

User manual

K-BUS KNX Push Button Thermostat, 8 Buttons_V1.1

Push button module: CHTRL-08/00.1.2x

Push button accessory: CHTKA-08/L.1.2x, CHTKA-08/L.2.2x

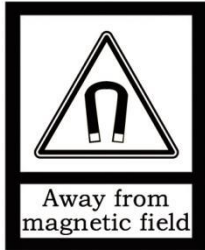
(x=1: Black; x=2: Silver; x=3: Gray; x=4: Golden)



KNX/EIB Home and Building Control System

Attentions

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



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



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



4. Do not disassemble the devices.

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Chapter 1 Summary

KNX Push Button Thermostat, 8 Buttons is mainly applied in building control system, connected to the bus via KNX connection 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 device is mainly used for HVAC control or AC control, Floor heating, Ventilation system, etc.. You can adjust the function configuration according to your requirements, and the screen displays the current control status.

KNX Push Button Thermostat, 8 Buttons integrates the basic control functions of Switch, Dimming, Scene control, Shutter control, Value output, Shift register, RGB dimming, Multiple operation, Delay mode, and has a built-in temperature sensor to detect the local ambient temperature and supports LED indication function, meets the requirements of most applications. Additionally, it supports panel lock, LCD brightness setting, event group and logic group function to make your life smarter.

KNX Push Button Thermostat, 8 Buttons are powered via KNX bus, installing in a 86 type wall-mounted box. The physical address assignment and parameter settings can be used with the engineering tool software ETS (version ETS5.7 or above) with the .knxprod file.

The manual provides detailed technical information about the KNX Push Button Thermostat, 8 Buttons, including installation and programming details, and explains how to use the panel in conjunction with examples in actual use.

The functions are summarized as followed:

- Support panel lock, LCD and LED brightness settings
- Thermostat function: Select HVAC or AC control, floor heating and ventilation function. Floor heating and ventilation support 5 scene functions
- Buttons can be configured for ventilation/HVAC/AC/floor heating power, function page/ mode/fan speed switch, temperature '+'/'-' and normal button. Normal button functions including: switch, dimming, scene control, shutter control, value output, shift register, RGB

dimming, multiple operation, delay mode.

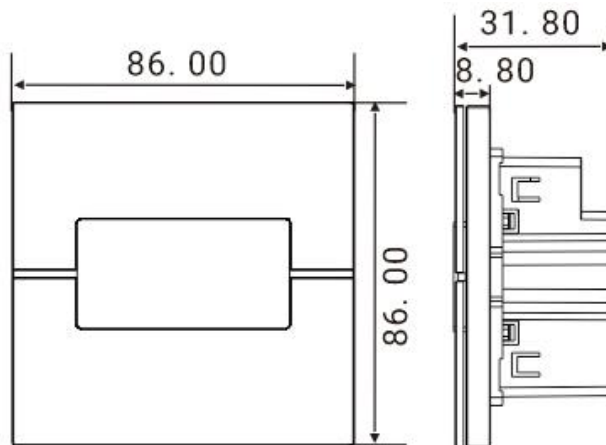
- LED indication function
- Built-in temperature sensor and external PT100 temperature sensor for detecting ambient temperature
- Supports 4 event groups, each with 8 configurable outputs
- Supports 4 logic function, with AND, OR, XOR, Gate transfer, Threshold compare, Format Convert

Chapter 2 Technical Data

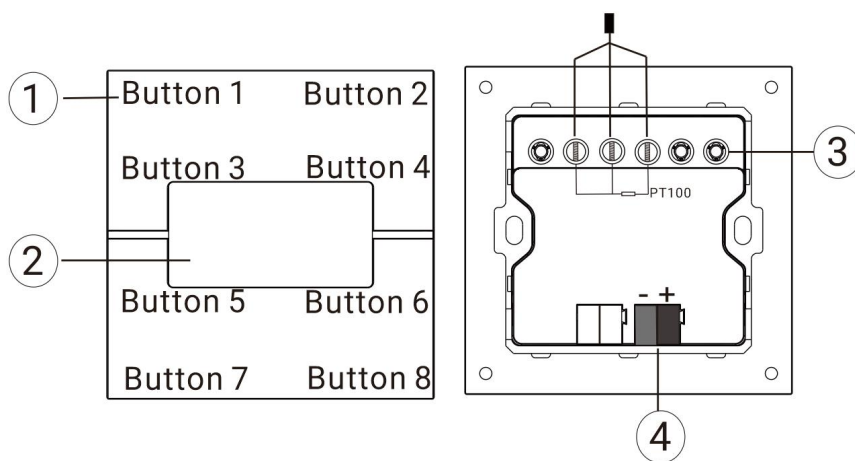
Power Supply	Bus voltage	21-30V DC, via the KNX bus
	Bus current	<15.0mA/24V; <12.0mA/30V
	Bus consumption	<0.3W
Connection	KNX	Bus connection terminal(Red/Black)
Operation and display	Press buttons 1 and 8 at the same time, all button LED flashing	For assigning the physical address
Temperature Sensor	Range	-20 °C ... + 85 °C
Temperature	Operation	-5 °C ... + 45 °C
	Storage	-25 °C ... + 55 °C
	Transport	-25 °C ... + 70 °C
Environment	Humidity	<93%, except dewing
Mounting	86 type wall-mounted box	
Dimension/Weight	86.0 x 86.0 x 31.8mm/0.2kg	

Chapter 3 Dimension and Structural Diagram

3.1.Dimension Diagram



3.2.Structural Diagram



- ① Button/Button LED 1-8
- ② Display area
- ③ Three-wires PT100 temperature sensor
- ④ KNX bus connection terminal

Chapter 4 Project Design and Programming

General function

General function includes panel lock, LCD/LED brightness settings, delay time for standby.

Button function

Buttons can be configured for ventilation/HVAC/AC/floor heating power, function page/ mode/fan speed switch, temperature '+'/'-' and normal button. Normal button functions including: switch, dimming, scene control, shutter control, value output, shift register, RGB dimming, multiple operation, delay mode.

Indication LED function

Brightness level of indication LED is adjustable, and adjusted according to enable/disable button function, standby/power-on status.

The indication settings for button functions: Disable, Control by switch object, Control by external object (1bit/1byte), Indicate button press (flash only once, flash at fast speed, flash at normal speed, flash at slow speed), Indicate button action.

Temperature measurement

Internal/PT100 sensor temperature measurement value is sent to the bus: respond after read only and respond after change.

Set the temperature calibration, and object value of 'Error'.

Thermostat function

HVAC: support to functions, including control mode input, heating/cooling system, operation mode and setpoint temperature, fan speed, temperature threshold, 2 points and PI control algorithm and etc;

AC: support IR split unit or gateway interface control mode. In addition support power on/off, setpoint temperature, mode, fan speed other control functions.

Floor heating: support 2-points control algorithm, and automatically switch the floor heating according to the temperature difference. In addition, you can set up to 5 floor heating scene.

Ventilation: support auto control, it is linkage control with PM2.5/CO2/VOC. And support the output types of 1bit or 1byte. In addition, you can set up to 5 ventilation scene.

Event Group

Up to support 4 channels of event group forward, each group up to support 8 configurable output, datatype is optional 1bit/1byte/2byte.

Logic Group

Up to support 4 channels of logic, each channel up to support 8 inputs and 1 logic result.

Logic function support functions, including AND, OR, XOR, Gate transfer, Threshold compare, Format convert.

Chapter 5 Parameter setting description in the ETS

5.1.Parameter window“General”

Panel lock function:	☐ Disable ☒ Enable
"On-Line" telegram:	☐ Disable ☒ Enable
Telegram interval:	5s
Telegram value:	0
Function:	
Thermostat function:	HVAC
Floor heating function:	☐ Disable ☒ Enable
Ventilation function:	☐ Disable ☒ Enable
LCD:	
LCD normal backlight:	Level 10
LCD standby backlight:	Level 1
LED:	
LED's level of 'On':	Level 8
LED's level of 'Off':	Level 3
LED's level of standby:	Level 1
LED status when power-on:	☐ Off ☒ Object value "0"
Other:	
Delay time for setpoint[3..15]s:	5
Delay time for standby:	20s
External wake-up:	☐ Disable ☒ Enable

Fig.5.1 Parameter window“General”

Parameter "Panel lock function"

This parameter is for setting whether to enable panel locking function. Options:

Disable

Enable

Enable: The "Panel lock" object is visible and allows locking the panel via the KNX bus. Once locked, button operations are disabled, but the panel can still enter programming mode via buttons and receive bus telegram.

Parameter "On-Line" telegram

This parameter is for setting whether to enable device cycle send telegrams through the bus to indicate this module in normal operation. Options:

Disable

Enable

Parameters as follow are visible when "Enable" is selected:

——Parameter "Telegram interval"

This parameter is for setting the interval for sending telegram. Options: **1s/5s/10s/15s**

——Parameter "Telegram value"

This parameter is for setting the telegram value. Options: **0...15**

Note: Whether to enable this function and setting time interval should be determined based on actual conditions to reduce the bus load as much as possible.

Function

Parameter "Thermostat function"

This parameter is for setting the thermostat function. Options:

Disable

HVAC

AC

When "HVAC" is selected, the "HVAC" is visible. This function is described in detail in [Chapter 5.4](#).

When "AC" is selected, the "AC" is visible. This function is described in detail in [Chapter 5.5](#).

Parameter "Floor heating function"

When this parameter is enabled, the "Floor heating" is visible. This function is described in detail in [chapter 5.6](#).

Disable

Enable

Parameter "Ventilation function"

When this parameter is enabled, the "Ventilation" is visible. This function is described in detail in [chapter 5.7](#).

Disable

Enable

LCD

Parameter "LCD normal backlight"

Parameter "LCD standby backlight"

This parameter is for setting LCD backlight brightness level in normal/standby mode. Options:

Level 1

Level 2

...

Level 10

The highest brightness level is Level 1, and the darkest is Level 10.

LED

Parameter "LED's level of On"

Parameter "LED's level of Off"

This parameter is for setting the brightness level of the button LED indicators in normal mode, corresponding to the enabled/disabled status of the associated functions. Options:Options:

Level 1

Level 2

...

Level 10

The highest brightness level is Level 1, and the darkest is Level 10.

Parameter "LED's level of standby"

This parameter is for setting the brightness level of the button LED in standby mode. Options:

Level 1

Level 2

...

Level 10

The highest brightness level is Level 1, and the darkest is Level 10.

Parameter "LED status when power-on"

This parameter is for setting the button LED status when device power-on. Options:

OFF

Object value "0"

Other

Parameter "Delay time for setpoint [3..10]s"

This parameter is for setting the delay time for exiting the setpoint interface. When setting the HVAC, AC, or floor heating temperature, the system enters the setpoint display interface. After the delay period ends, it returns to the current ambient temperature display interface. Options: **3...10**

Parameter "Delay time for standby"

This parameter is for setting the delay time for standby. Options:

Always on

10s

...

60s

Parameter "External wake-up"

This parameter is for setting whether the panel is woken up via the KNX bus.

Options:

Disable

Enable

5.2.Parameter window“Push button”

Button 1 Function:	Ventilation power ▼
Button 2 Function:	Function page switch ▼
Button 3 Function:	Function mode switch ▼
Button 4 Function:	Temperature '+' ▼
Button 5 Function:	Fan speed switch ▼
Button 6 Function:	Temperature '-' ▼
Button 7 Function:	HVAC/AC power ▼
Button 8 Function:	Floor heating power ▼

Fig.5.2 Parameter window“Push button”

Parameter“Button 1 function”

This parameter is for setting the function of button 1. Options:

- Disable**
- Ventilation power**
- Normal button**

Parameter“Button 2 function”

This parameter is for setting the function of button 2. Options:

- Disable**
- Function page switch**
- Normal button**

Parameter“Button 3 function”

This parameter is for setting the function of button 3. Options:

- Disable**
- Function mode switch**
- Normal button**

Parameter "Button 4 function"

This parameter is for setting the function of button 4. Options:

Disable

Temperature '+'

Normal button

Parameter "Button 5 function"

This parameter is for setting the function of button 5. Options:

Disable

Fan speed switch

Normal button

Parameter "Button 6 function"

This parameter is for setting the function of button 6. Options:

Disable

Temperature '-'

Normal button

Parameter "Button 7 function"

This parameter is for setting the function of button 8. Options:

Disable

HVAC/AC power

Normal button

Parameter "Button 8 function"

This parameter is for setting the function of button 8. Options:

Disable

Floor heating power

Normal button

Chapters as follow explain the normal button function separately.

5.2.1.Parameter window“Button x”(x=1~8)



Fig.5.2.1 Parameter window“Button x”

Parameter “Function mode”

This parameter is for setting the function of normal button. Options:

Switch

Dimming

Scene Control

Shutter Control

Value Output

Shift Register

RGB dimming

Multiple Operation

Delay Mode

5.2.1.1. Parameter window“Switch”

Function mode	Switch ▼
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5
Reaction on short operation	Toggle ▼
Reaction on long operation	No Action ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.1 Parameter window“Switch”

Parameter“Enable long operation”

This parameter is for setting whether to distinction the contact operation between short and long operation. Options:

No

Yes

When select “Yes”, the operation reaches a certain time to determine whether the operation is a long or short operation before the contact performs the setting action.

——Parameter“Long operation after (*0.1s)”

This parameter is visible when previous parameter is enabled. Used for setting the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation.

Options: **2..32**

Repeat parameters will not be illustrated in next chapters; the usage is similar.

Parameter“Reaction on short operation/press the button”

Parameter“Reaction on long operation/release the button”

These parameters are for setting the performed actions when press/release the contact or

short/long operation. The object value is updated when the input is determined.

No reaction

OFF

ON

TOGGLE

No action: no telegrams have been sent.

ON: send the on telegram.

OFF: send the off telegram.

TOGGLE: each operation will switch between on and off. For example, if the last telegram was sent (or received) for on, then the next operation will trigger a telegram for off. When the switch is operated again, it will send a telegram for on etc., So the switch will always remember the previous state and covert to opposite value during next operation. When the device is powered on for the first time or restarted after downloading, the default value for "Switch" is 0, meaning the first operation is ON.

Parameter "Disable function"

This parameter is for setting whether to enable disable function. Options:

Disable

Enable

——Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Used for setting trigger value to disable/enable contacts. Options:

Disable=1/Enable=0

Disable=0/Enable=1

Repeat parameters will not be illustrated in next chapters; the usage is similar.

5.2.1.2. Parameter window“Dimming”

Function mode	Dimming ▼
Long operation after(*0.1s)	5 ▲▼
Reaction on short operation	Off ▼
Reaction on long operation	No Action ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.2 Parameter window“Dimming”

Parameter“Reaction on short operation”

This parameter is for setting the the switch value to send when short operation. Options:

No reaction

OFF

ON

TOGGLE

No action: no telegrams have been sent.

ON: send the on telegram.

OFF: send the off telegram.

TOGGLE: each operation will switch between on and off. When the device is powered on for the first time or restarted after downloading, the default value for “Switch” is 0, meaning the first operation is ON.

Parameter“Reaction on long operation”

This parameter is for setting the the relative dimming value to send when long operation, with dimming brighter or darker; when release the contact stop dimming. Options:

No reaction

Brighter

Darker

Brighter/Darker

No action: no telegrams have been sent.

Brighter: the dimming up value will be sent.

Darker: the dimming down value will be sent.

Brighter/Darker: dimming up and down will be sent alternately. When the device is powered on for the first time or restarted after downloading, the default value for "Dimming" is 0, meaning the first operation is dim up the brightness.

Note: in "TOGGLE" mode of this parameter setting, the value sent will be linked. For example, if the last value is switching on status, then it will be dimmed down in next dimming operation; if the last value is switching off, then it will be dimmed up in next dimming operation.

Parameter "Dimming mode"

This parameter is visible when previous parameter is not "No reaction". Set the way of relative dimming. Options:

Start-Stop dimming

Step dimming

Start-stop dimming: the dimming mode will be start-stop, a dimming up or down telegram will be sent when the dimming starts, and a stop telegram will be sent when dimming ends. Here the dimming telegram will not be sent cyclically.

Steps dimming: the dimming mode will be a step one and the dimming telegram will be sent cyclically. When dimming ends, a stop dimming telegram will be sent immediately.

—Parameter "Brightness change on every action"

This parameter is visible when the dimming way is selected "Step dimming". Set a cyclically sending dimming telegram which changes the brightness percentage. Options:

100%

50%

...

1.56%

——Parameter“Interval of cyclic send (*0.1s,0=Once)”

This parameter is visible when the dimming way is selected “Step dimming”. Set intervals of telegrams cyclically sending dimming telegram. Options: **0..25, 0=Once**

5.2.1.3. Parameter window“Scene Control”

Function mode	Scene Control ▼
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5 ▲▼
Reaction on short operation	No Action ▼
Reaction on long operation	No Action ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.3 Parameter window“Scene Control”

Parameter“Reaction on short operation/press the button”

Parameter“Reaction on long operation/release the button”

These parameters are for setting to recall or storage scene when press/release the contact or short/long operation. Options:

No reaction

Recall scene

Store scene

——Parameter“Scene number [1..64]”

This parameter is visible when “No reaction” is not selected. Set the scene number.

Options:

Scene NO.1

...

Scene NO.64

Corresponding telegram is 0~63

5.2.1.4. Parameter window "Shutter Control"

Function mode	Shutter Control ▼
Long operation after(*0.1s)	5 ▲▼
Reaction on short operation	No Action ▼
Reaction on long operation	No Action ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.4 Parameter window "Shutter Control"

Parameter "Reaction on short operation"

Parameter "Reaction on long operation"

These two parameters are for setting to performed actions when short/long operation. Options:

No reaction

Up

Down

Up/Down

Stop(Adjust Up)

Stop(Adjust Down)

Stop(Adjust Up/Down)

No action: no telegram to be sent.

Up: the blinds will be opened or moved up.

Down: the blinds will be closed or moved down.

Up/Down: alternately open/close or move up/down the blinds. When the device is powered on for the first time or restarted after downloading, the default value for "Up/Down, Blind" is 0, meaning the first operation is closing or moving down the blinds.

Stop (Adjust Up): stop the blind movement or move up the angle of blinds.

Stop (Adjust Down): stop the blind movement or move down the angle of blinds.

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

When the device is powered on for the first time or restarted after downloading, the default value for

“Stop/Adjust, Blind” is 0, meaning the first operation is stop or move down the angle of blinds.

——Parameter “Interval of cyclic send [*0.1s,0=once] ”

This parameter is visible when the parameter “Reaction on long operation” is selected “Stop...”.

Set the time interval of cyclical blinds angle adjustment telegram sent.

Options: **0..15, 0=send once**

5.2.1.5. Parameter window“Value Output”

Function mode	Value Output ▼
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5 ▲▼
Reaction on short operation	No Action ▼
Reaction on long operation	No Action ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.5 Parameter window“Value Output”

Parameter“Reaction on short operation/press the button”

Parameter“Reaction on long operation/release the button”

These parameters are for setting the datatype to send when press/release the contact or short/long operation. Options:

No reaction

1bit value[On/Off]

2bit value[0..3]

4bit value[0..15]

1byte value[0..255]

2byte value[0..65535]

——Parameter“Output value”

These two parameters are visible when “No reaction” is not selected. Set the the data value to send when press/release the contact or short/long operation. Range of value is determined according to the previous parameter selected datatype.

5.2.1.6. Parameter window“Shift Register”

Function mode	Shift Register
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5
Reaction on short operation	☐ No Action ☒ Send Value
Reaction on long operation	☐ No Action ☒ Reset
Shift type	☒ Shift by step value ☐ Shift without step value
Value begin with	0
Value end with	10
Step size	2
Direction	☒ From lowest to highest ☐ From highest to lowest
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.6 Parameter window“Shift Register”

Parameter“Reaction on short operation/press the button”

Parameter“Reaction on release the button”

These parameters are for setting the performed actions when press/release the contact or short operation. Options:

No reaction

Send value

Parameter“Reaction on long operation”

These parameters are for setting the performed actions when long operation. Options:

No reaction

Reset

Parameter "Shift type"

This parameter is for setting the shift type. Options:

Shift by step value

Shift without step value

Shift by step value: Here the starting value and stopping value of shift can be set, the value increased (from low to high) or decreased (from high to low) from every shift can also be set.

Shift without step value: When there's no step value, the actual value sent by each shift can be set (max. 10 value), in every operation one value will be sent.

Parameters as follow are visible when "Shift by step value" is selected:

——Parameter "Value begin with"

This parameter is for setting the starting value of the shift. Options: **0..240**

——Parameter "Value end with"

This parameter is for setting the stopping value of the shift. Options: **1..250**

Note: the values must meet the condition: end value > begin value,

——Parameter "Step size"

This parameter is for setting the increase (from low to high) or decrease (from high to low) value.
Options: **0..240**

Parameters as follow are visible when "Shift without step value" is selected:

——Parameter "Shift number"

This parameter is for setting the number of shift, up to set 10 values.

Options: **1/2../10**

——Parameter "Value x" (x=1~10)

This parameter is for setting the value when each shift operation to send. Options: **0..255**

Parameter "Direction"

This parameter is for setting the shift direction. Options:

From lowest to highest

From highest to lowest

From lowest to highest: shift from low to high.

From highest to lowest: shift from high to low.

5.2.1.7. Parameter window“RGB dimming”

Function mode	RGB dimming
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5
RGB strip type	☐ RGB ☒ RGBW
Object type	☒ 1x6Byte ☐ 4x1Byte
Reacton when short operation	
Red Value	0
Green Value	0
Blue Value	0
White Value	0
Reaction when long operation	
Red Value	0
Green Value	0
Blue Value	0
White Value	0
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.7 Parameter window“RGB dimming”

Parameter“RGB strip type”

This parameter is for setting the RGB strip type. Options:

RGB

RGBW

Parameter“Object type”

This parameter is for setting the object datatype of RGB/RGBW. Options:

When "RGB" is selected, options:

1x3byte

3x1byte

When "RGBW" is selected, options:

1x6byte

4x1byte

Reaction when short operation/Reaction when long operation

Parameter "Red value"

Parameter "Green value"

Parameter "Blue value"

Parameter "White value"

These parameters are for setting the Red/Green/Blue/White value when short/long operation.

Options: **0..255**

5.2.1.8. Parameter window“Multiple Operation”

Function mode	Multiple Operation ▼
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5 ▲▼
Object type for object 1	1 Bit_On/Off ▼
Function of short operation	No Action ▼
Function of long operation	No Action ▼
Object type for object 2	1 Bit_Up/Down ▼
Function of short operation	No Action ▼
Function of long operation	No Action ▼
Object type for object 3	1 Byte_RecallScene ▼
Function of short operation	☐ No Action ☒ Send Value
Value 1(Scene)	Scene NO.1 ▼
Function of long operation	☐ No Action ☒ Send Value
Value 2(Scene)	Scene NO.1 ▼
Object type for object 4	1 Byte_StoreScene ▼
Function of short operation	☐ No Action ☒ Send Value
Value 1(Scene)	Scene NO.1 ▼
Function of long operation	☐ No Action ☒ Send Value
Value 2(Scene)	Scene NO.1 ▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.8 Parameter window“Multiple Operation”

Parameter "Object type for object x" (x=1~4)

This parameter is for setting the datatype when long/short operation to send. Options:

Disable

1Bit_On/Off

1Bit_Up/Down

1Byte_RecallScene

1Byte_StoreScene

1Byte_Percentage

1Byte_Unsigned value

Parameter "Function of short operation"

Parameter "Function of long operation"

This parameter is for setting the specific values to send when perform the operation, either no action or sending value (the specific value will be set in next parameter).

Parameter "Value x..." (x=1~2)

This parameter is visible when object type is selected "1byte_RecallScene", "1byte_StoreScene", "1byte_Percentage", "1byte_Unsigned value". Set sending values when perform operations. The range of value is up to the datatype selected by the parameter before last one.

5.2.1.9. Parameter window“Delay Mode”

Function mode	Delay Mode ▼
Enable long operation	☐ No ☒ Yes
Long operation after(*0.1s)	5 ▲▼
Object type for short operation	1Bit On/Off ▼
Send Mode	No action when press, delay then send value1 ▼
Delay time(s)	0 ▲▼
Value 1	0 ▲▼
Value 2	0 ▲▼
Object type for long operation	4Bit Dimming ▼
Send Mode	No action when press, delay then send value1 ▼
Delay time(s)	0 ▲▼
Value 1	0 ▲▼
Value 2	0 ▲▼
Disable function	☐ Disable ☒ Enable
Trigger value of disable object	☒ Disable=1/Enable=0 ☐ Disable=0/Enable=1

Fig.5.2.1.9 Parameter window“Delay Mode”

Parameter“Object type for short operation”

Parameter“Object type for long operation”

These two parameters are for setting the datatype when short/long operation to send. Options:

Disable

1Bit_On/Off

4Bit_Dimming

1Byte_Unsigned value

Parameters as follow are not visible when "Disable" is selected:

Parameter "Send mode"

This parameter is for setting the send mode. Options:

No action when press,delay then send value1

No action when press,delay then send value2

Send value1 when press,delay then send value2

Send value2 when press,delay then send value1

Parameter "Delay time [0..6500]s"

This parameter is for setting the delay time. Options: **0..65535**

Parameter "Value x"(x=1~2)

This parameter is for setting the value 1/2 to send. The range of value is up to the datatype selected by the parameters.

5.2.1.10. Parameter window "LED"

LED 1 function	Control by switch object ▼
Progressive transition	☐ Disable ☒ Enable
LED status (Switch = 0)	Level as 'Off' ▼
LED status (Switch = 1)	Level as 'On' ▼

Control by switch object

LED 1 function	Control by external object ▼
Progressive transition	☐ Disable ☒ Enable
External object datatype	☒ 1Bit ☐ 1Byte
LED status (Switch = 0)	Level as 'Off' ▼
LED status (Switch = 1)	Level as 'On' ▼

Control by external object

LED 1 function	Indicate button action ▼
LED flashing mode	Flash at fast speed ▼
LED flashing time	1.0s ▼
LED's level of flashing	Level as 'On' ▼
LED's level of idle	Level as 'Off' ▼

Indicate button action

LED 7 function	Indicate power status ▼
Progressive transition	☐ Disable ☒ Enable

Indicate power status

Fig.5.2.1.10 Parameter window "LED"

Parameter "LED x function" (x=1~8)

This parameter is for setting the LED indication status.

When "Normal button" is selected, options: **Disable/Control by switch object/Control by external object/Indicate button action**

When "Ventilation/HVAC/AC/Floor heating power" is selected, options: **Disable/Indicate power status/Indicate button action**

When "Function page switch/Function mode switch/Temperature '-'/Temperature '+' " is selected, options: **Disable/Indicate button action**

Parameter "Progressive transition"

This parameter is visible when "Indicate power status", "Control by switch object", "Control by external object" is selected. Used for setting whether to enable progressive transition function. Options:

Disable

Enable

Parameter "External object datatype"

This parameter is visible when "Control by external object" is selected. Used for setting the external object datatype. Options:

1bit

1byte

Parameter "LED status (Switch = 0)"

Parameter "LED status (Switch = 1)"

These two parameter are visible when "Control by switch object" or "Control by external object" and "1Bit" are selected. Used for setting the LED indication colour according to 1 bit object value from the bus. Options:

Off

Level as 'On'

Level as 'Off'

Parameter "Threshold of value"

This parameter is visible when "Control by external object" and "1Byte" is selected. Used for setting the threshold value. Options: **0..255**

Parameter "LED status (< threshold)"

Parameter "LED status (= threshold)"

Parameter "LED status (> threshold)"

These parameters are visible when "Control by external object" and "1Byte" are selected. Used for setting the LED indication colour according to the comparison of both the object value and the threshold value. Options:

Off

Level as 'On'

Level as 'Off'

Parameter "LED flashing mode"

This parameter is visible when "Indicate button action" is selected. Used for setting the LED flashing mode. Options:

Flash only once

Flash at fast speed

Flash at normal speed

Flash at slow speed

Parameter "LED flashing time"

This parameter is visible when "Indicate button action" is selected. Used for setting the LED flashing time. Options:

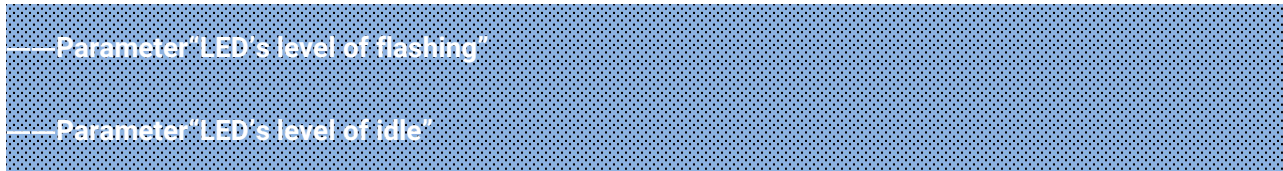
0.5s

1.0s

1.5s

...

3.0s



These two parameters are visible when "Indicate button action" are selected. Used for setting the LED's level of flashing/idle. Options:

Off

Level as 'On'

Level as 'Off'

5.3.Parameter window“Temperature”

Temperature display unit:	☒ Celsius(°C) ☐ Fahrenheit(°F)
Internal sensor:	
Send temperature of internal sensor:	☐ No ☒ Yes
Send temperature when change by [0-15]*0.5°C	2
Report interval for temperature [0-255] min	0
Internal sensor calibration:	0°C
Reply error of internal sensor:	Respond after change
Object value of 'Error':	☒ 1 : Error ☐ 0 : Error
Pt100 sensor:	
Pt100 temperature sensor:	☐ Disable ☒ Enable
Send temperature of pt100 sensor:	☐ No ☒ Yes
Send temperature when change by [0-15]*0.5°C	2
Report interval for temperature [0-255] min	0
Pt100 sensor calibration:	0°C
Reply error of pt100 sensor:	Respond after change
Object value of 'Error':	☒ 1 : Error ☐ 0 : Error

Fig.5.3 Parameter window“Temperature”

Parameter“Temperature display unit”

This parameter is for setting temperature display units.Options:

Celsius(°C)

Fahrenheit(°F)

Internal sensor/PT100 sensor

Parameter "Send temperature of internal sensor"

Parameter "Send temperature of PT100 sensor"

This parameter is for setting whether to send current internal/PT100 sensor temperature value to the bus. Options:

NO

Yes

Parameter as follow are visible when "Yes" is selected:

—Parameter "Send temperature when change by $[0-15] \times 0.5^{\circ}\text{C}$ "

This parameter is for setting when temperature turns to a certain value, whether to enable to send the current temperature value to the bus. Options: **0...15**

—Parameter "Report interval for temperature $[0-255]\text{min}$ "

This parameter is for setting the time for cyclically sending the temperature detection value to the bus. Options: **0..255**

This period is independent and starts time counting after programming completion or reset.

Transmission change has no affect on this period.

Parameter "Internal sensor calibration"

Parameter "PT100 sensor calibration"

This parameter is for setting the temperature calibration value of the internal/PT100 sensor, that is, to calibrate the measured value of internal/PT100 sensor to make it closer to the current ambient temperature. Options:

-5.0°C

...

0°C

...

5°C

Parameter "Reply error of internal sensor"

Parameter "Reply error of PT100 sensor"

This parameter is for setting condition of sending telegram when internal/PT100 sensor error.

Options:

No respond

Respond after read only

Respond after change

Respond after read: Only when the device receives a read error from other bus device or bus will the object "Error of internal/PT100 sensor" send the alarm status to the bus.

Respond after change: the object "Error of internal/PT100 sensor" will immediately send the telegram to the bus to report the error value when the error status has changed.

——Parameter "Object value of Error"

This parameter is visible when "Respond after read" or "Respond after change" is selected. Used for setting the object of error. Options:

1:Error

0:Error

5.4.Parameter window“HVAC”

5.4.1.Parameter window“HVAC General”

Power on/off for HVAC	☐ Disable ☒ Enable
Temperature referece from:	Internal and External Sensors ▼
Combination ratio:	50% Internal & 50% External ▼
Request interval for temperature [0-255]min:	1 ▲▼
Operating mode:	
Object type of operating mode:	☒ 4x1Bit ☐ 1Byte
Operating mode after reset:	Comfort mode ▼
Extended comfort mode[0..255]min:	0 ▲▼
Control mode:	
HVAC control mode:	Heating and Cooling ▼
Heating/Cooling switch:	Via button or object ▼
Heating/Cooling status after reset:	Cooling ▼
Control system:	
HVAC control system:	☐ 2 pipes system ☒ 4 pipes system

Fig.5.4.1 Parameter window“HVAC General”

Parameter“Power on/off for HVAC”

This parameter is for setting whether to enable power on/off for HVAC. Options:

Disable

Enable

Parameter“Temperature reference from”

This parameter is for setting the resource of the HVAC control temperature reference. Options:

Internal sensor

External sensor

PT100 sensor

Internal and External sensors

Internal and PT100 sensors

External and PT100 sensors

——Parameter“Request interval for temperature [0-255]min”

This parameter is visible when “External sensor”, “Internal and External sensors”, “External and PT100 sensors” is selected. Set the time period for read request external temperature sensor.

Options: **0..255**

——Parameter“Combination ratio”

This parameter is visible when “Internal and External sensors”, “Internal and PT100 sensors”, “External and PT100 sensors” is selected. Set the internal/external/PT100 sensor to measure the specific gravity of the temperature.

When “Internal and External sensors” is selected, options:

10% Internal & 90% External

...

90% Internal to 10% External

When “Internal and PT100 sensors” is selected, options:

10% Internal & 90% PT100

...

90% Internal & 10% PT100

When “External and PT100 sensors” is selected, options:

10% External & 90% PT100

...

90% External & 10% PT100

For example, if the option is “40% internal to 60% external”, then the internal sensor accounts for 40%, the external sensor accounts for 60%, and the control temperature = (internal sensor's

temperature × 40%) + (external sensor's temperature × 60%), the HVAC function of the device will control and display the temperature according to the calculated temperature.

Operating mode

Parameter "Object type of operating mode"

This parameter is for setting the object type of operating mode. Options:

4x1bit

1byte

Parameter "Operating mode after reset"

This parameter is for setting the operating mode after reset. Options:

Comfort mode

Standby mode

Economy mode

Frost/heat protection

Last mode before reset

Parameter "Extended comfort mode [0..255]min"

This parameter is for setting the extended time of comfort mode. Options: **0..255**

Note: This setting only takes effect when switching from economy mode to comfort mode.

Comfort mode will automatically switch back to economy mode after the set time.

Control mode

Parameter "HVAC control mode"

This parameter is for setting HVAC control mode. Options:

Heating

Cooling

Heating and Cooling

Parameters as follow are visible when "Heating and Cooling" is selected:

Parameter "Heating/Cooling switch"

This parameter is for setting the switchover way of Heating/Cooling. Options:

Only via button

Only via object

Via button or object

Parameter "Heating/Cooling status after reset"

This parameter is for setting the heating/cooling status after reset. Options:

Heating

Cooling

Last control before reset

Control system

Parameter "HVAC control system"

This parameter is for setting the type of HVAC control system, that is, pipe types of fan coil water inlet/outlet. Options:

2 pipes system

4 pipes system

2 pipes system: Shares an inlet and outlet pipe for heating and cooling, that is, both hot and cold water are controlled by a valve.

4 pipes system: Has its own inlet and outlet pipes for heating and cooling, and two valves are needed to control the entry and exit of hot water and cold water respectively.

5.4.2.Parameter window“HVAC Setpoint”

Setpoint method for operating mode: ☒ Relative ☐ Absolute

Base setpoint temperature[10..35]°C:

Heating:

Reduced value in standby mode [0..10]°C:

Reduced value in comfort mode [0..10]°C:

Reduced value in economy mode [0..10]°C:

Setpoint value in frost protection mode [5..10]°C:

Cooling:

Increased value in standby mode [0..10]°C:

Increased value in comfort mode [0..10]°C:

Increased value in economy mode [0..10]°C:

Setpoint value in heat protection mode [30..37]°C:

Range:

Minimum value of temperature[5..37]°C:

Maximum value of temperature[5..37]°C:

Relative

Setpoint method for operating mode: ☐ Relative ☒ Absolute

Heating:

Setpoint value in standby mode [5..37]°C:	19
Setpoint value in comfort mode [5..37]°C:	21
Setpoint value in economy mode [5..37]°C:	17
Setpoint value in frost protection mode [5..37]°C:	7

Cooling:

Setpoint value in standby mode [5..37]°C:	25
Setpoint value in comfort mode [5..37]°C:	23
Setpoint value in economy mode [5..37]°C:	27
Setpoint value in heat protection mode [5..37]°C:	35

Range:

Minimum value of temperature[5..37]°C:	5
Maximum value of temperature[5..37]°C:	37

Absolute

Fig.5.4.2 Parameter window“HVAC Setpoint”

Parameter“Setpoint method for operating mode”

This parameter is for setting the setpoint method for operating mode. Options:

Relative

Absolute

Relative adjustment, except for protection mode, other modes will refer to the defined temperature setpoint.

Absolute: Absolute adjustment, each mode has its independent temperature setpoint.

Parameters as follow are visible when the setpoint temperature adopts the relative adjustment

method:

Parameter "Base setpoint temperature[10..35]°C"

This parameter is for setting the basic setpoint temperature and modified through object "Base setpoint adjustment". Options:

10.0

10.5

...

35.0

Heating/Cooling

Parameter "Reduced value in standby mode [0...10]°C"

Parameter "Increased value in standby mode [0...10]°C"

Parameter "Reduced value in comfort mode [0...10]°C"

Parameter "Increased value in comfort mode [0...10]°C"

Parameter "Reduced value in economy mode [0...10]°C"

Parameter "Increased value in economy mode [0...10]°C"

These parameters are for setting the setpoint of standby/comfort/economy mode. Options:

0

1

...

10

Heating: The setpoint of standby/comfort/economy mode is the temperature setpoint minus the reference value;

Cooling: The setpoint of standby/comfort/economy mode is the temperature setpoint plus the reference value.

Parameter* Setpoint value in frost protection mode [5...10] °C*

This parameter is for setting the setpoint of frost protection mode. Options:

5°C

6°C

...

10°C

Under the frost protection mode, when room temperature reduce to the setpoint, the controller will trigger a control telegram so that related heating controller will output heating control to prevent the temperature from being too low.

Parameter* Setpoint value in heat protection mode [30...37] °C*

This parameter is for setting the setpoint of heat protection mode. Options:

30°C

31°C

...

37°C

Under the heat protection mode, when room temperature raise to the setpoint, the controller will trigger a control telegram so that related cooling controller will output cooling control to prevent the temperature from being too high.

Parameters as follow are visible when the setpoint temperature adopts the absolute adjustment method:

Heating/Cooling

Parameter* Setpoint value in standby mode [5...37] °C*

Parameter* Setpoint value in comfort [5...37] °C*

Parameter* Setpoint value in economy mode [5...37] °C*

These parameters are for setting the setpoint temperature in standby, comfort and economy

mode when heating or cooling. Options:

5°C

6°C

...

37°C

Parameter "Setpoint value in frost protection mode [5...10]"

This parameter is for setting the setpoint temperature in frost protection mode when heating.

Options:

5°C

...

10°C

Parameter "Setpoint value in heat protection mode [30...37]"

This parameter is for setting the setpoint temperature in heat protection mode when cooling.

Options:

30°C

31°C

...

37°C

 Note: The heating setpoint must be always less than the cooling setpoint.

Range

Parameter "Min. /Max. Value of temperature [5...37]°C"

This parameter is for setting the Min./Max. value of temperature. The minimum value set must be less than the maximum value; otherwise, the restriction will be invalid.

Options: **5°C/.../37°C**

5.4.3.Parameter window“HVAC control”

Heating:

Type of heating control: Switching On/Off(2-point control) ▼

Invert control value: ☒ No ☐ Yes

Hysteresis of heating[0..255]*0.1°C: 20 ▲▼

Cooling:

Type of cooling control: Switching On/Off(2-point control) ▼

Invert control value: ☒ No ☐ Yes

Hysteresis of cooling[0..255]*0.1°C: 20 ▲▼

Cyclically send control value[0..255]min: 10 ▲▼

Switching On/Off(2-point control)

Heating:

Type of heating control: Switching PWM(PI control) ▼

Invert control value: ☒ No ☐ Yes

PWM cycle time[1..255]min: 15 ▲▼

Heating speed: Hot water heating(5K/150min) ▼

Cooling:

Type of cooling control: Switching PWM(PI control) ▼

Invert control value: ☒ No ☐ Yes

PWM cycle time[1..255]min: 15 ▲▼

Cooling speed: Cooling ceiling(5K/240min) ▼

Cyclically send control value[0..255]min: 10 ▲▼

Switching PWM(PI control)

Heating:

Type of heating control: Continuous control(PI control) ▼

Invert control value: ☒ No ☐ Yes

Heating speed: Hot water heating(5K/150min) ▼

Send control value on change by[0..100, 0=inactive]: 4 ▼

Cooling:

Type of cooling control: Continuous control(PI control) ▼

Invert control value: ☒ No ☐ Yes

Cooling speed: Cooling ceiling(5K/240min) ▼

Send control value on change by[0..100, 0=inactive]: 4 ▼

Cyclically send control value[0..255]min: 10 ▼

Continuous control(PI control)

Fig.5.4.3(1) Parameter window“HVAC control”

This parameter window displays according to control mode and control system (2 pipe or 4pipe):

Heating/Cooling

Parameter“Type of heating/cooling control”

This parameter is visible when “Heating and Cooling&2pipe” is selected. Used for setting the type of heating/cooling control. Different control types are suitable for controlling different temperature controllers. Options:

Switching on/off(use 2-point control)

Switching PWM(PI control)

Continuous control(PI control)

Parameter“Invert control value”

This parameter is for setting whether to invert control value or normal sending control value, so that the control value will be suitable for the valve type. Options:

No

Yes

Yes: send the control value to the bus through objects after inverting the control value.

These parameters as follow are suitable for 2 point control:

Parameter "Hysteresis of heating [0...255]*0.1°C"

Parameter "Hysteresis of cooling [0...255]*0.1°C"

These two parameters are for setting the hysteresis temperature in HVAC heating or cooling.

Options: **0...255**

Under heating control,

When the actual temperature(T) > the setting temperature + hysteresis temperature, then will stop heating.

When the actual temperature(T) < the setting temperature - hysteresis temperature, then will start heating.

For example, the hysteresis temperature is 1°C, the setting temperature is 22°C, if T is higher than 23°C, then it will stop heating; if T is lower than 21°C, then it will start heating; if T is between 21~23°C, then it will maintain the previous status.

Under the cooling control,

When the actual temperature (T) < the setting temperature - hysteresis temperature, then will stop cooling.

When the actual temperature (T) > the setting temperature + hysteresis temperature, then will start cooling.

For example, the hysteresis temperature is 1°C, the setting temperature is 26°C, if T is lower than 25°C, then it will stop cooling; if T is lower than 27°C, then it will start cooling; if T is between 26~27°C, then it will maintain the previous status.

2-point control mode is a very simple control mode. When adopting this control mode, it is necessary to set the upper hysteresis temperature and the lower hysteresis temperature through

parameters. When setting the hysteresis temperature, the following effects need to be considered

1. When hysteresis interval is small, the temperature range will be small, however, frequent sending of control value will bring large load to the bus;
2. When hysteresis interval is large, the switch switching frequency will be low, but it is easy to cause uncomfortable temperature change.

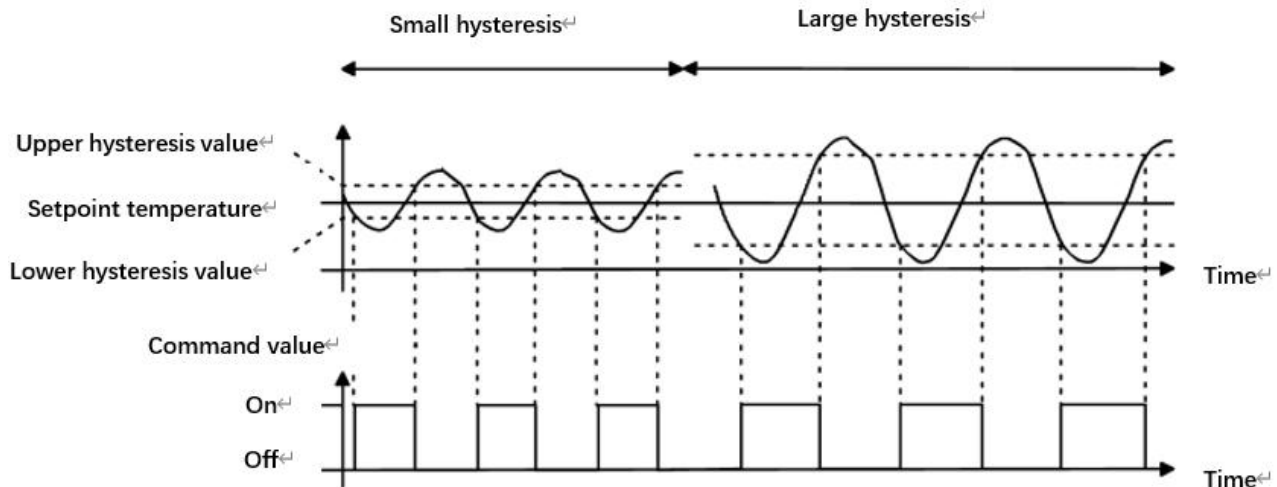


Fig.5.4.3(2) Effects of hysteresis on control value switch action(heating) under 2-point control mode

These parameters as follow are suitable for PI control:

Parameter "PWM cycle time [1...255]min"

This parameter is only visible when the control type is "Switching PWM(PI control)". Set the period of the control object cycle to send the switch value, the object sends the switch value according to the duty cycle of the control value. For example, if the set period is 10 min and the control value is 80%, then the object will send an open telegram for 8 min. If the control value is changed, the time duty ratio of the on/ off telegram of the object will also change, but the period is still the time of parameter setting.

Options: **1..255**

The PI values of "Switching PWM (PI control)" and "Continuous control (PI control)" are the same, only different in control objects, the control object of "Continuous control" output PI value(1byte) directly, while the control value of "Switching PWM" output a "on/off" telegram according to the duty

cycle of the control value.

PI control:

Parameter "Heating speed"

Parameter "Cooling speed"

These two parameters are for setting the responding speed of heating or cooling controller.

Different responding speeds are suitable for different environments.

Options:

Hot water heating (5K/150min)

Floor heating (5K/240 min)

Electrical heating (4K/100min)

Split unit (4K/90min)

User defined

Options:

Cooling ceiling (5K/240min)

Split unit (4K/90min)

Fan converter(4K/90min)

User defined

——Parameter "Proportional range [10..100]"

——Parameter "Reset time [0..255]"

These two parameters are visible when "User defined" is selected. Set the PI value of PI controller.

Options: **10..100**

Options: **0..255**

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

This parameter is visible when control type is "Continuous control (PI control)", for setting the changing value of the control value to be sent to the bus. Options: **0..100, 0=inactive**

In PI control mode, the predefined control parameters of each PI controller in heating or cooling system are recommended as follows:

(1) Heating

Heating type	P value	I value(integration time)	Recommended PI control type	Recommended PWM period
Hot water Heating	5K	150min	Continuous/PWM	15min
Underfloor heating	5K	240min	PWM	15-20min
Electrical heating	4K	100min	PWM	10-15min
Split unit	4K	90min	PWM	10-15min
Fan coil unit	4K	90min	Continuous	--

(2) Cooling

Cooling type	P value	I value(integration time)	Recommended PI control type	Recommended PWM period
Cooling ceiling	5K	240min	PWM	15-20min
Split unit	4K	90min	PWM	10-15min
Fan coil unit	4K	90min	Continuous	--

(3) User defined

When the parameter "Heating/Cooling speed" is set to "User defined", the parameter value of P (scale factor) and I (integration time) can be set through the parameter. When adjusting the parameters, refer to the fixed PI value mentioned in the above table. Even if the control parameters are adjusted slightly, the control behavior will be significantly different.

In addition, the integration time should be set properly. If the integration time is too long, the adjustment will be slow, and the oscillation will not be obvious; if the integration time is too small, the adjustment will be fast, but the oscillation will occur. 0 means the integral term is not used.

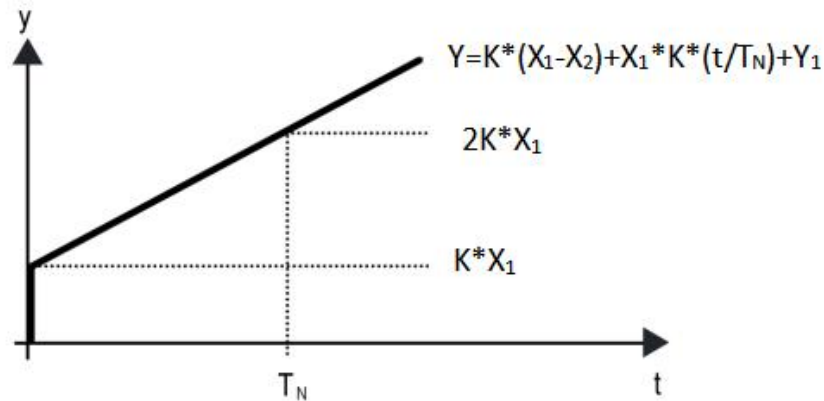


Fig.5.4.3 (3) control value of PI control mode

Y: control value

Y1: last control value

X1: temperature deviation = set temperature - actual temperature

X2: last temperature deviation = set temperature - actual temperature

T_N : integration time

K: scale factor (the scale factor is not zero)

PI control algorithm: $Y = K * (X1-X2) + X1 * K * t / T_N + Y1$

When the integration time is set to zero, the PI control algorithm is: $Y = K (X1-X2) + Y1$

Setting and influence of user-defined parameters:

Parameter setting	Effect
K: If the scale range is too small	Quick adjustment, and overshoot will occur
K: If the scale range is too small	Slow adjustment, but no overshoot
T_N : If the integration time is too short	Quick adjustment, but there will be oscillation
T_N : If the integration time is too long	Slow adjustment, no obvious oscillation

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

This parameter is for setting the period for cyclically sending the control value to the bus.

Options: **0..255**

5.4.4.Parameter window“HVAC Fan”

Fan function:	☐ Disable ☒ Enable
Fan level:	3 level(Off/L1/L2/L3) ▼
No 'Off' level via button:	☒ Disable ☐ Enable
Data type of fan speed:	☐ 1Bit ☒ 1Byte
Out value of fan speed:	
Output value of fan speed off:	0 ▲▼
Output value of fan speed 1:	84 ▲▼
Output value of fan speed 2:	168 ▲▼
Output value of fan speed 3:	255 ▲▼
Status value of fan speed:	
Status value of fan speed off:	0 ▲▼
Status value of fan speed 1:	1 ▲▼
Status value of fan speed 2:	2 ▲▼
Status value of fan speed 3:	3 ▲▼
Delay between speed switch[0..100] *50ms:	10 ▲▼
Auto operation function:	Local controller ▼
Minimum time in fan speed[0..65535]s	60 ▲▼
Threshold setting for PI control:	
Threshold value in speed off and 1 [1..255]:	80 ▲▼
Threshold value in speed 1 and 2 [1..255]:	100 ▲▼
Threshold value in speed 2 and 3 [1..255]:	200 ▲▼
Hysteresis value (+/-) [0..100]:	10 ▲▼

Difference setting for 2-point control:

Temperature difference in speed off and 1[1..255]*0.1°C:	20
Temperature difference in speed 1 and 2[1..255]*0.1°C:	40
Temperature difference in speed 2 and 3[1..255]*0.1°C:	60
Hysteresis difference(+/-) [0..100]*0.1°C:	10

Fig.5.4.4 Parameter window“HVAC Fan”

Parameter“Fan function:”

This parameter is for setting whether to enable fan function. Options:

Disable

Enable

Parameter as follow are visible when “Enable” is selected:

Parameter“Fan level”

This parameter is for setting the fan type. Options:

1 level(Off/L1)

2 level(Off/L1/L2)

3 level(Off/L1/L2/L3)

Parameter“No ‘Off’ level via button”

This parameter is for setting whether the fan speed can be switched to the off state via button.

Options:

Disable

Enable

Parameter“Data type of fan speed”

This parameter is for setting the data type of fan speed. Options:

1Bit

1Byte

Out value of fan speed

Parameter "Output value of fan speed off"

Parameter "Output value of fan speed 1"

Parameter "Output value of fan speed 2"

Parameter "Output value of fan speed 3"

These parameters are visible when "1Byte" is selected. Used for setting the value sent for each fan speed switchover. Fan speed off when telegram value is 0. Options: **0..255**

Status value of fan speed

Parameter "Status value for fan speed off"

Parameter "Status value for fan speed 1"

Parameter "Status value for fan speed 2"

Parameter "Status value for fan speed 3"

These parameters are visible when "1Byte" is selected. Used for setting the status feedback value of each fan speed. The device will update and display the fan speed according to the feedback value.

Options: **0..255**

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

This parameter is for setting the delay time for switch speed. Options: **0...100**

When receiving a fan speed switch telegram, the fan is turned off first. After the delay period, the speed switch is executed, but there is no delay when turning the fan on/off. When set to 0, the fan immediately switches to the new speed level. If a new speed telegram is received during the delay period, the delay timer does not restart, and the fan will switch directly to the latest speed.

Parameter "Automatic operation function"

This parameter is for setting the control way of automatic operation. Options:

Disable

Local controller

External controller

Parameters as follow are visible when “Local controller” is selected:

Threshold setting for PI control

Under PI control, control value is PI operated within program, controller will power on/off fan or switch fan speed according to the threshold range of the control values.

Parameter “Minimum time in fan speed [0..65535]s”

Defines the residence time of the fan from the current fan speed to a higher fan speed or lower fan speed, that is, the minimum time for a fan speed operation.

If you need 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 long enough, the fan speed can be changed quickly.

Options: **0..65535**

0: there is no minimum running time, but the delay switching time of fan speed still needs to be considered.

Note: The residence time for this parameter setting is only enabled in Auto mode.

Parameter “Threshold value in speed OFF and 1 [1..255]”

Define threshold value for speed OFF and 1. Options: **1..255**

If the control value is greater than or equal to this setting threshold value, start to run fan speed 1; if the control value is less than this setting threshold value, the fan will be turned off.

Parameter “Threshold value in speed 1 and 2 [1..255]”

Define the threshold value for speed 1<=>2, if the control value is greater than or equal to this setting threshold, start to run fan speed 2. Options: **1..255**

Parameter “Threshold value in speed 2 and 3 [1..255]”

Define the threshold for speed 2<=>3, if the control value is greater than or equal to this setting threshold, start to run fan speed 3. Options: **1..255**

Tip: The controller evaluates the threshold in ascending order.

First check →OFF <=>fan speed 1 threshold →fan speed 1<=> fan speed 2→fan speed 2 <=>fan

speed 3.

Parameter "Hysteresis value in +/-[0..100]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action of the fan when the control value fluctuates near the threshold. Options: **0..100**

If value is 0, no hysteresis. Fan switch to speed once control value greater than threshold value;

Suppose that hysteresis value is 10 and the threshold is 50, then the upper limit threshold 60 (Threshold value+Hysteresis value) and the lower limit threshold 40 (Threshold value-Hysteresis value). When the control value is between 40 ~60, fan action will not be caused, and the previous status will still be maintained. Only less than 40 or greater than or equal to 60 will change the running status of the fan.

Difference setting for 2-point control

Under 2-point control, controller will decide the fan power on/off or fan speed according to the temperature difference between the actual temperature and setpoint temperature.

Cooling: Temperature difference = actual temperature - setpoint temperature;

Heating: Temperature difference = setpoint temperature - actual temperature.

Parameter "Temperature difference in speed OFF<-->1[1..200]*0.1°C"

This parameter is for setting the temperature difference for speed OFF<-->1.

Options: **1..200**

If the temperature difference is greater than or equal to this setting temperature difference, start to run fan speed 1; if less than this setting temperature difference, the fan will be turned off.

Parameter "Temperature difference speed in speed 1<-->2[1..200]*0.1°C"

Define the temperature difference for speed 1<-->2, if the control value is greater than or equal to this setting temperature difference, start to run fan speed 2.

Options: **1..200**

Parameter "Temperature difference in speed 2<-->3 [1..200] * 0.1 °C h [1..200] * 0.1 °C"

Define the temperature difference for speed 2<-->3, if the control value is greater than or equal to this setting temperature difference, start to run fan speed 3. Options: **1..200**

Tip: The controller evaluates the temperature difference in ascending order.

First check → OFF <-> fan speed 1 temperature difference → fan speed 1 <-> fan speed 2 → fan speed 2 <-> fan speed 3.

Parameter "Hysteresis temperature difference in [0..100] * 0.1 °C"

This parameter is for setting the hysteresis value of the temperature difference, which can avoid the unnecessary action of the fan when the control value fluctuates near the temperature difference.

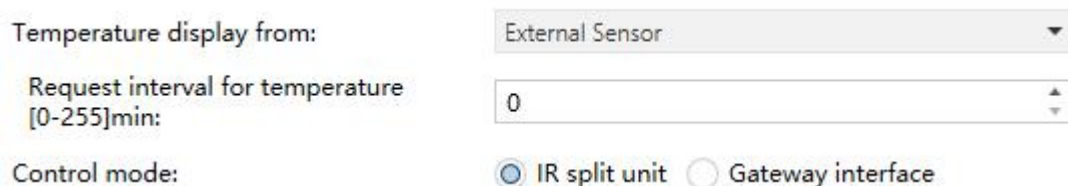
Options: **0..100**

If value is 0, no hysteresis. Fan switch to speed once control value greater than temperature difference;

Suppose that hysteresis value is 0.5°C and the temperature difference is 1°C, then the upper limit temperature difference 1.5°C (Temperature difference+Hysteresis value) and the lower limit temperature difference 0.5°C (Temperature difference-Hysteresis value). When the control value is between 0.5°C~1.5°C, fan action will not be caused, and the previous status will still be maintained. Only less than 0.5°C or greater than or equal to 1.5°C will change the running status of the fan.

5.5.Parameter window“AC”

5.5.1.Parameter window“AC General”



Temperature display from: External Sensor

Request interval for temperature [0-255]min: 0

Control mode: ☒ IR split unit ☐ Gateway interface

Fig.5.5.1 Parameter window“AC General”

Parameter“Temperature display from”

This parameter is for setting the resource of the AC control temperature reference. Options:

Internal Sensor

External Sensor

PT100 sensor

Parameter“Request interval for temperature [0...255]min.”

This parameter is visible when “External sensor” is selected. Set the time period for read request external temperature sensor. Options:**0...255**

Parameter“Control mode”

This parameter is for setting the AC control mode. Options:

IR split unit

Gateway interface

5.5.1.1. Parameter window“IR split unit”

Default setting after power-on:

Default mode after power-on:	Cool
Default fan speed after power-on:	Low
Default setpoint after power-on [16..32]°C:	25
Default setpoint of heat mode[16..32]°C:	16
Default setpoint of cool mode[16..32]°C:	26

Command of power control:

Command for power-on:	☐ Disable ☒ Enable
Command value[0-64]:	1
Command for power-off:	☐ Disable ☒ Enable
Command value[0-64]:	0

Command of operation mode:

Command for dry mode:	☐ Disable ☒ Enable
Command value[0-64]:	2
Command for fan mode:	☐ Disable ☒ Enable
Command value[0-64]:	3
Command for auto mode:	☐ Disable ☒ Enable
Command value[0-64]:	4

Temperature's range:

Minimum temperature value[16..32]°C:	16
Maximum temperature value[16..32]°C:	32

Fig.5.5.1.1 Parameter window“IR split unit”

Default setting after power-on

Parameter "Default mode after power-on"

This parameter is for setting the default mode after power-on. Options:

Dry

Fan

Auto

Heat

Cool

Parameter "Default fan speed after power-on"

This parameter is for setting the default fan speed after power-on. Options:

Low

Medium

High

Parameter "Default setpoint after power-on[16..32] °C"

This parameter is for setting the default setpoint after power-on. Options: **16...32**

Parameter "Default setpoint after heat mode[16..32] °C"

Parameter "Default setpoint after cool mode[16..32]°C"

This parameter is for setting the default setpoint after heat/cool mode. Options: **16...32**

Command of power control

Parameter "Command for power-on"

Parameter "Command for power-off"

These parameters are for setting whether to enable command for power-on/off. Options:

Disable

Enable

——Parameter“Command value[0...64]”

This parameter is visible when previous parameter is enabled. Set the command value for power-on/off. Options: **0...64**

Command of operation mode

Parameter“Command for dry mode”

Parameter“Command for fan mode”

Parameter“Command for auto mode”

These parameters are for setting whether to enable command for dry/fan/auto mode. Options:

Disable

Enable

——Parameter“Command value[0...64]”

This parameter is visible when previous parameter is enabled. Set the command value for dry/fan/auto mode. Options: **0...64**

Temperature's range

Parameter“Minimum temperature value[16..32]°C”

Parameter“Maximum temperature value[16..32]°C”

These parameters are for setting the Min./Max. temperature value. Options: **16...32**

5.5.1.2. Parameter window“Gateway interface”

Data type of mode: ☐ 1Bit ☒ 1Byte

Output value of mode:

Output value for Dry[0..255]:

Output value for Fan[0..255]:

Output value for Auto[0..255]:

Output value for Heat[0..255]:

Output value for Cool[0..255]:

Status value of mode:

Status value for Dry[0..255]:

Status value for Fan[0..255]:

Status value for Auto[0..255]:

Status value for Heat[0..255]:

Status value for Cool[0..255]:

Setpoint

Set temperature in auto mode: ☒ Disable ☐ Enable

Data type of setpoint: ☐ 1Byte(Temperature value) ☒ 2Byte(KNX standard DPT)

Temperature's range:

Minimum temperature value[16..32]°C:

Maximum temperature value[16..32]°C:

Fig.5.5.1.2 Parameter window“Gateway interface”

Parameter“Data type of mode”

This parameter is for setting the data type of mode. Options:

1Bit

1Byte

Output value of mode

Parameter" Output value for Dry [0,1]/[0..255]"

Parameter" Output value for Fan [0,1]/[0..255]"

Parameter" Output value for Auto [0,1]/[0..255]"

Parameter" Output value for Heat [0,1]/[0..255]"

Parameter" Output value for Cool [0,1]/[0..255]"

These parameters are for setting the output value for dry/fan/auto/heat/cool.

When "1Bit" is selected, options: **0,1**

When "1Byte" is selected, options: **0...255**

Status value of mode

Parameter" Status value for Dry[0..255]"

Parameter" Status value for Fan[0..255]"

Parameter" Status value for Auto[0..255]"

Parameter" Status value for Heat[0..255]"

Parameter" Status value for Cool[0..255]"

These parameters are visible when "1Byte" is selected. Set the status feedback value for dry/fan/auto/heat/cool. Options: **0...255**

Setpoint

Parameter" Set temperature in auto mode"

This parameter is for setting whether set temperature in auto mode. Options:

Disable

Enable

Parameter" Data type of setpoint"

This parameter is for setting the data type of setpoint. Options:

1Byte(Temperature value)

2Byte(KNX standard DPT)

Temperature's range

Parameter "Minimum temperature value[16..32]°C"

Parameter "Maximum temperature value[16..32]°C"

These parameters are for setting the Min./Max. temperature value. Options: **16...32**

5.5.2.Parameter window“AC Fan”

5.5.2.1. Parameter window“IR split unit”

Command of fan speed:

Command for speed low:

☐ Disable ☒ Enable

Command value[0-64]:

5

Command for speed medium:

☐ Disable ☒ Enable

Command value[0-64]:

6

Command for speed high:

☐ Disable ☒ Enable

Command value[0-64]:

7

5.5.2.1 Parameter window“AC Fan”

Command of fan speed

Parameter“Command for speed low”

Parameter“Command for speed medium”

Parameter“Command for speed high”

These parameters are for setting whether to enable command for speed low/medium/high.

Options:

Disable

Enable

——Parameter“Command value[0...64]”

This parameter is visible when previous parameter is enabled. Set the command value for speed low/medium/high. Options: **0...64**

5.5.2.2. Parameter window“Gateway interface”

Data type of fan speed: ☐ 1Bit ☒ 1Byte

Output value of fan speed:

Output value for speed low[0..255]:	1
Output value for speed medium[0..255]:	2
Output value for speed high[0..255]:	3

Status value of fan speed:

Status value for speed low[0..255]:	1
Status value for speed medium[0..255]:	2
Status value for speed high[0..255]:	3

Fig.5.5.2.2 Parameter window“Gateway interface”

Parameter“Data type of fan speed”

This parameter is for setting the data type of fan speed. Options:

1Bit

1Byte

Parameter as follow are visible when “1 Byte” is selected:

Output value of fan speed

Parameter“Output value for speed low[0..255]”

Parameter“Output value for speed medium[0..255]”

Parameter“Output value for speed high[0..255]”

These parameters are for setting the value sent for each fan speed switchover. Options: **0...255**

Status value of fan speed

Parameter“Status value for speed low[0..255]”

Parameter“Status value for speed medium[0..255]”

Parameter“Status value for speed high[0..255]”

These parameters are for setting the status feedback value for each fan speed. Options: **0...255**

5.5.3.Parameter window“AC Heat/Cooling”

Parameters as follow are visible when “IR split unit” is selected:

Setpoint in heat mode:

Command for setpoint 16°C:	☐ Disable ☒ Enable
Command value[0-64]:	16
Command for setpoint 17°C:	☐ Disable ☒ Enable
Command value[0-64]:	17
Command for setpoint 18°C:	☐ Disable ☒ Enable
Command value[0-64]:	18
Command for setpoint 19°C:	☐ Disable ☒ Enable
Command value[0-64]:	19
Command for setpoint 20°C:	☐ Disable ☒ Enable
Command value[0-64]:	20
Command for setpoint 21°C:	☐ Disable ☒ Enable
Command value[0-64]:	22
Command for setpoint 22°C:	☐ Disable ☒ Enable
Command value[0-64]:	22
Command for setpoint 23°C:	☐ Disable ☒ Enable
Command value[0-64]:	23
Command for setpoint 24°C:	☐ Disable ☒ Enable
Command value[0-64]:	24
Command for setpoint 25°C:	☐ Disable ☒ Enable
Command value[0-64]:	25

Command for setpoint 26°C:	☐ Disable ☒ Enable
Command value[0-64]:	26
Command for setpoint 27°C:	☐ Disable ☒ Enable
Command value[0-64]:	27
Command for setpoint 28°C:	☐ Disable ☒ Enable
Command value[0-64]:	28
Command for setpoint 29°C:	☐ Disable ☒ Enable
Command value[0-64]:	29
Command for setpoint 30°C:	☐ Disable ☒ Enable
Command value[0-64]:	30
Command for setpoint 31°C:	☐ Disable ☒ Enable
Command value[0-64]:	31
Command for setpoint 32°C:	☐ Disable ☒ Enable
Command value[0-64]:	32

Fig.5.5.3 Parameter window“AC heat/cooling”

Setpoint in heat/cooling mode

Parameter“Command for setpoint 16°C/.../32°C”

These parameters are for setting whether to enable command for setpoint. Options:

Disable

Enable

——Parameter“Command value[0...64]”

This parameter is visible when previous parameter is enabled. Set the command value for setpoint temperature. Options: **0...64**

5.6.Parameter window“Floor heating”

Power on/off floor heating:	☐ Disable ☒ Enable
Temperature referece from:	External Sensor
Request interval for temperature [0-255]min:	0
Floor status after reset:	Status before reset
Setpoint after power-on:	☒ Default setpoint value ☐ Value before power off
Default setpoint value[5..37]°C:	26
Value of heat object:	☒ On=1, Off=0 ☐ On=0, Off=1
Setpoint(2-point control):	
Hysteresis value[0..200]*0.1°C:	20
Minimum value of temperature[5..37]°C:	5
Maximum value of temperature[5..37]°C:	37
Scene(power & setpoint):	
Scene function:	☐ Disable ☒ Enable
1. Trigger scene (1-64,0-Disable):	1
Power status(Off/On):	☐ Off ☒ On
Setpoint temperature[5..37]°C:	20
2. Trigger scene (1-64,0-Disable):	0
3. Trigger scene (1-64,0-Disable):	0
4. Trigger scene (1-64,0-Disable):	0
5. Trigger scene (1-64,0-Disable):	0

Fig.5.6 Parameter window“Floor heating”

Parameter "Power on/off floor heating"

This parameter is for setting whether to enable power on/off for floor heating. Options:

Disable

Enable

Parameter "Temperature reference from"

This parameter is for setting the resource of the floor heating control temperature reference.

Options:

Internal Sensor

External Sensor

PT100 Sensor

Internal and External Sensors

Internal and PT100 Sensors

External and PT100 Sensors

——Parameter "Request interval for temperature [0...255]min"

This parameter is visible when "External sensor", "Internal and External sensors", "External and PT100 sensors" is selected. Set the time period for read request external temperature sensor.

Options: **0..255**

——Parameter "Combination ratio"

This parameter is visible when "Internal and External sensors", "Internal and PT100 sensors", "External and PT100 sensors" is selected. Set the internal sensor and the external sensor to measure the specific gravity of the temperature.

When "Internal and External sensors" is selected, options:

10% Internal & 90% External

...

90% Internal to 10% External

When "Internal and PT100 sensors" is selected, options:

10% Internal & 90% PT100

...

90% Internal & 10% PT100

When "External and PT100 sensors" is selected, options:

10% External & 90% PT100

...

90% External & 10% PT100

For example, if the option is "40% internal to 60% external", then the internal sensor accounts for 40%, the external sensor accounts for 60%, and the control temperature = (internal sensor's temperature × 40%) + (external sensor's temperature × 60%), the floor heating function of the device will control and display the temperature according to the calculated temperature.

Parameter "Floor status after reset"

This parameter is for setting the floor status after reset. Options:

Off

On

Status before reset

Parameter "Setpoint after power-on"

This parameter is for setting the setpoint after power-on. Options:

Default setpoint value

Value before power off

Parameter "Default setpoint value[5...37]°C"

This parameter is for setting the default setpoint value after power-on. Options: **5...37**

Parameter "Value of heat object"

This parameter is for setting the triggered value of floor heating on/off.

Options: On=1,Off=0/On=0,Off=1

Setpoint(2-point control)

Under 2-point control, when the temperature is higher than a certain setpoint temperature, heating off, below a certain setpoint temperature, heating on.

Parameter "Hysteresis value[0..200]*0.1°C"

These two parameters for setting the hysteresis setpoint temperature of floor heating.

Options: 0...200

When the actual temperature(T) > the setting temperature + hysteresis temperature, then will stop heating;

When the actual temperature(T) < the setting temperature - hysteresis temperature, then will start heating.

For example, the hysteresis temperature is 1°C, the setting temperature is 16°C, if T is higher than 17°C, then it will stop heating; if T is lower than 15°C, then it will start heating; if T is between 15~17°C, then it will maintain the previous status.

Parameter "Minimum value of temperature[5..37]°C"

Parameter "Maximum value of temperature[5..37]°C"

This parameter is for setting the Min./Max. Value of temperature. Options: 5...37

Scene(Power & setpoint)

Parameter "Scene function"

This parameter is for setting whether to enable scene function. Options:

Disable

Enable

Parameters as follow are visible when "Enable" is selected:

——Parameter "Trigger scene(1-64, 0-Disable)"

his parameter is for setting the triggered scene number. Up to support 5 triggered scenes.

Options: **1..64**, **0=Disable**

These two parameters as follow are visible when the option is greater than 0.

——Parameter“Power status(Off/On)”

This parameter is for setting status of ON/OFF. Options:

Off

On

——Parameter“Setpoint temperature[5..37] °C”

This parameter is visible when “On” is selected. Set the status of setpoint temperature.

Options: **5...37**

5.7.Parameter window“Ventilation”

5.7.1.Parameter window“Ventilation General”

Power on/off ventilation:	☐ Disable ☒ Enable
Temperature display from:	External Sensor
Request interval for temperature [0-255]min:	0
Ventilation status after reset:	Status before reset
Fan speed after power-on:	Low
Data type of fan speed:	☐ 1Bit ☒ 1Byte
Output value of fan speed:	
Output value of speed off[0..255]:	0
Output value of speed low[0..255]:	1
Output value of speed medium[0..255]:	2
Output value of speed high[0..255]:	3
Status value of fan speed:	
Status value of speed off[0..255]:	0
Status value of speed low[0..255]:	1
Status value of speed medium[0..255]:	2
Status value of speed high[0..255]:	3
Delay between speed switch[0..100] *50ms:	10
Scene function:	☐ Disable ☒ Enable
1. Trigger scene (1-64,0-Disable):	0
2. Trigger scene (1-64,0-Disable):	0
3. Trigger scene (1-64,0-Disable):	0
4. Trigger scene (1-64,0-Disable):	0
5. Trigger scene (1-64,0-Disable):	0

Fig.5.7.1 Parameter window“Ventilation General”

Parameter "Power on/off ventilation"

This parameter is for setting whether to enable power on/off for ventilation. Options:

Disable

Enable

Parameter "Temperature display from"

This parameter is for setting the resource of the ventilation control temperature reference.

Options:

Internal Sensor

External Sensor

PT100 Sensor

——**Parameter "Request interval for temperature [0...255]min"**

This parameter is visible when "External sensor", "Internal and External sensors", "External and PT100 sensors" is selected. Set the time period for read request external temperature sensor.

Options: **0..255**

Parameter "Ventilation status after reset"

This parameter is for setting the ventilation status after reset. Options:

Off

On

Status before reset

Parameter "Fan speed after power-on"

This parameter is for setting the fan speed after power-on. Options:

Off

Low

Medium

High

Parameter "Data type of fan speed"

This parameter is for setting the data type of fan speed. Options:

1Bit

1Byte

Output value of fan speed

Parameter "Output value for speed off[0..255]"

Parameter "Output value for speed low[0..255]"

Parameter "Output value for speed medium[0..255]"

Parameter "Output value for speed high[0..255]"

These three parameters are for setting the value sent for each fan speed switchover.

When "1bit" is selected, 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

When "1Byte" is selected, options: **0...255**

Status value of fan speed

Parameter "Status value for speed off[0..255]"

Parameter "Status value for speed low[0..255]"

Parameter "Status value for speed medium[0..255]"

Parameter "Status value for speed high[0..255]"

These parameters are visible when “1Byte” is selected, set the status feedback value of each fan speed. Options: **0...255**

Parameter “Delay between speed switch[0...100]~50ms”

This parameter is for setting the delay time for switch speed. Options: **0...100**

Parameter “Scene function”

This parameter is for setting whether to enable scene function. Options:

Disable

Enable

Parameters as follow are visible when “Enable” is selected:

——Parameter “Trigger scene(1-64, 0-Disable)”

This parameter is for setting the triggered scene number. Up to support 5 triggered scenes.

Options: **1..64, 0=Disable**

——Parameter “Fan speed”

This parameter is visible when the option is greater than 0. Set the status of fan speed.

Options:

Off

Low

Medium

High

5.7.2.Parameter window“Ventilation Auto”

Auto operation function:	☐ Disable ☒ Enable
Auto value in object:	☐ 0=Auto/1=Disable ☒ 1=Auto/0=Disable
Control reference from:	PM2.5
Request interval for control value[0..255] min:	2
Fan status on error of control:	Off
Data type of PM2.5	☐ DPT_7.001 Pluse ☒ DPT_9.008 Value_AirQuality
Threshold value between off and low [1..999]:	35
Threshold value between low and medium[1..999]:	75
Threshold value between medium and high[1..999]:	115
Hysteresis value(+/-)[10..30]:	10
Minimum time in fan speed[0..65535]s:	10

Fig.5.7.2 Parameter window“Ventilation Auto”

Parameter“Auto operation function”

This parameter is for setting whether to enable auto operation function. Options:

Disable

Enable

Parameters as follow are visible when “Enable” is selected:

Parameter“Auto value in object”

This parameter is for setting the triggered value of auto. Options:

0=Auto/1=Disable

1=Auto/0=Disable

Parameter "Control reference from"

This parameter is for setting the reference of control value under automatic operation. Options:

PM2.5

VOC

CO2

Parameter "Request interval for control value[0..255]min"

This parameter is for setting the time period for device to send a control value read request to PM2.5/VOC/CO2 sensor. Options: **0..255**

Parameter "Fan status on error of control"

This parameter is for setting the fan status on error of control. Options:

Off

Low

Medium

High

Parameter "Data type of PM2.5/VOC/CO2"

This parameter is for setting the data type of PM2.5/VOC/CO2. Datatype determines object type, select it according to the docking PM2.5 or VOC sensor data type. Options:

DPT_7.001 Pulse

DPT_9.008 Value_Air Quality

DPT_7.001 Pulse: Suitable for integrated value.

DPT_9.008 Value_Air Quality: Suitable for float value.

Parameter "Threshold value between off and low"

Define threshold value for speed OFF<-->low, options: **1..999**

If the control value is greater than or equal to this setting threshold value, start to run low fan speed; if the control value is less than this setting threshold value, the fan will be turned off.

Parameter "Threshold value between low and medium"

Define the threshold value for speed low $\leftrightarrow$ medium, if the control value is greater than or equal to this setting threshold, start to run medium fan speed. Options: **1..999**

Parameter "Threshold value between medium and high"

Define the threshold for speed medium $\leftrightarrow$ high, if the control value is greater than or equal to this setting threshold, start to run high fan speed. Options: **1..999**

Tip: The controller evaluates the threshold in ascending order.

First check $\rightarrow$ OFF $\leftrightarrow$ low fan speed threshold $\rightarrow$ low fan speed $\leftrightarrow$ medium fan speed $\rightarrow$ medium fan speed $\leftrightarrow$ high fan speed.

The correctness of functional execution is guaranteed only in this case:

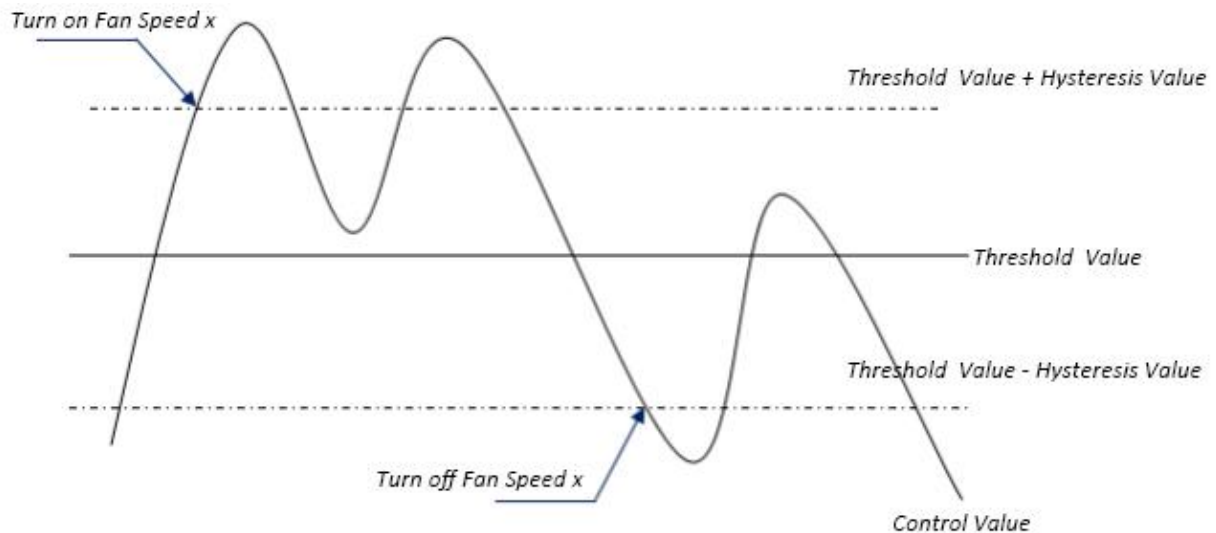
The threshold of OFF $\leftrightarrow$ low fan speed is lower than that of low fan speed $\leftrightarrow$ medium fan speed, and the threshold of low fan speed $\leftrightarrow$ medium fan speed is lower than that of medium fan speed $\leftrightarrow$ high fan speed.

Parameter "Hysteresis value (+/-)[10..30]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action of the fan when the control value fluctuates near the threshold.

Options: **10..30**

For example, the control type is CO₂, the Hysteresis value is 10 and the threshold is 45, then the upper limit threshold 55 (Threshold value+Hysteresis value) and the lower limit threshold 35 (Threshold value-Hysteresis value). When the control value is between 35 ~55, fan action will not be caused, and the previous status will still be maintained. Only less than 35 or greater than or equal to 55 will change the running status of the fan. As shown in the following figure:

**Note:**

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

- 1) Hysteresis determines the control point where Fan speed conversion occurs;
- 2) If Fan speed conversion occurs, new fan speed is determined by control value and threshold value, irrespective of hysteresis.

For example (1):

Take PM2.5 as an example

OFF $\leftrightarrow$ Low fan speed threshold value is 35

Low fan speed $\leftrightarrow$ Medium fan speed threshold value is 55

Medium fan speed $\leftrightarrow$ High fan speed threshold value is 75

Hysteresis value is 25

The fan speed of the fan turbine increases from OFF:

Fan OFF status will change at a control value of 60 ($\geq 25+35$), and new fan speed will be the mid-fan speed (because 60 is between 55 and 75, irrespective of hysteresis at this time), so the low fan speed is ignored;

The behavior of fan speed when descending from a high fan speed:

The high fan speed will change at a control value of 50 ($<75-25$), and new fan speed will be low fan speed (because 50 is between 35 and 55, irrespective of hysteresis), so the fan speed is ignored.

For example(2):

Take PM2.5 as an example

OFF $\leftrightarrow$ Low fan speed threshold value is 20

Low fan speed $\leftrightarrow$ Medium fan speed threshold value is 40

Medium fan speed $\leftrightarrow$ High fan speed threshold value is 70

Hysteresis value is 10

When fan speed is increasing from OFF:

The OFF status will be turned when the control value is 30 ($\geq 20+10$)

When the control value 41 is received, the new speed will be at medium(because the hysteresis is ignored when the value 41 is between 40 and 70), therefore the low speed is ignored.

When the control value 39 is received, the new speed will be at low (because the hysteresis is ignored when the value 39 is between 20 and 40)

When Fan Speed decreasing from high:

The high speed will be turned when the control value is 60 ($<70-10$)

When the control value 39 is received, the new speed will be at low(because the hysteresis is ignored when the value 39 is between 20 and 40),therefore the medium speed is ignored.

3) When the control value is 0,the fan will be off at any circumstances.

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

Defines the residence time of the fan from the current fan speed to a higher fan speed or lower fan speed, that is, the minimum time for a fan speed operation. Options: **0..65535**

If you need 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 long enough, the fan speed can be changed quickly.

0: there is no minimum running time, but the delay switching time of fan speed still needs to be considered.

Note: The residence time for this parameter setting is only enabled in Auto mode.

5.8.Parameter window“Event & Logic”

Event Group	
Event object 1	☐ Disable ☒ Enable
Event object 2	☒ Disable ☐ Enable
Event object 3	☒ Disable ☐ Enable
Event object 4	☒ Disable ☐ Enable
Logic Group	
Logic function 1	☐ Disable ☒ Enable
Logic function 2	☒ Disable ☐ Enable
Logic function 3	☒ Disable ☐ Enable
Logic function 4	☒ Disable ☐ Enable

Fig.5.8 Parameter window“Event & Logic”

Event Group

Parameter“Event object x”(x=1~4)

When this parameter is enabled, the “Event” is visible. This function is described in detail in [Chapter 5.8.1](#). Options:

Disable

Enable

Logic Group

Parameter“Logic function x”(x=1~4)

When this parameter is enabled, the “Logic” is visible. This function is described in detail in [Chapter 5.8.2](#). Options:

Disable

Enable

5.8.1.Parameter window“Event”

Object type of output	1 Bit
1. Trigger scene (1-64,0-Disable)	1
Object Value (0-1)	0
Delay time (0-255)*0.1s	0
2. Trigger scene (1-64,0-Disable)	0
3. Trigger scene (1-64,0-Disable)	0
4. Trigger scene (1-64,0-Disable)	0
5. Trigger scene (1-64,0-Disable)	0
6. Trigger scene (1-64,0-Disable)	0
7. Trigger scene (1-64,0-Disable)	0
8. Trigger scene (1-64,0-Disable)	0

Fig.5.8.1 Parameter window“Event”

Parameter“Object type of output”

This parameter is for setting the object type of output. Options:

1Bit

1Byte

2Byte

Parameter“z. Trigger scene(1-64, 0-Disable)”(z=1~8)

This parameter is for setting the triggered scene number of output y of group x. Up to 8 triggered scene of each output can be configured. Options: **0..64, 0=inactive**

Parameter“Object value”

This parameter is for setting the output value, the range depends on the data type of output y.

When the datatype is “1bit”, options: **0..1**

When the datatype is “1byte”, options: **0..255**

When the datatype is "2byte", options: **0..65535**

Parameter Delay time [0..255]*0.1s

This parameter is for setting the delay time for sending the output value to the bus.

Options: **0..255**

5.8.2.Parameter window“Logic”

Logic Function

AND

Fig.5.8.2 Parameter window“Logic”

Parameter“Logic function”

This parameter is for setting function of the channel. Options:

AND

OR

XOR

Gate Transfer

Threshold compare

Format convert

AND/OR/XOR: as the parameter is similar to the communication object (only the logic algorithm is different), the following parameters taking one options for example.

5.8.2.1. “AND/OR/XOR”

Logic Function	AND
Input A	Normal
Default value	0
Input B	Normal
Default value	0
Input C	Disable
Input D	Disable
Input E	Disable
Input F	Disable
Input G	Disable
Input H	Disable
Inverted in result	☐ No ☒ Yes
Output send when	☒ Each one new telegram ☐ Every change in output
Support delay in output	☐ No ☒ Yes
Send output after(*0.1s)	10

Fig.5.8.2.1 “AND/OR/XOR”

Parameter “Input a/b/c/d/e/f/g/h”

This parameter is for setting whether input x to calculate, whether to normally calculate or inverted calculate. Options:

Disable

Normal

Inverted

Disconnected: not to calculate.

Normal: to directly calculate the input value.

Inverted: invert the input value, then to calculate.

Note: not to invert the initiate value.

Parameter "Default value"

This parameter is for setting the initial value of logic input x.

Options: **0/1**

Parameter "Inverted in result"

This parameter is for setting whether to invert the logic calculation result. Options:

No

Yes

No: output directly.

Yes: output after inverting.

Parameter "Output send when"

This parameter is for setting the condition of sending logic result. Options:

Each one new telegram

Every change of output object

Receiving a new telegram: every time the object received a new input value will the logic result be sent to the bus.

Every change of output object: only when logic result has changed will it be sent to the bus.

Tip: when in the first time to logic calculate, the logic result will be sent even if it has no change.

Parameter "Support delay in output"

This parameter is for setting whether support delay in output.

——Parameter "Send output after(*0.1s)"

This parameter is visible when previous parameter is enabled. Used for setting the delay time for sending the logic calculation result to the bus. 可选项: **0...65535**

5.8.2.2. "Gate Transfer"

Logic Function	Gate Transfer
Object type of I/O	1 Bit
Default gate after startup	None
1) Gate trigger scene	NO.1
Input A send on	Output A
Input B send on	Output B
Input C send on	Output C
Input D send on	Output D
2) Gate trigger scene	None
3) Gate trigger scene	None
4) Gate trigger scene	None
5) Gate trigger scene	None
6) Gate trigger scene	None
7) Gate trigger scene	None
8) Gate trigger scene	None

Fig.5.8.2.2 "Gate forwarding"

Parameter "Object type of I/O"

This parameter is for setting the object type of input/output. Options:

1bit

4bit

1byte

Parameter "Default gate after startup"

This parameter is for setting the initial scene where logical gate forwarding can be performed by default after device starts, which needs to be configured in the parameters. Options :

None

NO.1

...

NO.8

Note: gate scene is recommended to be selected before operating, or it will enable the initiate scene by default.

Parameter "z->Gate trigger scene"(z=1~8)

This parameter is for setting scene number of logic gate forwarding. Up to 8 trigger scene number can be set for each logic. Options:

None

NO.1

...

NO.64

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

This parameter is for setting the output of input X (X=A/B/C/D) after gate forwarding. Options:

None

Output A

Output B

...

Output A,B,C,D

According to the options, one input can be forwarded into one or more outputs, the output value is the same as the input value.

5.8.2.3. "Threshold comparator"

Logic Function	Threshold Compare
Threshold data type	4 Bit
Threshold value(0-15)	10
If Object value < Threshold value	Send value "0"
If Object value > Threshold value	Send value "1"
If Object value == Threshold value	No action
Output send when	☒ Each one new telegram ☐ Every change in output
Support delay in output	☐ No ☒ Yes
Send output after(*0.1s)	10

Fig.5.8.2.3 "Threshold comparator"

Parameter "Threshold data type"

This parameter is for setting the threshold value data type. Options:

4bit

1byte

2byte

4byte

Parameter "Threshold value"

This parameter is for setting threshold value, the range depends on the data type.

Options: **0..15 / 0..255 / 0...65535/0..4294967295**

Parameter "If Object value<Threshold value"

Parameter "If Object value>Threshold value"

Parameter "If Object value==Threshold value"

This parameter is for setting the logic result value that should be sent when threshold value Less

than, greater than to the setting valve. Options:

No action

Send value "0"

Send value "1"

No action: not consider to select this option.

Send value "0"/"1": when condition is satisfied, send telegram 0 or 1.

If there is a conflict between the setting options between parameters, the base on the value that should be sent when reach the final parameter condition.

Parameter "Output send when"

This parameter is for setting the condition of sending logic result. Options:

Each one new telegram

Every change in output

Each one new telegram: every time the object received a new input value will the logic result be sent to the bus;

Every change in output: only when logic result has changed will it be sent to the bus.

Note: when in the first time to logic algorithm, the logic result will be sent even if it has no change.

Parameter "Support delay in output"

This parameter is for setting whether support delay in output.

——**Parameter "Send output after(*0.1s)"**

This parameter is visible when previous parameter is enabled. Used for setting the delay time for sending the logic calculation result to the bus. 可选项: **0...65535**

5.8.2.4. "Format convert"

Logic Function: Format Convert

Format convert type: 2x1Bit --> 1x2Bit

Output send when: ☒ Each one new telegram ☐ Every change in output

Fig.5.2.4 "Format convert"

Parameter "Format convert type"

This parameter is for setting 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"

This parameter is for setting the condition of sending logic result. Options:

Each one new telegram

Every change in output

Each one new telegram: every time the object received a new input value will the logic result be sent to the bus.

Every change in output: only when logic result has changed will it be sent to the bus.

Note: when in the first time to logic algorithm, the logic result will be sent even if it has no change.

Chapter 6 Description of communication object

The communication object is the medium to communicate other device on the bus, namely only the communication object can communicate with the bus.

Note: “C” in “Flag” column in the below table means enable the communication function of the object; “W” means value of object can be written from the bus; “R” means the value of the object can be read by the other devices; “T” means the object has the transmission function; “U” means the value of the object can be updated.

6.1. “General” Communication Object

	Number	Name	Object Function	Descrif	Group Add	Length	C	R	W	T	U	Data Type	Priority
	1	General	Panel lock			1 bit	C	-	W	-	-	enable	Low
	2	Pulse	"On line" telegram			4 bit	C	-	-	T	-		Low
	149	General	Wake Event,Input			1 bit	C	-	W	-	-	enable	Low

Fig.6.1 “General” Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
1	Panel lock	General	1bit	C,W	1.003 enable
The communication object is visible when parameter “Panel lock function” is enabled. Used to lock panel via bus.					
2	"On line"telegram	Pulse	4bit	C,T	
The communication object is visible when parameter “On-Line telegram” is enabled. Used to periodically send a telegram to the bus to indicate that the device is working properly. The period is set by the parameter.					
140	Wake Event,Input	General	1bit	C,W	1.001 switch
The communication object is visible when parameter “Exit standby via bus” is enabled. Used to wake up the device via the bus.					

Table.6.1 “General” Communication Object

6.2. "Push button" Communication Object

Communication objects as follow are visible when "Normal button" are selected:

	60	Button 1	Press/Release,Switch	1 bit	C	-	W	T	U	switch	低
	60	Button 1	Short operation,Switch	1 bit	C	-	W	T	U	switch	低
	61	Button 1	Long operation,Switch	1 bit	C	-	W	T	U	switch	低

Switch

	60	Button 1	Short operation,Switch	1 bit	C	-	W	T	U	switch	低
	61	Button 1	Long operation,Dimming	4 bit	C	-	W	T	-	dimming control	低

Dimming

	60	Button 1	Press operation,Scene	1 byte	C	-	-	T	-	scene control	低
	61	Button 1	Release operation,Scene	1 byte	C	-	-	T	-	scene control	低
	60	Button 1	Short operation,Scene	1 byte	C	-	-	T	-	scene control	低
	61	Button 1	Long operation,Scene	1 byte	C	-	-	T	-	scene control	低

Scene Control

	60	Button 1	Up/Down,Blind	1 bit	C	-	W	T	-	up/down	低
	61	Button 1	Stop/Adjust,Blind	1 bit	C	-	W	T	-	step	低

Shutter Control

	60	Button 1	Press operation,1bit value	1 bit	C	-	-	T	-	switch	低
	61	Button 1	Release operation,1bit value	1 bit	C	-	-	T	-	switch	低
	60	Button 1	Short operation,2byte value	2 bytes	C	-	-	T	-	pulses	低
	61	Button 1	Long operation,1bit value	1 bit	C	-	-	T	-	switch	低

Value Output

	60	Button 1	Register value	1 byte	C	-	-	T	-	counter pulses (0..255)	低
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Shift Register

	60	Button 1	RGB dimming value	3 bytes	C	-	-	T	-	RGB value 3x(0..255)	低
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RGB_1x3Byte

	60	Button 1	Red dimming value	1 byte	C	-	-	T	-	counter pulses (0..255)	低
	61	Button 1	Green dimming value	1 byte	C	-	-	T	-	counter pulses (0..255)	低
	62	Button 1	Blue dimming value	1 byte	C	-	-	T	-	counter pulses (0..255)	低

RGB_3x1Byte

	60	Button 1	RGBW dimming value	6 bytes	C	-	-	T	-	RGBW value 4x(0..100%)	低
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RGBW_1x6Byte

60	Button 1	Red dimming value	1 byte	C - - T -	counter pulses (0..255)	低
61	Button 1	Green dimming value	1 byte	C - - T -	counter pulses (0..255)	低
62	Button 1	Blue dimming value	1 byte	C - - T -	counter pulses (0..255)	低
63	Button 1	White dimming value	1 byte	C - - T -	counter pulses (0..255)	低

RGBW_4x1Byte

60	Button 1	Object1-On/Off	1 bit	C - W T -	switch	低
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Multiple Operation

60	Button 1	Short operation, Delay mode	1 bit	C - - T -	switch	低
61	Button 1	Long operation, Delay mode	4 bit	C - - T -	dimming control	低

Delay mode

64	LED 1	Status	1 byte	C - W - -	counter pulses (0..255)	低
65	Button 1	Disable	1 bit	C - W - -	enable	低

Fig.6.2 “Push button”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
60	Press/Release, Switch	Button x	1bit	C,W,T,U	1.001 switch
	Short operation, Switch				
61	Long operation, Switch	Button x	1bit	C,W,T,U	1.001 switch
These communication objects are used to trigger a switching operation. “Press/Release, Switch” are visible when there is no distinction for short/long operation; “Short/Long operation, Switch” are visible when there is distinction for short/long operation. Telegrams: 0—off 1—on					
60	Short operation, Switch	Button x	1bit	C,W,T,U	1.001 switch
61	Long operation, Dimming	Button x	4bit	C,W,T	3.007 dimming control
These two communication objects are used to switch/dimming operation, with distinction for long/short operation. Obj.60: Used to trigger switch operation. Telegrams: 0—off					

1——on

Obj.61: Used to trigger a relative dimming operation.

Dimming down when telegram is 1~7, and the larger this range the adjust step is smaller. That is, the maximum step of dimming down when is 1, and the minimum step of dimming down when is 7, stop dimming when is 0;

Dimming up when telegram is 9~15, and the larger this range the adjust step is smaller. That is, the maximum step of dimming up when is 9, and the minimum step of dimming up when is 15, stop dimming when is 8.

60	Press operation,Scene Short operation, Scene	Button x	1byte	C,T	18.001 scene control
61	Release operation,Scene Long operation, Scene	Button x	1byte	C,T	18.001 scene control

These communication objects are used to recall/storage scene via bus.

“Press/Release operation, Scene” are visible when there is no distinction for short/long operation;

“Short /Long operation ,Scene” are visible when there is distinction for short/long operation.

Telegrams:

Telegram	Description
0	Recall scene 1
1	Recall scene 2
2	Recall scene 3
...	...
63	Recall scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
...	...
191	Store scene 64

Parameter setting Options are 1~64, actually communication object "Scene" corresponds to the telegram received is 0~63 . Such as parameter settings is the scene 1, communication object "Scene" sends the scene for 0.

60	Up/Down, Blind	Button x	1bit	C,T	1.008 up/down
61	Stop/Adjust, Blind	Button x	1bit	C,T	1.007 step

These two communication objects are used to control the blind up,down, stop:

Obj.60: Used for sending the telegram to the bus, to control blind up/down. Telegrams:

1——Move down

0——Move up

Obj.61: Used for sending the telegram to the bus, to stop curtain movement. Telegrams:

1——Stop

60	Press operation,1bit value ... Short operation,1bit value	Button x	1bit 2bit 4bit 1byte 2byte	C,T	1.001 switch 2.001 switch control 3.007 dimming 5.010 counter pulses 7.001 pulses 9.x float value 12.001 counter pulses 14.x float value
61	Release operation,1bit value ... Long operation,1bit value	Button x	1bit 2bit 4bit 1byte 2byte	C,T	1.001 switch 2.001 switch control 3.007 dimming 5.010 counter pulses 7.001 pulses 9.x float value

					12.001 counter pulses 14.x float value
These two communication objects are used for sending a fixed value to the bus. “Press/Release operation, x value”are visible when there is no distinction for short/long operation; “Short Long operation, x value” are visible when there is distinction for short/long operation.Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.					
60	Register value	Button x	1byte	C,T	5.010 counter pulses
The communication object is used to send the value of shift register.					
60	RGB dimming value	Button x	3byte	C,T	232.600 RGB value 3x(0..255)
60	Red dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
61	Green dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
62	Blue dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
Obj.60: The communication object is visible when 1x3byte for the RGB object type is selected. Apply to control brightness of multi-colour lamp, used for sending brightness value of RGB three-colour lamp to the bus.					
3-Byte Code for RGB Dimming Object Data Type: U8 U8 U8, as follows:					
3 _{MSB}		2	1 _{LSB}		
R		G	B		
UUUUUUUU		UUUUUUUU	UUUUUUUU		
R: red dimming value; G: green dimming value; B: blue dimming value.					
Obj.60、Obj.61、Obj.62: These three communication objects are visible when 3x1byte for the RGB					

object type is selected. Apply to control brightness of multi-colour lamp, used for sending brightness value of the control R(red) / G(green) / B (blue) channel to the bus. Telegrams: 0...100%

60	RGBW dimming value	Button x	6byte	C,T	251.600 DPT_Colour_RGBW
60	Red dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
61	Green dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
62	Blue dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)
63	White dimming value	Button x	1byte	C,T	5.001 percentage(0..100%)

Obj.60: The communication object is visible when 1x6byte for the RGBW object type is selected.

Apply to control brightness of multi-colour lamp, used for sending brightness value of RGBW four-colour lamp to the bus.

6 _{MSB}	5	4	3	2	1 _{LSB}
R	G	B	W	保留	r r r r mR mG mB mW
UUUUUUUU	UUUUUUUU	UUUUUUUU	UUUUUUUU	00000000	0000BBBB

R: red dimming value; G: green dimming value; B: blue dimming value; W: white dimming value;

mR: determines whether the red dimming value is valid, 0 = invalid, 1 = valid;

mG: determines whether the green dimming value is valid, 0 = invalid, 1 = valid;

mB: determines whether the blue dimming value is valid, 0 = invalid, 1 = valid;

mW: Determines whether the white dimming value is valid, 0 = invalid, 1 = valid.

Obj.60、Obj.61、Obj.62、Obj.63: These four communication objects are visible when 4x1byte for the RGBW object type is selected. Apply to control brightness of multi-colour lamp, used for sending

brightness value of the control R(red) /G(green) / B (blue) / W(White) channel to the bus.

Telegrams: 0...100%

60	Object1-On/Off	Button x	1bit	C,W,T	1.001 switch
	Object1-Up/Down		1bit	C,W,T	1.008 up/down
	Object1-SceneControl		1byte	C,T	18.001 scene control
	Object1-Percentage		1byte	C,T	5.001 percentage(0..100%)
	Object1-Unsigned value		1byte	C,T	5.010 counter pulses

The communication object is object of multiple operation, up to activate 4 objects at the same time, and operation once can send the value of 4 different datatype objects to the bus via these objects. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.

60	Press operation,Delay mode Short operation,Delay mode	Button x	1bit	C,T	1.001 switch
			4bit		3.007 dimming
			1byte		5.010 counter pulses
61	Long operation, Delay mode	Button x	1bit	C,T	1.001 switch
			4bit		3.007 dimming
			1byte		5.010 counter pulses

These communication objects are used to send the value of delay mode to the bus.

“Press/Release, Delay” are visible when there is no distinction for short/long operation; “Short Long operation, Delay” are visible when there is distinction for short/long operation. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.

65	Disable	Button x	1bit	C,W	1.003 enable
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The communication object is used to disable/enable the function of contact input, apply to all the above functions.

64/ 67	LED status	Button x	1bit 1byte	C,W,	1.001 switch 5.010 counter pulses
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The communication object is used to receive status feedback. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.

Table.6.2 "Push button"Communication Object

6.3. "Temperature" Communication Object

3	Internal sensor	Internal temperature	2 bytes	C R - T -	temperature (°C)	低
4	Internal sensor	Error of internal sensor	1 bit	C R - T -	alarm	低
5	Internal sensor	Calibration (-10..10)°C	2 bytes	C - W - -	temperature (°C)	低
6	Pt100 sensor	Pt100 temperature	2 bytes	C R - T -	temperature (°C)	低
7	Pt100 sensor	Error of Pt100 sensor	1 bit	C R - T -	alarm	低
8	Pt100 sensor	Calibration (-10..10)°C	2 bytes	C - W - -	temperature (°C)	低

Fig.6.3 "Temperature" Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
3	Internal temperature	Internal sensor	2byte	C,R,T	9.001 temperature(°C)
The communication object is visible when parameter "Send temperature of internal sensor" is enabled. Used for transmitting the temperature value detected by the internal sensor of the device to the bus.					
4	Error of internal sensor	Internal sensor	1bit	C,R,T	1.005 alarm
The communication object is visible when parameter "Reply error of internal sensor" is selected "Respond after read" or "Respond after change". Used to send the error report of the internal sensor, and the object value is defined according to the parameters.					
5	Calibration(-10..10)°C	Internal sensor	2byte	C,W	9.001 temperature(°C)
The communication object is used to calibrate the measurement values of the internal sensor via the bus.					
6	PT100 temperature	PT100 sensor	2byte	C,R,T	9.001 temperature(°C)
The communication object is visible when parameter "Send temperature of PT100 sensor" is enabled. Used for transmitting the temperature value detected by the PT100 sensor of the device to the bus.					
7	Error of PT100 sensor	PT100 sensor	1bit	C,R,T	1.005 alarm
The communication object is visible when parameter "Reply error of PT100 sensor" is selected "Respond after read" or "Respond after change". Used to send the error report of the PT100 sensor,					

and the object value is defined according to the parameters.					
8	Calibration(-10..10)°C	PT100 sensor	2byte	C,W	9.001 temperature(°C)
The communication object is used to calibrate the measurement values of the PT100 sensor via the bus.					

Table.6.3 "Temperature"Communication Object

6.4. “HVAC” Communication Object

Parameters as follow are visible when “HVAC” is selected:

9	HVAC General	Power on/off	1 bit	C - W T U	switch	低
11	HVAC Setpoint	Setpoint adjustment,In	2 bytes	C - W - -	temperature (°C)	低
12	HVAC General	Heat/Cool mode,In	1 bit	C - W - U	cooling/heating	低
13	HVAC General	Comfort mode,In	1 bit	C - W - -	enable	低
14	HVAC General	Economy mode,In	1 bit	C - W - -	enable	低
15	HVAC General	Frost/heat protection,In	1 bit	C - W - -	enable	低
16	HVAC General	Standby mode,In	1 bit	C - W - -	enable	低
17	HVAC Fan	Fan speed 1,In	1 bit	C - W - U	switch	低
18	HVAC Fan	Fan speed 2,In	1 bit	C - W - U	switch	低
19	HVAC Fan	Fan speed 3,In	1 bit	C - W - U	switch	低
20	HVAC Fan	Fan speed off,In	1 bit	C - W - U	switch	低
21	HVAC Fan	Fan auto control,In	1 bit	C - W - U	switch	低
22	HVAC Setpoint	Setpoint value,Out	2 bytes	C R - T -	temperature (°C)	低
23	HVAC General	Heat/Cool mode,Out	1 bit	C R - T -	cooling/heating	低
24	HVAC General	Comfort mode,Out	1 bit	C - - T -	enable	低
25	HVAC General	Economy mode,Out	1 bit	C - - T -	enable	低
26	HVAC General	Frost/Heat protection,Out	1 bit	C - - T -	enable	低
27	HVAC General	Standby mode,Out	1 bit	C - - T -	enable	低
28	HVAC Control	Heat control value,Out	1 byte	C - - T -	percentage (0..100%)	低
29	HVAC Control	Cool control value,Out	1 bit	C - - T -	switch	低
30	HVAC Fan	Fan speed 1,Out	1 bit	C - - T -	switch	低
31	HVAC Fan	Fan speed 2,Out	1 bit	C - - T -	switch	低
32	HVAC Fan	Fan speed 3,Out	1 bit	C - - T -	switch	低
33	HVAC Fan	Fan speed off,Out	1 bit	C - - T -	switch	低
34	HVAC Fan	Fan auto control,Out	1 bit	C - - T -	enable	低

Fig.6.4 “HVAC” Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
9	Power on/off	HVAC General	1bit	C,W,T,U	1.001 switch
The communication object is used to send HVAC switch telegram, control HVAC switches on the KNX bus, or receive the switch status of HVAC devices on the bus.					
10	External temperature	HVAC General	2byte	C,W,T,U	9.001 temperature(°C)
The communication object is visible when parameter “Temperature reference from” is selected “External Sensor”. Used to receive the external temperature from the bus, and feedback to screen display.					
11	Setpoint adjustment,In	HVAC Setpoint	2byte	C,W	9.001 temperature(°C)

Relative adjustment: Used to modify the base value of the set temperature.

Absolute adjustment: Used to modify the temperature setpoint for the current mode.

12	Heat/Cool mode,In	HVAC General	1bit	C,W,U	1.100 cooling/heating
The communication object is visible when parameter “HVAC control mode” is selected “Heating and Cooling”. Used to receive control telegram for heating/cooling mode via the bus. The icon on the screen will update based on the received telegram value.					
13	HVAC mode,In	HVAC General	1byte	C,W	20.102 HVAC Mode
13	Comfort mode,In	HVAC General	1bit	C,W	1.003 enable
14	Economy mode,In	HVAC General	1bit	C,W	1.003 enable
15	Frost/heat protect,In	HVAC General	1bit	C,W	1.003 enable
16	Standby mode,In	HVAC General	1bit	C,W	1.003 enable
These communication objects are used to receive control telegram for the operating mode via the bus. When “1 byte”: object 13 is visible, telegrams: 1-comfort, 2-standby, 3-economy, 4-protection. When “4x1Bit”: Object 13—comfort Object 14—economy Object 15—protect Object 16—standby When the object receives the telegram “1”, the corresponding mode is activated and the screen will also update to the corresponding mode.					
17	Fan On/Off,In	HVAC Fan	1bit	C,W,U	5.001 percentage(0..100%)
17	Fan speed,In	HVAC Fan	1byte	C,W,U	1.001 switch
17	Fan speed 1,In	HVAC Fan	1bit	C,W,U	1.001 switch
18	Fan speed 2,In	HVAC Fan	1bit	C,W,U	1.001 switch

19	Fan speed 3,In	HVAC Fan	1bit	C,W,U	1.001 switch
20	Fan speed off,In	HVAC Fan	1bit	C,W,U	1.001 switch
These communication objects are used to receive fan speed status via the bus. When “1Byte”, Object 17 is visible. When “1Bit”: Object 17——fan on/off, the screen will update the fan switch status accord to the received telegram value. Object 17——fan speed 1 Object 18——fan speed 2 Object 19——fan speed 3 Object 20——fan speed off Obj.17~19: When the object receives the telegram “1”, the corresponding fan level is activated. Obj.20: When the object receives the telegram “0”, fan speed off.					
21	Fan auto control,In	HVAC Fan	1bit	C,W,U	1.003 enable
The communication object is visible when parameter “Auto operation function” is selected “Local controller” or “External controller”. Used to receive status feedback for automatic fan speed control via the bus. Telegram: 0——No sense 1——auto					
22	Setpoint value,Out	HVAC Setpoint	2byte	C,W,U	9.001 temperature(°C)
The communication object is used to send the setpoint temperature value for the current operating mode to the bus.					
23	Heat/Cool mode,Out	HVAC General	1bit	C,R,T	1.100 cooling/heating

The communication object is visible when parameter “HVAC control mode” is selected “Heating and Cooling”. Used to send telegram to the bus for switching between cooling and heating modes.

Telegram:

0——Cool

1——Heat

24	HVAC mode,Out	HVAC General	1byte	C,R,T	20.102 HVAC mode
24	Comfort mode,Out	HVAC General	1 bit	C,T	1.003 enable
25	Economy mode,Out	HVAC General	1 bit	C,T	1.003 enable
26	Frost/heat protect,Out	HVAC General	1 bit	C,T	1.003 enable
27	Standby mode,Out	HVAC General	1 bit	C,T	1.003 enable

These communication objects are used to send operating modes to the bus.

When “1Byte”, Object 24 is visible, telegrams: 1-comfort, 2-standby, 3-economy, 4-protection.

When “4x1Bit”:

Object 24——comfort

Object 25——economy

Object 26——protection

Object 27——standby

When switching to the corresponding mode, send telegram “1” to the bus.

28	Heat/Cool control value,Out Heat control value,Out	HVAC Control	1bit	C,T	1.001 Switch 5.001 percentage
29	Cool control value,Out	HVAC Control	1bit	C,T	1.001 Switch 5.001 percentage

These two communication objects are used to send control values for heating or cooling functions to the bus. The objects are displayed based on the control mode and the control system

(2-pipe or 4-pipe).					
30	Fan On/Off,Out	HVAC Fan	1bit	C,T	5.001 percentage
30	Fan speed,Out	HVAC Fan	1byte	C,T	1.001 switch
30	Fan speed 1,Out	HVAC Fan	1bit	C,T	1.001 switch
31	Fan speed 2,Out	HVAC Fan	1bit	C,T	1.001 switch
32	Fan speed 3,Out	HVAC Fan	1bit	C,T	1.001 switch
33	Fan speed off,Out	HVAC Fan	1bit	C,T	1.001 switch
These communication objects are used to send corresponding fan speed telegram to the bus. When "1Byte", Object 30 is visible. When "1bit", Object 30——fan on/off Object 30——fan speed 1 Object 31——fan speed 2 Object 32——fan speed 3 Object 33——fan speed off Object 30~32: When switching to the corresponding fan level, send telegram "1" to the bus. Object 33: When switching to the fan speed off, send telegram "0" to the bus.					
34	Fan auto control,Out	HVAC Fan	1bit	C,T	1.003 enable
The communication object is used to send automatically controlled telegram to the bus. Telegram: 0——Cancel automatic 1——Automatic					

Table.6.4 "HVAC"Communication Object

6.5. “AC”Communication Object

Parameters as follow are visible when “AC” is selected:

35	AC General	External temperature	2 bytes	C - W T U	temperature (°C)	低
36	AC General	Power On/Off	1 bit	C - - T -	switch	低
37	AC General	Status of power	1 bit	C - W T U	switch	低
38	AC General	Heat mode	1 bit	C - W T U	enable	低
39	AC General	Cool mode	1 bit	C - W T U	enable	低
40	AC General	Dry mode	1 bit	C - W T U	enable	低
41	AC General	Fan mode	1 bit	C - W T U	enable	低
42	AC General	Auto mode	1 bit	C - W T U	enable	低
43	AC Fan	Fan speed	1 byte	C - - T -	percentage (0..100%)	低
44	AC Fan	Status of Fan speed	1 byte	C - W T U	percentage (0..100%)	低
46	AC Setpoint	Setpoint value	1 byte	C - W T U	counter pulses (0..255)	低

Fig.6.5 “AC”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
35	External temperature	AC General	2byte	C,W,T,U	9.001 temperature(°C)
The communication object is visible when parameter “Temperature display from” is selected “External Sensor”. Used to receive the external temperature from the bus.					
36	IR Split unit command	AC General	1byte	C,T	5.010 counter pulses(0..255)
The communication object is visible when parameter “Control mode” is selected “IR split unit”. Used to send AC switch telegram, control AC switches on the KNX bus.					
36	Power on/off	AC General	1bit	C,T	1.001 switch
The communication object is visible when “Gateway interface” is selected. Used to send AC switch telegram, control AC switches on the KNX bus.					
37	Status of power	AC General	1bit	C,W,T,U	1.001 switch
The communication object is used to receive the switch status feedback from the AC via the bus.					
38	Control mode	AC General	1byte	C,T	5.010 counter pulses(0..255)
The communication object is visible when parameter “Data type of mode” is selected “1Byte”. Used to the control modes telegram to the bus. Different telegram values indicate different operating					

modes.					
38	Heat mode	AC General	1bit	C,W,T,U	1.003 enable
39	Cool mode	AC General	1bit	C,W,T,U	1.003 enable
40	Dry mode	AC General	1bit	C,W,T,U	1.003 enable
41	Fan mode	AC General	1bit	C,W,T,U	1.003 enable
The communication object is visible when parameter “Data type of mode” is selected “1Bit”. Used to send control mode telegram to the bus or receive control mode telegram via the bus. Different telegram values indicate different operating modes. Object 38——heat mode Object 39——cool mode Object 40——dry mode Object 41——fan mode					
42	Fan speed	AC Fan	1byte	C,T	5.001 percentage(0..100%)
The communication object is visible when parameter “Data type of mode” is selected “1Byte”. Used to send fan speed control telegram to the bus.					
42	Fan speed auto	AC Fan	1bit	C,W,T,U	1.001 switch
43	Fan speed low	AC Fan	1bit	C,W,T,U	1.001 switch
44	Fan speed medium	AC Fan	1bit	C,W,T,U	1.001 switch
45	Fan speed high	AC Fan	1bit	C,W,T,U	1.001 switch
The communication object is visible when parameter “Data type of mode” is selected “1Bit”. Used to send fan speed control telegram to the bus or receive fan speed status telegram via the bus. Object 42——auto Object 43——low					

Object 44——medium					
Object 42——high					
43	Status of Fan speed	AC Fan	1byte	C,W,T,U	5.001 percentage(0..100%)
The communication object is visible when parameter “Data type of mode” is selected “1Byte”. Used to receive the fan speed status feedback from the AC via the bus.					
45	Setpoint value	AC Setpoint	1Byte	C,W,T,U	5.001 percentage(0..100%)
			2Byte		9.001 temperature(°C)
The communication object is used to send the setpoint temperature value to the bus or receive the temperature value via the bus.					

Table.6.5 “AC”Communication Object

6.6. “Floor heating” Communication Object

47	Floor heating	Power on/off	1 bit	C - W T U	switch	低
48	Floor heating	External temperature	2 bytes	C - W T U	temperature (°C)	低
49	Floor heating	Heating on/off	1 bit	C - W T U	switch	低
50	Floor heating	Setpoint value	2 bytes	C - W T U	temperature (°C)	低
51	Floor heating	Scene	1 byte	C - W - -	scene number	低

Fig.6.6 “Floor heating” Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
47	Power on/off	Floor heating	1bit	C,W,T,U	1.001 switch
The communication object is used to send floor heating switch telegram, control floor heating switches on the KNX bus, or receive the switch status of floor heating devices on the bus.					
48	External temperature	Floor heating	2byte	C,W,T,U	9.001 temperature(°C)
The communication object is visible when parameter is selected “External Sensor”. Used to receive the external temperature from the bus.					
49	Heating on/off	Floor heating	1bit	C,W,T,U	1.001 switch
The communication object is used to send heating on/off telegram or to receive heating on/off telegram via the bus.					
50	Setpoint value	Floor heating	2byte	C,W,T,U	9.001 temperature(°C)
The communication object is used to send the setpoint temperature to the bus or to receive the setpoint temperature via the bus.					
51	Scene	Floor heating	1byte	C,W	17.001 scene number
The communication object is visible when parameter “Scene function” is enabled. Used to receive floor heating scene numbers via the bus, enabling the recall of scene functions.					

Table.6.6 “Floor heating” Communication Object

6.7. "Ventilation" Communication Object

52	Ventilation General	Power on/off	1 bit	C - W T U	switch	低
53	Ventilation General	External temperature	2 bytes	C - W T U	temperature (°C)	低
54	Ventilation General	Fan speed, In	1 byte	C - W T U	percentage (0..100%)	低
55	Ventilation General	Fan speed, Out	1 byte	C - - T -	percentage (0..100%)	低
57	Ventilation General	Scene, In	1 byte	C - W - -	scene number	低
58	Ventilation Auto	Automatic control, In/Out	1 bit	C - W T U	enable	低
59	Ventilation Auto	PM2.5, In	2 bytes	C - W T U	pulses	低

Fig.6.7 "Ventilation" Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
52	Power on/off	Ventilation General	1bit	C,W,T,U	1.001 switch
The communication object is used to send ventilation switch telegram, control ventilation switches on the KNX bus, or receive the switch status of ventilation devices on the bus.					
53	External temperature	Ventilation General	2byte	C,W,T,U	9.001 temperature(°C)
The communication object is visible when parameter is selected "External Sensor". Used to receive the external temperature from the bus.					
54	Fan speed, In	Ventilation General	1byte	C,W,T,U	5.001 percentage(0..100%)
The communication object is visible when parameter "Data type of fan speed" is selected "1Byte". Used to receive the fan speed status feedback from the ventilation via the bus.					
54	Fan speed No.1	Ventilation General	1bit	C,W,T,U	1.001 switch
55	Fan speed No.2	Ventilation General	1bit	C,W,T,U	1.001 switch
56	Fan speed No.3	Ventilation General	1bit	C,W,T,U	1.001 switch
The communication object is visible when parameter "Data type of fan speed" is selected "1Bit". Used to send fan speed control telegram to the bus or receive fan speed status telegram via the bus.					
55	Fan speed, Out	Ventilation General	1byte	C,T	5.001 percentage(0..100%)
The communication object is visible when parameter "Data type of fan speed" is selected "1Byte". Used to send fan speed control telegram to the bus.					

57	Scene, In	Ventilation General	1Byte	C、W	17.001 scene number
The communication object is visible when parameter “Scene function” is enabled. Used to receive ventilation scene numbers via the bus, enabling the recall of scene functions.					
58	Automatic control, In/Out	Ventilation Auto	1bit	C,W,T,U	1.003 enable
The communication object is visible when parameter “Auto operation function” is enabled. Used to enable automatic control functions or send automatic control status telegram to the bus.					
59	PM2.5, In	Ventilation Auto	2byte	C,W,T,U	7.001 pulses 9.008 value airquality
59	VOC, In	Ventilation Auto	2byte	C,W,T,U	7.001 pulses 9.008 value airquality
59	CO2, In	Ventilation Auto	2byte	C,W,T,U	7.001 pulses 9.008 value airquality
The communication object is visible when parameter “Auto operation function” is enabled. Used to receive values detected by PM2.5/VOC/CO2 sensors.					

Table.6.7 “Ventilation”Communication Object

6.8. "Event & Logic" Communication Object

6.8.1. "Event" Communication Object

108	Event	Scene recall	1 byte	C - W - -	scene number	低
109	Event Object 1	Event output 1	1 bit	C - - T -	switch	低

Fig.6.8.1 "Event" Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
108	Scene recall	Event	1byte	C,W	17.001 scene number
The communication object triggers each output in the scene group to send a specific value to the bus by recalling the scene number. Telegrams: 0.. 63					
109	Event Output x	Event Object x	1bit 1byte 2byte	C,T	1.001 switch 5.010 counter pulses 7.001 pulses
When a scene is recalled, the communication object is used to send the corresponding output value of the scene to the bus. If the output is not set to this scene, it will not be sent. A total of 4 scene groups can be set up, with 8 outputs per group.					

Table.6.8.1 "Event" Communication Object

6.8.2. “Logic”Communication Object

6.8.2.1. “And/OR/XOR”Communication Object

113	Logic Function 1	Input A	1 bit	C - W T U	boolean	低
114	Logic Function 1	Input B	1 bit	C - W T U	boolean	低
115	Logic Function 1	Input C	1 bit	C - W T U	boolean	低
116	Logic Function 1	Input D	1 bit	C - W T U	boolean	低
117	Logic Function 1	Input E	1 bit	C - W T U	boolean	低
118	Logic Function 1	Input F	1 bit	C - W T U	boolean	低
119	Logic Function 1	Input G	1 bit	C - W T U	boolean	低
120	Logic Function 1	Input H	1 bit	C - W T U	boolean	低
121	Logic Function 1	Logic result	1 bit	C - - T -	boolean	低

Fig.6.8.2.1 “And/OR/XOR”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
113/...	Input x	Logic Function X	1bit	C,W,T,U	1.002 boolean
The communication object is used to receive the value of logical input Input x.					
121	Logic result	Logic Function X	1bit	C,T	1.002 boolean
The communication object is used to send the results of logical operation.					

Table.6.8.2.1 “And/OR/XOR”Communication Object

6.8.2.2. "Gate Transfer"Communication Object

113	Logic Function 1	Input A	1 bit	C - W - -	switch	低
114	Logic Function 1	Input B	1 bit	C - W - -	switch	低
115	Logic Function 1	Input C	1 bit	C - W - -	switch	低
116	Logic Function 1	Input D	1 bit	C - W - -	switch	低
117	Logic Function 1	Output A	1 bit	C - - T -	switch	低
118	Logic Function 1	Output B	1 bit	C - - T -	switch	低
119	Logic Function 1	Output C	1 bit	C - - T -	switch	低
120	Logic Function 1	Output D	1 bit	C - - T -	switch	低
121	Logic Function 1	Gate Select	1 byte	C - W - -	scene number	低

Fig.6.8.2.2 "Gate Transfer"Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
121	Gate value select	Logic Function X	1byte	C,W	17.001 scene number
The communication object is used to select the scene of logical gate forwarding.					
113/... /116	Input x	Logic Function X	1bit 4bit 1byte	C,W	1.001 switch 3.007 dimming control 5.010 counter pulses(0..255)
The communication object is used to receive the value of the logic gate input Input x.					
117/.../ 120	Output x	Logic Function X	1bit 4bit 1byte	C,T	1.001 switch 3.007 dimming control 5.010 counter pulses(0..255)
The communication object is used to output the value forwarded by the logic gate. The output value is the same as the input value, but one input can be forwarded into one or more outputs, set by parameters.					

Table.6.8.2.2 "Gate Transfer"Communication Object

6.8.2.3. "Threshold Compare"Communication Object

113	Logic Function 1	Value input	4 bytes	C - W - U	counter pulses (unsign... 低
121	Logic Function 1	Logic result	1 bit	C - - T -	boolean 低

Fig.6.8.2.3 "Threshold Compare"Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
113	Value input	Logic Function X	4bit 1byte 2byte 4byte	C,W, U	3.007 dimming 5.010 counter pulses 7.001 pulses 12.001 counter pulses
The communication object is used to input threshold value.					
121	Logic result	Logic Function X	1bit	C,T	1.002 boolean
The communication object is used to send the results of logical operation. That is, the value that should be sent after the object input threshold is compared with the setting threshold value.					

Table.6.8.2.3 "Threshold Compare"Communication Object

6.8.2.4. "Format convert" Communication Object

113	Logic Function 1	Input bit0	1 bit	C - W - U	switch	低
114	Logic Function 1	Input bit1	1 bit	C - W - U	switch	低
121	Logic Function 1	Output 2bit	2 bit	C - - T -	switch control	低

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

Output 2bit=2

113	Logic Function 1	Input bit0	1 bit	C - W - U	switch	低
114	Logic Function 1	Input bit1	1 bit	C - W - U	switch	低
115	Logic Function 1	Input bit2	1 bit	C - W - U	switch	低
116	Logic Function 1	Input bit3	1 bit	C - W - U	switch	低
117	Logic Function 1	Input bit4	1 bit	C - W - U	switch	低
118	Logic Function 1	Input bit5	1 bit	C - W - U	switch	低
119	Logic Function 1	Input bit6	1 bit	C - W - U	switch	低
120	Logic Function 1	Input bit7	1 bit	C - W - U	switch	低
121	Logic Function 1	Output 1byte	1 byte	C - - T -	counter pulses (0..255)	低

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

113	Logic Function 1	Input 1byte	1 byte	C - W - U	counter pulses (0..255)	低
121	Logic Function 1	Output 2byte	2 bytes	C - - T -	pulses	低

"1x1byte -> 1x2byte"function: converts one 1byte values to a 2byte value, such as Input 1byte=125-->

Output 2byte=125. Although the value remains the same, the data type of the value is different.

113	Logic Function 1	Input 1byte-low	1 byte	C - W - U	counter pulses (0..255)	低
115	Logic Function 1	Input 1byte-high	1 byte	C - W - U	counter pulses (0..255)	低
121	Logic Function 1	Output 2byte	2 bytes	C - - T -	pulses	低

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

113	Logic Function 1	Input 2byte-low	2 bytes	C - W - U	pulses	低
115	Logic Function 1	Input 2byte-high	2 bytes	C - W - U	pulses	低
121	Logic Function 1	Output 4byte	4 bytes	C - - T -	counter pulses (unsign...	低

"2x2byte -> 1x4byte"function: converts two 2 byte values to a 4byte value, such as Input 2byte-low = 65530 (\$FF FA), Input 2byte-high = 32768 (\$80 00)--> Output 2byte = 2147549178 (\$80 00 FF FA)

113	Logic Function 1	Input 1byte	1 byte	C - W - U	counter pulses (0..255)	低
114	Logic Function 1	Output bit0	1 bit	C - - T -	switch	低
115	Logic Function 1	Output bit1	1 bit	C - - T -	switch	低
116	Logic Function 1	Output bit2	1 bit	C - - T -	switch	低
117	Logic Function 1	Output bit3	1 bit	C - - T -	switch	低
118	Logic Function 1	Output bit4	1 bit	C - - T -	switch	低
119	Logic Function 1	Output bit5	1 bit	C - - T -	switch	低
120	Logic Function 1	Output bit6	1 bit	C - - T -	switch	低
121	Logic Function 1	Output bit7	1 bit	C - - T -	switch	低

“1x1byte -> 8x1bit” function: converts one 1byte values to eight 1bit value, such as Input 1byte=200 --> Output bit0=0, bit1=0, bit2=0, bit3=1, bit4=0, bit5=0, bit6=1, bit7=1

113	Logic Function 1	Input 2byte	2 bytes	C - W - U	pulses	低
119	Logic Function 1	Output 1byte-low	1 byte	C - - T -	counter pulses (0..255)	低
121	Logic Function 1	Output 1byte-high	1 byte	C - - T -	counter pulses (0..255)	低

“1x2byte -> 2x1byte”function: converts one 2byte values to two 1byte value, such as Input 2byte = 55500 (\$D8 CC) --> Output 1byte-low = 204 (\$CC), Output 1byte-high =216 (\$D8)

113	Logic Function 1	Input 4byte	4 bytes	C - W - U	counter pulses (unsign...)	低
119	Logic Function 1	Output 2byte-low	2 bytes	C - - T -	pulses	低
121	Logic Function 1	Output 2byte-high	2 bytes	C - - T -	pulses	低

“1x4byte -> 2x2byte”function: converts one 4byte values to two 2byte value, such as Input 4byte = 78009500 (\$04 A6 54 9C) --> Output 2byte-low = 21660 (\$54 9C), Output 2byte-high =1190 (\$04 A6)

113	Logic Function 1	Input 3byte	3 bytes	C - W - U	RGB value 3x(0..255)	低
119	Logic Function 1	Output 1byte-low	1 byte	C - - T -	counter pulses (0..255)	低
120	Logic Function 1	Output 1byte-middle	1 byte	C - - T -	counter pulses (0..255)	低
121	Logic Function 1	Output 1byte-high	1 byte	C - - T -	counter pulses (0..255)	低

“1x3byte -> 3x1byte”function: converts one 3byte values to three 1byte value, such as Input 3byte = \$78 64 C8--> Output 1byte-low = 200 (\$C8) , Output 1byte-middle = 100 (\$64) , Output 1byte-high =120 (\$78)

113	Logic Function 1	Input 1byte-low	1 byte	C - W - U	counter pulses (0..255)	低
114	Logic Function 1	Input 1byte-middle	1 byte	C - W - U	counter pulses (0..255)	低
115	Logic Function 1	Input 1byte-high	1 byte	C - W - U	counter pulses (0..255)	低
121	Logic Function 1	Output 3byte	3 bytes	C - - T -	RGB value 3x(0..255)	低

“3x1byte -> 1x3byte”function: converts three 1byte values to a 3byte value, such as Input 1byte-low = 150 (\$96), Input 1byte-middle = 100 (\$64), Input 1byte-high = 50 (\$32)--> Output 3byte = \$32 64 96

Fig.6.8.2.4 “Format convert”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
113	Input ...	Logic Function X	1bit	C,W,U	1.001 switch
			1byte		5.010 counter pulses(0..255)
			2byte		7.001 pulses
			3byte		232.600 RGB value 3x(0..255)
			4byte		12.001 counter pulses
The communication object is used to input a value that needs to be converted.					
121	Output ...	Logic Function X	1bit	C,T	1.001 switch
			2bit		2.001 switch control
			1byte		5.010 counter pulses(0..255)
			2byte		7.001 pulses
			3byte		232.600 RGB value 3x(0..255)
4byte	12.001 counter pulses				
The communication object is used to output the converted value.					

Table.6.8.2.4 "Format convert"Communication Object