User Manual

K-BUS® KNX Multifunctional Thermostat, 55mm_V1.1

CHTPB-04/00.1.00（White, shiny finish）

### CHTPB-04/00.2.00（White, Matt. finish）

CHTPB-04/00.2.01（Dark gray, Matt. finish）
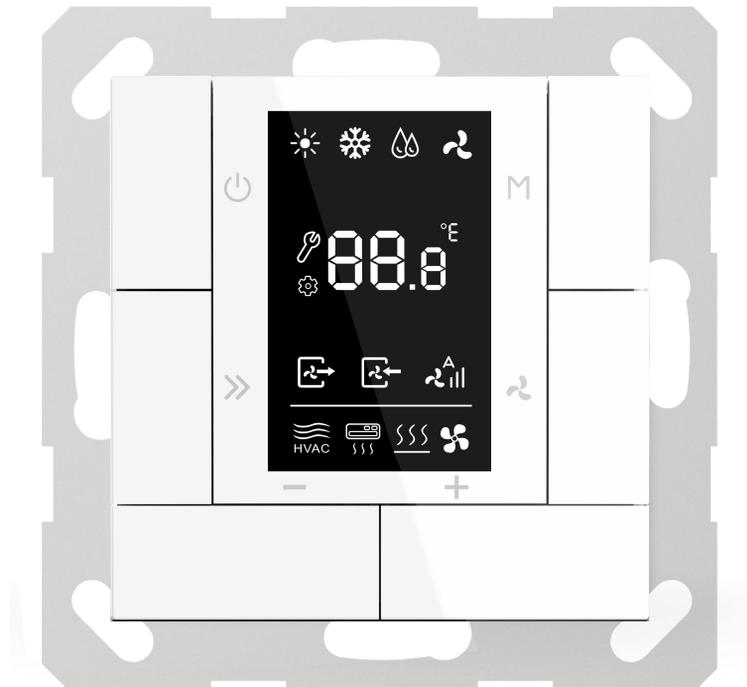
KNX/EIB Smart Home & Building control system

Attentions

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

Away from magnetic field	Away from high-temp	Prevent moisture

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

Handle with care

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

Wipe with care

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

Contents

Chapter 1   Summary

The temperature control panel "KNX Multifunctional Thermostat, 55mm", Hereinafter referred to as Thermostat. It is mainly applied in building control system, connected to the BUS via EIB terminals and installed together with other devices on the bus to become a system. It's functionally simple and intuitive to operate. Users can plan according to their own needs to performs these functions in the system.

The manual provides detailed technical information about the Thermostat, including installation and programming details, and explains how to use the panel in conjunction with examples in actual use.

The Thermostat is mainly designed according to European standards (55mm system panel frame), which can be used for HVAC control, air conditioning control, floor heating control, central ventilation control, common push button function, temperature detection and so on. The Thermostat is mounted in a standard 60- or 86-box wall mount. **Note: It is best to program the physical address before installing.**

The Thermostat is connected directly to the bus via the EIB terminal and does not require an additional supply voltage. The physical address assignment and parameter settings can be used with the engineering tool software ETS (version ETS4 or above) with the .knxprod file.

The main functions of the Thermostat are summarized as follows:

- **Operation lock function**

- **HVAC control: heating / cooling, control of up to 3 fan speed fans**

- **Air conditioning control: support split infrared (IR Split Unit) air conditioning and air conditioning gateway (Gateway Integrate) control**

- **Floor heating control: adopts two-point control mode, with 5 scenes**

- **Central ventilation control: support air intake and exhaust control, and each with 5 scenes**

- **Common button functions: switch, dimming, curtain, scene, value sending function**

- **Support 4 event group functions (each with 8 configurable outputs)**

- **Support 8 logic functions, support AND, OR, XOR, logic gate forwarding, threshold comparator, format convert of different data types**

- **Built-in temperature sensor**

- **With 2-Fold PT1000 temperature sensor interfaces**

Chapter 2 Technical Parameter

Power Supply	Operation Voltage	21-30V DC，supplied via BUS
	Bus Current	<12mA
	Bus Power Consumption	<360mW
Connection	EIB / KNX	Via bus connection terminal（Black/Red）
	2-Fold PT1000 input interfaces	2pcs 3 pin holder connection terminals
2-Fold temperature detection	3-wire/2-wire system PT1000 temperature sensor	
	Measuring range –9.9°C ... + 80°C，Accuracy ±1℃	
	Cable length	<2m
Built-in temperature sensor	Measuring range –9.9°C ... + 80°C，Accuracy±1℃	
Temperature range	Operating	–5 °C ... + 45 °C
	Storage	–25 °C ... + 55 °C
	Transportation	– 25 °C ... + 70 °C
Environmental conditions	Humidity	<93%,No dewing
Installation	Standard 60mm or 86mm box wall-mounted installation	
Size	70.8×70.8×19.3mm	
Weight	0.05KG	

Chapter 3 Dimension and Wiring Diagram

3.1. Dimension
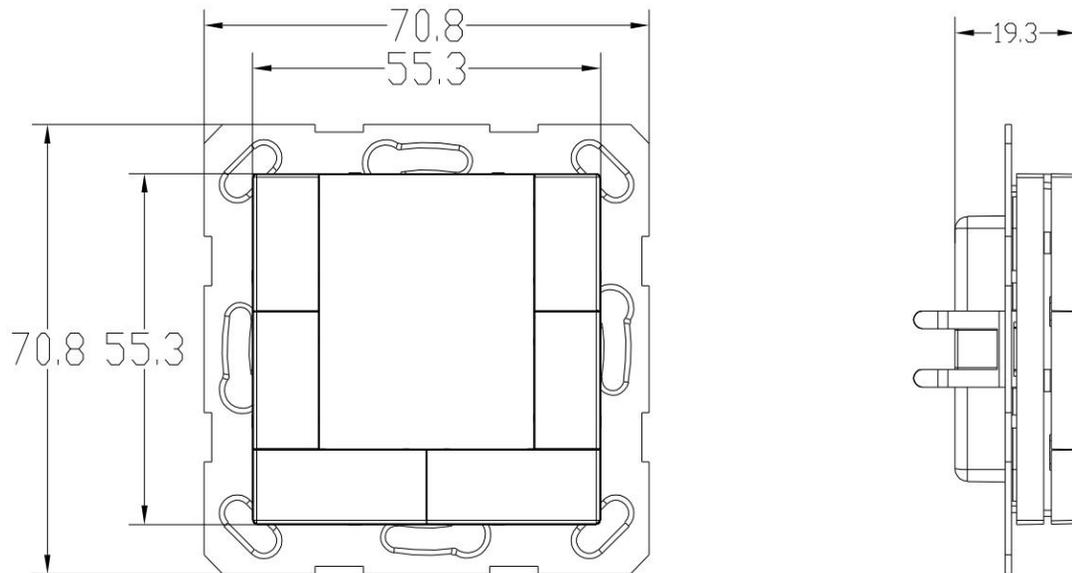
3.2. Wiring Diagram
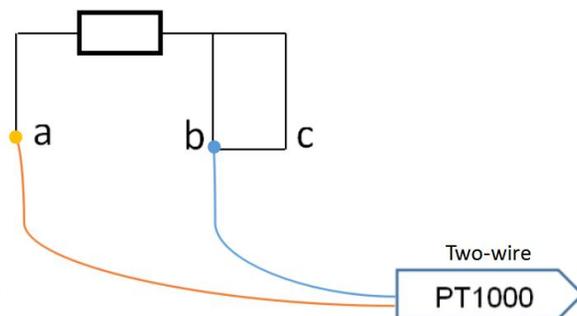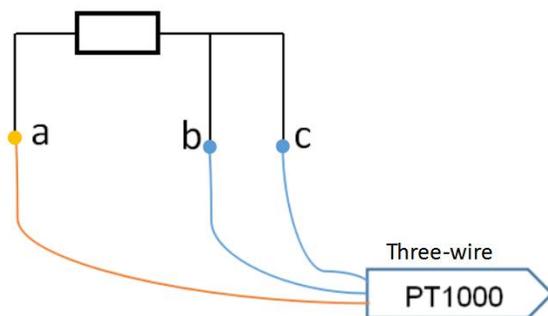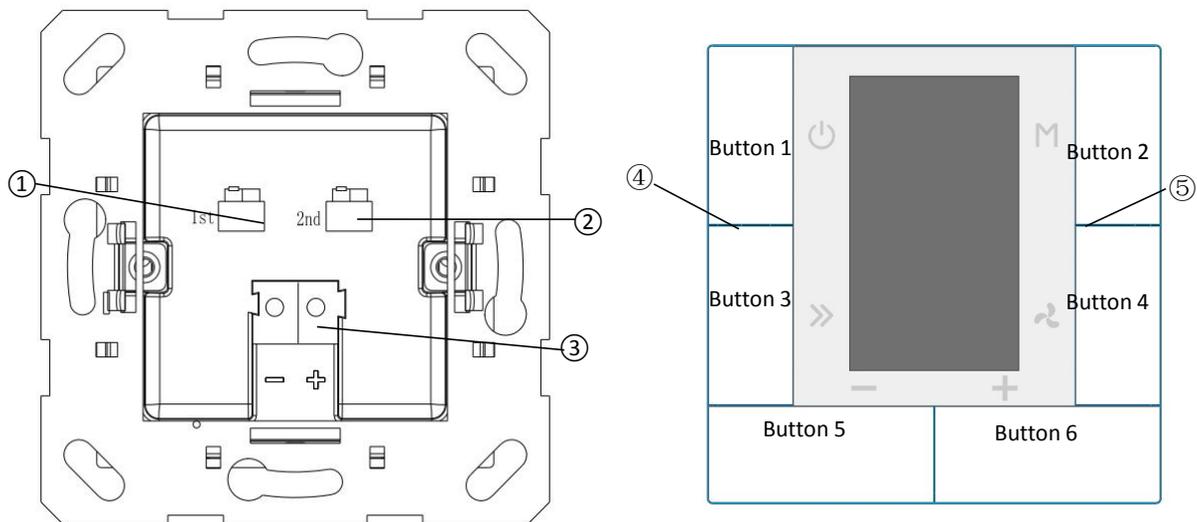
①1st PT1000 connection terminal

②2nd PT1000 connection terminal

③KNX/EIB BUS connection terminal

④Programming LED, the red LED indicates the device　entry to the physical address programming state.

Meanwhile, press Button 1 & Button 6 to enter programming mode.

⑤Built-in temperature sensor position

Note: The 1st PT1000 and 2nd PT1000 terminals can connected with the three-wire or two-wire PT1000 temperature sensor（as Wiring Diagram). For two-wire PT1000 sensor, the two pins on the right side of the terminal need be connected together. And due to the line resistance, the measured temperature value may not be accurate for two-wire PT1000.

Chapter 4 Project Design & Application

Application program	Max. number of communication objects	Max. number of group addresses	Max. number of Association addresses
KNX Multifunctional Thermostat, 55mm	187	400	400

General function

Common features include panel operation lockout, backlight settings for normal or standby mode of operation, etc.

HVAC control

HVAC is mainly used to control room temperature, to automate and optimize the heating and cooling control according to the use of the room or the needs of the occupants.

Supports switching heating/cooling control, three-speed fan speed and automatic speed can be adjusted, four room working modes: comfort, standby, night and protection mode.

The temperature setpoint supports the absolute and relative setting modes, as well as the temperature setpoint adjusting range setting. It supports two-point control and PI control.

Air conditioning control

Air conditioning control is divided into two types: IR Split Unit control and Gateway Integrate.

The IR Split Unit control is similar to functions of remote control. This function of the Thermostat controls the air conditioner through the infrared transmitting module on the bus. For example, the Thermostat sends a control message to the infrared transmitting module, the infrared transmitting module and the message box. The

assigned function code is transmitted to the air conditioner to control on/off, mode, air volume, etc.

The Gateway Integrate control is suitable for controlling air conditioning system like VRV, which needs to be controlled by an air conditioning gateway of KNX to VRV.

Floor heating control

The two-point control mode is adopted to automatically turn on/off floor heating, according to temperature difference. In addition, the scene function of the floor heating is available for setting and temperature setting value is adjustable for range setting.

Central Ventilation Control

Support configuration for inlet and exhaust vents at the same time.

Support for three fan speed adjustment.

Automatic control based on PM2.5 or CO_2 concentration, in addition, scene function is available for setting.

Event group function

By calling the scene number, 8 output messages can be triggered, and each output has three Options different data types. There are 4 sets of event functions available for setup.

Logic function

Support 8 logical inputs, And, OR, XOR; support logic gate forwarding, which can forward an input to one output or multiple outputs;

Supports threshold comparators and conversions between different data types. There are 8 logic functions available for setup.

General push button function

When the buttons on the Thermostat are not used for other functions, such as on/off, mode switching, function switching, fan speed switching or set temperature adjustment. In this case, they can be used as general push buttons for on/off, dimming, curtains and blinds control, value transmission, scene control, etc.

Temperature detection function

In addition to the built-in temperature sensor, the Thermostat can also be connected with two PT1000 temperature sensor inputs for collecting temperature in different occasions to meet different needs, such as HVAC, air conditioning, floor heating and so on.

Chapter 5 Parameter setting description in the ETS

5.1．Parameter window "General "

Figure 5.1 "General" parameter settings interface

"General" parameter setting interface is mainly applied in general setting of temperature, such as, panel lock function, backlight, delay in entering standby interface, etc.

Parameter "Panel lock function"

To set whether to enable the panel lock function. Options:

> **Disable**

> **Enable**

Enable: When enabled, the object "Panel block" is visible and is used to lock the panel via the bus. After locking, the operation of push buttons becomes invalid, except for the button operations for entering the programming mode.

Note: The function only lock the button operation. And bus telegrams can still be received.

Parameter "Normal backlight level[1..5] "

Sets the backlight brightness level of the panel under normal operation. Options: 1...5

Parameter "Standby backlight level[0..5]"

Sets the backlight brightness level of the panel under standby status. Options: 0...5

0：The backlight brightness is off in standby status.

Parameter "Delay time for normal to standby[0..255]s"

Set the delay time from normal operation to standby, and the delay starts from the last operation button. Available options: 0...255

0: The panel is always in normal operation and will not enter standby status.

Set the delay to exit the set temperature interface status, that is, when setting the HVAC, air conditioner or floor heating control set temperature, it will enter a set temperature interface status, the setting is completed, and after the delay, the interface will exit the setting. The temperature status enters the actual temperature display interface of the current environment. Options: 3..15

The following parameters are used for function use.

Parameter "HVAC function"

Set whether to enable HVAC control. Options:

Disable

Enable

Enable: After enabling, the corresponding parameter setting interface is visible.

Parameter "Air conditioner function"

Set whether to enable the air conditioning control function. Options:

Disable

Enable

Enable: After enabling, the corresponding parameter setting interface is visible.

Parameter "Floor heating function"

Set whether to enable the floor heating control function. Options:

Disable

Enable

Enable: After enabling, the corresponding parameter setting interface is visible.

Parameter "Ventilation function"

Set whether to enable the fresh air control function. Options:

Disable

Enable

Enable: After enabling, the corresponding parameter setting interface is visible.

5.2. Parameter window "Push button function"

Figure 5.2 "Push button function"parameter setting interface

"Push button function" parameter setting interface is mainly applied in setting push button function of the panel.

Parameter"Button 1 function"

Options:

   Disable

   Power on/off

   Switch sensor

Disable: buttons unused;

Power on/off: The buttons are used as the key to HVAC, air conditioning, floor heating and central ventilation control;

Switch sensor: The button is used as a normal switch button. When selecting this option, corresponding parameter setting interface "Button 1" is visible. Functions for switching, dimming, value transmission, scene or curtain control can be set. See Chapter 5.14 for a description of each function.

Parameter"Button 2 function"

Options:

   Disable

   Mode switchover

   Switch sensor

Disable: buttons unused;

Mode switchover: buttons are used as mode switching between HVAC and air conditioner control;

Switch sensor: function is same as Button 1。

Parameter"Button 3 function"

Options:

Disable

Page switchover

Switch sensor

Disable: buttons unused;

Page switchover: Buttons are used for function page switching, such as switching between HVAC, air conditioning, floor heating and central ventilation;

Switch sensor: Function is the same as Button 1。

Parameter"Button 4 function"

Options:

Disable

Fan speed switchover

Switch sensor

Disable: button is unused;

Fan speed switchover: The button is used to switch the fan speed of each gear, such as HVAC, air conditioner and central ventilation. On the central ventilation page, long press this button to switch between the air inlet and exhaust screens.

Switch sensor: function is same as Button 1。

Parameter"Button 5 function"

Options:

Disable

Temperature"-"

Switch sensor

Disable: The button is not used;

Temperature"-": It's used to lower the temperature setpoint, such as HVAC, air conditioning and floor heating temperature settings;

Switch sensor: Function is same as Button 1。

——Parameter"Long operation as switch sensor function"

This parameter is visible when "Temperature"-" is selected in the previous parameter and is used to set whether to enable long operation of this button. Options:

No

Yes

Yes: The long button operation is enabled. When enabled, the long operation function of button 5 is similar to the function under the Switch sensor option of button 1. See section 5.14 for a description of the long operating functions.

Parameter"Button 6 function"

Options:

Disable

Temperature"+"

Switch sensor

Disable: Button unused;

Temperature"+": it's used to increase the temperature setpoint, such as HVAC, air conditioning and floor heating temperature settings;

Switch sensor: Function is same as Button 1。

——Parameter"Long operation as switch sensor function"

This parameter is visible when "Temperature"+"" is selected in the previous parameter and is used to set whether to enable long operation of this button. Options:

No

Yes

Yes: The button long operation is enabled. When enabled, the long operation function of button 6 is similar to the function under the Switch sensor option of button 1. See section 6.14 for a description of the long operating functions.

Parameter"Entering programming mode"

This parameter states: Pressing Button 1 and Button 6 simultaneously enters programming mode. This app is not affected when the panel is locked.

5.3. Parameter window "Temperature sensor"

Figure 5.3 "Temperature sensor" parameter setting interface

"Temperature sensor"parameter setting interface is mainly used to set the function of temperature detection. This panel has a built-in temperature sensor and can be connected to two three-wire or two-wire system PT1000 temperature sensors for detecting ambient temperature.

Parameter"Temperature display units"

Set the temperature unit displayed on the panel. Options:

Celsius (℃)

Fahrenheit (℉)

The following are the parameter settings for the built-in temperature sensor of the panel:

Parameter"Internal sensor calibration"

Options:

-5℃

...

0℃

...

5℃

This parameter is used to set the temperature correction value of the built-in temperature sensor, that is, to correct the measured value of the built-in temperature sensor to make it closer to the current ambient temperature.

Parameter"Send the Temp. of internal sensor to bus"

Set whether to send the current temperature detected by the temperature sensor to the bus. Options:

No

Yes

Yes:The following two parameters are visible and are used to set the conditions for sending.

——Parameter" Send Temp. when change by[1..20]*0.5℃"

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

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

This parameter sets the time at which the temperature measurement period is sent to the bus. Options:0..255min

The cycle period starts from the the last telegram send.

Parameter"Reply error of sensor measurement"

This parameter defines how the temperature sensor will respond incorrectly. Options:

No respond

Respond after read only

Respond after change

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

Parameter"Object value of error"

The parameter defines the object value that is fed back when the temperature is wrong. 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 "Internal Temp. error output" sends the message "0". When an error occurs, the object sends the message "1"; vice versa.

In addition, the parameter settings of the external temperature sensors 1st PT1000 and 2nd PT1000 are similar to the built-in temperature sensor of the panel, and the description will not be repeated here.

5.4. Parameter window "HVAC General"

Figure 5.4 "HVAC General" parameter setting interface

"HVAC General" parameter setting interface is mainly used to set the part of HVAC Coil control.

The parameter of fan and coil control are set independently, if need use this device to control fan coil, it have to consider the parameter of fan and coil at the same time to make them work together better.

Parameter"Power on/off function setting"

Note: Whether the Power on/off key work or not, it depends on the setting of push button function. See interface "Push button function"setting.

Parameter"Power on/off for HVAC"

It used to set the Power on/off for HVAC. Options:

> **Disable**
>
> **Enable**

Disable：No use the Power on/off for HVAC;

Enable：The Power on/off for HVAC can turn on/off the interface display, also can on/off control. When turn off the display, the control of HVAC will also turn off, such as sending control value is 0 to the bus; when turn on

the display, the control of HVAC is also running.

It should be noted that the Power on/off must be enabled to make sure the parameter setting meaningfully.

When the Power on/off is disable, the switch of HVAC only control via bus.

Parameter"Temperature reference from"

The parameter is used to set the Temperature reference from, which can be obtained by single sensor detection or by combination of sensors. Options:

Internal sensor

External sensor

1st PT1000

2nd PT1000

(1)Internal sensor combine with (2)External sensor

(1)Internal sensor combine with (2)1st PT1000

(1)Internal sensor combine with (2)2nd PT1000

(1)External sensor combine with (2)1st PT1000

(1)External sensor combine with (2)2nd PT1000

(1)1st PT1000 combine with (2)2nd PT1000

When choose Internal sensor and PT1000 sensor, the temperature is determined by the parameter interface "Temperature sensor". In addition, when choose PT1000, the device is valid only connect PT1000.

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

This parameter is visible when last parameter select "...External sensor...", to set the time period for request external sensor. Options: 0...255

After the bus reset or programming is completed, a read request will be sent to external sensor.

——Parameter"Combination ratio"

This parameter is visible when temperature acquisition is achieved by using a combination sensors, set the proportion between Two sensors (1) and (2) to measure the temperature. Options:

(1)10%/(2)90%

(1)20%/(2)80%

…

(1)90%/(2)10%

For example, if the option is "(1) 40%/(2) 60%", then the sensor (1) accounts for 40% and the sensor (2) 60%. The control temperature = ((1) temperature *40%+((2) temperature *60%). The temperature control panel will control the temperature according to the calculated control temperature, and the calculated control temperature will be sent by the object "Actual temperature". This is the process of summing the specific gravity of the temperature detected by the two temperature sensors.

When two sensors are combined to detect, when one sensor makes a mistake, the temperature value detected by another sensor is used.

The following three parameters are used to set the send of control value:

Parameter"When temperature error occurs"

Note: When the sensor fails, the control value of HVAC is 0.

Parameter"Send control value when change by [0..100, 0=inactive]%"

To set control value when change by to send the bus. Options: 0..100，0＝change no send

Parameter"Cyclically send control value [0..255]min"

To set the period of cyclically send control value to bus. Options: 0..255

Parameter"Operating mode switchover"

The parameter is used to set the operating mode switchover. Options:

4x1bit

1byte

4x1bit：4 modes switchover is implemented by 1bit object type, with 8 objects visible.

The Comfort mode，In, Night mode，In, Frost/Heat protection,In and Standby mode,In are used to receive ON or Off telegram from bus for updating to different modes. When the value of the first three objects are 0, the operation mode is Standby mode,In.

In addition, objects Comfort mode, Out, Night mode, Out, Frost/Heat protection, Out and Standby mode, Out are used to send telegram value ON or OFF to the bus to indicate switching to a mode. That is, when a mode is activated, the corresponding object sends a telegram "1", otherwise it is "0".

1 byte: The switching of four modes is realized by 1 byte object type. Two objects are visible. HVAC mode, In and HVAC mode, Out are used to receive and send telegram values. Telegram values 1 represent comfortable mode, 2 represent standby mode, 3 represent night mode, and 4 represent protection mode.

Parameter"Controller status after restart"

It is used to set the HVAC operation mode after restart. Options:

Standby mode

Comfort mode

Night mode

Frost/heat protection

Restore operation mode before reset

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

It is used to set the extended comfort mode. Options: 0... 255

When the setting value is "0", it means that the comfort mode delay function is not used.

When the setting value is 1-255 and the room mode is switched from night mode to comfortable mode, this

function will take effect.

Comfort mode will automatically switch back to night mode after setting delay.

This parameter is only for switching between night mode and comfort mode.

Parameter"HVAC Control mode"

It is used to set the HVAC Control mode. Options:

Heating

Cooling

Heating and Cooling

Heating and cooling：It can realize heating and cooling. At the same time, the following parameters are visible.

——Parameter"Heating/Cooling switchover"

It is used to set the Heating/Cooling switchover. Options:

Only via button

Only via object

Via both button and object

Through object switchover, object"Switch Heat/Cool mode,In" is visible.

——Parameter"Heating/Cooling status after reset"

Set the Heating/Cooling status after reset. Options:

Heating

Cooling

Control option before reset

——Parameter "HVAC control system"

Set the HVAC control system, that is the pipe type in and out of fan coil unit. Options:

2 pipes system

4 pipes system

2 pipes system: share an inlet and outlet pipe for heating and refrigeration, that is, hot water and cold water share a valve control.

4 pipes system: for heating and refrigeration have their own inlet and outlet pipes, two valves are required to control the inlet and outlet of hot and cold water respectively.

——Parameter"Transmit Heat and Cool control value to share object"

This parameter indicates that under the two-pipe system, heating and cooling send HVAC control values through the same object.

5.5. Parameter window "HVAC Setpoint"

General	Setpoint method for operating mode	⦿ Relative ○ Absolute
Push button function	Base setpoint temperature(°C)	20.0 ▾
Temperature sensor	**Heating**	
	Reduced Heat in standby mode[0..10]°C	2
HVAC General	Reduced Heat in night mode[0..10]°C	4
HVAC Setpoint	Actual Temp.threshold in frost protection [5..10]°C	7
Heating/Cooling Control	**Cooling**	
HVAC Fan	Increased Cool in standby mode[0..10]°C	2
	Increased Cool in night mode[0..10]°C	4
Event Group & Logic	Actual Temp.threshold in heat protection [30..37]°C	35
	Min.set temperature[5..37]°C	5
	Max.set temperature[5..37]°C	37

General	Setpoint method for operating mode	○ Relative ⦿ Absolute
Push button function	**Heating**	
	Setpoint Temp.in comfort mode[5..37]°C	21
Temperature sensor	Setpoint Temp.in standby mode[5..37]°C	19
HVAC General	Setpoint Temp.in night mode[5..37]°C	17
HVAC Setpoint	Setpoint Temp.in frost protection[5..37]°C	7
Heating Control	**Cooling**	
	Setpoint Temp.in comfort mode[5..37]°C	23
Cooling Control	Setpoint Temp.in standby mode[5..37]°C	25
HVAC Fan	Setpoint Temp.in night mode[5..37]°C	27
Event Group & Logic	Setpoint Temp.in heat protection[5..37]°C	35
	Min.set temperature[5..37]°C	5
	Max.set temperature[5..37]°C	37

Figure5.5 "HVAC Setpoint" parameter setting interface

The temperature settings for each operation mode of HVAC are mainly set here. Different function options will present different parameter interfaces. But the function of parameters is the same.There is a functional description of each parameter as follows:

Parameter"Setpoint method for operation mode"

Set the Setpoint method for operation mode. Options:

> **Relative**
>
> **Absolute**

Relative ： The temperature settings for night and standby modes will refer to the defined reference temperature settings.

Absolute：each mode has its own independent temperature setting.

Select "Relative"，the following parameters are visible, to set the setpoint temperature relative mode.

——Parameter"Base setpoint temperature [℃]"

Used to set the Base setpoint temperature, the set temperature of the comfort mode of the room is generated by it. Options:

> **10℃**
>
> **10.5℃**
>
> **..**
>
> **35℃**

The setting value can be changed through the Bus Object "Setpoint Adjustment, In", and after the change, the new value will be saved after the bus power off.

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

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

Used to set the temperature setting value in standby mode. Options: 0...10 [℃]

Heating：The temperature setting value of standby mode is the reference value minus the setting value of this parameter.

Cooling：The standby mode temperature setting value is the reference value plus the value set by this parameter.

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

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

Used to set the temperature setting value in night mode. Options: 0...10 [℃]

Heating: The temperature setting value of night mode is the reference value minus the setting value of this parameter.

Cooling: The temperature setting value for night mode is the reference value plus the value set by this parameter.

——Parameter"Actual Temp. threshold in frost protection[5..10]℃"(for heating)

It is used to set the temperature setting value in the frost protection mode of heating function. Options：5...10 [℃]

In the frost protection mode, when the room temperature drops to the setting value of this parameter, the controller will trigger a control telegram to make the relevant heater actuator heat the room to avoid temperature to low.

——Parameter"Actual Temp. threshold in heat protection[30..37]℃"(for cooling)

It is used to set the temperature setting value in the heat protection. Options：30...37 [℃]

In the heat protection mode, when the indoor temperature rises to the set value of this parameter, the controller will trigger a control telegram to make the relevant refrigeration actuator refrigerate the room, so as to avoid temperature too high.

Select "Absolute"，the following parameters are visible to set the absolute adjust setting temperature.

——Parameter"Setpoint Temp. in comfort mode [5..37]℃"

——Parameter"Setpoint Temp. in standby mode [5..37]℃"

——Parameter"Setpoint Temp. in night mode [5..37]℃"

——Parameter"Setpoint Temp. in frost protection [5..37]℃"(for heating)

——Parameter"Setpoint Temp. in heat protection [5..37]℃"(for cooling)

These parameters are used to set the temperature setting value in various mode. Options: 5...37℃

Parameter"Min. /Max. set temperature [5..37]℃"

It is used to limit the adjustable range of temperature setting value. The minimum value set should be less than the maximum value.

If the temperature setting value exceeds the limit value range, it will be output according to the limit value.

5.6．Parameter window "Heating/Cooling Control"

Figure 5.6_1 "Heating/Cooling Control" parameter setting interface(Switching on/off)

Figure 5.6_2 "Heating/Cooling Control" parameter setting interface(Switching PWM)

Figure 5.6_3 "Heating/Cooling Control" parameter setting interface(Continuous control)

It is mainly set the type of HVAC control. In order not to repeat these similar parameters, there is no distinction between the parameters of various control types. If the control type does not have a certain parameter, then it does not have the function of the parameter. Following is a functional description of each parameter:

Parameter"Type of heating/cooling control"

Set the types of heating/cooling control. Different control types are suitable for controlling different temperature controllers. Options：

Switching on/off (use 2-point control)

Switching PWM (use PI control)

Continuous control (use PI control)

Switching on/off (use 2-point control): A lag interval can be set by parameters to prevent frequent switching of actuators and frequent valve switching due to a small drop or rise in temperature. This type is suitable for the control of ordinary switching valves. When the temperature exceeds the range of intervals, the valve is open close.

Switching PWM (use PI control)：The control object sends the switch value, and directly controls the output of the actuator through the switch command, that is, the direct switching solenoid valve. The cycle of the switch value can be set by parameters, and the switch value can be sent by the temperature control panel according to the duty cycle of the control value. For example, if the cycle time is 10 minutes (set in the temperature control panel parameters) and the control value is 80%, then the valve will be opened for 8 minutes and closed for 2 minutes, cyclically as that.

Continuous control (use PI control)：Control"，the control object send control value is Between 0…100%, when 0%, close valve, when 100%, open valve. If is 0%...100%, the actuator will adjust the output of the control according to the duty cycle of the control value. For example, assuming that the period is 10 minutes (set in the switching actuator) and the control value is 60%, the valve will be opened for 6 minutes and closed for 4 minutes, so on. The temperature control panel will calculate the control value every 30 seconds according to the temperature condition, scale range and integration time, and send the control value to the bus according to the bus. (Note: In switching actuator, without setting cycle parameters, the actuator will not output according to the duty cycle of the control value. Perhaps in this case, the application of temperature control panel is not suitable for the control of switching actuator. It applies only to executors that can receive 1 byte control values.)

Parameter"Invert control value"

Set the control object is to send the control value normally or to send the control value back, so that the control value can be adapted to the type of valve. Options,

No

Yes

No: Control object"Heat/Cool control value，Out"sends control value normally.

Yes：Control"Heat/Cool control value，Out", If the control value is "off or 0%", the reverse control value is "on or 100%"; if the control value is "on or 100%", the reverse control value is "off or 0%"; if the control value is "60%", the reverse control value is 40%.

The following two parameters are suitable for two-point switch control mode(2 point control)：

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

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

This parameter sets the temperature hysteresis of HVAC heating or cooling. Options：0..200

When heating, the actual temperature (T) > the setting temperature, stop heating；

When actual temperature <＝Setting temperature-lower hysteresis, start heating.

If the hysteresis is 3℃, setting temperature is 22℃, when T exceeds 22℃, stop heating;

If T less than 19℃, start heating; when T is between 19~22℃, remain the previous status.

When cooling, the actual temperature (T) < the setting temperature, stop cooling；

When actual temperature >＝Setting temperature+upper hysteresis, start cooling.

If the hysteresis is 3℃, setting temperature is 26℃, when T less than 26℃, stop cooling;

If T higher than 29℃, start cooling; when T is between 29~26℃, remain the previous status.

Parameter"PWM cycle time (1..255 min)"

This parameter is only visible when the control type is "switching PWM" (use PI control). It is used to set the cycle of the control object to send the switch value. The temperature control panel transmits the switch value according to the duty cycle of the control value. For example, if the set period is 10 minutes and the control value is 80%, the temperature control panel will send an open telegram at 8 minutes and a related message at 2 minutes, so on. Loop, if the control value changes, the time duty cycle of the temperature control panel sending on/off telegram will also change, but the period is still the time of parameter setting. If the control object sends a all on/off telegram, it will still send periodically.

Options：1...255

"Switching PWM (use PI control)" and "Continuous control (use PI control)" The control values of the two control types are the same, except that the control object is different. The control object of "Continuous control" directly outputs the PI control value (1 byte).), and the "Switching PWM" control object outputs an "on/off" control message based on the duty cycle of the PI control value.

The following two parameters apply to PI control:

Parameter"Heating speed"
Parameter"Cooling speed"

Set the response speed of the heating or cooling PI controller. Different response speeds are available for different environments.

Options:

Hot water heating (5K/150min)

Floor heating (5K/240 min)

Electric heating (4K/100min)

Split unit (4K/90min)

User defined

Options:

Cooling ceiling (5K/240min)

Split unit (4K/90min)

Fan convector(4K/90min)

User defined

——Parameter"Proportional range (P value) 0...65.535"

——Parameter"Readjust time (I value) (0...65.535)*s "

Visible when the parameter "Heating / Cooling speed" is "User defined", used to customize the PI value of the PI controller.

5.7．Parameter window "HVAC Fan"

Figure 5.7_1 "HVAC Fan" parameter setting interface (1 Level)

General	
Push button function	
Temperature sensor	
HVAC General	
HVAC Setpoint	
Heating/Cooling Control	
HVAC Fan	
Air Conditioner	
Floor heating	
Ventilation General	
Event Group & Logic	

Fan function	○ Disable ◉ Enable
Fan Level	2Level (OFF/Level 1, 2) ▼
Data type of fan speed	○ 1bit ◉ 1byte
Output value for fan speed	
Output value for Fan speed 1	84
Output value for Fan speed 2	168
Status feedback for fan speed	
Status value for Fan speed 1	1
Status value for Fan speed 2	2
Delay between fan speed switch[0..100] *50ms	10
Auto.operation function	Local controller ▼
Minimum time in fan speed[0..65535]s	60
Condition setting for using PI control	
Threshold value OFF<->speed 1[1..255]	80
Threshold value speed 1<->speed 2 [1..255]	150
Hysteresis threshold value in +/-[0..50]	10
Condition setting for using 2-point control	
Temp.difference OFF<->speed 1[1..200] *0.1°C	20
Temp.difference spped 1<->speed 2 [1..200]*0.1°C	30
Hysteresis Temp.difference in +/-[0...50] *0.1°C	10

Figure 5.7_2 "HVAC Fan" Parameter setting interface (2 Level)

Figure 5.7_3 "HVAC Fan" parameter setting interface (3 Level)

Parameter setting for HVAC fan control. Fans are divided into 1st, 2nd and 3rd grades. The functions and parameters of different grades of fans are similar, except that the supported fan speeds are different. In order not to repeat these similar parameters, the parameters of the fans at each level are not distinguished here. If the fan does not have a certain parameter, then it does not have the function of the parameter. The following describes each parameter:

Parameter"Fan function"

Set the HVAC fan function, available options:

> **Disable**

> **Enable**

Parameter"Fan Level"

Set the type of fan to be controlled. Options:

> **1 Level (OFF/Level 1)**

> **2 Level (OFF/Level 1,2)**

3 Level (OFF/Level 1,2,3)

1Level(OFF/Level 1)：It can control the fan with 1 fan speed;

2Level(OFF/Level 1,2)：It can control the fan with 2 fan speed;

3Level(OFF/Level 1,2,3)：It can control the fan with 3 fan speed.

Parameter"Data type of fan speed"

Set the data type of the fan speed object. Options:

1bit

1byte

When the fan speed object is 1 byte, the following parameters are visible:

Output value for fan speed

——Parameter"Output value for Fan speed 1/2/3"

Define the value sent by switching to each fan speed. Options：0..255

Status feedback for fan speed

——Parameter"Status value for Fan speed 1/2/3"

Set the status feedback value for each fan speed. The panel will display the fan speed update based on the feedback value. Options：0..255

——Parameter"Delay between fan speed switch[0..100]*50ms"

Set the fan speed conversion delay, which is a specific element of the fan and should be considered in any case. Available options: 0...100

When receiving a fan speed conversion message, first turn off the fan, and the fan speed conversion will be performed after the delay. At the same time, there is no delay required to turn the fan on/off. When set to 0, the fan switches directly to the new fan speed.

If the device receives a new fan speed during the delay of the switch, the delay will not be re-timed, but the last received fan speed will be executed.

When the fan speed control type is 1 bit, you need to set the delay time. When the control type is 1 byte, no delay is required. It is determined by the technical characteristics of the fan.

Parameter "Auto. Operation function"

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

Disable

Local controller

External controller

Local controller：When enabled, the following parameters are visible. Under automatic operation, the

control value of the fan speed is the control value of HVAC.

External controller: With this option selected, the temperature control panel only sends the message to activate/deactivate the automatic mode to the bus. The specific control mode in the automatic mode is determined by the fan actuator or other bus device.

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

This parameter defines the minimum time for a fan speed to run.

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

0：Means that you can switch immediately.

Note:

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

Each fan speed (not including off) in the automatic mode needs to consider the minimum running time, and the fan speed under automatic operation is directly switched to the target fan speed, not step by step.

The conditions for the fan speed conversion when using the PI control method are as follows:

When the PI control mode is used, the control value is calculated by the PI inside the program, and the controller switches or switches the fan speed according to the threshold range in which the control value is located.

——Parameter "Threshold value OFF<-->speed 1 [1…255]"

This parameter defines the threshold for turning off the fan and speed 1. Options: 1...255

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

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

——Parameter "Threshold value speed 1<-->speed 2 [1…255]"

This parameter defines the threshold for switching the fan speed to speed 2, and if the control value is greater than or equal to the threshold set by the parameter, then speed 2 is run.

Options: 1 ... 255

——Parameter "Threshold value speed 2<-->speed 3 [1…255]"

This parameter defines the threshold for switching the fan speed to speed 3, and if the control value is greater than or equal to the threshold set by the parameter, then speed 3 is run.

Options: 1...255

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

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

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

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

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

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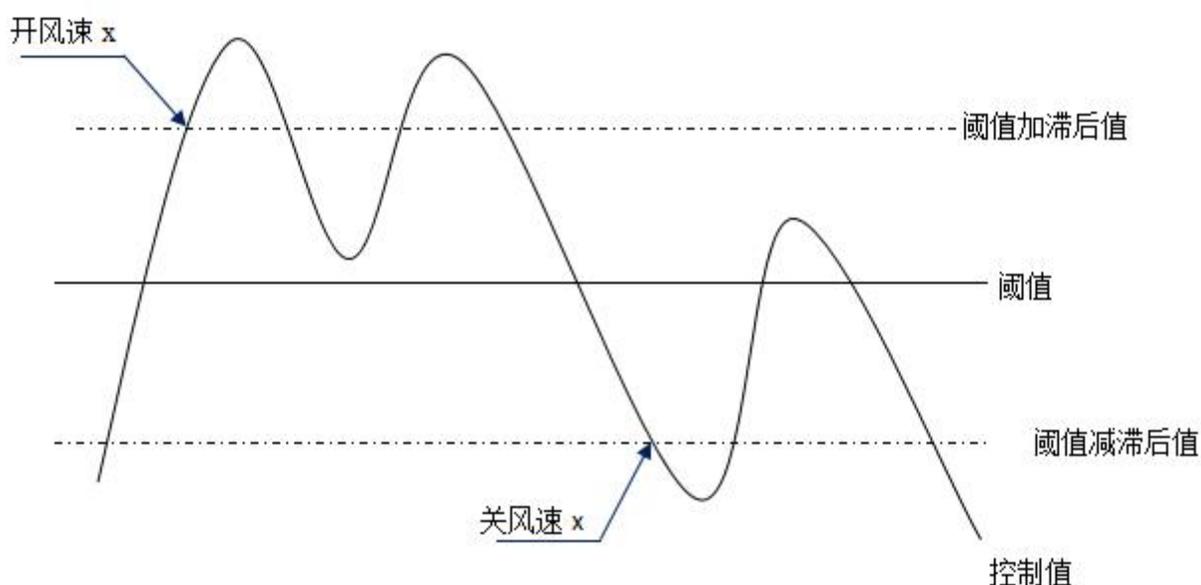
Note:

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

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

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

For example (1):

OFF <-> fan speed 1 threshold is 10%

Fan speed 1 <-> fan speed 2 threshold is 20%

Fan speed 2 <-> fan speed 3 threshold is 30%

Lag is 15%

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

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

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

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

For example (2):

OFF <-> fan speed 1 threshold is 10%

Fan speed 1 <-> fan speed 2 threshold is 40%

Fan speed 2 <-> fan speed 3 threshold is 70%

Lag is 5%

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

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

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

If the control value received is 39%, the new fan speed will be 1 (since 39% is between 10% and 40%, no need to consider hysteresis).

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

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

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

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

The conditions for the fan speed conversion when using the two-point switch control mode are as follows:

In the case of the 2-point control method, the controller determines the switch or fan speed of the fan based on the temperature difference between the actual temperature and the set temperature.

Under cooling: temperature difference = actual temperature - set temperature

Under heating: temperature difference = set temperature - actual temperature

Parameter "Temp. difference OFF<-->speed 1 [1..200]*0.1℃"

This parameter defines the temperature difference that switches the fan speed from off to speed 1. Options: 1...200

If the temperature difference is greater than or equal to the temperature difference set by the parameter, the running speed 1;

If it is less than this temperature difference, turn off the fan.

Parameter "Temp. difference speed 1<-->speed 2 [1..200]*0.1℃"

This parameter defines the temperature difference that switches the fan speed to speed 2. If the temperature difference is greater than or equal to the temperature difference set by the parameter, the speed 2 is run.

Options: 1...200

Parameter "Temp. difference speed 2<-->speed 3 [1..200]*0.1℃"

This parameter defines the temperature difference that switches the fan speed to speed 3. If the temperature difference is greater than or equal to the temperature difference set by the parameter, the speed is 3.

Options: 1 ... 200

Note: The controller evaluates these temperature differences in ascending order, that is, first check the temperature difference of OFF <-> fan speed 1, then fan speed 1 <-> fan speed 2, then fan speed 2 <-> fan speed 3 . The correctness of the function execution is only guaranteed in this case: OFF <-> fan speed 1 temperature difference is less than fan speed 1 <-> fan speed 2 temperature difference, fan speed 1 <-> fan speed 2 temperature difference is less than fan speed 2 <- >The temperature difference of fan speed 3.

——Parameter "Hysteresis Temp. difference in +/- [0..50]*0.1℃"

This parameter sets the hysteresis value of the temperature difference. The hysteresis can avoid unnecessary action of the fan when the temperature difference fluctuates near the temperature value defined by the parameter. Available options: 0...50

If it is 0, there is no hysteresis. Once the temperature difference is greater than the defined temperature difference, the fan will switch the fan speed immediately;

Assuming a hysteresis value of 0.5 ° C, the defined temperature difference is 1 ° C, then there will be a maximum temperature difference of 1.5 ° C (defined temperature difference + hysteresis value), the lower temperature difference of 0.5 ° C (definition temperature difference - hysteresis value), then when the temperature difference When it is between 0.5 °C and 1.5 °C, it will not cause the fan to operate, and will maintain the previous state.

Only less than 0.5 ° C or greater than (or equal to) 1.5 ° C will change the operating state of the fan. As shown below:
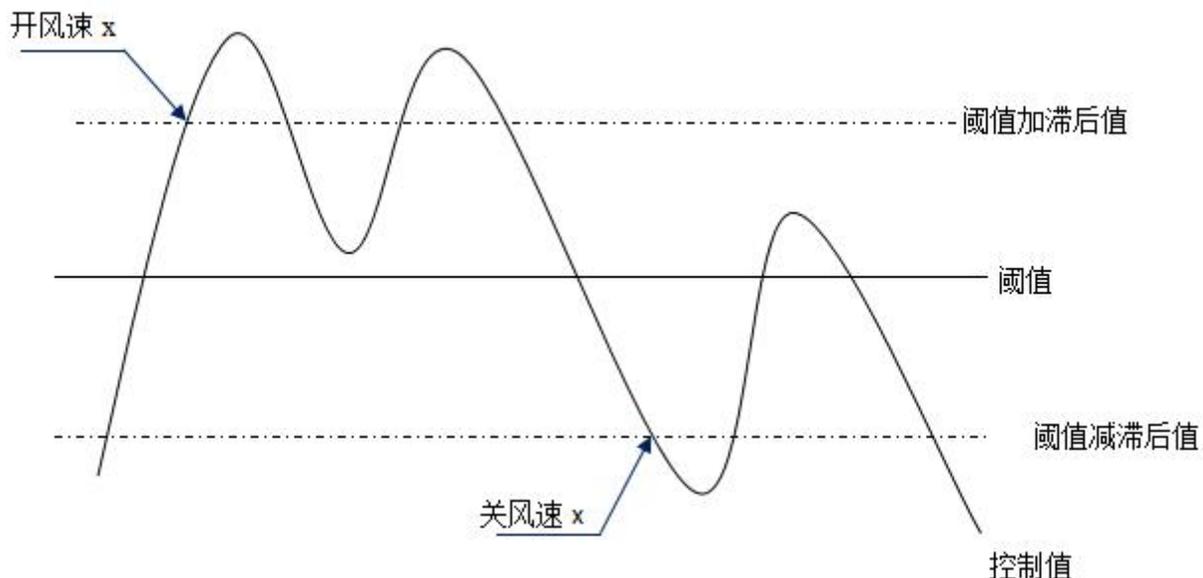
In the case of lag is enabled, if the temperature difference overlap occurs, the action of the fan is treated like the PI control mode.

5.8. Parameter window "Air Conditioner"

Figure 5.8_1"Air conditioner" parameter setting interface（Gateway Integrate _1bit）

Figure 5.8_2"Air conditioner" parameter setting interface（Gateway Integrate _1byte）

The "Air Conditioner" parameter setting interface is mainly used to set parameters related to air conditioning control. There are two types of air conditioning controls: IR Split Unit and Gateway Integrate.

The application of each parameter will be explained below:

Parameter"Power on/off function setting"

This parameter indicates: Whether the air conditioner's power on/off function is enabled depends on the setting of the button function. See the interface "Push button function" setting.

It should be noted that when the air conditioner type is a split type infrared air conditioner, the opening key must be enabled, and the setting of the air conditioner is meaningful.

Parameter"Actual temperature display by"

Used to set the source of the panel air conditioning interface temperature display. Options:

None

Internal sensor

External sensor

1st PT1000

2nd PT1000

When the internal sensor / PT1000 temperature sensor is selected, the temperature is determined by the

setting of the parameter interface "Temperature sensor". In addition, when the PT1000 is selected, the device must be connected to the PT1000 to be effective.

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

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

A read request is sent to the external temperature sensor after a bus reset or programming is completed.

Parameter"Control mode"

This parameter is used to set the control mode of the air conditioner. Options:

IR Split Unit

Gateway Integrate

The IR Split Unit is suitable for split infrared air conditioner.

The Gateway Integrate is suitable for air conditioning gateways.

Air conditioning gateway

The following parameters are visible when the air conditioning mode is set to Air Conditioning Gateway. The parameter interface of the air conditioning gateway is shown in Figure 5.8_1(2).

Parameter"Data type of mode"

Define the type of object that controls the air conditioning mode. Options:

1bit

1byte

——Parameter"Output value for Heat/Cool/Dry/Fan"

These parameters are visible when the air conditioning mode object type is "1byte" or "1bit", and define the value sent by switching to each mode.

Options: 0..255

Options: 0/1

Status feedback for mode

The following parameters are visible when the air conditioner mode object type is "1byte", and the status feedback values of each mode are set.

——Parameter"Status value for Heat/Cool/Dry/Fan"

These parameters are used to set the status feedback value of each mode, and the panel will update the icon status of the mode according to the received feedback value. Options: 0..255

Parameter"Date type of fan speed"

This parameter is used to set the data type of fan speed. Options:

1bit

1byte

——Parameter"Output value for fan speed auto/low/medium/high"

These parameters are visible when the fan speed object type is "1byte" and define the value that is sent to each fan speed. Options: 0..255

Status feedback for fan speed

The following parameters are visible when the fan speed object type is "1byte", and the state feedback values of each fan speed are set.

——Parameter"Status value for fan speed auto/low/medium/high"

These parameters are used to set the status feedback value of each fan speed, and the screen will update the status of the fan speed icon according to the received feedback value. Options: 0..255

Parameter"Data type of set point"

This parameter is used to set the data type of the temperature set point. Options:

1byte (real temperature value)

2byte (KNX standard DPT)

1 byte type: the message value is consistent with the temperature value.

2-byte type: it is KNX standard data type.

Parameter"Min. /Man. set temperature [16..32]℃"

These two parameters are used to limit the adjustable range of temperature set points. The minimum value set should be less than the maximum value.

If the temperature set value is outside the limit range, it will be output as the limit value.

Split Type Infrared (IR) air conditioner

General	Control mode	◉ IR Split Unit ○ Gateway Integrate
Push button function	Command No. for Power on (1~64,0=inactive)	1
Temperature sensor	Default mode for power on	Cool
Air Conditioner	Default setpoint for power on	25°C
Event Group & Logic	Default fan speed for power on	Auto
	Command No. for Power off (1~64,0=inactive)	2
	Default setpoint for Heat mode	16°C
	Default setpoint for Cool mode	26°C
	Command No. for Dry mode (1~64,0=inactive)	3
	Command No. for Fan mode (1~64,0=inactive)	4
	Command No. for fan speed-auto (1~64,0=inactive)	5
	Command No. for fan speed-low (1~64,0=inactive)	6
	Command No. for fan speed-mid. (1~64,0=inactive)	7
	Command No. for fan speed-high (1~64,0=inactive)	8
	Temperature setpoint on Heat	
	Command No. for setpoint 16°C (1~64,0=inactive)	16
	Command No. for setpoint 17°C (1~64,0=inactive)	17
	Command No. for setpoint 18°C (1~64,0=inactive)	18

Figure 5.8_3 *"Air conditioner" parameter setting interface (IR Split Unit)*

The following parameters are visible when the air conditioning mode is set to split infrared, which is used to set the value to be sent for each function command.

The actual message value is the value entered -1. The setting interface is shown in Figure 5.8_3

Parameters "Command No. for Power on (1~64, 0=inactive)"

When the air conditioner is turned on, the value of the message that the object "IR Split Unit Command" should send. Available options: 0...64, 0=inactive Other parameters similar to those set by this parameter will not be described here. When the default mode of the air conditioner is heating or cooling, the sent message value is the value of the corresponding default temperature (the temperature at this time is also limited by the maximum/minimum value).

The following three **parameters** are set when the air conditioner is turned on, the initial icon status displayed on the screen.

──Parameters "Default mode for power on"

Set the initial mode displayed on the panel when the air conditioner is turned on.Options:

Heat

Cool

Dry

Fan

──Parameters"Default setpoint for power on"

Set the initial set temperature displayed on the panel when the air conditioner is turned on.Options:

16℃

...

32℃

──Parameters"Default fan speed for power on"

Set the initial fan speed displayed on the panel when the air conditioner is turned on.Options:

Auto

Low

Medium

High

──Parameters "Default setpoint for Heat/Cool"

Set the initial set temperature displayed on the panel when switching to heating/cooling.Options:

16℃

...

32℃

The sent message value is the message **value** of the corresponding temperature (the temperature at this time is also limited by the maximum/minimum value).

5.9. Parameter window "Floor heating"

"Floor heating" parameter setting interface is shown in Figure 5.9, which mainly sets the parameters of the floor heating control.

Figure 5.9 "Floor heating" parameter setting interface

This parameter indicates whether the floor heating switch is enabled or not, depending on the setting of the button function. See the interface "Push button function" setting.

Parameters "Power on/off for floor heating"

Whether the floor heating switch is enabled. Options:

Disable

Enable

Disable: The floor heating switch is disable.

Enable: The floor heating switch can be used for the interface display and control of the on/off floor heating

control. When the display is turned off, the floor heating control is also turned off; when the display is turned on, the floor heating control is also started.

It should be noted that the power on/off function must be enabled and the setting of this parameter makes sense.

When the on/off button function is not enabled, the floor heating switch can only be controlled via the bus.

Parameters "Temperature reference from"

This parameter sets the source of the floor heating function temperature reference. Options:

Internal sensor

External sensor

1st PT1000

2nd PT1000

(1)Internal sensor combine with (2)External sensor

(1)Internal sensor combine with (2)1st PT1000

(1)Internal sensor combine with (2)2nd PT1000

(1)External sensor combine with (2)1st PT1000

(1)External sensor combine with (2)2nd PT1000

(1)1st PT1000 combine with (2)2nd PT1000

When the internal sensor and PT1000 temperature sensor are selected, the temperature is determined by the setting of the parameter interface "Temperature sensor". In addition, when the PT1000 is selected, the device must be connected to the PT1000 to be effective.

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

This parameter is visible when "...External sensor..." is selected in the previous parameter and is used to set the time period during which the device sends a temperature read request to the external temperature sensor. Available options: 0...255

A read request is sent to the external temperature sensor after a bus reset or programming is completed.

——Parameters "Combination ratio"

When the temperature acquisition is obtained by using a combined sensor, this parameter can be seen by setting the two sensors (1) and (2) to measure the specific gravity of the temperature. Options:

(1)10%/(2)90%

(1)20%/(2)80%

…

(1)90%/(2)10%

For example, the option is "(1)40%/(2)60%", then sensor (1) occupies 40% of the ratio, sensor (2) occupies 60% of the ratio, and control temperature = ((1) temperature × 40 %)+((2) temperature × 60%), the temperature control panel will perform temperature control according to the calculated control temperature, and the calculated control temperature is sent by the object "Actual temperature". This is the process of summing the temperatures

detected by the two temperature sensors.

When two sensors are combined, when one of the sensors fails, the temperature value detected by the other sensor is used.

Parameters "Floor status after bus recovery"

Set the switch state of the bus reset floor heating interface. Options:

> **OFF**
>
> **ON**
>
> **Before power off**

After the floor heating operation is turned on, the floor heating will perform a 2-point calculation based on the set value and the actual temperature difference to determine whether the heating is on or off.

Parameters "Default set temperature[5..37]℃"

Set the initial set temperature when the floor heating is turned on.Options: 5..37

Parameters "The value of object "Heating on/off""

Define the trigger value for the warm heating on/off.Options:

> **Heat on=1, Heat off=0**
>
> **Heat on=0, Heat off=1**

Parameters "Temperature control method"

Note the floor heating temperature control uses a two-point control method.

When the temperature is higher than a certain set temperature, the switch is turned off, and when it is lower than a certain set temperature, the switch is turned on.

——Parameters "Hysteresis[0..200]*0.1℃"

Used to set the hysteresis value of the set temperature.Options: 0..200

When the temperature is higher than the set temperature, the switch is turned off; when the temperature is lower than or equal to the set temperature-hysteresis value, the switch is turned on.

Parameters "Min. /Man. set temperature [5..37]℃"

Adjustable range for limiting temperature setpoints. The minimum value set should be less than the maximum value.

The temperature set value is outside the limit range and is output as a limit value.

Parameters "Scene function"

A scene function for enabling floor heating, a total of 5 scenes are available for setting.Options:

> **Disable**
>
> **Enable**

——Parameters "x->Assign scene NO. (1..64,0=inactive), x=1~5"

Used to set the scene number.Options: 0..64,0=inactive

——Parameters "Floor status"

Set the floor heating interface switch status of scene x.Options:

OFF

ON

——Parameters "Set temperature[5..37]℃"

Set the set temperature of scene x.Options: 5..37

Note: The new scene will be saved after bus power off.

5.10．Parameter window "Ventilation General"

"Ventilation General" parameter setting interface is shown in Figure 5.10, which mainly sets the parameters of the fresh air control.

Figure 5.10_1 "Ventilation General" parameter setting interface

Parameters "Ventilation Exhaust function"

Whether the exhaust function for setting the fresh air is enabled.Options:

Disable

Enable

Some new fans only support air inlet settings and do not support air outlet settings. Some new fan air inlets and air outlets can be set. The configuration of this function is to meet different needs. When "Enable" is selected, the following parameter setting interface 5.10_3 is visible.

Parameters "————Switchover between Ventilation and Exhaust"

This parameter indicates that the switching of the fresh air intake and exhaust functions is achieved by the long operation button 4.

The parameter setting interface 5.10_1 is used to configure the function of the fresh air inlet. The parameter functions are described as follows:

Parameters "Power on/off function setting"

This parameter indicates whether the opening of the fresh air is enabled or not, depending on the setting of the button function. See the interface "Push button function" setting.

Parameters "Power on/off for Ventilation"

Used to set the enable key of the fresh air enabled. Options:

Disable

Enable

Disable: The opening key of the fresh air is disable;

Enable: The opening key of the fresh air can be used to open/close the interface display and control of the fresh air control. When the display is turned off, the control of the fresh air is also turned off; when the display is turned on, the fresh air control becomes operational.

It should be noted that the switch key must be enabled and the setting of this parameter makes sense.

When the on/off button function is not enabled, the fresh air switch can only be controlled via the bus.

Parameters "Actual temperature display by"

Used to set the source of the panel fresh air interface temperature display. Options:

> **None**
>
> **Internal sensor**
>
> **External sensor**
>
> **1st PT1000**
>
> **2nd PT1000**

When the internal sensor / PT1000 temperature sensor is selected, the temperature is determined by the setting of the parameter interface "Temperature sensor". In addition, when the PT1000 is selected, the device must be connected to the PT1000 to be effective.

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

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

A read request is sent to the external temperature sensor after a bus reset or programming is completed.

Parameters "Ventilation status after bus recovery"

Set the switch state of the bus reset fresh air interface.Options:

> **OFF**
>
> **ON**
>
> **Before power off**

When the interface is open, the fresh air control can be operated.

Parameters "Default fan speed"

Set the initial fan speed when the fresh air is turned on. Options:

> **Low**
>
> **Medium**
>
> **High**

Parameters "Data type of Fan speed"

The type of data used to set the fan speed. Options:

> **1bit**
>
> **1byte**

——Parameters "Output value for fan speed off/low/medium/high"

Visible when the fan speed object type is "1byte", it defines the value sent by switching to each fan speed. Options: 0..255

——Parameters "Object value for fan speed off/low/medium/high"

When the fan speed object type is "1bit", it is defined to switch to the value sent by each fan speed, and is sent by three 1-bit objects at the same time. Options:

No.1=0, No.2=0, No.3=0

No.1=1, No.2=0, No.3=0

No.1=0, No.2=1, No.3=0

No.1=1, No.2=1, No.3=0

No.1=0, No.2=0, No.3=1

No.1=1, No.2=0, No.3=1

No.1=0, No.2=1, No.3=1

No.1=1, No.2=1, No.3=1

Status feedback for fan speed

——Parameters "Status value for fan speed off/low/medium/high"

When the fan speed object type is "1byte", it is used to set the state feedback value of each fan speed, and the panel will update the fan speed icon status according to the received feedback value. Available options: 0-255

——Parameters "Delay between fan speed switch [0..100]*50ms"

Define the conversion delay, the time can be considered according to the technical characteristics of the fan. Available options: 0...100

When switching the fan speed, first turn off the fan speed, and after the delay time and then open the fan speed, the message can be sent to the bus.

Parameters "Auto. operation function"

Automatic control for enabling fresh air. Options:

Disable

Enable

Enable: The following parameter setting interface 6.10_2 is visible.

Parameters "Scene function"

A scene function for enabling fresh air, a total of 5 scenes are available for setting. Options:

Disable

Enable

──Parameters "x->Assign scene NO. (1..64,0 = inactive), x=1~5"

Used to set the scene number. Options: 0..64,0=inactive

──Parameters "Fan level"

Set the fan speed status of scene x. Options:

Off

Low

Medium

High

Note: The new scene will be saved after bus power off.

5.10.1．V: Auto. Control

After the automatic operation is activated, the fresh air system will automatically adjust the fan speed according to the size of the control value.

The following parameters are visible when the automatic control function of the fresh air system is enabled. The parameter interface of the automatic control is shown in Figure 5.10_2:

Figure 5.10_2 "V: Auto. control" parameter setting interface (PM2.5)

Floor heating	Threshold value OFF<->speed low [1..4000]	450
Ventilation General	Threshold value speed low<->mid. [1..4000]	1000
V: Auto control	Threshold value speed mid.<->high [1..4000]	2000
Button 1	Hysteresis value is threshold value in +/- [100..400]	200

Figure 5.10_2 "V: Auto. control" parameter setting interface (CO2)

Parameters "Auto. Operation on object value"

Set the message value used to activate the automatic operation. Options:

0=Auto/1=Cancel

1=Auto/0=Cancel

0=Auto/1=Cancel: When the object "Automatic function, In/Out" receives the message value "0", the automatic operation is activated. When "1" is received, the automatic operation is exited*;*

1=Auto/0=Cancel: When the object "Automatic function, In/Out" receives the message value "1", the automatic operation is activated. When "0" is received, the automatic operation is exited.

Parameters "Control value reference from"

The source of control values used to set up automatic operations. Options :

PM2.5 (ug/m3)

CO2 (ppm)

Parameters "Period for request control value [0..255]min"

Used to set the time period during which the screen sends a control value read request to an external sensor. Available options: 0...255

Parameters "The speed status when the control value error"

Sets the fan speed that the fresh air is turned on by default when an error occurs in the control value. Options:

Off

Low

Medium

High

Note: When reading the control value to an external sensor, if there is no response, the default external sensor is faulty and the control value is wrong

Parameters "Threshold value OFF<-->speed Low[1..999]/ [1...4000]"

Define thresholds for fan turbines and low fan speeds. Options: 1...999/1...4000

If the control value is greater than or equal to the threshold set by this parameter, the low fan speed is run; if the control value is less than this threshold, the fan is turned off

——Parameters "Threshold value speed low<-->medium[1..999]/ [1...4000]"

Defines the threshold for switching the fan speed to the mid-range fan speed. If the control value is greater than or equal to the threshold set by this parameter, the mid-speed fan speed is run. Options: 1...999/1...4000

——Parameters "Threshold value speed medium<-->high[1..999]/ [1...4000]"

Define the threshold for switching the fan speed to the high-speed fan speed. If the control value is greater than or equal to the threshold set by this parameter, the high-speed fan speed is run. Options: 1...999/1...4000

Note:The controller evaluates the threshold in ascending order.

First check → OFF <-> low fan speed threshold → low fan speed <-> medium fan speed → middle speed <-> high fan speed.

The correctness of the function execution is only guaranteed in this case:

OFF <-> The threshold of low fan speed is less than the threshold of low fan speed <-> middle fan speed, and the threshold of low fan speed <-> middle fan speed is less than the threshold of middle speed <-> high fan speed.

——Parameters "Hysteresis value is threshold value in +/- [10...30]/[100..400]"

To set the hysteresis value of the threshold, which can avoid unnecessary action of the fan when the control value fluctuates near the threshold.

Options: 10...30/100..400

For example, the control value is PM2.5, the hysteresis value is 10, the threshold value is 35, the upper limit threshold is 45 (threshold + hysteresis value), and the lower limit threshold is 25 (threshold-lag value). When the control value is between 25 and 45, it will not causes the action of the fan to maintain the previous state.

Only the value below 25 or equal or above 45 will change the operating state of the fan. As shown below:
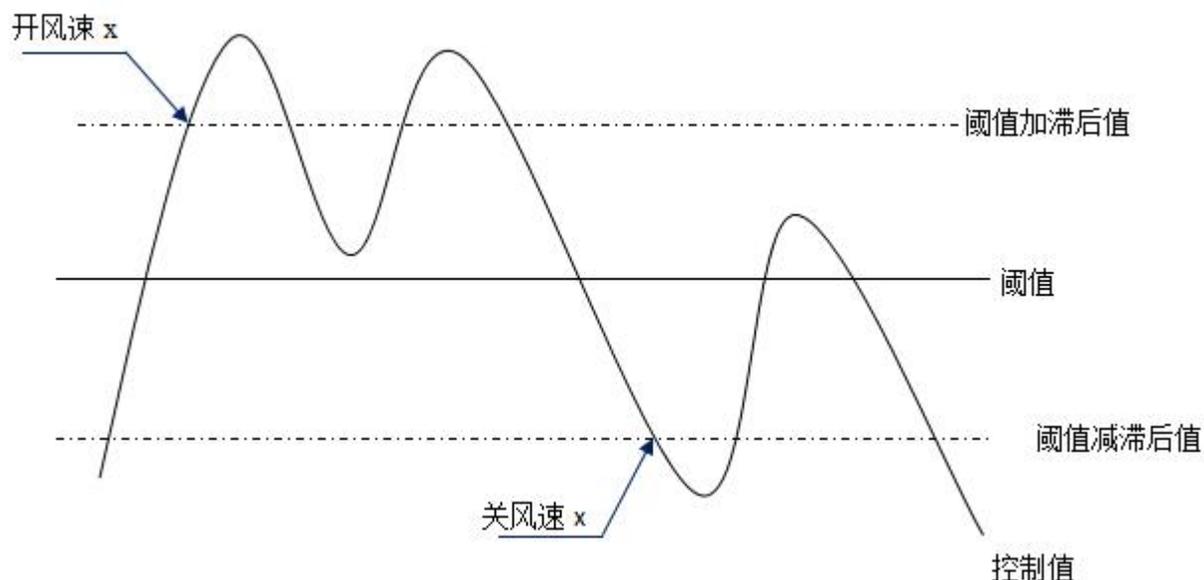
Note:

When the hysteresis is enabled, if the threshold overlap occurs, the action of the fan is as follows:

1) The lag determines the control point at which the fan speed transition occurs;

2) If fan speed transition occurs, the new fan speed is determined by the control value and the threshold, without considering the hysteresis.

For example(1):

    PM2.5

    OFF <-> low fan speed threshold is 35

    Low fan speed <-> mid-fan speed threshold is 55

    Stroke speed <-> high fan speed threshold is 75

    The lag is 25

The action of the fan when the fan speed rises from OFF:

The fan OFF state will change at a control value of 60 (≥25+35), and the new fan speed will be the mid-fan speed (because 60 is between 55 and 75, there is no need to consider hysteresis), so the low fan speed is ignored;

The behavior of the fan's fan speed as it descends from high fan speed:

The high fan speed of the fan will change at a control value of 50 (<75-25), and the new fan speed will be a low fan speed (because 50 is between 35 and 55, there is no need to consider hysteresis), so the mid-fan speed is ignored.

For example(2):

PM2.5

    OFF <-> fan speed 1 threshold is 20

Fan speed 1 <-> fan speed 2 threshold is 40

Fan speed 2 <-> fan speed 3 threshold is 70

The lag is 10

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

The fan OFF state will transit at a control value of 30 (≥20+10).

If the received control value is 41, the new fan speed will be the mid-fan speed (because 41 is between 40 and 70, there is no need to consider hysteresis)

Therefore the low fan speed is ignored;

If the received control value is 39, the new fan speed will be a low fan speed (because 39 is between 20 and 40, there is no need to consider hysteresis).

The behavior of the fan's fan speed when it descends from high fan speed:

The high fan speed of the fan will transit at a control value of 60 (<70-10).

If the received control value is 39, the new fan speed will be low fan speed (because 39 is between 20 and 40, there is no need to consider hysteresis)

Therefore, the mid-fan speed is ignored.

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

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

To define the dwell time before the fan switches from the current fan speed to a higher or lower fan speed, which is the minimum time for a fan speed operation.

If you need to switch to another fan speed, you have to wait for this time before you can switch.

If the current fan speed has been running for a long enough time, the fan speed can be switched quickly. Available options: 0...65535

0: Indicates that there is no minimum running time, but it is necessary to consider the delay switching time of the fan speed.

Note: The dwell time set by this parameter is only enabled in auto mode.

Each fan speed (including off) in the automatic mode needs to consider the minimum running time, and each fan speed runs after the minimum running time. At the same time, the delay time of the fan speed switching needs to be considered.

5.10.2．Ventilation Exhaust

The parameter setting interface 5.10_3 is used to configure the function of the fresh air exhaust port, similar to the function of the air inlet. The difference is that the air exhaust does not have the automatic operation function setting. This section no longer describes the parameter setting of the ventilation exhaust, please refer to description of the parameters of the air inlet.

Figure 5.10_3 "Ventilation Exhaust"Parameter Setting Interface

5.11. Parameter window "Event Group & Logic"

The "Event Group & Logic" parameter setting interface is shown in Figure 5.11. It is used to enable event group and logic functions. There are 4 groups of event functions that can be set, and each group has 8 outputs, as shown in Figure 5.12. There are 8 logic functions available for setup, as shown in Figure 5.13 below.

General	Event Group 1 Function ◉ Disable ○ Enable
Push button function	Event Group 2 Function ◉ Disable ○ Enable
Temperature sensor	Event Group 3 Function ◉ Disable ○ Enable
	Event Group 4 Function ◉ Disable ○ Enable
Event Group & Logic	
	1st Logic function ◉ Disable ○ Enable
	2nd Logic function ◉ Disable ○ Enable
	3rd Logic function ◉ Disable ○ Enable
	4th Logic function ◉ Disable ○ Enable
	5th Logic function ◉ Disable ○ Enable
	6th Logic function ◉ Disable ○ Enable
	7th Logic function ◉ Disable ○ Enable
	8th Logic function ◉ Disable ○ Enable

Figure 5.11 "Event Group setting -- disable/enable" parameter Setting Interface

Parameter"Event Group x Function (x: 1~4)"

To enable event group function. Options:

> **Disable**

> **Enable**

When an event group function is enabled, the eight output configuration parameters of the group are visible.

Parameter"X Logic function (X:1~8)"

To enable logic function. Options:

> **Disable**

> **Enable**

When a logic function is enabled, the configuration parameters of the logic function are visible.

5.12. Parameter window "Event Group setting"

The event group parameter setting interface is shown in Figure 5.12.

Since the functions of the four groups are the same, so are the eight output functions in the group, so we take parameter description of only one group as an example:

Figure 5.12 "G x: Output y Function" parameter setting interface

Parameter"Object type of output y (y:1~8)"

To define the object type of the output y in this group.

> **1bit**
>
> **1byte**
>
> **2byte**

Parameter"z->Output y trigger scene NO. is(1~64,0=inactive)"   (z:1~8)

To set the scene No., which can trigger the output y. It support maximum 8 scenes of each output.The options:0..64，0=disable.

The range of output value is determined by the datatype of output y. 1bit 0..1/1byte 0..255/ 2byte 0..65535

Parameter"Object value of output y (0..1/0..255/0..65535)"

To set the output value, the range of values is determined by the object type of the output y.

Parameter " Delay time for sending [0..255]*0.1s "

To set the delay time for sending the output value to the bus. Options: 0..255

5.13. Parameter window "Logic function setting"

"Logic function" parameter setting interface is shown as Figure 5.13.

Figure 5.13_1 "Logic function -- AND/OR/XOR" parameter setting interface

Parameter"Function of channel"

To set the logic function of this channel. Options:

AND

OR

XOR

Gate forwarding

Threshold comparator

Format convert

AND/OR/XOR: The parameters are similar to the communication objects. Only the logic algorithm is different. We take parameters of one option described below as an example.

5.13.1．"AND/OR/XOR" Function

Parameter"Input a/b/c/d/e/f/g//h"

To set whether the logic input "input x" participates in the operation, whether it is a normal participation operation or a inverted participation operation. Options:

Disconnected

Normal

Inverted

Disconnected: not connected, no participation in the operation;

Normal: The input value directly participates in the operation;

Inverted: Inverts the input value and participates in the operation. **Note: Do not invert the initial value**

Parameter"Default value"

To set the default value of logic input x. Options：

0

1

Parameter"Result is inverted"

To set whether to invert the logical operation result. Options:

No

Yes

No: direct output;

Yes: Invert and output.

Parameter"Read input object value after bus voltage recovery"

To set whether to send a read request to the logic input object after the bus reset or after programming. Options:

No

Yes

Parameter"Output send when"

To set the conditions for sending logical operation results. Options:

Receiving a new telegram

Every change of output object

Receiving a new telegram：

Every change of output object：

Receiving a new telegram: Every time when a new logical input value is received, the logical result is sent to the bus;

Every change of output object: When the logical result changes, it is sent to the bus.

Note: When the logic operation is performed for the first time, the logical operation result will be sent even when it does not change.

Parameter "Send delay time"

Base:

        None

        0.1s

        1s

        ...

        10s

        25s

Factor: **1..255**

To use to set the delay time for sending logical operation results to the bus.

Delay = Base x Factor, if the Base option is "None", there is no delay.

5.13.2. "Gate forwarding" Function

Figure 5.13_2"Logic function -- Gate forwarding" parameter setting interface

Parameter"Object type of Input/Output"

To set the object type of the input/output object. Options:

1bit

4bit

1byte

Parameter"Default scene NO. Of Gate after startup (1..64, 0=inactive)"

After the device is started, the scenario of logical gate forwarding can be performed by default. This scenario needs to be configured in the parameters.

Options: 1..64,0=inactive

Parameter"z->Gate trigger scene NO. is(1..64,0=inactive)" (z:1~8)

To set the scene number of logic gate forwarding. Each logic can trigger maximum 8 scenes. Options: 1..64, 0=inactive.

Parameter"Input A/B/C/D send on"

To set the output after gate forwarding input. Options:

Output A

Output B

..

Output B,C,D

Usually the input value is the same as the output value, and depending on the option, one input can be forwarded to single or multiple outputs.

Note: Select the door scene before operation, otherwise the default scene will be activated.

5.13.3. "Threshold comparator" function

Figure 5.13_3"Logic function -- Threshold comparator" parameter setting interface

Parameter"Threshold value data byte"

To set the data type of the threshold value. Options:

> **4bit**
>
> **1byte**
>
> **2byte**
>
> **4byte**

Parameter"Threshold value...."

To set the threshold value, the range of the threshold value is determined by the data type. 4bit 0..15/1byte 0..255/ 2byte 0..65535 /4byte 0..4294967295

Parameter"If Object value<Threshold value"

Parameter "If Object value=Threshold value"

Parameter "If Object value!=Threshold value"

Parameter "If Object value>Threshold value"

Parameter "If Object value<=Threshold value"

Parameter "If Object value>=Threshold value"

These parameters are used to set the logical result value should be sent when the input object threshold value is less than, equal to, not equal to, larger than, less than or equal to, or larger than or equal to the set threshold.

Options:

Do not send telegram

Send value "0"

Send value "1"

Do not send telegram: Regardless of the parameters that select this option;

Send value "0"/"1"： When the condition is met, value is 0 or 1 is sent.

If there is a conflict between the parameter setting options, the value sent when meets final parameter condition should prevail.

For example: the parameter "If Object value=Threshold value" sets the Send value "0",

The parameter "If Object value<=Threshold value" sets the Send value "1",

When the object value is equal to the threshold, the logical result will send the value "1".

Parameter"Output send when"

To set the conditions for sending logical operation results. Options:

Receiving a new telegram
Every change of output object

Receiving a new telegram： Each time an object receives a new input value, the result is sent to the bus;

Every change of output object： Only when the logic result changes, the result will be sent to the bus.

Note: When the logic operation is performed for the first time, the logical operation result will be sent even when it does not change.

Parameter"Send delay time"

Base:

None

0.1s

1s

...

25s

Factor: 1..255

It's used to set the delay time for sending logic operation results to the bus. Delay = Base x Factor, if the Base option is "None", there is no delay.

5.13.4. "Format convert" Function

Figure 5.13_4 "Logic function -- Format convert" parameter setting interface

Parameter"Format convert type"

To set the format convert type. Options:

         2x1bit-->1x2bit

         8x1bit-->1x1byte

         1x1byte-->1x2byte

         2x1byte-->1x2byte

         2x2byte-->1x4byte

         1x1byte-->8x1bit

         1x2byte-->2x1byte

         1x4byte-->2x2byte

         1x3byte-->3x1byte

         3x1byte-->1x3byte

Parameter"Output send when"

To set the conditions for sending logical results. Options:

         Receiving a new telegram

         Every change of output object

Receiving a new telegram： Each time an object receives a new input value, the result is sent to the bus;

Only when the logic result changes, the result will be sent to the bus.

Note: When the logic operation is performed for the first time, the logical operation result will be sent even when it does not change.

5.14. Parameter window "Switch sensor"

When the button function is set to "Switch sensor" in section 5.2, the following interface can be configured.

This section mainly describes the functions of the buttons as normal switch buttons, details as follows:

5.14.1. "Switch" Function

The Switching parameter setting interface is shown in Figure 5.14_1. Through this application, the user can send a switch telegram through operating switch button or long and short operation.

Figure 5.14_1 "Button x_Switch" parameter setting interface

Parameter"Function of Button"

This parameter sets the function of the button. Options:

> **Switch**
>
> **Switch/Dimming**
>
> **Value output**
>
> **Scene control**
>
> **Blind**

This section mainly describes the functions of the "Switch".

Parameter "Reaction on short operation"

To set the reaction on short operation of the button, when the input is determined, the object value is immediately updated. Options:

> **No action**
>
> **OFF**
>
> **ON**
>
> **TOGGLE**

No action: No message is sent.

OFF: Send an OFF message;

ON: Send ON message;

TOGGLE: Each operation will switch between on and off. For example, if the last message sent (or received) is a switch-on message, then this operation will trigger a message to be sent off. When the switch is operated again, an open message will be sent. So the switch will always remember its last state, and converts to another value when operated.

Parameter"Long operation function"

This parameter is used to enable long operation of the button. Options:

> **Disable**
>
> **Enable**

Enable： The operation can be determined as a long or short operation after the operation lasts for a certain time, then the contact performs the set action.

——Parameter"Long operation after [3..25]*0.1s"

This parameter is visible when long operation function is enabled, where the effective time for long operations is set. If the key operation time exceeds the time set here, the operation is determined to be a long operation, otherwise it is a short operation. Options: 3..25

Parameter"Reaction on long operation"

To set the reaction on long operation of the button. When the input is determined, the object value is immediately updated. Options:

> **OFF**
>
> **ON**
>
> **TOGGLE**

The option function is the same as the description of the parameter "Reaction on short operation".

Parameter "Disable function"

To set whether to enable the disable function of the button. Options:

> **Disable**
>
> **Enable**

Enable:The button can be disabled or enabled through object. The default setting is enabled after downloading.

This parameter is not described below, the usage is similar.

——Parameter"Trigger value of disable object"

To set the trigger value of disable/enable button. Options:

> **Disable=1/enable=0**
>
> **Disable=0/enable=1**

This parameter is not described below, the usage is similar.

5.14.2．"Switch/Dimming" Functions

The parameter setting interface is shown in Figure 5.14_2.

Figure 5.14_2 "Button x_Switch/Dimming" parameter setting interface

Parameter "Long operation after [3..25]*0.1s"

To set the effective time for long operation. If the key operation time exceeds the time set here, the operation is determined to be a long operation, otherwise it is a short operation. Options: 3..25

Parameter "Reaction on short operation"

To set the reaction on short operation of the button. Options:

   No action

   OFF

   ON

   TOGGLE

No action：No message is sent;

OFF：Send an OFF message;

ON：Send an OPEN message;

TOGGLE：Each operation will switch between on and off.

Parameter "Reaction on long operation"

This parameter sets the relative dimming value,brighter or darker when there is long operation, the dimming stops when the button is released. Options:

   No action

   Brighter

   Darker

Brighter/darker

No action：Short operation processing;

Brighter：Sends a message to dim up.

Darker：Send an message to dim down;

Brighter/darker：Each operation will switch between dim brighter or dim darker.

Note: In the parameter setting of switch and relative dimming, when one of the options is "TOGGLE", there will be a linkage relationship between them. For example, if the switch object receives a switch ON state, then the next dimming performance will be darker. If an OFF state is received, it will be dimmed brighter when dimming. (Linked to the receiving value of the switch object)

Parameter "Dimming mode"

To the relative dimming mode, whether it is the start-stop dimming mode or the step dimming mode. Options:

Start-stop dimming

Step dimming

Start-stop dimming ：The relative dimming mode is the start-stop dimming mode. A brighter or darker dimming message is sent during dimming, and a stop message is sent when dimming finishes. In the start-stop dimming mode, the dimming message does not need to be sent cyclically.

Step dimming ：The relative dimming mode is a step-by-step dimming mode. The dimming message is cyclically transmitted. When the dimming is finished, the stop dimming message is sent immediately.

——Parameter "Step size"

Under Step dimming mode, this parameter is used to set a cyclically sending dimming telegram which changes the brightness percentage, Options:

100%

50%

……

1.56%

——Parameter "Interval for Cyclic send dimming Telegram [0..25, 0＝send once]*0.1s"

Under Step dimming mode, this parameter is used to set intervals of two cyclically sending dimming telegram, the range is from 0 to 25, 0 means the telegram will be sent once only.

5.14.3．"Value/Forced output" Function

The parameter setting interface of "Value/Force output" is shown in Figure 5.14_3.
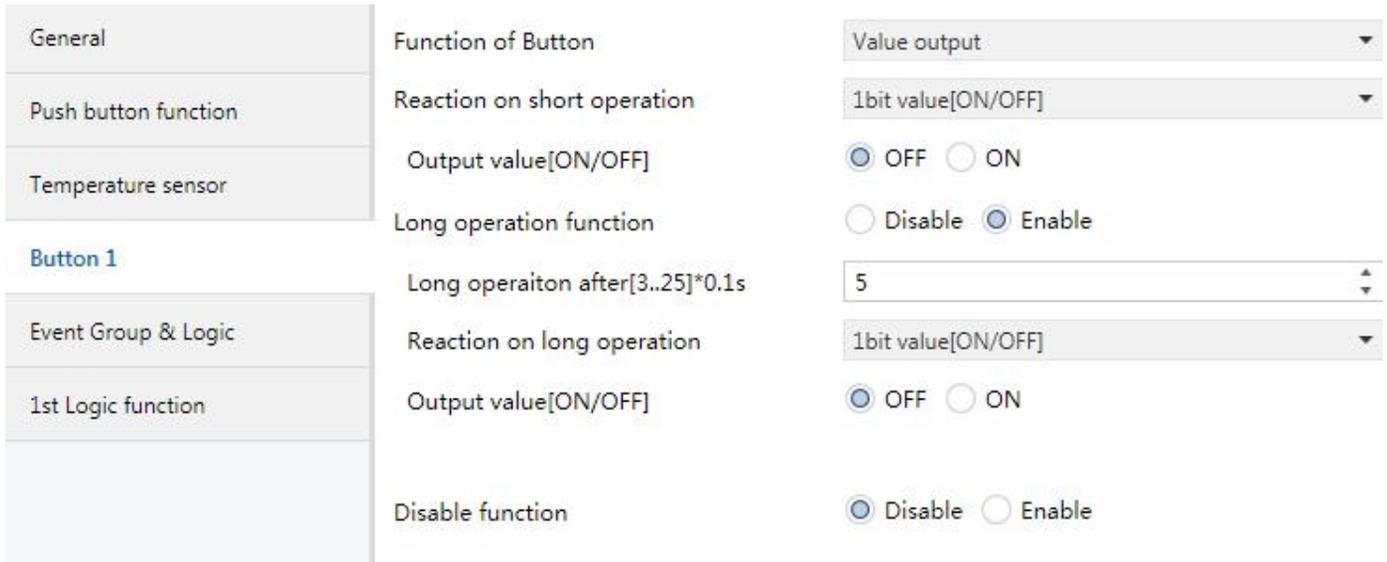
Figure 5.14_3 "Button x_Value output" parameter setting interface

Parameter "Reaction on short operation"

Here set the data type sent when button is operated in short operation. Options:

No action

1bit value [ON/OFF]

……

2 byte value [0…65535]

──Parameter"Output value[…]"

This parameter is used to define the data value sent after operation, range of the value is defined by the above parameter data type.

Parameter"Long operation function"

This parameter is used for enable long operation of the button. Options:

Disable

Enable

Enable： long or short operation can be confirmed only after a certain amount of time, and the contact will execute setup actions.

──Parameter"Long operation after [3..25]*0.1s"

This parameter is visible when long operations are enabled, and set the valid time for long operation here. Therefore, when the operating time of rocker switch surpasses the setting time here, the operation is defined as long operation, otherwise, it's considered as short operation. Options: 3..25

This parameter is used to set the data type when button is operated in long operation. Options:

1bit value [0...1]

……

2 byte value [0…65535]

The option function is the same as the description of the parameter "Reaction on short operation".

——Parameter"Output value[…]"

This parameter is used to define the data value sent after operation, range of the value is defined by the above parameter data type.

5.14.4．"Scene control" Function

The parameter setting interface "Scene control" is shown in Figure 5.14_4.
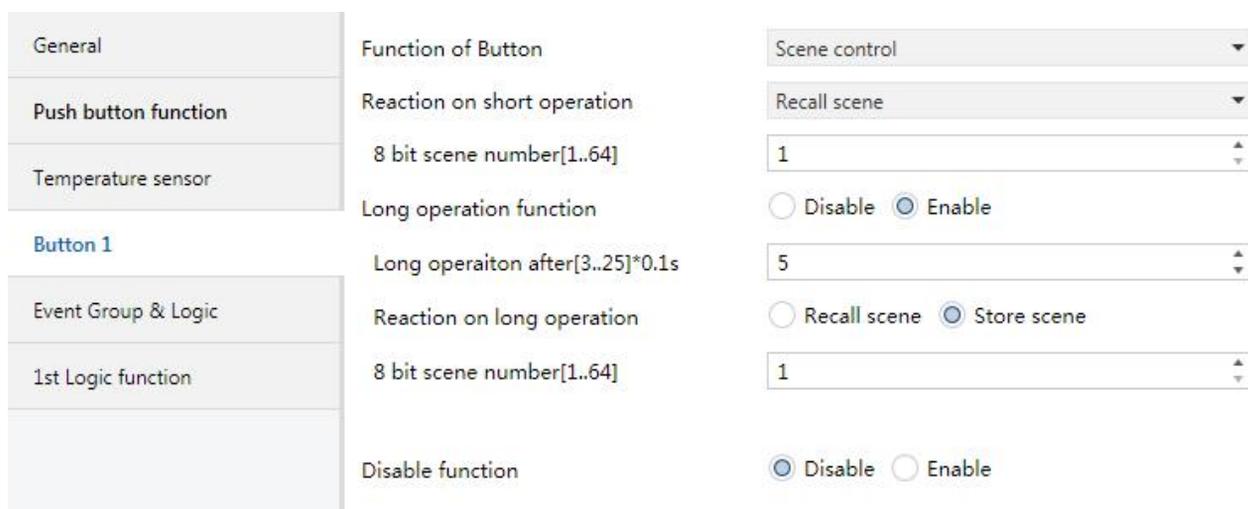
Figure 5.14_4　"Button x_Scene control" parameter setting interface

Parameter "Reaction on press the button"

This parameter is used to set the reaction for the scene use or storage when button is operated in short operation, Options :

No action

Recall scene

Store scene

——Parameter"8 bit scene number (1..64)"

This parameter is used to set the scene number, range No.1~64 is correspondent to telegram 0~63.

Parameter"Long operation function"

This parameter is used to enable long operation of button. Options:

Disable

Enable

Enable: long or short operation can be confirmed only after a certain amount of time, and the contact will execute setup actions.

——Parameter"Long operation after [3..25]*0.1s"

This parameter is visible when long operations are enabled, and set the valid time for long operation here. Therefore, when the operating time of rocker switch surpasses the setting time here, the operation is defined as long operation, otherwise, it's considered as short operation. Options: 3..25

Parameter "Reaction on long operation"

This parameter is used to set the reaction for the scene use or storage when button is operated in long operation, Options :

Recall scene

Store scene

The option function is the same as the description of the parameter "Reaction on short operation".

——Parameter"Scene number(1..64)"

This parameter is used to set the scene number, range No.1~64 is correspondent to telegram 0~63.

5.14.5. "Blind" Function

The parameter setting interface "Blind" is shown in Figure 5.14_5.
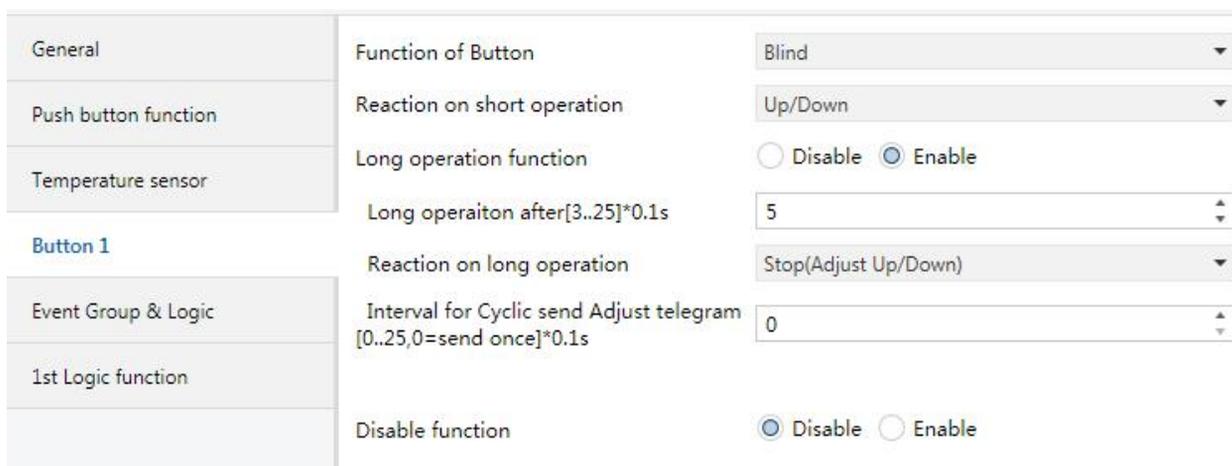
Figure 5.14_5   "Button x_Blind" parameter setting interface

Parameter "Reaction on short operation"

This parameter is used to set the actions when the button is operated in short operation, Options:

No action

Up

Down

Up/Down

Stop (Adjust Up)

Stop (Adjust Down)

Stop (Adjust Up/Down)

No action: no action is performed.

Up:the shutter/blinds will be opened or moved up;

Down: the shutter/blinds will be closed or moved down;

Up/Down:alternately open/close or move up/down the shutter/blinds

Stop (Adjust Up):stop the shutter movement or move up one angle of blinds;

Stop (Adjust Down): or move down the angle of blinds;

Stop (Adjust Up/Down): Stop the shutter movement or move up/down the angle of blinds alternately.

Parameter"Long operation function"

This parameter is used to enable long operation of the button. Options:

Disable

Enable

Enable: long or short operation can be confirmed only after a certain amount of time, and the contact will execute setup actions.

——Parameter"Long operation after [3..25]*0.1s"

This parameter is visible when long operations are enabled, and set the valid time for long operation here. Therefore, when the operating time of rocker switch surpasses the setting time here, the operation is defined as long operation, otherwise, it's considered as short operation. Options: 3..25

Parameter"Reaction on long operation"

This parameter is used to set the actions when the button is operated in long operation. Options:

Up

Down

Up/Down

Stop (Adjust Up)

Stop (Adjust Down)

Stop (Adjust Up/Down)

The option function is the same as the description of the parameter "Reaction on short operation".

——Parameter"Interval for Cyclic send Adjust telegram[0..25, 0＝send once]*0.1s"

This parameter is visible when last one is chosen as "Stop...", it is used to set the time interval of cyclical blinds angle adjustment telegram sent, Options are 0..25, 0 means sent once only.

Chapter 6 Communication object description

The medium for One devices communicate with other devices on the bus is Communication object, each communications object is detailed below.

Note: in the property column in the table below "C" Communications represents a communication object functionality is enabled, the "W" On behalf of a distribution object to rewriting across the bus, "R"On behalf of a distribution object's value can be read via the bus, "T" Represents a communication object with transfer function, "U" On behalf of a distribution object's value can be updated.

6.1."General" communication object description

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Panel block			1 bit	C	-	W	-	-	enable	Low

Fig.6.1 "General" communication object

Object No.	Function	Communication object name	Type	Property	DPT
1	Panel block	General	1bit	C,W	1.003 enable
This communication object is used to lock the panel through the bus. After locking, the operation of the panel buttons becomes invalid, except for the button operations for entering the programming mode. Message value: 0 —— Unlock 1 —— lock button operation					

Table 6.1 "General" communication object table

6.2."Temperature sensor" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
2	Temperature measurement	Internal temperature			2 bytes	C	R	-	T	-	temperatu...	Low
3	Temperature measurement	Internal Temp. error output			1 bit	C	R	-	T	-		Low
4	Temperature measurement	1st PT1000 sensor value			2 bytes	C	R	-	T	-	temperatu...	Low
5	Temperature measurement	1st PT1000 sensor error output			1 bit	C	R	-	T	-		Low
6	Temperature measurement	2nd PT1000 sensor value			2 bytes	C	R	-	T	-	temperatu...	Low
7	Temperature measurement	2nd PT1000 sensor error output			1 bit	C	R	-	T	-		Low
187	Internal sensor	Temp.correction(-10..10)°C			2 bytes	C	-	W	-	-	temperatu...	Low

Figure 6.2 "Temperature sensor" communication object

Object No.	Function	Communication object name	Type	Property	DPT
2	Internal temperature	Temperature measurement	2byte	C,R,T	9.001 temperature
The communication object is used to send the temperature value of internal sensor to the bus. The value ranges: -9.9~80°C					
3	Internal Temp.error output	Temperature measurement	1bit	C,R,T	1.005 alarm
When an error occurs in the built-in temperature sensor of the panel, this object will send a telegram to the bus to report an error. The object value is determined by the parameter settings.					

4	1st PT1000 sensor value	Temperature measurement	2byte	C,R,T	9.001 temperature
This communication object is used to send the temperature value obtained by external temperature sensor 1st PT1000 interface. The value ranges: -9.9~80°C					
5	1st PT1000 sensor error output	Temperature measurement	1bit	C,R,T	1.005 alarm
When an error occurs in the 1st PT1000 temperature sensor, this object will send a telegram to the bus to report the error. The object value is determined by the parameter settings.					
6	2nd PT1000 sensor value	Temperature measurement	2byte	C,R,T	9.001 temperature
This communication object is used to send the temperature value obtained by external temperature sensor 2nd PT1000 interface. The value ranges: -9.9~80°C					
7	2nd PT1000 sensor error output	Temperature measurement	1bit	C,R,T	1.005 alarm
When an error occurs in the 2nd PT1000 temperature sensor, the object will send a telegram to the bus to report the error. The object value is determined by the parameter settings.					
187	Temp.correction(-10..10)°C	Internal sensor	2Byte	C,W	9.001 temperature
The communication object is used to correct the temperature measurement value of the built-in temperature sensor of the panel through the bus.					

Table 6.2 "Temperature sensor" communication object table

6.3."HVAC" communication object

Number	Name	Object Function	Description	Group Add	Length	C	R	W	T	U	Data Type	Priority
8	HVAC General	Power on/off			1 bit	C	-	W	T	U	switch	Low
9	HVAC General	External Temp. sensor,In			2 bytes	C	-	W	T	U	temperature (°C)	Low
10	HVAC Setpoint	Setpoint adjustment,In			2 bytes	C	-	W	-	-	temperature (°C)	Low
11	HVAC General	Switch Heat/Cool mode,In			1 bit	C	-	W	-	U	cooling/heating	Low
12	HVAC General	Comfort mode,In			1 bit	C	-	W	-	-	enable	Low
13	HVAC General	Night mode,In			1 bit	C	-	W	-	-	enable	Low
14	HVAC General	Frost/Heat protection,In			1 bit	C	-	W	-	-	enable	Low
15	HVAC General	Standby mode,In			1 bit	C	-	W	-	-	enable	Low
16	HVAC Fan	Fan speed 1,In			1 bit	C	-	W	-	U	switch	Low
17	HVAC Fan	Fan speed 2,In			1 bit	C	-	W	-	U	switch	Low
18	HVAC Fan	Fan speed 3,In			1 bit	C	-	W	-	U	switch	Low
19	HVAC Fan	Fan speed off,In			1 bit	C	-	W	-	U	switch	Low
20	HVAC Fan	Fan Automatic operation,In			1 bit	C	-	W	-	U	enable	Low
21	HVAC Setpoint	Instantaneous setpoint,Out			2 bytes	C	R	-	T	-	temperature (°C)	Low
22	HVAC General	Heat/Cool mode,Out			1 bit	C	R	-	T	-	cooling/heating	Low
23	HVAC General	Comfort mode,Out			1 bit	C	-	-	T	-	enable	Low
24	HVAC General	Night mode,Out			1 bit	C	-	-	T	-	enable	Low
25	HVAC General	Frost/Heat protection,Out			1 bit	C	-	-	T	-	enable	Low
26	HVAC General	Standby mode,Out			1 bit	C	-	-	T	-	enable	Low
27	HVAC Controller	Heat control value,Out			1 bit	C	-	-	T	-	switch	Low
28	HVAC Controller	Cool control value,Out			1 bit	C	-	-	T	-	switch	Low
29	HVAC Fan	Fan speed 1,Out			1 bit	C	-	-	T	-	switch	Low
30	HVAC Fan	Fan speed 2,Out			1 bit	C	-	-	T	-	switch	Low
31	HVAC Fan	Fan speed 3,Out			1 bit	C	-	-	T	-	switch	Low
32	HVAC Fan	Fan speed off,Out			1 bit	C	-	-	T	-	switch	Low
33	HVAC Fan	Fan Automatic operation,Out			1 bit	C	-	-	T	-	enable	Low
12	HVAC General	HVAC mode,In			1 byte	C	-	W	-	-	HVAC mode	Low
23	HVAC General	HVAC mode,Out			1 byte	C	R	-	T	-	HVAC mode	Low

	16	HVAC Fan	Fan speed,In	1 byte	C	-	W	-	U	counter pulses (0..255)	Low
	29	HVAC Fan	Fan speed,Out	1 byte	C	-	-	T	-	counter pulses (0..255)	Low
	16	HVAC Fan	Fan ON/OFF,In	1 bit	C	-	W	-	U	switch	Low
	29	HVAC Fan	Fan ON/OFF,Out	1 bit	C	-	-	T	-	switch	Low
	27	HVAC Controller	Heat/Cool control value,Out	1 bit	C	-	-	T	-	switch	Low
	27	HVAC Controller	Heat/Cool control value,Out	1 byte	C	-	-	T	-	percentage (0..100%)	Low
	27	HVAC Controller	Heat control value,Out	1 byte	C	-	-	T	-	percentage (0..100%)	Low
	28	HVAC Controller	Cool control value,Out	1 byte	C	-	-	T	-	percentage (0..100%)	Low

Figure 6.3 "HVAC" communication object

Object No.	Function	Communication object name	Type	Property	DPT
8	Power on/off	HVAC General	1bit	C,W,T,U	1.001 switch
This object is used to switch the HVAC control interface through the bus or to send the switch status of the HVAC interface. Whether the HVAC control will be turned off when off, it will be determined by the parameter settings.				
9	External Temp. sensor, In	HVAC General	2byte	C,W,T,U	9.001 temperature
	This communication object is used to receive temperature value which is sent from the bus. The value ranges: -9.9~99.9°C				
10	Setpoint adjustment, In	HVAC Setpoint	2byte	C,W	9.001 temperature
	When the set temperature is opposite adjustment, this object is used to adjust the reference value of the set temperature via the bus. Under the circumstance of definite set temperature, the adjustment of set temperature is only used for all current modes.When the set temperature is for definite adjustment, the communication object is used for temperature set value of modifying current room operation mode.				
11	Switch Heat/Cool mode, In	HVAC General	1bit	C,W,U	1.100 cooling/heating
	The communication object is used to receive status feedback of heating and cooling from the BUS. The panel will update icon display according to the received message value. Message value: 1 - heating 0 - cooling				
12	HVAC mode, In Comfort mode, In	HVAC General	1byte 1bit	C,W	20.102 DPT_HVACMode 1.003 enable
13	Night mode, In	HVAC General	1bit	C,W	1.003 enable
14	Frost/heat protection, In	HVAC General	1bit	C,W	1.003 enable
15	Standby mode, In	HVAC General	1bit	C,W	1.003 enable
	Room operation mode can receive status feedback via four 1bit object (objects 12, 13, 14, 15) or 1byte object (HVAC mode). When it's 1bit: object 12: comfort mode, object 13: night mode, object 14: protection mode, object 15: standby mode. When the object receives message "1", the corresponding mode will be activated, and the mode display status will also update to relative mode on the panel. When it's 1byte: the relation between input value and operation mode is as following: no:0: unused 1: Comfort mode 2: Standby mode 3: Night mode 4: Protection mode 5-255: Not used				

16	Fan speed, In	HVAC Fan	1byte	C,W,U	5.010 counter pulses
	Fan speed 1, In		1bit		1.001 switch
	Fan ON/OFF, In		1bit		1.001 switch
17	Fan speed 2, In	HVAC Fan	1bit	C,W,U	1.001 switch
18	Fan speed 3, In	HVAC Fan	1bit	C,W,U	1.001 switch

Fan speed can receive status status feedback via object of 3 1bit (objects 16, 17, 18) or object of 1byte o Fan speed).

When it's 1bit: object 16: first-class fan speed, object 17: secondary fan speed, object 18: third-level fan speed. When the object receives the message "1", the corresponding fan speed will be activated, and the fan display state will also update to relative fan speed on the panel.

When it's 1byte: fan speed status value will be defined by parameter.When object receive appointed value, and fan speed display status will also update to relative fan speed on the panel.

The object "Fan ON/OFF" is visible when the fan type is a fan with a class 1 fan speed and is used to receive fan switch status feedback.

19	Fan speed off, In	HVAC Fan	1bit	C,W,U	1.001 switch

When the object receives the message "0", the panel fan speed will be update to the fan close state. The message "1" is meaningless.

20	Fan Automatic operation, In	HVAC Fan	1bit	C,W,U	1.003 enable

This object is used to receive status feedback of automatic controlled fan speed.

Message value:

       1 - automatic control

       0 - meaningless

21	Instantaneous setpoint, Out	HVAC Setpoint	2byte	C,R,T	9.001 temperature

The communication object is used to send temperature set value of current operation mode to the BUS.

22	Heat/Cool mode, Out	HVAC General	1bit	C,R,T	1.100 cooling/heating

The communication object is used to send messages of switching cooling and heating function to the BUS.

Message value:

       1 - heating

       0 - cooling

23	HVAC mode, Out	HVAC General	1byte	C,R,T	20.102 DPT_HVACMode
	Comfort mode, Out		1bit	C,T	1.003 enable
24	Night mode, Out	HVAC General	1bit	C,T	1.003 enable
25	Frost/Heat protection, Out	HVAC General	1bit	C,T	1.003 enable
26	Standby mode, Out	HVAC General	1bit	C,T	1.003 enable

The communication object is used to send message of reporting room operation mode to the BUS.

When object type is "1byte", different message means different work mode, such as: 0: remaining, 1: comfort mode, 2: standby mode, 3: night mode, 4: freezing protection / heating protection, 5~ 255: remaining, unused.

When the object type is "1 bit", switching to corresponding mode, object of corresponding mode sends message "1" to the BUS.

27	Heat control value, Out Heat/Cool control value, Out	HVAC Controller	1byte/1bit	C,T	5.001 percentage 1.001 switch
28	Cool control value, Out	HVAC Controller	1byte/1bit	C,T	
	The communication object is used to send controlling value of heating or cooling function, to control the switch of HVAC value, and adjust internal temperature. Send message value（switch on/off use 2-point control）: on/off Send message value（switch PWM use PI control）: on/off Send message value（continuous control use PI control）: 0…100%				
29	Fan speed, Out Fan speed 1, Out Fan ON/OFF, Out	HVAC Fan	1byte 1bit 1bit	C,T	5.010 counter pulses 1.001 switch
30	Fan speed 2, Out	HVAC Fan	1bit	C,T	1.001 switch
31	Fan speed 3, Out	HVAC Fan	1bit	C,T	1.001 switch
	These communication objects are used to send messages that control fan speed to the bus. 1bit time: object 29: primary fan speed, object 30: secondary fan speed, object 31: third-level fan speed. The corresponding fan speed is activated via the panel and the corresponding object sends a message "1" to the bus. The corresponding fan speed is activated by the panel, and the object 29 will send the message value corresponding to the fan speed to the bus. The object 29 "Fan ON / OFF" is visible when the fan type is a fan with a 1st fan speed and is used to send a message to control the fan switch to the bus.				
32	Fan speed off, Out	HVAC Fan	1bit	C,T	1.001 switch

	This object is used to send messages from the fan to the bus.
	
	Message value:
	
	    1 - meaningless
	    0 - off fan				

33	Fan Automatic operation, Out	HVAC Fan	1bit	C,T	1.001 switch

	The communication object is used to send automatic control messages of fan speed to the bus.
	
	Message value:
	
	    1 - automatic control
	    0 - exit automatically				

Table 6.3 "HVAC" communication object table

6.4. "Air conditioner" communication object

	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
	34	Air Conditioner	External Temp. sensor			2 bytes	C	-	W	T	U	temperature (°C)	Low
	35	Air Conditioner	Power on/off			1 bit	C	-	-	T	-	switch	Low
	36	Air Conditioner	Status of Power			1 bit	C	-	W	T	U	switch	Low
	37	Air Conditioner	Control mode			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
	38	Air Conditioner	Status of control mode			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
	41	Air Conditioner	Fan speed			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
	42	Air Conditioner	Stauts of Fan speed			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
	45	Air Conditioner	Temperature setpoint			1 byte	C	-	W	T	U		Low

Figure 6.4_1 "Air conditioner" communication object（Gateway Integrate _1byte）

Number ▲	Name	Object Function	Description	Group Add	Length	C	R	W	T	U	Data Type	Priority
35	Air Conditioner	Power on/off			1 bit	C	-	-	T	-	switch	Low
36	Air Conditioner	Status of Power			1 bit	C	-	W	T	U	switch	Low
37	Air Conditioner	Heat mode			1 bit	C	-	W	T	U	enable	Low
38	Air Conditioner	Cool mode			1 bit	C	-	W	T	U	enable	Low
39	Air Conditioner	Dry mode			1 bit	C	-	W	T	U	enable	Low
40	Air Conditioner	Fan mode			1 bit	C	-	W	T	U	enable	Low
41	Air Conditioner	Fan speed Auto			1 bit	C	-	W	T	U	switch	Low
42	Air Conditioner	Fan speed low			1 bit	C	-	W	T	U	switch	Low
43	Air Conditioner	Fan speed medium			1 bit	C	-	W	T	U	switch	Low
44	Air Conditioner	Fan speed high			1 bit	C	-	W	T	U	switch	Low
45	Air Conditioner	Temperature setpoint			1 byte	C	-	W	T	U		Low

Figure 6.4_2 "Air conditioner" communication object（Gateway Integrate _1bit）

Number ▲	Name	Object Function	Description	Group Add	Length	C	R	W	T	U	Data Type	Priority
35	Air Conditioner	IR Split unit command			1 byte	C	-	-	T	-	scene number	Low

Figure 6.4_3 "Air conditioner" communication object（IR Split Unit）

Object No.	Function	Communication object name	Type	Property	DPT
34	External Temp. sensor	Air Conditioner	2byte	C,W,T,U	9.001 temperature
The communication object is visible when the temperature reference selects an external sensor and is used to receive temperature measurements sent from the temperature sensor on the bus. Range: -9.9~99.9°C					
35	Power on/off	Air Conditioner	1bit	C,T	1.001 switch
35	IR Split unit command	Air Conditioner	1byte	C,T	17.001 scene number
Power on/off: This communication object is visible in the air conditioner gateway mode and is used to send air conditioner switch messages. IR Split unit command: This communication object is visible in the split infrared mode and is used to send air conditioning control messages. The parameter can be set to control the message 1~64, and the actual message value on the bus corresponds to 0~63.					
36	Status of Power	Air Conditioner	1bit	C,W,T,U	1.001 switch
This communication object is visible in the air conditioning gateway mode and is used to receive feedback on the status of the air conditioner switch.					
37	Control mode	Air Conditioner	1byte	C,T	5.010 counter pluses
37	Heat mode	Air Conditioner	1bit	C,W,T,U	1.003 enable
1byte: This communication object is visible in the air conditioner gateway mode and is visible when the mode type is 1 byte. It is used to send control messages of various modes of the air conditioner. 1bit:This communication object is visible in the air conditioning gateway mode and the mode type is 1 bit. It is used to send the air conditioning mode-heating control message and also receive status feedback.					
38	Status of control mode	Air Conditioner	1byte	C,W,T,U	5.010 counter pulses
38	Cool mode	Air Conditioner	1bit	C,W,T,U	1.003 enable
1byte: This communication object is visible in the air-conditioning gateway mode and is visible when the mode type is 1 byte. It is used to receive status feedback messages of various modes of the air conditioner. 1bit: This communication object is visible in the air conditioning gateway mode and the mode type is 1 bit. It is used to send the air conditioning mode-cooling control message and also receive status feedback.					
39	Dry mode	Air Conditioner	1bit	C,W,T,U	1.003 enable
This communication object is visible in the air-conditioning gateway mode and the mode type is 1 bit. It is used to send the air conditioning mode- dehumidification control message, and can also receive status feedback.					
40	Fan mode	Air Conditioner	1bit	C,W,T,U	1.003 enable
This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 bit. It is used to send the air-conditioning mode-supply control message, and can also receive status feedback.					

41	Fan speed	Air Conditioner	1byte	C,T	5.010 counter pulses
41	Fan speed Auto	Air Conditioner	1bit	C,W,T,U	1.001 switch

1byte: This communication object is visible in the air-conditioning gateway mode and is visible when the fan speed type is 1 byte. It is used to send control messages of various fan speeds.

1bit: This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 bit. It is used to send fan speed-automatic control messages and also receive status feedback.

42	Status of Fan speed	Air Conditioner	1byte	C,W,T,U	5.010 counter pulses
42	Fan speed low	Air Conditioner	1bit	C,W,T,U	1.001 switch

1byte: This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 byte. It is used to receive status feedback messages of various fan speeds.

1bit: This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 bit. It is used to send fan speed-low-level control messages and also receive status feedback.

43	Fan speed medium	Air Conditioner	1bit	C,W,T,U	1.001 switch

This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 bit. It is used to send fan speed-mid-range control messages and also receive status feedback.

44	Fan speed high	Air Conditioner	1bit	C,W,T,U	1.001 switch

This communication object is visible in the air-conditioning gateway mode and the fan speed type is 1 bit. It is used to send fan speed-high-end control messages and also receive status feedback.

45	Temperature setpoint	Air Conditioner	2byte	C,W,T,U	9.001 temperature
			1byte		No-DPT

This communication object is visible in the air conditioning gateway mode and is used to send and receive the set temperature of the air conditioner.

Note: The object type is set by parameters, 2byte is applicable to KNX standard; 1byte is KNX non-standard, usually applicable to some custom control classes, the message value is the actual temperature value, for example, the message value of 17°C is 17 (decimal number) .

Figure 6.4"Air conditioner" communication object table

6.5. "Floor heating" communication object

	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
	46	Floor heating	Power on/off			1 bit	C	-	W	T	U	switch	Low
	47	Floor heating	External Temp. sensor			2 bytes	C	-	W	T	U	temperature (°C)	Low
	48	Floor heating	Heating on/off			1 bit	C	-	W	T	U	switch	Low
	49	Floor heating	Setpoint			2 bytes	C	-	W	T	U	temperature (°C)	Low
	50	Floor heating	Scene			1 byte	C	-	W	-	-	scene number	Low

Figure 6.5 "Floor heating" communication object

Object No.	Function	Communication object name	Type	Property	DPT
46	Power on/off	Floor heating	1bit	C,W,T,U	1.001 switch

This object is used to control the floor heating through the bus switch, or according to the parameter configuration, when the switch button is operated, the switch message of the floor heating can also be sent.

When it is off, the control of the floor heating is turned off.

47	External Temp. sensor	Floor heating	2byte	C,W,T,U	9.001 temperature

The communication object is visible when the temperature reference selects an external sensor and is used to receive temperature measurements sent from the temperature sensor on the bus. Range: -9.9~99.9°C

48	Heating on/off	Floor heating	1bit	C,W,T,U	1.001 switch

The communication object is used to send a switch control command for the floor heating. It can also receive the switch state feedback of the floor heating. The switch status corresponding to the message value is specifically set by the parameter.

49	Setpoint	Floor heating	2byte	C,W,T,U	9.001 temperature
This communication object is used to send the temperature setpoint to the bus. It is also possible to receive feedback temperature settings. Range: 5~37°C					
50	Scene	Floor heating	1byte	C,W	18.001 scene number
This communication object is used to call the scene control of the floor heating. The parameter setting is 1~64, and the actual corresponding message value is 0~63. The scene can be saved.					

Figure 6.5 "Floor heating" communication object table

6.6. "Ventilation" communication object

The parameters of the air inlet and the air outlet of the fresh air control are similar. The following is an example of the communication object of the fresh air inlet:

Number ⁴	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
51	Ventilation	External Temp. sensor,In			2 bytes	C	-	W	T	U	temperature (°C)	Low
52	Ventilation	Power on/off			1 bit	C	-	W	T	U	switch	Low
53	Ventilation	Fan speed, In			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
54	Ventilation	Fan speed, Out			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
56	Ventilation	Scene, In			1 byte	C	-	W	-	-	scene number	Low
57	Ventilation	Automatic function, In/Out			1 bit	C	-	W	T	U	enable	Low
58	Ventilation	CO2,In			2 bytes	C	-	W	-	-	parts/million (ppm)	Low
58	Ventilation	PM2.5, In			2 bytes	C	-	W	-	-		Low
53	Ventilation	Fan Speed No.1 1Bit, In/Out			1 bit	C	-	W	T	U	switch	Low
54	Ventilation	Fan Speed No.2 1Bit, In/Out			1 bit	C	-	W	T	U	switch	Low
55	Ventilation	Fan Speed No.3 1Bit, In/Out			1 bit	C	-	W	T	U	switch	Low

Figure 6.6 "Ventilation" communication object

Object No.	Function	Communication object name	Type	Property	DPT
51	External Temp. sensor, In	Ventilation	2byte	C,W,T,U	9.001 temperature
The communication object is visible when the temperature reference selects an external sensor and is used to receive temperature measurements sent from the temperature sensor on the bus. Range: -9.9~99.9°C					
52	Power on/off	Ventilation	1bit	C,W,T,U	1.001 switch
This object is used to control the fresh air through the bus switch, or according to the parameter configuration, when the switch button is operated, the switch message of the fresh air can also be sent. When it is closed, the control of the fresh air is turned off.					
53	Fan speed, In	Ventilation	1byte	C,W,T,U	5.010 counter pulses
The communication object is visible when the fan speed type is "1 byte" and is used to receive state feedback of fan speed. The specific message value corresponding to each fan speed is defined by the parameter.					
54	Fan speed, Out	Ventilation	1byte	C,T	5.010 counter pulses
The communication object is visible when the fan speed type is "1 byte", and is used to send a message that controls the fan speed to the bus. The specific message value corresponding to each fan speed is defined by the parameter.					

53	Fan Speed No.1 1Bit, In/Out	Ventilation	1bit	C,W,T,U	1.001 switch
54	Fan Speed No.2 1Bit, In/Out	Ventilation	1bit	C,W,T,U	1.001 switch
55	Fan Speed No.3 1Bit, In/Out	Ventilation	1bit	C,W,T,U	1.001 switch

The three communication objects are visible when the fan speed type is "1 bit", the fan speed is controlled by three objects at the same time, and the specific message value corresponding to each fan speed is defined by the parameter. Status feedback can be received, but the feedback value also needs to correspond to the parameter definition value to update the display on the panel.

56	Scene, In	Ventilation	1byte	C,W	18.001 scene number

This communication object is used to call the scene control of the fresh air. The parameter setting is 1~64, and the actual corresponding message value is 0~63. The scene can be saved.

57	Automatic function, In/Out	Ventilation	1bit	C,W,T,U	1.003 enable

This communication object is used to enable the automatic operation of the fresh air.

After the bus is reset or programmed, the automatic operation is not enabled by default. Shut down, manually adjust the fan speed, and the scene can exit the automatic operation.

The value of the automatic operation enabled/disabled message is specifically defined by parameters.

58	CO2, In	Ventilation	2byte	C,W,T,U	9.008 DPT_Value_AirQuality

When the control value of the automatic operation is set to CO2, the communication object is visible and is used to receive the input of the CO2 value in ppm. Range: 0~4000ppm

Under automatic control, the fresh air system will automatically adjust the fan speed according to the concentration of CO2.

58	PM2.5, In	Ventilation	2byte	C,W,T,U	9.008 DPT_Value_AirQuality

When the control value of the automatic operation is set to PM2.5, the communication object is visible and is used to receive the input of the PM2.5 value in units of ug/m3. Range: 0~999ug/m3

Under automatic control, the fresh air system will automatically adjust the fan speed according to the concentration of PM2.5.

Figure 6.6 "Ventilation" communication object table

6.7. "Event Group" communication object

Figure 6.7"Event Group" communication object

Object No.	Function	Communication object name	Type	Property	DPT
82	Main scene recall	Event Group	1byte	C,W	17.001 scene number
This communication object triggers each output in the event group to send a specific value to the bus by calling the scene number. Message: 0..63					
83/84/85/.. .	Sub event output 1..8	1st /.../4th Event Group	1bit 1byte 2byte	C,T	1.001 switch 5.010 counter pulses 7.001 pulses
When a scene is called, this communication object is used to send the corresponding output value of this scene to the bus. If this output is not set for this scene, it will not be sent.					

Figure 6.7 "Event Group" communication object table

6.8. "Logic function" communication object

6.8.1. "AND/OR/XOR" communication object

Figure 6.8_1"Logic function_AND/OR/XOR" communication object

Object No.	Function	Communication object name	Type	Property	DPT
115..122	Input x	1st /.../8th Logic	1bit	C,W,T,U	1.002 boolean
The communication object is used to receive the value of the logical input Input x.					
123	Logic result	1st /.../8th Logic	1bit	C,T	1.002 boolean
This communication object is used to send the result of the logical operation.					

Figure 6.8_1 "Logic function_AND/OR/XOR" communication object table

6.8.2. "Gate forwarding" communication object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Gate value select			1 byte	C	-	W	-	-	scene number	Low
116	1st Logic	Input A			1 bit	C	-	W	-	-	switch	Low
117	1st Logic	Input B			1 bit	C	-	W	-	-	switch	Low
118	1st Logic	Input C			1 bit	C	-	W	-	-	switch	Low
119	1st Logic	Input D			1 bit	C	-	W	-	-	switch	Low
120	1st Logic	Output A			1 bit	C	-	-	T	-	switch	Low
121	1st Logic	Output B			1 bit	C	-	-	T	-	switch	Low
122	1st Logic	Output C			1 bit	C	-	-	T	-	switch	Low
123	1st Logic	Output D			1 bit	C	-	-	T	-	switch	Low

Figure 6.8_2 "Logic function_Gate forwarding" communication object

Object No.	Function	Communication object name	Type	Property	DPT
115	Gate value select	1st /.../8th Logic	1byte	C,W	17.001 scene number
The communication object is used to select a scene for logic gate forwarding.
116..119	Input x	1st /.../8th Logic	1bit / 4bit / 1byte	C,W	1.001 switch / 3.007 DPT_Dimming control / 5.010 DPT_counter pulses
The communication object is used to receive the value of the logic gate input Input x.
120..123	Output x	1st /.../8th Logic	1bit / 4bit / 1byte	C,T	1.001 switch / 3.007 DPT_Dimming control / 5.010 DPT_counter pulses
The communication object is used to output the value after the logic gate is forwarded. The output value is the same as the input value, but an input can be forwarded to one or more outputs, set by parameters.

Figure 6.8_2 "Logic function_Gate forwarding"Communication object table

6.8.3. "Threshold comparator" communication object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Threshold value input			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
123	1st Logic	Logic result			1 bit	C	-	-	T	-	boolean	Low

Figure 6.8_3" Logic function_Threshold comparator" communication object

Object No.	Function	Communication object name	Type	Property	DPT
115	Threshold value input	1st /.../8th Logic	4bit / 1byte / 2byte / 4byte	C,W, U	3.007 DPT_Dimming control / 5.010 DPT_counter pulses / 7.001 DPT_pulses / 12.001 DPT_counter pulses
This communication object is used to enter a threshold.
123	Logic result	1st /.../8th Logic	1bit	C,T	1.002 DPT_boolean
This communication object is used to send the result of the logical operation. That is, the value that should be sent after the object input threshold is compared with the parameter set threshold.

Figure 6.8_3"Logic function_Threshold comparator" communication object table

6.8.4. "Format convert" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 1bit-bit0			1 bit	C	-	W	-	U	switch	Low
116	1st Logic	Input 1bit-bit1			1 bit	C	-	W	-	U	switch	Low
123	1st Logic	Output 2bit			2 bit	C	-	-	T	-	switch control	Low

"2x1bit --> 1x2bit" function: converts 2 1-bit values into a 2-bit value, such as Input bit1=1, bit0=0--> Output 2bit=2

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 1bit-bit0			1 bit	C	-	W	-	U	switch	Low
116	1st Logic	Input 1bit-bit1			1 bit	C	-	W	-	U	switch	Low
117	1st Logic	Input 1bit-bit2			1 bit	C	-	W	-	U	switch	Low
118	1st Logic	Input 1bit-bit3			1 bit	C	-	W	-	U	switch	Low
119	1st Logic	Input 1bit-bit4			1 bit	C	-	W	-	U	switch	Low
120	1st Logic	Input 1bit-bit5			1 bit	C	-	W	-	U	switch	Low
121	1st Logic	Input 1bit-bit6			1 bit	C	-	W	-	U	switch	Low
122	1st Logic	Input 1bit-bit7			1 bit	C	-	W	-	U	switch	Low
123	1st Logic	Output 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

"8x1bit --> 1x1byte" function: Convert 8 1-bit values into a 1byte value, such as Input bit2=1, bit1=1, bit0=1, other bits are 0--> Output 1byte=7.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
123	1st Logic	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

"1x1byte --> 1x2byte" function: Convert a 1byte value into a 2byte value, such as Input 1byte=125--> Output 2byte=125.

Although the value is unchanged, the data type of the value is different.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
116	1st Logic	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
123	1st Logic	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

"2x1byte --> 1x2byte" function: Convert 2 1byte values into a 2byte value, such as Input 1byte-low = 255 ($FF), Input 1byte-high = 100 ($64) --> Output 2byte = 25855 ($64 FF)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 2byte-low			2 bytes	C	-	W	-	U	pulses	Low
116	1st Logic	Input 2byte-high			2 bytes	C	-	W	-	U	pulses	Low
123	1st Logic	Output 4byte			4 bytes	C	-	-	T	-	counter pulses (unsign...	Low

"2x2byte --> 1x4byte" function: Convert 2 2byte values into a 4byte value, such as 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 Address	Length	C	R	W	T	U	Data Type	Priority
115	1st Logic	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
116	1st Logic	Output 1bit-bit0			1 bit	C	-	-	T	-	switch	Low
117	1st Logic	Output 1bit-bit1			1 bit	C	-	-	T	-	switch	Low
118	1st Logic	Output 1bit-bit2			1 bit	C	-	-	T	-	switch	Low
119	1st Logic	Output 1bit-bit3			1 bit	C	-	-	T	-	switch	Low
120	1st Logic	Output 1bit-bit4			1 bit	C	-	-	T	-	switch	Low
121	1st Logic	Output 1bit-bit5			1 bit	C	-	-	T	-	switch	Low
122	1st Logic	Output 1bit-bit6			1 bit	C	-	-	T	-	switch	Low
123	1st Logic	Output 1bit-bit7			1 bit	C	-	-	T	-	switch	Low

"1x1byte --> 8x1bit" function: Convert 1 1byte value into 8 1 bit values, such as 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
115	1st Logic	Input 2byte			2 bytes	C	-	W	-	U	pulses	Low
122	1st Logic	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
123	1st Logic	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

"1x2byte --> 2x1byte" function: Convert 1 2byte value into 2 1byte values, such as 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
115	1st Logic	Input 4byte			4 bytes	C	-	W	-	U	counter pulses (unsign...	Low
122	1st Logic	Output 2byte-low			2 bytes	C	-	-	T	-	pulses	Low
123	1st Logic	Output 2byte-high			2 bytes	C	-	-	T	-	pulses	Low

"1x4byte --> 2x2byte" function: converts a 4byte value into 2 2byte values, such as 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
115	1st Logic	Input 3byte			3 bytes	C	-	W	-	U		Low
121	1st Logic	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
122	1st Logic	Output 1byte-middle			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
123	1st Logic	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

"1x3byte --> 3x1byte" function: converts a 3byte value into 3 1byte values, such as 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
115	1st Logic	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
116	1st Logic	Input 1byte-middle			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
117	1st Logic	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
123	1st Logic	Output 3byte			3 bytes	C	-	-	T	-		Low

"3x1byte --> 1x3byte" function: converts 3 1byte values into 1 3byte value, such as Input 1byte-low = 150 ($96), Input

1byte-middle = 100 ($64), Input 1byte-high = 50 ($32) --> Output 3byte = $32 64 96

Object No.	Function	Communication object name	Type	Property	DPT
115..	Input ...	1st /.../8th Logic	1bit	C,W,U	1.001 switch
			1byte		5.010 DPT_counter pulses
			2byte		7.001 DPT_pulses
			3byte		232.600 RGB value 3x(0..255)
			4byte		12.001 DPT_counter pulses
This communication object is used to enter the value that needs to be converted.					
123..	Output ...	1st /.../8th Logic	1bit	C,T	1.001 switch
			2bit		2.001 switch control
			1byte		5.010 DPT_counter pulses
			2byte		7.001 DPT_pulses
			3byte		232.600 RGB value 3x(0..255)
			4byte		12.001 DPT_counter pulses
This communication object is used to output the converted value.					

Figure 6.8_4"Logic function_Format convert" communication object table

6.9. "Switch sensor" communication object

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
	64	Button 1	Switch, Short			1 bit	C	-	W	T	U	switch	Low
	65	Button 1	Switch, Long			1 bit	C	-	W	T	U	switch	Low
	66	Button 1	Disable			1 bit	C	-	W	-	-	enable	Low

"Switch" Feature

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
	64	Button 1	Switch, Short			1 bit	C	-	W	T	U	switch	Low
	65	Button 1	Dimming, Long			4 bit	C	-	W	T	-	dimming control	Low
	66	Button 1	Disable			1 bit	C	-	W	-	-	enable	Low

"Switch/dimming" Feature

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
	64	Button 1	1bit value ON/OFF, Short			1 bit	C	-	-	T	-	switch	Low
	65	Button 1	2bit value 0..3, Long			2 bit	C	-	-	T	-	switch control	Low
	66	Button 1	Disable			1 bit	C	-	W	-	-	enable	Low

"Value output" Feature

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
	64	Button 1	Scene, Short			1 byte	C	-	-	T	-	scene control	Low
	65	Button 1	Scene, Long			1 byte	C	-	-	T	-	scene control	Low
	66	Button 1	Disable			1 bit	C	-	W	-	-	enable	Low

"Scene control" Feature

	Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
	64	Button 1	Up/Down,Blind			1 bit	C	-	W	T	-	up/down	Low
	65	Button 1	Stop/Adjust,Blind			1 bit	C	-	W	T	-	step	Low
	66	Button 1	Disable			1 bit	C	-	W	-	-	enable	Low

"Blind" Feature

Figure 6.9 "Switch sensor" communication object

Object No.	Function	Communication object name	Type	Property	DPT
64	Switch, Short	Button X	1bit	C,W,T,U	1.001 DPT_Switch
64	Switch, Short	Button X	1bit	C,W,T,U	1.001 DPT_Switch
65	Switch, Long	Button X	1bit	C,W,T,U	1.001 DPT_Switch
This communication object is used to trigger the switch operation. Message: 0 —— off 1 —— on					
65	Dimming, Long	Button X	4bit	C,W,T	3.007 DPT_Dimming control
This communication object triggers a relative dimming operation. When the value of the message is 1~7, it is dimmed downward. The larger the value is, the smaller the dimming amplitude is. When it is 1, the dimming is the largest. The minimum is 7 and the 0 is the stop dimming. When the input value is 9~15, the dimming is upward. In this range, the larger the value, the smaller the dimming amplitude is. When it is 9 o'clock, the dimming amplitude is the largest, and when it is 15 o'clock, the dimming amplitude is the smallest, 8 It is to stop dimming.					

64	1bit/2bit/4bit/1byte/2byte value..., Short	Button X	1bit/2bit/4bit/1byte/2byte	C,T	1.001 DPT_Switch/
65	1bit/2bit/4bit/1byte/2byte value..., Long	Button X	1bit/2bit/4bit/1byte/2byte	C,T	2.001 DPT_Switch control/ 3.007 DPT_Dimming control/ 5.010 DPT_counter pulses/ 7.001 DPT_pulses

The communication object is used to send a fixed value. The range of values that can be sent is determined by the data type. The data type is set by the parameter "Reaction on short operation" / "Reaction on long operation".

64	Scene, Short	Button X	1byte	C,T	18.001 DPT_SceneControl
65	Scene, Long	Button X	1byte	C,T	18.001 DPT_SceneControl

This communication object sends an 8-bit instruction to call or store the scene. The meaning of the 8-bit instruction is explained in detail below.

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

F: call the scene for '0'; store the scene for '1';

X:0;

NNNNNN: Scene number (0...63).

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

Object message value	Description
0	Call scene 1
1	Call scene 2
2	Call scene 3
…	...
63	Call scene 64
128	Storage scenario 1
129	Storage scenario 2
130	Storage scenario 3
…	...
191	Storage scenario 64

64	Up/Down, Blind	Button X	1bit	C,W,T	1.008 DPT_up/down

This communication object is used to move the curtain up/down. Message:

0 —— move up the curtain/blind

1 —— move down the curtain/blind

65	Stop/Adjust, Blind	Button X	1bit	C,W,T	1.007 DPT_Step

This communication object is used to stop the curtain running or adjust the louver angle.

66	Disable	Button X	1bit	C,W	1.003 DPT_enable

This communication object is used to disable/enable the function of the button.

Figure 6.9 "Switch sensor" communication object table