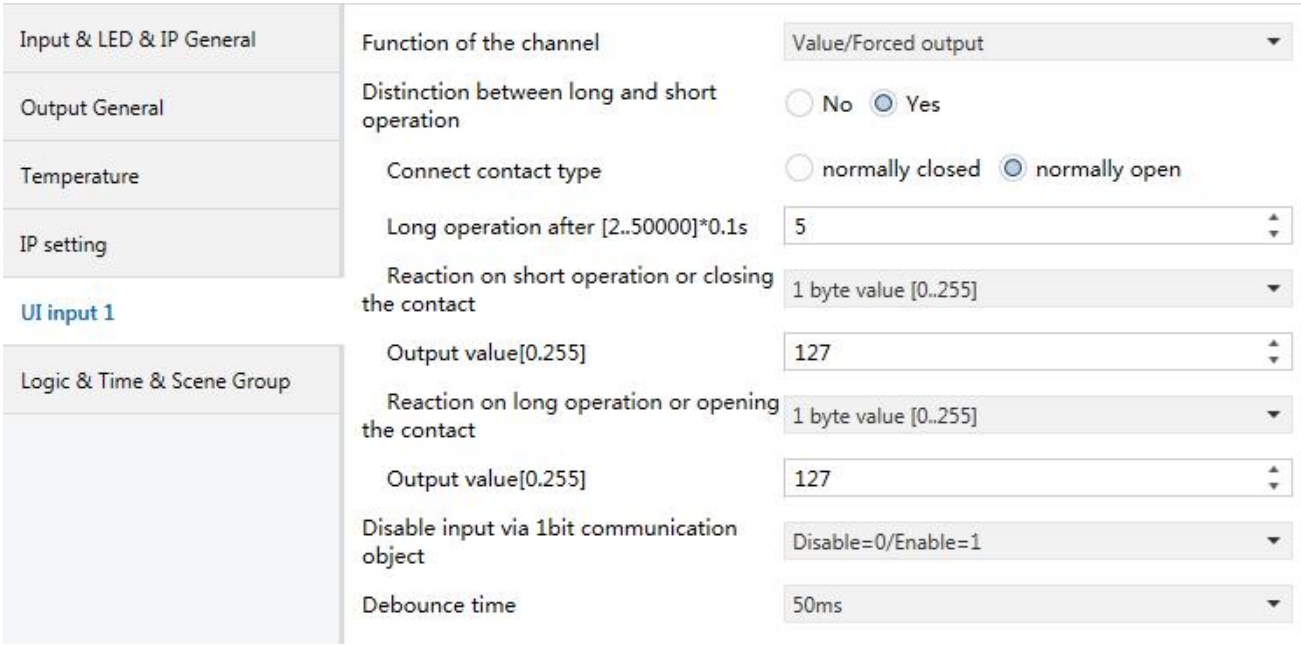


Figure 5.8_2 Parameter window "Value / Force output" (Distinction long/short operation)

Parameter"Distinction between long and short operation"

This parameter defines whether the input distinguishes between a short and long operation. If "yes" is selected, there is a delay to determine whether there is a long or short operation. Only then contact will perform the setting action.

Options:

No

Yes

Parameter"Connect contact type"

This parameter is visible if there is distinction between a short and long operation. It is used to set whether the input contact is a normally closed or normally open contact.

Options:

Normally closed

Normally open

Note:

The parameters that are described in this chapter are based on normally open connect type as example, the normally closed connect type is just opposite.

Parameter"Long operation after [2..50000]*0.1s"

The parameter is visible when there is distinction between long/short operation, here you can set the effective time for long operations.

When the connection time of input contact over the setting time here, the operation is determined as long operation, otherwise it is a short operation. Available options: 2..50000

Parameter "Send object value after voltage recovery"

This parameter is visible if there is no distinction between a short and long operation as shown in fig. 5.8_1. It can be set whether to send the value of the object "…-long/open (short/close)" on the bus after bus voltage recovery. If "Yes" is selected, the object value will be sent on the bus after bus voltage recovery.

Options:

Yes

No

Parameter "Reaction on short operation or closing the contact"and"Reaction on long operation or opening the contact"

If there is distinction between short and long operation, the parameter is used to define the data type that is sent when the contact is actuated with short or long operation.

If no distinction, it defines the data type that is sent when the contact is actuated with closing or opening.

Options:

No reaction

1bit value [0/1]

……

4 byte value [0…4294967295]

Parameter "Output value[…]"

Here defines the value which is sent with the operation. The value range depends on the data type set for the parameter "Reaction on short operation or closing the contact" or "Reaction on long operation or opening the contact"

5.5.4 Parameter setting interface "UI/BI input x- Shutter Control"

Parameter window "Shutter control" can be shown in fig.5.9. It is visible when the input is operated with the function "shutter control". The function enables the operation of blinds and shutters with buttons or switches.

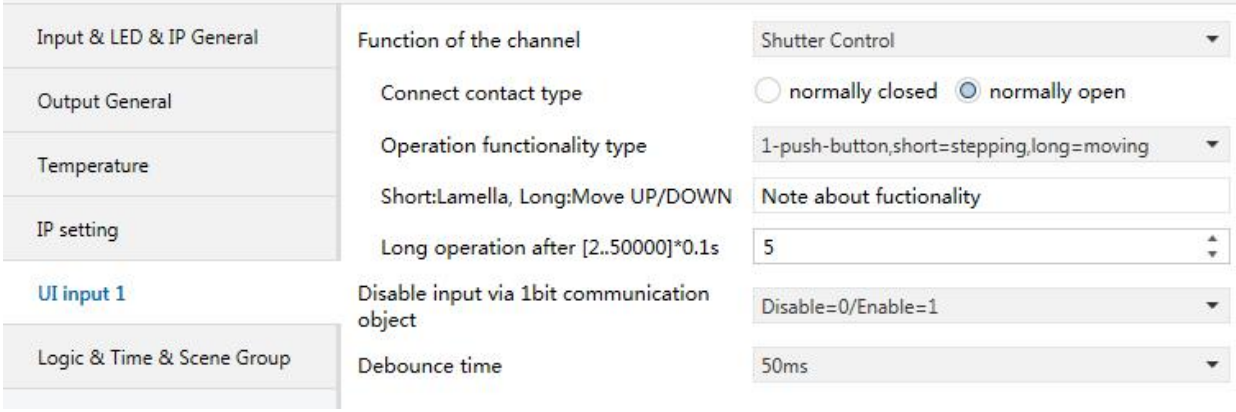


Figure 5.9 parameter window "Shutter control"

Parameter"Connect contact type"

This parameter is used to set whether the input contact is a normally closed or normally open contact.

Options:

Normally closed

Normally open

Note:

The parameters that are described in this chapter are based on normally open connect type as example, the normally closed connect type is just opposite.

Parameter"Operation functionality type"

This parameter sets the shutter operating functionality type, which overview is provided in the following tables. According to the actual use, select an appropriate operation type.

1-push-button,short=stepping, long=moving	
Short operation	Stop/Adjust (Message value with the same value as the long operation)
Long operation	Alternate implement “Move up” or “Move down” operation. (alternate send the value of the object “0”and“1”)
1-push-button, short=moving, long=stepping	
Short operation	Alternate implement “Move up” or “Move down” operation (alternate send the value of the object “0”and“1”)
Long operation	Stop/Adjust (keep pressing the button can send cyclic) Message value with the same value as the short operation
1-push-button-operation, moving	
On operation	When operation, send the command in sequence: …… - >Move up - >Stop/Adjust upward - >Move down -> Stop/Adjust downward ->……
1-switch-operation, moving	
Start of operation (contact closed)	Alternate implement “Move up” or “Move down” operation (alternate send the value of the object “0”and“1”)
End of operation (contact open)	Stop/Adjust

2-push-button, standard	
Short operation	“Stop/Adjust upward” or “Stop/Adjust downward” (set by parameter)
Long operation	“Move up” or “Move down”(set by parameter)
2-push-button, moving[shutter]	
On operation	When operation, send the command in sequence: ……->Move up->Stop/Adjust upward->…… or ……->Move down->Stop/Adjust downward->…… (Move up/down set by parameter)
2-push-button, stepping	
On operation	“Stop/ Adjust upward” or “Stop/ Adjust downward” (set by parameter) (keep pressing the button can send cyclic)
2-switch-operation, moving[shutter]	
Start of operation (contact closed)	“Move up” or “Move down”(set by parameter)
End of operation (contact open)	“Stop / Adjust upward” or “Stop / Adjust downward” (the sending value is identical to the value that the operation starting)

Parameter“Long operation after [2..50000]*0.1s”

This parameter is visible when the input needs to perform a long operation and is used to define the effective time with long operation.

The contact input is determined as long operation when input timing exceeds this setting time.

Options: 2..50000

Parameter“Tele. STOP/lamella adj Cyclic send [2..50000]*0.1s”

It is visible if the shutter control type is “1-push-button, short=moving, long=stepping” and “2-push-button, stepping”. It is able to set the interval time of sending the object “stop/adjust adj.” cyclical.

Options:2..50000

Parameter“Reaction on short operation”

It is visible if the shutter control type is “2-push-button, standard”. This parameter defines the operation with short operation.

Options:

STOP / lamella UP

STOP / lamella DOWN

Parameter“Reaction on long operation”

It is visible if the shutter control type is “2-push-button, standard”. This parameter defines the operation with long operation.

Options:

MOVE UP

MOVE DOWN

Parameter"Reaction on operation"

It is visible if the shutter operation functionally type is"2-push-button, moving [shutter]"、"2-switch-operation, moving [shutter]"and"2-push-button, stepping". It is defines the action when operation. Different operation functionally type makes different operate action. The former two operations functionally type is move up and down; the last operation functionally type is stop/lamella reaction.

Options:

MOVE UP

MOVE DOWN

Options:

STOP / lamella UP

STOP / lamella DOWN

5.6 LED indication

This interface is used to set the function of LED. The number of LED indication channels corresponds to the number of dry contact input channels, and 5 channels can be set.

Each input provides an LED indication, and each LED can be set separately. Below we take one of the LEDs as an example for parameter setting description.

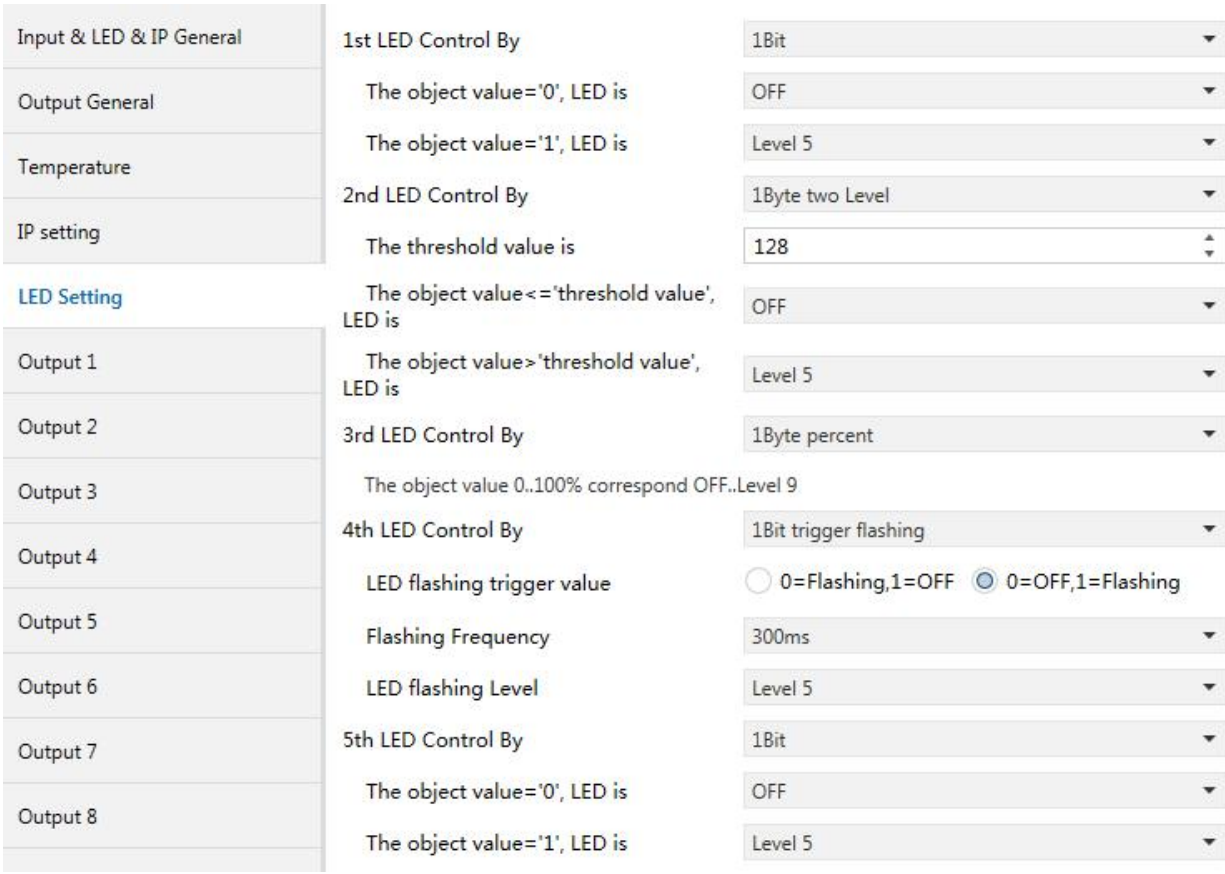


Figure 5.10 Parameter window "LED"

Parameter"x LED Control By"

It can be set the function of the LED, options:

1Bit

1Byte two Level

1Byte percent

1Bit trigger flashing

Parameter"The object value ='0/1', LED is"

This parameter is visible when the LED function option is "1bit", and the LED will indicate according to the message value "1" or "0" received by the object.

Options:

OFF

Level 1

...

Level 9

Level 1~9 : The brightness level of the LED. The higher of level, the brighter of LED.

Parameter"The threshold value is"

This parameter is visible when the LED function is selected as "1Byte two level", it is used to set the threshold indicated by the LED. Available options: 0...255

Parameter"The object value<=threshold value, LED is" / "The object value>threshold value, LED is"

These two parameters are visible when the LED function is selected as "1Byte two level", it can be set the brightness indicated by the LED when the object value is less than or equal to the threshold or greater than the threshold. Options:

OFF

Level 1

...

Level 9

Parameter"The object value 0..100% correspond OFF..Level 9"

This parameter is visible when the LED function is selected as "1Byte percent". The brightness value of the annotation object value 0~100% is OFF~Level 9, which means that the LED brightness increases with the increase of the object value.

Parameter"LED flashing trigger value"

This parameter is visible when the LED function is selected as "1Bit trigger flashing" and is used to set the trigger value of the LED flashing. Options:

0＝Flashing, 1=OFF

0=OFF, 1=Flashing

Parameter"Flashing Frequency"

This parameter is visible when the LED function is selected as "1Bit trigger flashing" and is used to set the frequency at which the LED flashes. Options:

100ms

300ms

500ms

1s

Parameter"LED flashing Level"

This parameter is visible when the LED function is selected as "1Bit trigger flashing" and is used to set the brightness of the LED flashing. Options:

OFF

Level 1

...

Level 9

5.7 Switch output

There are 25 outputs. As parameters and objects which are assigned to each output are the same. Using output 1 as an example described.

Part of the switch output is multiplexed with the fan coil and curtain output. Please refer to section 5.2 for details.

The enable of the switch output is set in window 5.2. It is visible when enabled, the window shown in Figure 5.11.

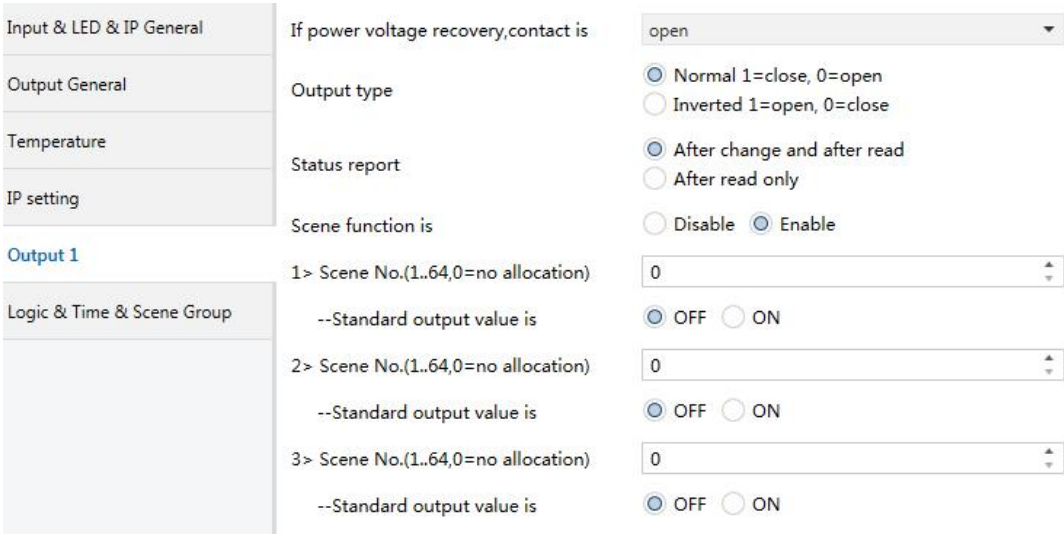


Figure 5.11 Parameter window "Output X"

Parameter "If power voltage recovery, contact is"

This parameter is used to set the position of the relay contacts after the power-down reset. Options:

Open

Close

As before bus voltage fail

Open: When the system is powered up, the relay contacts of the channel are disconnected;

Close: When the system is powered up, the relay contacts of the channel are closed;

As before bus voltage fail: When the system is powered up, the relay contacts of the channel return to their state before power down.

Note: All switch outputs do not change state after power down.

Parameter"Output type"

This parameter sets the output type. Optional:

Normal 1= close; 0= open ***Normally open type***

Inverted 1= open; 0= close ***Normally closed***

Normal 1= close; 0= open: When the object "Switch" receives the message value "1", the relay contact closes and the relay contact opens when the value is "0"; vice versa. The switch state feedback value corresponds to it.

Parameter"Status report"

This parameter sets the switch state feedback mode. Optional:

After change and after read

After read only

After change and after read：When the switch status of the channel changes or a read request is received, the object "Switch status" immediately sends a message to the bus to report the current status;

After read only：The object "Switch status" sends the current switch status to the bus only when the switch status receives a read request from another bus device or bus.

Parameter"Scene function is"

This parameter is used to enable the scene function. Optional:

Disable

Enable

After enabling, the following parameters for setting the scene are visible. A total of 8 scenes can be set.

Parameter "x> Scene NO. (1..64,0= no allocation)"

Each channel can be assigned 64 different scene numbers.

Optional： 1... 64 ， 0=no allocation

Note:

The effective scene number in the parameter setting option is 1~64, and the corresponding message value is 0~63. A power loss will save the new scene value.

Parameter "–Standard output value is"

This parameter sets the state of the switch that is output when the scene is called. Optional:

OFF

ON

5.8 Shutter Output

There are a total of 2 channels for the curtain output. Since the parameters assigned to each output are the same as the communication objects, one of the outputs is taken as an example.

The enable of the curtain output is set in interface 5.2. When enabled, the interface shown in Figure 5.12 is visible.

Curtain output has two modes of operation: Shutter and Blinds.

Shutter is suitable for blinds, and Blinds is suitable for curtains without louver adjustments such as opening and closing curtains or lifting curtains.

The following two modes of operation are described separately:

5.8.1 Parameter Setting Interface"Curtain X- Shutter"

"Shutter"The parameter setting interface is shown in Figure 5.12.

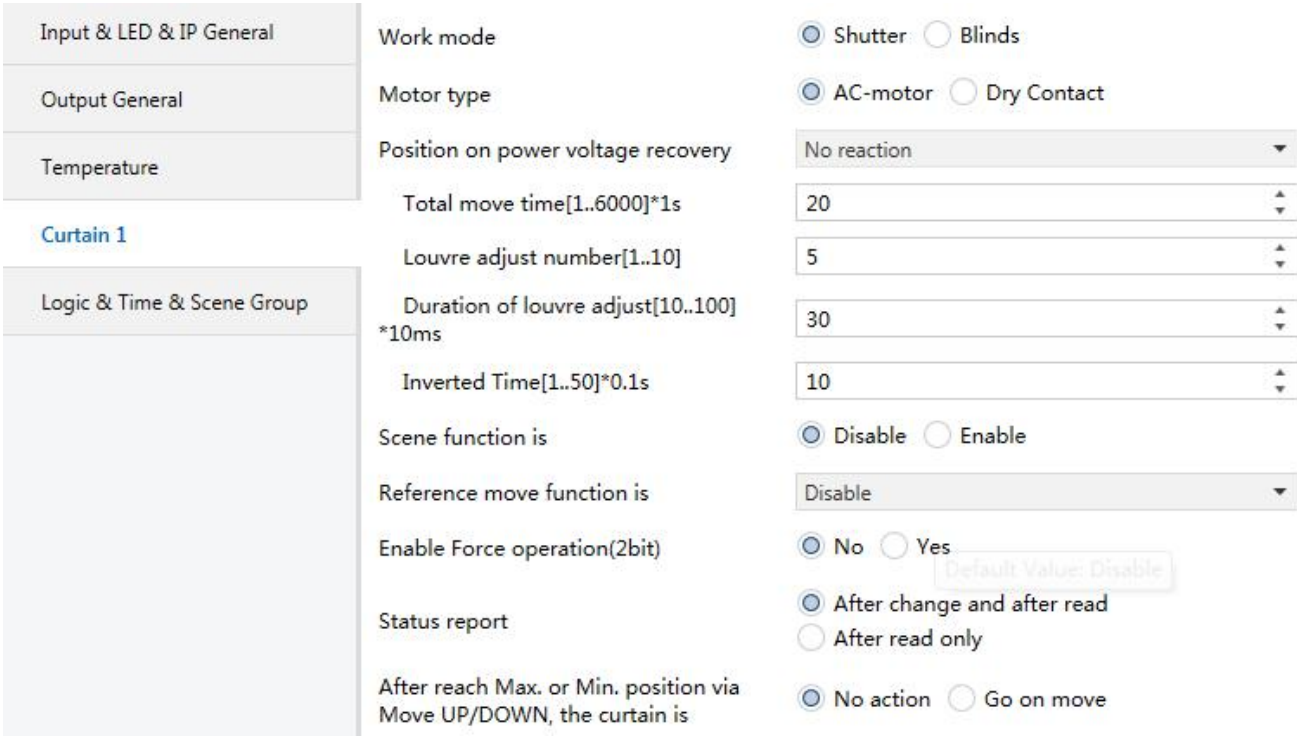


Figure 5.12 parameter setting interface"Curtain X - Shutter"

Parameter "Work mode"

This parameter is used to set the working mode of the channel. There are two working modes to choose from. Different working modes correspond to different parameters and communication objects.

Optional:

Shutter

Blinds

The option is “Shutter”, and the working mode is the Shutter operation mode, that is, the curtain with louvers can be operated;

The option is "Blinds", which works like the "Shutter" mode, except that it does not adjust the louvers;

This section details the parameters and communication objects of the "Shutter" operating mode.

Parameter “Motor type”

This parameter sets the type of shutter drive. Optional：

AC-motor

Dry contact

The option "AC-motor" is suitable for driving drives of the high power type;

Option "Dry contact" for dry contact controlled drives (dry contact motors);

Note: Dry contact type only apply to the blind work mode, the action of the output relay needs to be set. For details, see parameter section 5.8.1.1.

Parameter “Position on power voltage recovery”

This parameter sets the position to which the channel shutters move after the system is reset or after programming. Optional:

No reaction

Preset position

Move to saved position

No reaction: The shutter of the channel maintains the current state when the system is powered on;

Preset position: The shutter of the channel runs to the parameter preset position when the system is powered on;

Move to saved position: The channel's shutter run to the last saved position when the system is powered up. The initial value is 50%.

Note:

If the option “no reaction” is set to the position after programming or after reset, the shutter actuator cannot detect the current position of the shutter. At this time, the communication object “position status” takes 50% and will not be sent to the bus.

If the shutter need to be clearly positioned for the first time after programming, the shutter first run to the top or bottom (to move to the extreme position near the target position) to perform a full run to determine the current position and then move to the target position. Only when the shutter are fully operational, then they be clearly positioned.

The following two parameters are visible when the "preset position" option is selected:

——Parameter “Position: Shutter 0…100%(0%=top,100%=bottom)”

This parameter is used to preset the position of the shutter:0…100%，0%＝top, 100%=bottom

——Parameter “Position: Louvers 0…100%(0%=open,100%=close)”

This parameter is used to preset the angular position of the louver: 0…100%，0%＝opened, 100%=closed

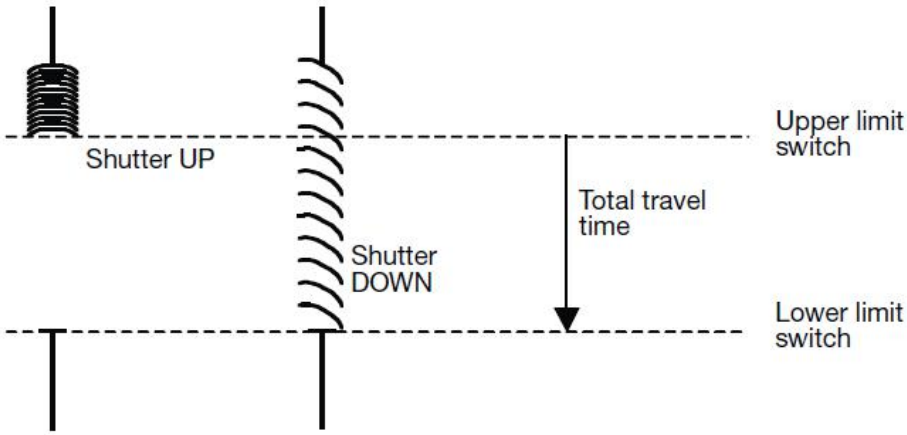
Parameter “Total move time [1…6000]*1s”

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 shutter to move from the highest position to the lowest position (as shown below).

When the shutter actuator receives a command to move up or down, the shutter moves according to the required direction until the shutter receives a command to stop moving, or until it moves to the highest or lowest position, then the shutter passes through itself The limit switch turns the motor off.

If the shutter 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 shutter during operation is estimated by the total travel time of the move, so it is important to measure and set the total travel time as accurately as possible.

Especially in the case of "mobile positioning" and "state reply", the only way to accurately calculate the current position of the blinds is.

Parameter “Louvre adjust number [1…10]”

This parameter sets the number of times the louver angle needs to be adjusted from the fully closed state to the fully open state. The current position during the louver angle adjustment is determined by this parameter. The number of blinds angle adjustments requires the debugger to count before entering a more accurate value.

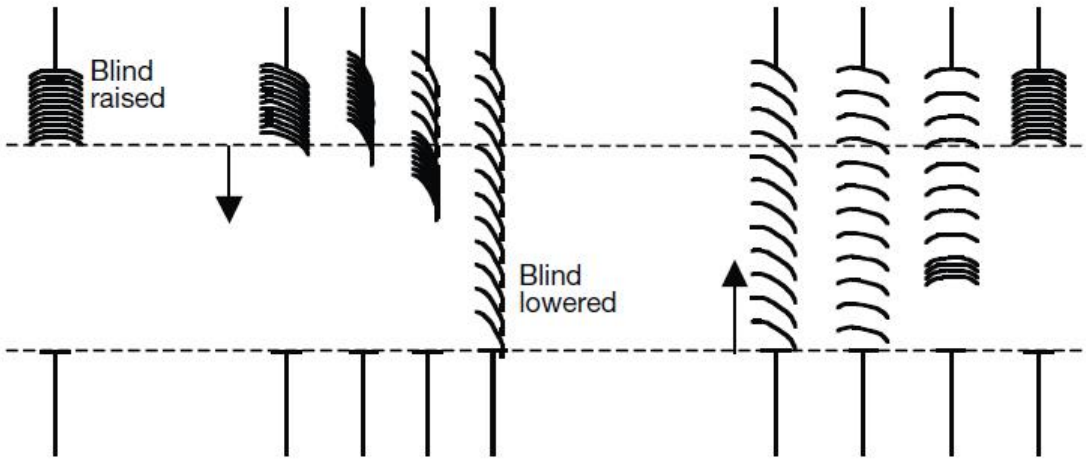
Parameter “Duration of louver adjust [10…100]*10ms”

This parameter sets the time for the louver angle adjustment, 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.。

This parameter is used in conjunction with the previous parameter. The total time of the louver angle adjustment from the fully closed state to the fully open state = the time of the louver angle adjustment × the number of times.

louver running process:

After the louver moves up, the louver angle is usually open, for example, now the louver is lowered, the louver angle is first closed, and then the louver is moved downward. For example, the louver now rise again, the louver angle first opens and then rises. (As shown below)



Parameter "Inverted Time [1..50]*0.1s"

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 drive manufacturer to obtain an appropriate value.

Steering suspension prevents the shutter drive from damaging when it suddenly changes direction, extending the life of the drive.

Parameter "Scene function is"

This parameter is used to enable the scene function. Each scene can be set with 8 scenes at the same time. Different scenes can define different shutter positions and shutter angles.

After enabling, the parameter settings of the scene are described in Section 5.8.1.2.

Parameter "Reference movement function is"

This parameter is used to specify how the shutter actuator works when performing a reference move. Optional:

Disable

UP or Down Move

Move to saved position

Disable: Reference move is not activated；

UP or Down Move : When the object "Reference movement" receives the message '0', the shutter run to

the top; When the object receives the message '1', the shutter run to the bottom.

Move to saved position: When the object "Reference movement" receives the message '0' or '1', the shutter first runs to the uppermost（value '0'） or lowermost (value '1')end to perform a full-time operation and then returns to the original position.

While the shutter are moving, the actuator constantly detects the current position of the shutter and the angular position of the louvers.

When the shutter are used for a long time, the detected position may be a bit inaccurate due to temperature changes and aging. If the top or bottom position cannot be reached, a reference movement can be triggered by the bus to cause the shutter to move to the top or bottom.

Depending on the parameter settings, the shutter may stay at the top or bottom and may move to their original position.

Parameter "Enable Force operation [2bit]"

This parameter sets whether the forced operation is enabled. Optional:

No

Yes

The forced operation is controlled by a 2-digit command. When the forced operation function is activated, the shutter actuator can command the blind to move to the topmost position or the bottom most position, and other operations of the blinds are interrupted.

For example, in the case of window cleaning, the forced operation function is more suitable, the shutter can be raised, and other operations of the blinds are interrupted, so that the cleaner does not cause danger due to accidental movement of the shutter during the cleaning process.

When the object "Force Operation" receives the message of '0' or '1', the forced operation priority is canceled and the operation is reset.

When the object receives the message of '2', the shutter moves to the highest position; when the object receives the message of '3', the shutter moves to the lowest position.

Parameter "Status report"

This parameter defines the feedback method for the position of the curtain. Optional:

After change and after read

After read only

After change and after read： When the position status changes or a read request is received, the object "Position Status[0...100%]/Louvre Status[0...100%]" immediately sends a message to the bus to report the current status;

After read only： The object "Position Status[0...100%]/Louvre Status[0...100%]" sends the current position status to the bus only when the position status receives a read request from another bus device or bus.

Parameter "After reach Max. or Min. Position via Move UP/DOWN, the curtain is"

This parameter is used to set whether to stop moving when the curtain movement reaches the maximum

(100%) or minimum position (0%). Optional:

No action

Go on move

No action: When moving to the maximum (100%) or minimum position (0%), continue to move, the mobile message will be ignored;

Go on move： When moving to the maximum (100%) or minimum position (0%), you can continue to move.

5.8.1.1 Parameter setting interface“CX: Driver setting”

“Drive setting”The parameter setting interface is shown in Figure 5.13. Only apply to the blind mode.

When the drive type of the curtain output is dry contact control type, this interface is visible and used to set the output action of the relay under each operation.

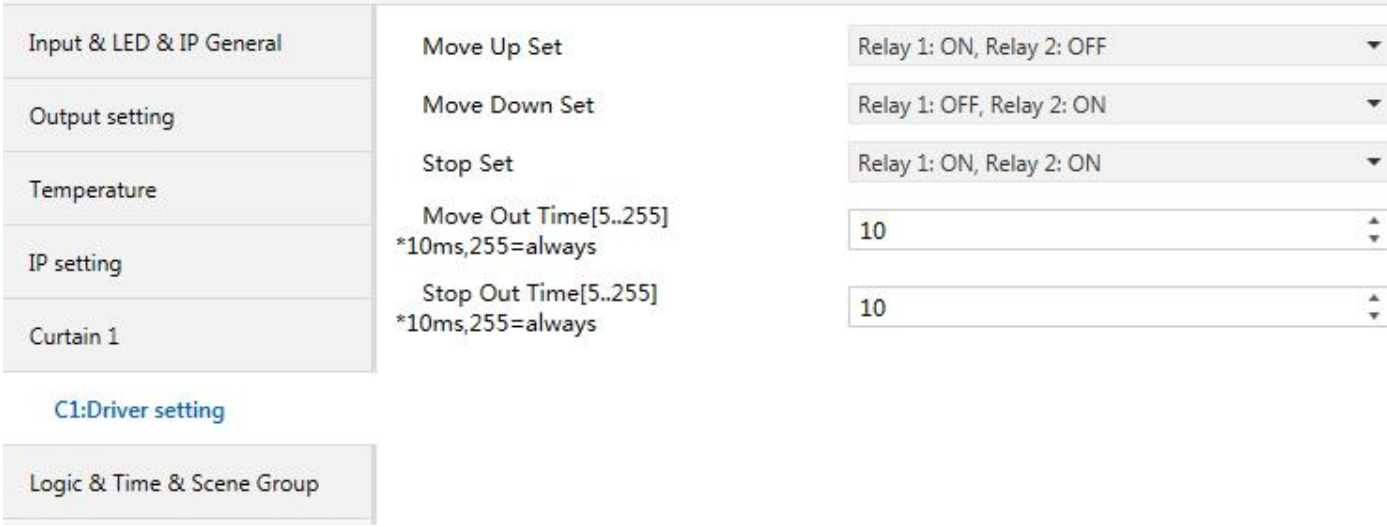


Figure 5.13 Parameter setting interface "CX: Drive setting"

Parameter “Move Up Set”/ “Move Down Set”/ “STOP Set”

The above parameters are used to set the output action of the relay under each operation. Optional:

Relay 1: OFF, Relay 2: OFF

Relay 1: ON, Relay 2: OFF

Relay 1: OFF, Relay 2: ON

Relay 1: ON, Relay 2: ON

Parameter“Move Out Time [5…255]*10ms, 255=always”

Parameter“Stop Out Time [5…255]*10ms, 255=always”

The above parameters are used to set the pulse trigger time of the relay output under each operation. Optional: 5..255

When set to 255, it means that the corresponding relay will always have output when there is a trigger state.

5.8.1.2 Parameter setting interface“CX: Scene”

The “Scene” parameter setting interface is shown in Figure 5.14 and is mainly used to set the scene.

Each scene can be set with 8 scenes at the same time. Different scenes can define different louver positions and louver angles.

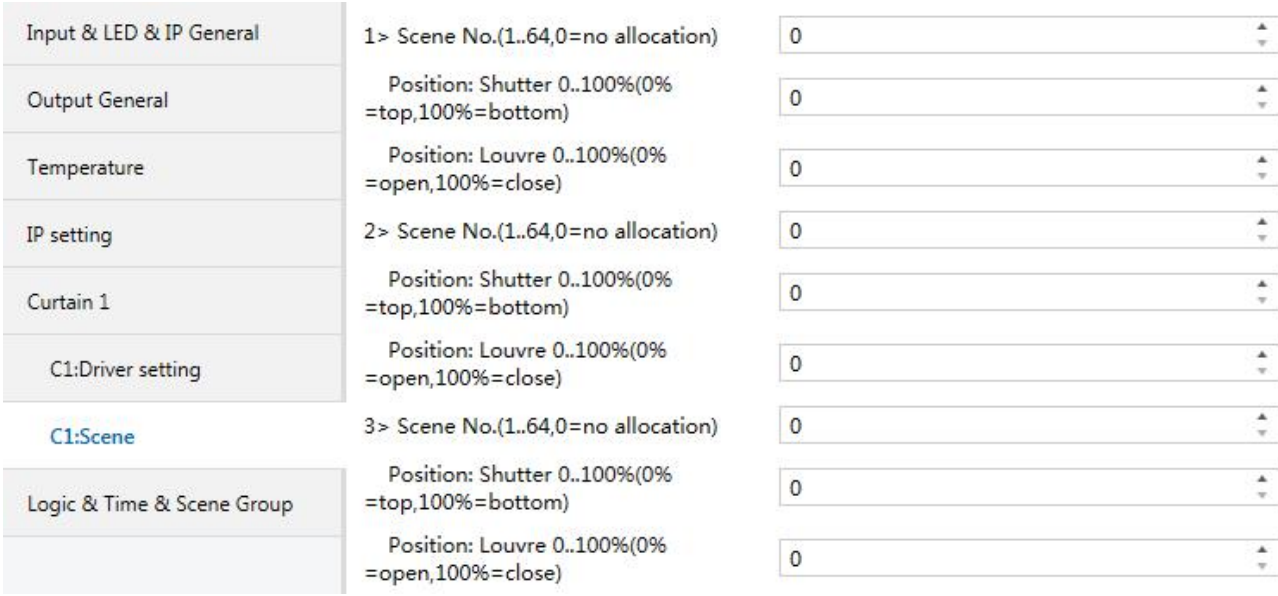


Figure 5.14 Parameter setting interface "CX: Scene"

——Parameter “x> Scene NO. (1...64 , 0= no allocation)”

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. Optional: Scene 1... Scene 64 , 0=no allocation

Note:

The effective scene number in the parameter setting option is 1~64, and the corresponding message is 0~63. A power loss will save the new scene value.

——Parameter “Position: Shutter 0•••100%(0%=top,100%=bottom)”

This parameter sets the position of the shutter when the scene is called: 0...100%, 0%=top, 100%=bottom——Parameter “Position: Louvres 0…100%(0%=open,100%=close)”

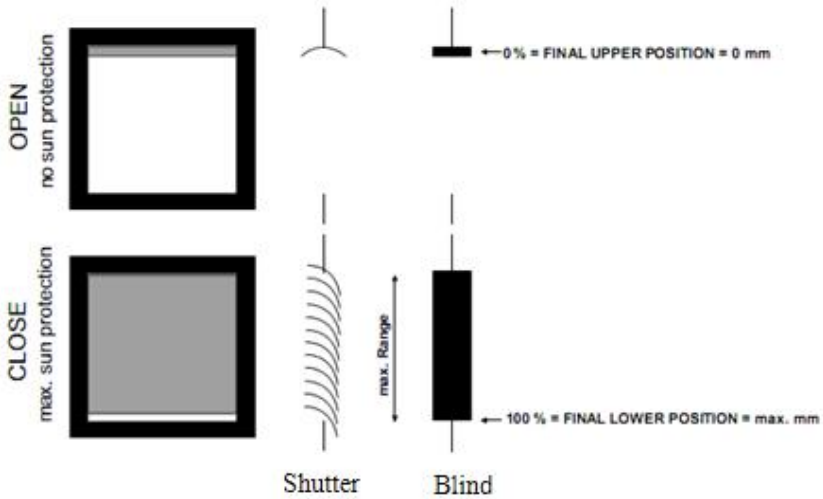
This parameter sets the angular position of the louver when the scene is called：0…100%，0%＝opened, 100%=closed

5.8.2 Parameter setting interface“Curtain X- Blinds”

The "Blinds" working mode is similar to the parameters and communication objects of the "Shutter" working mode, and the functions are similar.

The difference is that there is no function to adjust the louver angle in the "Blinds" mode. The "Blind" mode only involves the movement of the curtains, without the louvers.

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



The "Blinds" working mode will not be introduced here. The function can refer to the "Shutter" working mode (except for the louver adjustment function).

5.9 Dimming output

The dimming output has a total of 5 outputs, of which 2 are TRIAC dimming and 3 are 0-10V dimming.

Since the parameters assigned to each dimming output are the same as the communication objects, one of the outputs is taken as an example for explanation.

The 0-10V dimming output is multiplexed with the fan coil output. See section 5.2 for details. The enable of the dimming output is set in interface 5.2. When enabled, the interface shown in Figure 5.15 is visible.

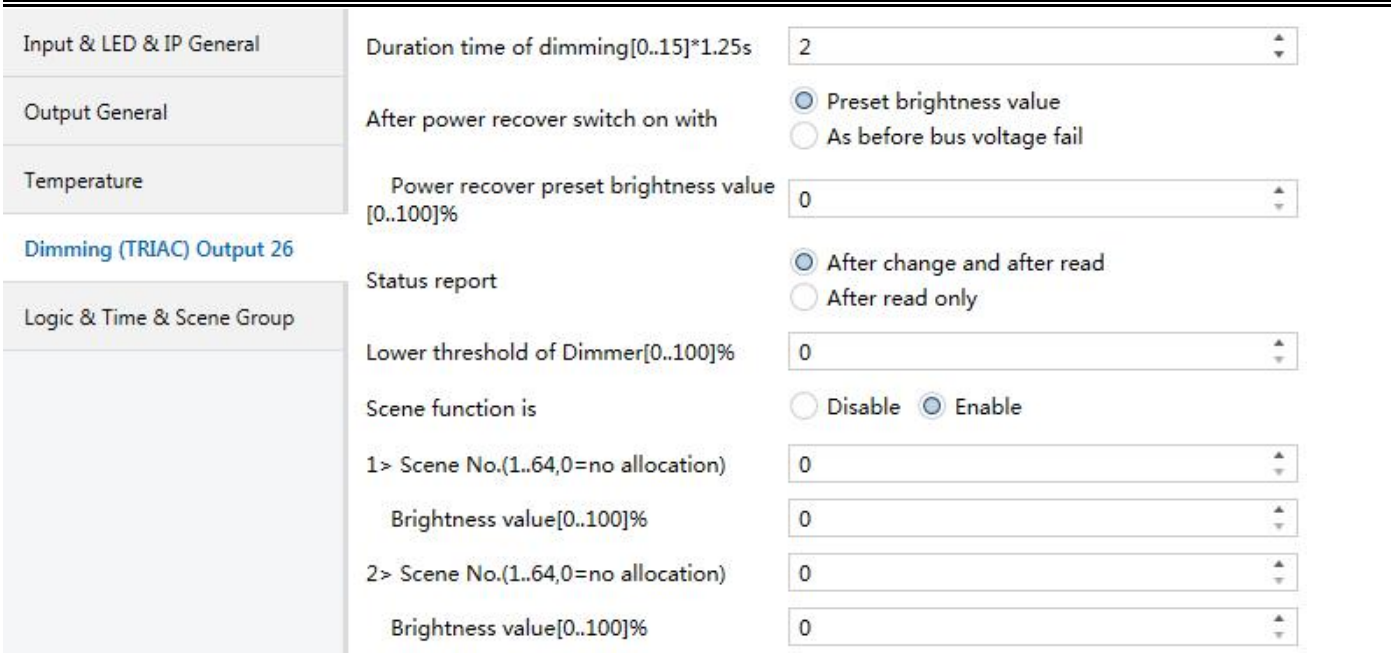


Figure 5.15 Parameter setting interface "Dimming (TRIAC/0-10V) Output X"

Parameter"Duration time of dimming [0..15]*1.25s"

This parameter sets the duration of the dimming. Whether through "Brightness", "Switch", or "Relative dimming" switch illumination, the dimming time is multiplied by 1.25s for this input value, allowing input values: 0...15

Parameter"After power recover switch on with"

This parameter defines the illumination brightness after power-on reset, whether it is the brightness before power-down or the specified brightness. Optional:

Preset brightness value

As before bus voltage fail

Preset brightness value： After the system power-on reset, the brightness value is the default value of the brightness input by the next parameter “Power recover preset brightness value (0%～100%)”.

When the preset value of the system power-on reset input is less than the low brightness limit, the brightness value at power-on reset is the low brightness limit.

As before bus voltage fail： After the system power-on reset, the brightness is the brightness before power-down.

——Parameter “Power recover preset brightness value(0%...100%)”

This parameter is used to set the brightness value after the system power-on reset, and the brightness range is 0%~100%.

Parameter"Status report"

This parameter sets the state feedback mode of the dimming output. Optional:

After change and after read

After read only

After change and after read： When the switch status/brightness status changes or a read request is

received. The object "Switch status" / "Brightness status" immediately sends a message to the bus to report the current status;

After read only： Only when the switch status/brightness status receives read requests from other bus devices or buses, the object "Switch status" / "Brightness status" sends the current status to the bus.

Parameter"Lower threshold of Dimmer [0..100]%"

This parameter sets the low limit of the dimmer, which is the lowest output value. Available options: 0~100%.

After setting the minimum output value, all output operations below this value are output with the lowest output value, and the output of this channel cannot be turned off.

When the message is sent, the brightness will also be output with the lowest output value.

This feature prevents some fixtures from flashing at low brightness.

Parameter "Scene function is"

This parameter is used to enable the scene function. Optional:

Disable

Enable

After enabling, the following parameters for setting the scene are visible. A total of 8 scenes can be set.

Parameter "x> Scene NO. (1..64,0= no allocation)"

Each channel can be assigned 64 different scene numbers.

Optional： 1... 64 ， 0=no allocation

Note:

The effective scene number in the parameter setting option is 1~64, and the corresponding message value is 0~63. A power loss will save the new scene value.

Parameter "Brightness value [0..100]%"

This parameter is used to set the brightness of the scene, the brightness range：0%～100%.

The following is a three-part (5.10, 5.11, 5.12) description of the fan coil output parameter settings.

5.10 Fan coil controller

5.10.1 Parameter setting interface "HVAC General"

The "HVAC General" parameter setting interface is shown in Figure 5.16. The controller can be defined as local control or bus control according to requirements, as shown in the figure below.

This parameter interface mainly sets some basic parameters of the coil controller. The specific description of each parameter is as follows.

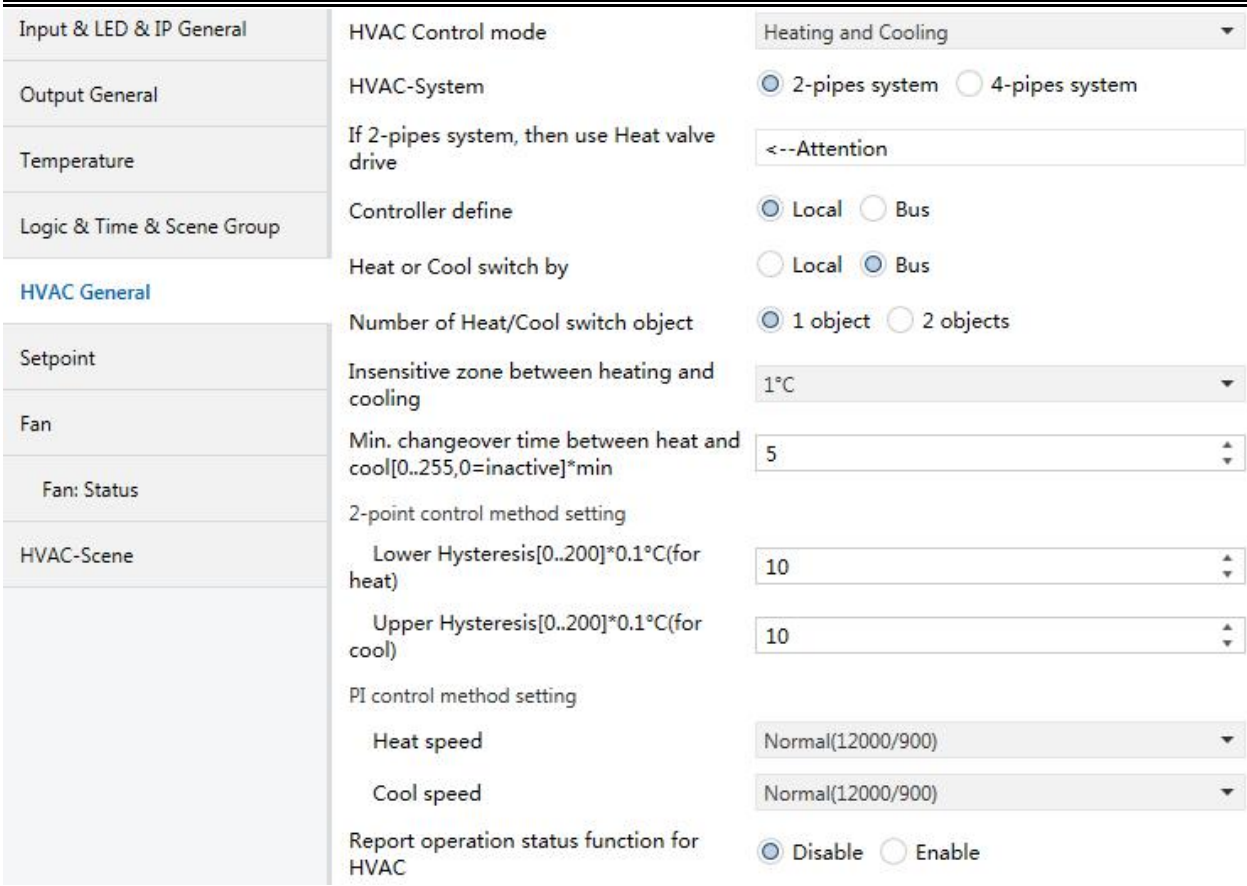


Figure 5.16 Parameter setting interface "HVAC General -- Local"

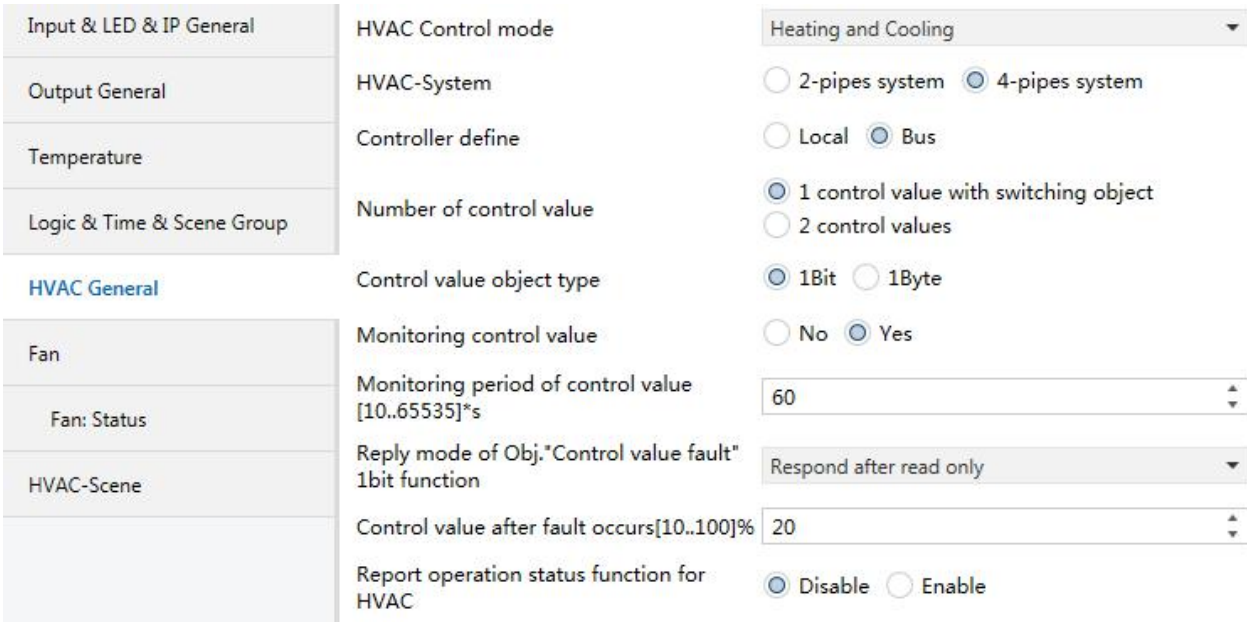


Figure 5.16 Parameter setting interface "HVAC General -- Bus"

Parameter"HVAC Control mode"

This parameter sets 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 the cooling function;

Heating and cooling：it can achieve heating or cooling, the fan coil controller will automatically outputs whether it is heating or cooling according to d-value between the set temperature and the actual temperature and Insensitive zone temperature. In the meantime, the following parameters are visible.

Parameter "HVAC System"

This parameter is used to set the HVAC system, that is, define the pipe system of Fan coil.

2 pipes system

4 pipes system

2 pipes system: heating and cooling shared one inlet and outlet pipe. (heating and cooling are controlled via one valve).

4 pipes system: heating and cooling use their own inlet and outlet pipes, they have their valve to control the in and out of hot and cold water.

Note: If 2-pipes system, then use Heat valve drive.

Parameter"Controller define"

This parameter is used to set the source of pipe controller. Options:

Local

Bus

Local: the cooling and heating is controlled via the output control of controller, that is, to be control equipment, to control the valve.

Bus：the cooling and heating is controlled via external input, that is, to be controlled equipment, the valve only can be controlled via external input (e.g. thermostat panel).

Note: Due to the different control methods, the parameters setting of database are also different. The following content are consist of the parameters setting of "Local" and "Bus".

- **Local**

Parameter"Heat or Cool switch by"

This parameter is in Interface 4.2, the parameter "HVAC-System" is visible while "2 pipes system" is selected, to set the Heat and Cool switch methods in the case of 2 pipes system. Options:

Local

Bus

Local：determine the output control is heating or cooling according the actual temperature and setting parameter, while switch the object "Heating/Cooling mode" will send the status to the bus.

Bus：the heating and cooling is controlled via external input. While "Bus" is chosen, the following parameter is visible.

Parameter"Number of Heat/Cool switch object"

The parameter define the Number of Heat/Cool Object. Options:

1 object

2 objects

1 object： determine the water of pipe is cold water or hot water through the object "Switch Heat/Cool Mode", while receiving telegram "1", switch to heating; while receiving telegram "0", switch to Cooling.

2 objects： determine the water of pipe is cold water or hot water through object "Heat mode enable" and "Cool mode enable", while receiving telegram "1", switch to the corresponding operation; while receiving telegram "0", it is invalid.

Parameter：Insensitive zone between heating and cooling

This parameter is visible while "Heating and cooling" is selected on "HVAC Control mode".

It is used to set the insensitive zone automatically switch between heating and cooling.

The smaller the insensitive zone value is, the faster the response of switching heating and cooling, that is, the more frequent of switching heating and cooling;

The bigger the insensitive zone value is, the switching heating and cooling will less, to save energy, however the response of switching and cooling will slower.

Options: 0.5...6.0 [℃]

For the usage of Insensitive zone please refer to the section 5.10.2.1 Setting Temperature adjustment instruction.

Parameter"Min. changeover time between heat and cool [0..255, 0=inactive]"min"

This parameter is used to set the changeover time between heat and cool, mainly for prevent frequent change heating and cooling.

Options: 0...255[min.]

2-point control method setting： the following two parameters apply to 2-point control method.

——Parameter "Lower Hysteresis [0..200]*0.1℃" (For heat)

——Parameter "Upper Hysteresis [0..200]*0.1℃" (For cool)

The parameter is to set the temperature hysteresis value of HAVC heating and cooling. Options: 0..200

In the case of heating, while actual temperature(T) > setting temperature, stop heating;

While actual temperature <= setting value- Lower Hysteresis, start heating.

For example, while hysteresis is 3℃, setting temperature is 22℃, when T exceeds 22℃, stop heating;

When T smaller than 19℃, start heating; while T is between 19~22℃, remain the working status as previous.

In the case of cooling, while actual temperature(T) < setting temperature, stop cooling;

While actual temperature >= setting value+Upper Hysteresis, start cooling.

For example, while hysteresis is 3℃, setting temperature is 26℃, when T lower than 26℃, stop cooling;

When T more than 29℃, start cooling; while T is between 29~26℃, remain the working status as previous.

PI control method setting：the following two parameters apply to PI control method.

——Parameter “Heat speed”

——Parameter “Cool speed”

The parameter is used to set the response speed of heating and cooling PI control.Options:

Slow（12000/1800）

Normal（12000/900）

Fast（12000/450）

User defined

Parameter “Proportional range (P value) 0...65,535”

Parameter “Readjust time (I value) (0...65,535)*s ”

The above parameters are visible while “User defined” is selected on parameter “Heat/Cool speed”.

Parameter“Report operation status function for HVAC”

This parameter is to set the Report operation status function for HVAC. Options:

Disable

Enable

While “Enable”, the object “Status of operation” is visible. Define object as follows,

DPT_StatusHVAC: B6N2							
7	6	5	4	3	2	1	0
Not used	0: Limit 4 disable 1: Limit 4 enable	0: Limit 3 disable 1: Limit 3 enable	0: Limit 2 disable 1: Limit 2 enable	0: Limit 1 disable 1: Limit 1 enable	0: Cooling 1: Heating	00: comfort mode 01: standby mode 10: night mode 11: Frost/heat protection mode	

- **Bus**

Parameter"Number of control value"

This parameter will visible while "4 pipes system" is selected on parameter "HVAC-System".

It is used to set the number of external input control valve.Options:

1 control value with switching object

2 control values

1 control value with switching object：control the Heating valve and Cooling valve via one object(object 254). Switch Heating and Cooling via object "Switch Heat/Cool mode"(Object 250);

2 control values：heating valve and cooling valve have their own objects (object 254 and object 258)

Parameter"Control value object type"

This parameter is to set the control value object type. The local heating cooling valve will be controlled by the received the control value. Options,

1 Bit

1 Byte

1Bit：the control value of external input is 1Bit

1Byte：the control value of external input is 1Byte

Parameter"Monitoring control value"

This parameter is for monitoring control value of external input. Options:

No

Yes

While "yes" is selected, the following parameters are visible.

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

The parameter is used to set the monitoring period of control value, if it can not receive control value during the period, the controller will consider the external controller error, it will output according the next parameter setting value. Options: 10…65535s

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

The parameter defines the reply mode of Obj. "Control value fault"Options:

Respond after read only

Respond after change

Respond after read only：respond after read only the device receiving the device from bus or other bus, Object "Control value fault" respond the current status to the bus.

Respond after change： while error change or the device receiving the request of read status, object "Control value fault" will send telegram to respond the current status to bus.

——Parameter “Control value after fault occurs [10..100]%”

While the external controller error, the controller will adjust valve according the parameter setting value. Options: 0…100 %

Tips:
1.The controller define as local, the control fault is 0 while the temperature sensor error.
2.The control value is influence via the Valve characteristic curve adjustment parameter.

5.10.2 Parameter Setting Window “Setpoint”

The parameter setting window “Setpoint”is as shown in the figure 5.17.

The window is visible while “Local” is selected on parameter “Controller define” in the figure 5.16.

Mainly set the basic parameter of heating and cooling, the parameter of “Heating” and “Cooling” will appear while selecting the corresponding heating or cooling in the figure 5.16. There is the specific introduction of setting of each parameter.

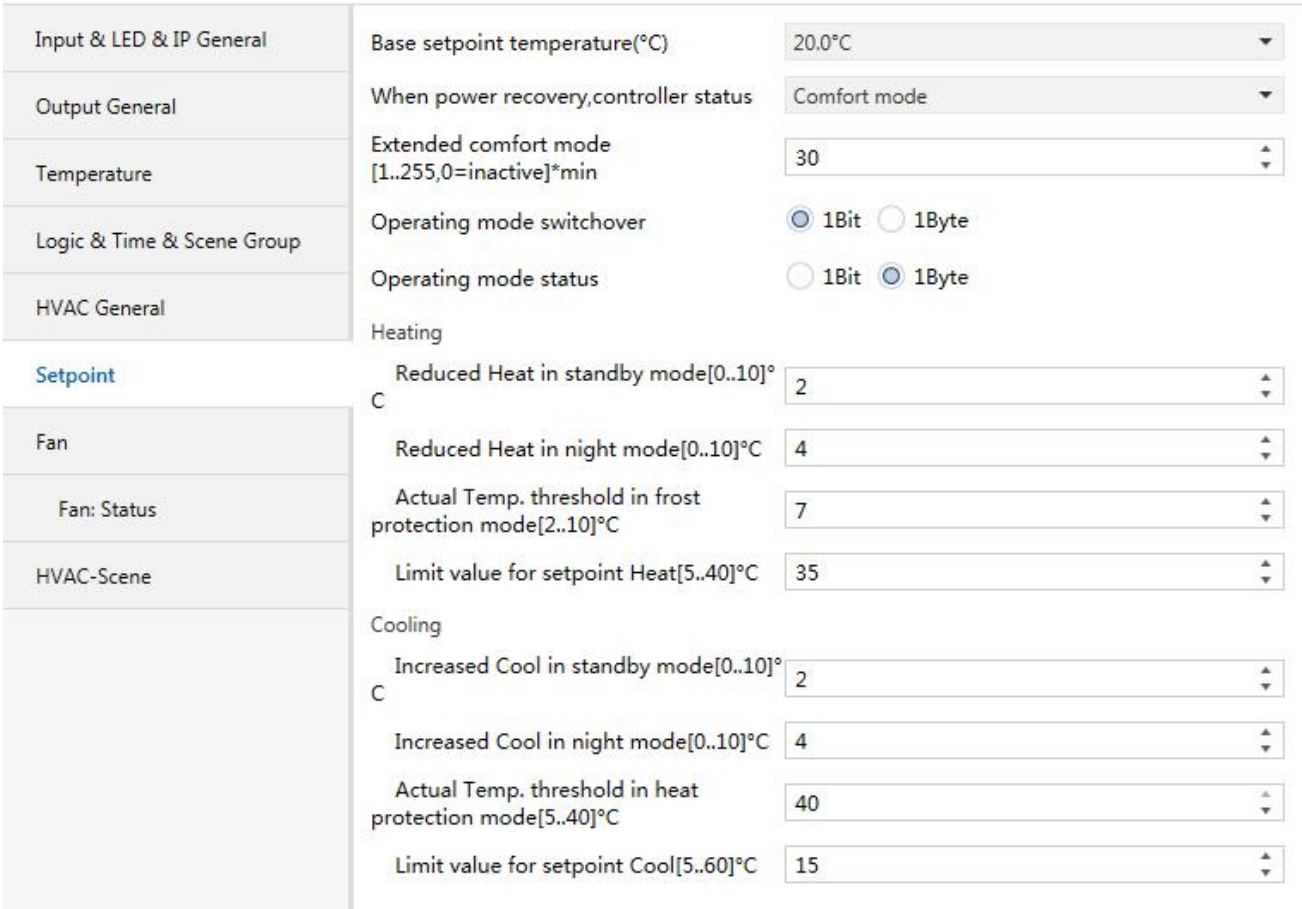


Figure 5.17 Parameter Setting Window“Setpoint”

Parameter“Base setpoint temperature(15..30)℃”

The parameter is used to set the base setpoint temperature,producing the setpoint temperature of room mode. Options: 15…30 [℃]

Parameter"When power recovery, Controller status"

This parameter is used to set the controller status when power recovery, the controller status are Standby mode, Comfort mode, Night setback and Frost/heat protection. Options

Standby mode

Comfort mode

Night setback

Frost/heat protection

Parameter"Extended comfort mode[1..255, 0=inactive]"min"

This parameter is used to set the delay time of Comfort mode. Options: 0...1-255 [min.]

While the set value is "0", meaning do not use the delay time function of Comfort mode.

While the set value is 1-255, it comes to effect while the room mode shift from Night mode to Comfort mode.

The Comfort mode will automatically switch back to Night mode after the delay time. This parameter is only for the switching between Night mode and Comfort mode.

Parameter"Operating mode switchover"

This parameter is used to set the Object type of operating mode switchover. Options:

1bit

1byte

While choosing "1bit", 4 object 1bit are visible, which will switch different mode depending on it's ON or OFF.

The 4 objects are Comfort mode, Night mode, standby mode and Frost/heat protection mode, while the value of them all are "0", the operating mode is standby mode.

Priority should be note while switching, Frost/heat protection mode has highest-priority, the other modes have the same priority.

Thus, before entering a mode with a low priority, the mode with a higher priority should be turn off.

While choosing "1byte", 1 means Comfort mode, 2 means standby mode, 3 means Night mode, 4 means Frost/heat protection mode, it will shift to the corresponding mode according the received telegram value.

Parameter"Operating mode status"

This parameter is used to set the room operation mode status. Options:

1bit

1byte

While choosing "1bit", 4 object 1bit are visible.

The 4 objects are Comfort mode, Night mode, standby mode and Frost/heat protection mode, while a certain mode is activated, the corresponding object will send telegram "1", otherwise, it is "0".

While choosing 1byte, the sending telegram value:1 means Comfort mode, 2 means standby mode, 3 means Night mode, 4 means Frost/heat protection mode.

Heating / Cooling

These parameters are used to set the room's temperature set value in various operation mode.

Parameter "Reduced Heat in standby mode [0..10]℃"

Parameter "Increased Cool in standby mode [0..10]℃"

This parameter is used to set the temperature set value on Standby mode. Options: 0...10 [℃]

Heating：the temperature set value of Standby mode is base value minus setting value;

Cooling：the temperature set value of Standby mode is base value plus setting value;

Parameter "Reduced Heat during night mode [0..10]℃"

Parameter "Increased Cool during night mode [0..10]℃"

This parameter is used to the temperature set value on Night mode. Options: 0...10 [℃]

Heating：the temperature set value of Night mode is base value minus setting value;

Cooling：the temperature set value of Night mode is base value plus setting value.

Parameter"Actual Temp. threshold in frost protection mode [2..10]℃"

This parameter is used to set the temperature set value in frost protection mode. Options: 2...10 [℃]

In frost protection mode, when the room temperature drops to the value sets by this parameter, the fan coil controller will output control to prevent the temperature from falling below this temperature setting value.

For example, when the setting temperature is 5℃, while the room temperature lower than 5℃, the fan coil controller will output to maintain the room temperature at 5℃ or so for protection.

Parameter"Actual Temp. threshold in heat protection mode[5..40]℃"

This parameter is used to set the temperature setting value in heat protection mode. Options：5...40 [℃]

In heat protection mode, when the room temperature rises to the value sets by this parameter, the fan coil controller will output control to prevent the temperature from being higher than this temperature setting value.

For example, when the setting temperature is 30℃, while the room temperature higher than 30℃, the fan coil controller will output to maintain the room temperature at 30℃ or so for protection.

Parameter "Limit value for setpoint Heat [5...40]℃"

Parameter "Limit value for setpoint Cool [5...60]℃"

The above parameters are used to set the limit value on heating and cooling.

Heating：The temperature setting value can not higher than this limit value, if higher, it will output as this limit value;

Cooling：The temperature setting value can not lower than this limit value, if lower, it will output as this limit value.

➢ **Temperature setting adjustment instruction**

The corresponding setting of temperature setting can be set on the parameter window “Setpoint”.

The actual output of setting temperature can be accounted as follows,

In Comfort mode： Heating: Actual setting temperature= basic value setting temperature+setting temperature adjustment value.

2-pipe system mode cooling: actual setting temperature=basic value setting temperature+ setting temperature adjustment value.

4-pipe system mode cooling: actual setting temperature=basic value setting temperature+setting temperature adjustment+Insensitive zone temperature.

In Standby mode: Heating: actual setting temperature=basic value temperature- decrement in standby mode+setting temperature adjustment value.

Cooling: actual setting temperature=basic value temperature + increment in standby mode+setting temperature adjustment value.

In night mode: Heating: actual setting temperature=basic value temperature- decrement in night mode+setting temperature adjustment value.

Cooling: actual setting temperature=basic value temperature + increment in night mode+setting temperature adjustment value

In Frost/heat protection: Heating: actual setting temperature=heat protection setting temperature.

Cooling: actual setting temperature=frost protection setting temperature.

Setting temperature adjustment value can amend through object 269 “Setpoint adjustment”.

Actual temperature setting value will be sent after object 270 read the request.

Note:

when “Heating and cooling” is chose on “HVAC Control mode”, the automatic control switching heating and cooling is only related to the setting temperature in Comfort mode, that is, heating or cooling is obtained after comparison between setting temperature and actual temperature.

That is while the actual temperature is larger than setting temperature at cooling, it shift to cooling; while the actual temperature is smaller than setting temperature at heating, it shift to heating.

5.11 Fan control

The below parameters are basically same whatever the driver interface of fan control is relay or 0-10V. The function of each parameter will be described in detail below.

5.11.1 Parameter setting window“Fan type -- One level”

The parameters of “Fan type -- One level” are setting as shown in figure 5.18, to set the parameter of one level fan. The parameter setting is shown as follows,

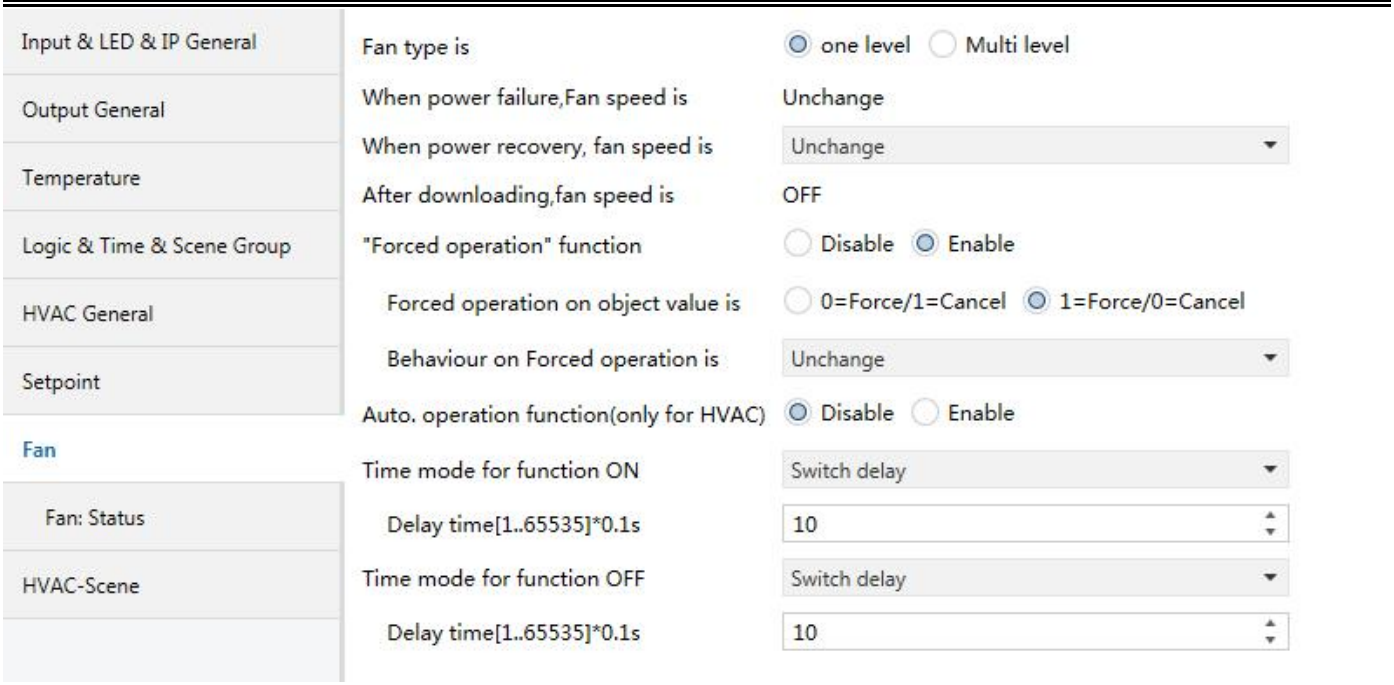


Figure 5.18 Parameter setting window"Fan type -- One level"

Parameter"Fan type is"

This parameter define the fan type which would be controlled. Options,

One level

Multi-level

One level： can control the fan with one level fan speed.

Multi level： can control the fan as many as three levels fan speed, it can choose 2 level, but also can choose 3 level.

Parameter"When power failure, Fan speed is"

Fan speed is unchanged when power failure.

Note: in 0-10V control port mode, the port outputs 0V when power failure.

Parameter"When power recovery, Fan speed is"

This parameter defines the fan speed when power recovery. Options,

Unchange

OFF

ON

As before as bus fail

Unchange: the status do not change;

OFF： turn off fan;

ON： turn on fan;

As before as bus fail： the status before power failure.

Note:

It is advised to connect the bus and the auxiliary supply voltage firstly before connecting fan, to avoid possibility of damage for fan due to incorrect connection.

Parameter"After downloading, fan speed is"

This parameter notes the fan will be turn off after downloading.

Parameter" "Forced operation" function "

This parameter is used to enable the forced operation function.Options,

Disable

Enable

If "Enable", the 1 bit communication object "Forced operation"will visible, the following two parameter will also visible, for setting the object value and the action of "Forced operation".

——Parameter "Forced operation on object value is "

This parameter is used to activate the object value of forced operation. Options,

0=Force/1=Cancel

1=Force/0=Cancel

0=Force/1=Cancel： when object"Forced operation"receiving value "0", activate force operation. When receiving "1", cancel force operation;

1=Force/0=Cancel：when object"Fan Forced operation"receiving value "1", activate force operation. When receiving "0", cancel force operation.

——Parameter "Behaviour on Forced operation is"

This parameter defines how the fan should respond with the Forced operation. Options:

Unchange

ON

OFF

Unchanged： the current speed is remained.

ON：the fan is switched on.

OFF： the fan is switched off.

The Forced operation has the Second highest priority, so its action is influenced by the minimum time and switching delay of the follow parameter setting.

Parameter"Auto. Operation function (only for HVAC)"

This parameter is uesed to enable/disable the auto. Operation of the fan.The options:

Disable

Enable

Enable：With the “Enable”, Automatic mode is enabled, an Automatic operation Parameter window (fig.5.19) appears. And the Auto. operation will be influenced by the follow two parameters “switching delay” and “minimum time”.

Note: The auto. operation function is only effected when the HVAC control is enabled.Please refer to the details instruction at chapter 5.12.4.

Parameter“Time mode for function ON”

The function time at fan ON is defined with this parameter. Options:

None

Switch delay

Minimum time

None：the time function is executed.

Switch delay： the fan is switched on using this delay.

The delay time can be set by the parameter “Delay time *0.1s [1…65535]”

If the object “Fan speed” received more than telegram “1” in a row,the delay time is counted from the first telegram“1” ,instead of the last one.

Note:

The operation ON after reset is also effected by this delay time.That is to say when the delay time is over,then the fan activated.

Minimum time：the fan remains ON for at least this time

The minimum time for ON can be set by the parameter “Minimum time *0.1s [1…65535]”

If the telegram of OFF the Fan during the period of this minimum time,the OFF operation is only executed after.

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

The fan is switched on using this delay. Option: 1…65535

——Parameter “Minimum time*1s [1…65535]”

The fan remains ON for at least this time. Option: 1…65535

Parameter“Time mode for function OFF”

The function time at fan OFF is defined with this parameter. Options:

None

Switching delay

Minimum time

None：the time function is executed.

Switch delay： the fan is switched off using this delay.

The delay time can be set by the parameter “Delay time *0.1s [1…65535]”

minimum time： the fan remains OFF for at least this time.

The minimum time for OFF can be set by the parameter “Minimum time *0.1s [1…65535]”

If the telegram of ON the Fan during the period of this minimum time,the ON operation is only executed after.

Note:The operation OFF after reset is also effected by this minimum time.

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

The fan is switched off using this delay. Option: 1…65535

——Parameter “Minimum time[1…65535]s ”

The fan remains OFF for at least this time. Option: 1…65535

5.11.1.1 Parameter Window“Fan: Auto. operation”

This Parameter window is visible if in the fig.5.18 the option “Enable” has been selected in the parameter“Auto. Operation function”.

Fig.5.19 window is used to set auto. operation of one level fan, the threshold values for switchover of the fan ON/OFF is defined.

If the coil controller is from the local,the fan operation status can be changed automatic based on the control value or the threshold values range.

The control value is defined by the PI algorithm of the internal program,which will not be sent to the bus.

IF the coil controller is from the bus,the fan speed is determined by the control value from the bus. Furthermore, the 4 limitations can also be enabled.

The direct operation and automatic operation cannot occur at the same time. That is, in the case that “Automatic function” has been activated, if there is direct operation, the Auto. Operation will be exited automatically, and it can be activated again by the object “Automatic function”. The object“Status Automatic”will report whether the status of automatic operation is activated or not.

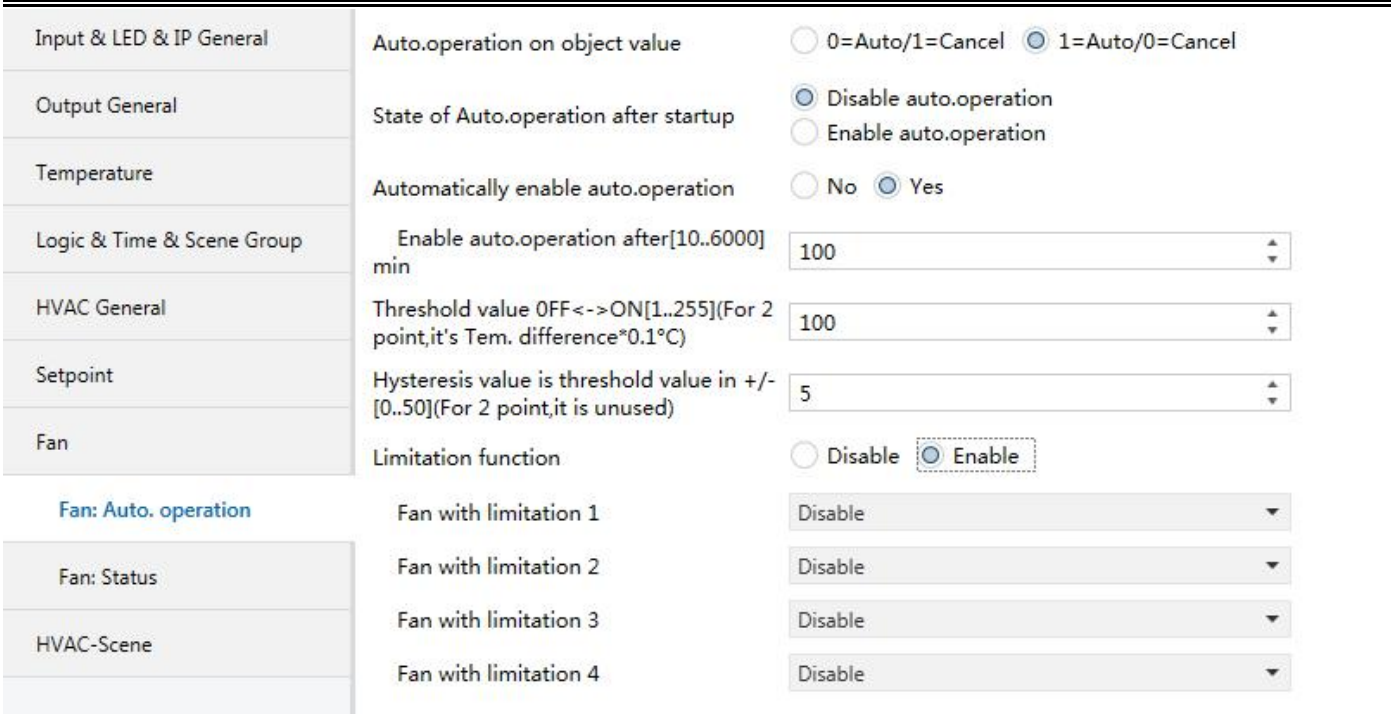


Fig.5.19 Parameter window"Fan: Auto. operation"

Parameter"Auto. Operation on object value"

This parameter is used to activate the telegram value of auto.operation.Options:

0=Auto/1=Cancel

1=Auto/0=Cancel

0=Auto/1=Cancel：When the object "Automatic function"receives the telegram value "0",the auto. Operation is activated;when telegram value "1",the auto. Operation is canceled.

1=Auto/0=Cancel：When the object "Automatic function"receives the telegram value "1",the auto. Operation is activated;when telegram value "0",the auto. Operation is canceled.

Parameter"State of Auto. operation after startup"

This parameter is used to Enable/Disable the auto.Operation when the devices is started up.Options:

Disable auto. operation

Enable auto. operation

Disable auto. Operation：After startup,the default auto.Operation is disable.

Enable auto. Operation：After startup,the default auto.Operation is enable.

Parameter"Automatically enable auto. operation"

This parameter is used to set if the automatically enable function of the auto.Operation is enabled or not.Options:

No

Yes

Yes: When enabled,the following parameter is visible.If there is no operation after the time,which is set in the following parameter,it will automatically enable the auto.Operation.

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

This parameter is used to set the time from the direct operation to auto.operation.

Parameter"Threshold value OFF<-->ON [1..255](For 2 point, it's Tem. difference*0.1℃)"

Here the threshold value, at which switch on occurs, is defined. The control value is determined by the object "Control value".Options:1…255

If the control value is greater than or equal to the parameterized threshold value, the fan is switched on.

If the value is less, the fan is switched off.

Note:

If the controller is from the local under the 2-point control,it will automatically ON/OFF the fan based on the temperature difference between the actual temp.and set temp.Thus this parameter is used to set the temperature difference 1..255（*0.1℃）

Under PI control,the control value is defined by the PI algorithm of the internal program,which will not be sent to the bus.The controller will be determine the fan ON/OFF based on where the control value is located in threshold value range.

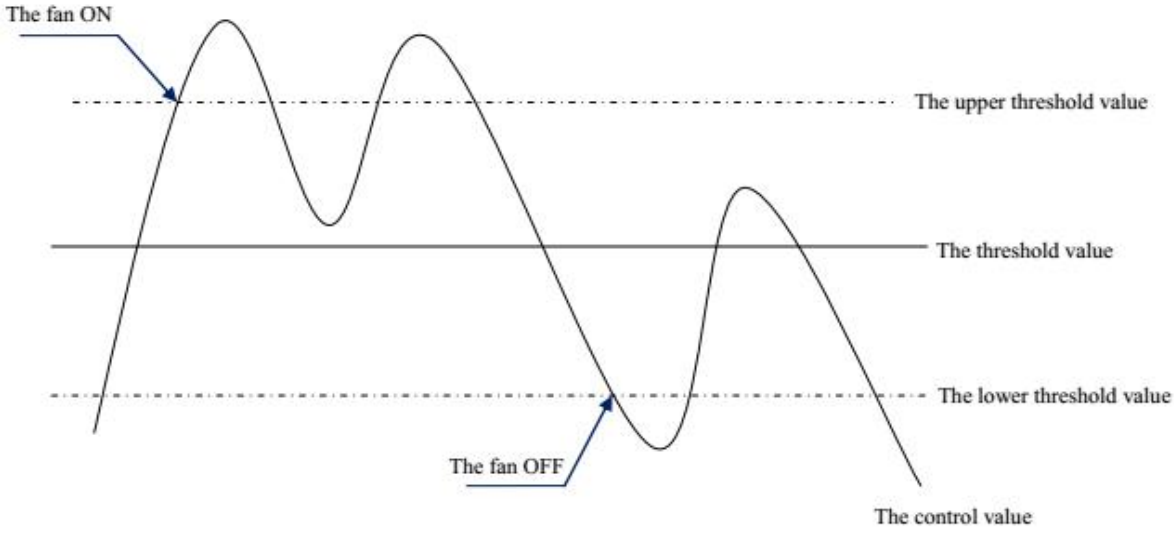
Parameter"Hysteresis value is threshold value in +/- [0…50](For 2 point, it is unused)"

Here a hysteresis value is set, at which switchover to the fan switch occurs. Using hysteresis, a continuous switching of the fan around the threshold value with the control value deviating can be avoided. Options: 0…50.

The setting 0 causes immediate switching without hysteresis.

Assuming the hysteresis value is 10 and the threshold value is 50, then the upper threshold value will be 60 (the threshold value + the hysteresis value), the lower threshold value will be 40(the threshold value - the hysteresis value), then when the control value is between 40 and 60, it will not cause the operation of the fan.

Only less than 40 is off the fan, and greater than 60 is on the fan. As shown below:



Parameter"Limitation function"

The parameter set the fan speed limitation under the Auto. Operation. Options:

Disable

Enable

Enable：the following parameters is visible.And 4 communication objects"Fan Limitation x (x=1,2,3,4)" for limitation of the fan switching are enabled.

The four limitations can be used for example for the control of various operation modes such as:

Limitation 1: e.g. for frost/heat protection

Limitation 2: e.g. for comfort operation

Limitation 3: e.g. for night shutdown

Limitation 4: e.g. for standby operation

In normal cases, the thermostat takes these operating modes into account in its control variable for the room controller.

The sequence of the displayed parameters corresponds with their priorities, i.e. the parameter with the highest priority has limitation 1 followed by limitation 2, 3 and 4. So the highest priority is assigned to limitation 1, e.g. Frost/Heat protection; the lowest priority is assigned to limitation 4, e.g. standby operation.

The limitation is activated if a telegram with the value 1 is received on the limitation object. The limitation is deactivated if a telegram with the value 0 is received on the limitation object.

The direct operation and the forced operation can end the Auto. Operation, but the limitations status can be maintained, it will affect the Auto. Operation again when the Auto. Operation is activated again. And even if the limitations can be also activated during the forced operation, but they only affect the Auto. Operation.

If a limitation is activated during the Auto. Operation, the switching of the fan is switchover to the parameterized status regardless of the control value.

For example, a limit is set to "ON", the fan is only switched on when the limit is activated.

If there are several limitations, their priorities need to be considered.

After the limitations are cancelled or the Auto. Operation is re-activated, the fan switching and the control value are recalculated and executed. This means that the fan switching will be executed according to the latest control value.

After programming or bus voltage recovery, if the control value has been not received before the Auto. Operation active and the limitations are not activated, now the output is no action.

Parameter"Fan with limitation x (x=1,2,3,4)"

With this parameter, the fan switching can be set in active limitation. There are the same parameters for each of the individual four limitations. Options:

Disable

Unchange

OFF

ON

Disable：The limitation is not effect to the Auto. Operation, but the status can be activated.

Unchange：The fan status is remained the current status when the limitation is activated.

OFF：The fan is only switched off when the limitation is activated.

ON：The fan is only switched on when the limitation is activated.

5.11.1.2 Parameter window“Fan：status”

The Parameter window “Fan: Status”is shown in fig.5.20.,Here the status messages are defined for the Fan-one level.

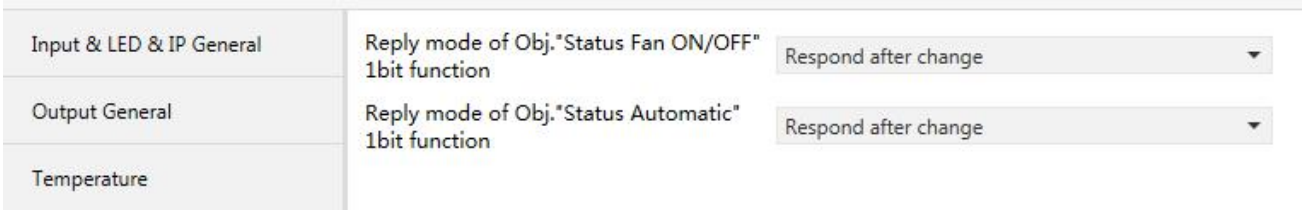


Fig 5.20 Paramter window“Fan status”

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

This parameter is used to set the feedback way of fan working status.Options:

Respond after read only

Respond after change

Respond always

Respond, after read only： Only when the devices receives a read request of the working status from other devices or the bus,the object “Status Fan ON/OFF”will send the current working status to the bus.

Respond after change： The object“Status Fan ON/OFF”status send the status after a change or a read request.

Respond always: No matter the fan status is after read or after change,the object “Status Fan ON/OFF”is always send the current status to the bus.

Parameter“Relay mode of Obj. “Status Automatic”1 bit function”

This parameter is visible when auto operation enabled and used to define the feedback way of auto.Operation status.

When the parameter“Status Automatic”send telegram value 1,the auto.Operation is activated;send 0,the auto.Operation is disabled.Options:

Respond after read only

Respond after change

Respond always

Respond after read only： Only when the devices receives a read request of the working status from other devices or the bus,the object “Status Automatic”will send the current working status to the bus under the auto.Operation.

Respond after change： The object“Status Fan ON/OFF”status send the status after a change or a read request under auto.operation.

***Respond always*:** No matter the fan status is after read or after change,the object “Status Fan ON/OFF”is always send the current status to the bus under auto.operation.

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

The Parameter window of multi-level fan speeds is shown in fig.5.21.The parameters is shown as follows:

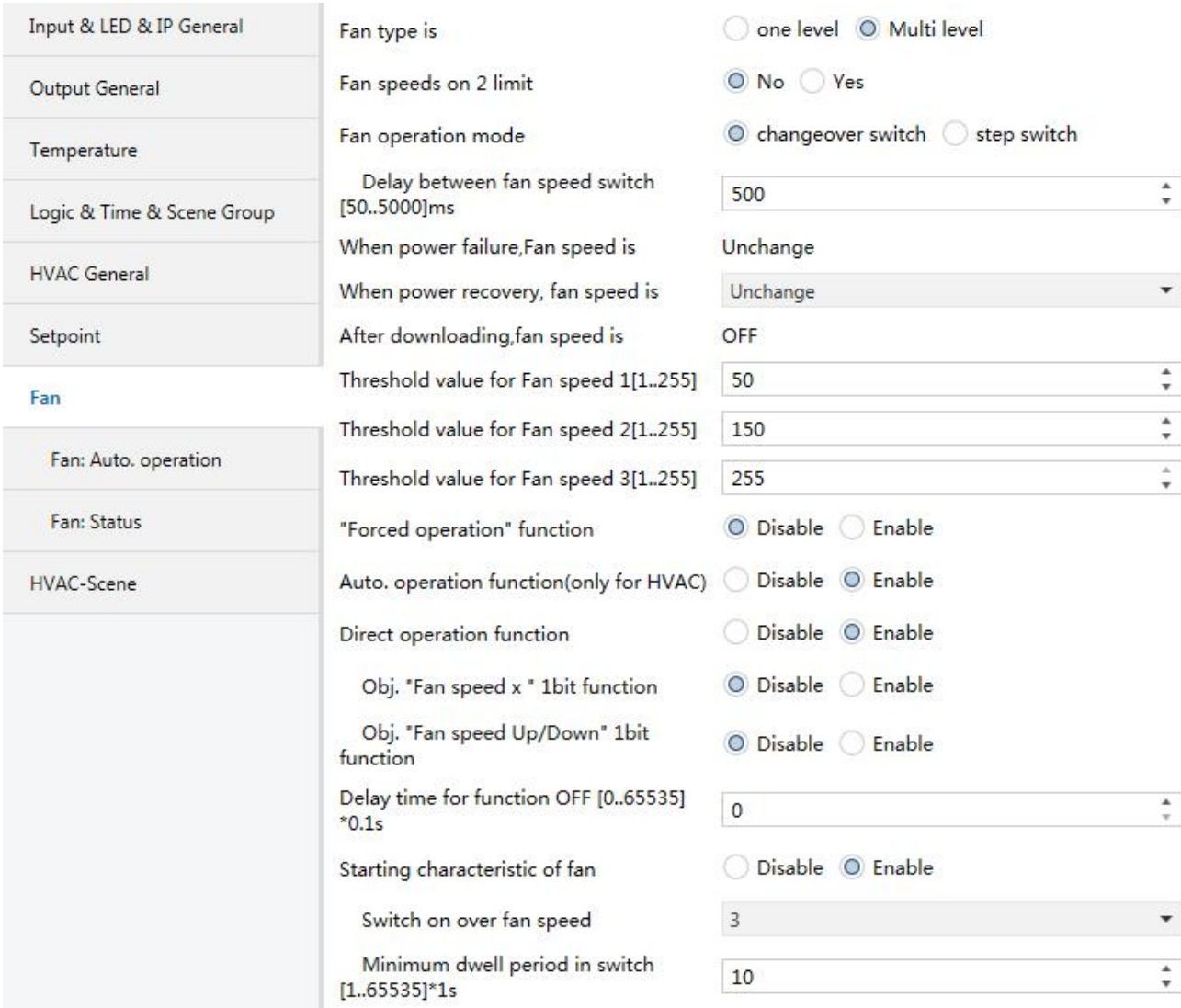


Fig5.21parameter window“Fan-two/three level”

The two level fan speeds and the three level fan speeds have the same parameter settings. Just the fan speeds are limited to two, the fan speed 3 is non-functional.

Some technical characteristics need to be considered with a multi level speed fan, such as fan operation mode, starting characteristic etc. Only know these characteristics, you can set the following parameters reasonably.

Parameter“Fan speeds on 2 limit”

With the parameter, the fan speeds can be limited to two. Options:

No

Yes

No： Can control the 3 level speed fan.

Yes： Can control the 2 level speed fan.A two speed fan is controlled via fan speeds 1 and 2, fan speed 3 is non-functional.

Note:

When the fan speed is limited to 2 level,even the fan speed is set to 3 level after power recovery or reset,it will not be executed.It will keep the current status.

Parameter"Fan operation mode"

The control of the fan is set with this parameter. The mode of fan control should be taken from the technical data of the fan. Options:

Changeover switch

Step switch

***Changeover switch*：** Only the corresponding output of the assigned fan speed is switched on with the parameterization. The delay time between the speed switchover and a minimum dwell time in a valve speed are programmable. The minimum dwell time in a fan speed is only active in automatic mode. With the changeover switch, the fan speed is directly switched on, as follows:

Output / Fan speed	Output O	Output P	Output Q
Off	0	0	0
Fan speed 1	1	0	0
Fan speed 2	0	1	0
Fan speed 3	0	0	1

***Step switch*：** The individual fan speeds are activated consecutively (outputs switched on) until the required fan speed is achieved. The minimum dwell time in a fan speed is also only active in automatic mode. A step switch normally means that the previous fan speeds are usually switched on consecutively:

Output / Fan speed	Output O	Output P	Output Q
Off	0	0	0
Fan speed 1	1	0	0
Fan speed 2	1	1	0
Fan speed 3	1	1	1

For example,when it is speed 3,all three output work(CH O.P.Q) ;When speed 2,two output work(CH O.P)

Note: This is parameter is not effect when it is under 0-10V control interface.

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

The parameter is visible if the fan operation mode selects "changeover switch", which is used to set a switchover delay. This time is a fan specific factor and it is always taken into consideration. Options: 50…5000

After a target fan speed telegram is received, the target fan speed is carried out as soon as the delay has passed. However, switch the fan on do not need delay, switch the fan off need delay.

If a new fan speed is received during the delay, delay is not restarted and the new fan speed is carried out in the last.

Note: This parameter is not effect when it is under 0-10V control interface.

Parameter "When power failure, Fan speed is"

The parameter defines that the behavior of the fan on power voltage failure is unchanged.

Note: When under 0-10V control mode,the output is 0V when power failure.

Parameter"When power recovery, fan speed is"

The behavior of the fan on power voltage recovery is defined here. Options:

Unchange

OFF

1

2

3

As before as bus fail

OFF：the fan is switched off.

1，2 or 3：the fan switches to fan speed 1, 2 or 3.

As before as bus fail：The speed is the same with the speed before the power fails.

Note:

It is advisable to apply a power voltage before connecting the fan in order to achieve a defined switch state of the fan. This eliminates the possibility of the destruction of the fan due to an incorrect contact setting.

If the fan speed is limited to 2 levels, but the parameter is with 3, then the fan speed will be unchanged after bus voltage recovery.

Parameter "After downloading, fan speed is"

It is used to switch off the fan after program downloaded.

Parameter "Threshold value for Fan speed 1(1-255)"

The parameter is used to set a threshold value for switching to fan speed 1.if value of fan speed is no less than the value, then fan will run at speed 1,otherwise fan will be cut off.Option:1-255

Parameter "Threshold value for Fan speed 2(1-255)"

The parameter is used to set a threshold value for switching to fan speed 2.if value of fan speed is no less than the value, then fan will run at speed 2.Option:1-255

Parameter= "Threshold value for Fan speed 3(1-255)"

The parameter is used to set a threshold value for switching to fan speed 3.if value of fan speed is no less than the value, then fan will run at speed 3.Option:1-255

——Parameter" "Force operation" function"

This parameter is used to enable the force operation.Options:

Disable

Enable

Disable： No limitation,every fan speed can run,including off the fan.

Enable： a 1bit communication object “Fan Forced Operation” is enabled. The follow two parameters appear at the same time:

——Parameter “Forced operation on object value is”

This parameter is used to set the telegram value of the activating the force operation.Options:

0=Force/1=Cancel

1=Force/0=Cancel

0=Force/1=Cancel ： The Forced operation is activated by a telegram value 0 of the object “Forced Operation” and is cancelled by value 1.

1=Force/0=Cancel： the Forced operation is activated by a telegram value 1 of the object “Forced Operation” and is cancelled by value 0.

Note:

During the force operation, it is ignored of the automatic operation of the limit setting. After cancel compulsory operation, it will be updated of the automatic operation .

Mandatory is activating, but the wind speed under automatic operation still need to consider the minimum operation time, except the start-up wind speed, because it has its own minimum running time.

After a bus reset or programming, forced the default operation is inactive.

——Parameter"Limitation on forced operation "

This parameter defines forced under operation, the speed of the fan can run. Optional:

Unchange

1

1, off

2

2, 1

2, 1, off

3

3, 2

3, 2, 1

Off

Unchanged： Fan wind speed remains the same, to maintain the current running status;

1：can only run wind speed 1 ;

1, off： can only run wind speed 1 and turn off the fan;

2：can only run wind speed 2;

2, 1： can only run wind speed 1 and 2;

2, 1, off：can only run wind speed 1, 2, and turn off the fan;

3：can only run wind speed 3;

3, 2：can only run wind speed 3 and 2;

3, 2, 1：can only run 1, 2, and 3 wind speed;

Off：only turn off the fan;

Note:

In the case of compulsory activation operation, if the current wind speed is not in the allowed range, the wind speed will switch to close to the current wind speed of wind speed, running in the allowed range, such as the current wind speed is 1, allows the wind speed is 2, 3, so when activation force operation, winds will automatically switch to 2, if it is manually to the wind speed is set to 1, run the wind speed will be 2.

Another case, if the current wind speed is zero, allowing the wind speed is 1, 2, 3, start wind speed is 3, when the activation force operation, fan 3 to start with the speed of the wind, then automatically switch to the wind speed 1; If the current wind speed is 2, allowing the wind speed is 1, 2, when the activation force operation, receive a message a wind speed 0, then the wind speed will switch to 1, this kind of circumstance is the wind speed will switch to the near target wind speed .

Parameter"Auto. Operation function (only for HVAC)"

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

Disable

Enable

Enable：parameter interface 5.22 will be visible.

Note: Automation operation is available only when HVAC controls enable. Detailed description refer to section 5.12.4.

Parameter"Direct operation function"

This parameter can make the fan control operation directly. Direct operating mainly in a different way to manually adjust the wind speed.

Different types of fans, such as switch type of blower fan and stepping switch mode, suitable for different control mode, according to actual needs. Optional:

Disable

Enable

Enable：the following two parameters can be seen, each parameter corresponding to a kind of control mode,

three levels of wind speed can be separately controlled by 3 1bit object. also can through an 1bit object step by step raised or lowered, or through an 1byte object directly open the specified wind speed.

Note:

during the period of direct operation, it is ignored of the setting of the minimum residence time in the automatic mode. Therefore, timely detection of direct manipulation response.

In order to protect the fan, wind speed switch delay time are still valid. Mandatory operation is activated at the same time, need to take into account the force can run under wind speed.

——Parameter"Obj. 'Fan speed x' 1bit function"

Optional:

Disable

Enable

Enable：Three 1 bit of object "Fan speed 1", "Fan speed 2" and "Fan speed 3" will be visible.

When object received "1", open speed, three objects of any object received "0" , the fan off.

If three objects in a short time continuous received ON/OFF, so the message is received by the final object value to control fan speed.

——Parameter"Obj. 'Fan speed Up/Down' 1bit function"

Optional:

Disable

Enable

Enable：1 bit of object "Fan speed UP/DOWN" visible, object received "1" raised wind speed , received "0" cut wind speed .

When wind speed reaches maximum (speed 3) or minimum (off), continue to rise or fall, the wind speed will remain, the continue to increase or reduce the message will be ignored and does not perform, and the wind speed is to increase or decrease step by step.

If multiple upward or downward adjustment wind speed in a short time, the target speed will increase a continuous multistage or reduce stage, such as the current wind speed is 1, received two consecutive increase message, then will execute 3 wind speed.

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

This parameter is used to define the delay off time.

For example,when the current wind speed is speed 1 and a fan OFF telegram is received,the fan will keep the current speed and start to counting the delay time.After this delay time,the fan off action will be executed.

Note:

Under the auto.operation mode,this parameter is executed when the parameter"Minimum time in fan speed [0…65535]s"is set to 0.

Parameter"Starting characteristic of fan"

This parameter to define the fan characteristics of start , this is also a technical characteristics of the fan.

Generally, in order to guarantee the safety of the fan motor start, when the fan open, to open a higher wind speed fan motor will be better, so that the fan motor in startup phase to obtain a higher torque.

Fan used in our life, such as floor fan, when open the fan, usually started from the second wind speed, and then switch to the minimum wind speed, some fans start also like this kind of situation. Options:

Disable

Enable

Enable：the following two parameters visible .

Note:

due to it is a technical characteristics of startup feature of the fan, so start behavior has a higher priority than activate the automatic operation under the restriction or forced operation .

If the fan itself has No start features, we don't have to consider the characteristics of relevant parameters, it can be as long as you select "No".

For example, Start wind speed is 3, limit allowed by the operation of the wind speed is 2, the current in the OFF state, when receiving a control message in the wind speed is 1, the fan will open with wind speed 3 , and then turn to wind speed 2, then the actual need of wind speed 1 will not run due to the limit. (to be automatic operation under the restrictions described in the next chapters “Fan: Auto. operation”)

For stepping switch type of fan, the feature of start is not the same, stepping switch type of fan is usually continuous open wind speed, and switch to switch type of fan is directly open the wind speed. So in defining characteristic parameters of start , also need to consider the fan switch type.

Switching wind speed in the Automatic mode , the minimum residence time will be considered after startup phase, in the start-up phase it is not activated.

Start-up wind speed on the minimum residence time can be set up in addition, refer to the following parameters.

——Parameter “Switch on over fan speed”

This parameter is set the needed speed to start the fan from the OFF state . Optional: 1/2/3

When in the wind speed 2, if start wind speed set 3, then start up automatically with speed 2 to start.

But in order to ensure the normal operation of the fan , it can set the parameters associated with fan performance, it's best to know the characteristics of the fan, reasonable according to the characteristics of the fan to set these parameters, so that no damage to the fan.

——Parameter “Minimum dwell period in switch[1..65535]*s”

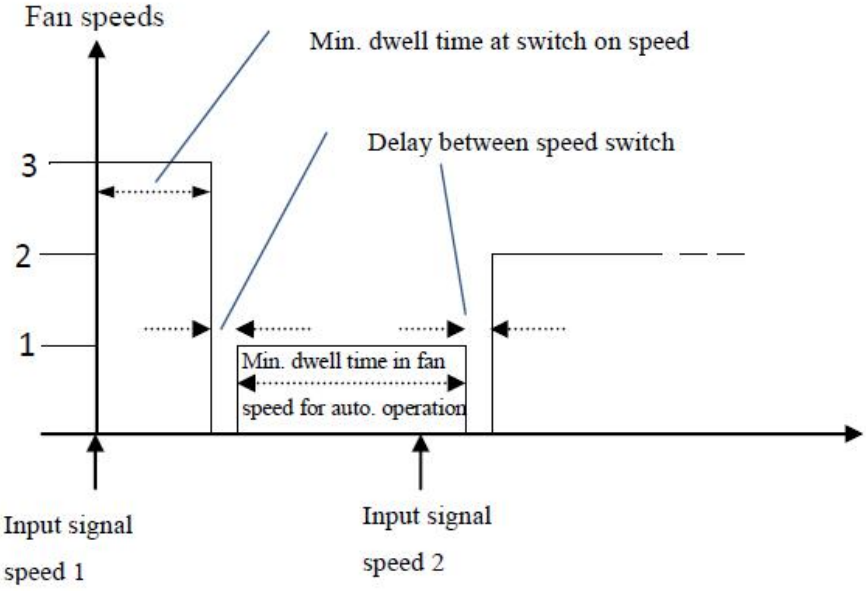
1…65535This parameter defined in the start stage to open a certain wind speed, the minimum residence time. Optional: 1... 65535

When the fan star up, will start up with the star up wind speed , switch to the target wind speed after the minimum residence time , the target speed can be the wind speed of the reset fan, or triggered by other operating speed.

Start-up phase, delay time of switch between two wind speed is also need to be taken into account.

For example: a start-up behavior with 3 levels wind speed of the fan

Assuming that the fan current state is closed, the wind speed is level 3, target speed is level 1, eventually wind speed is level 2, as shown in the figure below:



Shown above, if the fan is in a off state, when it received a "wind speed 1" message, it will star up with "wind 3" , after the minimum residence time of start-up wind speed, and then switch wind speed, switch of wind speed needs a delay time (this is a technical parameters of the fan, good to protect the fan), after the delay, and switch to the target speed "wind speed 1", in the process of the operation of the "wind speed 1", if the fan receives a message of "wind speed 2" , at this time need to consider whether the automatic mode is activated, if the automatic mode is active, you will need to consider the minimum residence time of wind speed run , if it is a direct operation, do not need to consider the minimum residence time of wind speed run , after the switching delay, and running to "wind speed 2".

5.11.2.1 Parameter window“Fan: Auto. operation”

This parameter window (fig.5.22) is visible if in fig. 5.21 the option Enable has been selected in the parameter “Auto. Operation function”.

Here set the auto. Operation of multilevel fan, the threshold values for switch over of the fan ON/OFF is defined.If the coil controller is from the local,the fan will automatically ON/OFF the fan based on the control value or temperature difference in the threshold value range.The control value is defined by the PI algorithm of the device internal program,which will not be sent to the bus.

If the coil controller is from the bus,the speed is determined by the control value of the bus.Furthermore,there are 4 limitations can be set.

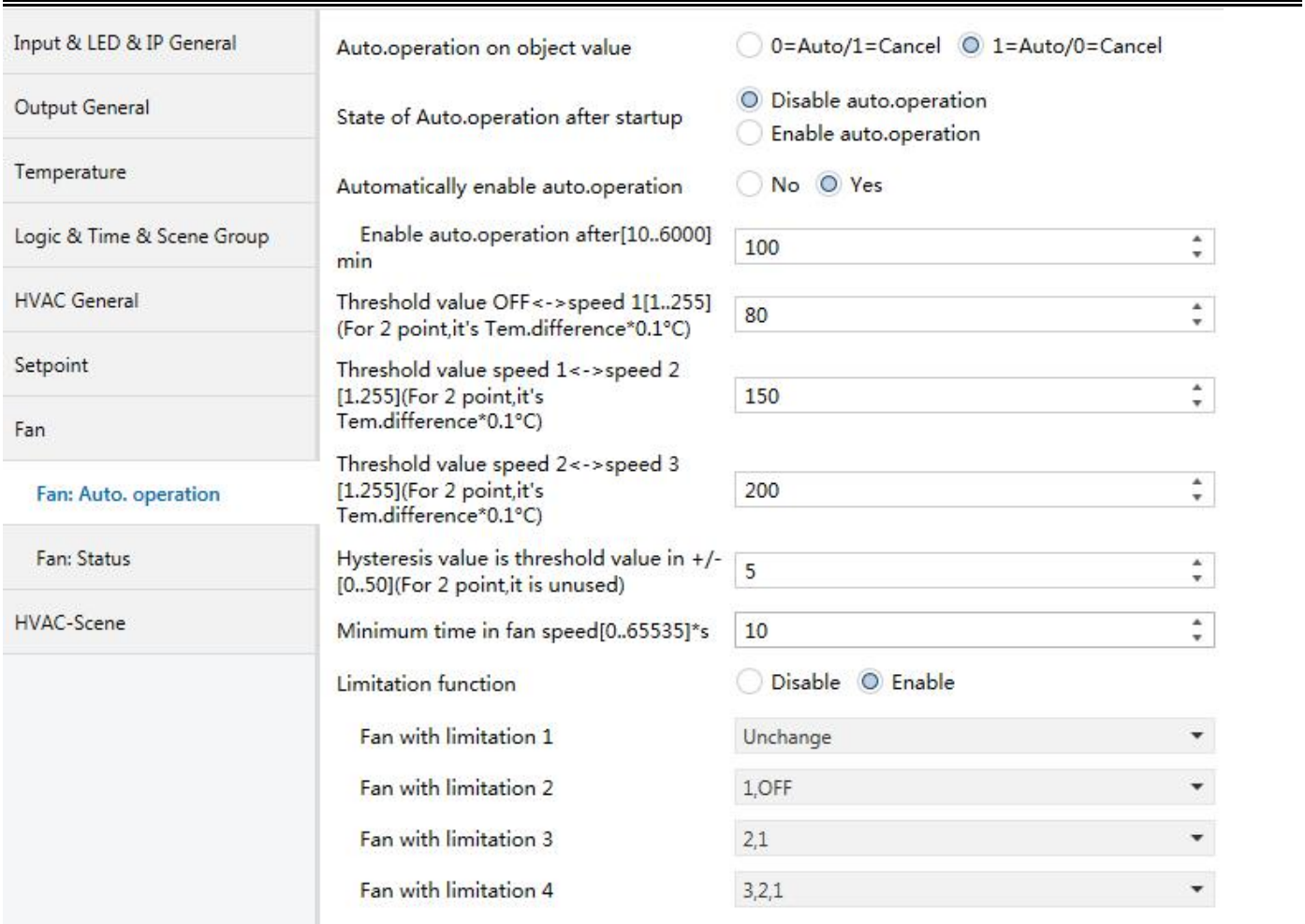


Fig 5.22Parameter window"Fan: Auto. operation"

——Parameter "Auto. operation on object value "

This parameter defines how to react to a telegram value of activating the auto.Operation. Options:

0=Auto/1=Cancel

1=Auto/0=Cancel

0=Auto/1=Cancel： Automatic is activated by a telegram with value 0 and inactive by value 1.

1=Auto/0=Cancel： Automatic is activated by a telegram with value 1 and inactive by value 0.

Parameter"State of Auto. operation after startup"

This parameter is used to Enable/Disable the auto.Operation when the devices is started up.Options:

Disable auto. operation

Enable auto. operation

Disable auto. Operation： After startup,the default auto.Operation is disable.

Enable auto. Operation： After startup,the default auto.Operation is enable.

Parameter"Automatically enable auto. operation"

This parameter is used to set if the automatically enable function of the auto.Operation is enabled or not.Options:

No

Yes

Yes: When enabled,the following parameter is visible.If there is no operation after the time,which is set in the following parameter,it will automatically enable the auto.Operation.

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

This parameter is used to set the time from the direct operation to auto.operation.Options:10..6000

Parameter"Threshold value OFF<-->speed 1 [1…255](For 2 point, it's Tem. difference*0.1℃)"

Here to defined the threshold value that switch between fan off and fan speed 1.Options: 1…255

If the control values greater than or equal to the threshold of the parameter Settings, run speed 1, else off the fan

Note:

If the controller is from the local under the 2-point control,it will automatically ON/OFF the fan based on the temperature difference between the actual temp.and set temp.Thus this parameter is used to set the temperature difference 1..255（*0.1℃）

Under PI control,the control value is defined by the PI algorithm of the internal program,which will not be sent to the bus.

The controller will be determine the fan ON/OFF based on where the control value is located in threshold value range.

The following 2 parameter is similar to this one.

——Parameter "Threshold value speed 1<-->speed 2 [1•••255](For 2 point, it' s Tem. difference*0.1℃)"

Here to defined the threshold value when switch to speed 2, if the control values greater than or equal to the threshold of the parameter Settings, run speed 2;

Options:1…255

——Parameter "Threshold value speed 2<-->speed 3 [1•••255](For 2 point, it' s Tem. difference*0.1℃)"

Here to defined the threshold value when switch to speed 3, if the control values greater than or equal to the threshold of the parameter Settings, run speed 3.

Options:1…255

Note:

room controller in the form of an ascending to evaluate these thresholds, that is, first of all check OFF < - > threshold of wind speed 1 , and then the wind speed 1 < - > wind speed 2, wind speed 2 < - > wind speed 3. The

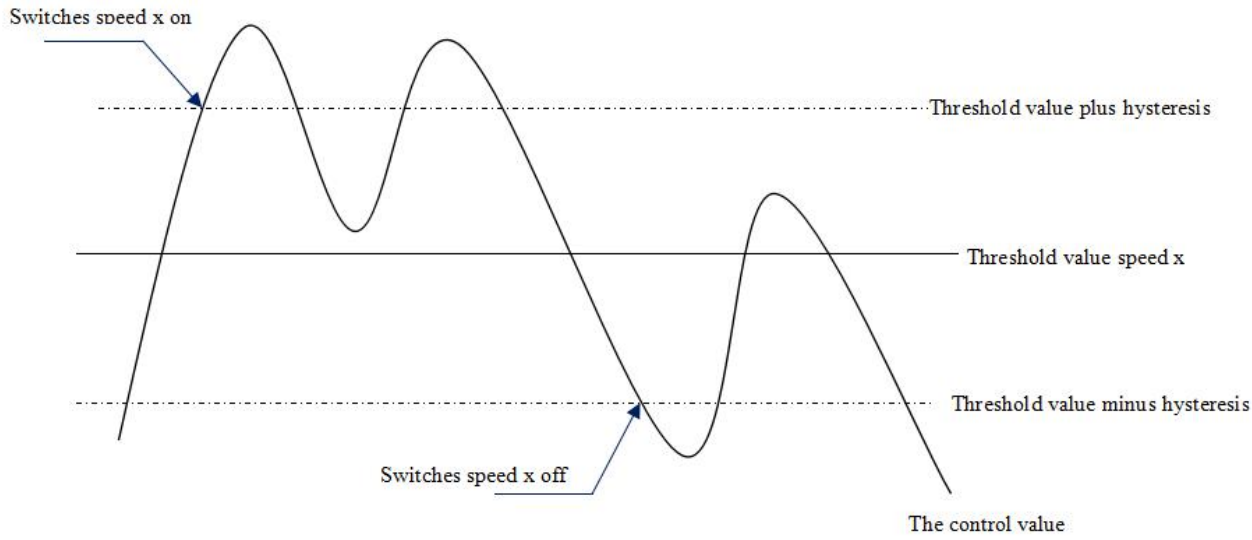
correctness of the functions performed in such a case only guaranteed: the threshold of OFF < - > wind speed 1 is less than the threshold of wind speed 1 < - > wind speed 2's threshold, the threshold of wind speed 1 < - > wind speed 2 is less than the threshold wind velocity 2 < - > wind speed of 3's threshold.

——Parameter "Hysteresis value is threshold value in +/- [0…50](For 2 point, it is unused)"

Here a hysteresis value is set, at which switch over to the fan switch occurs. Using hysteresis, a continuous switching of the fan around the threshold value with the control value deviating can be avoided. Options: 0…50

The setting 0 causes immediate switching without hysteresis.

Assuming the hysteresis value of 10 and the threshold value is 50, then the upper threshold value will be 60 (the threshold value + the hysteresis value), the lower threshold value will be 40(the threshold value - the hysteresis value), then when the control value is between 40 and 60.it will not cause the operation of the fan, only less than 40 is off the fan, and greater than 60 is on the fan. As shown below:



Note:

In enabling the lagging situation, if there is a threshold overlap, fan action rules are as follows:

lag determine the wind speed conversion of control points;

2)if the wind speed transformation, the new wind speed is determined by the control values and threshold, without considering lag;

For example, (1) :

OFF < - > wind speed 1 threshold of 10%

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

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

Hysteresis is 15%

The wind speed behavior of fan raise from OFF :

OFF state of the fan will be in the control values of 25% （≥10%+15%） this point to shift , the new wind speed will be 2 (because of 25% between 20% to 30% , no need to consider lag at this time), so the wind speed

1 is ignored;

The behavior of the fan's wind speed decreased from 3:

Fan speed 3 will be in control values 14% (< 30% 15%) this point to shift, a new wind speed will be 1 (because of 14% between 10% to 20% , no need to consider lag), so the wind speed 2 is ignored.

For example, (2) :

OFF < - > wind speed 1 threshold of 10%

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

3 wind speed 2 < - > wind speed threshold of 70%

Hysteresis is 5%

The wind speed behavior of fan raise from OFF :

OFF state of the fan will be in the control values of 15%（≥10%+5%）this point to shift .

If received the control value is 41%, the new wind speed will be 2 (because of 41% between 40% to 70% , no need to consider lag at this time), so the wind speed 1 is ignored; if received the control value is 39%, the new wind speed is 1 (because of 39% between 10% to 40% , no need to consider lag at this time)

The behavior of the fan's wind speed decreased from 3:

Fan speed 3 will be in control values 64%（<70%-5%) this point to shift.

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

3)No matter what happens, control values is 0, the fan will turn off;

——Parameter “Minimum time in fan speed [0…65535]*s”

This parameter to define the residence time before the current wind speed switch to a higher or lower wind speed , which is a minimum wind speed running time, if you want to switch to another wind speed, can only be to switch after waiting for this period of time, if the current wind speed has been running long enough, the wind speed change can quickly switch. Optional: 0... 65535

0: means not delay switch;

Note：

The setting of the residence time in this parameter is only using in automatic mode .

Automatic mode of each wind speed (including off) need to consider the minimum operation time, and automatic operation of the wind speed is changed step by step , such as the current wind speed is 1, the target speed is 3, then the wind speed transform from 1 to 2, and 3, and each operation of the wind speed over the minimum operation time to transform.

Start wind speed without considering the minimum run time, because the starting wind speed has its own minimum running time.

——Parameter “Limitation function”

The parameter set the fan speed limitation under the Auto. Operation. Options:

Disable

Enable

Enable：The following parameters is visible.And 4 communication objects“Fan Limitation x (x=1,2,3,4)” for limitation of the fan switching are enabled.

The four limitations can be used for example for the control of various operation modes such as:

Limitation 1: e.g. for frost/heat protection

Limitation 2: e.g. for comfort operation

Limitation 3: e.g. for night shutdown

Limitation 4: e.g. for standby operation

In normal cases, the thermostat takes these operating modes into account in its control variable for the room controller.

The sequence of the displayed parameters corresponds with their priorities, i.e. the parameter with the highest priority has limitation 1 followed by limitation 2, 3 and 4. So the highest priority is assigned to limitation 1, e.g. Frost/Heat protection; the lowest priority is assigned to limitation 4, e.g. standby operation.

The limitation is activated if a telegram with the value 1 is received on the limitation object. The limitation is deactivated if a telegram with the value 0 is received on the limitation object.

The direct operation and the forced operation can end the Auto. Operation, but the limitations status can be maintained, it will affect the Auto. Operation again when the Auto. Operation is activated again. And even if the limitations can be also activated during the forced operation, but they only affect the Auto. Operation.

If a limitation is activated during the Auto. Operation, the switching of the fan is switchover to the parameterized status regardless of the control value. For example, a limit is set to “ON”, the fan is only switched on when the limit is activated. If there are several limitations, their priorities need to be considered.

After the limitations are canceled or the Auto. Operation is re-activated, the fan switching and the control value are recalculated and executed. This means that the fan switching will be executed according to the latest control value.

After programming or bus voltage recovery, if the control value has been not received before the Auto. Operation active and the limitations are not activated, now the output is no action.

——Parameter “Fan with limitation x (x=1, 2, 3, 4)”

With this parameter, the fan switching can be set in active limitation. There are the same parameters for each of the individual four limitations. Options:

Disable
Unchange
1
1, off
2
2, 1
2, 1, off
3
3, 2
3, 2, 1
Off

“Disable”：No limitation,every fan speed can run,including off the fan.

“Unchanged”：Fan wind speed remains the same, to maintain the current running status;

“1”：can only run wind speed 1 ;

“1, off”：can only run wind speed 1 and turn off the fan;

“2”：can only run wind speed 2;

“2, 1”：can only run wind speed 1 and 2;

“2, 1, off”：can only run wind speed 1, 2, and turn off the fan; 只能运行风速 1，2 和关风机；

“3”：can only run wind speed 3;

“3, 2”：can only run wind speed 3 and 2;

“3, 2, 1”：can only run 1, 2, and 3 wind speed;

“off”：only turn off the fan.

5.11.2.2 Parameter window“Fan: status”

The parameter window “Fan: Status” is shown in fig.5.23. This interface is used to set multilevel wind speed of the fan's running status information.

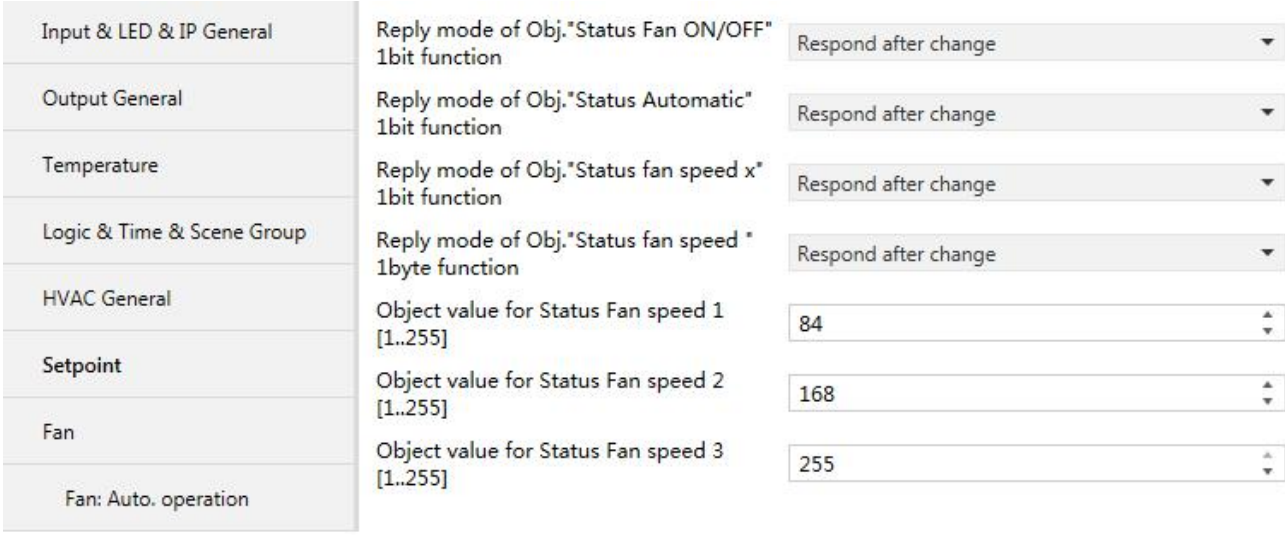


Fig.5.23 Parameter Window“Fan: status”

Parameter “Reply mode of Obj. “status Fan ON/OFF mode” 1bit function”

This parameter is used to set the feedback way of fan working status.Options:

Respond after read only

Respond after change

Respond always

Respond, after read only： Only when the devices receives a read request of the on/off status from other devices or the bus,the object “Status Fan ON/OFF”will send the current on/off status to the bus.

Respond after change： The object“Status Fan ON/OFF”status send the status after a change or a read request.

Respond always: No matter the fan status is after read or after change,the object “Status Fan ON/OFF”is always send the current status to the bus.

Parameter“Relay mode of Obj. “status Automatic”1 bit function”

This parameter is visible when auto operation enabled and used to define the feedback way of auto.Operation status. When the object “Status Automatic”send telegram value 1,the auto.Operation is activated;send 0,the auto.Operation is disabled.Options:

Respond after read only

Respond after change

Respond always

Respond after read only： Only when the devices receives a read request of the working status from other devices or the bus,the object “Status Automatic”will send the current status of the auto.Operation to the bus .

Respond after change： The object “Status Automatic” send the status of auto.operation after a change or a read request .

Respond always: No matter the fan status is after read or after change,the object “Status Automatic” is always send the current status of auto.operation to the bus.

Parameter“Relay mode of Obj. “Status fan speed x”1bit function”

The parameter is used to define the feedback way of the speed status.The following three 1 bit object “Status Fan speed 1”、“Status Fan speed 2” and “Status Fan speed 3” are used to indicate the status of every level speed.

Respond after read only

Respond after change

Respond always

Respond after read only： Only when the devices receives a read request of the working status from other devices or the bus,the objects will send the current working status to the bus under the auto.Operation.

Respond after change： The objects send the status after a change or a read request .

Respond always: No matter the fan status is after read or after change,the objects are always send the current status to the bus.

Parameter“Relay mode of Obj. “Status fan speed ”1byte function”

This parameter is used to set the feedback way of current fan working status.The length is 1 byte.The fan speed output status value is defined by the following parameter(“Object value for Status Fan speed 1/2/3 [1..255]”) Options:

Respond after read only

Respond after change

Respond always

Respond, after read only：；Only when the devices receives a read request of the working status from other devices or the bus,the object will send the current working status to the bus.

Respond after change： The object sends the status after a change or a read request.

Respond always： No matter the fan status is after read or after change,the object always sends the current status to the bus.

Parameter“Object value for Status Fan speed 1/2/3 [1..255]”

This parameter is used to set the output value of fan speed status.That is to say it can define the output value of every fan speed.Options:1..255

The status of fan off is predefined as 0.

5.12 Coil Output

This chapter introduces HVAC system of the valve control unit, following the fan control of the previous section. The room controller can be used to control 2-pipe or 4-pipe system.

The fan and the HVAC system can be parameterized independently. Therefore, when we use the room controller to control the valve, we need to consider both the fan and HVAC system parameter settings and reasonably set them in order to the two parts to better work together.

The valve is the end product of central air-conditioning, thus the function of the room controller is mainly used in places with central air-conditioning, to give a room heating, cooling and ventilation.

Pipe systems description:

In daily life, a fan coil unit can be configured as a 4-, 3- or 2-pipe system.

The 2 pipe system consists of just a single water circuit, which is heated or cooled alternately to suit the season. In a 2 pipe fan coil unit, there is only one heat exchanger with a valve for heating or cooling, the control value for heating or cooling is provided by a thermostat, only warm or only cold water is supplied centrally to the pipe system.

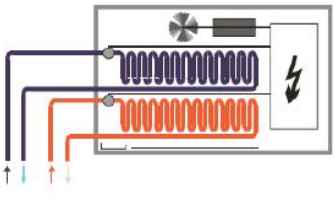
In many HVAC systems, cooling is undertaken exclusively with a 2 pipe fan coil unit. The heating function is undertaken by a conventional heater or an electrical heater in the fan coil unit.

The 3 pipe system has a similar design to the 4 pipe system. It has a separate inlet for heating and cooling water as well as two separate heat exchangers with one valve each.In contrast to a 4 pipe system the 3 pipe system has a common return flow for heating or cooling water.

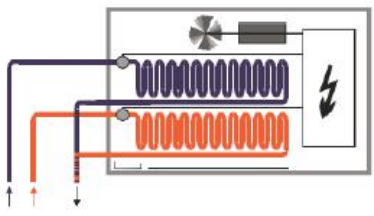
Note:this device don not support 3-pipe system.

In a 4 pipe system, separate water circulation loops are used for heating and cooling water. Thus there are also two separate heat exchangers for heating and cooling which are each triggered via a single valve in the fan. Warm and cold water is provided centrally to two separate pipe system.That is to say the heating and cooling can not be used at the same time.

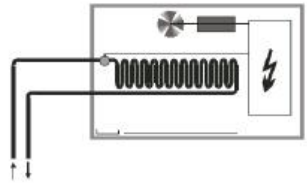
Connections of 4-pipe system: Connect the relevant valve of the pipe to the heating/cooling output of the device to control flow the warm and cool water.



4 pipe system



3 pipe system



2 pipe system

5.12.1 Parameter “Heat/Cool valve (Relay)”

The parameter setting interface of “Heat valve (Relay)” and “Cool valve (Relay)” is shown in Figures 5.24 and 5.25.

When the drive interface of the heating valve/cooling valve is controlled by relay, the following uses the parameters of the heating valve/cooling valve in detail.

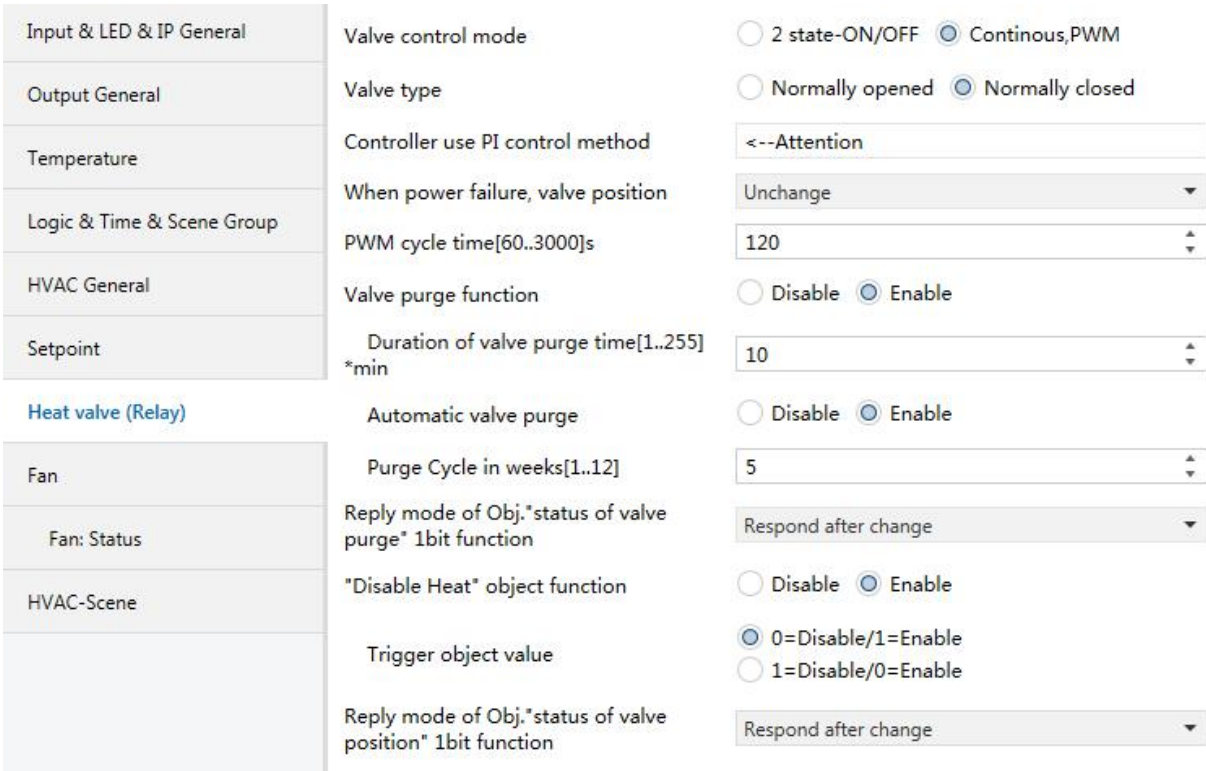


Figure 5.24 “Heat valve (Relay)” Parameter setting interface

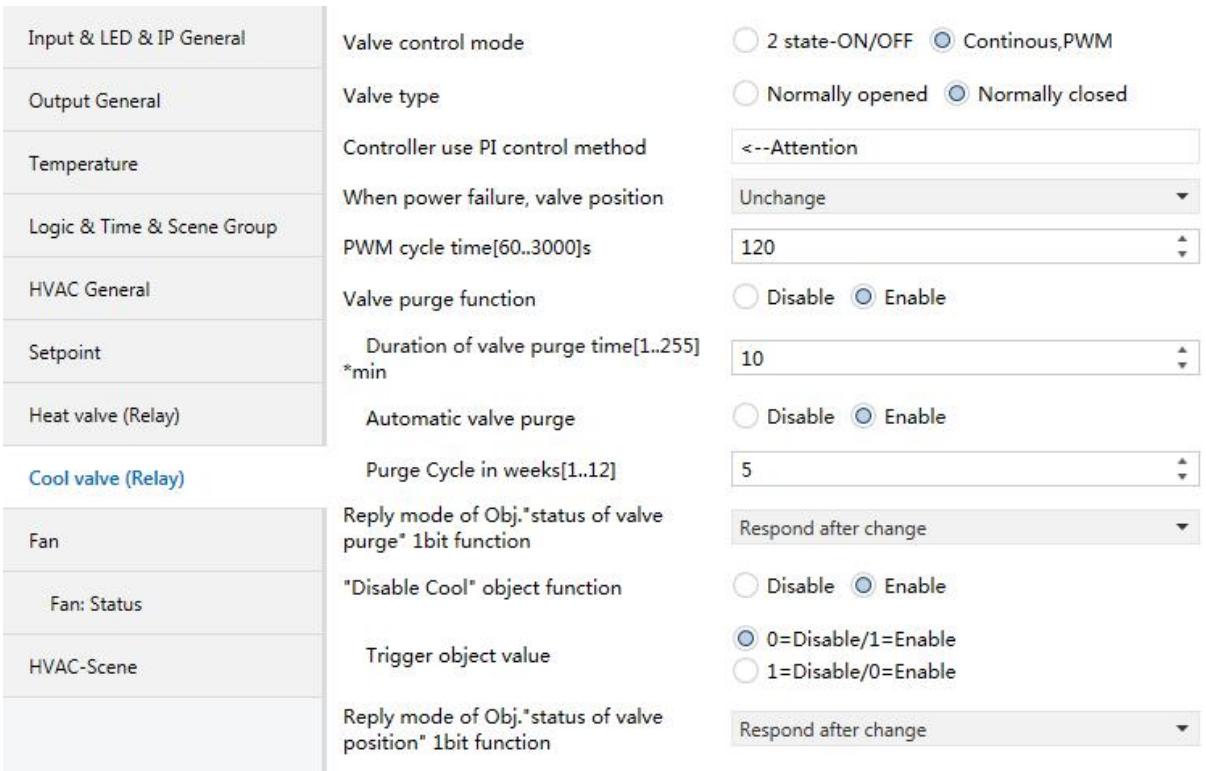


Figure 5.25 Parameter setting interface “Cool valve (Relay)”

Parameter"Valve control mode"

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

2 state-ON/OFF

Continuous, PWM

2 state-ON/OFF：Two-point switch control mode;

Continuous, PWM：PWM continuous control mode.

Parameter"Valve type"

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

Normally opened

Normally closed

Normally closed：Normally closed switch;

Normally opened：Normally opened switch.

——Parameter "Controller use 2-point control method"

When the parameter type is "2 state-ON/OFF", the two-point control mode is used only when the controller is local.

——Parameter "Controller use PI control method"

This parameter indicates that when the valve type is "Continuous, PWM", the PI control mode is used only when the controller is local.

Parameter "When power failure, valve position"

This parameter sets the position of the valve after the voltage is de-energized. Optional:

Unchanged

Open

Close

Unchanged: After the voltage is de-energized, the valve state remains unchanged;

Open：Valve open;

Close：Valve close.

——Parameter "PWM cycle time [60…3000]*1s"

This parameter is visible when the valve type is "Continuous, PWM" and is used to set the time period for PWM control.

The larger the value of the parameter, the smaller the valve switching frequency. Conversely, the smaller the value, the more frequent the valve switch. Optional: 60...3000s

Parameter "Valve purge function"

Optional：

Disable

Enable

Enable： A 1-bit communication object "Trigger valve purge" is visible to trigger 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. Available options: 1...255min

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

——Parameter "Automatic valve purge"

Visible when the valve cleaning function is enabled. Optional：

Disable

Enable

Enable： Enable the automatic valve cleaning function, the following parameters are visible.

——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, this time will be reset. Optional：1…12

Note:

The manual priority is the highest, and the cleaning priority is the second highest. If the cleaning time is not reached, the cleaning process is manually interrupted. After the cleaning is finished, the manual exit will not continue the cleaning.

——Parameter "Reply mode of Obj."status of valve purge" 1bit function"

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

Respond after read only

Respond after change

Respond always

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

Respond always： Always respond, receive control commands, regardless of whether the status changes or not.

Parameter "Disable Heat" object function"

Parameter "Disable Cool" object function"

Optional：

Disable

Enable

Enable： A 1-bit communication object "Disable, Heat/Cool" 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. Optional:

0=Disable/1=Enable

1=Disable/0=Enable

0=Disable/1=Enable： When the object "Disable, Heat/Cool" receives the message value "0", the heating/cooling operation is prohibited.

Reactivate when receiving "1";

1=Disable/0=Enable： When the object "Disable, Heat/Cool" receives the message value "1", the heating/cooling operation is prohibited.

Reactivate when "0" is received.

Parameter "Reply mode of Obj."Status of valve position" 1bit function"

This parameter defines how the valve status responds. Optional:

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 the status 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;

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

Valve switch type	Description
Normally opened	When the valve is in the open state, the object "Status of valve position" sends the message "0"; when there is current (relay closed), the message "1" is sent; When there is no voltage (0V), the object "Status of valve position" sends the message "0"; when there is voltage (10V), the message "1" is sent.
Normally closed	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; When the valve is at voltage (0V~10V, excluding 10V), the object "Status of valve position" sends the message "1"; when there is voltage (10V), the message "0" is sent.

5.12.2 Parameter setting interface “Heat/Cool valve (0-10V)”

The parameter setting interface of “Heat valve (0-10V)” and “Cool valve (0-10V)” is shown in Figures 5.26 and 5.27.

When the drive interface of the heating valve/cooling valve is controlled by 0-10V, the following uses the parameters of the heating valve/cooling valve in detail. The functions of some parameters are the same as those in section 5.12.1 .

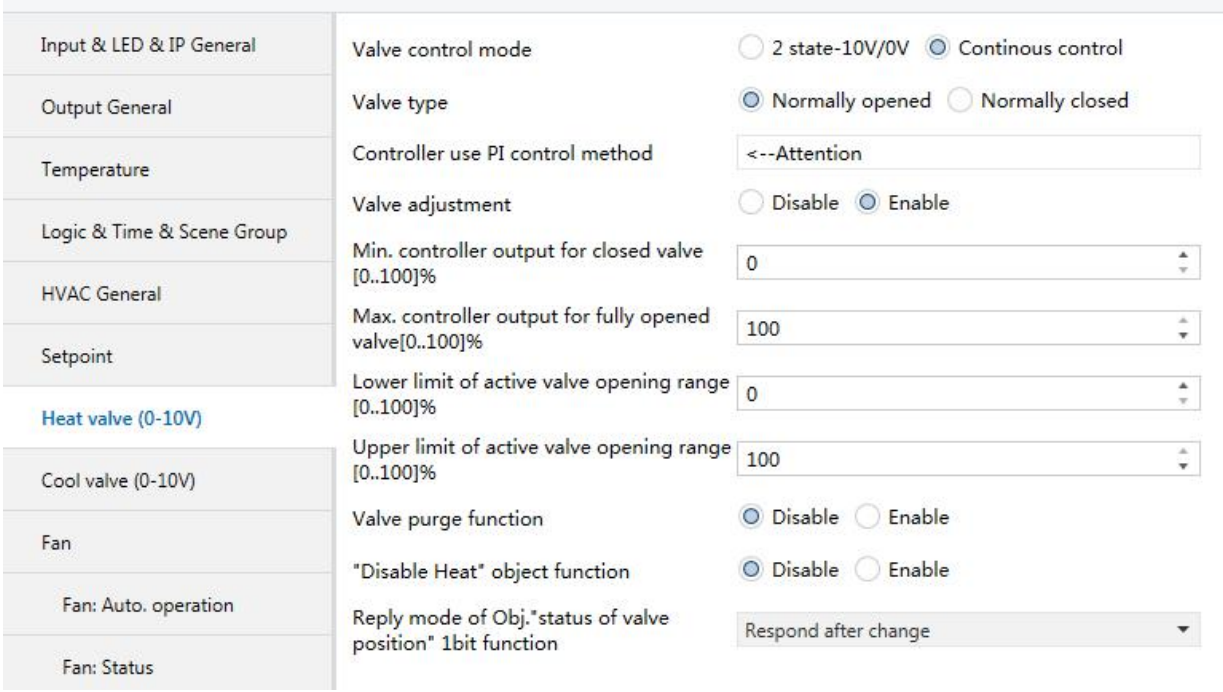


Figure 5.26 Parameter setting interface “Heat valve (0-10V)”

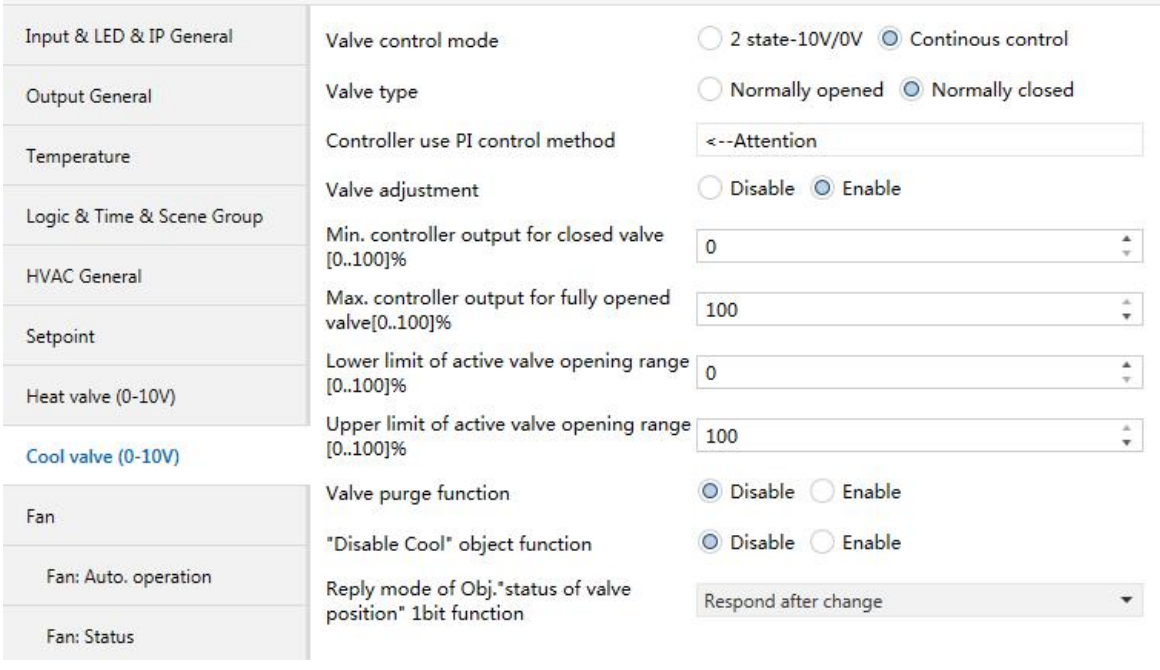


Figure 5.27 “Cool valve (0-10V)” Parameter setting interface

Parameter "Valve adjustment"

This parameter sets whether the characteristic curve adjustment of the valve is enabled. Optional:

Enable

Disable

——Parameter "Min. controller output for closed valve[0-100]%"

——Parameter "Max. controller output for fully opened valve[0...100]%"

——Parameter "Lower limit of active valve opening range[0...100]%"

——Parameter "Upper limit of active valve opening range[0...100]%"

The above parameters are only visible when "Enable" is selected in the parameter "Valve adjustment" and are used to set the characteristic curve of the valve output.

Optional： 0...100 [%]

Min. controller output for closed valve: The lower limit control value of the valve characteristic curve;

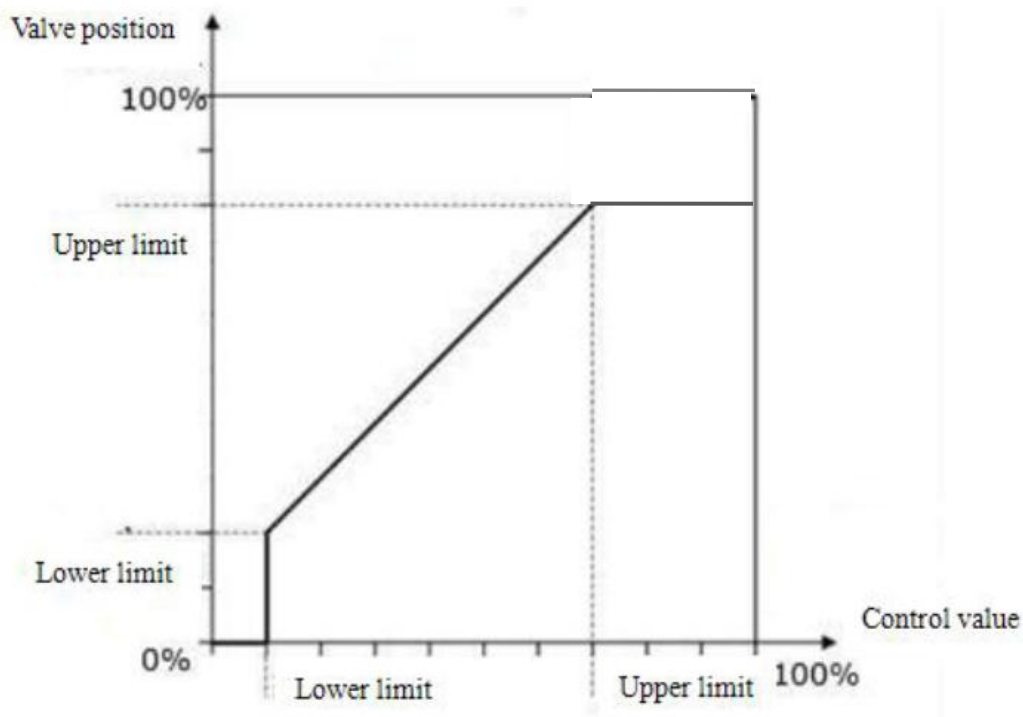
Max. controller output for fully opened valve： The upper limit control value of the valve characteristic curve;

Lower limit for active valve opening range： The lower limit of the valve limit value;

Upper limit for active valve opening range： The upper limit of the valve is limited.

Take the valve with the valve interface as the relay as an example. Assume that the lower limit of the control value is set to 10%, the lower limit of the valve is set to 20%, and the upper limit of the control value is set to 70%.

When the upper limit of the valve is set to 80%, there is an output characteristic curve as shown below:



5.12.3 Parameter setting interface “Scene”

The “Scene” parameter setting interface is shown in Figures 5.28 and 5.29 and is visible when the HVAC output is enabled.

Mainly set the scene of HVAC control, you can set 8 scenes.

Note: If the fan control is not enabled, the wind speed setting in the scene is meaningless.

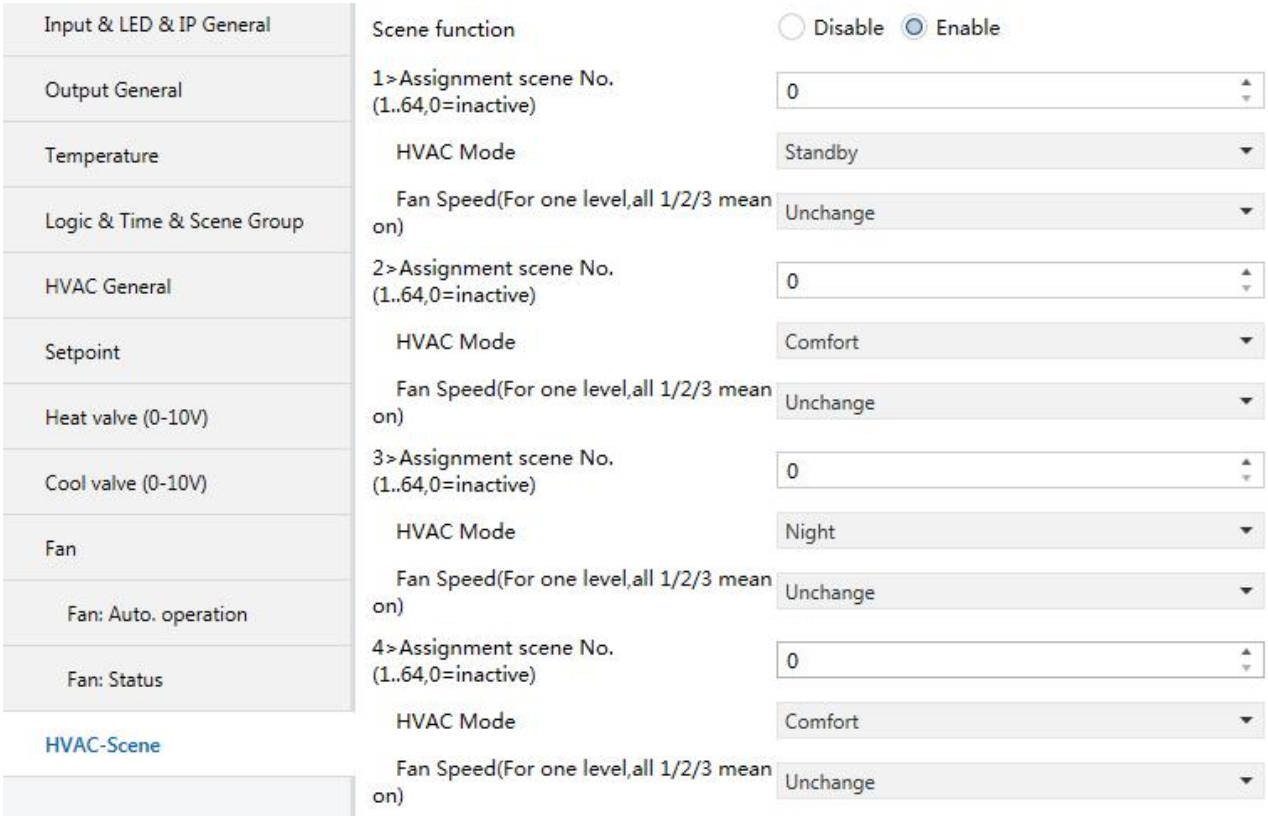


Figure 5.28 Parameter setting interface“Scene_Local”

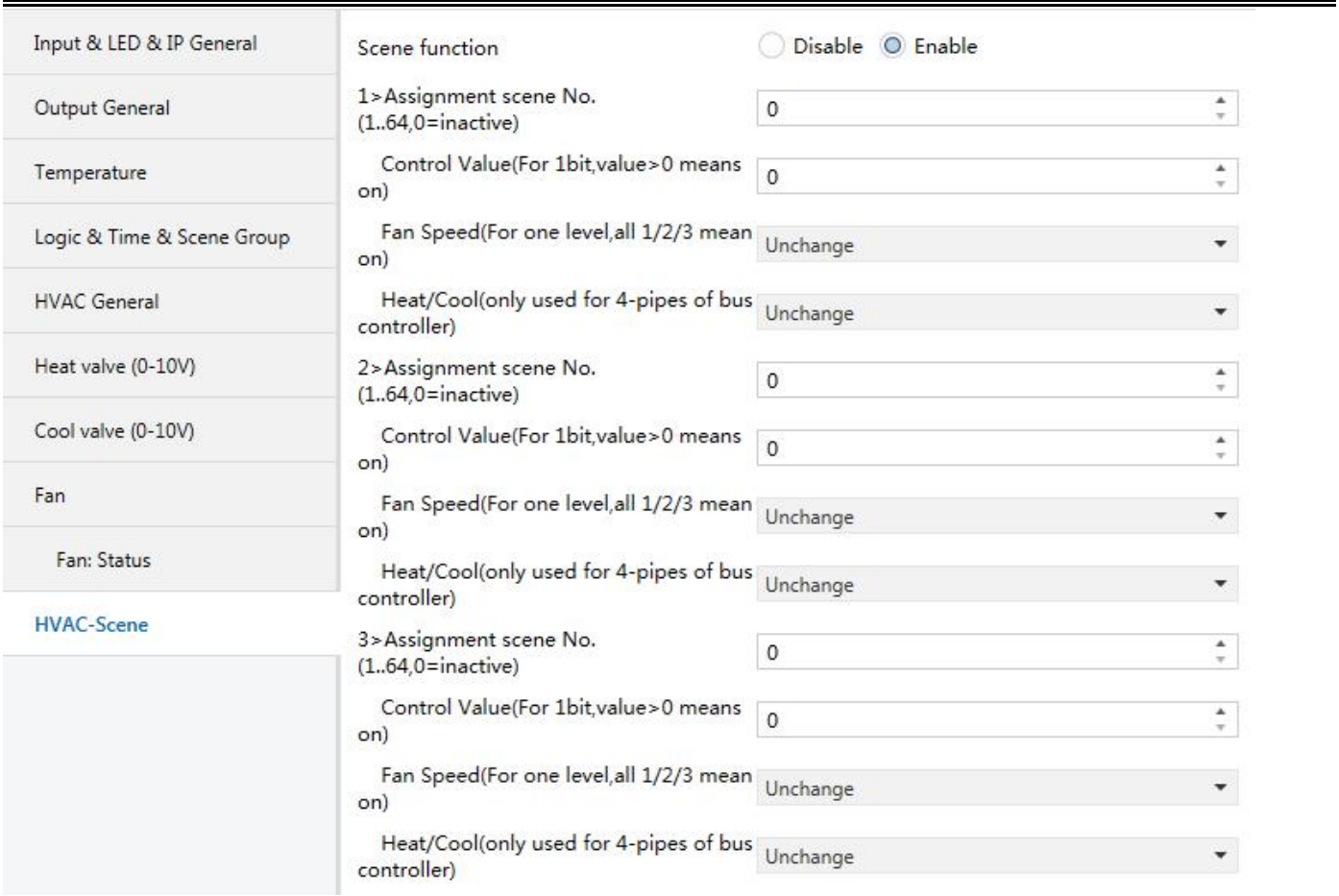


Figure 5.29 Parameter setting interface"Scene_Bus"

Parameter "Assignment scene NO. (1...64 , 0= no assignment)"

64 different scene numbers can be assigned. Optional: 1-64 is active, 0 is no assignment.

Note:

The effective scene number in the parameter setting option is 1~64, and the corresponding message is 0~63. The scene function can be saved.

Parameter "HVAC Mode"

This parameter is available when the coil control is controlled locally, setting the HVAC mode. Optional:

Standby mode

Comfort mode

Night mode

Frost/heat protection

Parameter"Control Value (For 1bit ,then value>0 means on)"

This parameter is available when the coil control is externally controlled and sets the control value. Available options: 0...255

If the valve control mode is two-point control, the valve is open when the set control value is greater than zero.

Parameter "Fan Speed (For one level, all 1/2/3 mean on)"

This parameter is available when the fan is enabled and is used to set the wind speed. Optional:

Unchange

Off

1

2

3

Parameter "Heat/Cool (only used for 4-pipes of bus controller)"

This parameter is available when the HVAC control mode is "Heating and Cooling" and the heating/cooling mode is set. Optional:

Unchange

Heat

Cool

5.12.4 Fan automatic control and coil

Automatic operation of the fan is only effective when HVAC control is enabled. The following table shows how the wind speed can be automatically operated under various control modes of the coil:

Controller	Valve control mode	Fan type	Control value type	Description
Local	**2-state**	**One-level**	**——**	The controller automatically switches the fan according to the temperature difference between the actual temperature and the set temperature. For the setting of the temperature difference threshold, see section 5.11.1.1;
		Multi-level	**——**	The controller automatically switches the fan according to the temperature difference between the actual temperature and the set temperature. For the setting of the temperature difference threshold, see section 5.11.2.1;
	Continuous control	**One-level**	**——**	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is obtained by PI operation inside the program and will not be sent to the bus. For the setting of the threshold, see section 5.11.1.1;
		Multi-level	**——**	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is obtained by PI operation inside the program and will not be sent to the bus. The threshold settings are detailed in Section 5.11.2.1;
Bus	**2-state /Continuous control**	**One-level**	**1bit**	Control value 0: Off the fan, control value 1: Open fan; control value is received from the bus by the object "Control value".
			1byte	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is received from the bus by the object "Control value". The threshold settings are detailed in Section 5.11.1.1;
		Multi-level	**1bit**	Control value 0: off the fan, control value 1: wind speed 3; control value is received from the bus by the object "Control value".
			1byte	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is received from the bus by the object "Control value". The threshold settings are detailed in Section 5.11.2.1;

5.13 Parameter setting interface“Logic&Time&Scene Group”

This chapter is mainly used to enable logic, time, and scene group functions. A total of 4 logic functions, 4 time functions, and 4 scene group functions.

The parameter interface is shown in Figure 5.30.

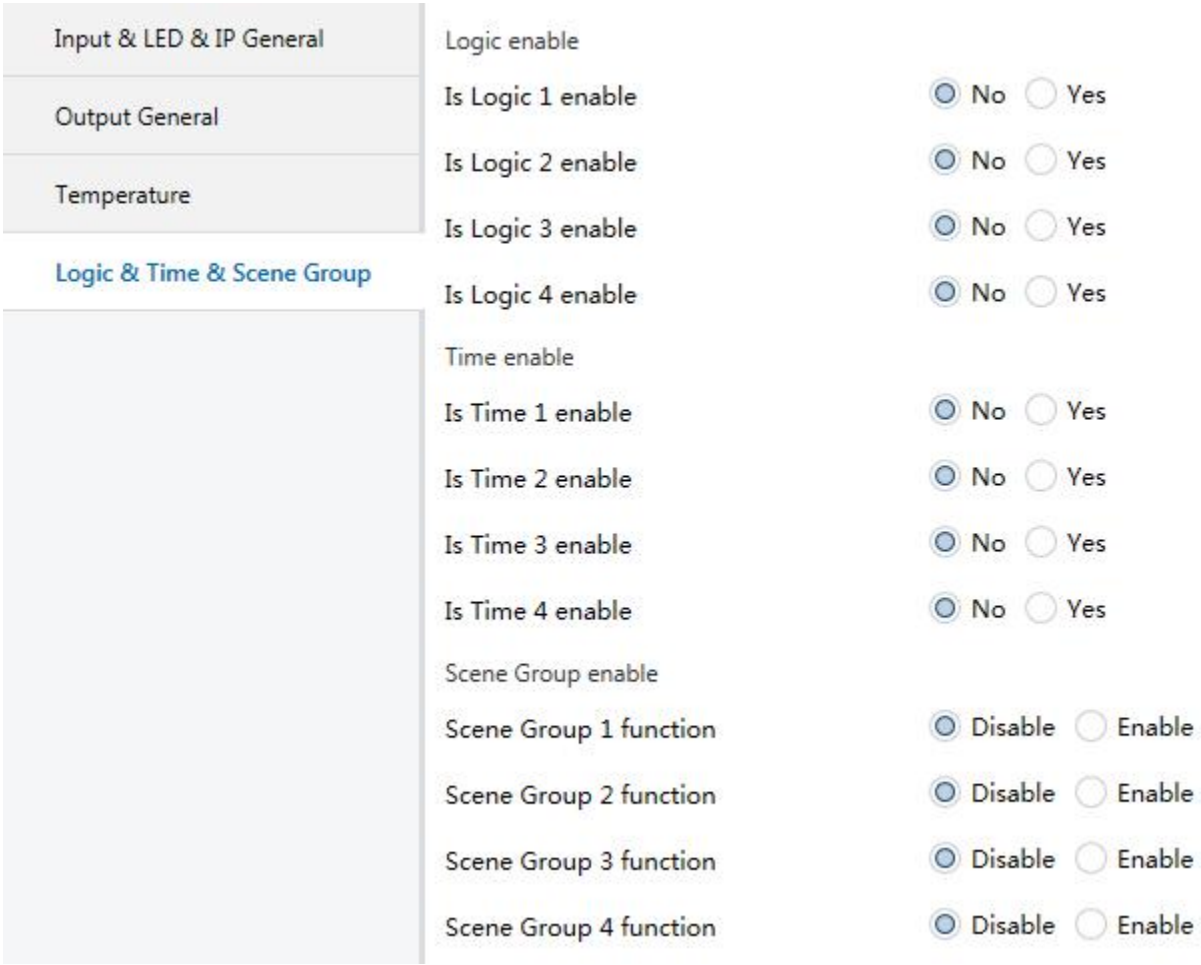


Figure 5.30 parameter setting interface“Logic&Time&Scene Group”

The following three chapters explain the logic, time, and scene group functions:

5.14 Parameter setting interface “Logic X”

The “Logic X” parameter setting interface is shown in Figures 5.31 and 5.32. Here, the function of logic X is set, and each logic function has a maximum of 8 inputs.

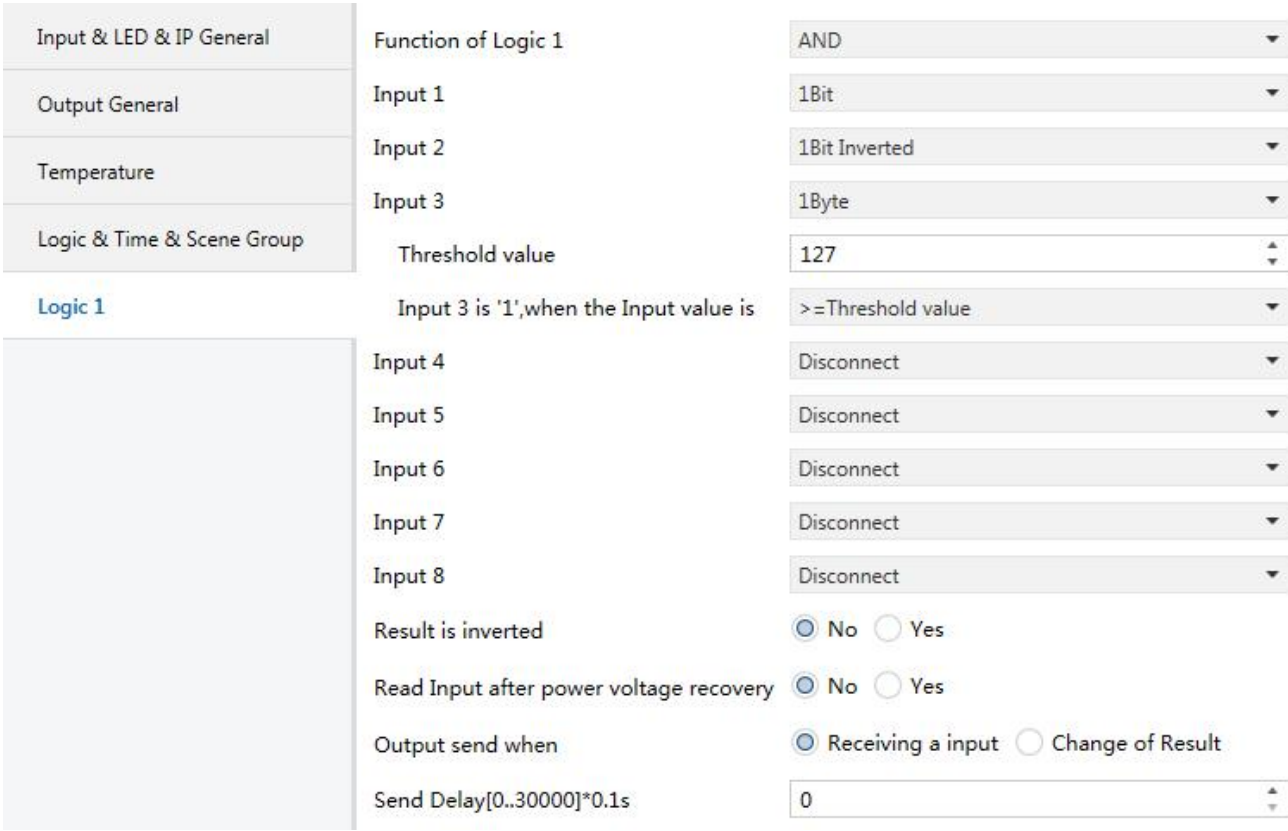


Figure 5.31 Parameter setting interface“Logic function -- AND/OR/XOR”

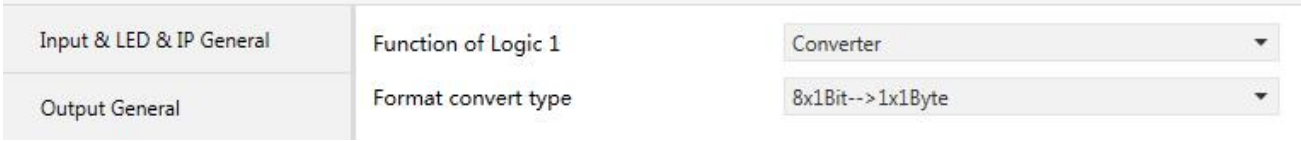


Figure 5.32 Parameter setting interface“Logic function -- Converter”

Parameter “Function of Logic X”

This parameter is used to set the function of logic X. Optional:

AND

OR

XOR

Converter

AND/OR/XOR：The parameters of these options are similar to the communication objects. Only the logic algorithms are different. The following takes the parameters of one of the options as an example.

5.14.1 “AND/OR/XOR” Function parameter

“AND/OR/XOR” The function parameter interface is shown in Figure 5.31.

Parameter “Input x (x=1~8)”

This parameter sets whether the logic input Input x participates in the operation, or whether it participates in the operation normally, or whether it participates in the operation, or participates in the operation according to the result of the comparison by the threshold comparator. Optional:

Disconnected

1Bit

1Bit Inverted

1Byte

Disconnected: Do not participate in the operation

1Bit： Input values directly participate in the operation；

1Bit Inverted： Invert the input value and then participate in the operation；

1Byte： The results are compared according to the results of the threshold comparator comparison. When this option is selected, the following two parameters are visible.

——Parameter “Threshold value....”

This parameter sets the threshold and has options: 0..255

——Parameter “Input x is ‘1’ , when the Input value is”

When the input value satisfies the option condition, the input value of the participating logical operation is '1', and when it is not satisfied, it is '0'. Optional:

>= Threshold value

>Threshold value

=Threshold value

<=Threshold value

<Threshold value

!=Threshold value

>= Threshold value: When the input object value is greater than or equal to the set threshold, the logic input value is 1, and when it is less than the set threshold, the logic input value is 0.

Other options are similar.

Parameter “Result is inverted”

This parameter sets whether to reverse the result of the logical operation. Optional:

No

Yes

No: Direct Output；

Yes：Invert, then output.

Parameter "Read input after power voltage recovery"

This parameter sets whether a read request is sent to the logic input object after a power-down reset or after programming. Optional:

No

Yes

Parameter "Output send when"

This parameter sets the condition for sending the result of the logical operation. Optional:

Receiving a input

Change of Result

Receiving a input：**Change of Result**：When the logic result changes, it is sent to the bus.

Note: When the logic operation is performed for the first time, the result of the logic operation will be sent although it does not change.

Parameter "Send Delay [0..30000]*0.1s"

This parameter is used to set the delay time for sending the logical operation result to the bus. Optional：0..30000

If the option is 0, there is no delay.

5.14.2 "Converter"Function parameter

"Converter"function parameter interface is shown in Figure 5.32.

Parameter "Format convert type"

This parameter sets the data conversion type. Optional:

2x1Bit -->1x2Bit

8x1Bit -->1Byte

1x1Byte -->1x2Byte

2x1Byte -->1x2Byte

2x2Byte -->1x4Byte

1x1Byte -->8x1Bit

1x2Byte -->2x1Byte

1x4Byte -->2x2Byte

1x3Byte-->3x1Byte

3x1Byte-->1x3Byte

5.15 Parameter setting interface“Time X”

“Time X” parameter setting interface is shown in Figure 5.33, which is used to set the function of time X.

When the time function receives a trigger value, it can trigger an output value, two output values or a flashing output, and the delay output can be set.

This function is used with the sensor and is convenient for the control of stairs and corridor lighting. The flashing output is suitable for aging tests of lamps etc.

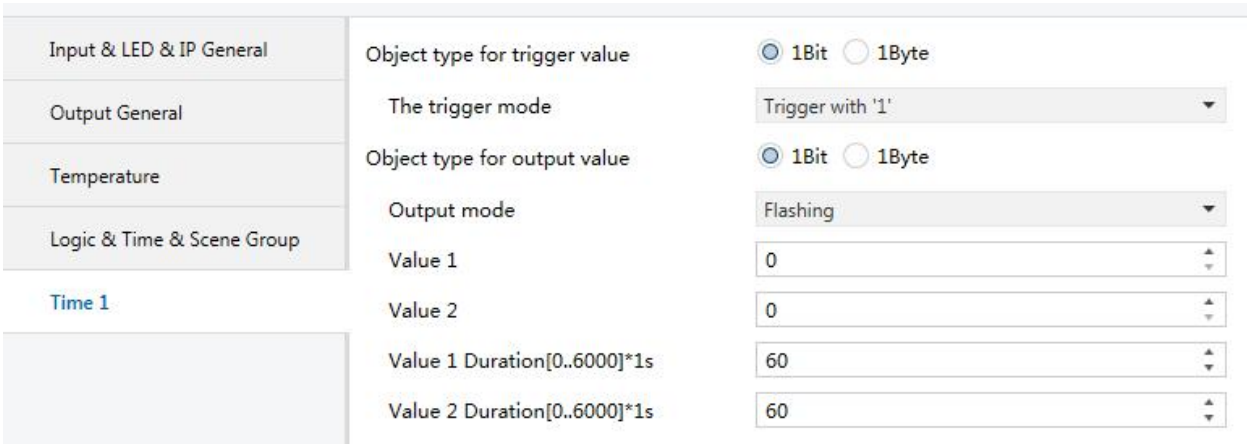


Figure 5.33 Parameter Setting Interface“Time X_1bit”

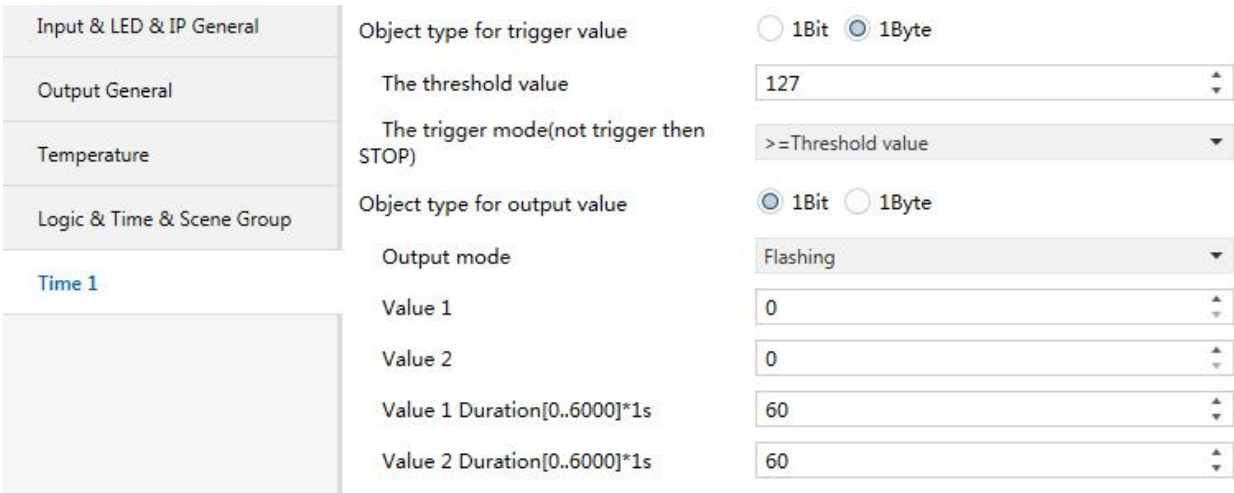


Figure 5.33 Parameter Setting Interface“Time X _1byte”

Parameter “Object type for trigger value”

This parameter sets the data type of the time function trigger value. Optional:

1Bit

1Byte

——Parameter “The trigger mode”

This parameter is visible when “1Bit” is selected in the previous parameter and is used to set the trigger mode of the time function. Optional:

Trigger with ‘1’

Trigger with ‘0’

Trigger with ‘0/1’

If the trigger condition is met, the action is triggered. If it is not satisfied, the triggered action is not triggered or stopped.

——Parameter “The threshold value”

This parameter is visible when the parameter "Object type for trigger value" is selected as "1Byte" and is used to set the threshold for time function triggering.

Optional: 0..255

——Parameter “The trigger mode (not trigger then STOP)”

This parameter is visible when "1Byte" is selected for the parameter "Object type for trigger value" and is used to set the trigger mode of the time function. Optional:

>= Threshold value

<=Threshold value

=Threshold value

!=Threshold value

All

>= Threshold value: When the trigger value is greater than or equal to the set threshold, the trigger time function is less than the threshold, and the trigger action is stopped.

Other options are similar. If the trigger condition is met, the action is triggered. If not, the triggered action is not triggered or stopped.

Parameter“Object type for output value”

This parameter sets the data type of the time function output value. Optional:

1Bit

1Byte

——Parameter “Output mode”

This parameter sets the output mode of the time function. Optional:

Send value 1 immediately, delay send value 2

Delay send value 1

Flashing

Send value 1 immediately, delay send value 2: When the trigger object receives the specified trigger value, it immediately sends the value 1 to the bus, and after a delay, sends the value 2 to the bus;

Delay send value 1：

When the trigger object receives the specified trigger value, after a delay, send the value 2 to the bus.

The values of delay time, value 1 and value 2 are set in the following parameters;

Flashing： Blinking, that is, alternating output value 1 and value 2, the duration of output value 1 and value 2 is set in the following parameters.

——Parameter “Value 1/2”

This parameter sets the data value to be sent 1/2. The range of values depends on the data type selected by the output parameters.

——Parameter “Delay time [0..6000]*1s”

This parameter sets the delay time. Optional: 0..6000s

——Parameter “Value 1/2 Duration [0..6000]*1s”

This parameter is visible under the "Flashing" option and is used to set the duration of the value 1 and value 2 outputs. Optional: 0..6000s

5.16 Parameter setting interface“Scene Group X”

The “Scene Group X” parameter setting interface is shown in Figure 5.34. It is used to set the scene group function. Each group provides 8 scene outputs. Each scene has 8 outputs, and the delay output time can be set for each output.

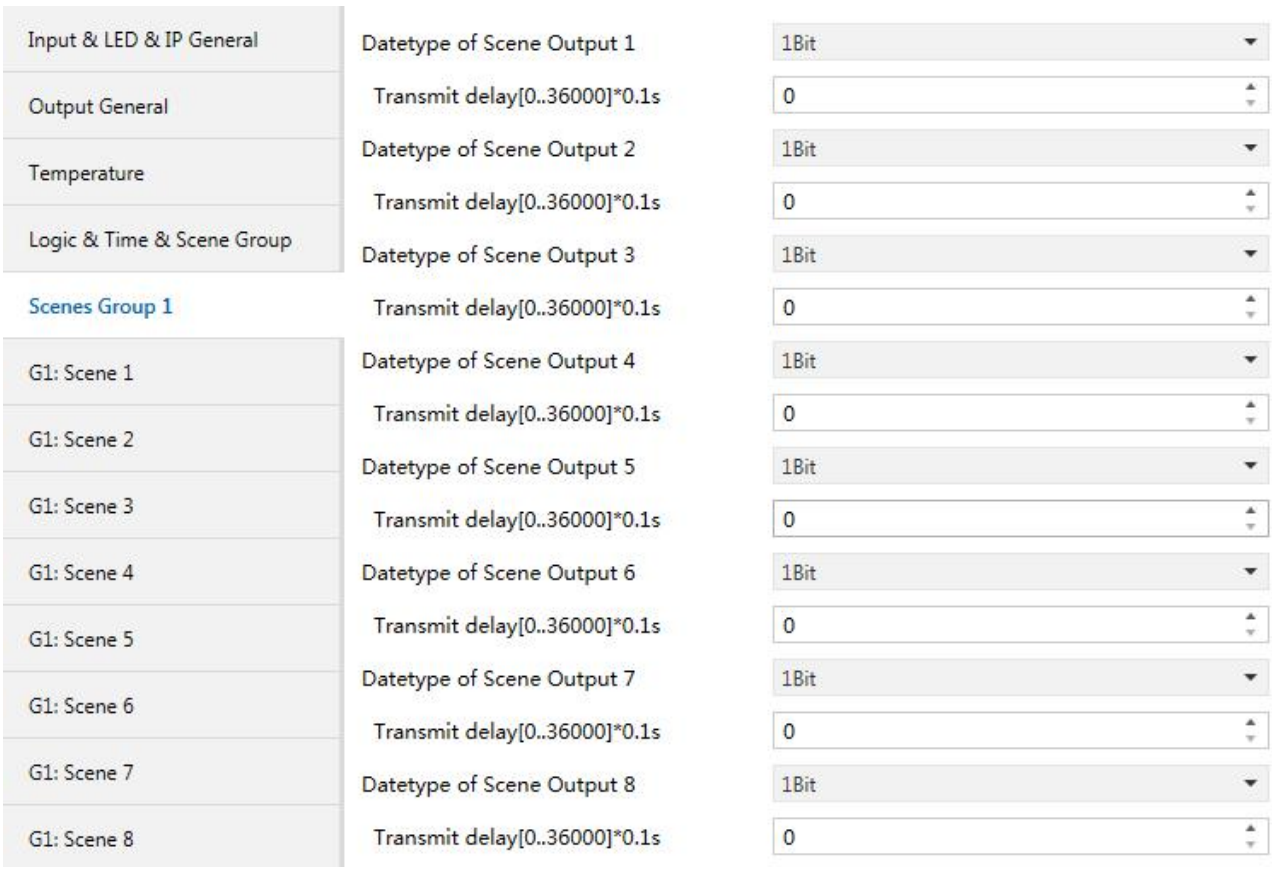


Figure 5.34 Parameter Setting Interface“Scene Group X”

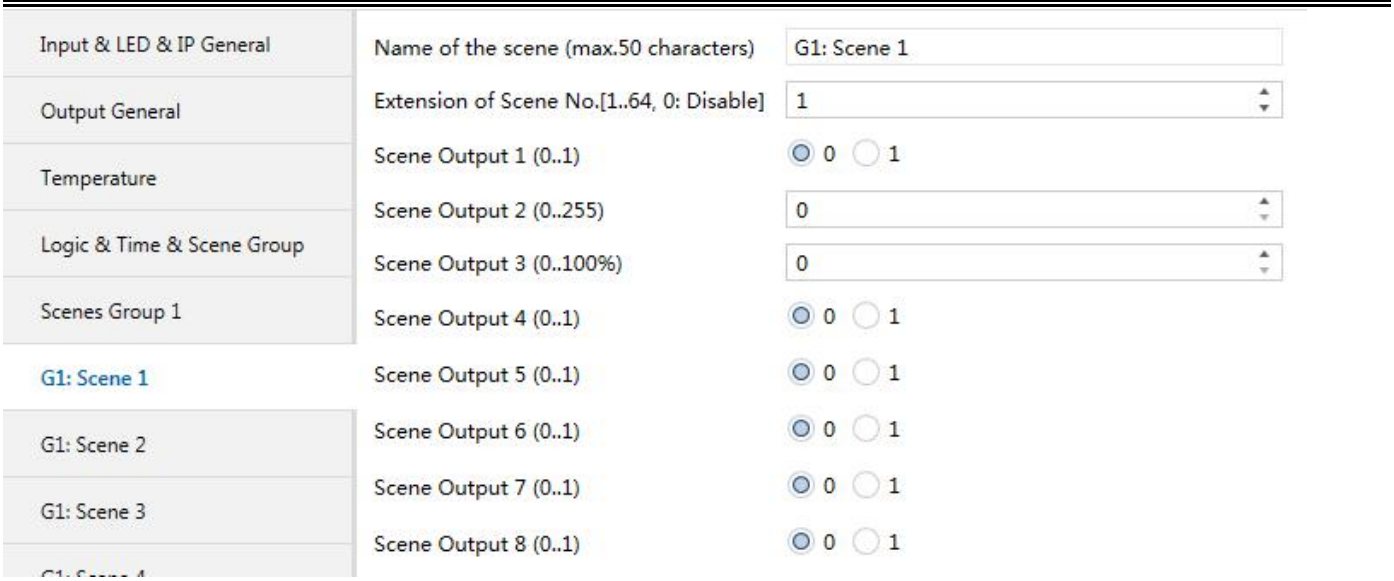


Figure 5.35 Parameter Setting Interface"GX(X=1..4): Scene x(x=1..8)"

The functions of the four groups are the same, and the output functions of the eight scenes in the group are also the same. The following is an example of the output of one of the scenes:

Parameter "Datetype of Scene Output x (x=1~8)"

This parameter defines the data type of the output x in the group. Optional:

1bit

1byte 0..255

1byte 0..100%

——Parameter "Transmit delay [0..36000]*0.1s"

This parameter sets the delay time for the output x send value to the bus. Optional: 0..36000.

The option is 0, no delay.

"GX: Scene x" Interface setting

Parameter "Name of the scene (max. 50 characters)"

This parameter sets the name of the scene and can be entered up to 50 characters.

Parameter"Extension of Scene No. [1..64, 0:Disable)"

This parameter defines the scene number. Optional: 0..64, 0=not active.

Parameter"Scene Output x (0..1/0..255/0..100%)"

This parameter sets the output value, and the range of values is determined by the data type of the output x. 1bit 0..1/1byte 0..255/ 1byte 0..100%

Chapter 6 Description of Communication Objects

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 role of each communication object is described in detail below.

Note:

The "C" in the property bar of the table below represents the communication function of the communication object.

"W" means that the value of the communication object can be rewritten by the bus, and "R" means that the value of the communication object can be read through the bus.

"T" means that the communication object has a transmission function, and "U" means that the value of the communication object can be updated.

6.1 "General &Temp."communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
271	Temperature	Actual temperature output			2 bytes	C	R	-	T	-	temperature (°C)	Low
272	Temperature	Local sensor error output			1 bit	C	R	-	T	-	alarm	Low
274	Temperature	Temp.correction(-128..127)*0.1			1 byte	C	-	W	-	-	counter pulses (-128..127)	Low
275	General	In operation			1 bit	C	R	-	T	-	switch	Low
273	Temperature	External sensor			2 bytes	C	-	W	T	U	temperature (°C)	Low

Figure 6.1 "General & Temp"communication object

No.	Name	Object function	Type	Attribute	DPT
271	**Temperature**	**Actual temperature output**	**2Byte**	**C,R,T**	**9.001 temperature**
This communication object is used to send the local actual temperature to the bus and is obtained from the local PT1000 sensor interface.					
272	**Temperature**	**Local sensor error output**	**1bit**	**C,R,T**	**1.005 DPT_alarm**
Local sensor error report. When an error occurs in the temperature sensor of this device (such as PT1000), this object will send a message to the bus to report an error.					
273	**Temperature**	**External sensor**	**2byte**	**C,W,T,U**	**9.001 DPT_Value_Temp**
When an external sensor is enabled to measure temperature, the device receives temperature measurements from the external sensor through this object.					
274	**Temperature**	**Temp.correction(-128..127)*0.1℃**	**1Byte**	**C,W**	**6.010 counter pulses**
The communication object is used to correct the temperature measurement of the local temperature sensor (PT1000) via the bus.					
275	**General**	**In operation**	**1bit**	**C,T**	**1.001 switch**
This communication object is used to periodically send a message "1" to the bus to indicate that the device is functioning properly.					

Form 1 "General & Temp"Communication Object form

6.2 “BI/UI input”Communication Object

6.2.1 “Switch Sensor” Communication Object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
1	UI input 1	Switch			1 bit	C	-	W	T	-	switch	Low
2	UI input 1	Switch-long			1 bit	C	-	W	T	-	switch	Low
3	UI input 1	Enable communication			1 bit	C	-	W	-	-	enable	Low

Figure 6.2 “Switch Sensor”Communication Object

No.	Name	Object function	Type	Attribute	DPT
1	UI/BI input x	Switch	1bit	C,W,T	1.001 DPT_Switch
The communication object is visible when the channel function "Switch Sensor" is enabled. The input value of the communication object drives the switch, and the corresponding action is performed according to the parameter setting, such as ON, OFF, TOGGLE, and the like. When the message is "1", the switch is turned on; when the message is "0", the switch is turned off.					
2	UI/BI input x	Switch_long	1bit	C,W,T	1.001 DPT_Switch
The communication object is visible when the parameter "Distinction between long and short operation" is "yes". When the input reaches a certain time, the communication object outputs a control value according to the parameter setting, and performs corresponding actions, such as ON and OFF. , TOGGLE. When the output message is "1", the switch is turned on; when the output message is "0", the switch is turned off.					
3	UI/BI input x	Enable communication	1bit	C,W	1.003 DPT_Enable
This communication object is used to disable/enable channel functions. All operations are disabled when the channel function is not enabled. When the system resumes power, the channel function is enabled by default. (Disable communication, the communication object of all the functions of the channel, the operation is the same, and will not be repeated below)					

Form 2 “Switch Sensor”Communication Object Form

6.2.2 “Switch /Dimming”Communication Object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
1	UI input 1	Switch			1 bit	C	-	W	T	-	switch	Low
2	UI input 1	Dimming			4 bit	C	-	W	T	-	dimming control	Low
3	UI input 1	Enable communication			1 bit	C	-	W	-	-	enable	Low

Figure 6.3 “Switch/Dimming”Communication Object

No.	Name	Object function	Type	Attribute	DPT
1	UI/BI input x	Switch	1bit	C,W,T	1.001 DPT_Switch
If the parameter "Dimming functionality" is "Dimming and switching", the communication object is visible, and the switch is driven by the contact input value, and the corresponding action is performed according to the parameter setting, such as ON, OFF, TOGGLE, and the like. When the message is "1", the switch is turned on; when the message is "0", the switch is turned off. (contact input is short operation)					
2	UI/BI input x	Dimming	4bit	C,W,T	3.007 DPT_Control Dimming
The communication object sends a brightness adjustment or dimming command through the contact input, and can control the dimming device on the bus to perform relative dimming. When the input is disconnected, an end command is sent to stop dimming. (When the option is "Dimming and switching", the contact input is long operation, and when the option is "only dimming", the contact input does not distinguish between long/short operation)					

Form 3“Switch/Dimming”Communication Object form

6.2.3 "Value/force output"Communication Object

This function has more data types and more communication objects. Figure 6.4 is not an example. Communication objects of different data types implement the same operation, and are the object values for sending input, but the range of object values sent is different. Long/short operations can be distinguished or not.

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
1	UI input 1	1byte unsigned-short/close			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
2	UI input 1	1byte unsigned-long/open			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
3	UI input 1	Enable communication			1 bit	C	-	W	-	-	enable	Low

Figure 6.4 "Value/Forced output"Communication Object

No.	Name	Object function	Type	Attribute	DPT
1	UI/BI input x	1bit-short/close	1bit [0/1]	C,T	1.001 Switch
		2bit- short/close	2bit [0…3]		2.002 Bool_Control
		4bit- short/close	4bit [0…15]		3.007 Control_Dimming
		1byte signed- short/close	1byte [-128…127]		6.010 Value_1_Count
		1byte unsigned- short/close	1byte [0…255]		5.010 Value_1_UCount
		1byte recall scene-short/close	1byte [recall scene]		17.001 SceneControl
		1byte store scene- short/close	1byte [store scene]		18.001 SceneControl
		2byte signed- short/close	2byte [-32768…32767]		8.001 Value_2_Count
		2byte unsigned- short/close	2byte [0…65535]		7.001 Value_2_UCount
		2byte float-short/close	2byte[float]		9.001 Value_Temp
		3byte time- short/close	3byte[time of day]		10.001 TimeOfDay
		4byte signed- short/close	4byte [-2147483648… 2147483647]		13.001 Value_4_Count
		4byte unsigned- short/close	4byte [0…4294967295]		12.001 Value_4_UCount
The communication object is used to send the contact input value. If the long/short operation is distinguished, the contact input value in the short operation is sent; if the long/short operation is not distinguished, the contact input value when the contact is closed is sent. The range of values that can be sent by the communication object is determined by the data type, which is set by the parameter "Reaction on short operation/closing the contact".					
2	UI/BI input x	1bit-long/open	1bit [0/1]	C,T	1.001 Switch
		2bit- long/open	2bit [0…3]		2.002 Bool_Control
		4bit- long/open	4bit [0…15]		3.007 Control_Dimming
		1byte signed- long/open	1byte [-128…127]		6.010 Value_1_Count
		1byte unsigned- long/open	1byte [0…255]		5.010 Value_1_UCount
		1byte recall scene- long/open	1byte [recall scene]		17.001 SceneControl
		1byte store scene- long/open	1byte [store scene]		18.001 SceneControl
		2byte signed- long/open	2byte [-32768…32767]		8.001 Value_2_Count
		2byte unsigned- long/open	2byte [0…65535]		7.001 Value_2_UCount
		2byte float- long/open	2byte[float]		9.001 Value_Temp
		3byte time- long/open	3byte[time of day]		10.001 TimeOfDay
		4byte signed- long/open	4byte [-2147483648… 2147483647]		13.001 Value_4_Count
		4byte unsigned- long/open	4byte [0…4294967295]		12.001 Value_4_UCount
The communication object is used to transmit the contact input value. If the long/short operation is distinguished, the contact input value during the long operation is sent; if the long/short operation is not distinguished, the contact input value					

when the contact is opened is sent. The range of values that can be sent by the communication object is determined by the data type, which is set by the parameter "Reaction on long operation/opening the contact".

Form 4 "Value/Forced output"Communication Object Form

6.2.4 "Shutter control"Communication Object

The communication object for shutter control is shown in Figure 6.5..

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
1	UI input 1	Shutter UP/DOWN			1 bit	C	-	-	T	-	up/down	Low
2	UI input 1	Stop/lamella adj			1 bit	C	-	-	T	-	step	Low
3	UI input 1	Enable communication			1 bit	C	-	W	-	-	enable	Low

Figure 6.5 "Shutter Control"Communication Object

No.	Name	Object function	Data Type	Attribute	DPT
1	UI/BI input x	shutter UP/DOWN	1Bit	C,T	1.008 DPT_UpDown
The communication object sends a command to move the curtain up/down through the bus. When the communication object sends a "1" message, it moves downwards; when a "0" message is sent, it moves up.					
2	UI/BI input x	Stop/lamella adj.	1Bit	C,T	1.007 DPT_Step
The communication object sends a command to stop/adjust the curtain through the bus. When the communication object sends a "1" message, it stops/down. When the "0" message is sent, it stops/upgrades.					

Form 5"Shutter Control"Communication Object form

6.3 LED Communication Object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
22	LED 1	Status			1 bit	C	-	W	-	-	switch	Low
23	LED 2	Status			1 bit	C	-	W	-	-	switch	Low
24	LED 3	Status			1 bit	C	-	W	-	-	switch	Low
25	LED 4	Status			1 bit	C	-	W	-	-	switch	Low
26	LED 5	Status			1 bit	C	-	W	-	-	switch	Low

Figure 6.6 LED communication object

No.	Name	Object function	Type	Attribute	DPT
22	LED X	Status	1bit/1byte	C,W	1.001 DPT_Switch 5.001 DPT_percentage 0..100% 5.010 DPT_counter pulses 0..255
This communication object is used to receive 1bit/1byte type messages, and the LEDs indicate the status according to the received message values and parameter settings.					

Table 6 Communication Object Table of LED

6.4 Communication Object of Switch Outputs

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
27	Output 1	Switch			1 bit	C	-	W	-	-	switch	Low
28	Output 1	Switch status			1 bit	C	R	-	T	-	switch	Low
29	Output 1	Scene			1 byte	C	-	W	-	-	scene control	Low

Fig.6.7 Communication Object of Switch Actuator

No.	Name	Object Functions	Type	Flags	DPT
27	Output X	Switch	1bit	C,W	1.001 DPT_Switch
This object is used to trigger the switch operation. It will start the switch operation with "1", and end with "0". Or the opposite operation will be decided by parameter setup.					

28	Output X	Switch status	1bit	C,R,T	1.001 DPT_Switch
This object value can directly point out the status of relay contact. Status value corresponds to trigger value. If selecting “After read only”, the status telegram will not be sent out until receiving a read request telegrams from the bus via the object. If selecting “After change and after read”, it will send the status immediately to the bus via the object when there are any changes or receiving a read request on the output.					
29	**Output X**	**Scene**	**1byte**	**C,W**	**18.001 DPT_SceneControl**
It is able to call or save the scene when sending an 8-bit command by this object, which will be enabled when enabling the scene function. The definition of the 8-bit command will be described below: Assuming an 8-bit command (binary coding) as: FXNNNNNN F: call the scene with “0”; save the scene with “1”; X: 0 NNNNNN: scene number (0-63). Telegram value shown as follow: 1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene”. For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Scene”.					

Object value	Description
0	Call scene 1
1	Call scene 2
2	Call scene 3
…	…
63	Call scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
…	…
191	Store scene 64

Table 7 Communication objects table “Switch output”

6.5 Communication objects of Shutter outputs

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
102	Curtain 1	Move UP/DOWN			1 bit	C	-	W	-	-	up/down	Low
103	Curtain 1	Louvre adj./Stop			1 bit	C	-	W	-	-	step	Low
104	Curtain 1	Move to Position 0..100%			1 byte	C	-	W	-	-	percentage (0..100%)	Low
105	Curtain 1	Louvre Position 0..100%			1 byte	C	-	W	-	-	percentage (0..100%)	Low
106	Curtain 1	Position Status 0..100%			1 byte	C	R	-	T	-	percentage (0..100%)	Low
107	Curtain 1	Louvre Status 0..100%			1 byte	C	R	-	T	-	percentage (0..100%)	Low
108	Curtain 1	Force Operation			2 bit	C	-	W	-	-	switch control	Low
109	Curtain 1	Reference movement			1 bit	C	-	W	-	-	up/down	Low
110	Curtain 1	Scene			1 byte	C	-	W	-	-	scene control	Low

Fig. 6.8 Communication objects of shutter actuator

No.	Name	Object Function	Data Type	Flags	DPT
102	**Curtain X**	**Move UP/DOWN**	**1Bit**	**C,W**	**1.008 DPT_UpDown**
If this communication object receives a telegram with the value “0”, the Shutter/Blind is raised. If the object receives a telegram with the value “1”, the Shutter/Blind is lowered. Telegram value 0 —— Shutter/Blind moves UP 1 —— Shutter/Blind moves down					

103	Curtain X	Louvre adj. / Stop	1Bit	C,W	1.007 DPT_Step

If the Shutter/Blind is in motion, the movement stops on this communication object when receiving a telegram value “0” or “1”.

“Shutter” operating mode: if the Blind is idle, it is raised for the louvres adjustment on the communication object receiving a telegram value “0”; it is lowered for the louvres adjustment on the communication object receiving a telegram value “1”.

“Blind” operating mode: if the Shutter is idle, no action is carried out on the communication object receiving any telegram value.

Telegram value 0 ——Stop/louvre adj. UP

1 —— Stop/louvre adj. DOWN

104	Curtain X	Mover to Position 0…100%	1byte	C,W	5.001 DPT_Scaling

If this communication object receives a telegram value, the Shutter/Blind moves to the corresponding position for the received value. In the “Shutter” operation mode, after the Shutter reaching the target position, the louvres are positioned as before. Only the object “Louvre position [0…100%]” receives a telegram value, the louvres will be positioned accordingly.

Telegram value 0% —— top

…… —— intermediate position

100% —— bottom

105	Curtain X	Louvre Position 0…100%	1byte	C,W	5.001 DPT_Scaling

Only in the “Shutter” operation mode, the communication is visible. If the object receives a telegram value, the louvres are positioned according to the received value.

Telegram value 0% —— louvres fully open

…… —— intermediate position

100% —— louvres completely close

106	Curtain X	Position Status 0..100%	1byte	C, R,T	5.001 DPT_Scaling

This object is used to send or inquire the current position of shutter.

Telegram value 0% —— louvres fully open

…… —— intermediate position

100% —— louvres completely close

107	Curtain X	Louvre Status 0..100%	1byte	C, R,T	5.001 DPT_Scaling

Only in the “Shutter” operation mode, the communication object is visible, which is used to send or inquire the current position of shutter.

Telegram value 0% —— louvres fully open

…… —— intermediate position

100% —— louvres completely close

108	Curtain X	Force Operation	2bit	C,W	2.001 DPT_switch control

The shutter/blind executes forced operation via the object receiving a telegram “2” or “3”. When the object receives a telegram “0” or “1”, the forced operation is cancelled, and other operations enables.

Telegram value:

“0” (“00”) ——call forced operation, enable other operations

“1” (“01”) ——call forced operation, enable other operations

“2” (“10”) ——execute forced operation, Shutter/Blind moves to top, disable other operations

“3” (“11”) ——execute forced operation, Shutter/Blind moves to bottom, disable other operations

109	Curtain X	Reference movement	1Bit	C,W	1.008 DPT_UpDown

The object is used for thr Shutter/Blind to execute a reference movement that makes sure its location exactly.

Telegram value

0——first the Shutter/Blind is fully raised, then moves to the target position

1—— first the Shutter/Blind is fully lowered, then moves to the target position

The detail process is described in relevant parameter chapter.

207	Curtain X	Scene	1byte	C,W	18.001 DPT_SceneControl

It is able to call or store the scene when sending an 8-bit command by this object. The definition of the 8-bit command will be described below:

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

F: call scene with “0”; store scene with “1”;

X: 0

NNNNNN: scene number (0-63).

Telegram value shown as follow:

Object value	Description
0	Call scene 1
1	Call scene 2
2	Call scene 3
…	…
63	Call scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
…	…
191	Store scene 64

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

Table 8 Communication objects table of Shutter actuator

6.6 Communication object of Dimmer outputs

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
120	DIM (TRIAC) Output 26	Switch			1 bit	C	-	W	-	-	switch	Low
121	DIM (TRIAC) Output 26	Switch status			1 bit	C	R	-	T	-	switch	Low
122	DIM (TRIAC) Output 26	Relative dimming			4 bit	C	-	W	-	-	dimming control	Low
123	DIM (TRIAC) Output 26	Brightness			1 byte	C	-	W	-	-	percentage (0..100%)	Low
124	DIM (TRIAC) Output 26	Brightness status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
125	DIM (TRIAC) Output 26	Scene			1 byte	C	-	W	-	-	scene control	Low

Fig. 6.9 Communication objects of dimmer actuator

No.	Name	Object Function	Type	Flags	DPT
120	DIM Output X	Switch	1bit	C,W	1.001 DPT_Switch

This object is only used to switch on/off dimmer output. It will receive switch on/off command via the object. It will switch on the dimmer actuator with “1”, off with “0”.

121	DIM Output X	Switch status	1bit	C,R,T	1.001 DPT_Switch

This object is used to report the status of the current switch to the bus. The object will send “1” to the bus when the value of the brightness is larger than 0, which means the switch is on; “0” to the bus if value of brightness is “0”, which means the switch is off.

122	DIM Output X	Relative dimming	4bit	C,W	3.007 DPT_Control Dimming

This object is used to dim up or down the outputs. It will dim down when the telegram value is from 1 to 7. During this range, smaller amplitude of dimming down with larger value; that means it will dim down to the biggest amplitude with 1, while to the smallest amplitude with 7, and 0 means stop dimming. It will dim up when the telegram value is from 9-15. During this range, smaller amplitude of dimming up with larger value; that means it will dim up to the biggest amplitude with 9, while to the smallest amplitude with 15, and 8 means stop dimming. Defined as follow:

Object value	0	1	2	3	4	5	6	7
Dim down	Unchanged/ stop dimming	255	128	64	32	16	8	4
Object value	8	9	10	11	12	13	14	15
Dim up	Unchanged/ stop dimming	255	128	64	32	16	8	4

123	DIM Output X	Brightness	1byte	C,W	5.001 DPT_Scaling

It is used to receive a brightness value to switch on/off the dimmer actuator, switching on the actuator when the received value is larger than 0, and off with the received value with “0”.

124	DIM Output X	Brightness status	1byte	C,R,T	5.001 DPT_Scaling

This object is used to send the brightness status of the current output to the bus. Whatever causes the changes of the value, data will be sent to the bus via the object to report the current brightness value.

125	DIM Output X	Scene	1byte	C,W	18.001 DPT_SceneControl

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

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

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

X: unused, without effect to the result;

NNNNNN: scene number (0-63).

1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene/save”.Such as, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Scene/save”. As follow:

Object value	Description
0	Call scene 1
1	Call scene 2
2	Call scene 3
…	…
63	Call scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
…	…
191	Store scene 64

6.7 Communication object of Fan coil control

Local control：

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
250	HVAC	Switch Heat/Cool mode			1 bit	C	-	W	-	-	cooling/heating	Low
251	HVAC mode	Comfort mode			1 bit	C	-	W	-	-	enable	Low
252	HVAC mode	Night mode			1 bit	C	-	W	-	-	enable	Low
253	HVAC mode	Frost/heat protection mode			1 bit	C	-	W	-	-	enable	Low
254	HVAC mode	Standby mode			1 bit	C	-	W	-	-	enable	Low
262	HVAC Status	Comfort mode			1 bit	C	R	-	T	-	enable	Low
263	HVAC Status	Night mode			1 bit	C	R	-	T	-	enable	Low
264	HVAC Status	Frost/heat protection mode			1 bit	C	R	-	T	-	enable	Low
265	HVAC Status	Standby mode			1 bit	C	R	-	T	-	enable	Low
266	HVAC Status	Heating/Cooling mode			1 bit	C	R	-	T	-	cooling/heating	Low
267	HVAC Status	Status of operation			1 byte	C	R	-	T	-		Low
268	Input setpoint	Base setpoint			2 bytes	C	-	W	-	-	temperature (°C)	Low
269	Input setpoint	Setpoint adjustment			2 bytes	C	-	W	-	-	temperature (°C)	Low
270	Output setpoint	Instantaneous setpoint			2 bytes	C	R	-	T	-	temperature (°C)	Low
250	HVAC	Heat mode enable			1 bit	C	-	W	-	-	enable	Low
251	HVAC mode	HVAC mode			1 byte	C	-	W	-	-	HVAC mode	Low
258	HVAC	Cool mode enable			1 bit	C	-	W	-	-	enable	Low
262	HVAC Status	HVAC mode			1 byte	C	R	-	T	-	HVAC mode	Low
247	HVAC	Scene			1 byte	C	-	W	-	-	scene number	Low

Bus control：

247	HVAC	Scene			1 byte	C	-	W	-	-	scene control	Low
250	HVAC	Switch Heat/Cool mode			1 bit	C	-	W	-	-	cooling/heating	Low
254	HVAC	Heat/Cool Control value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
262	HVAC	Fault Control Value			1 bit	C	R	-	T	-	alarm	Low
266	HVAC Status	Heating/Cooling mode			1 bit	C	R	-	T	-	cooling/heating	Low
267	HVAC Status	Status of operation			1 byte	C	R	-	T	-		Low
254	HVAC	Heat Control value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
258	HVAC	Cool Control value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
262	HVAC	Fault Control Value			1 bit	C	R	-	T	-	alarm	Low
266	HVAC Status	Heating/Cooling mode			1 bit	C	R	-	T	-	cooling/heating	Low

Fig. 6.10 Communication object of fan control

No.	Name	Object Function	Data Type	Flags	DPT
247	**HVAC**	**Scene**	**1byte**	**C,W**	**18.001 DPT_SceneControl**
The object is visible when HVAC scene enables, which is used to call or save scene. 1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene”. For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Scene”.					
250	**HVAC**	**Switch Heat/Cool mode**	**1bit**	**C,W**	**1.100 DPT_cooling/heating**
The object is visible when heating/cooling switch via one object. It’s used to receive telegram of switching heating and cooling, cooling with “0”, and heating with “1”.					
250	**HVAC**	**Heat mode enable**	**1bit**	**C,W**	**1.003 DPT_Enable**
258	**HVAC**	**Cool mode enable**	**1bit**	**C,W**	**1.003 DPT_Enable**
The two objects are visible when heating/cooling switch via two objects. Enables corresponding control mode, when object receives a telegram of “1”, and invalid of “0”.					
251	**HVAC mode**	**Comfort mode** **HVAC mode**	**1bit** **1byte**	**C,W**	**1.003 DPT_Enable** **20.102 DPT_HVACMode**
252	**HVAC mode**	**Night mode**	**1bit**	**C,W**	**1.003 DPT_Enable**

253	**HVAC mode**	**Frost/heat protection mode**	**1bit**	**C,W**	**1.003 DPT_Enable**
254	**HVAC mode**	**Standby mode**	**1bit**	**C,W**	**1.003 DPT_Enable**

Room operation mode can be switched via 4 objects of 1bit(object 251,252,253,254) and 1 object of 1 byte(HVAC mode).

1 bit: object 251: room comfort mode. Object 252: room night mode. Object 253: room protection mode. Object 254: room standby mode. Meanwhile, when writing “1” in corresponding object, means enabling corresponding operation mode; “0” means canceling corresponding operation mode.

Notes: the priority of the 4 objects if 1bit should be: (Frost/heat protection mode)> (Comfort mode)= (Night mode)= (Standby mode). When the object value of 251, 252, 253 are all zero, room operation mode is considered as standby mode by default.

When it’s 1byte: the relationship between input value and operation mode is as folows: no:0: unused.

1: comfort mode

2: standby mode

3: room mode

4: protection mode

5-255: unused

262	**HVAC Status**	**Comfort mode** **HVAC mode**	**1bit** **1byte**	**C,R,T**	**1.003 DPT_Enable** **20.102 DPT_HVACMode**
263	**HVAC Status**	**Night mode**	**1bit**	**C,R,T**	**1.003 DPT_Enable**
264	**HVAC Status**	**Frost/heat protection mode**	**1bit**	**C,R,T**	**1.003 DPT_Enable**
265	**HVAC Status**	**Standby mode**	**1bit**	**C,R,T**	**1.003 DPT_Enable**

This object is used to feedback the HVAC mode of current controller. It will be sent to the bus when changing, definition of object value refers to object 251,252,253,254.

266	**HVAC Status**	**Heating/Cooling mode**	**1bit**	**C,R,T**	**1.100 DPT_cooling/heating**

This object is used to feedback heating/cooling status of current controller, being sent to the bus when changing, “0” means cooling, “1” means heating.

267	**HVAC Status**	**Status of operation**	**1byte**	**C,R,T**	

This object is used to report operation status of HVAC, definition as below:

DPT_StatusHVAC: B6N2							
7	6	5	4	3	2	1	0
Not used	0:Limit 3disable 1:Limit 3 enable	0:Limit 3 disable 1:Limit 3 enable	0:Limit 2 disable 1:Limit 2 enable	0:Limit 1 disable 1:Limit 1 enable	0:heating 1:cooling	00: comfort mode 01: standby mode 10: night mode 11: protection mode	

268	**Input setpoint**	**Base setpoint**	**2bytes**	**C,W**	**9.001 DPT_Value_Temp**

Benchmark sets temperature. The object is used as benchmark value for temperature setting value of each operation mode. The value is used to judge current status as cooling or heating by combining dead zone temperature under the circumstance with both heating and cooling.

269	**Input setpoint**	**Setpoint adjustment**	**2bytes**	**C,W**	**9.001 DPT_Value_Temp**

Benchmark sets correction of temperature. Benchmark setup temperature can be modified via written value to the object.(Relative adjustment, modifying on the original setup temperature.)

270	**Output setpoint**	**Instantaneous setpoint**	**2bytes**	**C,R,T**	**9.001 DPT_Value_Temp**
Temperature setup value of actual output, which is used to send temperature setup value of current operation mode to the bus.					
254	**HVAC**	**Heat / Cool Control value** **Heat Control value**	**1bit/** **1byte**	**C,W**	**1.001 DPT_switch** **5.001 DPT_Percentage**
258	**HVAC**	**Cool Control value**	**1bit/** **1byte**	**C,W**	**1.001 DPT_switch** **5.001 DPT_Percentage**
The object is used to receive valve control value from other controllers. If heating valve and cooling valve share one object(254) to receive valve control value, decided by parameter setup, so heating and cooling will switch via object 250(Switch Heat/ Cool mode). Control value can be 1bit or 1byte, which is decided by parameter setup.					
262	**HVAC**	**Control value fault**	**1bit**	**C,R,T**	**1.005 DPT_alarm**
When controller is bus control, and control value monitors enabling, the object will be visible. When the present device can not punctually receive the control valve sent by outer controller, this object will report error of the control value. Once control value is received, error status will be relieved. Telegram “0”——no mistake “1”——mistake occur					

Table 10 Communication object of fan control

6.8 Communication object of Fan control

When the fan type is level 1, the communication object is as follows:

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
231	1Level-Fan	Fan speed			1 bit	C	-	W	-	-	switch	Low
235	1Level-Fan	Status Fan ON/OFF			1 bit	C	R	-	T	-	switch	Low
240	1Level-Fan	Automatic function			1 bit	C	-	W	-	-	enable	Low
241	1Level-Fan	Status Automatic			1 bit	C	R	-	T	-	enable	Low
242	1Level-Fan	Fan Limitation 1			1 bit	C	-	W	-	-	enable	Low
243	1Level-Fan	Fan Limitation 2			1 bit	C	-	W	-	-	enable	Low
244	1Level-Fan	Fan Limitation 3			1 bit	C	-	W	-	-	enable	Low
245	1Level-Fan	Fan Limitation 4			1 bit	C	-	W	-	-	enable	Low
246	1Level-Fan	Forced operation			1 bit	C	-	W	-	-	enable	Low

Fig.6.11 Communication object of Fan-one level (1)

When the fan type is multi level, the communication object is as follows:

Number	Name	Object Function	Description	Group Addr	Length	C	R	W	T	U	Data Type	Priority
230	Multi-Fan	Fan speed			1 byte	C	-	W	-	-	counter pulses (0..255)	Low
231	Multi-Fan	Fan speed 1			1 bit	C	-	W	-	-	switch	Low
232	Multi-Fan	Fan speed 2			1 bit	C	-	W	-	-	switch	Low
233	Multi-Fan	Fan speed 3			1 bit	C	-	W	-	-	switch	Low
234	Multi-Fan	Fan speed Up/Down			1 bit	C	-	W	-	-	up/down	Low
235	Multi-Fan	Status Fan ON/OFF			1 bit	C	R	-	T	-	switch	Low
236	Multi-Fan	Status Fan speed			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
237	Multi-Fan	Status Fan speed 1			1 bit	C	R	-	T	-	switch	Low
238	Multi-Fan	Status Fan speed 2			1 bit	C	R	-	T	-	switch	Low
239	Multi-Fan	Status Fan speed 3			1 bit	C	R	-	T	-	switch	Low
240	Multi-Fan	Automatic function			1 bit	C	-	W	-	-	enable	Low
241	Multi-Fan	Status Automatic			1 bit	C	R	-	T	-	enable	Low
242	Multi-Fan	Fan Limitation 1			1 bit	C	-	W	-	-	enable	Low
243	Multi-Fan	Fan Limitation 2			1 bit	C	-	W	-	-	enable	Low
244	Multi-Fan	Fan Limitation 3			1 bit	C	-	W	-	-	enable	Low
245	Multi-Fan	Fan Limitation 4			1 bit	C	-	W	-	-	enable	Low
246	Multi-Fan	Forced operation			1 bit	C	-	W	-	-	enable	Low

Fig. 6.11 communication object of Fan-Multi level (2)

No.	Name	Object Function	Data Type	Flags	DPT
230	**1Level/Multi - Fan**	**Fan speed**	**1bit/ 1byte**	**C,W**	**1.001 DPT_Switch 5.010 DPT_Counter pulses**
To single fan speed, the object is 1bit type, which is used to switch on/off fan. Telegram “0”——fan OFF “1”——fan ON To multi fan speed, the object is 1byte, which is used to switch on/off each level fan speed. There’s only one level fan speed is switching on at the same time, meanwhile, a new fan speed is switched on taking the start-up phase into consideration. Corresponding wind speed of object value is as follows: Telegram value: <threshold value 1 ——the fan off >=threshold value 1 —— fan speed 1 >=threshold value 2 —— fan speed 2 >=threshold value 3 —— fan speed 3					
231	**Multi - Fan**	**Fan speed 1**	**1bit**	**C,W**	**1.001 DPT_Switch**
The communication object is available in multi level fan speed. The communication object can switch on the fan speed 1. If several On telegrams are received consecutively in a short period of time at various fan speed 1-3 communication objects, the value last received by the fan control is the decisive value. An OFF telegram to one of the three communication objects, fan speed 1-3, switches off the fan completely. Telegram value: 0 ——fan OFF 1 —— fan ON in speed 1					
232	**Multi - Fan**	**Fan speed 2**	**1Bit**	**C,W**	**1.001 DPT_Switch**
Refer to communication object 231					
233	**Multi - Fan**	**Fan speed 3**	**1Bit**	**C,W**	**1.001 DPT_Switch**
Refer to communication object 231					
234	**Multi - Fan**	**Fan speed Up/Down**	**1Bit**	**C,W**	**1.008 DPT_UpDown**
The object is available in multi level fan speed. With this communication object, the fan can be switched one fan speed further up or down. After the maximum or minimum speed is achieved, further UP/DOWN telegrams are ignored and not executed. Telegram value: 0 ——switch fan speed DOWN 1 —— switch fan speed UP					
235	**1Level/Multi - Fan**	**Status Fan ON/OFF**	**1bit**	**C,R,T**	**1.001 DPT_Switch**
This object is used to send fan off/on status to the bus. As long as there’s fan speed, the fan is switching on. Telegram value: “0”——fan OFF “1”——fan ON					
236	**Multi - Fan**	**Status Fan speed**	**1byte**	**C,R,T**	**5.010 DPT_Counter pulses**
The object is available in multi level fan speed. The object is used to send current operating speed to the bus. Parameter “Object value for Status Fan speed 1/2/3 [1..255]” appoint telegram value corresponded by per level fan speed. Telegram “0”: fan OFF.					
237	**Multi - Fan**	**Status Fan speed 1**	**1bit**	**C,R,T**	**1.001 DPT_Switch**

The object is available in multi level fan speed.

The object is used to send operating status of fan speed 1 to the bus.

Telegram value “0”——fan speed 1 OFF

“1”——fan speed 1 ON

238	**Multi - Fan**	**Status Fan speed 2**	**1bit**	**C,R,T**	**1.001 DPT_Switch**

Refer to communication object 237

239	**Multi - Fan**	**Status Fan speed 3**	**1bit**	**C,R,T**	**1.001 DPT_Switch**

Refer to communication object 237

240	**1Level/Multi - Fan**	**Automatic function**	**1bit**	**C,W**	**1.003 DPT_Enable**

This communication object is used to activate automatic operation.

After power-down reset or programming, the automatic operation is activated by the parameter settings. Normal operation can exit automatic operations. After the automatic operation is exited, the limit states under the automatic operation will remain, and will be activated again when the automatic operation is entered again.

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

If the parameter “carry out auto. Operation when the object value is” is set to “0”:

Telegram value 0 ——the Auto. operation active

1 —— the Auto. operation inactive

If the parameter “carry out auto. Operation when the object value is” is set to “1”:

Telegram value 0 ——the Auto. operation inactive

1 —— the Auto. operation active

The general operation as the following objects can activate the operation like:

Object 230: Fan speed

Object 231, 232, 233: Fan speed x (x=1,2,3,)

Object 234: Fan speed UP/DOWN

241	**1Level/Multi - Fan**	**Status Automatic**	**1bit**	**C,R,T**	**1.003 DPT_Enable**

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

Telegram value 0 ——the Auto. operation inactive

1 —— the Auto. operation active

242	**1Level/Multi - Fan**	**Fan Limitation 1**	**1bit**	**C,W**	**1.003 DPT_Enable**

The limitation 1 is active if a telegram “1” is received on the object. The limitation 1 is deactivated if a telegram “0” is received on the object.

When the limitation 1 is activated, the fan speed at which the fan is allowed to operate under limit 1 is set by the parameter "Fan with limitation 1".

Telegram value 0 ——limitation 1 inactive

1 ——limitation 1 active

Note: limitation 1 is only active in automatic mode.

243	**1Level/Multi - Fan**	**Fan Limitation 2**	**1bit**	**C,W**	**1.003 DPT_Enable**

Refer to communication object 242

244	**1Level/Multi - Fan**	**Fan Limitation 3**	**1bit**	**C,W**	**1.003 DPT_Enable**

Refer to communication object 242

245	**1Level/Multi - Fan**	**Fan Limitation 4**	**1bit**	**C,W**	**1.003 DPT_Enable**

Refer to communication object 242

246	1Level/Multi - Fan	Forced operation	1bit	C,W	1.003 DPT_Enable

The communication object is used to activate the forced operation.

When the forced operation is activated, the fan speed that the fan can operate is set by the parameter “Behaviour on Forced operation is” or“Limitation on forced operation”. Meanwhile, during Forced operation, the limits setting in Automatic operation is ignored, like the Fan Limitation 1 to 4.

If the parameter “forced operation on object value is” is set to “0”:

Telegram value 0 ——forced operation

1 ——no forced operation

If the parameter “forced operation on object value is” is set to “1”:

Telegram value 1 —— forced operation

0 ——no forced operation

Table 11 Communication Objects Table of Fan Control

6.9 Communication Object of Coil Output

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
255	Valve Heat	Trigger valve purge			1 bit	C	-	W	-	-	enable	Low
256	Valve Heat	Status of valve purge			1 bit	C	R	-	T	-	enable	Low
248	Valve Heat	Disable, Heat			1 bit	C	-	W	-	-	enable	Low
257	Valve Heat	Status of valve position			1 bit	C	R	-	T	-	switch	Low
259	Valve Cool	Trigger valve purge			1 bit	C	-	W	-	-	enable	Low
260	Valve Cool	Status of valve purge			1 bit	C	R	-	T	-	enable	Low
261	Valve Cool	Status of valve position			1 bit	C	R	-	T	-	switch	Low
249	Valve Cool	Disable, Cool			1 bit	C	-	W	-	-	enable	Low

Fig.6.12 Communication Objects of Coil Output

No.	Object name	Object Function	Data type	Flags	DPT
248	Valve Heat	Disable, Heat	1bit	C,W	1.003 DPT_Enable
Through this communication object, the heating 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 operates according to the current control value.					
249	Valve Cool	Disable, Cool	1bit	C,W	1.003 DPT_Enable
Refer to communication object 248.					
255/259	Valve Heat/Cool	Trigger valve purge	1bit	C,W	1.003 DPT_Enable
The communication is used to trigger the valve purge. When the valve purge is triggered, the valve will be fully opened. Telegram value 0 ——end valve purge 1 ——start valve purge					
256/260	Valve Heat/Cool	Status of valve purge	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 ——valve purge not active 1 ——valve purge active					
257/261	Valve Heat/Cool	Status of valve position	1bit	C,R,T	1.001 DPT_switch
This object is used to indicate the switch status of the valve. Telegram value 0 ——Valve off 1 ——Valve on					

Table 12 Communication Objects Table of Coil Output

6.10 Communication Object of Logical Function

6.10.1 Communication Object of "AND/OR/XOR"

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1			1 bit	C	-	W	T	U	boolean	Low
151	Logic 1	Input 2			1 bit	C	-	W	T	U	boolean	Low
152	Logic 1	Input 3			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
153	Logic 1	Input 4			1 bit	C	-	W	T	U	boolean	Low
154	Logic 1	Input 5			1 bit	C	-	W	T	U	boolean	Low
155	Logic 1	Input 6			1 bit	C	-	W	T	U	boolean	Low
156	Logic 1	Input 7			1 bit	C	-	W	T	U	boolean	Low
157	Logic 1	Input 8			1 bit	C	-	W	T	U	boolean	Low
158	Logic 1	Logic Result			1 bit	C	-	-	T	-	boolean	Low

Fig.6.13 Communication Objects of logic

No.	Object name	Function	Data type	Flags	DPT
150..157	**Logic 1/../8**	**Input x**	**1bit/ 1byte**	**C,W,T,U**	**1.002 DPT_boolean 5.010 DPT_counter pulses**
The communication object is used to receive the value of the logical input Input x.					
158	**Logic 1/../8**	**Logic Result**	**1bit**	**C,T**	**1.002 DPT_boolean**
This communication object is used to send the result of the logical operation.					

Table 13 Communication Objects Table of Logical Function

6.10.2 Communication Object of "Converter"

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	Low
151	Logic 1	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	Low
158	Logic 1	Output 2bit			2 bit	C	-	-	T	-	switch control	Low

The function of"2x1bit --> 1x2bit"： Convert two of 1bit values into a 2bit value, like Input bit1=1, bit0=0--> Output 2bit=2

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	Low
151	Logic 1	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	Low
152	Logic 1	Input 1bit-bit2			1 bit	C	-	W	-	U	boolean	Low
153	Logic 1	Input 1bit-bit3			1 bit	C	-	W	-	U	boolean	Low
154	Logic 1	Input 1bit-bit4			1 bit	C	-	W	-	U	boolean	Low
155	Logic 1	Input 1bit-bit5			1 bit	C	-	W	-	U	boolean	Low
156	Logic 1	Input 1bit-bit6			1 bit	C	-	W	-	U	boolean	Low
157	Logic 1	Input 1bit-bit7			1 bit	C	-	W	-	U	boolean	Low
158	Logic 1	Output 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

The function of "8x1bit --> 1x1byte": Convert eight of 1bit values into a 1byte value, like Input bit2=1, bit1=1, bit0=1, other bits are 0--> Output 1byte=7

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
158	Logic 1	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

The function of"1x1byte --> 1x2byte"： Convert a 1byte value into a 2byte value, like Input 1byte=125--> Output 2byte=125. Although the value isn't changed, the type of the value is different.

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
151	Logic 1	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
158	Logic 1	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

The function of"2x1byte --> 1x2byte": Convert two of 1byte values into a 2byte value, like Input 1byte-low = 255 ($FF), Input 1byte-high = 100 ($64) --> Output 2byte = 25855 ($64 FF)

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 2byte-low			2 bytes	C	-	W	-	U	pulses	Low
151	Logic 1	Input 2byte-high			2 bytes	C	-	W	-	U	pulses	Low
158	Logic 1	Output 4byte			4 bytes	C	-	-	T	-	counter pulses (unsigned)	Low

The function of “2x2byte --> 1x4byte”：Convert two of 2byte values into a 4byte value, like Input 2byte-low = 65530 ($FF FA), Input 2byte-high = 32768 ($80 00)--> Output 2byte = 2147549178 ($80 00 FF FA)

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
151	Logic 1	Output 1bit-bit0			1 bit	C	-	-	T	-	boolean	Low
152	Logic 1	Output 1bit-bit1			1 bit	C	-	-	T	-	boolean	Low
153	Logic 1	Output 1bit-bit2			1 bit	C	-	-	T	-	boolean	Low
154	Logic 1	Output 1bit-bit3			1 bit	C	-	-	T	-	boolean	Low
155	Logic 1	Output 1bit-bit4			1 bit	C	-	-	T	-	boolean	Low
156	Logic 1	Output 1bit-bit5			1 bit	C	-	-	T	-	boolean	Low
157	Logic 1	Output 1bit-bit6			1 bit	C	-	-	T	-	boolean	Low
158	Logic 1	Output 1bit-bit7			1 bit	C	-	-	T	-	boolean	Low

The function of “1x1byte --> 8x1bit”：Convert a 1byte value into eight of 1bit values, like Input 1byte=200 --> Output bit0=0, bit1=0, bit2=0, bit3=1, bit4=0, bit5=0, bit6=1, bit7=1

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 2byte			2 bytes	C	-	W	-	U	pulses	Low
151	Logic 1	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
152	Logic 1	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

The function of “1x2byte --> 2x1byte”：Convert a 2byte value into two of 1byte values, like Input 2byte = 55500 ($D8 CC) --> Output 1byte-low = 204 ($CC), Output 1byte-high =216 ($D8)

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 4byte			4 bytes	C	-	W	-	U	counter pulses (unsigned)	Low
151	Logic 1	Output 2byte-low			2 bytes	C	-	-	T	-	pulses	Low
152	Logic 1	Output 2byte-high			2 bytes	C	-	-	T	-	pulses	Low

The function of“1x4byte --> 2x2byte”：Convert a 4byte value into two of 2byte values, like Input 4byte = 78009500 ($04 A6 54 9C) --> Output 2byte-low = 21660 ($54 9C), Output 2byte-high =1190 ($04 A6)

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 3byte			3 bytes	C	-	W	-	U	RGB value 3x(0..255)	Low
151	Logic 1	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
152	Logic 1	Output 1byte-middle			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
153	Logic 1	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

The function of“1x3byte --> 3x1byte”： Convert a 3byte value into three of 1byte values, like Input 3byte = $78 64 C8--> Output 1byte-low = 200 ($C8) , Output 1byte-middle = 100 ($64) , Output 1byte-high =120 ($78)

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
150	Logic 1	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
151	Logic 1	Input 1byte-middle			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
152	Logic 1	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
158	Logic 1	Output 3byte			3 bytes	C	-	-	T	-	RGB value 3x(0..255)	Low

The function of “3x1byte --> 1x3byte”：Convert three of 1byte values into a 3byte value, like Input 1byte-low = 150 ($96), Input 1byte-middle = 100 ($64), Input 1byte-high = 50 ($32)--> Output 3byte = $32 64 96

No.	Object name	Function	Data type	Flags	DPT
150	Logic 1/../8	Input ...	1bit/ 1byte/ 2byte/ 3byte/ 4byte	C,W,U	1.002 DPT_boolean/ 5.010 DPT_counter pulses/ 7.001 DPT_pulses/ 232.600 RGB value 3x(0..255)/ 12.001 DPT_counter pulses
This communication object is used to input the value that needs to be converted.					

158	Logic 1/../8	Output ...	1bit/ 2bit/ 1byte/ 2byte/ 3byte/ byte	C,T	1.002 DPT_boolean/ 2.001 DPT_Switch control/ 5.010 DPT_counter pulses/ 7.001 DPT_pulses/ 232.600 RGB value 3x(0..255)/ 12.001 DPT_counter pulses
This communication object is used to output the converted value.					

Table 14 Communication Objects Table of logic"Converter"

6.11 Communication Object of Time Function

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
186	Time 1	Trigger value			1 byte	C	-	W	-	-	counter pulses (0..255)	Low
187	Time 1	Output value			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Fig.6.15 Communication Objects of Time Function

No.	Object name	Function	Data type	Flags	DPT
186	**Time X**	**Trigger value**	**1bit/ 1byte**	**C,W**	**1.001 DPT_Switch/ 5.010 DPT_counter pulses/**
This communication object is used to receive the trigger value of the time function.					
187	**Time X**	**Output value**	**1bit/ 1byte**	**C,T**	**1.001 DPT_Switch/ 5.010 DPT_counter pulses/**
This communication object is used to send the output value of the time function. Only when being triggered will it have an output. The specific output value is set by the parameter.					

Table 15 Communication Objects Table of Time Function

6.12 Communication Object of Scene Group Function

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
194	Scene Group 1	Extension Input			1 byte	C	-	W	-	-	scene number	Low
195	Scene Group 1	Output 1 1bit			1 bit	C	-	-	T	-	switch	Low
196	Scene Group 1	Output 2 1byte 0..255			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
197	Scene Group 1	Output 3 1byte 0..100%			1 byte	C	-	-	T	-	percentage (0..100%)	Low
198	Scene Group 1	Output 4 1bit			1 bit	C	-	-	T	-	switch	Low
199	Scene Group 1	Output 5 1bit			1 bit	C	-	-	T	-	switch	Low
200	Scene Group 1	Output 6 1bit			1 bit	C	-	-	T	-	switch	Low
201	Scene Group 1	Output 7 1bit			1 bit	C	-	-	T	-	switch	Low
202	Scene Group 1	Output 8 1bit			1 bit	C	-	-	T	-	switch	Low

Fig.6.16 Communication Object of Scene Group Function

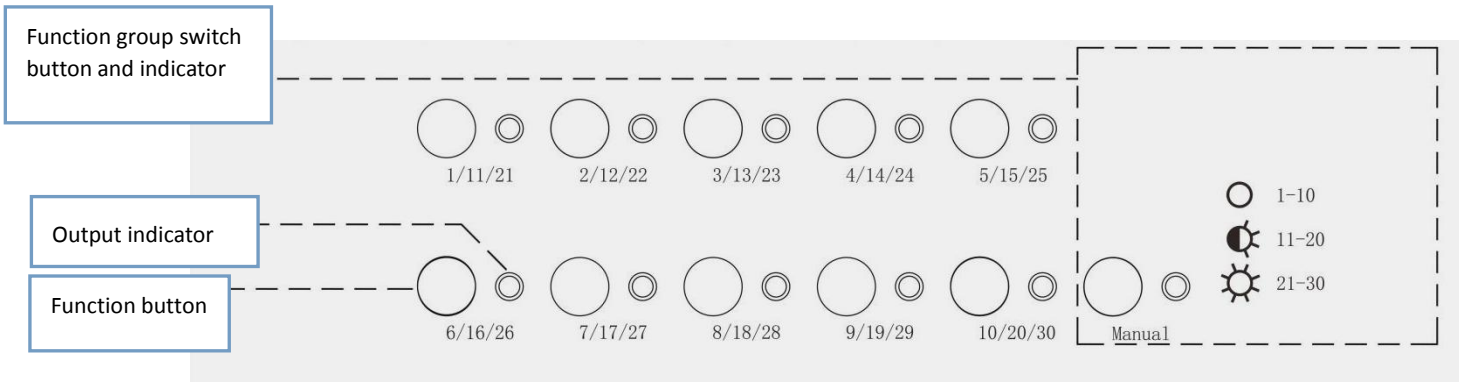
No.	Object name	Function	Data type	Flags	DPT
194	Scene Group X	Extension Input	1byte	C,W	17.001 DPT_scene number
This communication object triggers each output in the scene group to send a specific value to the bus by calling the scene number. Telegram value: 0..63					
195	Scene Group X	Output x 1bit / 1byte 0..255 / 1byte 0..100%	1bit/ 1byte	C,T	1.001 DPT_Switch/ 5.010 DPT_counter pulses/ 5.001 DPT_Percentage
When a scene is called, this communication object is used to send the corresponding output value of this scene to the bus.					

Table 16 Communication Objects Table of Scene Group Function

Chapter 7 Manual Function Description

All outputs of Room Controller are equipped with electronic manually control output function. The system needs to be powered normally, and the parameters have the corresponding output enabled to operate.

After the device is powered up, the electronic switch acts on the first functional group.



As shown in the above figure, the manual function buttons of this product are divided into two categories according to their use:

1. **Function button**: Used to control the output of the corresponding channel

2. **Function group switch button**: Used to switch the function group, that is, the channel output and indicator light corresponding to the switch function button;

When the right-side indicator of the Function group switch button is off normally. The function button and output indicator work for the first function group, and control and indicate 1-10 channel status;

When the right-side indicator of the Function group switch button is flashing. The function button and output indicator work for the second function group, and control and indicate 11-20 channel status;

When the right-side indicator of the Function group switch button is always on. The function button and output indicator work for the third function group, and control and indicate 21-30 channel status;

The function buttons and LED indications correspond to the output, and the manual control output of each function is as follows:

Switch outputs: Manual switch output is instant switch output, output channel 1-25;

Although the switch output is not enabled, it can be manually controlled via button. Other functions (such a dimming outputs , curtain outputs, etc.) are not available, and the corresponding LED will flash twice to indicate that the output is not enable.

Shutter outputs: 2 output channels, corresponding output 22 (↓) &23 (↑) , 24 (↓) &25 (↑) ;

The operation button performs the function of moving the curtain up/down;

Since the switch output 22-25 is multiplexed with the curtain output, when the curtain output is enabled, the corresponding switch output is not available;

Fan control: When the fan and switch output are multiplexed, the 3rd fan speed corresponds to the output

15&16&17； the 2nd fan speed corresponds to the output 15&16;

The 1st fan speed corresponds to the output 15; the corresponding function keys have the same function, such as the 3rd speed, then the output 15&16&17 keys can be used to switch the fan speed. When any one of the buttons is operated, the next speed of the wind speed will be switched (... -- 1st speed -- 2nd speed -- 3rd speed -- Off --...)

When the switch output is multiplexed by the fan, the corresponding switch output is not available. i.e. the fan drive is selected for the relays output, the output 15 &16 & 17 will be not used for the switch output.

When the fan is multiplexed with the 0-10V output 28, the operation button 28 cyclically switches the fan speed (... - 1st speed - 2nd speed - 3rd speed - off - ...);

Coil control: When the heating valve is multiplexed with the switch output 18, the corresponding switch output is not available. When the heating valve is multiplexed with 0-10V output 29, the corresponding dimming output is not available. When the refrigerating valve is multiplexed with the switch output 19, the corresponding switch output is not available. When the heating valve is multiplexed with 0-10V output 30, the corresponding dimming output is not available;

When the HVAC controller is only defined for bus, the valve outputs can be switched on/off or changed heating/cooling function via buttons. And the heating and cooling valve is interlocked. Once the control value is received again, the valve will output with the new control value.

Dimming outputs: The dimming output channel 26-30, the operation button performs the function of the switch output. If the output is set the low threshold value, it will be output at the low threshold value when it is switched off via button.

Note: When operating each function button, pay attention to the indication of the function group.