User Manual

K-BUS Multifunctional Sensor_V1.2

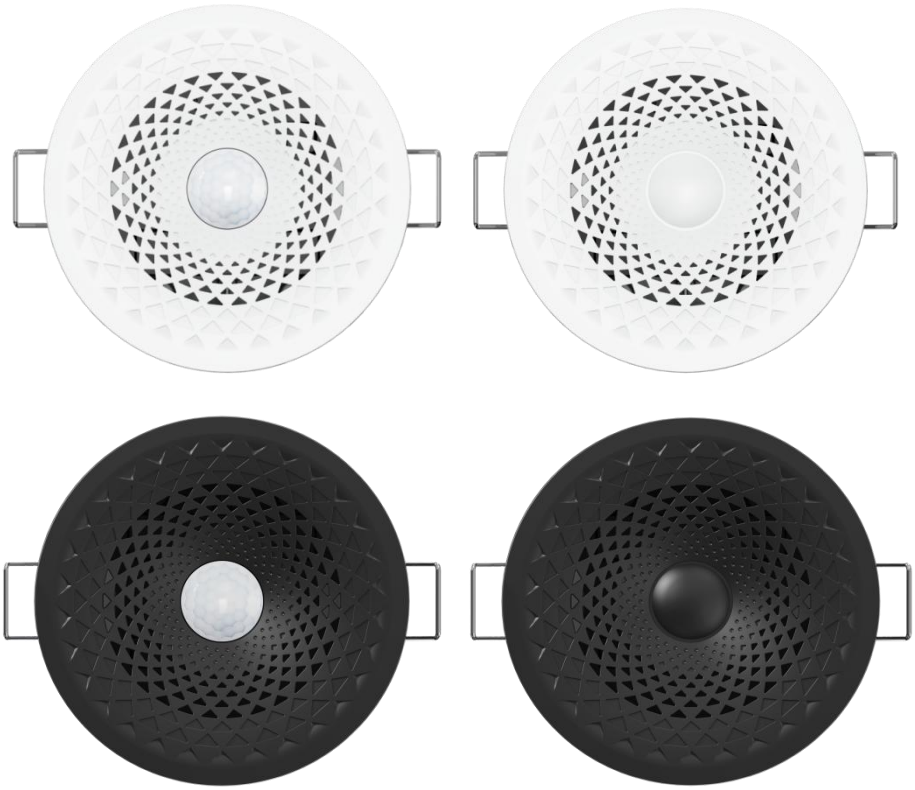
CSMS-04/00.1.0x（4 in 1）

CSMS-05/00.1.0x（5 in 1）

CSMS-06/00.1.0x（6 in 1）

CSMS-09/00.1.0x（9 in 1）

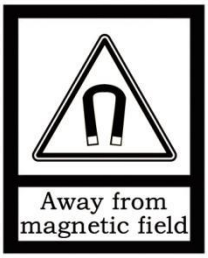
(x=0:White; x=1:Black)



KNX/EIB Home and Building Control System

Attentions

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



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

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

4.Do not disassemble the devices.

Contents

Chapter 1 Summary

Multifunctional sensor is mainly applied in KNX smart 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, users can plan according to their own needs to performs these functions in the system.

Multifunctional sensor can be used to detect temperature, humidity, PM2.5, PM10, CO2, TVOC, formaldehyde values in the current environment and set the level. When the measured value reaches the threshold, it will send an alarm to remind the user to ventilate, dehumidify, etc., so as to optimize the home environment and improve air quality. Besides, built in presence sensor, brightness sensor which are used for illumination or occasions where presence/motion is required (office, hotel, home and etc.). Brightness sensor measures the current brightness, support to light control and constant lighting function, and the brightness and presence detector can be flexibly combined control.

Multifunctional sensor also supports to CO2 controller, relative humidity controller, room temperature controller, ventilation controller, logic function and scene group function, can meet more complex and diverse control and applications.

This manual provides specific technical information about multifunctional sensor for users, as well as assembly and programming details, and explains how to use the sensor by the application examples.

Multifunctional sensor is connected to KNX bus, and need a 12-30V DC auxiliary supply voltage and adopts ceiling mounting. It is available to assign the physical address and configure the parameters by engineering design tools ETS with .knxprod (support edition ETS5.7 or higher).

Functions are summarized as followed:

- ●Detects temperature, humidity,PM2.5, PM10, CO2, TVOC, formaldehyde, movement, Illuminance data and output AQI.
- ●Support sending alarm value, when the temperature, humidity, CO2, PM2.5, PM10, TVOC, formaldehyde, AQI detection data exceeds the threshold, it can send the corresponding alarm telegram

- AQI, CO2, relative humidity, PM2.5, PM10, TVOC, formaldehyde level control
- Support for motion detection, using pyroelectric infrared detection technology, which can only detect normal movement behavior. Can configurable up to 4 presence control outputs and work modes of master/slave
- Built-in brightness sensor, and control the light via brightness threshold and also control logically with movement signal
- Constant lighting control
- Room temperature controller, support heating, cooling control modes, and HVAC modes, with 2-pipes or 4pipes system, Temperature logic algorithm supports 2-point and PI control, and Fan auto.control
- Relative humidity/Ventilation/CO2 control, 3 level humidity/fan speed/CO2
- Logic functions and scene group functions
- Support the KNX Data Secure

Note: Different models of multifunctional sensor can be configured with different types of sensors (temperature, humidity, PM2.5, PM10, CO2, TVOC, formaldehyde, motion, brightness sensors)

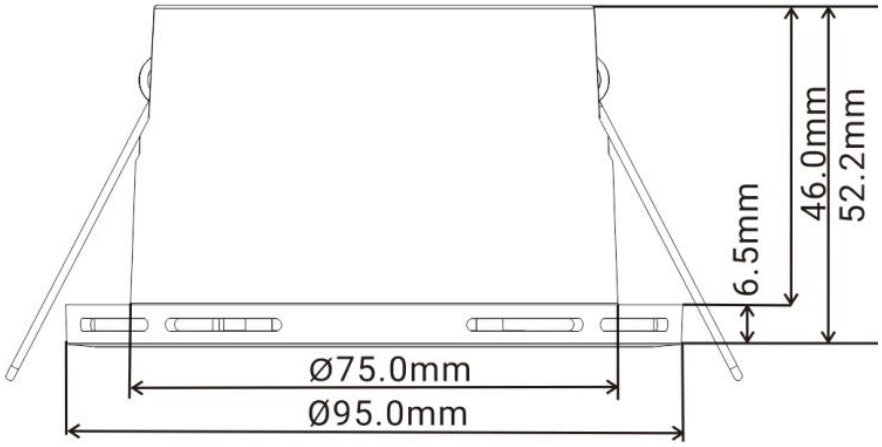
Model	Supported Sensor Types
CSMS-04/00.1.00	Temp./RH/PM2.5/PM10
CSMS-05/00.1.00	Temp./RH/CO2/PM2.5/PM10
CSMS-06/00.1.00	Temp./RH/CO2/PM2.5/PM10/TVOC
CSMS-09/00.1.00	Temp./RH/CO2/PM2.5/PM10/TVOC/Formaldehyde/Brightness/Motion

Chapter 2 Technical Data

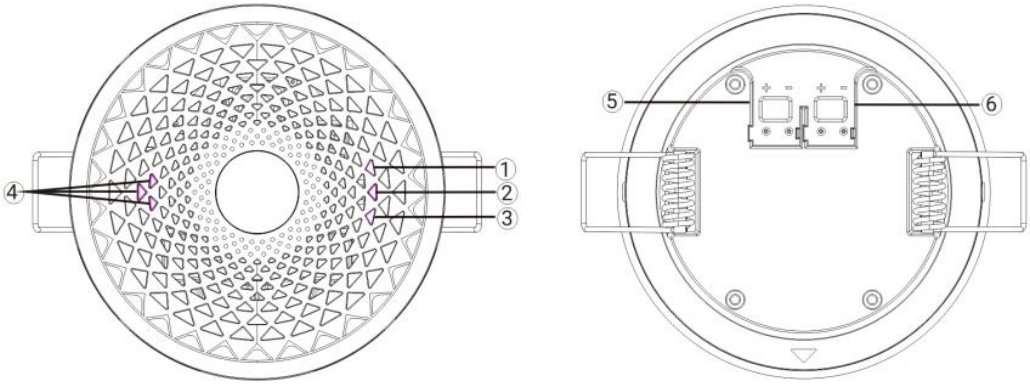
Power supply	Bus voltage	21-30V DC, via the KNX bus
	Bus current	<4mA/24V，<4mA/30V
	Bus consumption	<100mW
Auxiliary supply	Voltage	12-30V DC
	Current	<16mA/24V DC，<12mA/30V DC
	Consumption	<0.5W
Connection line	KNX	Bus connection terminal(Red/Black)
	Auxiliary supply	Connection terminal(Yellow/White)
Operation and display	Programming button and LED	For assigning the physical address
Temperature sensor	Range	−10°C~ + 45 °C
Humidity sensor	Range	0~100%
PM2.5/PM10 sensor	Range	0-1000μg/m³
	Efficiency	50%(φ=0.3um), 98%(φ≥0.5 um)
	Response time	≤1s
CO2 sensor	Range	400~2000ppm
TVOC sensor	Range	0~65000ppb
Formaldehyde sensor	Range and resolution	0~5 ppm
Brightness sensor	Range	0~10000 Lux
Temperature range	Operation	– 5 °C ... 45 °C
	Storage	– 25 °C ... 55 °C
	Transport	– 25 °C ... 70 °C
Ambient	Humidity	<93%, except dewing
Installation	Ceiling mounted or Surface mounted	
	Surface mounted with additional accessory CSMSA-00/0.1.0x	
	Mounting height 2.5-6m	
Dimension	ϕ95*95*52.2mm	
Weight	0.2kg	

Chapter 3 Dimension and Structural Diagram

3.1.Dimension Diagram



3.2.Structural Diagram



①Programming LED ②Programming button

③Alarm LED ④Brightness sensor

⑤KNX bus connection terminal ⑥Auxiliary supply connection terminal

Reset the device to the factory configuration: press the programming button and hold for 4 seconds then release, repeat the operation for 4 times, and the interval between each operation is less than 3 seconds.

3.3.Installation Diagram

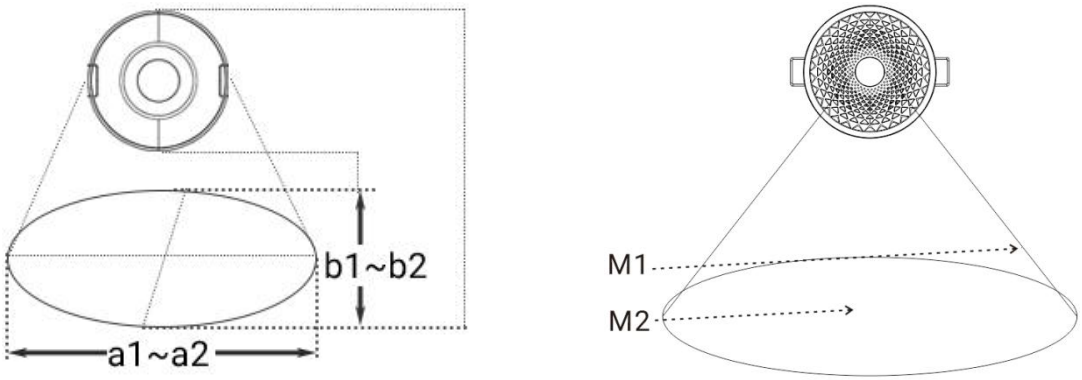


Fig.3.3.2(1)Installation diagram

The following table shows the maximum range of the different areas for different installation heights (H) **(unit: meter)**, with a movement speed of 1.0m/s:

a: the wide range of detection diameter; b: the narrow range of detection diameter;

a, b is corresponds to direction of sensor installation

M1: walking straight to sensor; M2: walking across sensor; M3: tiny movement;

H	M1		M2	
	a1	b1	a2	b2
2.5	5	4	7	6
3	6	5	8	7
4	8	7	11	9.5
5	10	8.5	13.5	11.5
6	11	10	15.5	13.5

Note:

1. the data is referred from internal laboratory, there may be differences in results depending on the environment, object and movement speeds.For better detection effect, temperature difference between the ambient and the human body should be greater than 5°C, to avoid abnormal triggering.

2.According to Pyroelectric Infrared sensor detection principle,the detection range is consist of mul tiple detection units,the inside area is crowed white the outside area is scattered,as shown in Fig.3.3.2(2),and there is a dead zone between different detection units,especially in the outside area,s

o the distance will be different in different direction even though the motion behavior is the same,mak e sure to confirm whether the detection result is fulfil the requirement according to the actual applicat ion.

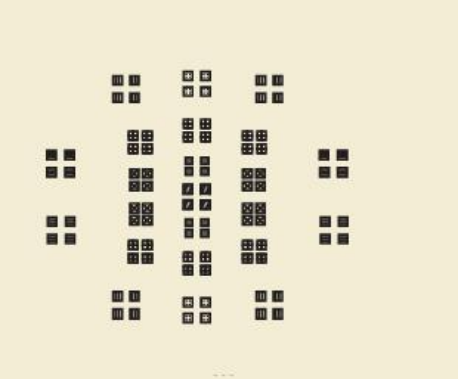


Fig.3.3.2(2)

3.Keep it far away fridge, air conditioning, and stovepipe, where temperature changes violently.

4.In a certain temperature, speed of wind affects a little.

5.If ambient temperature approaches body temperature, the sensor will lose efficacy.

6.Between the sensor and detected area must not have stumbling block.

7.Sensor can not be directly on the windows and doors, and where there is direct sunlight. Air flow and dramatic changes in light will case sensor generates fault alarm.

Chapter 4 Project Design and Programming

Application	Maximum of communication objects	Maximum number of group addresses	Maximum number of associations	Secure group addresses
PM2.5/PM10/TVOC/Formaldehyde/CO2 /Temp./RH/Brightness/Motion/00B3 1.0	**444**	**700**	**700**	**444**

General function

General function includes device In operation setting, request device status after bus voltage recovery.

Internal sensor measurement

Internal temperature, humidity PM2.5, PM10, CO2, TVOC and Formaldehyde measurement values are sent to the bus: respond after read only and respond after change.

Set their calibrations, and send alarm telegrams when the preset range of threshold values for alarm is exceeded. In addition, support for sending sensor error report to the bus.

Brightness measurement

Internal brightness measurement value is sent to the bus: respond after read only and respond after change.

Set brightness calibration via parameters, support to be updated via bus and overwrite during download.

Presence control function

Up to set 4 presence controls.

Support 2 types of output: Master mode, slave mode.

Support to disable function for presence control, control via object and the object telegrams is

optional, the output behavior is set by parameter.

Begin of presence and End of presence send telegrams independently, support to send the last telegram cyclically, up to send 3 output values (Begin is A/B/C, End is D/E/F), thus, 3 levels of lighting control can be achieved. You can set output values for day and night respectively when night mode is enabled.

Support to 2 operation modes: Automatic mode (Begin of presence and End of presence are both dependent on the sensor), Semi-automatic mode (Begin of presence is triggered by external input, End of presence is dependent on the sensor or external input).

Support presence control depending on brightness, control via object and the object telegrams is optional.

Brightness control

Support to disable function for brightness control , control via object and the object telegrams is optional

The reference of brightness is optional internal, external and proportional mixing internal + external , the mixing data is fed back to bus. The external brightness is optional 1~3.

Support to set the lower and upper thresholds to be compared with brightness, then send the telegram, which can be applied to turn on/off light or recall scene. The threshold behaviour is optional with hysteresis or without hysteresis. When with hysteresis, it is as a buffer area between lower and upper threshold, in which brightness is no action.

Constant lighting

The reference of brightness is optional internal, external and proportional mixing internal + external, the mixing data is fed back to bus. The external brightness is optional 1~3.

Trigger controller on/off via external presence sensor or local presence sensor, send telegram after controller status is changed.

When controller is on, main output brightness support to 3 settings: Specified via parameter, The output is calculated based on a comparison of the current brightness and setpoint, Read the value

obtained via request actuator status. You can set output values for day and night respectively when night mode is enabled.

Support to 2 control method: Calculating via proportional, Calculating via offsets. Up to set 4 sub groups. When via proportional, output sub brightness is dependent on the influence of proportional for sub to the main; when via offsets, output sub brightness is dependent on the offset for sub to the main.

Support to set hysteresis value for the main output brightness (Hysteresis value = Setpoint × Hysteresis percent), compare current brightness and "Setpoint ± Hysteresis value" to change brightness and keep output.

When the output is the minimum brightness value and is greater than "Setpoint ± Hysteresis value", controller will be in standby mode, output OFF and brightness 0%; when delay time for standby is 0, controller will be always in activation status, output the minimum brightness value. If the current brightness value is lower than "Setpoint - hysteresis - additional hysteresis", restart controller from standby mode.

Support to stop function. When it is necessary to stop the constant lighting control, manually send the control command to interrupt via other devices (such as button panels, dimmers), the controller will be inactive after receiving the command. After stopping, you can also set a delay to activate the controller automatically.

Air Quality Level

Support the Level output function of AQI, temperature, relative humidity, PM2.5, PM10, CO2, TVOC, Formaldehyde , and independent setting.

The reference of measurement value is optional internal, external, multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. The external sensors are optional 1~3.

Up to 4 Level outputs, except AQI, PM2.5 which supports 6 levels of output. The control type can be set to 1bit, 1byte unsigned value, percent, scene or RGB.

Configure the threshold value of each Level, and the measurement value is compared with the threshold values, then output the Level telegrams, and you can customizes alarm massage when type

is 1byte or RGB.

If the internal sensor failure or external sensor cannot request data, it is determined to be a sensor error, and you can set the output value for sensor failure.

Air Quality Controller

Support the Controller function of CO2 and relative humidity, and independent setting. CO2 controller supports step control and PI control, while relative humidity only support the step control, which can be set 3 levels control, control type can be set 1byte unsigned value or percent.

The reference of measurement value is optional internal, external, proportional mixing internal+external, the mixing data is fed back to bus.

If the internal sensor failure or external sensor cannot request data, it is determined to be a sensor error, and you can set the control value for sensor failure.

Support to stop function. When it is necessary to stop the CO2 or humidity control, manually send the control command to interrupt via other devices, the controller will be inactive after receiving the command. After stopping, you can also set a delay to activate the controller automatically.

RTC function

RTC is mainly used to control the room temperature, automatically and optimally control the heating and cooling according to the use of the room or the needs of the occupants.

Support manually switching of heating/cooling control, support options for three-level fan speed and auto fan speed, four operation modes: comfort, standby, economy and protection mode. Linkage control with window contact input detection and presence sensor detection. As well as support additional heating/cooling, to speed up the response of temperature control.

The setting temperature supports absolute and relative settings, as well as adjustable temperature range settings. Supports 2-point and PI control.

Ventilation controller

Auto control object, used for receiving enable auto function of device, and used to whether to trigger to enter auto control when bus voltage recovery. Link to PM2.5, CO2, TVOC, to control Ventilation, with 3 level fan speed and 1bit/1byte output type.

Logic function

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

Logic function support functions, including AND, OR, XOR, Gate forwarding, Threshold comparator, Format convert, Delay function and Staircase lighting.

Scene group function

By calling the scene number, up to eight output telegrams can be triggered. Each output has five different data type options. There are a total of 8 scene group function can be configured.

Chapter 5 Parameter setting description in the ETS

5.1.KNX Secure

Multifunctional sensor is a KNX device that complies with the KNX secure standard. That is, you can run the device in safe way.

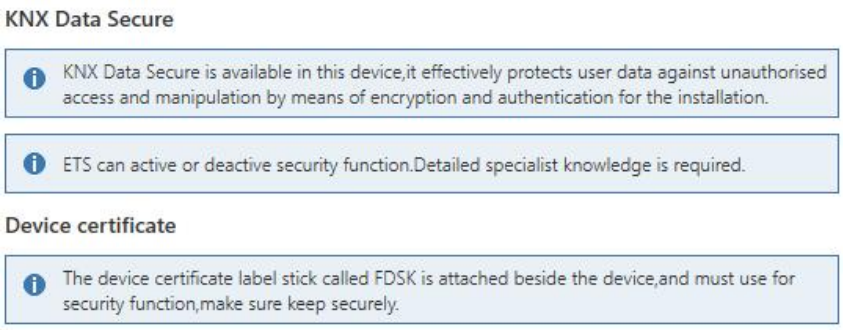
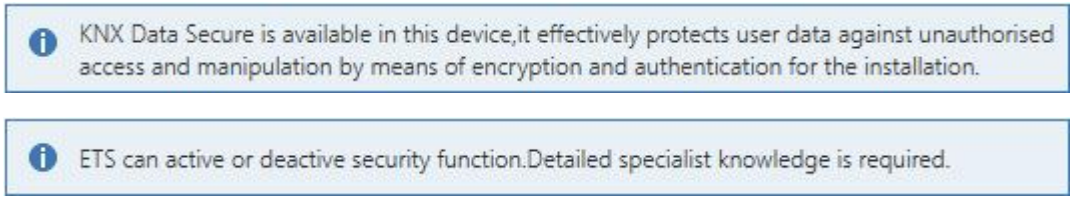


Fig.5.1 (1) "KNX Secure" parameter window

The device with KNX secure will be displayed notes on ETS, as shown as Fig.5.1(1).



If secure commissioning is actived in ETS project, the following information must be considered during device debugging:

❖It is essential to assign a project password as soon as a KNX Secure device is imported into a project. This will protect the project against unauthorized access.

The password must be kept in a safe place – access to the project is not possible without it (not even the KNX Association or device manufacturer will be able to access it)!

Without the project password, the commissioning key will not be able to be imported.

❖A commissioning key is required when commissioning a KNX Secure device (first download). This key (FDSK = Factory Default Setup Key) is included on a sticker on the side of the device, and it must be imported into the ETS prior to the first download:

✧On the first download of the device, a window pops up in the ETS to prompt the user to enter the key, as shown in Fig.5.1 (2) below.

The certificate can also be read from the device using a QR scanner (recommended).

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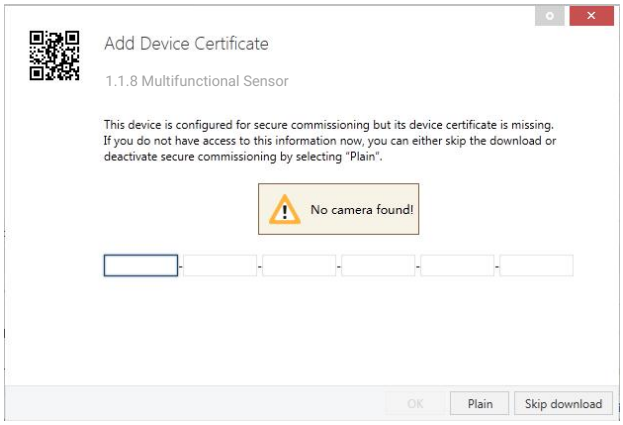


Fig.5.1(2) Add Device Certificate window

✧Alternatively, the certificates of all Secure devices can be entered in the ETS beforehand.

This is done on the “Security” tab on the project overview page, as shown in Fig.5.1(3) below.

The certificates can be also added to the selected device in the project, as shown in Fig.5.1(4).

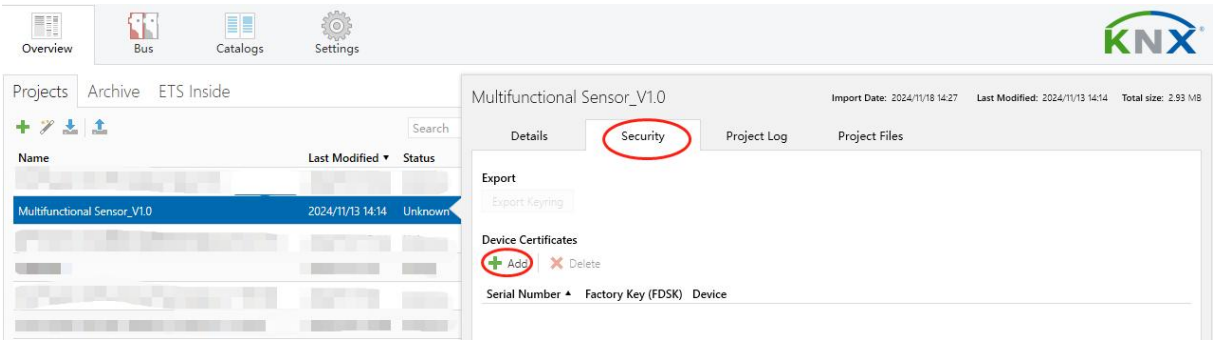


Fig.5.1(3) Add Device Certificate

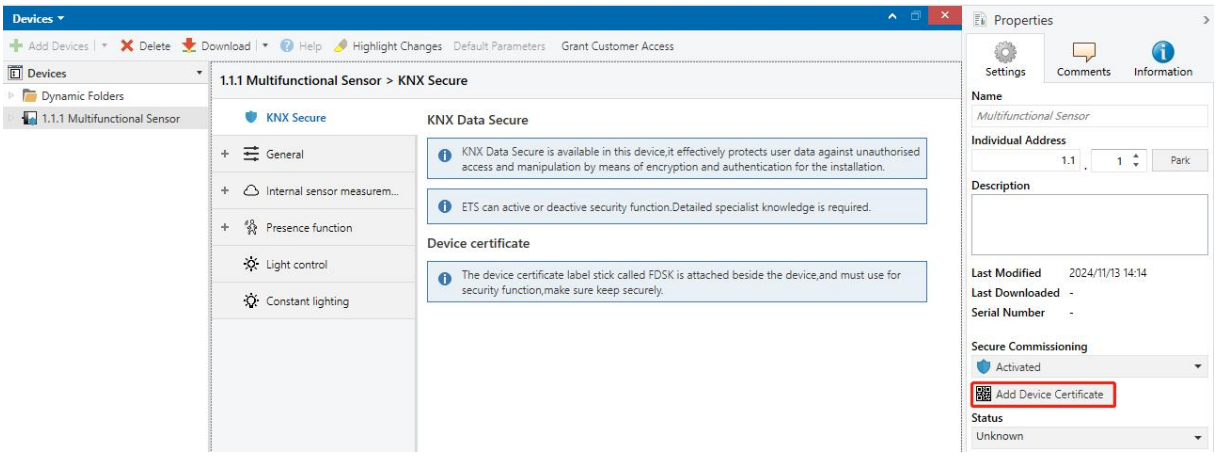


Fig.5.1(4) Add Device Certificate

✧There is a FDSK sticker on the device, which is used for viewing FDSK number.

Without the FDSK, it will no longer be possible to operate the device in KNX Secure mode after a reset.

The FDSK is required only for initial commissioning. After entering the initial FDSK, the ETS will assign a new key, as shown in Fig.5.1(5) below.

The FDSK will be required again only if the device was reset to its factory settings (e.g. If the device is to be used in a different ETS project).

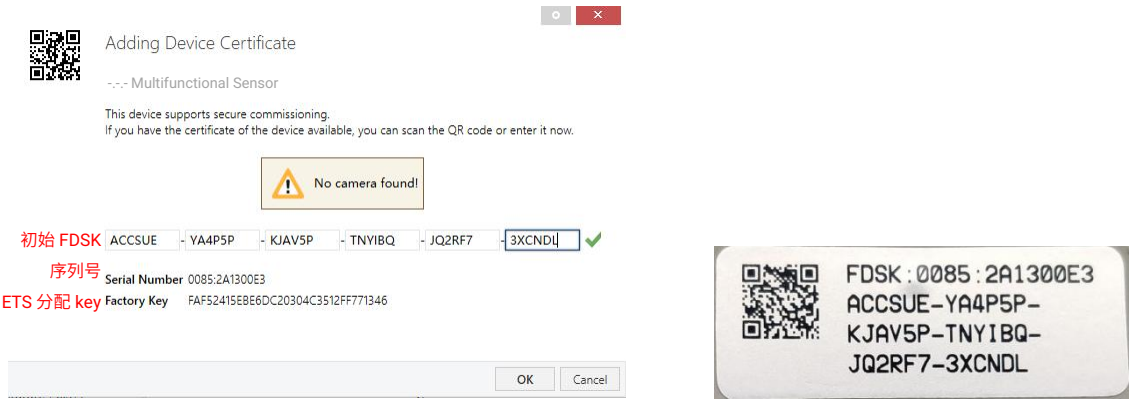


Fig.5.1(5)

Example:

If this application in the project needs to be tried with another device, it is no longer the original device. When the application is downloaded to a new device, the following prompt will appear on the left of Fig.5.1(6), click yes, the Add Device Certificate window will appear, then enter the initial FDSK of the new device, and you need to reset the device to the factory settings (it is not required if the device is still factory default; If it has been used, it will be required to reset, otherwise the following error message will appear on the right of Fig.5.1(6)), and then the device can be successfully downloaded again.

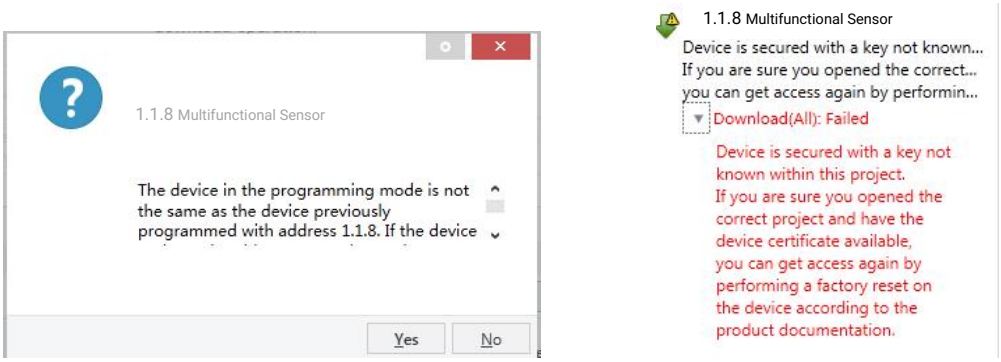


Fig.5.1(6) Example

Whether the device is replaced in the same project, or the device is replaced in a different project, the processing is similar: **Reset the device to the factory settings, then reassign the FDSK.**

After the device is downloaded successfully, the label Add Device Certificate turns gray, indicating that the key for this device has been assigned successfully, as shown in Fig.5.1(7) below.

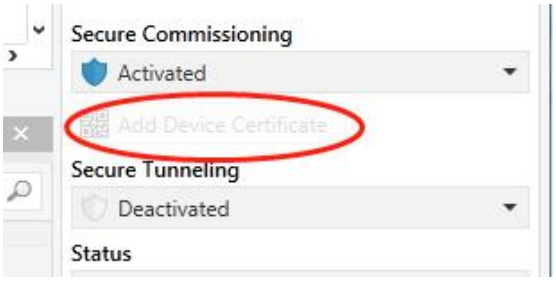


Fig.5.1(7)

ETS generates and manages keys:

Keys and passwords can be exported as needed to the use of security keys outside of the associated ETS projects. As shown in Fig.5.1(8) below, the file extension is .knxkeys.

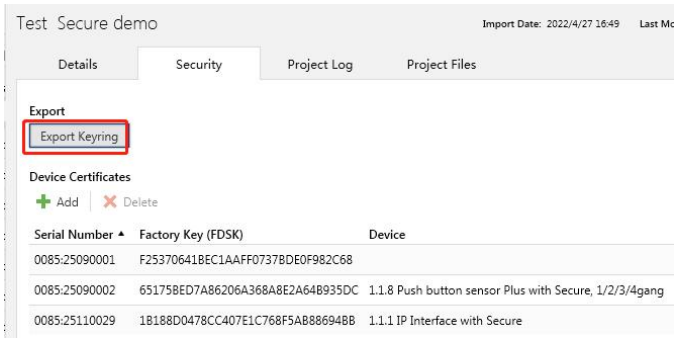


Fig.5.1(8)

Note: Any USB interface used for programming a KNX Secure device must support "long frames".

Otherwise ETS will report a download failure information, as shown below.

5.2.Parameter window“General”

5.2.1.Parameter window“General setting”

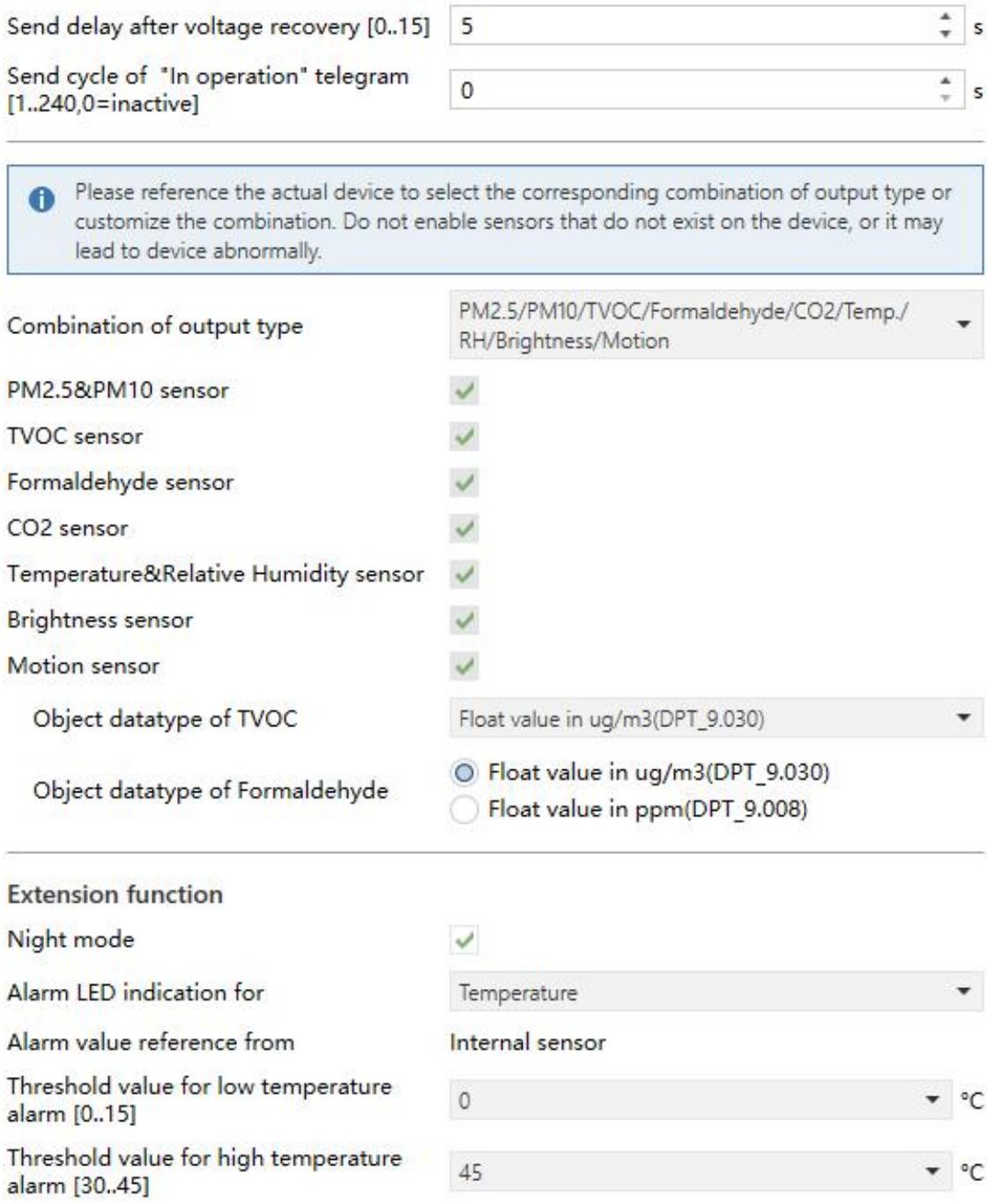


Fig.5.2.1 “General setting” Parameter window

Parameter“Send delay after voltage recovery [0..15]”

This parameter is for setting the delay time to send to bus after bus voltage recovery. Options: **0..15 s**

The setting dose not contain the device initialization time, and bus telegrams received during delay time will be recorded.

Parameter"Send cycle of "In operation" telegram [1..240,0=inactive]"

This parameter is for setting the time interval when cyclically send telegrams through the bus to indicate this device in normal operation. When set to "0", the object "In operation" will not send a telegram. If the setting is not "0", the object "In operation" will send a telegram according to the setting period time with logic "1" to the bus. Options: **0…240 s, 0= inactive**

As to reduce the bus load as much as possible, the maximum time interval should be selected according to actual application requirement.

Parameter"Combination of output type"

This parameter sets the combination of output type.Options:

PM2.5/PM10/Temp./RH

PM2.5/PM10/CO2/Temp./RH

PM2.5/PM10/TVOC/CO2/Temp./RH

PM2.5/PM10/TVOC/Formaldehyde/CO2/Temp./RH/Brightness/Motion

User defined

The following parameters are displayed according to the "Combination of output type" setting.

——Parameter"PM2.5&PM10 sensor"

——Parameter"TVOC sensor"

——Parameter"Formaldehyde sensor"

——Parameter"CO2 sensor"

——Parameter"Temperature&Relative Humidity sensor"

——Parameter"Brightness sensor"

——Parameter"Motion sensor"

These parameters are used to set whether to enable PM2.5 & PM10, TVOC, formaldehyde, CO2,

temperature & humidity, brightness and motion sensors. After enabling, the corresponding internal sensor settings page is visible, more details refer to chapter 5.3.1-5.3.8.

——Parameter"Object datatype of TVOC"

This parameter is visible when the TVOC sensor is enabled. Used to set the object datatype of TVOC.Options:

Float value in ug/m3(DPT_9.030)

Float value in ppb(DPT_9.008)

Float value in ppm(DPT_9.008)

——Parameter"Object datatype of Formaldehyde"

This parameter is visible when the formaldehyde sensor is enabled. Used to set the object datatype of formaldehyde.Options:

Float value in ug/m3(DPT_9.030)

Float value in ppm(DPT_9.008)

Extension function

Parameter"Night mode"

This parameter sets whether to enable night mode.

Parameter"Alarm LED indication for"

This parameter sets whether to enable the alarm indicator function.Options:

Disable

Temperature

Relative humidity

PM2.5

PM10

CO2

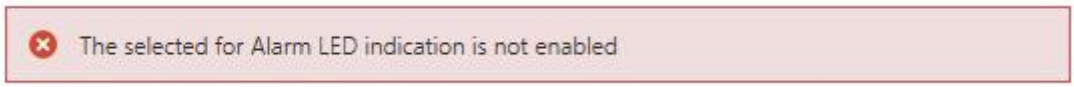
TVOC

Formaldehyde

Brightness

External 1bit object

Note: When the corresponding sensor parameter is not enabled, the corresponding alarm type cannot be selected, otherwise display red box warning, as shown as follow:



Parameter"Alarm value reference from"

This parameter is visible when the previous parameter is enabled, set the resource of the alarm value reference. Options:

Internal sensor

Air Quality Level

When the parameter "Alarm LED indication for" is selected as "Temperature", the following parameters are visible:

——Parameter"Threshold value for low temperature alarm [0..15]"

This parameter is for setting the threshold value for low temperature alarm. When the temperature lower than low threshold, low temperature alarm object will send telegram. Options:

0°C

1°C

...

15°C

——Parameter"Threshold value for high temperature alarm [30..45]"

This parameter is for setting the threshold value for high temperature alarm. When the temperature higher than high threshold, high temperature alarm object will send telegram. Options:

Options:

30°C

31°C

...

45°C

When the parameter "Alarm LED indication for" is selected as "Relative humidity", the following parameters are visible:

——Parameter"Threshold value for low humidity alarm [5..50]"

This parameter is for setting the threshold value for low humidity alarm. When the humidity lower than low threshold, low humidity alarm object will send telegram. Options: **5..50%**

——Parameter"Threshold value for high humidity alarm [55..85]"

This parameter is for setting the threshold value for high humidity alarm. When the humidity higher than high threshold, high humidity alarm object will send telegram. Options: **55..85%**

When the parameter "Alarm LED indication for" is selected as "PM2.5", the following parameters are visible:

——Parameter"Threshold value for PM2.5 alarm [1..999]"

This parameter is for setting the threshold value for PM2.5 alarm. When the PM2.5 higher than threshold, PM2.5 alarm object will send telegram. Options: **1...999ug/m3**

When the parameter "Alarm LED indication for" is selected as "PM10", the following parameters are visible:

——Parameter"Threshold value for PM10 alarm [1..999]"

This parameter is for setting the threshold value for PM10 alarm. When the PM10 higher than threshold, PM10 alarm object will send telegram.Options: **1...999ug/m3**

When the parameter "Alarm LED indication for" is selected as "CO2", the following parameters are visible:

——Parameter"Threshold value for CO2 alarm [400..2000]"

This parameter is for setting the threshold value for CO2 alarm. When the CO2 higher than threshold, CO2 alarm object will send telegram. Options: **400...2000ppm**

When the parameter "Alarm LED indication for" is selected as "TVOC", the following parameters are visible:

——Parameter"Threshold value for TVOC alarm [1..3000]/[10..5000]/[0.01..5]"

This parameter is for setting the threshold value for TVOC alarm. When the TVOC higher than threshold, TVOC alarm object will send telegram.

Options: **[1..3000ug/m3]/[10..5000ppb]/[0.01..5ppm], displayed according to the parameter "Object datatype of TVOC"**

When the parameter "Alarm LED indication for" is selected as "Formaldehyde", the following parameters are visible:

——Parameter"Threshold value for formaldehyde alarm [1..999]/[0.01..5]"

This parameter is for setting the threshold value for formaldehyde alarm. When the formaldehyde higher than threshold, formaldehyde alarm object will send telegram.

Options: [**1..999ug/m3]/[0.01..5ppm], displayed according to the parameter "Object datatype of Formaldehyde"**

When the parameter "Alarm LED indication for" is selected as "Brightness", the following parameters are visible:

——Parameter"Threshold value for brightness alarm [1..2000]"

This parameter is for setting the threshold value for brightness alarm. When the brightness higher than threshold, brightness alarm object will send telegram.

Options: **1...2000lux**

5.2.2.Parameter window“Advanced function”

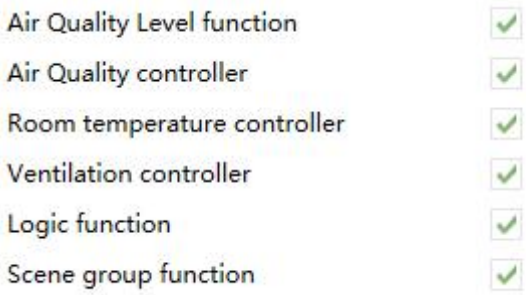


Fig.5.2.2 “Advanced function” Parameter window

Parameter“Air Quality Level function”

Setting page of air quality level function is visible after this parameter enabled. More details refer to chapter 5.4.

Parameter“Air Quality controller”

Setting page of air quality controller is visible after this parameter enabled. More details refer to chapter 5.5.

Parameter“Room temperature controller”

Setting page of room temperature controller is visible after this parameter enabled. More details refer to chapter 5.9.

Parameter“Ventilation controller”

Setting page of ventilation controller is visible after this parameter enabled. More details refer to chapter 5.10.

Parameter“Logic function”

Setting page of logic function is visible after this parameter enabled. More details refer to chapter 5.11.

Parameter“Scene group function”

Setting page of scene group function is visible after this parameter enabled. More details refer to chapter 5.12.

5.3.Parameter window“Internal sensor measurement”

These parameters as follow are used for setting the calibration value, sending condition and error report of internal sensor, if controller, Level function or alarm value select to use internal sensor, refer to the settings here.

5.3.1.Temperature sensor

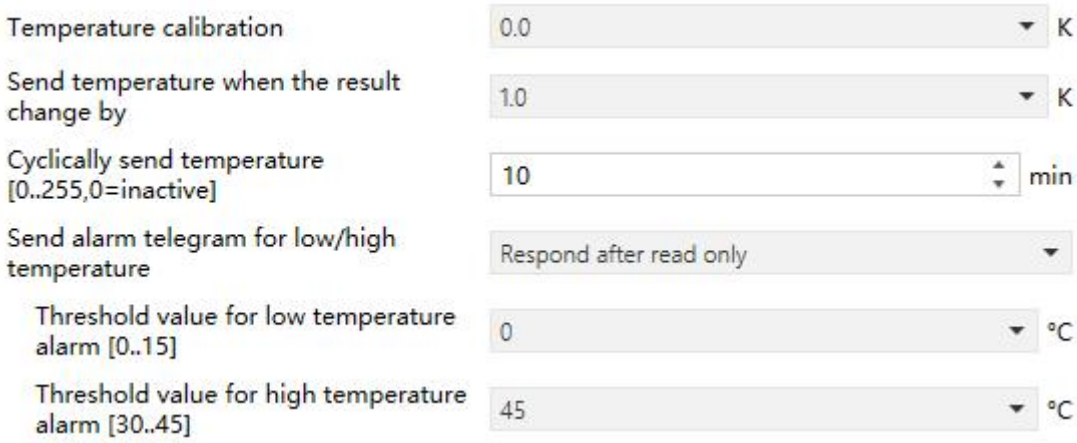


Fig.5.3.1 “Temperature sensor” Parameter window

Parameter“Temperature calibration”

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

Options:

-10.0K

...

0.0K

...

10.0K

Note: after the device is powered on, the stability time of internal sensor measurement will take 30 minutes, therefore, the measured temperature value in the early stage of device work may be inaccurate.

Parameter“Send temperature when the result change by”

This parameter is for setting when temperature measurement value changes, whether to enable to

send the current temperature value to the bus. No telegram is sent when Disable is selected.

Options:

Disable

0.1K

1.0K

...

10.0K

Parameter"Cyclically send temperature [0...255,0=inactive]"

Setting the time for cyclically sending the temperature measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Send alarm telegram for low/high temperature"

This parameter is for setting condition of sending telegram when low/high temperature alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only: the object "Low temperature alarm"/" High temperature alarm" will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object "Low temperature alarm"/"High temperature alarm" will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when "Respond after read only" or "Respond after change" are selected.

——Parameter"Threshold value for low temperature alarm [0..15]"

This parameter is for setting the threshold value for low temperature alarm. When the temperature lower than low threshold, low temperature alarm object will send telegram.

Options:

0°C

1°C

...

15°C

——Parameter"Threshold value for high temperature alarm [30..45]"

This parameter is for setting the threshold value for high temperature alarm. When the temperature higher than high threshold, high temperature alarm object will send telegram.

Options:

30°C

31°C

...

45°C

5.3.2.Relative humidity sensor

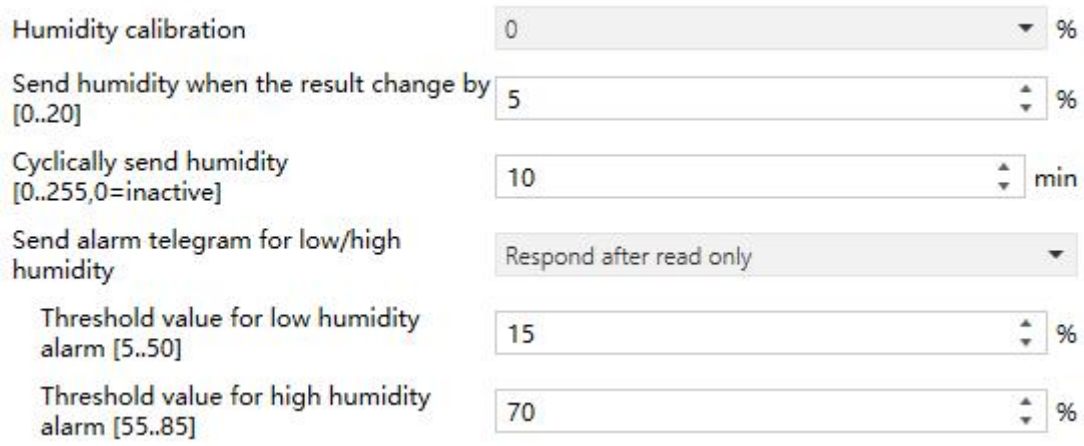


Fig.5.3.2 "Relative humidity sensor" Parameter window

Parameter"Humidity calibration"

This parameter is for setting the humidity calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient humidity.

Options:

-20%

...

0%

...

20%

Parameter"Send humidity when the result change by [0..20]"

This parameter is for setting when humidity measurement value changes, whether to enable to send the current humidity value to the bus. Not send when value is 0. Options: **0..20 %**

Parameter"Cyclically send humidity [0..255,0=inactive]"

Setting the time for cyclically sending the humidity measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Send alarm telegram for low/high humidity"

This parameter is for setting condition of sending telegram when low/high humidity alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only: the object “Low humidity alarm”/“ High humidity alarm” will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object “Low humidity alarm”/“High humidity alarm” will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when “Respond after read only” or “Respond after change” are selected.

——Parameter“Threshold value for low humidity alarm [5..50]”

This parameter is for setting the threshold value for low humidity alarm. When the humidity lower than low threshold, low humidity alarm object will send telegram.

Options: **5..50 %**

——Parameter“Threshold value for high humidity alarm [55..85]”

This parameter is for setting the threshold value for high humidity alarm. When the humidity higher than high threshold, high humidity alarm object will send telegram.

Options: **55..85 %**

5.3.3.CO2 sensor

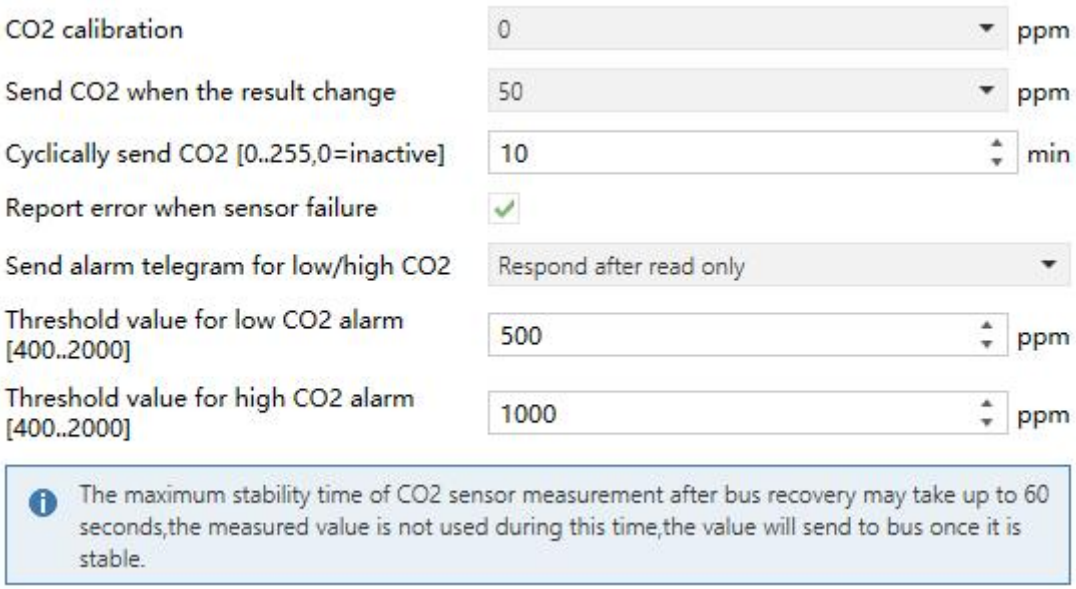


Fig.5.3.3 "CO2 sensor" Parameter window

Parameter"CO2 calibration"

This parameter is for setting the CO2 calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient CO2. Options:

-500ppm

...

0ppm

...

500ppm

Note: the maximum stability time of CO2 sensor measurement after bus recovery may take up to 60 seconds, the measured value is not used during this time, the value will send to bus once it is stable.

Parameter"Send CO2 when the result change"

This parameter is for setting when CO2 measurement value changes, whether to enable to send the current CO2 value to the bus. No telegram is sent when Disable is selected. Options:

Disable

10ppm

20ppm

...

500ppm

Parameter"Cyclically send CO2 [0..255,0=inactive]

This parameter is for setting the time for cyclically sending the CO2 measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Report error when sensor failure"

This parameter is for setting whether report error when sensor failure. When the sensor does not measure a value, it is generally handled as a sensor failure.

Parameter"Send alarm telegram for low/high CO2"

This parameter is for setting condition of sending telegram when low/high CO2 alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only：the object "Low CO2 alarm"/" High CO2 alarm" will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object "Low CO2 alarm"/ "High CO2 alarm" will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when "Respond after read only" or "Respond after change" are selected.

——Parameter"Threshold value for low CO2 alarm [400..2000]"

This parameter is for setting the threshold value for low CO2 alarm. When the CO2 lower than low threshold, low CO2 alarm object will send telegram. Options: **400..2000 ppm**

——Parameter"Threshold value for high CO2 alarm [400..2000]"

This parameter is for setting the threshold value for high CO2 alarm. When the CO2 higher than

high threshold, high CO2 alarm object will send telegram. Options: **400..2000 ppm**

The low CO2 alarm value must less than the high value, if not, it can not be modified on ETS.

Threshold value for low CO2 alarm [400..2000]	1000	ppm
Threshold value for high CO2 alarm [400..2000]	1000	ppm

5.3.4.PM2.5 sensor

Fig.5.3.4 "PM2.5 sensor" Parameter window

Parameter"PM2.5 calibration"

This parameter is for setting the PM2.5 calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient PM2.5.

Options: **-30...30ug/m3**

Parameter"Send PM2.5 when the result change by"

This parameter is for setting when PM2.5 measurement value changes, whether to enable to send the current PM2.5 value to the bus. No telegram is sent when 0 is selected. Options: **0...50ug/m3**

Parameter"Cyclically send PM2.5 [0...255,0=inactive]"

This parameter is for setting the time for cyclically sending the PM2.5 measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Report error when sensor failure"

This parameter is for setting whether report error when sensor failure. When the sensor does not measure a value, it is generally handled as a sensor failure.

Parameter"Send alarm telegram for PM2.5"

This parameter is for setting condition of sending telegram when PM2.5 alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only：the object “PM2.5 alarm” will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object “PM2.5 alarm” will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when “Respond after read only” or “Respond after change” are selected.

——Parameter“Threshold value for PM2.5 alarm [1..999]”

This parameter is for setting the threshold value for PM2.5 alarm. When the PM2.5 higher than threshold, PM2.5 alarm object will send telegram. Options: **1...999ug/m3**

5.3.5.PM10 sensor

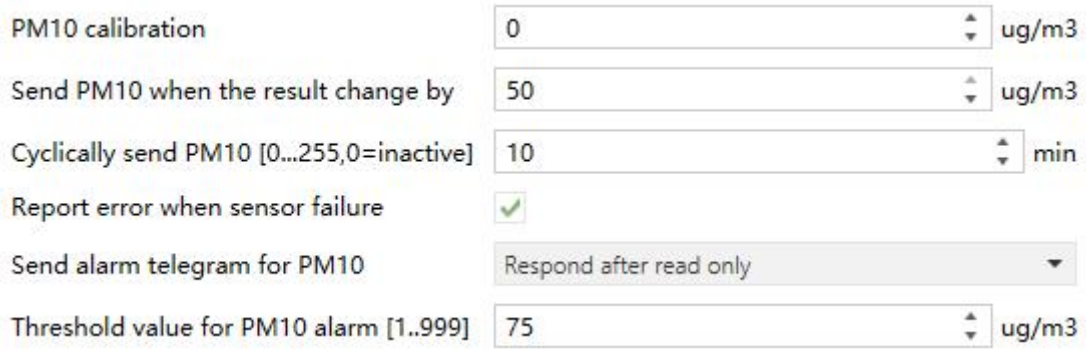


Fig.5.3.5 "PM10 sensor" Parameter window

Parameter"PM10 calibration"

This parameter is for setting the PM10 calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient PM10.

Options: **-30...30ug/m3**

Parameter"Send PM10 when the result change by"

This parameter is for setting when PM10 measurement value changes, whether to enable to send the current PM10 value to the bus. No telegram is sent when 0 is selected. Options: **0...50ug/m3**

Parameter"Cyclically send PM10 [0...255,0=inactive]"

This parameter is for setting the time for cyclically sending the PM10 measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Report error when sensor failure"

This parameter is for setting whether report error when sensor failure. When the sensor does not measure a value, it is generally handled as a sensor failure.

Parameter"Send alarm telegram for PM10"

This parameter is for setting condition of sending telegram when PM10 alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only：the object “PM10 alarm” will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object “PM10 alarm” will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when “Respond after read only” or “Respond after change” are selected.

——Parameter“Threshold value for PM10 alarm [1..999]”

This parameter is for setting the threshold value for PM10 alarm. When thePM10 higher than threshold, PM10 alarm object will send telegram. Options: **1...999ug/m3**

5.3.6.TVOC sensor

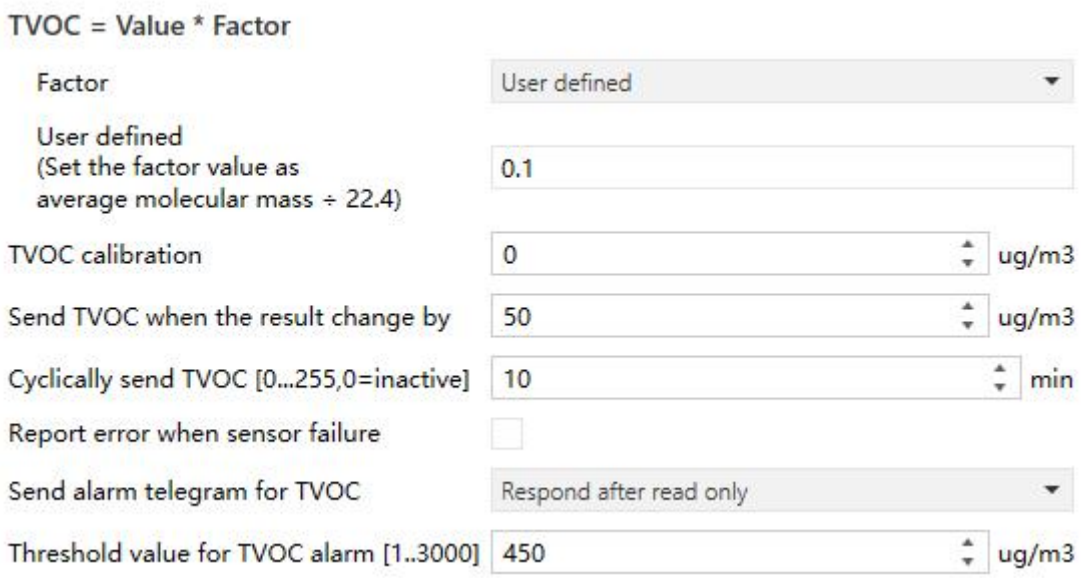


Fig.5.3.6 “TVOC sensor” Parameter window

Note: Within 24 hours of the first power on of the device, the TVOC sensor is in the self-calibration stage, and the data at this stage may deviate from the actual situation. Considering the existence of molecular motion, in order to more accurately output the current TVOC value in the environment, the TVOC sensor output value comprehensively refers to the data of nearly 1 min, which is approximately the average value of the measured TVOC. If at a certain moment, the TVOC concentration in the environment changes drastically, then the TVOC sensor output value will also change, but the amount of change is relatively low; if a long period of time in a high concentration environment, the output value will be closer to the actual value.

TVOC = Value * Factor

Parameter"Factor"

When the TVOC sensor outputs the original unit of ppb, the average molecular concentration of TVOC varies in different environments. When converting to μg/m ^{3}, different conversion factors are required. Therefore,This parameter is visible when “Float value in ug/m3(DPT_9.030)”c is selected for “Object datatype of TVOC”, set the TVOC calibration factor.

Options: **2.5(indoor) / 2.9(outdoor) / 4.16(industrial) / User defined**

2.5(indoor): suitable for indoor environment in the home, at this time, the composition of TVOC is mainly Benzene, Aldehydes and Esters, and the average molecular mass is about 56g/mol;

2.9(outdoor): suitable for outdoor environment, at this time, the composition of TVOC is mainly Alkanes, Aromatics, etc., and the average molecular mass is about 65g/mol;

4.16(industrial): suitable for industrial environment, the composition of TVOC is relatively complex at this time, mainly Benzene, Organic Chloride, Ketones, Ammonia, etc., and the average molecular mass is about 93g/mol;

User defined: if the usage environment does not belong to the above situation, please select this option.

——Parameter "User defined"

This parameter is visible when "user defined" is selected for the previous parameter, set the TVOC custom calibration factor.

Options: **0.1...10**

Set the factor value as **average molecular mass ÷ 22.4** .

Parameter"TVOC calibration"

This parameter is for setting the TVOC calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient TVOC.

Options: **[-500...500ug/m3]/[-500...500ppb]/[-5...5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Parameter"Send TVOC when the result change by"

This parameter is for setting when TVOC measurement value changes, whether to enable to send the current TVOC value to the bus. No telegram is sent when 0 is selected.

Options: **[0...500ug/m3]/[0...500ppb]/[0...5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Parameter"Cyclically send TVOC [0...255,0=inactive]"

This parameter is for setting the time for cyclically sending the TVOC measurement value to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Report error when sensor failure"

This parameter is for setting whether report error when sensor failure. When the sensor does not measure a value, it is generally handled as a sensor failure.

Parameter"Send alarm telegram for TVOC"

This parameter is for setting condition of sending telegram when TVOC alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only：the object "TVOC alarm" will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object "TVOC alarm" will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when "Respond after read only" or "Respond after change" are selected.

——Parameter"Threshold value for TVOC alarm [1..3000]/[0...5000]/[0...5]"

This parameter is for setting the threshold value for TVOC alarm. When the TVOC higher than threshold, TVOC alarm object will send telegram.

Options: **[1...3000ug/m3]/[0...5000ppb]/[0...5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

5.3.7.Formaldehyde sensor

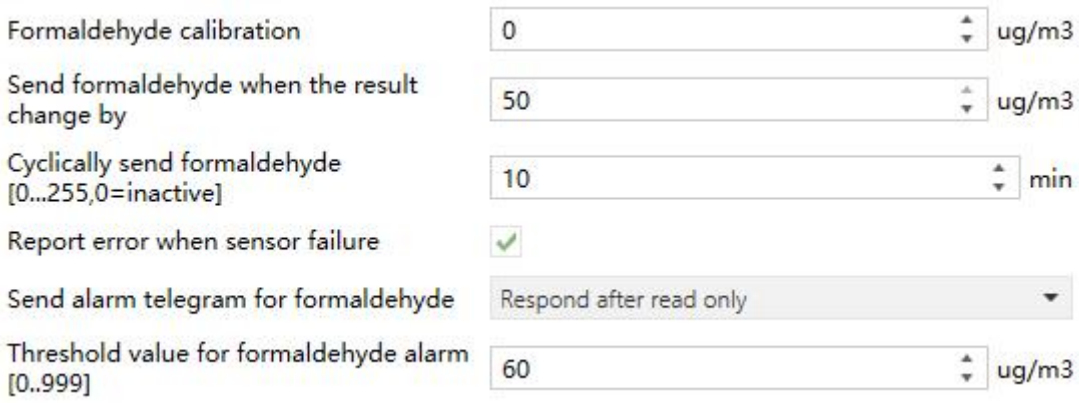


Fig.5.3.7 “Formaldehyde sensor” Parameter window

Note: Considering the existence of molecular motion, in order to more accurately output the current formaldehyde value in the environment, the formaldehyde sensor output value comprehensively refers to the data of nearly 1 min, which is approximately the average value of the measured formaldehyde. If at a certain moment, the formaldehyde concentration in the environment changes drastically, then the formaldehyde sensor output value will also change, but the amount of change is relatively low; if a long period of time in a high concentration environment, the output value will be closer to the actual value.

Parameter"Formaldehyde calibration"

This parameter is for setting the formaldehyde calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient formaldehyde.

Options: **[-500...500ug/m3]/[-5...5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Parameter"Send Formaldehyde when the result change by"

This parameter is for setting when formaldehyde measurement value changes, whether to enable to send the current formaldehyde value to the bus. No telegram is sent when 0 is selected.

Options: **[0...50ug/m3]/[0...5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Parameter"Cyclically send Formaldehyde [0...255,0=inactive]"

This parameter is for setting the time for cyclically sending the formaldehyde measurement value

to the bus.

Options: **0..255 min**

This period is independent and starts time counting after programming completion or reset. Transmission change has no affect on this period.

Parameter"Report error when sensor failure"

This parameter is for setting whether report error when sensor failure. When the sensor does not measure a value, it is generally handled as a sensor failure.

Parameter"Send alarm telegram for Formaldehyde"

This parameter is for setting condition of sending telegram when formaldehyde alarm.

Options:

No respond

Respond after read only

Respond after change

Respond after read only：the object "formaldehyde alarm" will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object "formaldehyde alarm" will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when "Respond after read only" or "Respond after change" are selected.

——Parameter"Threshold value for Formaldehyde alarm [0..999]/[0...5]"

This parameter is for setting the threshold value for formaldehyde alarm. When the formaldehyde higher than threshold, formaldehyde alarm object will send telegram.

Options: **[0...999ug/m3]/[0...5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

5.3.8.Brightness sensor

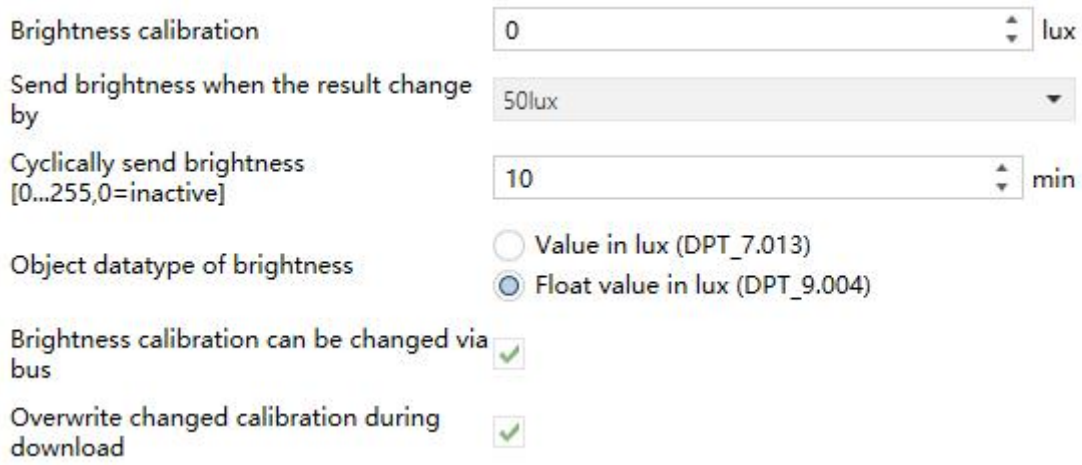


Fig.5.3.8 “Brightness sensor” Parameter window

Parameter“Brightness calibration”

This parameter is for setting the brightness calibration value of the internal sensor, that is, to calibrate the measured value of internal sensor to make it closer to the current ambient brightness.

Options: **-500...500lux**

Parameter“Send Brightness when the result change by”

This parameter is for setting when brightness measurement value changes, whether to enable to send the current brightness value to the bus. No telegram is sent when disable is selected.

Options:

Disable

5lux

10lux

...

100lux

Parameter“Cyclically send Brightness [0...255,0=inactive]”

This parameter is for setting the time for cyclically sending the brightness measurement value to the bus.

Options: **0..255 min**

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

Transmission change has no affect on this period.

Parameter"Object datatype of brightness"

This parameter is for setting the object datatype of brightness. Options:

Value in lux (DPT_7.013)

Float value in lux (DPT_9.004)

Parameter"Brightness calibration can be changed via bus"

This parameter is for setting whether the brightness calibration is changed via bus. When enabled, correct the value via the object "Brightness correction[-500...500]".

——Parameter"Overwrite changed calibration during download"

This parameter is visible when previous parameter is enabled. Set whether the brightness calibration value is overwrote during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the calibration value.

5.4.Parameter window“Air Quality Level”

Support independent setting of AQI, CO2, relative humidity, PM2.5, PM10, TVOC and formaldehyde level output functions. More details refer to chapter 5.4.1 and 5.4.7.

5.4.1.Parameter window“AQI Level”

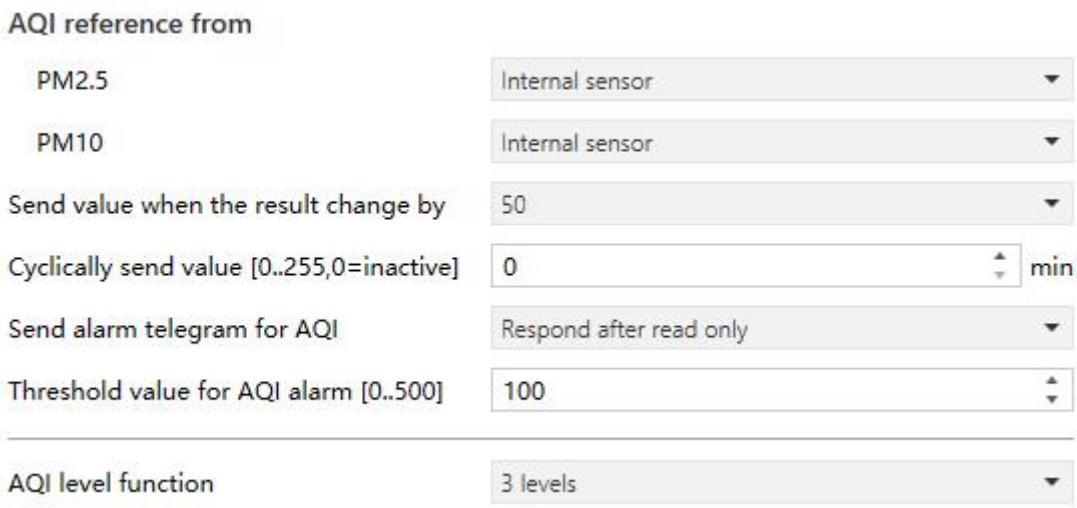


Fig.5.4.1 “AQI Level” Parameter window

AQI reference from:

Parameter“PM2.5”

Parameter“PM10”

This parameter is for setting the resource of the PM2.5、PM10 reference. Options:

Disable

Internal sensor

Air Quality Level

Internal sensor: Refer to the measured values of the built-in PM2.5 or PM10 sensor, more details refer to chapter 5.3.4 or 5.3.5.

Air Quality Level: Reference to the measured value of the PM2.5 or PM10 level function, the device combines the calculation and takes the maximum value of the result and feeds it back to the bus, more details refer to chapter 5.4.4 or 5.4.5 .

Parameter"Send value when the result change by"

This parameter is for setting when AQI measurement value changes, whether to enable to send the current AQI value to the bus. Not send when disable. Options:

Disable

10

20

50

...

450

500

Parameter"Cyclically send value [0..255,0=inactive]"

Setting the time for cyclically sending the humidity measurement value to the bus. Not send when value is 0. Options: **0..255 min**

Note: cyclically sending and change sending are independent of each other.

Parameter"Send alarm telegram for AQI"

This parameter is for setting condition of sending telegram when AQI alarm.

No respond

Respond after read only

Respond after change

Respond after read only: the object "AQI alarm" will send the alarm status to the bus only when the device receives a read alarm from bus.

Respond after change: the object "AQI alarm" will immediately send the telegram to the bus to report the alarm value when the alarm status has changed.

These two parameters as follow are visible when "Respond after read only" or "Respond after change" are selected.

——Parameter"Threshold value for AQI alarm [0..999]"

This parameter is for setting the threshold value for AQI alarm. When the AQI higher than threshold,

AQI alarm object will send telegram. Options: **0...500**

Parameter"AQI level function"

This parameter is for setting the number of levels for AQI. More details refer to chapter 5.4.1.1.

Options:

Disable

2 levels

...

6 levels

5.4.1.1.Parameter window"Output"

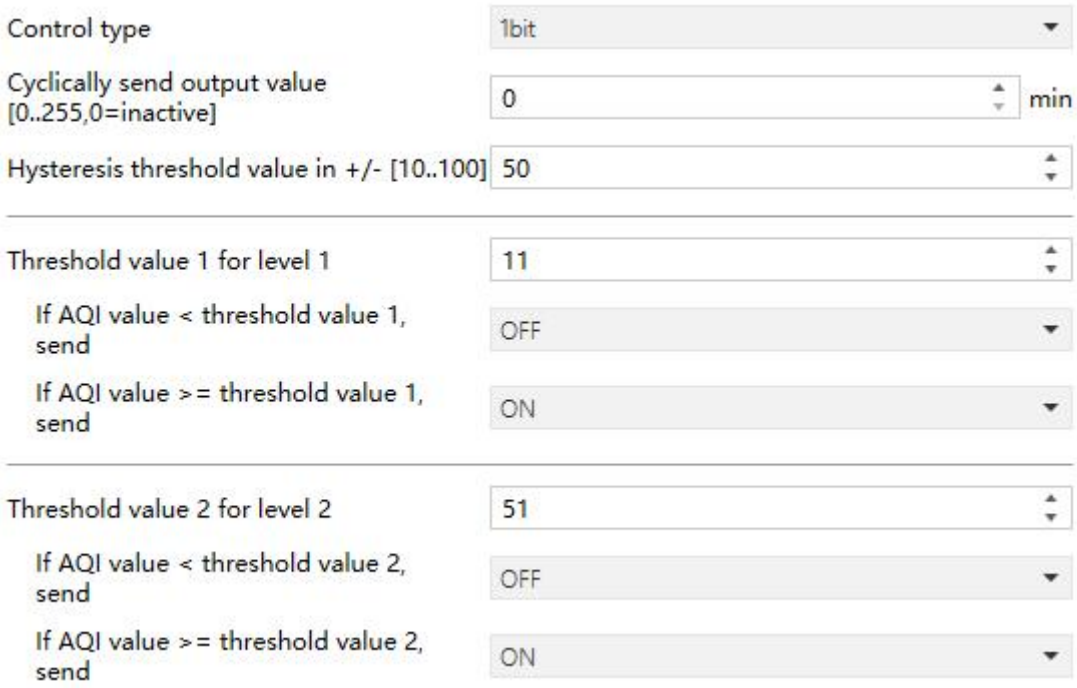


Fig.5.4.1.1 "Output" Parameter window

Parameter"Control type"

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

1bit

1byte

3byte(RGB)

Parameter"Object datatype"

This parameter is visible when "1byte" is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter"Cyclically send output value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the output values of the levels to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Hysteresis threshold value in +/- [10..100]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **10...100**

Suppose that hysteresis value is 50 and the threshold is 350, then the upper limit threshold 400 (Threshold value+Hysteresis value) and the lower limit threshold 300 (Threshold value-Hysteresis value). When the AQI is between 300~400, level switchover will not be caused, and the previous status will still be maintained. Only less than 300 or greater than or equal to 400 will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~6)

This parameter is for setting the threshold value x of level x, up to set 6 AQI levels, 6 corresponding threshold values need to be set for 1bit.

Options: **0...500**

Note: Threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4 < Threshold value 5 for level 5 < Threshold value 6 for level 6, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

——Parameter"If AQI value < threshold value x, send"(x=1~6)

This parameter is for setting the output value if AQI value is less than threshold value x. Options:

Nothing

OFF

ON

——Parameter "If AQI value >= threshold value x, send"(x=1~6)

This parameter is for setting the output value if AQI value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if AQI is greater than or equal to this threshold; change to level 1 while it is less than this threshold. Options:**0...500**

Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if AQI is greater than or equal to this threshold. Options: **0...500**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if AQI is greater than or equal

to this threshold. Options: **0...500**

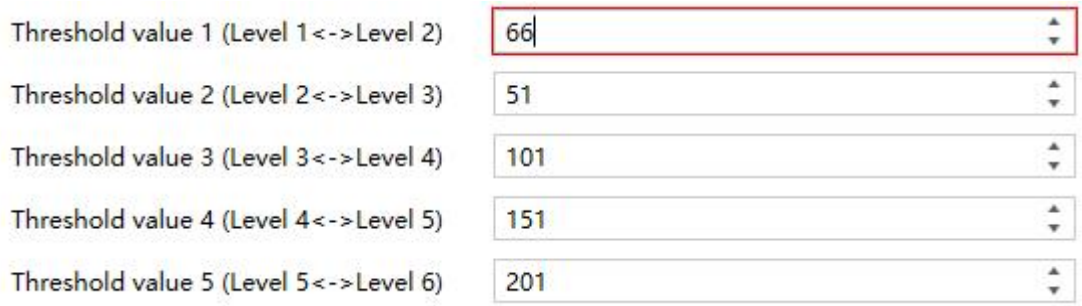
Parameter"Threshold value 4 (Level 4<->Level 5)"

This parameter is for setting the threshold value 4, change to level 5 if AQI is greater than or equal to this threshold. Options: **0...500**

Parameter"Threshold value 5 (Level 5<->Level 6)"

This parameter is for setting the threshold value 5, change to level 6 if AQI is greater than or equal to this threshold. Options: **0...500**

Note: Threshold value 1 < Threshold value 2 < Threshold value 3 < Threshold value 4 < Threshold value 5, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the AQI is compare with threshold value 1~5:

Parameter"If AQI value < threshold value 1, send"

Parameter"If threshold value 1 <= AQI value < threshold value 2, send"

Parameter"If threshold value 2 <= AQI value < threshold value 3, send"

Parameter"If threshold value 3 <= AQI value < threshold value 4, send"

Parameter"If threshold value 4 <= AQI value < threshold value 5, send"

Parameter"If AQI value >= threshold value 5, send"

These parameters are for setting whether to send output value after the AQI is compare with threshold value 1~5. Options:

Nothing

Send value

——Parameter“Value"

This parameter is visible when ”Send value” is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters “Control type” and “Object datatype”**

——Parameter“Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

5.4.2.Parameter window“CO2 Level”

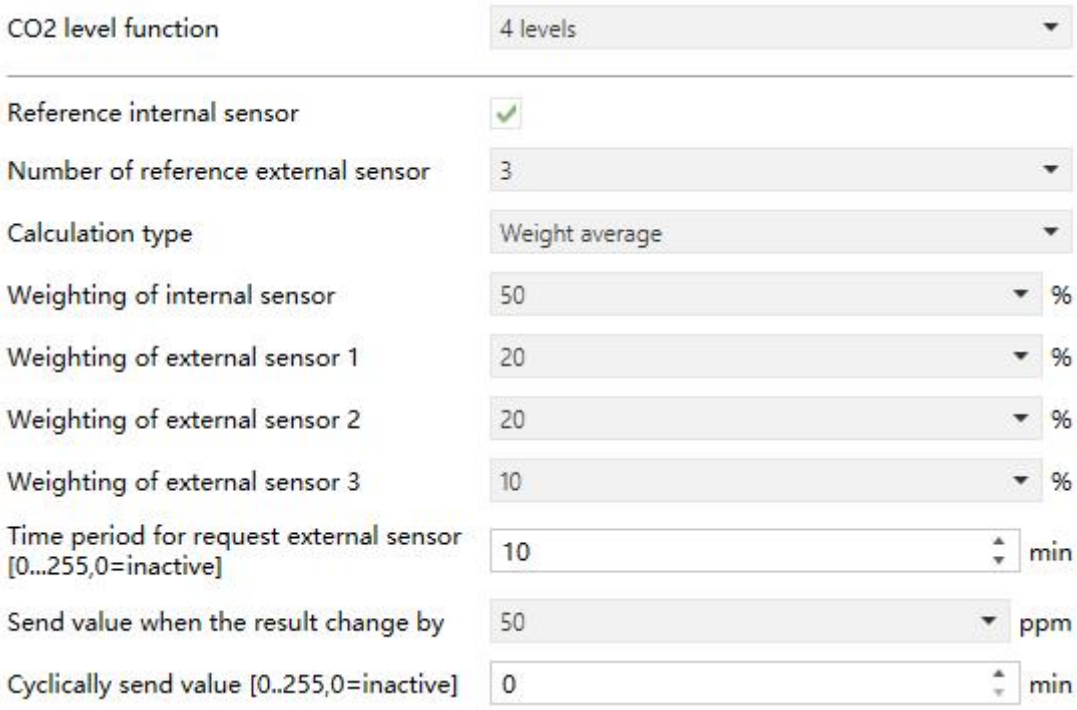


Fig.5.4.2 “CO2 Level” Parameter window

Parameter“CO2 level function”

This parameter is for setting the number of levels for CO2. More details refer to chapter 5.4.2.1.

Options:

Disable

2 levels

3 levels

4 levels

Parameter"Reference internal sensor"

This parameter is for setting whether the CO2 to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter"Number of reference external sensor"

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of CO2. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual CO2.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0...255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request CO2 value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when CO2 measurement value changes, whether to enable to send the current CO2 value to the bus. Not send when "Disable" is selected. Options:

Disable

10ppm

20ppm

...

450ppm

500ppm

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the CO2 measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.4.2.1.Parameter window“Output”

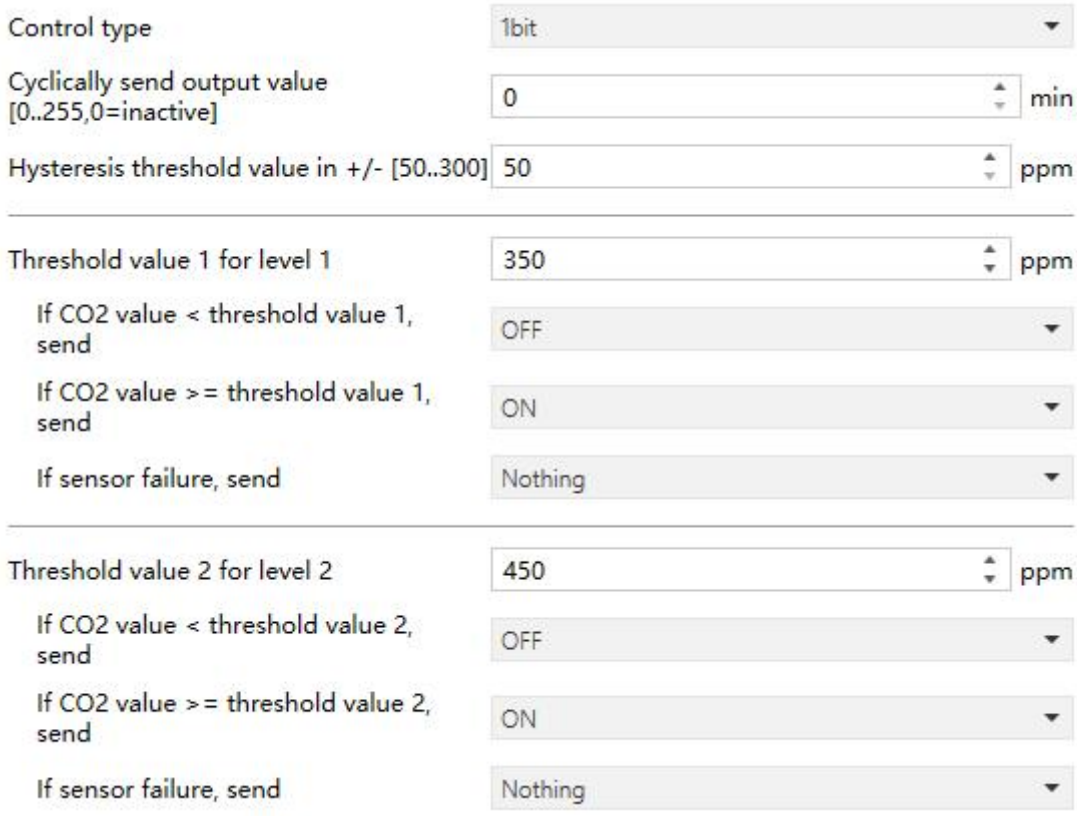


Fig.5.4.2.1 “Output” Parameter window

Parameter“Control type”

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

1bit

1byte

3byte(RGB)

Parameter“Object datatype”

This parameter is visible when ”1byte” is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter"Cyclically send output value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the output values of the levels to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Hysteresis threshold value in +/- [50..300]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **50..300 ppm**

Suppose that hysteresis value is 50ppm and the threshold is 350ppm, then the upper limit threshold 400ppm (Threshold value+Hysteresis value) and the lower limit threshold 300ppm (Threshold value-Hysteresis value). When the CO2 is between 300~400ppm, level switchover will not be caused, and the previous status will still be maintained. Only less than 300ppm or greater than or equal to 400ppm will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~4)

This parameter is for setting the threshold value x of level x, up to set 4 CO2 levels, 4 corresponding threshold values need to be set for 1bit.

Options: **1..2000 ppm**

Note: These parameters are display according to the number of levels. And threshold value 1 for 1 < Threshold value 2 for 2 < Threshold value 3 for 3 < Threshold value 4 for 4, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

——Parameter"If CO2 value < threshold value x, send"(x=1~4)

This parameter is for setting the output value if CO2 value is less than threshold value x. Options:

Nothing

OFF

ON

——Parameter "If CO2 value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if CO2 value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

——Parameter "If sensor failure, send"

This parameter is for setting the output value if internal or external sensor failure. Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if CO2 is greater than or equal to this threshold; change to level 1 while it is less than this threshold. Options: **1..2000 ppm**

Parameter"Threshold value 2 (Level 2<->Level 3)"

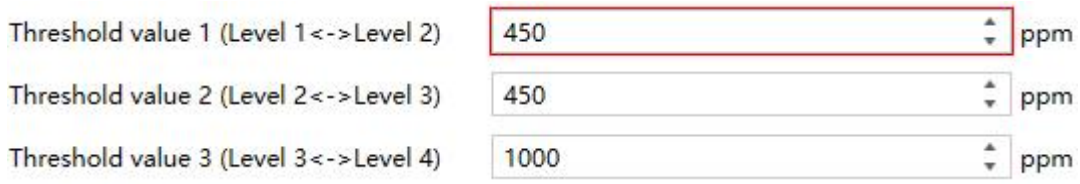
This parameter is for setting the threshold value 2, change to level 3 if CO2 is greater than or equal

to this threshold. Options: **1..2000 ppm**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if CO2 is greater than or equal to this threshold. Options: **1..2000 ppm**

Note: These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the CO2 is compare with threshold value 1~3:

Parameter"If CO2 value < threshold value 1, send"

Parameter"If threshold value 1 <= CO2 value < threshold value 2, send"

Parameter"If threshold value 2 <= CO2 value < threshold value 3, send"

Parameter"If CO2 value >= threshold value 3, send"

These parameters are for setting whether to send output value after the CO2 is compare with threshold value 1~3. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

——Parameter"Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to

14 bytes allowed.

Parameter"If sensor failure, send"

This parameter is for setting whether to send output value when internal or external sensor is failure. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF], displayed according to the settings of the parameters "Control type" and "Object datatype".**

5.4.3.Parameter window“Relative humidity Level”

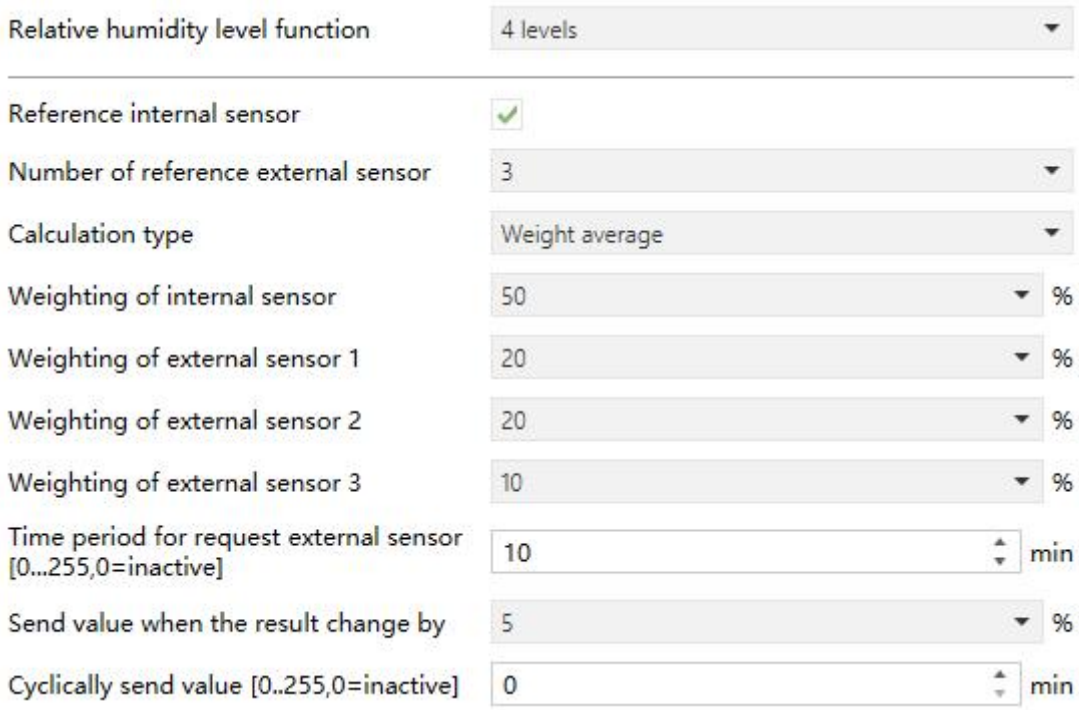


Fig.5.4.3 “Relative humidity Level” Parameter window

Parameter“Relative humidity level function”

This parameter is for setting the number of levels for relative humidity.More details refer to chapter 5.4.3.1. Options:

Disable

2 levels

3 levels

4 levels

Parameter“Reference internal sensor”

This parameter is for setting whether the relative humidity to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter“Number of reference external sensor”

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of relative humidity. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual relative humidity.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0..255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request relative humidity value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when relative humidity measurement value changes, whether to enable to send the current relative humidity value to the bus. Not send when "Disable" is selected. Options:

Disable

1%

2%

3%

...

25%

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the relative humidity measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.4.3.1.Parameter window“Output”

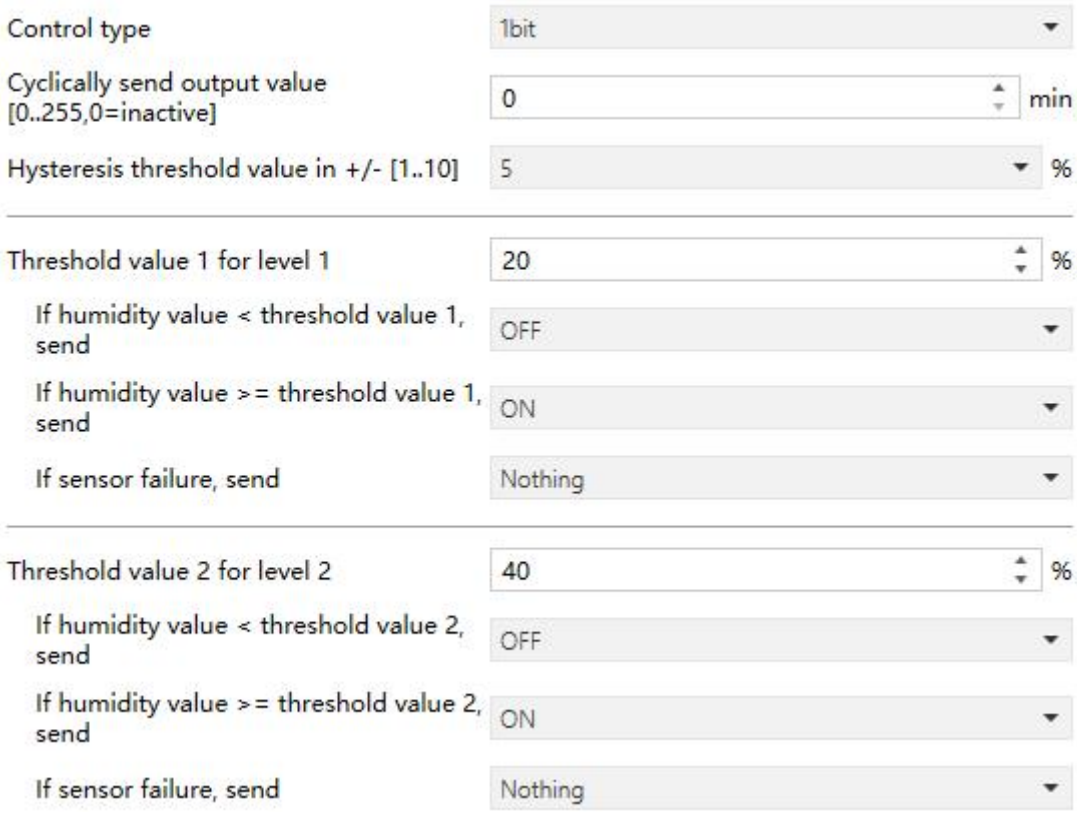


Fig.5.4.3.1 “Output” Parameter window

Parameter”Control type”

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

1bit

1byte

3byte(RGB)

Parameter”Object datatype”

This parameter is visible when ”1byte” is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter”Cyclically send output value [0..255,0=inactive]”

This parameter is for setting the time for cyclically sending the output values of the levels to the

bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Hysteresis threshold value in +/- [1..10]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **1..10%**

Suppose that hysteresis value is 5% and the threshold is 20%, then the upper limit threshold 25% (Threshold value+Hysteresis value) and the lower limit threshold 15% (Threshold value-Hysteresis value). When the relative humidity is between 15%~25%, level switchover will not be caused, and the previous status will still be maintained. Only less than 15% or greater than or equal to 25% will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~4)

This parameter is for setting the threshold value x of level x, up to set 4 relative humidity levels, 4 corresponding threshold values need to be set for 1bit.

Options: **0...100%**

These parameters are display according to the number of levels. And threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

——Parameter"If humidity value < threshold value x, send"(x=1~4)

This parameter is for setting the output value if relative humidity value is less than threshold value x.

Options:

Nothing

OFF

ON

——Parameter "If humidity value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if relative humidity value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

——Parameter "If sensor failure, send"

This parameter is visible when there is external sensor. Set the output value if sensor failure.

Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if relative humidity is greater than or equal to this threshold; change to level 1 while it is less than this threshold. Options: **0..100 %**

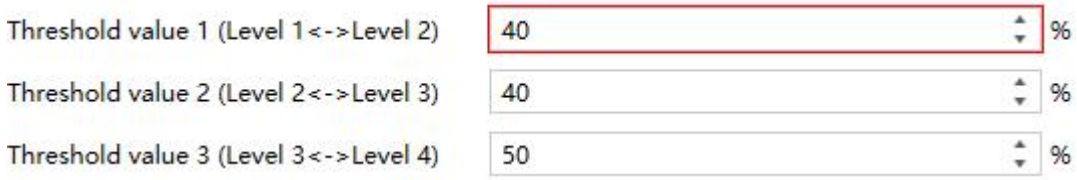
Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if relative humidity is greater than or equal to this threshold. Options: **0..100 %**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if relative humidity is greater than or equal to this threshold. Options: **0..100 %**

These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the relative humidity is compare with threshold value 1~3:

Parameter"If humidity value < threshold value 1, send"

Parameter"If threshold value 1 <= humidity value < threshold value 2, send"

Parameter"If threshold value 2 <= humidity value < threshold value 3, send"

Parameter"If humidity value >= threshold value 3, send"

These parameters are for setting whether to send output value after the relative humidity is compare with threshold value 1~3. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF], displayed according to the settings of the parameters "Control type" and "Object datatype"**

——Parameter"Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set whether to send output value when external sensor is failure. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

5.4.4.Parameter window"PM2.5 Level"

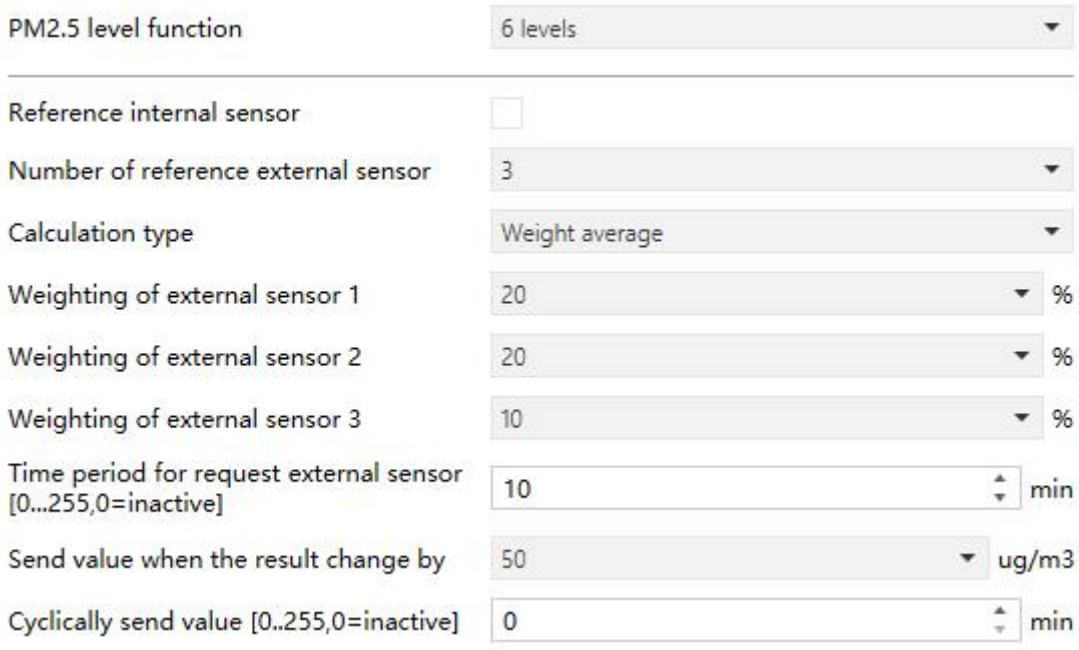


Fig.5.4.4 "PM2.5 Level" Parameter window

Parameter"PM2.5 level function"

This parameter is for setting the number of levels for PM2.5.More details refer to chapter 5.4.4.1. Options:

Disable

2 levels

3 levels

4 levels

5 levels

6 levels

Parameter"Reference internal sensor"

This parameter is for setting whether the PM2.5 to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter"Number of reference external sensor"

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of PM2.5. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual PM2.5.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0...255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request PM2.5 value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when PM2.5 measurement value changes, whether to enable to send the current PM2.5 value to the bus. Not send when "Disable" is selected. Options:

Disable

10ug/m3

20ug/m3

...

50ug/m3

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the PM2.5 measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.4.4.1.Parameter window"Output"

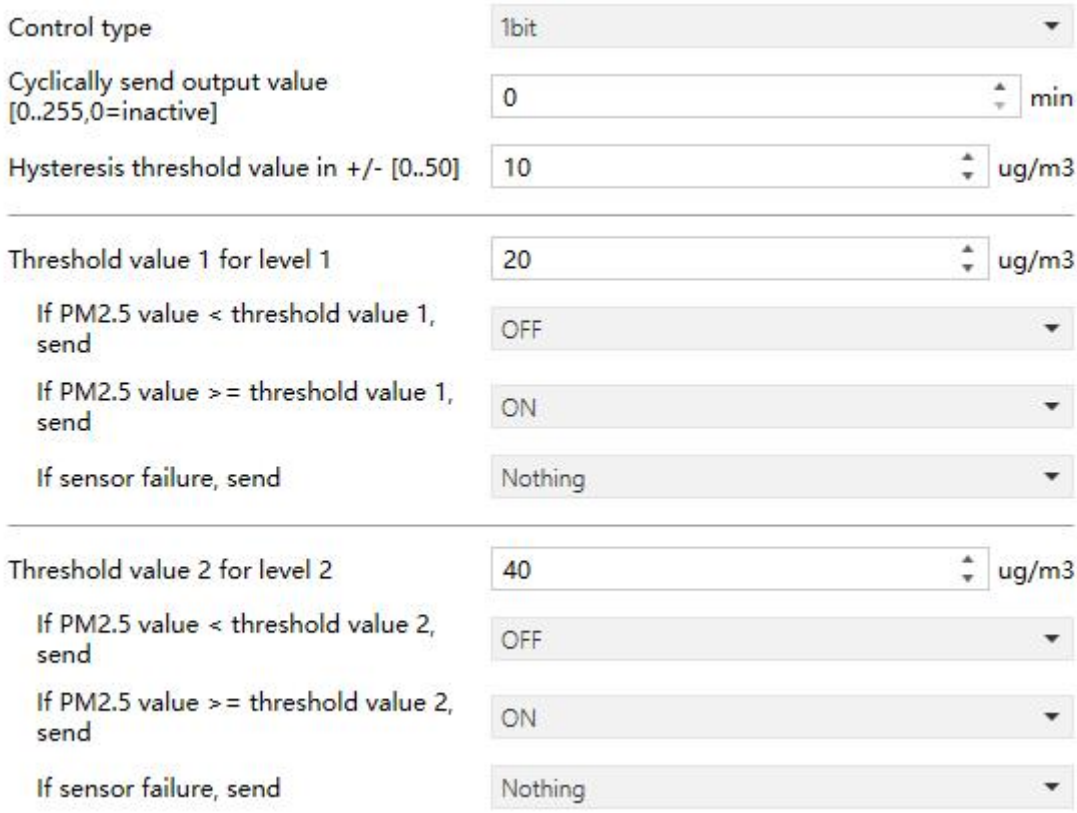


Fig.5.4.4.1 "Output" Parameter window

Parameter"Control type"

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

1bit

1byte

3byte(RGB)

Parameter"Object datatype"

This parameter is visible when "1byte" is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter"Cyclically send output value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the output values of the levels to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

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

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **0...50ug/m3**

Suppose that hysteresis value is 50ug/m3 and the threshold is 350ug/m3, then the upper limit threshold 400ug/m3 (Threshold value+Hysteresis value) and the lower limit threshold 300ug/m3 (Threshold value-Hysteresis value). When thePM2.5 is between 300~400ug/m3, level switchover will not be caused, and the previous status will still be maintained. Only less than 300ug/m3 or greater than or equal to 400ug/m3 will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~6)

This parameter is for setting the threshold value x of level x, up to set 6 PM2.5 levels, 6 corresponding threshold values need to be set for 1bit.

Options: **1...999ug/m3**

These parameters are display according to the number of levels. And threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4 < Threshold value 5 for level 5 < Threshold value 6 for level 6, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

——Parameter"If PM2.5 value < threshold value x, send"(x=1~6)

This parameter is for setting the output value if PM2.5 value is less than threshold value x.

Options:

Nothing

OFF

ON

——Parameter"If PM2.5 value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if PM2.5 value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

——Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set the output value if sensor failure.

Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if PM2.5 is greater than or equal to this threshold; change to level 1 while it is less than this threshold. Options:**1...999ug/m3**

Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if PM2.5 is greater than or equal to this threshold. Options: **1...999ug/m3**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if PM2.5 is greater than or equal to this threshold. Options: **1...999ug/m3**

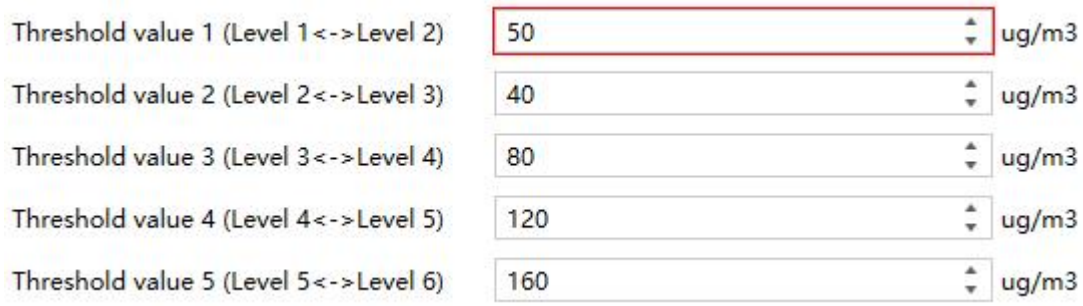
Parameter"Threshold value 4 (Level 4<->Level 5)"

This parameter is for setting the threshold value 4, change to level 5 if PM2.5 is greater than or equal to this threshold. Options: **1...999ug/m3**

Parameter"Threshold value 5 (Level 5<->Level 6)"

This parameter is for setting the threshold value 5, change to level 6 if PM2.5 is greater than or equal to this threshold. Options: **1...999ug/m3**

These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3 < Threshold value 4 < Threshold value 5, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the PM2.5 is compare with threshold value 1~5:

Parameter"If PM2.5 value <= threshold value 1, send"

Parameter"If threshold value 1 <= PM2.5 value < threshold value 2, send"

Parameter"If threshold value 2 <= PM2.5 value < threshold value 3, send"

Parameter"If threshold value 3 <= PM2.5 value < threshold value 4, send"

Parameter"If threshold value 4 <= PM2.5 value < threshold value 5, send"

Parameter"If PM2.5 value >= threshold value 5, send"

These parameters are for setting whether to send output value after the PM2.5 is compare with threshold value 1~5. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

——Parameter"Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set whether to send output value when external sensor is failure. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

5.4.5.Parameter window"PM10 Level"

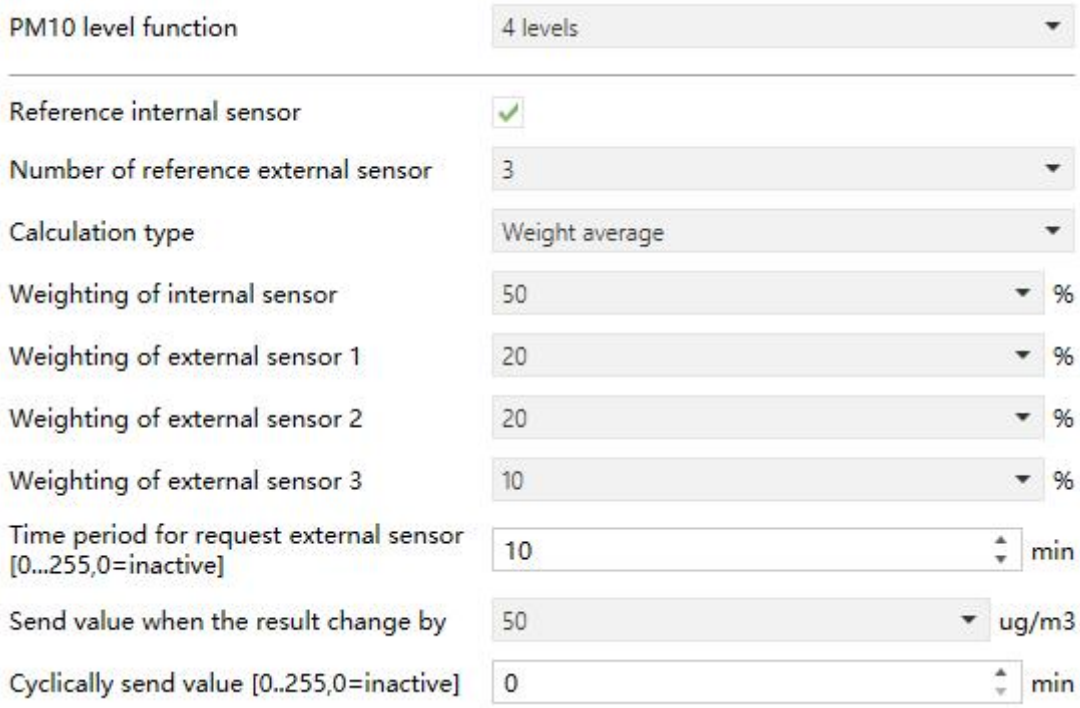


Fig.5.4.5 "PM10 Level" Parameter window

Parameter"PM10 level function"

This parameter is for setting the number of levels for PM10.More details refer to chapter 5.4.5.1.

Options:

Disable

2 levels

3 levels

4 levels

Parameter"Reference internal sensor"

This parameter is for setting whether the PM10 to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the

maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter"Number of reference external sensor"

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of PM10. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual PM10.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0...255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request PM10 value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when PM10 measurement value changes, whether to enable to send the current PM10 value to the bus. Not send when "Disable" is selected. Options:

Disable

10ug/m3

20ug/m3

...

50ug/m3

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the PM10 measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.4.5.1.Parameter window“Output”

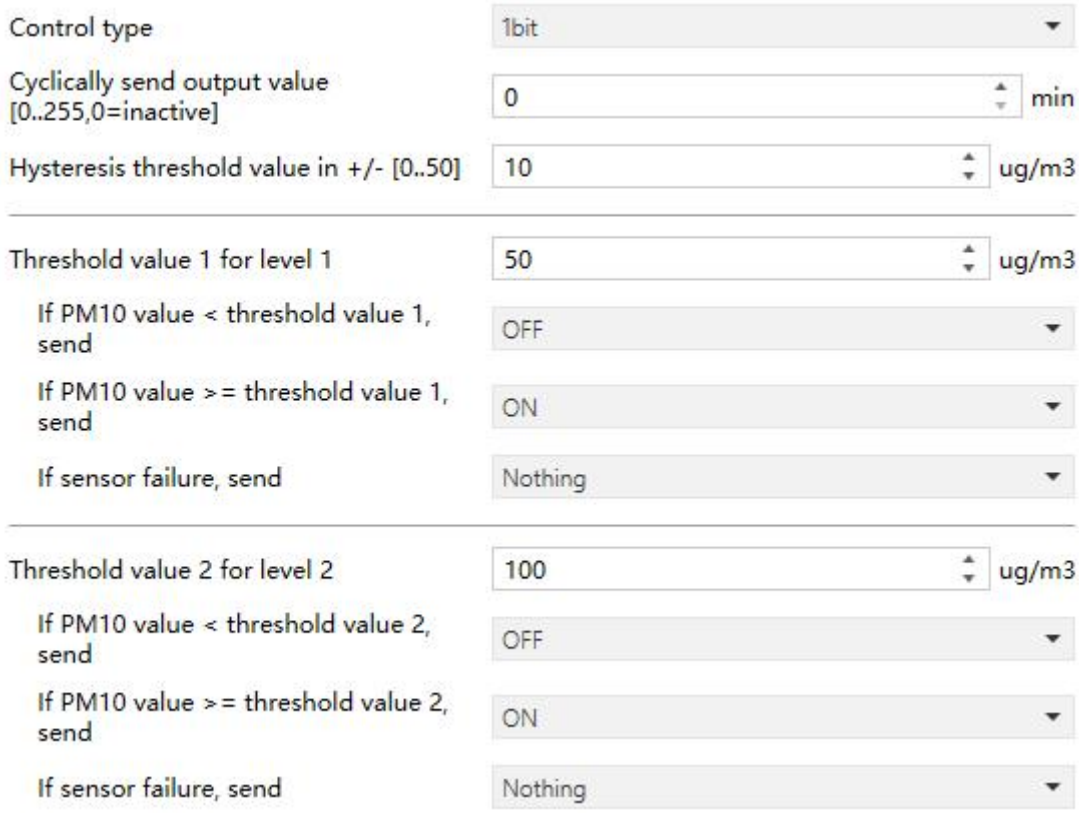


Fig.5.4.5.1 “Output” Parameter window

Parameter”Control type”

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

1bit

1byte

3byte(RGB)

Parameter”Object datatype”

This parameter is visible when ”1byte” is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter”Cyclically send output value [0..255,0=inactive]”

This parameter is for setting the time for cyclically sending the output values of the levels to the

bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

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

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **0...50ug/m3**

Suppose that hysteresis value is 50ug/m3 and the threshold is 350ug/m3, then the upper limit threshold 400ug/m3 (Threshold value+Hysteresis value) and the lower limit threshold 300ug/m3 (Threshold value-Hysteresis value). When the PM10 is between 300~400ug/m3, level switchover will not be caused, and the previous status will still be maintained. Only less than300ug/m3 or greater than or equal to 400ug/m3 will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~4)

This parameter is for setting the threshold value x of level x, up to set 4 PM10 levels, 4 corresponding threshold values need to be set for 1bit.

Options: **1...999ug/m3**

These parameters are display according to the number of levels. And threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4 , if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

---Parameter"If PM10 value < threshold value x, send"(x=1~4)

This parameter is for setting the output value if PM10 value is less than threshold value x.

Options:

Nothing

OFF

ON

---Parameter"If PM10 value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if PM10 value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

---Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set the output value if sensor failure.

Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if PM10 is greater than or equal to this threshold; change to level 1 while it is less than this threshold. Options:**1...999ug/m3**

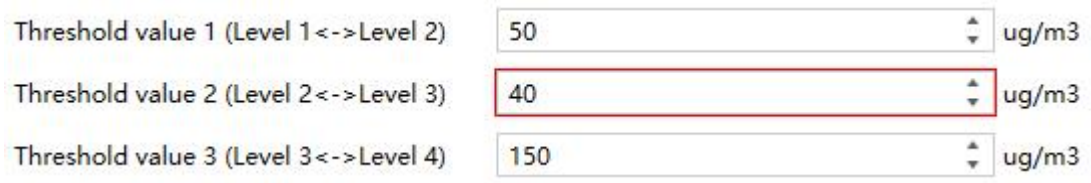
Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if PM10 is greater than or equal to this threshold. Options: **1...999ug/m3**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if PM10 is greater than or equal to this threshold. Options: **1...999ug/m3**

These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3 , if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the PM10 is compare with threshold value 1~3:

Parameter"If PM10 value <= threshold value 1, send"

Parameter"If threshold value 1 <= PM10 value < threshold value 2, send"

Parameter"If threshold value 2 <= PM10 value < threshold value 3, send"

Parameter"If PM10 value >= threshold value 3, send"

Parameter"If sensor failure, send"

These parameters are for setting whether to send output value after the PM10 is compare with threshold value 1~3. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

——Parameter"Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set whether to send output value when external sensor is failure. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

5.4.6.Parameter window"TVOC Level"

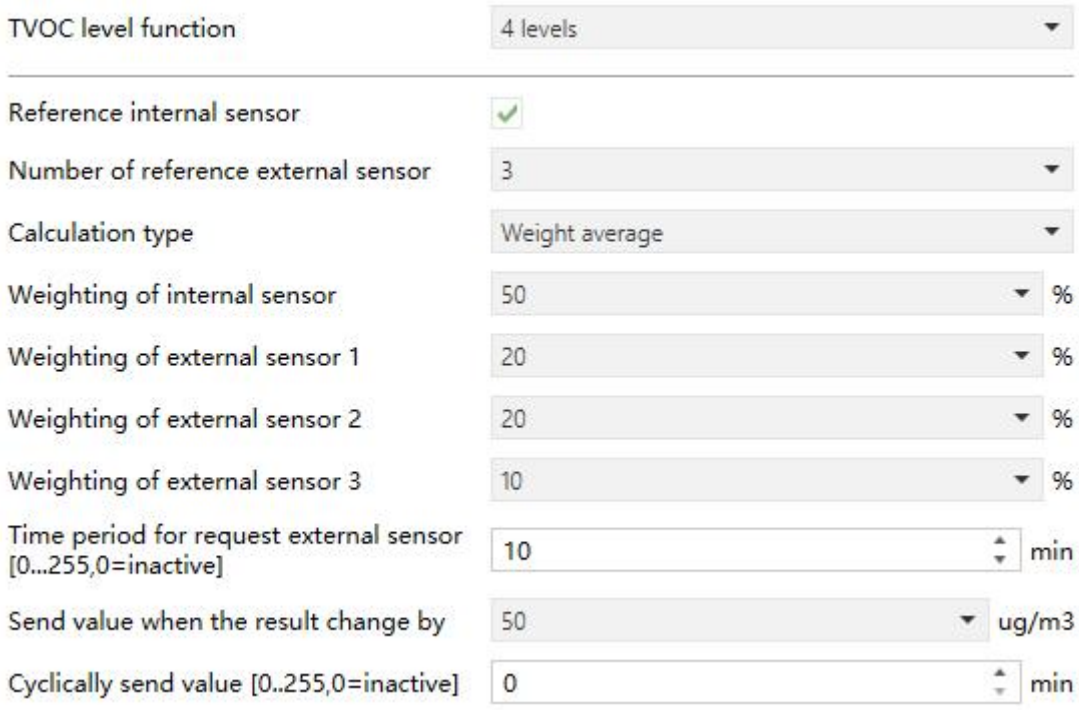


Fig.5.4.6 "TVOC Level" Parameter window

Parameter"TVOC level function"

This parameter is for setting the number of levels for TVOC. More details refer to chapter 5.4.6.1.

Options:

Disable

2 levels

3 levels

4 levels

Parameter"Reference internal sensor"

This parameter is for setting whether the TVOC to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter"Number of reference external sensor"

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of TVOC. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual TVOC.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0...255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request TVOC value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when TVOC measurement value changes, whether to enable to send the current TVOC value to the bus. Not send when "Disable" is selected.

Options: **[Disable]/[10...500ug/m3]/[10...500ppb]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the TVOC measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

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

change has no affect on this period.

5.4.6.1.Parameter window“Output”

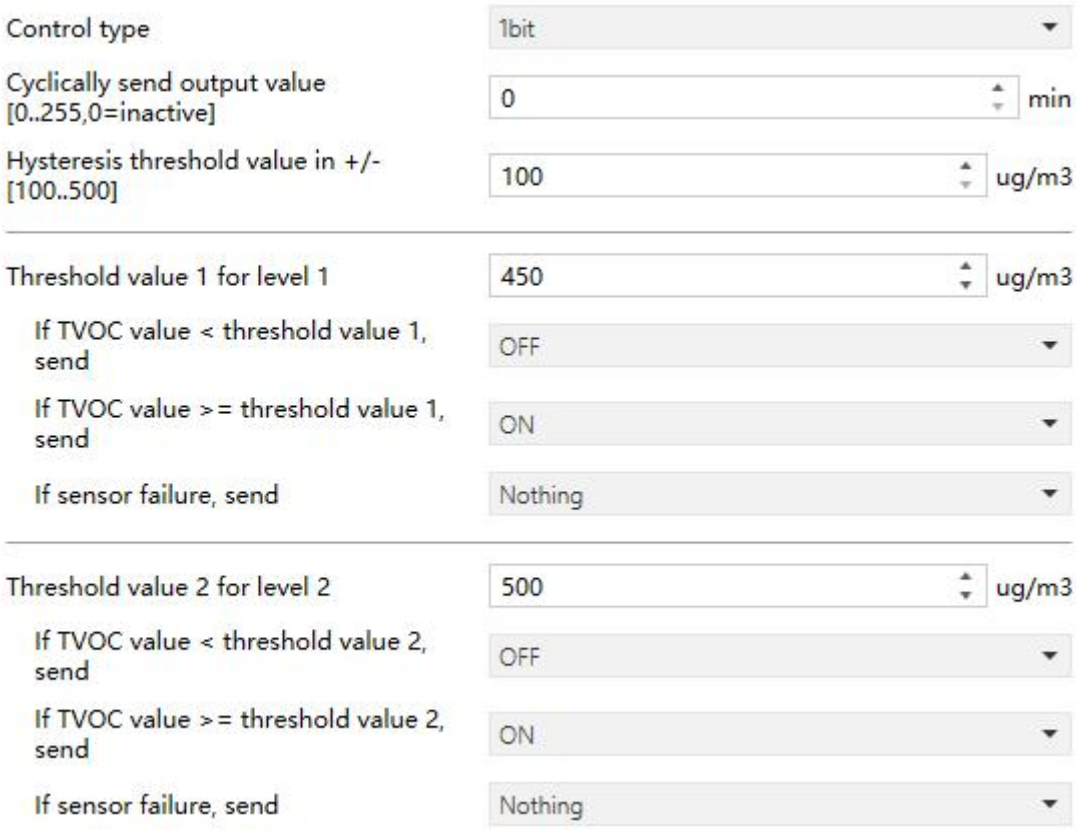


Fig.5.4.6.1 “Output” Parameter window

Parameter”Control type”

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

1bit

1byte

3byte(RGB)

Parameter”Object datatype”

This parameter is visible when ”1byte” is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter"Cyclically send output value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the output values of the levels to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Hysteresis threshold value in +/- [100..500]/[10...30]/[0.01...0.03]"

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

Options: **[100...500ug/m3]/[10...30ppm]/[0.01...0.03ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Suppose that hysteresis value is 100ug/m3 and the threshold is 350ug/m3, then the upper limit threshold 450ug/m3 (Threshold value+Hysteresis value) and the lower limit threshold 250ug/m3 (Threshold value-Hysteresis value). When the TVOC is between250~450ug/m3, level switchover will not be caused, and the previous status will still be maintained. Only less than250ug/m3 or greater than or equal to 450ug/m3 will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

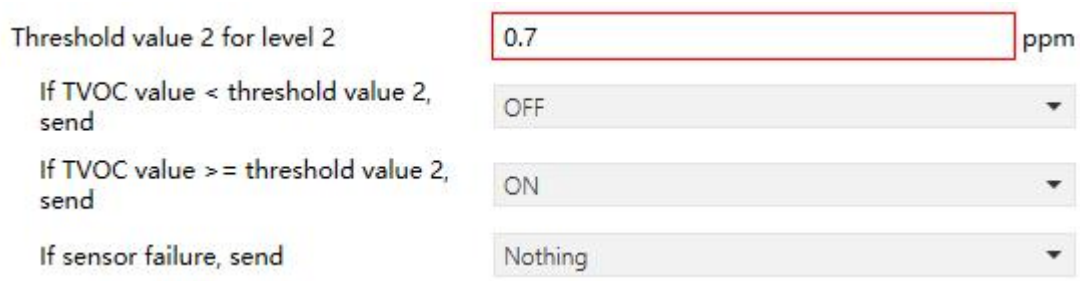
Parameter"Threshold value x for level x"(x=1~4)

This parameter is for setting the threshold value x of level x, up to set 4 TVOC levels, 4 corresponding threshold values need to be set for 1bit.

Options: **[10...500ug/m3]/[10...500ppb]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

These parameters are display according to the number of levels. And threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4, if not

meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



----Parameter"If TVOC value < threshold value x, send"(x=1~4)

This parameter is for setting the output value if TVOC value is less than threshold value x.

Nothing

OFF

ON

----Parameter "If TVOC value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if TVOC value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

----Parameter "If sensor failure, send"

This parameter is visible when there is external sensor. Set the output value if sensor failure.

Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if TVOC is greater than or

equal to this threshold; change to level 1 while it is less than this threshold.

Options: **[10...500ug/m3]/[10...500ppb]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if TVOC is greater than or equal to this threshold.

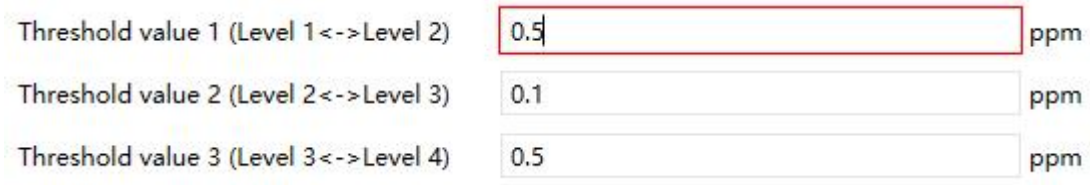
Options: **[10...500ug/m3]/[10...500ppb]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if TVOC is greater than or equal to this threshold.

Options: **[10...500ug/m3]/[10...500ppb]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of TVOC"**

These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



Parameters as follow are for setting the output values after the TVOC is compare with threshold value 1~3:

Parameter"If TVOC value <= threshold value 1, send"

Parameter"If threshold value 1 <= TVOC value < threshold value 2, send"

Parameter"If threshold value 2 <= TVOC value < threshold value 3, send"

Parameter"If TVOC value >= threshold value 3, send"

Parameter"If sensor failure, send"

These parameters are for setting whether to send output value after the TVOC is compare with

threshold value 1~3. Options:

Nothing

Send value

——Parameter“Value"

This parameter is visible when ”Send value” is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters “Control type” and “Object datatype”**

——Parameter“Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

Parameter“If sensor failure, send”

This parameter is visible when there is external sensor. Set whether to send output value when external sensor is failure. Options:

Nothing

Send value

——Parameter“Value”

This parameter is visible when ”Send value” is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters “Control type” and “Object datatype”**

5.4.7.Parameter window“Formaldehyde Level”

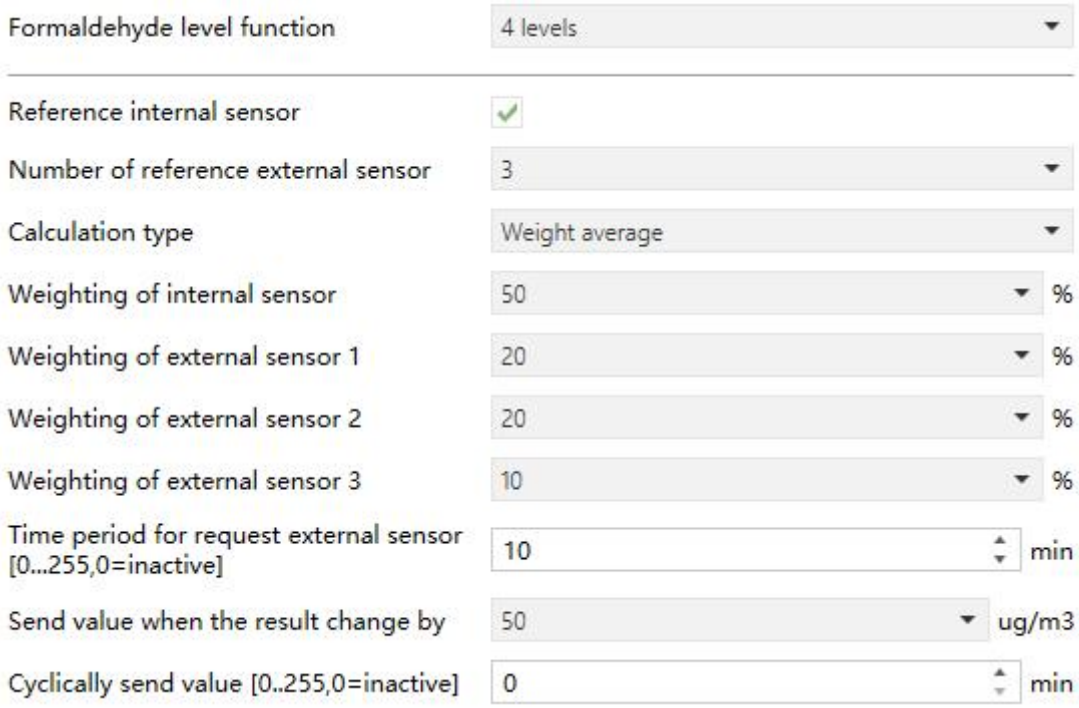


Fig.5.4.7 “Formaldehyde Level” Parameter window

Parameter“Formaldehyde level function”

This parameter is for setting the number of levels for formaldehyde.More details refer to chapter 5.4.7.1. Options:

Disable

2 levels

3 levels

4 levels

Parameter“Reference internal sensor”

This parameter is for setting whether the formaldehyde to reference internal sensor.

The reference of measurement value is can be from internal sensor, external sensor or multiple sensors proportional mixing, the final result can be calculated by Average or Weight average, or take the maximum/minimum value. The result is fed back to bus. Up to 3 external sensors can be set.

Parameter“Number of reference external sensor”

This parameter is for setting the number of reference external sensors.

If the previous parameter is enabled, options: **0 / 1 / 2 / 3**

If the previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Calculation type"

This parameter is visible when there are 2 referenced sensors or above. Set the calculation type of formaldehyde. Options:

Average

Weight average

Minimum value

Maximum value

Average: take the average of measurement values from sensors.

Weight average: set the weight average of measurement values from each sensors, then take the calculation value.

Minimum value: take the minimum measurement value from sensors.

Maximum value：take the maximum measurement value from sensors.

Parameter"Weighting of internal sensor"

Parameter"Weighting of external sensor 1/2/3"

These parameters are visible when "Weight average" is selected. Set the Weighting of internal or external sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as actual formaldehyde.

Note: when any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, keeping the current status.

Parameter"Time period for request external sensor [0...255,0=inactive]"

This parameter is visible when there is External sensor. Used for setting the period for request formaldehyde value from external sensor. Options: **0 ..255 min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send value when the result change by"

This parameter is visible when there are 2 referenced sensors or above. Used for setting when formaldehyde measurement value changes, whether to enable to send the current formaldehyde value to the bus. Not send when "Disable" is selected.

Options:**[Disable]/[10...500ug/m3]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Parameter"Cyclically send value [0..255,0=inactive]"

This parameter is visible when there are 2 referenced sensors or above. Used for setting the time for cyclically sending the formaldehyde measurement value to the bus. Not send when 0 is set.

Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.4.7.1.Parameter window“Output”

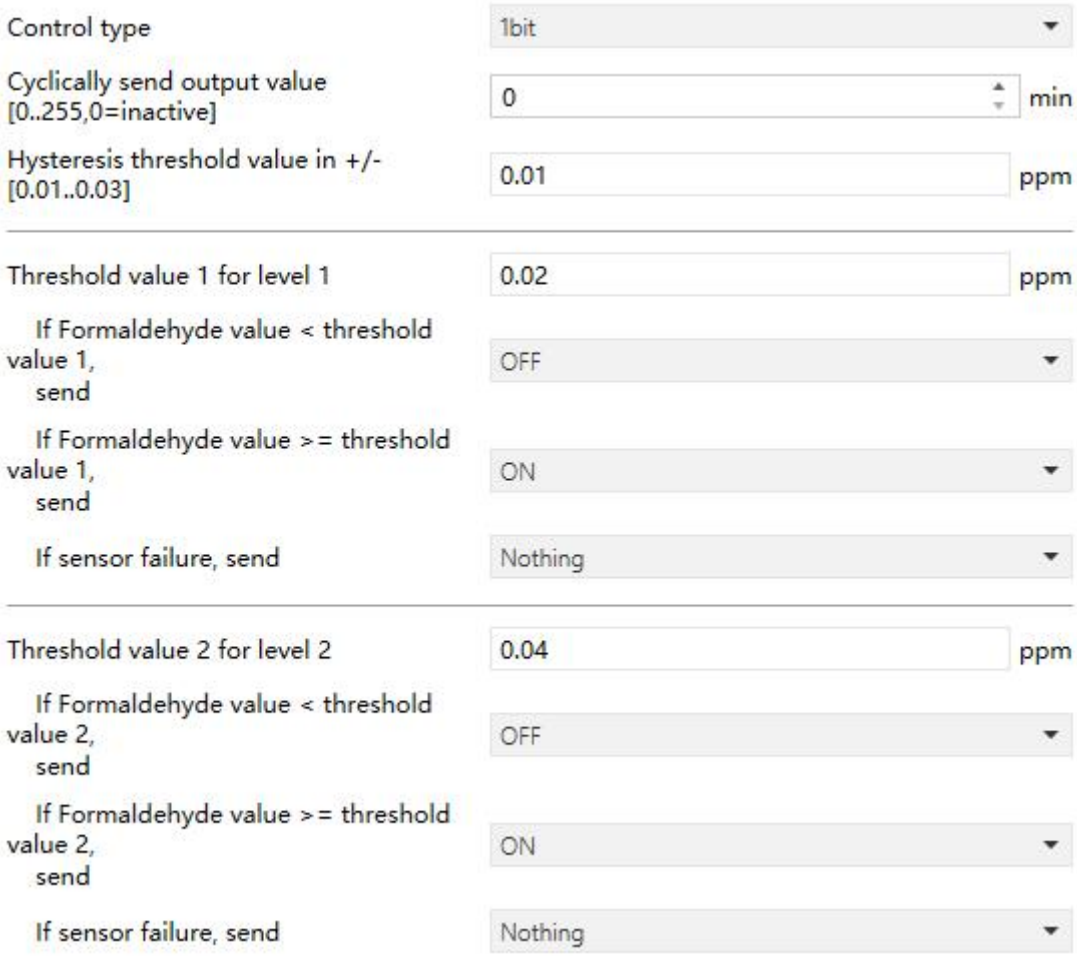


Fig.5.4.7.1 “Output” Parameter window

Parameter“Control type”

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

1bit

1byte

3byte(RGB)

Parameter“Object datatype”

This parameter is visible when ”1byte” is selected for the previous parameter. Set the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Scene number

Parameter"Cyclically send output value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the output values of the levels to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Hysteresis threshold value in +/- [100..500]//[0.01...0.03]"

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

Options: **[100...500ug/m3]/[0.01...0.03ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Suppose that hysteresis value is 50ug/m3 and the threshold is 350ug/m3, then the upper limit threshold 400ug/m3 (Threshold value+Hysteresis value) and the lower limit threshold 300ug/m3 (Threshold value-Hysteresis value). When the formaldehyde is between 300~400ug/m3, level switchover will not be caused, and the previous status will still be maintained. Only less than 300ug/m3 or greater than or equal to 400ug/m3 will change the output level.

Parameter"Send additional alarm message"

This parameter is visible when 1byte or 3byte is selected for control type. Set whether to send additional alarm message. You can customize the message if enabled the parameter.

If control type is 1bit:

Parameter"Threshold value x for level x"(x=1~4)

This parameter is for setting the threshold value x of level x, up to set 4 formaldehyde levels, 64corresponding threshold values need to be set for 1bit.

Options: **[10...500ug/m3]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

These parameters are display according to the number of levels. And threshold value 1 for level 1 < Threshold value 2 for level 2 < Threshold value 3 for level 3 < Threshold value 4 for level 4, if not

meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

——Parameter"If Formaldehyde value < threshold value x, send"(x=1~4)

This parameter is for setting the output value if formaldehyde value is less than threshold value x.

Options:

Nothing

OFF

ON

——Parameter"If Formaldehyde value >= threshold value x, send"(x=1~4)

This parameter is for setting the output value if formaldehyde value is greater than or equal to threshold value x. Options:

Nothing

OFF

ON

——Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set the output value if sensor failure.

Options:

Nothing

OFF

ON

If control type is 1byte or 3byte:

Parameter"Threshold value 1 (Level 1<->Level 2)"

This parameter is for setting the threshold value 1, change to level 2 if formaldehyde is greater than or equal to this threshold; change to level 1 while it is less than this threshold.

Options: **[10...500ug/m3]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Parameter"Threshold value 2 (Level 2<->Level 3)"

This parameter is for setting the threshold value 2, change to level 3 if formaldehyde is greater than or equal to this threshold.

Options: **[10...500ug/m3]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

Parameter"Threshold value 3 (Level 3<->Level 4)"

This parameter is for setting the threshold value 3, change to level 4 if formaldehyde is greater than or equal to this threshold.

Options: **[10...500ug/m3]/[0.01...0.5ppm], displayed according to the setting of the parameter "Object datatype of Formaldehyde"**

These parameters are display according to the number of levels. And threshold value 1 < Threshold value 2 < Threshold value 3, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

Parameters as follow are for setting the output values after the formaldehyde is compare with threshold value 1~3:

Parameter"If Formaldehyde value <= threshold value 1, send"

Parameter"If threshold value 1 <= Formaldehyde value < threshold value 2, send"

Parameter"If threshold value 2 <= Formaldehyde value < threshold value 3, send"

Parameter"If Formaldehyde value >= threshold value 3, send"

Parameter"If sensor failure, send"

These parameters are for setting whether to send output value after the formaldehyde is compare with threshold value 1~3. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

——Parameter"Alarm message"

This parameter is visible when additional alarm message is enabled. Set the alarm message, up to 14 bytes allowed.

Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set whether to send output value when external sensor is failure. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value for sensor failure.

Options: **[0...100%]/[0...255]/[Scene No.1...Scene No.64]/[#000000...#FFFFFF],displayed according to the settings of the parameters "Control type" and "Object datatype"**

5.5.Parameter window“Air Quality Controller”

Support independent setting of relative humidity controller functions and CO2. More details refer to chapter 5.5.1 and 5.5.2.

5.5.1.Parameter window“Relative humidity controller”

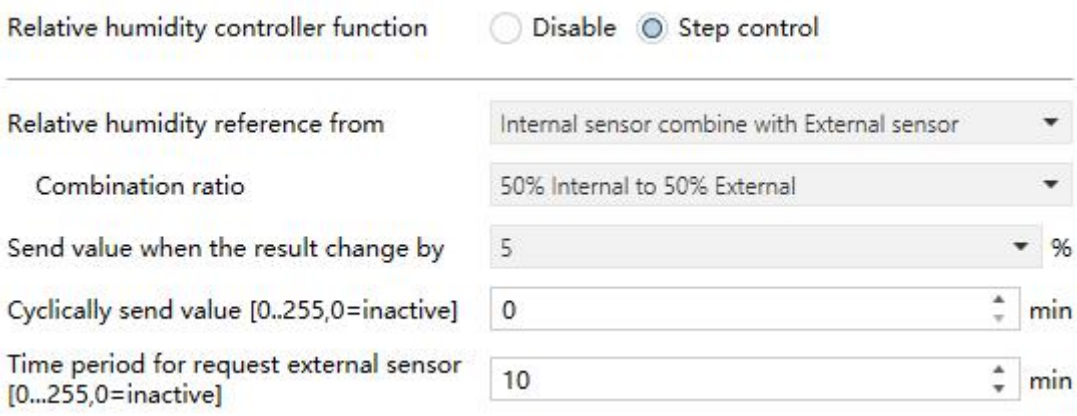


Fig.5.5.1 “Relative humidity controller” Parameter window

Parameter“Relative humidity controller function”

This parameter is for setting the controller function of relative humidity. Options:

Disable

Step control

Disable: the relative humidity controller is not activated.

Step control: up to set 3 steps for controller, which can connect with fan control.

Parameter“Relative humidity reference from”

This parameter is for setting the resource of the relative humidity reference. Options:

Internal sensor

External sensor

Internal sensor combine with External sensor

When selecting the reference is internal sensor, the relative humidity is determined by the setting of the “Internal sensor measurement” in the parameter interface, more details refer to chapter 5.3.2.

——Parameter“Time period for request external sensor [0...255]”

This parameter is visible when there is External sensor. Set the time period for read request

external humidity sensor. Options: **0..255 min**

Parameters as follow are visible when "Internal sensor combine with External sensor" is selected:

——Parameter"Combination ratio"

This parameter is for setting the internal sensor and the external sensor to measure the specific gravity of the humidity. Options:

10% Internal to 90% External

20% Internal to 80% External

...

90% Internal to 10% External

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 actual humidity = (internal sensor's humidity × 40%) + (external sensor's humidity × 60%), the controller function of the device will control according to the calculated humidity.

When two sensors are combined for measurement, when one sensor is in error, the humidity value measured by the other sensor is used.

——Parameter"Send value when the result change by"

This parameter is for setting when humidity measurement value changes, whether to enable to send the current humidity value to the bus. Not send when disable. Options:

Disable

1%

2%

...

25%

——Parameter"Cyclically send value [0...255]"

Setting the time for cyclically sending the humidity measurement value to the bus. Not send when

value is 0. Options: **0..255 min**

Note: cyclically sending and change sending are independent of each other.

5.5.1.1.Parameter window“Output”

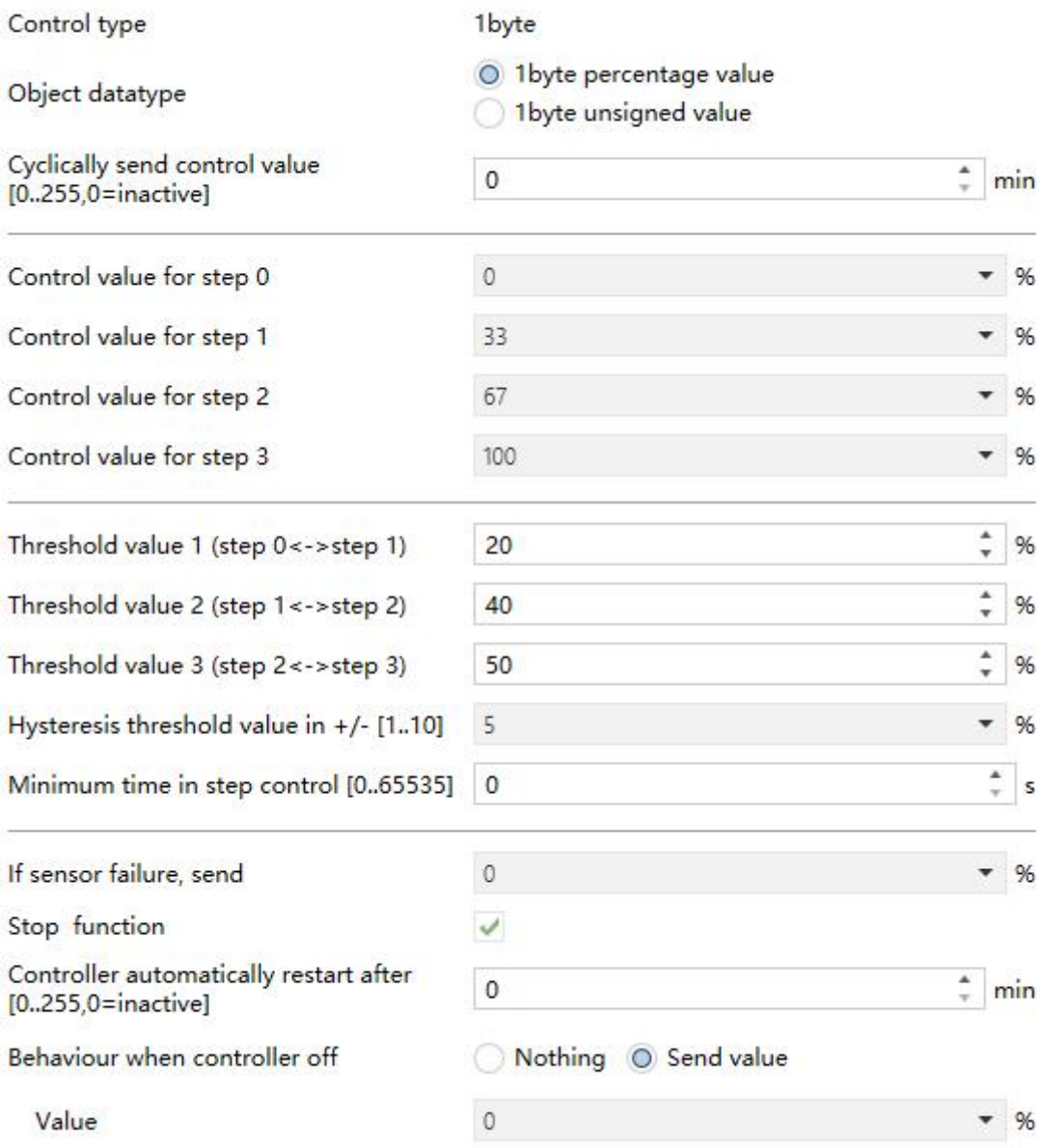


Fig.5.5.1.1 “Output” Parameter window

Parameter“Control type”

This parameter is for setting the output type of control value. Option is only **1byte**

Parameter“Object datatype”

This parameter is for setting the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Parameter"Cyclically send control value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the control values to the bus. Not send when 0 is set. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Control value for step 0"(x=0~3)

These parameters are for setting the control values for each steps. Options are displayed according to 1byte object datatype.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

Parameter"Threshold value 1 (step 0 <->step 1)"

This parameter is for setting the threshold value 1, send the control value of step 1 if relative humidity is greater than or equal to this threshold; send the control value of step 0 while it is less than this threshold. Options: **0..100 %**

Parameter"Threshold value 2 (step 1 <->step 2)"

This parameter is for setting the threshold value 2, send the control value of step 2 if relative humidity is greater than or equal to this threshold. Options: **0..100 %**

Parameter"Threshold value 3 (step 2 <->step 3)"

This parameter is for setting the threshold value 3, send the control value of step 3 if relative humidity is greater than or equal to this threshold. Options: **0..100 %**

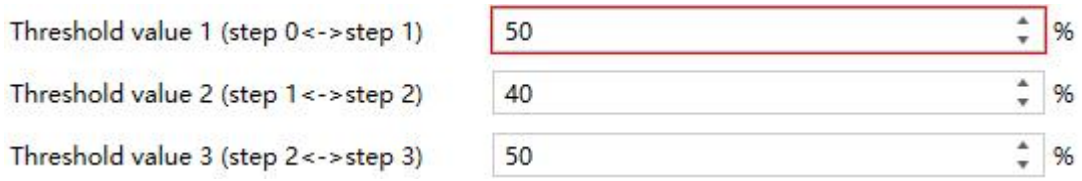
Note: The controller evaluates the threshold in ascending order.

First check →step 0<->step 1 threshold →step 1<->step 2 →step 2<->step 3.

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

The threshold of step 0<->step 1 is lower than that of step 1<->step 2, and the threshold of step 1<->step 2 is lower than that of step 2<->step 3.

If not, they can not be configured on ETS, and display red box warning, as shown as follow:



Parameter"Hysteresis threshold value in +/- [1..10]"

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

1%

2%

...

10%

Suppose that hysteresis value is 5% and the threshold is 20%, then the upper limit threshold 25% (Threshold value+Hysteresis value) and the lower limit threshold 15% (Threshold value-Hysteresis value). When the relative humidity is between 15%~25%, device action will not be caused, and the previous status will still be maintained. Only less than 15% or greater than or equal to 25% will change the output level.

Parameter"Minimum time in step control [0..65535]"

This parameter is for setting the minimum running time for a step control, you need to wait at least until this period of time has elapsed before changing another step. 0 is no minimum running time.

Options: **0...65535 s**

Parameter"If sensor failure, send"

This parameter is visible when there is external sensor. Set whether to send control value when external sensor is failure (**failure to request data**). Options are display according to the object datatype

of 1byte.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

Parameter"Stop function"

This parameter is for setting whether to enable stop function. When enabled, display 1byte object, when receive command, controller becomes off. (**Not send the control value, and only the controller status changes to OFF.**)

——Parameter"Controller automatically restart after [0..255,0=inactive]"

This parameter is visible when previous parameter is enabled. Used for setting the delay time for controller automatically restart from stop status. 0 is not automatically turned on the controller, and you can turn on controller via external object. If there is a delay time, automatically return to active status.

Options: **0..255 min**

Parameter"Behaviour when controller off"

This parameter is for setting whether to send value when controller receives an off command from bus. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value. Options are display according to the object datatype of 1byte.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

5.5.2.Parameter window“CO2 controller”

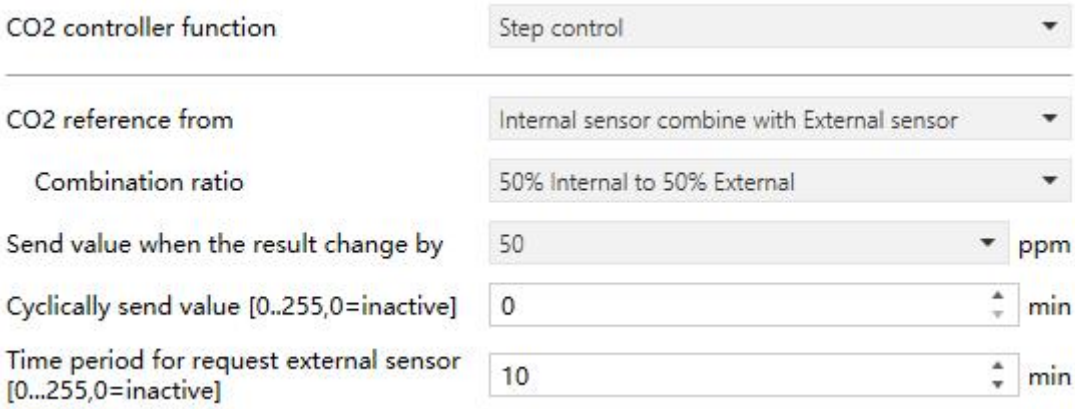


Fig.5.5.2 “CO2 controller” Parameter window

Parameter“CO2 controller function”

This parameter is for setting the controller function of CO2. Options:

Disable

Step control

PI control

Disable: the CO2 controller is not activated.

Step control: up to set 3 steps for controller, which can connect with fan control.

PI control: use PI continue control.

Parameter“CO2 reference from”

This parameter is for setting the resource of the CO2 reference. Options:

Internal sensor

External sensor

Internal sensor combine with External sensor

When selecting the reference is internal sensor, the CO2 is determined by the setting of the “Internal sensor measurement” in the parameter interface, more details refer to chapter 5.3.3.

——Parameter“Time period for request external sensor [0...255]”

This parameter is visible when there is External sensor. Set the time period for read request external CO2 sensor. Options: **0..255 min**

Parameters as follow are visible when “Internal sensor combine with External sensor” is selected:

——Parameter“Combination ratio”

This parameter is for setting the internal sensor and the external sensor to measure the specific gravity of the CO2. Options:

10% Internal to 90% External

20% Internal to 80% External

...

90% Internal to 10% External

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 actual CO2 = (internal sensor's CO2 × 40%) + (external sensor's CO2 × 60%), the controller function of the device will control according to the calculated CO2.

When two sensors are combined for measurement, when one sensor is in error, the CO2 value measured by the other sensor is used.

——Parameter“Send value when the result change by”

This parameter is for setting when CO2 measurement value changes, whether to enable to send the current CO2 value to the bus. Not send when disable. Options:

Disable

10ppm

20ppm

50ppm

...

450ppm

500ppm

——Parameter“Cyclically send value [0...255]”

Setting the time for cyclically sending the CO2 measurement value to the bus. Not send when value is 0. Options: **0..255 min**

Note: cyclically sending and change sending are independent of each other.

5.5.2.1.Parameter window“Output”

There are step control and PI control for CO2 output setting, Explained in detail in the following.

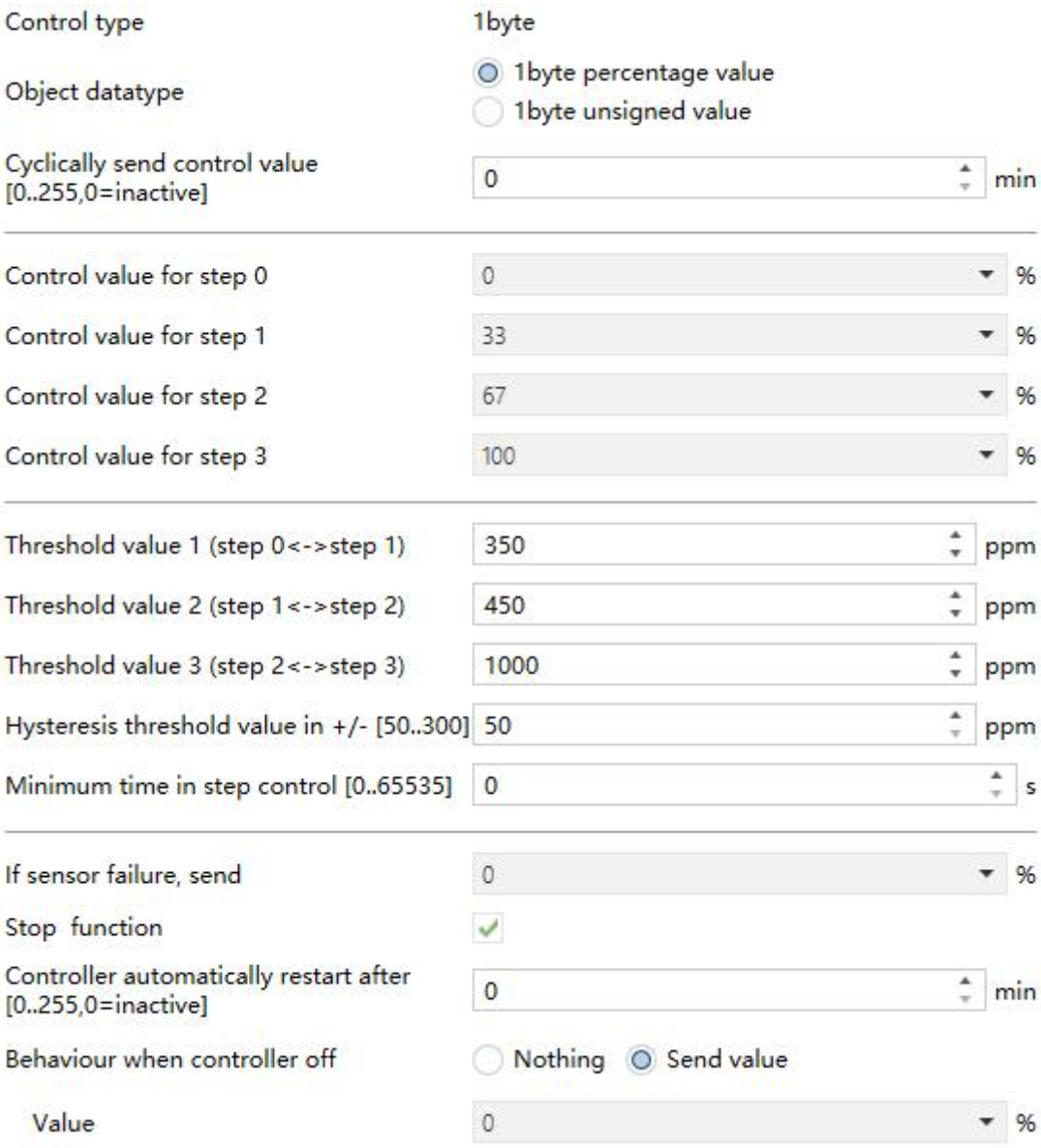


Fig.5.5.2.1(1) “Output”-Step control Parameter window

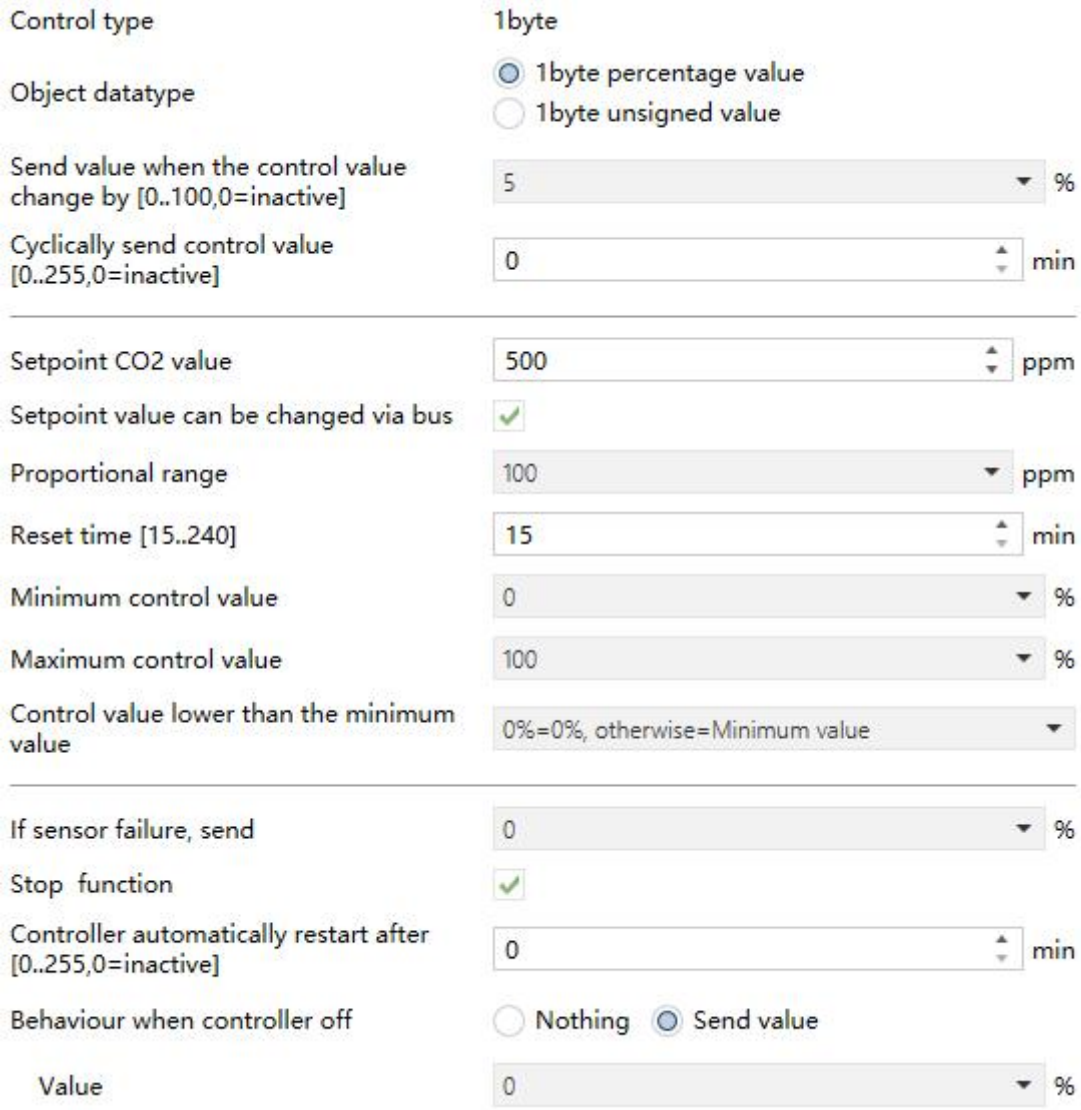


Fig.5.5.2.1(2) "Output"-PI control Parameter window

Parameter"Control type"

This parameter is for setting the output type of control value. Option is only **1byte**

Parameter"Object datatype"

This parameter is for setting the object datatype of 1byte. Options:

1byte percentage value

1byte unsigned value

Parameter"Cyclically send control value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the control values to the bus. Not send when 0 is set. Options: **0..255 min**

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

change has no affect on this period.

When step control, parameters as follow are visible:

Parameter"Control value for step 0"(x=0~3)

These parameters are for setting the control values for each steps. Options are displayed according to 1byte object datatype.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

Parameter"Threshold value 1 (step 0 <->step 1)"

This parameter is for setting the threshold value 1, send the control value of step 1 if CO2 is greater than or equal to this threshold; send the control value of step 0 while it is less than this threshold.

Options: **1..2000 ppm**

Parameter"Threshold value 2 (step 1 <->step 2)"

This parameter is for setting the threshold value 2, send the control value of step 2 if CO2 is greater than or equal to this threshold. Options: **1..2000 ppm**

Parameter"Threshold value 3 (step 2 <->step 3)"

This parameter is for setting the threshold value 3, send the control value of step 3 if CO2 is greater than or equal to this threshold. Options: **1..2000 ppm**

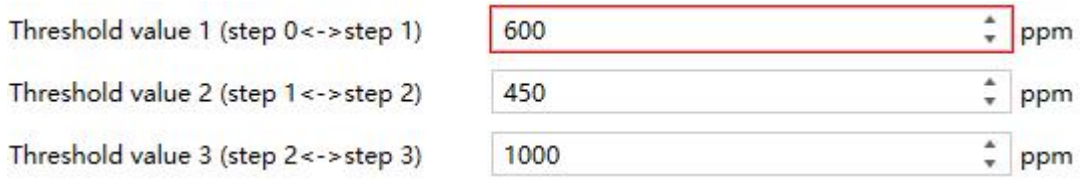
Tip: The controller evaluates the threshold in ascending order.

First check →step 0<->step 1 threshold →step 1<->step 2 →step 2<->step 3.

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

The threshold of step 0<->step 1 is lower than that of step 1<->step 2, and the threshold of step 1<->step 2 is lower than that of step 2<->step 3.

If not, they can not be configured on ETS, and display red box warning, as shown as follow:



Parameter"Hysteresis threshold value in +/- [50..300]"

This parameter is for setting the hysteresis value of the threshold value, which can avoid the unnecessary action when the control value fluctuates near the threshold. Options: **50..300 ppm**

Suppose that hysteresis value is 50ppm and the threshold is 350ppm, then the upper limit threshold 400ppm (Threshold value+Hysteresis value) and the lower limit threshold 300ppm (Threshold value-Hysteresis value). When the humidity is between 300~400ppm, device action will not be caused, and the previous status will still be maintained. Only less than 300ppm or greater than or equal to 400ppm will change the output level.

Parameter"Minimum time in step control [0..65535]"

This parameter is for setting the minimum running time for a step control, you need to wait at least until this period of time has elapsed before changing another step. 0 is no minimum running time.

Options: **0...65535 s**

When PI control, parameters as follow are visible:

Parameter"Setpoint CO2 value"

This parameter is for setting the setpoint value of CO2. Options: **1..1500 ppm**

Parameter "Setpoint value can be changed via bus"

This parameter is for setting whether the setpoint value can be changed via bus. When enabled, once a new value is received from bus, that value is used as the new setpoint.

Note: the value changed via bus is limited in 400~1500 ppm.

Parameter"Proportional range"

Parameter"Reset time [15..240]"

These two parameters are for setting the PI value for PI control.

Options **(P value)**:

100 ppm

200 ppm

...

1500 ppm

Options **(I value)**: **15..240 min**

Parameter"Minimum control value"

Parameter"Maximum control value"

These two parameters are for setting the minimum/maximum control value. Options are displayed according to 1byte object datatype.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

Note: minimum value < maximum value, if not, they can not be configured on ETS.

Parameter"Control value lower than the minimum value"

This parameter is for setting the behaviour when control value lower than the minimum value. Options are displayed according to 1byte object datatype, they are similar, only explain the options of 1byte percentage value:

0%=0%，otherwise=Minimum value

To be the minimum value

To be 0%

0%=0%, otherwise=Minimum value: send telegram 0 when control value is 0%, but operate as minimum value when the control value is lower than the minimum.

To be the minimum value: operate as minimum value when the control value is lower than the minimum, even if it is 0%.

To be 0%: operate as minimum value once the control value is lower than the minimum.

Parameter"If sensor failure, send"

This parameter is for setting whether to send control value when internal or external sensor is failure (**failure to request data**). Options are display according to the object datatype of 1byte.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

Parameter"Stop function"

This parameter is for setting whether to enable stop function. When enabled, display 1byte object, when receive command, controller becomes off. (**Not send the control value, and only the controller status changes to OFF.**)

——Parameter"Controller automatically restart after [0..255,0=inactive]"

This parameter is visible when previous parameter is enabled. Used for setting the delay time for controller automatically restart from stop status. 0 is not automatically turned on the controller, and you can turn on the controller via external object. If there is a delay time, automatically return to active status.

Options: **0..255 min**

Parameter"Behaviour when controller off"

This parameter is for setting whether to send value when controller receives an off command from bus. Options:

Nothing

Send value

——Parameter"Value"

This parameter is visible when "Send value" is selected for previous parameter. Set the output value. Options are display according to the object datatype of 1byte.

When it is 1byte percentage value, Options:

0%

1%

...

100%

When it is 1byte unsigned value, Options: **0..255**

5.6.Parameter window“Presence function”

Fig.5.4 “Presence function” Parameter window

Parameter“Number of presence control”

This parameter is for setting the number of presence control, up to set 4 controls, if select “None”, presence function is not activated. Options: **None / 1 / 2 / 3 / 4**

5.6.1.Parameter window“Presence control x”(x=1~4)

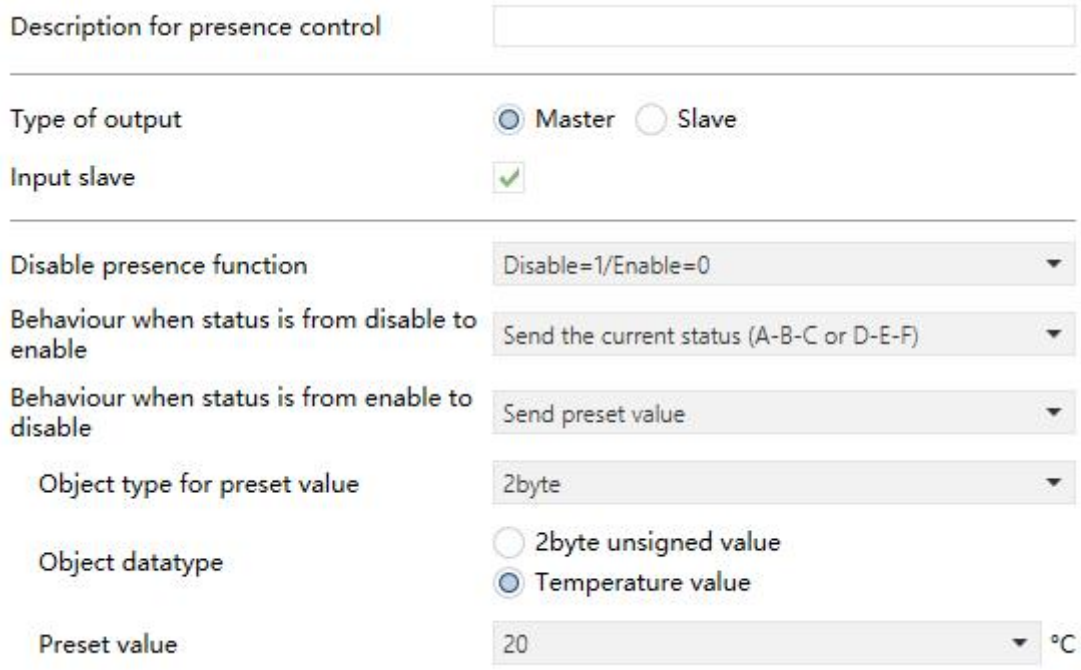


Fig.5.6.1 “Presence control x” Parameter window

Parameter“Description for presence control”

This parameter is for setting the name description for current presence control, up to input 30 characters.

Parameter“Type of output”

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

Master

Slave

Master type is used to output control, slave type is mainly used for sending presence signal to the master.

Parameter"Input slave"

This parameter is visible when master type is selected. Used for setting whether support to input slave signal (telegram 1 is valid). Master-slave type is mainly used to extend detected area.

Parameter"Disable presence function"

This parameter is for setting whether to disable or enable presence function, and set the object value. Options:

Disable

Disable=1/Enable=0

Disable=0/Enable=1

Note: detector is enabled by default after programming or reset.

Following parameters are visible when "Disable" is selected and master type:

Parameter"Behaviour when status is from disable to enable"

This parameter is for setting the output behaviour when status is from disable to enable. Options:

No telegram

Send the current status (A-B-C or D-E-F)

Send the value for presence begin (A-B-C)

Send the value for presence end (D-E-F)

Send the current status (A-B-C or D-E-F): send the presence begin value or presence end value according to current is presence status or no presence. A-B-C or D-E-F is performed in order.

Send the value for presence begin (A-B-C): send the presence begin value, process the enable action as a presence trigger action (no consider brightness value factor). A-B-C is performed in order.

Send the value for presence end (D-E-F): send the presence end value, process the enable action as a presence end action (consider the dead time). D-E-F is performed in order.

Note: for detector 2 / 3 / 4, above options has no the description of "B, C, E, F".

Parameter"Behaviour when status is from enable to disable"

This parameter is for setting the output behaviour when status is from enable to disable. Options:

No telegram

Send end value after expiration of the follow-up time

Send the value for presence begin (A-B-C)

Send the value for presence end (D-E-F)

Send preset value

Send end value after expiration of the follow-up time: after disable, send value of presence end D-E-F in order after follow-up time has elapsed. (If it is no movement before disable, and D-E-F is only partially executed, then continue to complete the execution, while if it completes, no any actions.)

Send the value for presence begin (A-B-C): after disable, send value of presence begin A-B-C in order. If the last telegram is set to cyclically send, it is also sent cyclically here.

Send the value for presence end (D-E-F): after disable, send value of presence end D-E-F in order. If the last telegram is set to cyclically send, it is also sent cyclically here.

Send preset value: define the preset value via following parameters.

Note: for detector 2 / 3 / 4, above options has no the description of "B, C, E, F".

——Parameter"Object type for preset value"

This parameter is for setting the object type for preset value. Options:

1bit

1byte

2byte

——Parameter"Object datatype"

This parameter is for setting the object type for 1byte or 2byte.

When 1byte, options:

1byte unsigned value

1byte percentage value

Scene number

HVAC mode

When 2byte, options:

2byte unsigned value

Temperature value

——Parameter"Preset value"

This parameter is for setting the preset value, options display according to the object datatype.

When 1bit, options:

OFF

ON

When 1byte and 1byte unsigned value, options: **0..255**

When 1byte and 1byte percentage value, options:

0%

5%

...

100%

When 1byte and Scene number, options:

Scene No.1

Scene No.2

...

Scene No.64

When 1byte and HVAC mode, options:

Auto

Comfort mode

Standby mode

Economy mode

Frost/heat protection

When 2byte and 2byte unsigned value, options: **0..65535**

When 2byte and Temperature value, options:

-5°C

-4°C

...

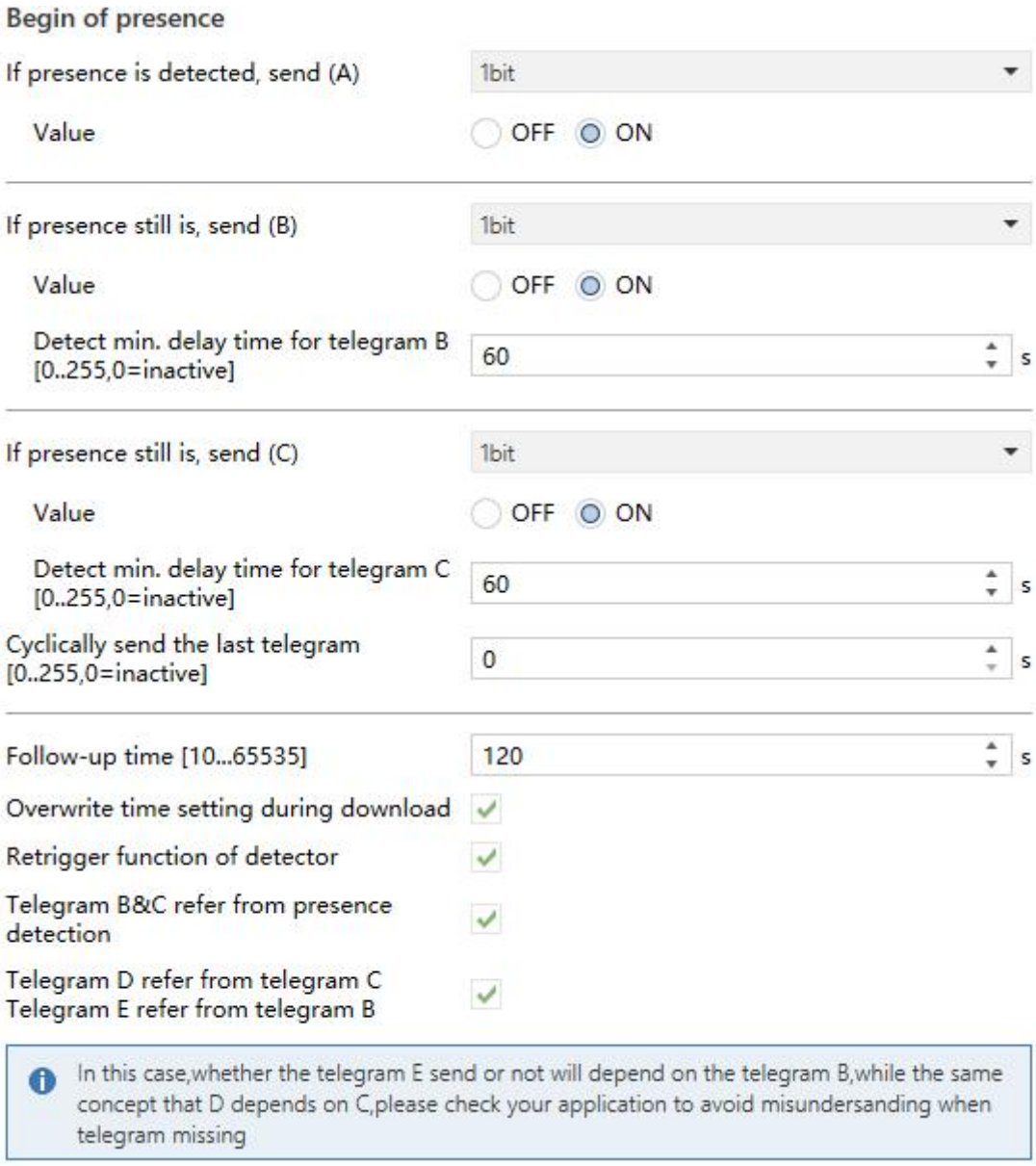
44°C

45°C

5.6.1.1.Parameter window“Output”

This parameter is mainly used for setting output telegrams of presence controls, there is different configuration between master type and slave type.

Master type



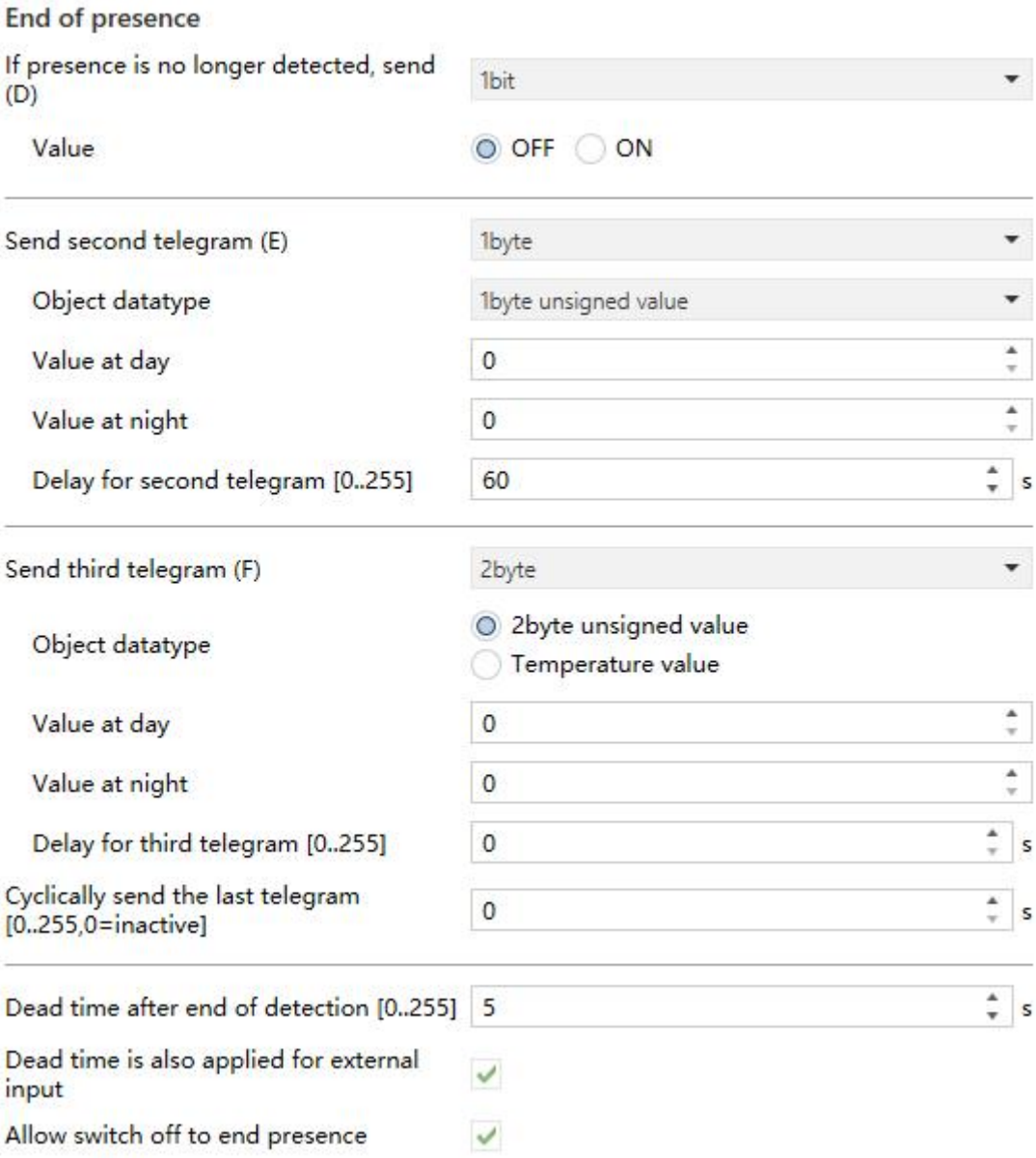


Fig.5.6.1.1 (1) "Output" -MasterParameter window

Begin of presence

Up to send 3 telegrams (A / B / C) when begin of presence, the setting of each telegram is the same. Also can set to not sent the telegram, for example, the first telegram A is set to not send, then it will send the second telegram B directly, and telegram C is the same. The three telegrams are configured respectively, the following takes telegram A as an example, detail of B / C not repeat again.

Parameter"If presence is detected, send (A)"

This parameter is for setting the object type for telegram A. Select "No telegram" is not send. Options:

No telegram

1bit

1byte

2byte

——Parameter"Object datatype"

This parameter is for setting the object type for 1byte or 2byte.

When 1byte, options:

1byte unsigned value

1byte percentage value

Scene number

HVAC mode

When 2byte, options:

2byte unsigned value

Temperature value

——Parameter"Value"

——Parameter"Value at day"

——Parameter"Value at night"

This parameter is for setting the output value, options display according to the object datatype. Please refer to the setting of preset value, not repeat here.

You can set the output value (besides 1bit) for day and night respectively when night mode is enabled.

——Parameter"Detect min. delay time for telegram B [0..255, 0=inactive]"

This parameter is visible when telegram B is selected to send telegram. Used for setting the minimum delay time for send telegram B. Options: **0..255s, 0=inactive**

After the telegram A has sent, if detect presence during the follow-up time and the minimum time has elapsed, send telegram B immediately.. (**This minimum time starts timing after A is executed.**)

——Parameter"Detect min. delay time for telegram C [0..255, 0=inactive]"

This parameter is visible when telegram C is selected to send telegram. Used for setting the minimum delay time for send telegram C. Options: **0..255s, 0=inactive**

It is similar to telegram B, not explain again here.

Note that the minimum time starts timing after B is executed.

Parameter"Cyclically send the last telegram [0...255,0=inactive]"

This parameter is for setting the period of sending the last telegram cyclically, Options: **0..255s**

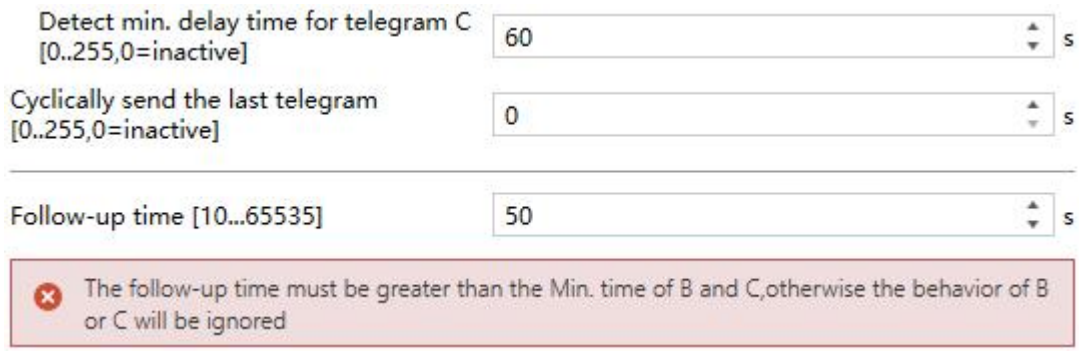
For example 3 levels of lighting control A → B → C, when executed to C, telegram C is sent cyclically, stop the cycle after the follow-up time is completed. If telegram C is not configured, send telegram B cyclically, if telegram B is also not configured, send telegram A cyclically.

Parameter"Follow-up time [10...65535]"

This parameter is for setting follow-up time. It can be changed via bus.

Options: **10..65535s**

Note: the minimum time among A, B and C should be smaller than follow-up time, otherwise, the telegram will be ignored. When there is an illegal time setting, display a warning, for example, minimum delay time between B and C is 60s, follow-up time is set to 50s, as follow:



Parameter"Overwrite time setting during download"

This parameter is for setting whether overwrite follow-up time during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the modified time.

Parameter"Retrigger function of detector"

This parameter is for setting whether retrigger function of detector is enabled.

Retrigger function is enabled, there is a presence detected or an external input from bus during follow-up time, the follow-up time is reset. If detect presence before follow-up time is completed, execute telegram B and C in order, if the minimum time of B has not arrived, only execute B when the minimum time is completed and a movement is detected, then start the minimum time of C and execute C.

After A, B, C are completed, execute end telegrams D, E, F when follow-up time has elapsed.

If not detect other presence again after executing A during follow-up time, neither B nor C is executed, please consider the relation between D&E and C&B when follow-up time has elapsed. If D&E refer from telegram C&B, skip D&E and only execute F; while not, execute telegrams D, E, F.

Retrigger function is disabled, execute A-B-C in order according to the minimum time until the follow-up time is completed, after dead time has elapsed, restart only when a trigger command is detected. **Note: execute B-C only when presence is detected, if the minimum time of B is not arrived, execute B when the minimum time is completed and a movement is detected, then start the minimum time of C and execute C. But follow-up time will not reset, only presence is detected will the follow-up reset after dead time has elapsed.**

Parameter"Telegram B&C refer from presence detection"

This parameter is used to set whether the execution of B/C depends on the validity of the presence detection, if it depends on presence detection, it is necessary to check for presence detection before sending, and the telegram is sent only when it is detected; Otherwise, it there is no need to check, and the telegram is sent after the minimum delay.

Parameter"Telegram D refer from telegram C"

Parameter"Telegram E refer from telegram B"

This parameter is for setting whether telegram D and E refer from telegram C and B, used to confirm whether to skip D and E, that is D refer to C, E is refer to B. When enabled, only B is executed will the minimum time and output of E is execute, only C is executed will the minimum time and output of D is execute.

When it is enabled, display following information, please check the application in ETS to avoid thinking that the DE telegram is lost:

In this case,whether the telegram E send or not will depend on the telegram B,while the same concept that D depends on C,please check your application to avoid misundersanding when telegram missing

End of presence

Up to send 3 telegrams (D / E / F) when end of presence, the setting of each telegram is the same. Also can set to not sent the telegram, for example, the first telegram D is set to not send, then it will send the second telegram E directly, and telegram F is the same. The three telegrams are configured respectively, the following takes telegram D as an example, detail of E / F not repeat again.

Parameter"If presence is no longer detected, send (D)"

This parameter is for setting the object type for telegram D. Select “No telegram” is not send.

Options:

No telegram

1bit

1byte

2byte

——Parameter“Object datatype”

This parameter is for setting the object type for 1byte or 2byte.

When 1byte, options:

1byte unsigned value

1byte percentage value

Scene number

HVAC mode

When 2byte, options:

2byte unsigned value

Temperature value

——Parameter“Value”

——Parameter“Value at day”

——Parameter"Value at night"

This parameter is for setting the output value, options display according to the object datatype. Please refer to the setting of preset value, not repeat here.

You can set the output value (besides 1bit) for day and night respectively when night mode is enabled.

——Parameter"Delay for second telegram [0..255]"

This parameter is visible when telegram E is selected to send telegram. Used for setting the delay time for send telegram E. Options: **0..255s**

——Parameter"Delay for third telegram [0..255]"

This parameter is visible when telegram F is selected to send telegram. Used for setting the delay time for send telegram F. Options: **0..255s**

Parameter"Cyclically send the last telegram [0...255,0=inactive]"

This parameter is for setting the period of sending the last telegram cyclically, Options: **0..255s**

For example 3 levels of lighting control D → E → F, when executed to F, telegram F is sent cyclically, stop the cycle after the dead time is completed. If telegram F is not configured, send telegram E cyclically, if telegram E is also not configured, send telegram F cyclically.

Parameter"Dead time after end of detection [0..255]"

This parameter is for setting dead time after end of detection, after follow-up time is completed or external sensor input end signal or receiving OFF status of actuator, start timing. Options: **0..255s**

The delay time among D, E and F should be smaller than dead time, otherwise, the telegram will be ignored (If there is movement).

Example 1: when turn off the light, the nearby ambient temperature will cool in a short time, and it is within the detection range of the detector, this situation can be important. If there is no dead time, an unintentional activation of detector will occur. Dead time is used to prevent re-activating immediately.

Example 2: manually turn off the light when leave room. If there is no dead time, the detected movement will restart the detector during end of presence.

Parameter"Dead time is also applied for external input"

This parameter is for setting whether dead time is also applied for external input, when disabled, execute trigger telegram immediately when detector receives the external input.

Parameter"Allow switch off to end presence"

This parameter is for setting whether allow receiving on/off status of actuator to end presence. When enabled, enter dead time when receive telegram OFF, and suppress presence detection, telegram ON is no meaning.

Only suppress presence detection, but not effect the sending of ABCDEF, they will still follow their own rules.

Slave type

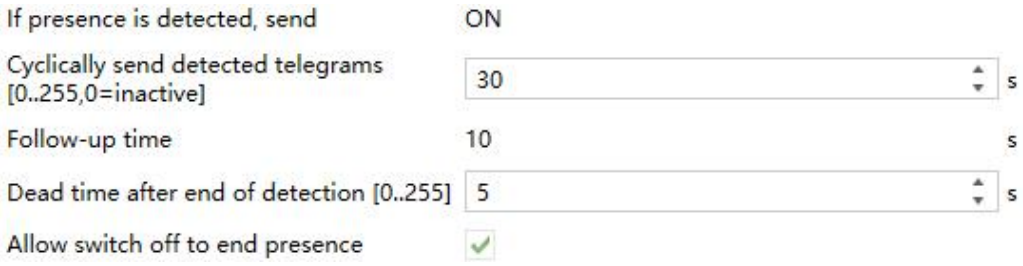


Fig.5.6.1.1 (2) "Output" -SlaveParameter window

Parameter"If presence is detected, send"

This parameter is for setting to send telegram to the master on bus when presence detected, option is only **ON**

Parameter"Cyclically send detected telegrams [0..255,0=inactive]"

This parameter is for setting the period of sending the detected telegram cyclically.

Options: **0..255s**

Stop to send telegram ON to bus when end of presence, but no OFF telegram is sent.

Parameter"Follow-up time"

This parameter is for setting follow-up time of slave detector, fix to **10s**

Parameter"Dead time after end of detection [0..255]"

This parameter is for setting dead time after end of detection, after follow-up time is completed or external sensor input end signal or receiving OFF status of actuator, start timing. Options: **0..255s**

Parameter"Allow switch off to end presence"

This parameter is for setting whether allow receiving on/off status of actuator to end presence. When enabled, enter dead time when receive telegram OFF, and suppress presence detection, telegram ON is no meaning.

5.6.1.2.Parameter window"Operation mode"

This parameter is mainly used for setting operation mode of presence controls, it is only applied to master type.

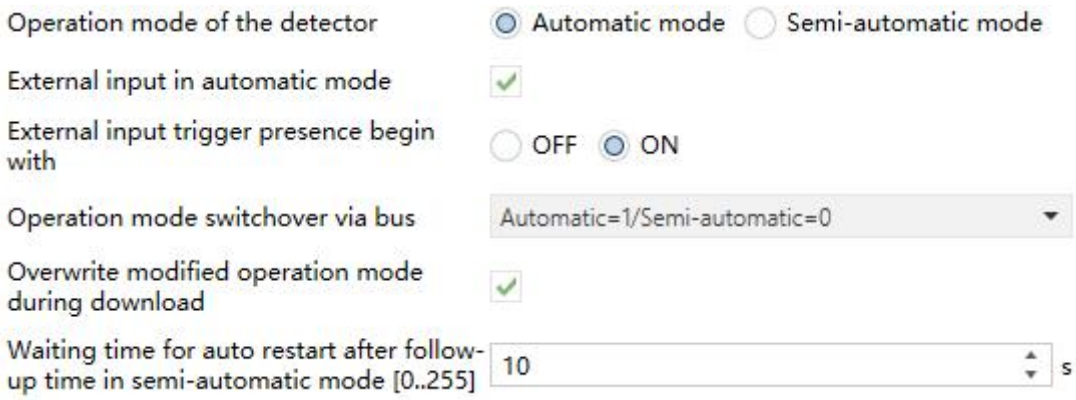


Fig.5.6.1.2 "Operation mode" Parameter window

Parameter"Operation mode of the detector"

This parameter is for setting operation mode of the detector. Options:

Automatic mode

Semi-automatic mode

Automatic mode: begin and end of presence depend on sensor.

Semi-automatic mode: begin of presence is triggered via external input, end of presence depends on sensor or external.

Note: this parameter sets the initial operation mode, change via bus, and keep current operation mode when bus voltage recovery.

Parameter"External input in automatic mode"

This parameter is for setting whether support external input in automatic mode. When enabled, external input is used as a movement action in automatic mode.

Parameter"Operation mode switchover via bus"

This parameter is for setting whether switchover operation mode via bus. When enabled, you can define the object value. Options:

Disable

Automatic=1/Semi-automatic=0

Automatic=0/Semi-automatic=1

Parameter"Overwrite modified operation mode during download"

This parameter is for setting whether overwrite modified operation mode during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the modified operation mode.

Parameter"Waiting time for auto restart after follow-up time in semi-automatic mode [0...255]"

This parameter is for setting the waiting time for auto restart after follow-up time in semi-automatic mode. Options: **0..255s**

Trigger presence detection via external input, end of presence once follow-up time has elapsed. During this waiting time, if detect presence, detection is activated automatically, after this time has passed, presence detection must be turned on again by external input.

5.6.1.3.Parameter window“Brightness”

This parameter is mainly used for setting brightness for presence controls, there is different configuration between master type and slave type.

Master type

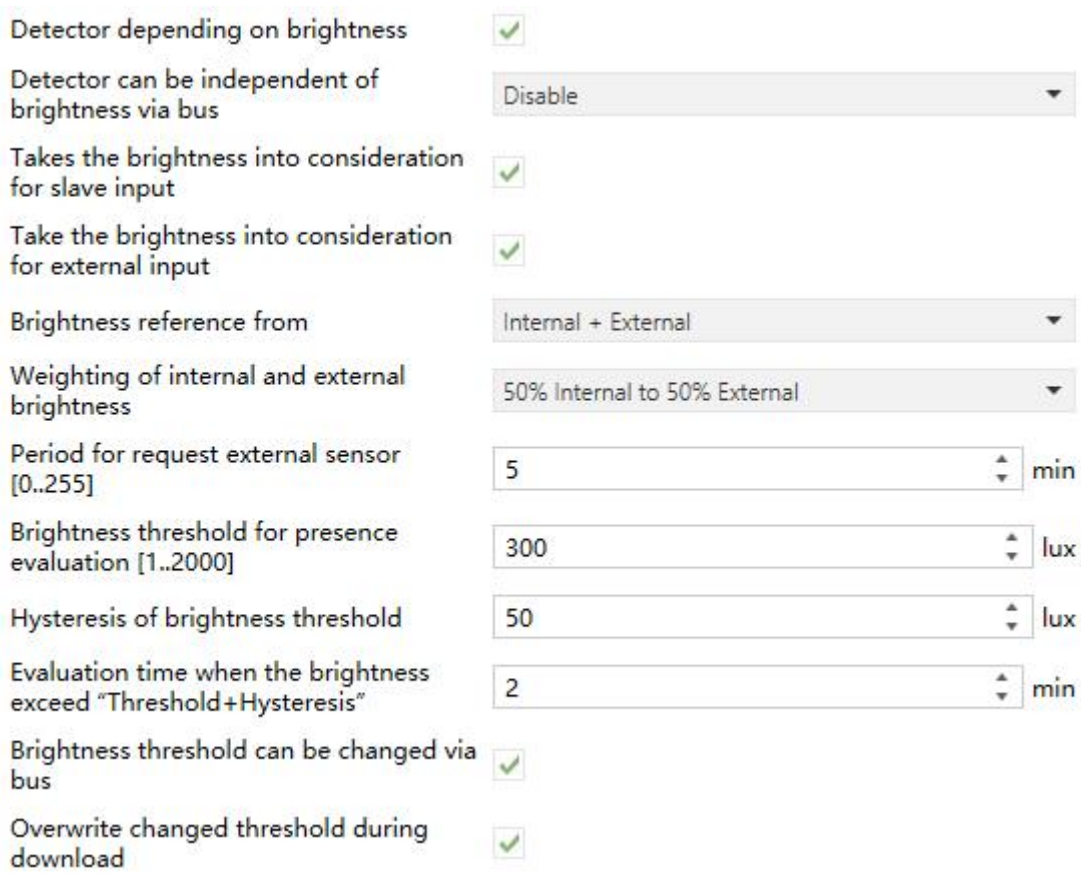


Fig.5.6.1.3(1) “Brightness”-Master Parameter window

Parameter“Detector depending on brightness”

This parameter is for setting whether the presence control depending on brightness. When enabled, following parameters are visible.

Parameter“Detector can be independent of brightness via bus”

This parameter is for setting whether detector can be independent of brightness via bus. Options:

Disable

Depending=1/Independent=0

Depending=0/Independent=1

Disable: can not switchover via object, and detector depend on brightness by default.

Depending=1/Independent=0: when device restart, detector depends on brightness by default, you can change to depend on or independent of brightness via the object, telegram 0 is independent, telegram 1 is depending. The same goes for option “Depending=0/Independent=1”.

Parameter“Takes the brightness into consideration for slave input”

This parameter is visible when parameter “Input slave” is enabled. Used for setting whether take the brightness into consideration for slave input.

When enabled, only when actual brightness is lower than brightness threshold will turn on detector or reset follow-up time; when disabled, independent of brightness, each input telegram ON can turn on detector or reset follow-up time.

For processing within the hysteresis interval, refer to the description of the hysteresis value.

Parameter“Take the brightness into consideration for external input”

This parameter is for setting whether take the brightness into consideration for external input.

When enabled, only when actual brightness is lower than brightness threshold will turn on detector or reset follow-up time; when disabled, trigger the detector directly.

For processing within the hysteresis interval, refer to the description of the hysteresis value.

Parameter“Brightness reference from”

This parameter is for setting the reference of brightness. Options:

Internal only

External only

Internal + External

When depend on brightness, if external brightness is not obtained (sensor error), there is only presence and will not output telegram.

Parameter“Weighting of internal and external brightness”

This parameter is visible when “Internal + External” is selected. Used for setting the weighting of internal and external brightness. Options:

10% Internal to 90% External

20% Internal to 80% External

...

90% Internal to 10% External

When two sensors are combined for detection, if one of the sensors fails, use the brightness value detected by the other sensor.

Parameter"Period for request external sensor [0...255]"

This parameter is visible when there is External sensor. Used for setting the period for request external sensor. Options: **0..255min**

Parameter"Brightness threshold for presence evaluation [1..2000]"

This parameter is for setting the brightness threshold for evaluating begin of presence. It can be changed via bus.

Options: **1..2000 lux**

Only when brightness lower than this threshold, and there is a presence (in Automatic mode) or external input (if configured), detector will execute begin of presence.

Parameter"Hysteresis of brightness threshold"

This parameter is for setting the brightness hysteresis for end of presence. Options: **10..200 lux**

When the brightness reaches the "brightness threshold + hysteresis value" for a period of time (next parameter to define), even if there is a presence, it will execute end of presence. During brightness hysteresis interval, the operating logic of brightness and presence is determined by the previous status (for example, brightness changes upward from below the threshold, begin of presence, while the brightness goes down from above the threshold, can not begin of presence).

Parameter"Evaluation time when the brightness exceed "Threshold+Hysteresis" "

This parameter is for setting the evaluation time when brightness reaches the "brightness threshold + hysteresis value", once this time has elapsed, presence detection is no longer processed.

Options: **1..10 min**

Parameter"Brightness threshold can be changed via bus"

This parameter is for setting whether brightness threshold can be changed via bus.

Parameter"Overwrite changed threshold during download"

This parameter is visible when previous parameter is enabled. Used for setting whether overwrite modified brightness threshold during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the modified brightness threshold.

Slave type

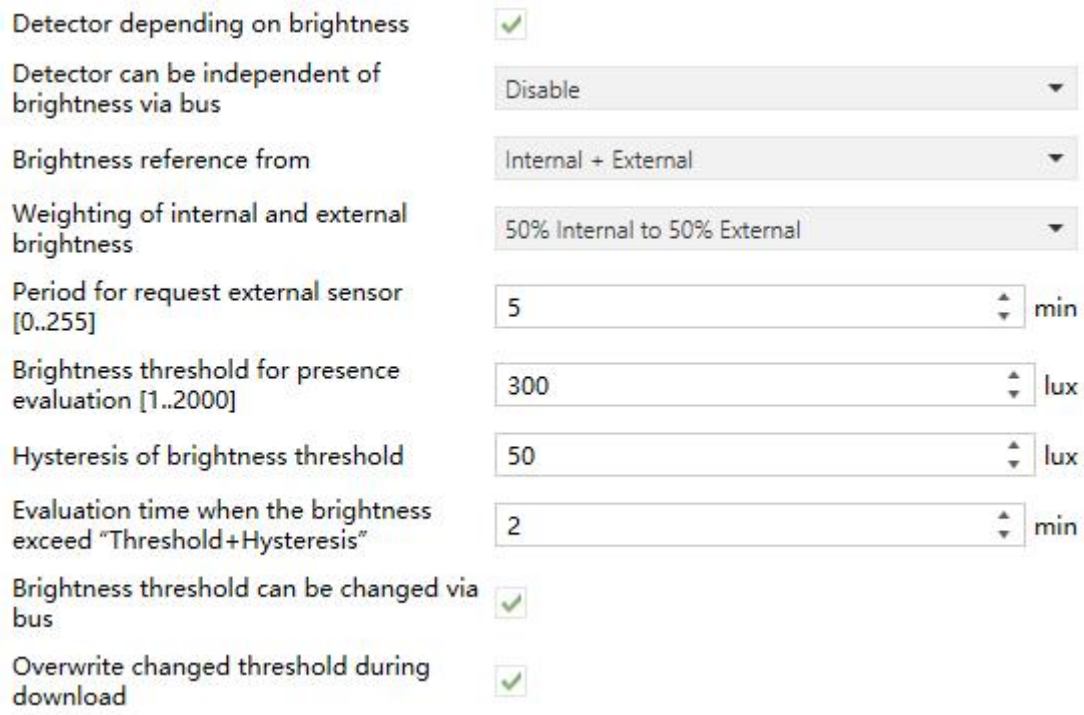


Fig.5.6.1.3(2) "Brightness"-Slave Parameter window

When slave type, not take brightness into consideration for slave input / external input. Other parameters is similar to master type, not repeat here.

5.7.Parameter window“Light control”

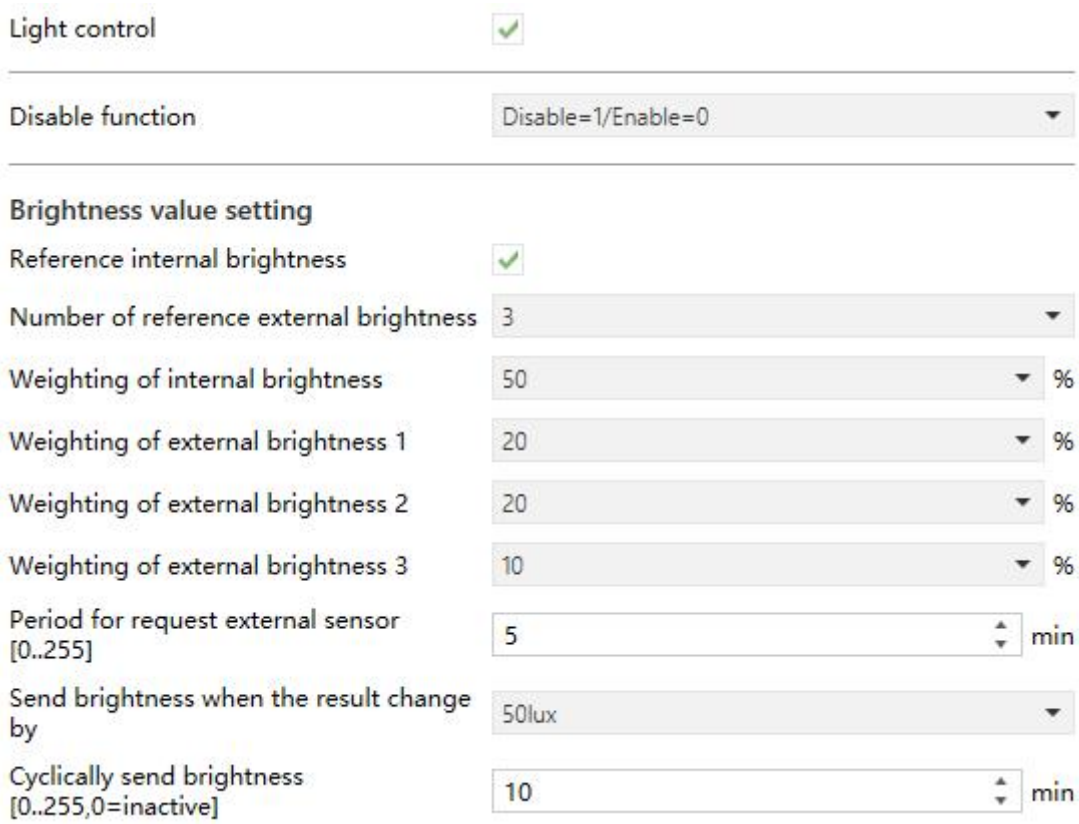


Fig.5.7 “Light control” Parameter window

Parameter“Light control”

This parameter is for setting whether the light control is enabled. Compare the setting brightness threshold with current brightness, to output switch or scene control telegrams.

When enabled, following parameters are visible.

Parameter“Disable function”

This parameter is for setting whether disable function of light control is enabled. Options:

Disable

Disable=1/Enable=0

Disable=0/Enable=1

Note: the detector is enabled by default after programming or reset.

Brightness value setting

Parameter“Reference internal brightness”

This parameter is for setting whether reference internal brightness.

The reference of brightness is optional internal, external, proportional mixing internal+external, the mixing data need to be fed back to bus. It is up to set 3 external brightness sensors.

Parameter"Number of reference external brightness"

This parameter is for setting the number of reference external brightness sensors.

Previous parameter is enabled, options: **0 / 1 / 2 / 3**

Previous parameter is disabled, options: **1 / 2 / 3**

Parameter"Weighting of internal brightness"

Parameter"Weighting of external brightness x" (x=1~3)

This parameter is for setting the weighting of internal or external brightness sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as the brightness used for controlling. When there is only one (internal or external) sensor, these parameters is not visible.

Note: when Any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, and there will be no control output, keeping the current status.

Parameter"Period for request external sensor [0...255]"

This parameter is visible when there is External sensor. Used for setting the period for request brightness from external sensor. Options: **0 ..255min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send brightness when the result change by "

This parameter is visible when there is a combination of internal and external sensors. Used for setting when brightness turns to a certain value, whether to enable to send the current brightness value

to the bus. Not send when value “Disable” is selected. Options:

Disable

5 lux

10 lux

15 lux

...

100 lux

Parameter"Cyclically send brightness [0...255,0=inactive]"

This parameter is visible when there is a combination of internal and external sensors. Used for setting the time for cyclically sending the brightness detection value to the bus. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.7.1.Parameter window“Output”

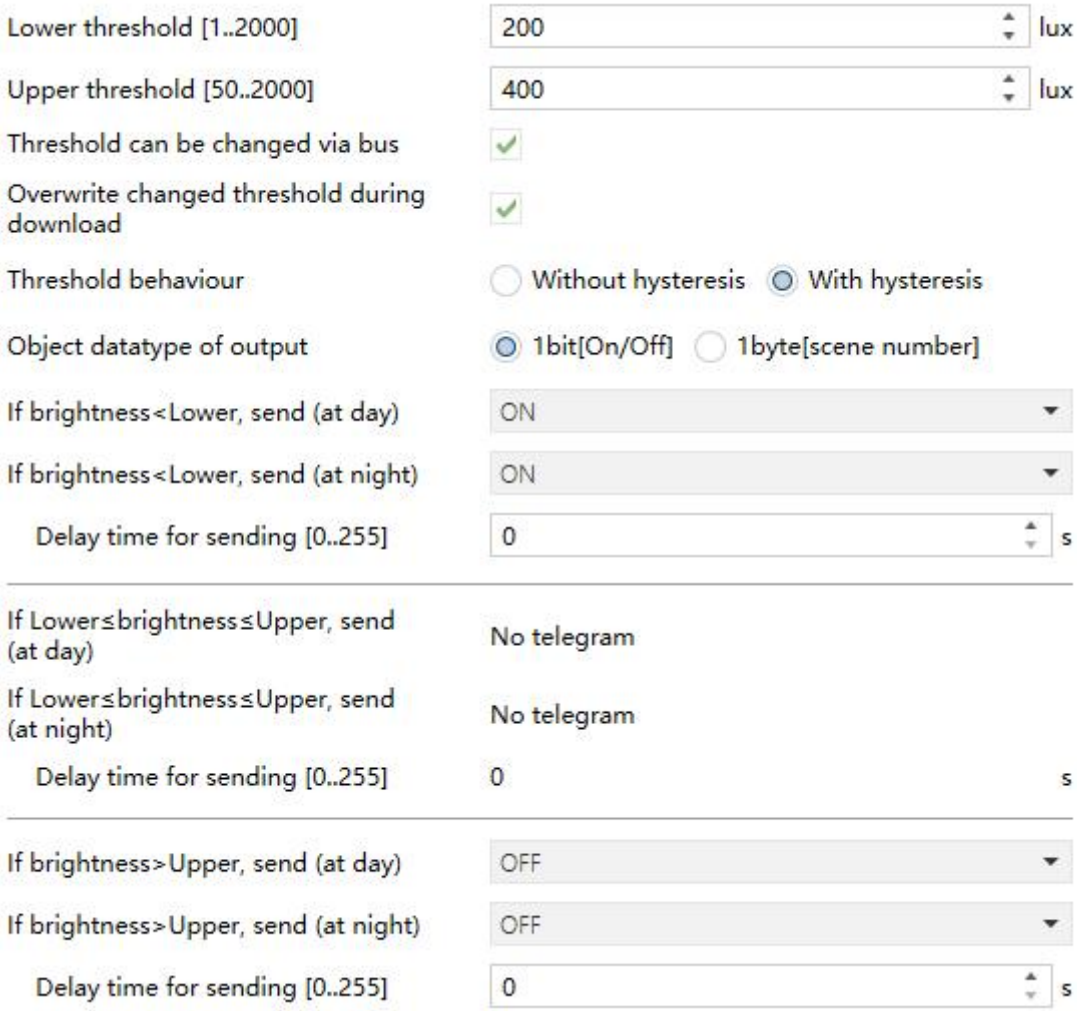


Fig.5.7.1 “Output” Parameter window

Parameter“Lower threshold [1..2000]”

This parameter is for setting the lower threshold of brightness. Options: **1..2000 lux**

Parameter“Upper threshold [50..2000]”

This parameter is for setting the upper threshold of brightness. Options: **50..2000 lux**

Note: the threshold value must meet the condition lower < upper, if not, they can not be configured on ETS, and display red box warning, as shown as follow:

Parameter“Threshold can be changed via bus”

This parameter is for setting whether lower and upper threshold can be changed via bus.

Parameter"Overwrite changed threshold during download"

This parameter is visible when previous parameter is enabled. Used for setting whether overwrite modified range of brightness threshold during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the modified brightness threshold range.

Parameter"Threshold behaviour"

This parameter is for setting threshold behaviour. Options:

Without hysteresis

With hysteresis

When with hysteresis, the range of lower and upper threshold is used as a buffer, and no action occurs when the brightness is in it.

Parameter"Object datatype of output"

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

1bit[On/Off]

1byte[scene number]

Support to compare lower and upper brightness threshold with brightness to output telegrams, parameters as shown as follow, which can apply to turn on/off light or scene recall.

Parameter"If brightness<Lower, send (at day)"

Parameter"If brightness<Lower, send (at night)"

This parameter is for setting the output telegram when brightness is lower than lower threshold. You can set the output value for day and night respectively when night mode is enabled.

When 1bit, options:

No telegram

ON

OFF

When 1byte, options:

No telegram

Scene No.1

Scene No.2

...

Scene No.64

——Parameter "Delay time for sending [0..255]"

This parameter is for setting the delay time for sending output telegram. Options: **0..255 s**

If brightness is higher than lower threshold during delay time, previous timing is ignored.

Parameter"If Lower≤brightness≤Upper, send (at day)"

Parameter"If Lower≤brightness≤Upper, send (at night)"

This parameter is for setting the output telegram when brightness is between lower and upper thresholds. You can set the output value for day and night respectively when night mode is enabled.

When 1bit, options:

No telegram

ON

OFF

When 1byte, options:

No telegram

Scene No.1

Scene No.2

...

Scene No.64

When with hysteresis, option is only **No telegram**, that is no output telegram and the delay time is default to 0.

——Parameter"Delay time for sending [0..255]"

This parameter is for setting the delay time for sending output telegram. Options: **0..255 s**

If brightness is lower than lower threshold or higher than upper threshold during delay time, previous timing is ignored.

Parameter"If brightness>Upper, send (at day)"

Parameter"If brightness>Upper, send (at night)"

This parameter is for setting the output telegram when brightness is higher than upper threshold. You can set the output value for day and night respectively when night mode is enabled.

When 1bit, options:

No telegram

ON

OFF

When 1byte, options:

No telegram

Scene No.1

Scene No.2

...

Scene No.64

——Parameter"Delay time for sending [0..255]"

This parameter is for setting the delay time for sending output telegram. Options: **0..255 s**

If brightness is lower than upper threshold during delay time, previous timing is ignored.

5.8.Parameter window“Constant Lighting”

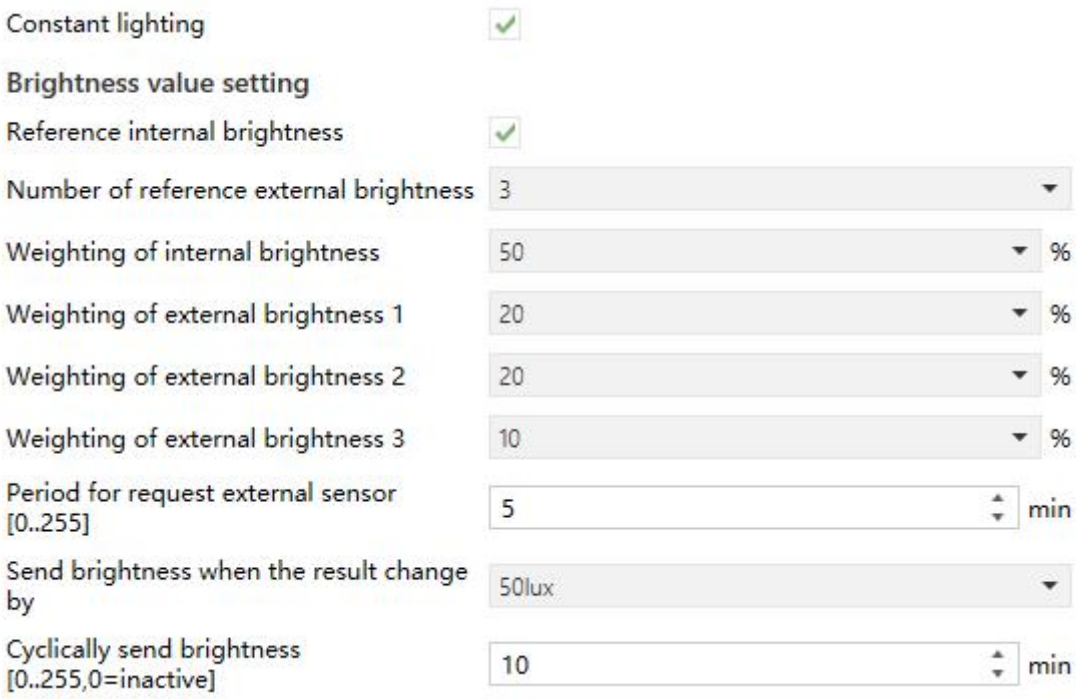


Fig.5.8 “Constant lighting” Parameter window

Parameter“Constant lighting”

This parameter is for setting whether the constant lighting is enabled, to maintain brightness at a certain value. When enabled, following parameters are visible.

Brightness value setting

Parameter“Reference internal brightness”

This parameter is for setting whether reference internal brightness.

The reference of brightness is optional internal, external, proportional mixing internal+external, the mixing data need to be fed back to bus. It is up to set 3 external brightness sensors.

Parameter“Number of reference external brightness”

This parameter is for setting the number of reference external brightness sensors.

Previous parameter is enabled, options: **0 / 1 / 2 / 3**

Previous parameter is disabled, options: **1 / 2 / 3**

Parameter“Weighting of internal brightness”

Parameter“Weighting of external brightness x” (x=1~3)

This parameter is for setting the weighting of internal or external brightness sensors. Options:

10%

20%

...

100%

The weighting of each sensor is setting independently by parameters, then add up these data as the brightness used for controlling. When there is only one (internal or external) sensor, these parameters is not visible.

Note: when Any one of these sensors went wrong (including internal sensor), still consider its weighting, however, because it is illegal data, it will not be actively sent to the bus, and there will be no control output, keeping the current status.

Parameter"Period for request external sensor [0...255]"

This parameter is visible when there is External sensor. Used for setting the period for request brightness from external sensor. Options: **0 ..255min**

Send a read request to external sensor after bus recovery or finish programming.

Parameter"Send brightness when the result change by "

This parameter is visible when there is a combination of internal and external sensors. Used for setting when brightness turns to a certain value, whether to enable to send the current brightness value to the bus. Not send when value "Disable" is selected. Options:

Disable

5 lux

10 lux

15 lux

...

100 lux

Parameter"Cyclically send brightness [0...255,0=inactive]"

This parameter is visible when there is a combination of internal and external sensors. Used for

setting the time for cyclically sending the brightness detection value to the bus. Options: **0..255 min**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

5.8.1.Parameter window“Output”

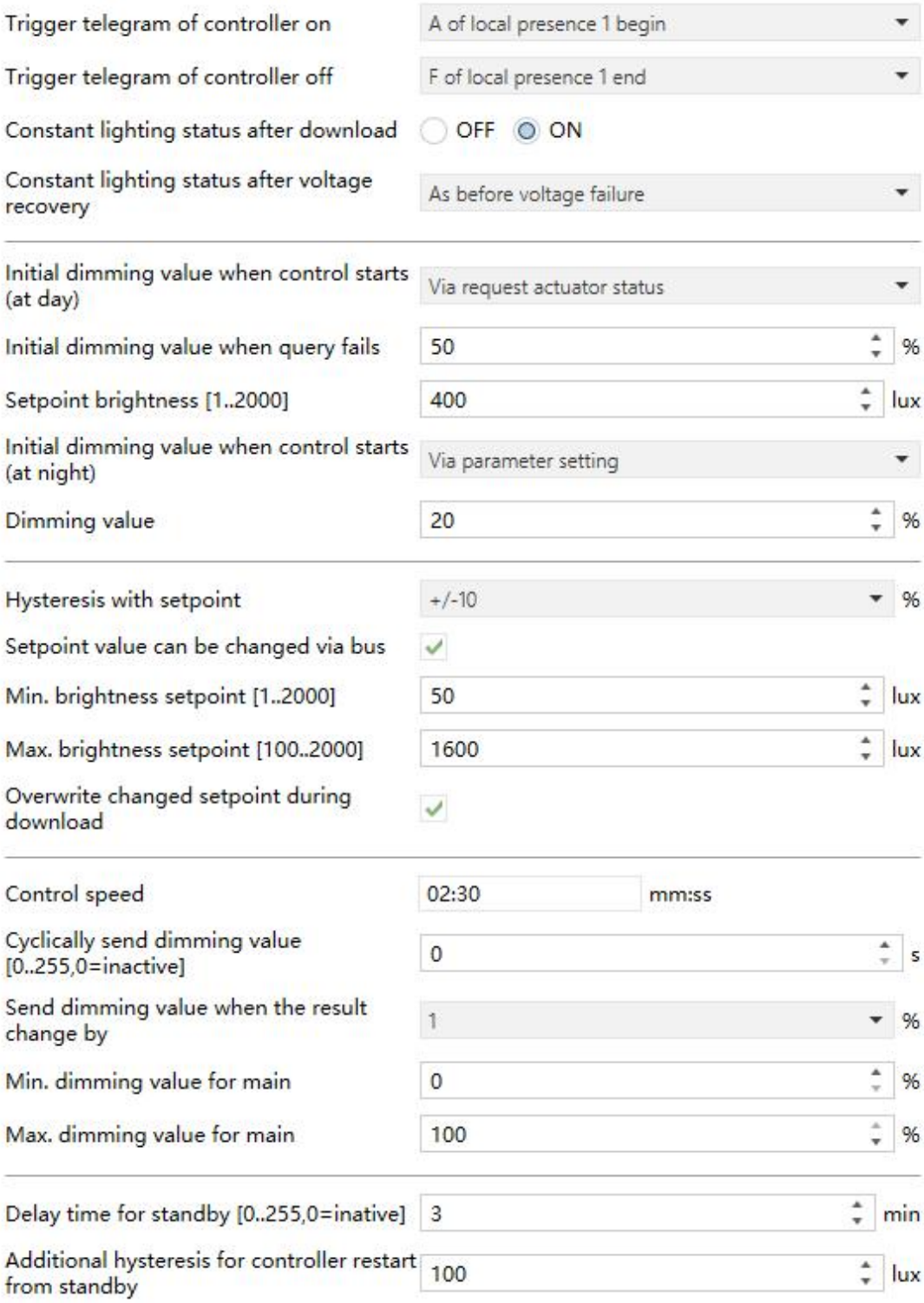


Fig.5.8.1 “Output” Parameter window

Parameter”Trigger telegram of controller on”

This parameter is for setting external or local presence sensor to trigger controller on, send controller status when it changes.

Options is related to the number of local presence detector:

ON of external presence sensor

A of local presence 1 begin

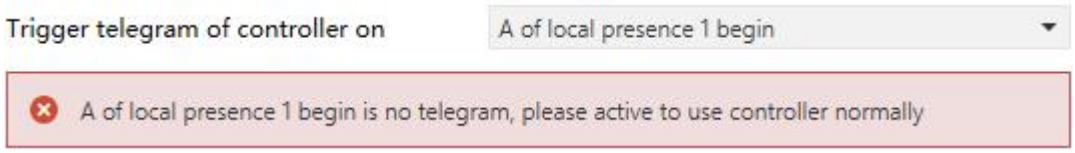
B of local presence 1 begin

...

A of local presence 4 begin

When there is none local presence detector, option is only **ON of external presence sensor**

When controller is triggered via local sensor, you can configure the specific telegram when begin presence. **If the selected telegram is not activated, a warning is displayed, for example, select telegram A of presence detector 1 but it is not activated:**



Parameter”Trigger telegram of controller off”

This parameter is for setting external presence sensor or local presence sensor to trigger controller off, send controller status when it changes.

Options is related to the number of presence detector:

OFF of external presence sensor

D of local presence 1 end

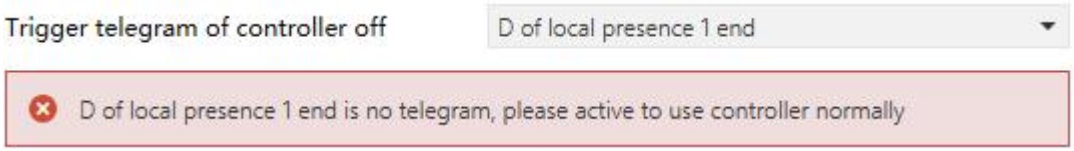
E of local presence 1 end

...

D of local presence 4 end

When there is none local presence detector, option is only **OFF of external presence sensor**

When controller is triggered via local sensor, you can configure the specific telegram when end presence. **If the selected telegram is not activated, a warning is displayed, for example, select telegram D of presence detector 1 but it is not activated:**



Note: if the selected telegram is not configured, or the local presence sensor is not configured or disabled, once the controller is turned off, there is no way to trigger it again via the sensor, so, the configuration should be synchronized with the configuration of the local presence sensor.

Parameter"Constant lighting status after download"

This parameter is for setting constant lighting status after download. Options:

OFF

ON

Parameter"Constant lighting status after voltage recovery"

This parameter is for setting constant lighting status after bus voltage recovery. Options:

OFF

ON

As before voltage failure

Parameter"Initial dimming value when control starts (at day)"

This parameter is for setting initial dimming value of the main when control starts. You can set the output value for day independently with this parameter when night mode is enabled. Options:

Via parameter setting

Via request actuator status

Via calculate start value

The sub brightness output is calculated from the influence of proportional for sub to the main. (**As long as the adjustment reaches the level of the main, the brightness control always follows the proportional output; when it can not reach the level, increase all area's brightness level in any case,**

until all areas reach the maximum dimming value)

——Parameter"Initial dimming value"

This parameter is visible when "Via parameter setting" is selected. Used for setting initial dimming value. Options: **1..100%**

——Parameter"Initial dimming value when query fails"

This parameter is visible when "Via query actuator status" is selected. Used for setting initial dimming value when fail to query actuator or read 0. Options: **1..100%**

——Parameter"Setpoint brightness [1..2000]"

This parameter is for setting brightness setpoint value. Options: **1..2000 lux**

Parameter"Initial dimming value when control starts (at night)"

This parameter is visible when night mode is enabled. Used for setting initial dimming value of the main for night when control starts. Options:

Via parameter setting

Via request actuator status

Via calculate start value

When controller is always on, from day mode to night mode, brightness value will slowly update to the setting in night mode.

——Parameter"Dimming value"

This parameter is visible when "Via parameter setting" is selected. Used for setting dimming value. Options: **1..100%**

——Parameter"Dimming value when query fails"

This parameter is visible when "Via query actuator status" is selected. Used for setting dimming value when fail to query actuator or read 0. Options: **1..100%**

——Parameter"Setpoint brightness [1..2000]"

This parameter is visible when "Via calculate start value" is selected. Used for setting brightness setpoint value. Options: **1..2000 lux**

Parameter"Hysteresis with setpoint"

This parameter is for setting hysteresis percent with setpoint of the main output. Options:

+/-5%

+/-10%

+/-15%

+/-20%

Hysteresis value = Current setpoint value × Hysteresis percent

Compare current brightness with setpoint value, when the brightness is higher than "Setpoint value + Hysteresis value", the lamp slowly darkens until is lower than "Setpoint value + Hysteresis value", to maintain output; when the brightness is lower than "Setpoint value - Hysteresis value", the lamp slowly brightens until is higher than "Setpoint value - Hysteresis value", to maintain output.

Parameter"Setpoint value can be changed via bus"

This parameter is for setting whether setpoint value can be changed via bus.

When enabled, following parameter is visible:

——Parameter"Min. brightness setpoint [1..2000]"

——Parameter"Max. brightness setpoint [100..2000]"

This parameter is for setting the minimum and maximum brightness setpoint value.

Options of minimum value: **1..2000 lux**; options of maximum value: **100..2000 lux**

Note: it must meet the condition minimum value < maximum value, if not, they can not be configured on ETS, and display red box warning, as shown as follow:

——Parameter"Overwrite changed setpoint during download"

This parameter is for setting whether overwrite modified brightness setpoint value during download. Enabled - overwrite, follow the parameter setting; disabled - non-overwrite, it still uses the modified brightness setpoint value.

Parameter"Control speed"

his parameter is for setting the control speed of the whole time, the shorter time, the faster the dimming control value changes. Such as set to 200 seconds, that is adjust 0.5% brightness for 1 second. Options: **2:30..20:00 mm:ss**

Parameter"Cyclically send dimming value [0..255,0=inactive]"

This parameter is for setting the time for cyclically sending the dimming value to the bus.

Options: **0..255s**

This period is independent and starts time counting after programming or reset. Transmission change has no affect on this period.

Parameter"Send dimming value when the result change by "

This parameter is for setting the time for when brightness turns to a certain value to send the current brightness value to the bus. Options:

1%

2%

3%

4%

5%

Parameter"Min. dimming value for main"

Parameter"Max. dimming value for main"

These parameter are for setting the minimum and maximum dimming value for the main.

Options of the minimum: **0..50 %**; options of the maximum: **51..100 %**

Parameter"Delay time for standby [0..255,0=inactive]"

This parameter is for setting the delay time when controller enter standby status.

Options: **0..255 min**

When the output is the minimum dimming value and current brightness is still higher than "Setpoint value + Hysteresis value", the controller enter standby status, output telegram OFF and brightness 0%. When the delay time is 0, the controller is always active, output the minimum dimming value.

Note: the controller does not enter standby status when in night mode.

Parameter"Additional hysteresis for controller restart from standby"

This parameter is not visible when delay time is 0. Used for setting additional hysteresis for controller restart automatically from standby status. Options: **0..255 lux**

When current brightness is lower than "Setpoint value - Hysteresis value - Additional hysteresis", activate controller.

Note: if "Setpoint value - Hysteresis value - Additional hysteresis" is lower than 50 lux, use 50 lux to restart from standby status.

Parameter"Stop function"

This parameter is for setting whether the stop function. When enabled, display objects 1bit/4bit/1byte, when receive command, controller becomes inactive. (**The output of the dimmer remains in the status of external control, if the output of the controller is not updated, not send the telegram OFF, and only the controller status changes to OFF.**)

Parameter"Controller automatically restart after [0..255,0=inactive]"

This parameter is visible when previous parameter is enabled. Used for setting the delay time for controller automatically restart from stop status. 0 is not automatically activate, and activate controller via external object or presence detection. If there is a delay time, automatically return to active status.

Options: **0..255 min**

5.8.2.Parameter window“Main-Sub operation”

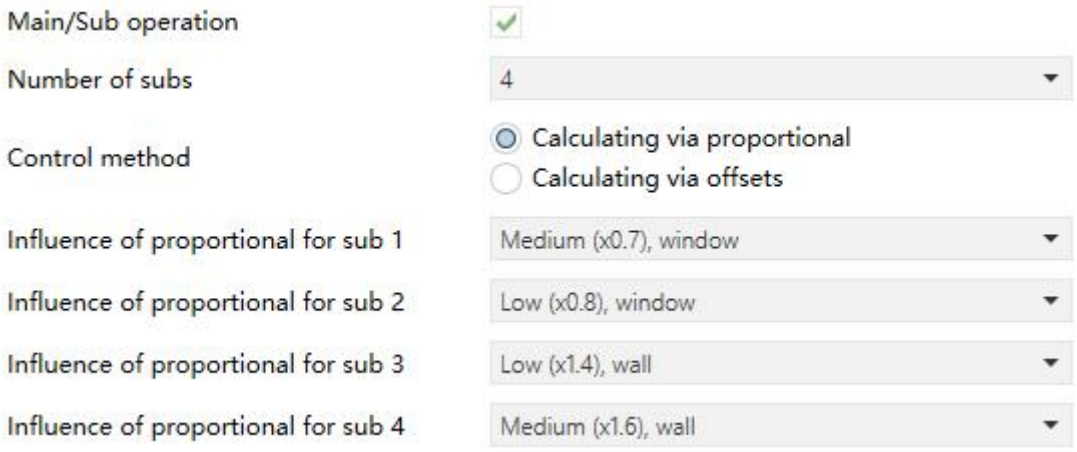


Fig.5.8.2(1) “Main-Sub operation” Parameter window

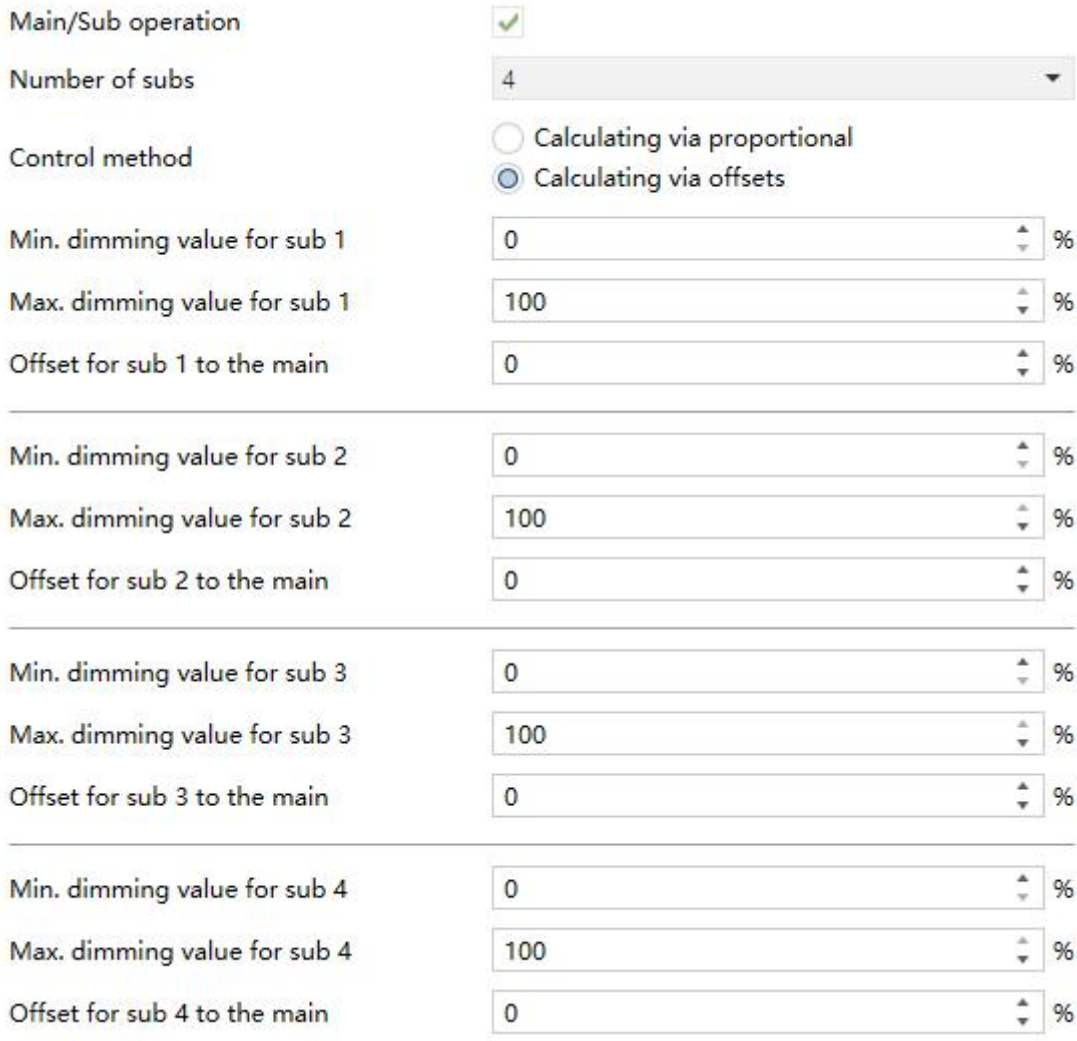


Fig.5.8.2(2) “Main-Sub operation” Parameter window

Parameter"Main/Sub operation"

This parameter is for setting whether Main/Sub operation is enabled. When enabled, following parameters are visible:

Parameter"Number of subs"

This parameter is for setting the number of subs, up to set 4 subs.

Parameter"Control method"

This parameter is for setting control method. Options:

Calculating via proportional

Calculating via offsets

Following parameters are visible when "Calculating via proportional" is selected:

Parameter"Influence of proportional for sub x" (x=1~4)

This parameter is for setting influence of proportional of sub x to the main. Options:

Very high (x0.5), window

High (x0.6), window

Medium (x0.7), window

Low (x0.8), window

Very low (x0.9), window

No change (x1)

Very low (x1.2), wall

Low (x1.4), wall

Medium (x1.6), wall

High (x1.8), wall

Very high (x2.0), wall

When "No change (x1)" is selected, close proportional control, the all lighting groups lights up with the same value.

When "Very high (x0.5), window" or "Very high (x2.0), wall" is selected, it means that a large difference between the absolute dimming values at the wall and the window.

The sensor is usually installed in the middle position, and set it as the main lighting group, and the sub lighting group is located in the window or wall area.

Following parameters are visible when “Calculating via offsets” is selected:

Parameter“Min. dimming value for sub x” (x=1~4)

Parameter“Max. dimming value for sub x” (x=1~4)

These parameters are for setting the minimum and maximum value for sub x.

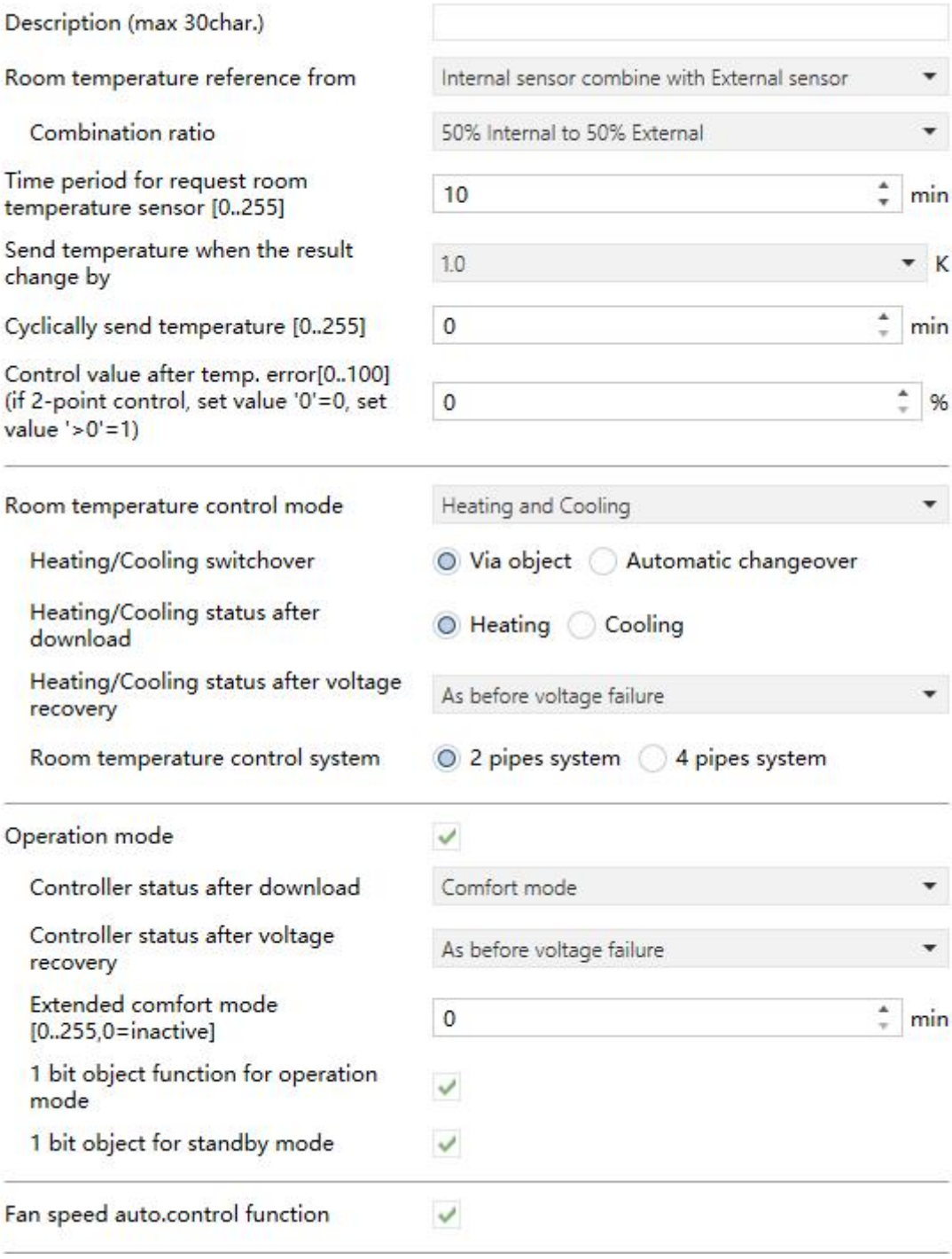
Options of the minimum: **0..50 %**; options of the maximum: **51..100 %**

Parameter“Offset for sub x to the main” (x=1~4)

This parameter is for setting output offset for sub x to the main. Options: **-100...100 %**

5.9.Parameter window“Room temperature controller”

5.9“Room temperature controller” Parameter window



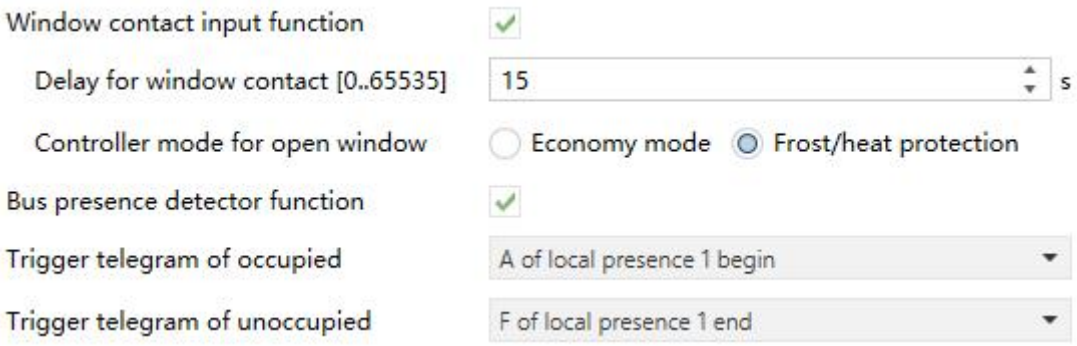


Fig.5.9 “RTC x-...” Parameter window

Parameter“RTC x”(x=1~3)

This parameter is for setting whether to enable function of room temperature controller, up to set 3 controllers.

Parameter“Description (max 30char.)”

This parameter is for setting the name description of room temperature controller.

Parameter“Room temperature reference from”

This parameter is for setting the resource of the RTC function temperature reference. Options:

Internal sensor

External sensor

Internal sensor combine with External sensor

When selecting the reference internal sensor, the temperature is determined by the setting of the “Internal sensor measurement” in the parameter interface, more details refer to chapter 5.3.

——Parameter“Time period for request room temperature sensor [0...255]”

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

Parameters as follow are visible when “Internal sensor combine with External sensor” is selected:

——Parameter“Combination ratio”

This parameter is for setting the internal sensor and the external sensor to measure the specific gravity of the temperature. Options:

10% Internal to 90% External

20% Internal to 80% External

...

90% Internal to 10% External

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 actual temperature = (internal sensor's temperature × 40%) + (external sensor's temperature × 60%), the RTC function of the device will control according to the calculated temperature.

When two sensors are combined for measurement, when one sensor is in error, the temperature value measured by the other sensor is used.

——Parameter“Send temperature when the result change by”

This parameter is for setting when temperature measurement value changes, whether to enable to send the current temperature value to the bus. Not send when disable. Options:

Disable

0.5K

1.0K

...

10K

——Parameter“Cyclically send temperature [0...255]”

Setting the time for cyclically sending the temperature measurement value to the bus. Not send when value is 0. Options: **0..255 min**

Note: cyclically sending and change sending are independent of each other.

Parameter“Control value after temp. error[0..100] (if 2-point control, set value '0'=0, set value '>0'=1)”

This parameter is for setting the control value when temperature error occur. Options: **0..100 %**

If 2-Point control, then the parameter value is 0, as well as the control value; if the parameter value is more than 0, then the control value will be 1.

Parameter“Room temperature control mode”

This parameter is for setting room temperature control mode. Options:

Heating

Cooling

Heating and Cooling

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

——Parameter"Heating/Cooling switchover"

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

Via object

Automatic changeover

——Parameter"Heating/Cooling status after download"

This parameter is for setting the heating/cooling control mode of device after download.

Options:

Heating

Cooling

——Parameter"Heating/Cooling status after voltage recovery"

This parameter is for setting the heating/cooling control mode of device after bus voltage recovery.

Options:

Heating

Cooling

As before voltage failure

As before voltage failure: when the device is reset after power on, the control mode will recover as before voltage failure.

——Parameter"Room temperature control system"

This parameter is for setting the type of RTC 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.

Parameter"Operation mode"

This parameter is for setting whether to enable RTC operation mode.

When enable, support 4 modes with comfort, standby, economy and frost/heat protection. Support datatype of 1bit and 1byte, and preset a operation mode when download and bus voltage recovery.

Parameters as follow are visible when operation mode enabled.

——Parameter"Controller status after download"

This parameter is for setting the operation mode after download. Options:

Comfort mode

Standby mode

Economy mode

——Parameter"Controller status after voltage recovery"

This parameter is for setting the operation mode after bus voltage recovery. Options:

Comfort mode

Standby mode

Economy mode

Frost/heat protection

As before voltage failure

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

This parameter is for setting the extended time of comfort mode. When value >0, activate the extended, and 1 bit object "Extended comfort mode" is visible. Options: **0..255 min**

When object receives telegram 1, comfort mode is activated. If receive telegram 1 again during the

delay time, the time will be reset. And comfort mode will return to previous operation mode once finish the timing. Exit the comfort mode when a new operation mode in delay time.

Change the operation mode will quit the timing, and heating/cooling switchover will not.

——Parameter"1 bit object function for operation mode"

This parameter is for setting whether to enable 1 bit objects of operation mode are visible. Corresponding mode activation when objects send telegram 1; Perform standby mode when object values of comfort, economy, protection received from the bus are 0.

——Parameter"1 bit object for standby mode"

This parameter is visible when previous parameter enabled. Set whether to enable 1 bit object of standby mode is visible.

Parameters as follow are visible when operation mode disabled:

——Parameter"Initial setpoint temperature"

This parameter is for setting the initial value of setpoint temperature. Options:

10.0°C

10.5°C

...

35.0°C

The setpoint temperatures can not exceed the configured range of maximum and minimum values. If not, it can not be modified on ETS. Please consider the limitations of multiple conditions when configuring.

Parameter"Fan speed auto control function"

This parameter is for setting whether to enable fan auto control interface is visible.

Parameter"Window contact input function"

This parameter is visible when operation mode enabled. Set whether to link to window contact status.

——Parameter"Delay for window contact [0..65535]"

This parameter is visible when operation mode and window contact input function are enabled. Set the delay time to window contact detection. That is, when receive a telegram "Open window", the controller will regard that as a valid signal and execute the behaviour after this delay time.

Options: **0..65535 s**

——Parameter"Controller mode for open window"

If window status is open, perform corresponding operation according to configuration. (Other control telegram receiving will be record during window is open and performed after receiving the telegram "Close window". If there is no telegram receiving when window is open, return to the mode before opening the window). Options:

Economy mode

Frost/heat protection

Parameter"Bus presence detector function"

This parameter is visible when operation mode is enabled. Set whether to link to bus presence detector status.

If presence is detected, enter the comfort mode and it will be restored to original mode after leaving. If there is a telegram/manual operation to adjust the mode during the period, the telegram is logged in the background, and it will be exited comfort mode and restored to this mode after leaving. If there is no telegram receiving during timing, return to original mode. (If receive the presence status cyclically, comfort mode can not be re-triggered, and only can be after leaving.)

——Parameter"Trigger telegram of occupied"

This parameter is for setting the external or local presence senor to trigger telegram of occupied.

Options is related to the number of local presence detector:

External presence sensor

A of local presence 1 begin

B of local presence 1 begin

C of local presence 1 begin

A of local presence 2 begin

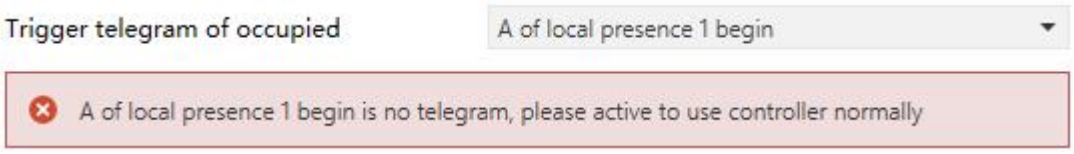
A of local presence 3 begin

A of local presence 4 begin

When there is none local presence detector, option is only **External presence sensor**

When the occupied is triggered via local sensor, you can configure the specific telegram when begin presence.

If the selected telegram is not activated, a warning is displayed, for example, select telegram A of presence detector 1 but it is not activated:



——Parameter"Trigger telegram of unoccupied"

This parameter is for setting the external or local presence senor to trigger telegram of unoccupied.

Options is related to the number of local presence detector:

External presence sensor

D of local presence 1 end

E of local presence 1 end

F of local presence 1 end

D of local presence 2 end

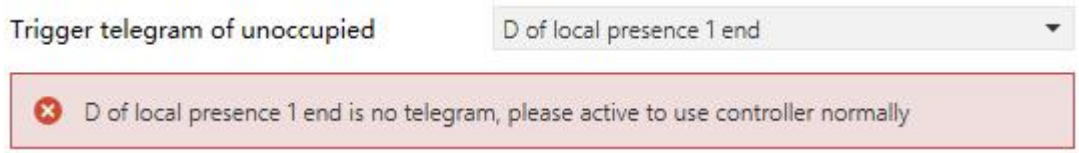
D of local presence 3 end

D of local presence 4 end

When there is none local presence detector, option is only **External presence sensor**

When the unoccupied is triggered via local sensor, you can configure the specific telegram when end presence.

If the selected telegram is not activated, a warning is displayed, for example, select telegram D of presence detector 1 but it is not activated:



Parameter"Min./Max. setpoint temperature [5..37]"

These parameters are visible when operation mode is disabled. Set to limit the adjustable range of the setpoint temperature, the minimum value should be less than the maximum value. If the setpoint temperature beyond the limited range, the will output the limited temperature. Options:

5°C

6°C

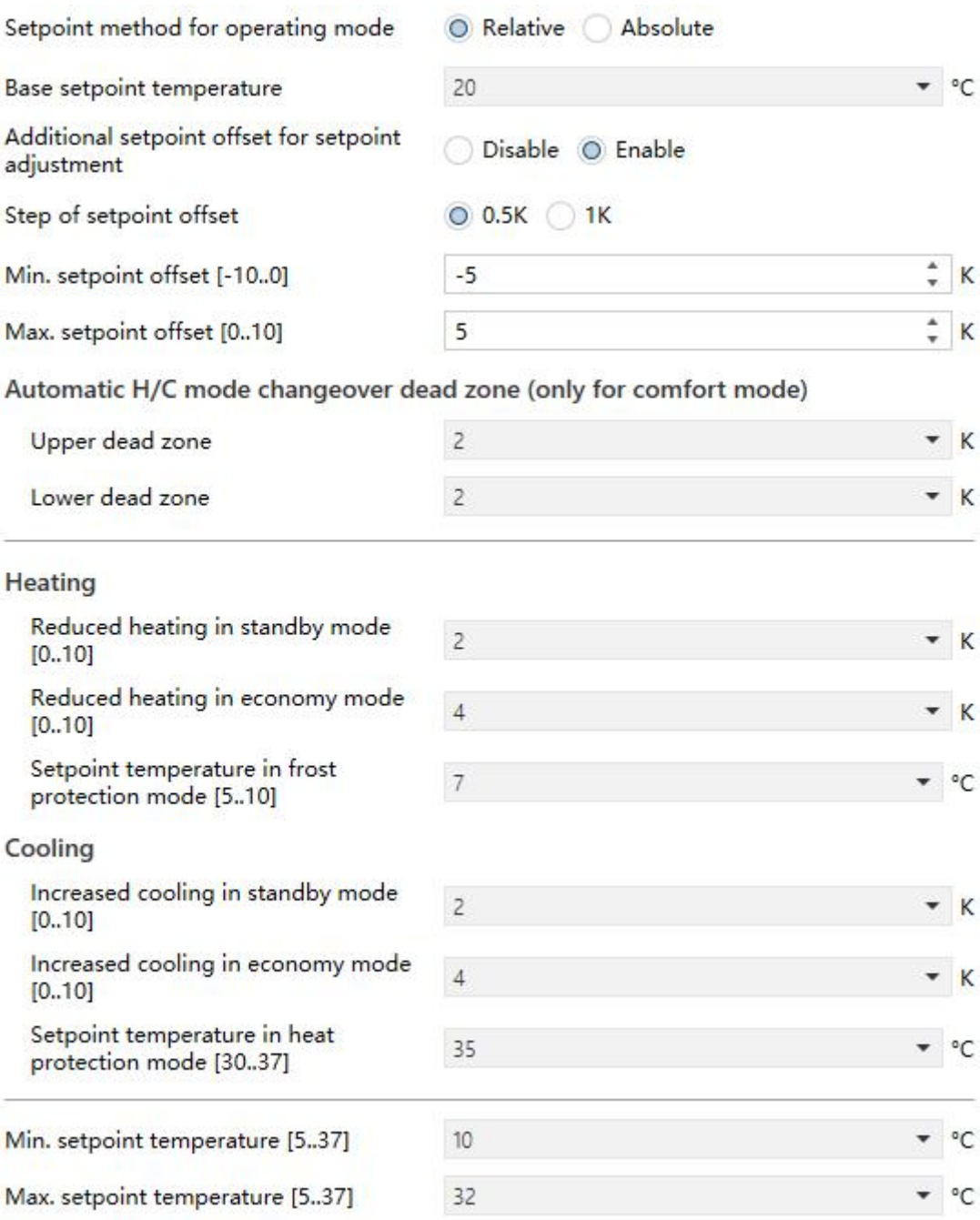
...

37°C

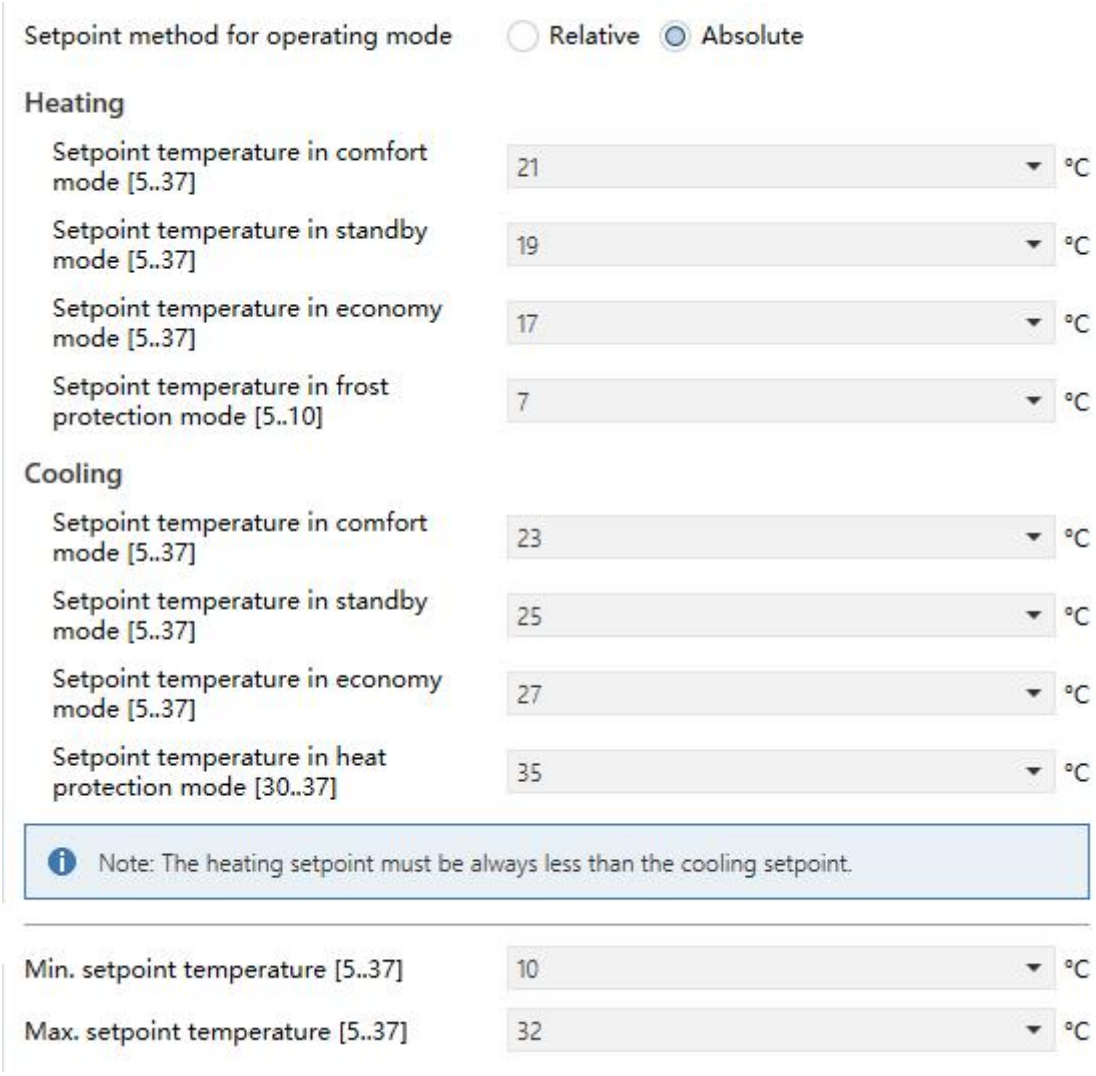
These two parameters are display below the parameters settings interface "Setpoint" when operation mode is enabled.

For setpoint temperature, the Min. value must less than the Max., if not, it can not be configured on ETS.

5.9.1.Parameter window“Setpoint”



Relative



Absolute

Fig.5.9.1 “Setpoint” Parameter window

Parameters of this window are visible when RTC operation mode enabled, display according to control mode.

Parameter"Setpoint method for operating mode"

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

Relative

Absolute

Relative: Relative adjustment, the setting temperature of economy mode and standby mode will refer to the defined temperature setpoint.

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

5.9.1.1.Relative adjustment

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

Parameter"Base setpoint temperature"

This parameter is for setting the basic setpoint temperature, from which the initial setpoint temperature of the room comfort mode is obtained. Options:

10.0°C

10.5°C

...

35.0°C

Note: the base setpoint temperature can not exceed the configured range of maximum and minimum values. If not, it can not be modified on ETS. Please consider the limitations of multiple conditions when configuring.

The setpoint value will be modified through object "Base temperature setpoint, status", then the new value will be stored after the device power off.

Current basic setpoint temperature = modified basic setpoint temperature +/- accumulated offset(if existence)

When adjusting the setpoint temperature of current operation mode, the setpoint value will be changed with it, but the relative temperature of each mode is unchanged. Relative temperature of standby, economy and comfort mode is set by the parameters as follows.

Parameter"Additional setpoint offset for setpoint adjustment"

This parameter is for setting whether to enable additional setpoint offset function for setpoint adjustment, mainly used to adjust setpoint temperature by 1 bit object. Options:

Disable

Enable

Increase/decrease offset by 1 bit object "Setpoint offset", adjust the setpoint temperature indirectly, and send offset value to the bus by 2 byte object "Float offset value". Also reset the offset

value by 1 bit object "Setpoint offset reset", modified the offset value by 2 byte object "Float offset value". Save the offset value when control mode and operation mode changed.

Three parameters as follow are visible when offset function enabled.

——Parameter"Step of setpoint offset"

This parameter is for setting step value of setpoint offset increased/decreased when receiving telegrams. Telegram 1- increase, telegram 0- decrease. Accumulated offset can be saved when power off. Options:

0.5K

1K

Setpoint temperature of current mode = base temperature + fix offset of mode + accumulated additional offset

Note: Fix offset of mode is the offset of standby and economy modes compared to comfort mode, which is decided by the follow parameters of heating/cooling. Accumulated additional offset is adjusted by 1bit object "Setpoint offset", or directly modified the offset value by 2 byte object "Float offset value".

——Parameter"Min. setpoint offset [-10..0]"

This parameter is for setting the maximum offset allowed when negative offset (setpoint temperature is decreased). Options: **-10..0 K**

——Parameter"Max. setpoint offset [0..10]"

This parameter is for setting the maximum offset allowed when forward offset (setpoint temperature is increased). Options: **0..10 K**

For offset, the Min. value and the Max. can not equal to 0 at the same time, if not, it can not be modified on ETS.

Automatic H/C mode changeover dead zone (only for comfort mode)

Parameter"Upper/Lower dead zone"

These two parameters are visible when control mode "Heating and Cooling" is selected, and "Automatic changeover" is selected. Setting the dead zone range of auto switchover heating/cooling.

Options:

0.5K

1.0K

...

10K

Under heating control, when the actual temperature(T) is greater than or equal to the setpoint temperature + the upper dead zone, then mode heating switch to cooling;

Under cooling control, when the actual temperature(T) is less than or equal to the setpoint temperature + the upper dead zone, then mode cooling switch to heating.

Parameter"Reduced heating in standby mode [0...10]"

Parameter"Increased cooling in standby mode [0...10]"

These two parameters are for setting the setpoint of economy mode. Options:

0K

1K

...

10K

Heating: The setpoint of economy mode is the base setpoint temperature minus the setting value;

Cooling: The setpoint of economy mode is the base setpoint temperature plus the setting value.

Parameter"Reduced heating in economy mode [0...10]"

Parameter"Increased cooling in economy mode [0...10]"

These two parameters are for setting the setpoint of economy mode. Options:

0K

1K

...

10K

Heating: The setpoint of economy mode is the base setpoint temperature minus the setting value.

Cooling: The setpoint of economy mode is the base setpoint temperature plus the setting value.

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

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 temperature in heat protection mode [30...37]"

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.

5.9.1.2.Absolute adjustment

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

Parameter"Setpoint temperature in comfort mode [5...37]"

Parameter"Setpoint temperature in standby mode [5...37]"

Parameter"Setpoint temperature in economy mode [5...37]"

These parameters are for setting the setpoint temperature in comfort, standby and economy mode when heating or cooling. Options:

5°C

6°C

...

37°C

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

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

5°C

6°C

...

10°C

Parameter"Setpoint temperature 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.

For absolute adjustment mode, when "Heating and Cooling" is selected, whether it is manual changeover, either bus changeover or automatic changeover, the heating setpoint value must be less than or equal to the cooling of the same operation mode. At the same time, these setpoint temperatures can not exceed the configured range of maximum and minimum values. If not, it can not be modified on ETS. Please consider the limitations of multiple conditions when configuring.

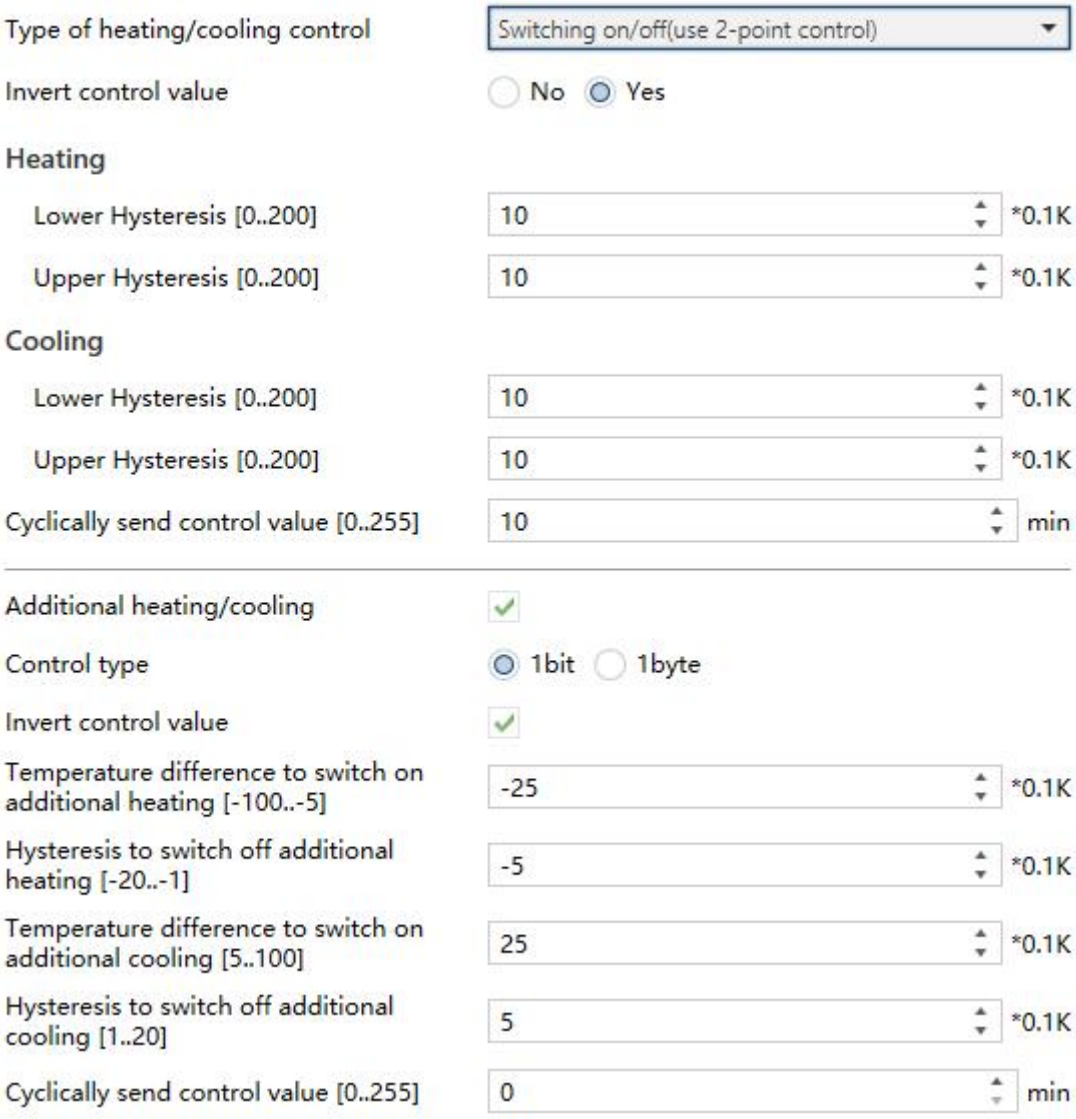
1.When the ambient temperature is higher than the setpoint temperature of current mode in cooling, it is changed to cooling mode; When the ambient temperature is lower than the setpoint temperature of current mode in heating, it is changed to heating mode.

2.In the same operation mode, the setpoint temperature difference between cooling and heating remains constant, whether it is written on the bus or adjusted on the panel. That is, when adjust the setpoint temperature, it need to update cooling and heating setpoint temperature of current operation mode at the same time.

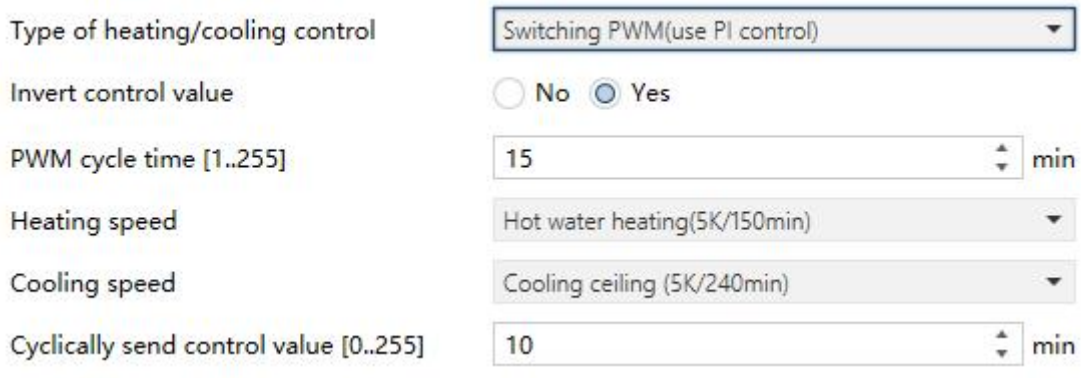
3.When the bus is received setpoint temperature, it is still necessary to limit the value according to the high and low thresholds, that is heating and cooling temperature neither can not be lower than the min., or can not be higher than the max.

Note: for relative/absolute adjustment, in protection mode, the setpoint temperature is only configured via ETS, and not limited with the min./max. value. When the received setpoint value from bus is different from the ETS configuration, the value is not updated and returned to the current setpoint temperature, to update synchronously to other devices on the bus.

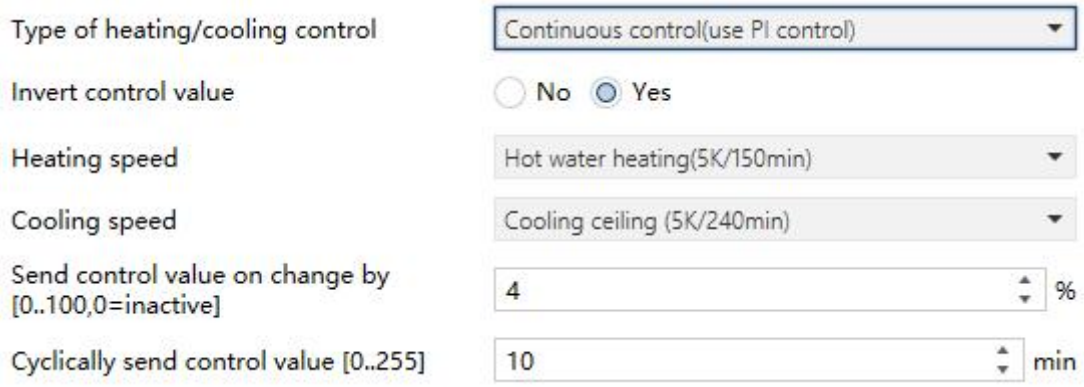
5.9.2.Parameter window“Heating/Cooling control”



“Switching on/off(use 2-point control)”



“Switching PWM(use PI control)”



"Continuous control(use PI control)"

Fig.5.9.2(1) "Heating/Cooling control" Parameter window

Parameters of this window display according to control mode and control system(2 pipe or 4pipe).

Parameter"Type of heating/cooling control"

This parameter is 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(use PI control)

Continuous control(use 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: Sending the control value to the bus through objects after inverting the control value.

Two parameters as follow are suitable for 2 point control:

——Parameter"Lower Hysteresis [0...200]"

——Parameter"Upper Hysteresis [0...200]"

These two parameters are for setting the lower/upper hysteresis temperature in RTC heating or cooling. Options: **0..200 *0.1K**

Under heating control,

When the actual temperature(T) > the setpoint temperature + the upper hysteresis temperature,

then will stop heating;

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

For example, the lower hysteresis temperature is 1K, the upper hysteresis temperature is 2K, the setpoint temperature is 22℃, if T is higher than 24℃, then it will stop heating; if T is lower than 24℃,then it will start heating; if T is between 21~24℃, then it will maintain the previous status.

Under the cooling control,

When the actual temperature (T) < the setpoint temperature -the lower hysteresis temperature, then will stop cooling;

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

For example, the lower hysteresis temperature is 1K, the upper hysteresis temperature is 2K, the setpoint temperature is 26℃, if T is lower than 25℃, then it will stop cooling; if T is lower than 28℃, then it will start cooling; if T is between 28~25℃, 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.

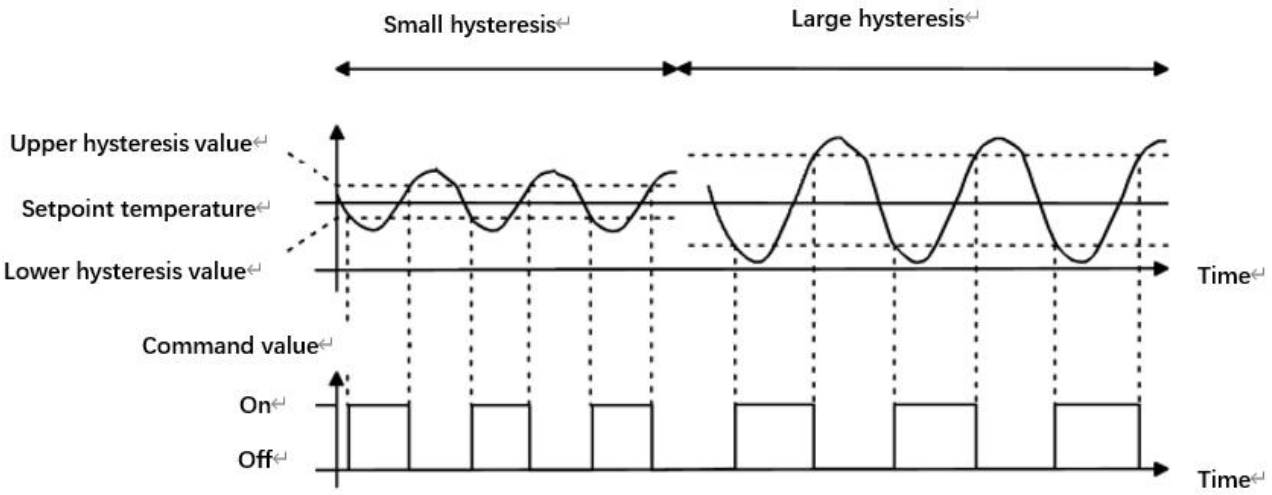


Fig.5.9.2(2) Effects of hysteresis on control value switch action(heating) under2-point control mode

These two parameters as follow are suitable for 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)

Underfloor heating (5K/240 min)

Electrical heating (4K/100min)

Split unit (4K/90min)

Fan coil unit (4K/90min)

User defined

Options:

Cooling ceiling (5K/240min)

Split unit (4K/90min)

Fan coil unit(4K/90min)

User defined

——Parameter"Proportional range [10..100]"(P value)

——Parameter"Reset time [0..255]"(I value)

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

Options: **10..100 *0.1K (P value)**

Options: **0..255 min (I value)**

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

This parameter is only visible when the control type is "Switching PWM(use 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 min**

The PI values of "Switching PWM (use PI control)" and "Continuous control (use 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.

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

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

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

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

Options: **0..255 min**

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.

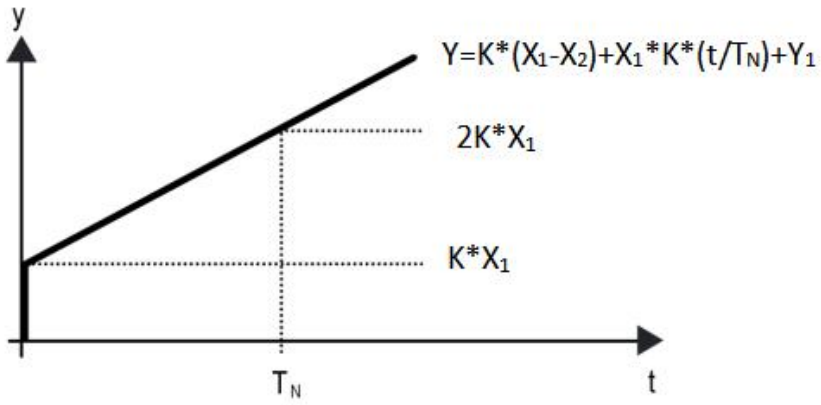


Fig.5.5.2(3) Control value of PI control mode

Y: control value

Y1: last control value

X1: temperature deviation = set temperature - actual temperature

X2: last temperature deviation = set temperature - actual temperature

TN: integration time

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

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

When the integration time is set to zero, the PI control algorithm is: Y = K (X1-X2) + Y2

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"Additional heating/cooling"

This parameter is for setting whether to activate additional control of heating/cooling valve. The control is applied to *Two valve unit in one system*, and is used to increase response of temperature control via additional coil system.

Following parameters are visible after additional control is activated:

——Parameter"Control type"

This parameter is for setting the object datatype of control value for additional heating/cooling valve. Options:

1bit

1byte

——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.

For additional heating valve:

——Parameter"Temperature difference to switch on additional heating [-100..-5]"

This parameter is for setting the temperature difference value to switch on additional heating.

Options: **-100...-5 *0.1K**

——Parameter"Hysteresis to switch off additional heating [-20..-1]"

This parameter is for setting the hysteresis valve to switch off additional heating.

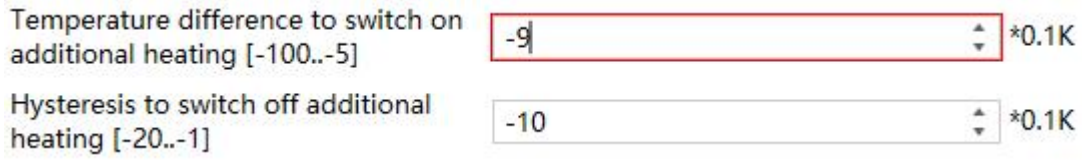
Options: **-20...-1 *0.1K**

When the actual temperature (T) < (Setpoint temperature + Temperature difference), start heating.

When the actual temperature (T) > (Setpoint temperature + Temperature difference - Hysteresis), then will stop heating.

For example, the temperature difference is -10K, the hysteresis is -2K, the setting temperature is 25℃, if T is lower than 15℃, then it will start heating; if T is higher than 17℃, then it will stop heating; if T is between 15~17℃, then it will maintain the previous status.

Note: |Hysteresis| < |Temperature difference|, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:



For additional cooling valve:

Parameter "Temperature difference to switch on additional cooling [5..100]"

This parameter is for setting the temperature difference value to switch on additional cooling.

Options: **5...100 *0.1K**

Parameter "Hysteresis to switch off additional cooling [1..20]"

This parameter is for setting the hysteresis valve to switch off additional **cooling**.

Options: **1..20 *0.1K**

When the actual temperature (T) > (Setpoint temperature + Temperature difference), start cooling.

When the actual temperature (T) < (Setpoint temperature + Temperature difference - Hysteresis), then will stop cooling.

For example, the temperature difference is 10K, the hysteresis is 5K, the setting temperature is 15℃, if T is higher than 25℃, then it will start cooling; if T is lower than 20℃, then it will stop cooling; if T is between 20~25℃, then it will maintain the previous status.

Note: |Hysteresis| < |Temperature difference|, if not meet the condition, they can not be configured in ETS, and display red box warning, as shown as follow:

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

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

Options: **0..255 min**

5.9.3.Parameter window“Fan auto.control”

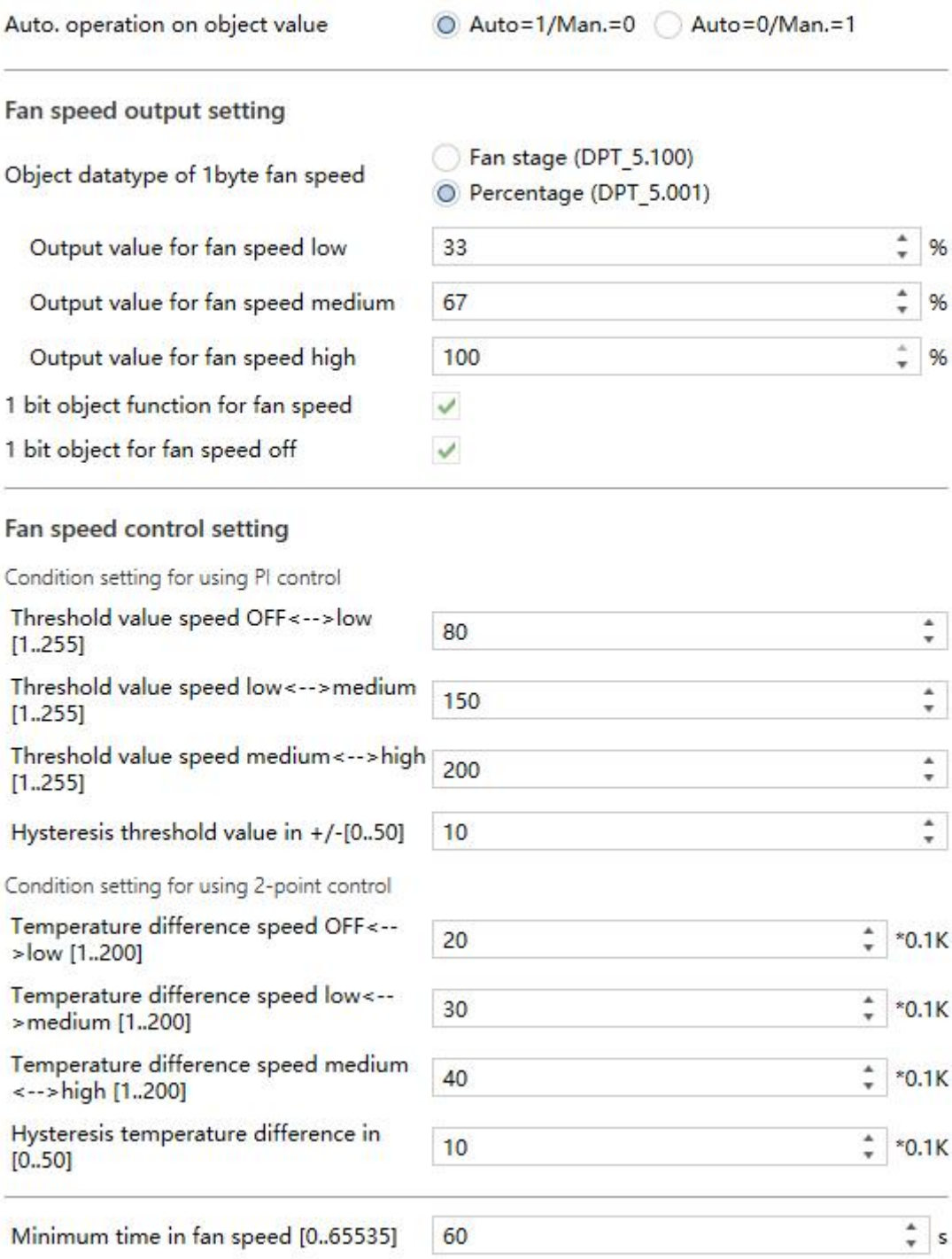


Fig.5.9.3 “Fan” Parameter window

Parameters of this window are visible when fan auto control enabled.

Parameter“Auto. operation on object value”

This parameter is for setting the telegram value to activate automatic operation. Options:

Auto=1/Man.=0

Auto=0/Man.=1

Auto=1/Man.=0: When the object “Fan automatic operation” receives the telegram value “0”, activate the automatic operation, when receive “1”, exit the automatic operation.

Auto=0/Man.=1: When the object “Fan automatic operation” receives the telegram value “1”, activate the automatic operation, when receive “0”, exit the automatic operation.

After power-on, automatic operation is not activated by default.

Fan speed output setting

Parameter"Object datatype of 1byte fan speed"

This parameter is for setting the object datatype of 1 byte fan speed. Options:

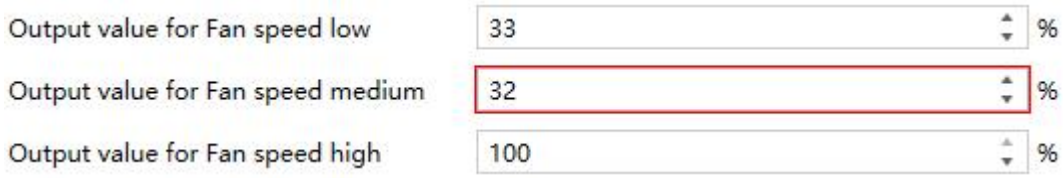
Fan stage (DPT 5.100)

Percentage (DPT 5.001)

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

These three parameters are for setting the value sent for each fan speed switchover. Fan speed off when value is 0. Options according to fan object datatype: **1..255 /1..100 %**

Note: the out value and status value must meet the condition low<medium<high, if not, they can not be configured on ETS, and display red box warning, as shown as follow:



Parameter"1 bit object function for fan speed"

This parameter is for setting whether to enable 1 bit object function for fan speed. 1 bit control objects of each fan speed are visible when enabled.

Parameter"1 bit object for fan speed off "

This parameter is visible when previous parameter is enabled. Set whether to enable 1 bit object of fan speed off.

Fan speed control setting

Condition setting for using 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"Threshold value speed OFF<-->low [1..255]"

Define threshold value for off-fan and low-level fan speeds, options: **1..255**

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

Parameter"Threshold value speed low<-->medium [1..255]"

Define the threshold value for switching the fan speed to medium fan speed, if the control value is greater than or equal to this setting threshold, the medium fan speed will start running. Options: **1..255**

Parameter"Threshold value speed medium<-->high [1..255]"

Define the threshold for switching the fan speed to high fan speed, if the control value is greater than or equal to this setting threshold, the high fan speed will start running. Options: **1..255**

Note: The controller evaluates the threshold in ascending order.

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

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

The threshold of OFF <-> low fan speed is lower than that of low fan speed <-> medium fan speed, and the threshold of low fan speed <-> medium fan speed is lower than that of medium fan speed <-> high fan speed. If not, they can not be configured on ETS, and display red box warning, as shown as follow:

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

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..50**

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.

Condition setting for using 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 speed OFF<-->low [1..200] "

This parameter is for setting the temperature difference between off-fan and low-level fan speeds.

Options: **1..200 *0.1K**

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

Parameter"Temperature difference speed low<-->medium [1..200]"

Define the temperature difference for switching the fan speed to medium fan speed, if the control value is greater than or equal to this setting temperature difference, the medium fan speed will start running. Options: **1..200 *0.1K**

Parameter"Temperature difference speed medium<-->high [1..200]"

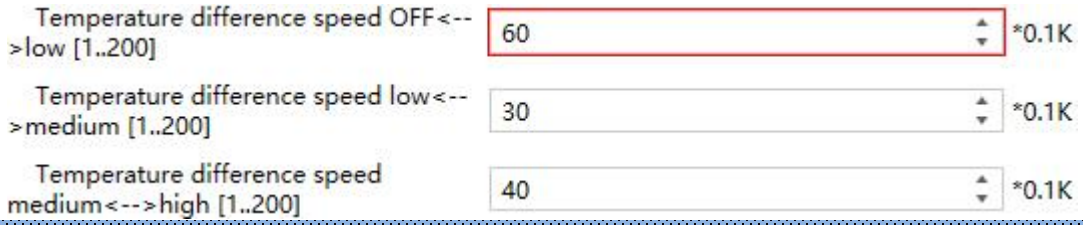
Define the temperature difference for switching the fan speed to high fan speed, if the control value is greater than or equal to this setting temperature difference, the high fan speed will start running. Options: **1..200 *0.1K**

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

First check → OFF <->low fan speed temperature difference → low fan speed <->medium fan

speed →medium fan speed <->high fan speed.

If not meet the condition, they can not be modified on ETS, and display red box warning, as shown as follow:



Parameter"Hysteresis temperature difference in [0..50]"

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..50 *0.1K**

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

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

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

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 s**

0: there is no minimum running time.

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

5.10.Parameter window“Ventilation controller”

This parameter window is visible when “Ventilation controller” is selected as the controller type,which realizes the automatic control of wind speed, and the linkage control of wind speed with PM2.5, CO2, TVOC detection value, as shown in Fig.5.10.

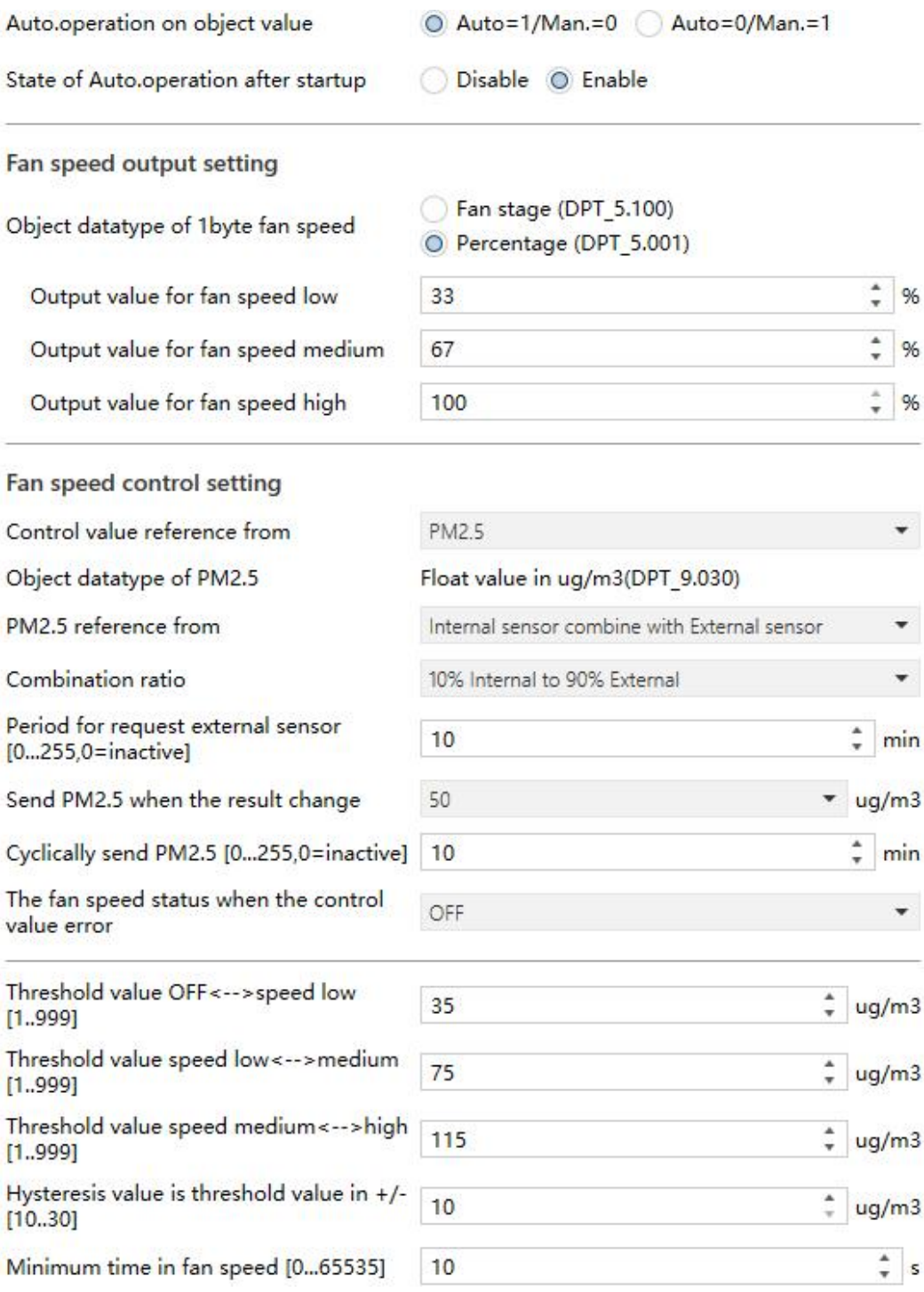


Fig.5.10 “Ventilation controller”Parameter window

Parameter"Auto. operation on object value"

This parameter is for setting the telegram value to activate automatic operation. Options:

Auto=1/Man.=0

Auto=0/Man.=1

Auto=1/Man.=0: When the object "Fan automatic operation" receives the telegram value "1", activate the automatic operation, when receive "0", exit the automatic operation.

Auto=0/Man.=1: When the object "Fan automatic operation" receives the telegram value "0", activate the automatic operation, when receive "1", exit the automatic operation.

After power-on, automatic operation is not activated by default.

Parameter"State of Auto.operation after startup"

This parameter is for setting whether to enable state of Auto.operation after startup the device. Options:

Disable

Enable

Fan speed output setting

Parameter"Object datatype of 1byte fan speed"

This parameter is for setting the object datatype of 1 byte fan speed. Options:

Percentage (DPT_5.001)

Fan stage (DPT_5.100)

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

These three parameters are for setting the value sent for each fan speed switchover. Fan speed off when value is 0.

Options: **1..255 /1..100%, displayed according to the setting of the parameter "Object datatype of 1byte fan speed"**

Fan speed control setting

Parameter"Control value reference from"

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

PM2.5

CO2

TVOC

Parameter" Object datatype of PM2.5/CO2/TVOC"

These parameters display the object datatype of PM2.5/CO2/TVOC.

Parameter"PM2.5/CO2/TVOC reference from"

This parameter is for setting the resource of the PM2.5/CO2/TVOC reference. Options:

Internal sensor

External sensor

Internal and External sensor combination

When selecting the reference internal sensor, the PM2.5/CO2/TVOC is determined by the setting of the "Internal sensor measurement" in the parameter interface, more details refer to chapter 5.3.

——Parameter"Period for request external sensor [0...255,0=inactive]"

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

Parameters as follow are visible when "Internal sensor combine with External sensor" is selected:

——Parameter"Combination ratio"

This parameter is for setting the internal sensor and the external sensor to measure the specific gravity of the PM2.5/CO2/TVOC. Options:

10% Internal to 90% External

20% Internal to 80% External

…

80% Internal to 20% External

90% Internal to 10% External

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 actual PM2.5/CO2/TVOC = (internal sensor's

PM2.5/CO2/TVOC × 40%) + (external sensor's PM2.5/CO2/TVOC × 60%), the controller function of the device will control according to the calculated PM2.5/CO2/TVOC.

When two sensors are combined for measurement, when one sensor is in error, the PM2.5/CO2/TVOC value measured by the other sensor is used.

——Parameter"Send PM2.5/CO2/TVOC when the result change "

This parameter is for setting when PM2.5/CO2/TVOC measurement value changes, whether to enable to send the current PM2.5/CO2/TVOC value to the bus. Not send when disable.

Options**:[Disable]/[10...50ug/m3]/[10...500ppm]/[10...500ug/m3]/[0.01...0.5ppm],Displayed according to the settings of the parameters "Control value reference from" and "Object datatype of TVOC"**

——Parameter"Cyclically send PM2.5/CO2/TVOC [0...255,0=inactive]"

Setting the time for cyclically sending the PM2.5/CO2/TVOC measurement value to the bus. Not send when value is 0. Options: **0..255 min**

Parameter"The fan speed status when the control value error"

This parameter is for setting the default fan speed of ventilation system when control value is error.

Options:

Off

Low

Medium

High

Parameter"Threshold value OFF<-->speed low [1..999]/ [1..4000]"

Define threshold value for off-fan and low-level fan speeds.

Options: **1..999/1..4000, Displayed according to the setting of the parameter "Control value reference from"**

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

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

Define the threshold value for switching the fan speed to medium fan speed, if the control value is greater than or equal to this setting threshold, the medium fan speed will start running.

Options: **1..999/1..4000, Displayed according to the setting of the parameter "Control value reference from"**

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

Define the threshold for switching the fan speed to high fan speed, if the control value is greater than or equal to this setting threshold, the high fan speed will start running.

Options: **1..999/1..4000, Displayed according to the setting of the parameter "Control value reference from"**

Note: The controller evaluates the threshold in ascending order.

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

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

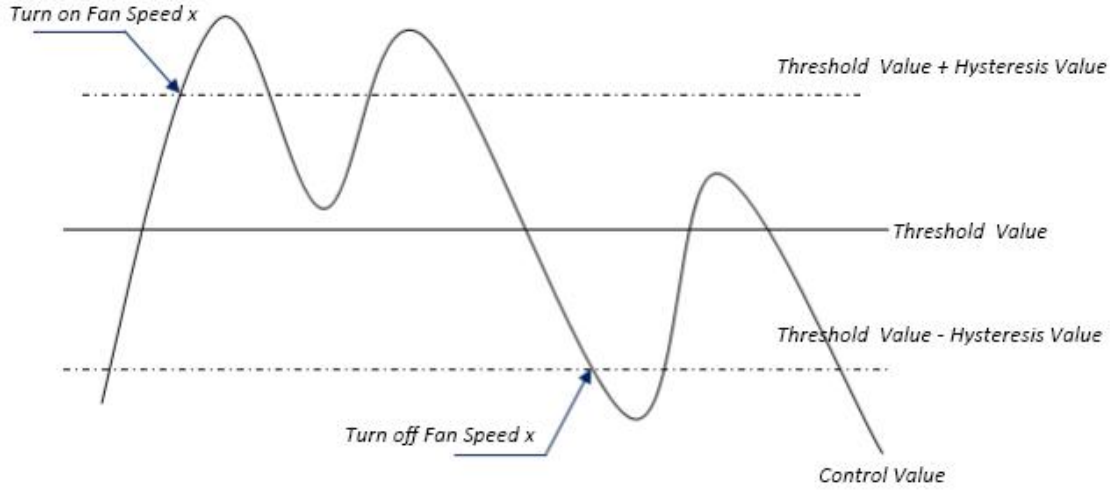
The threshold of OFF <-> low fan speed is lower than that of low fan speed <-> medium fan speed, and the threshold of low fan speed <-> medium fan speed is lower than that of medium fan speed <-> high fan speed.

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

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..30/100..400, Displayed according to the setting of the parameter "Control value reference from"**

For example, the control type is CO2, the Hysteresis value is 100 and the threshold is 450, then the upper limit threshold 550 (Threshold value+Hysteresis value) and the lower limit threshold 350 (Threshold value-Hysteresis value). When the control value is between 350 ~550, fan action will not be caused, and the previous status will still be maintained. Only less than 350 or greater than or equal to 550 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 <-> Low fan speed threshold value is 35

Low fan speed <->Medium fan speed threshold value is 55

Medium fan speed <-> 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 (⩾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 <-> Low fan speed threshold value is 20

Low fan speed <->Medium fan speed threshold value is 40

Medium fan speed <-> 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（≥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.

5.11.Parameter window“Logic function”

Parameter window “Logic function” as shown as Fig.5.11, for enable logic function, up to 8 logic functions can be configured.

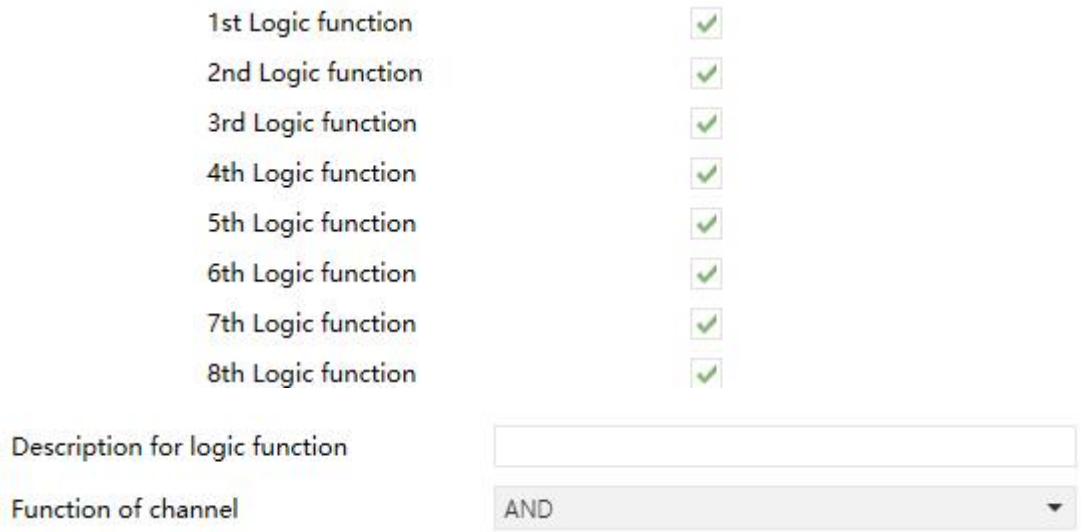


Fig.5.11 “Logic function” Parameter window

Parameter“1st/2nd/3rd... Logic function”

This parameter is for setting the setting interface of logic function, display corresponding logic function page when select. Up to enable 8 logic functions.

Parameter“Description for logic function”

This parameter is for setting the name description for logic function, up to input 30 characters.

Parameter“Function of channel”

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

AND

OR

XOR

Gate forwarding

Threshold comparator

Format convert

Gate function

Delay function

Staircase lighting

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.

5.11.1.“AND/OR/XOR”

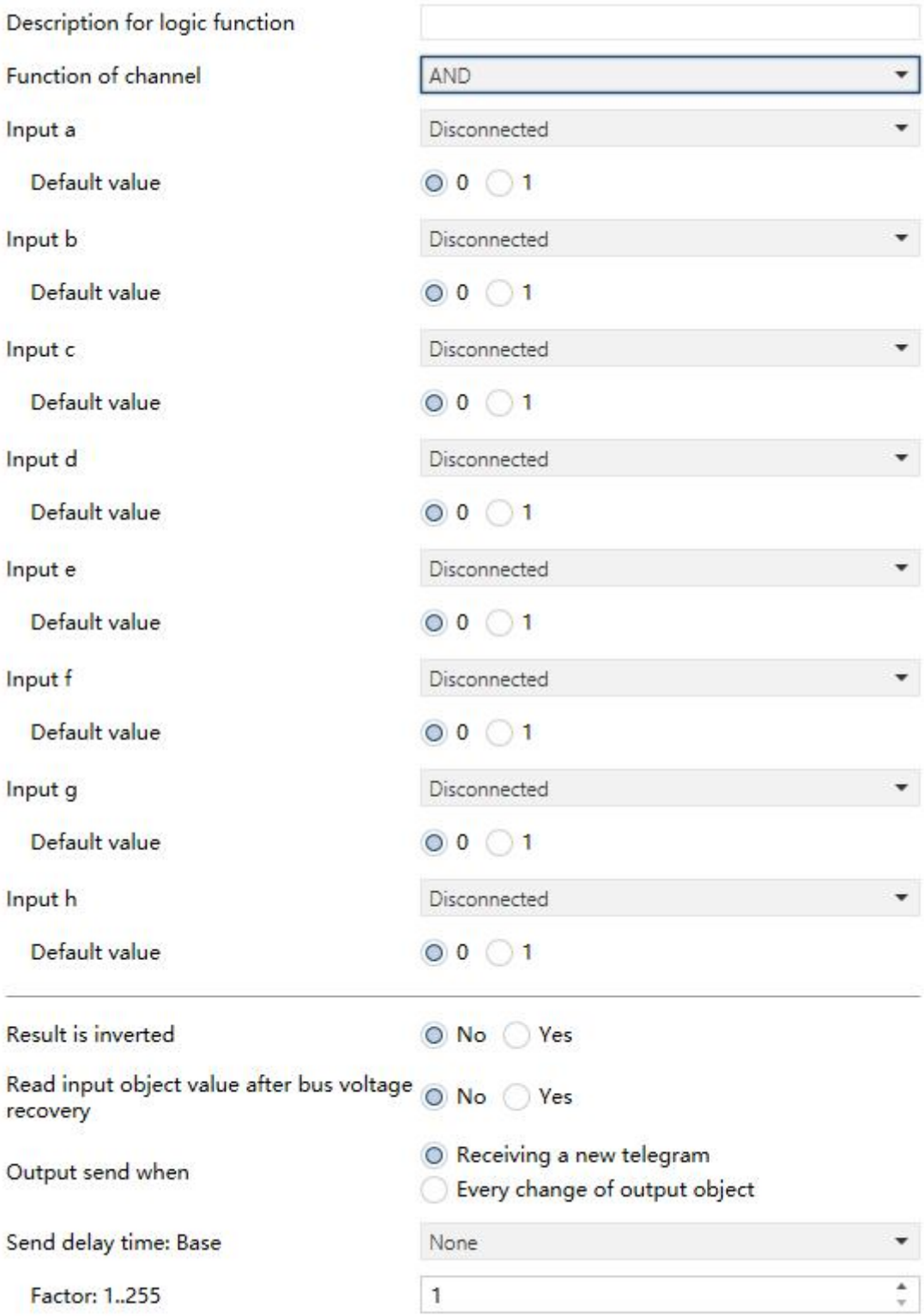


Fig.5.11.1 “Logic function_AND/OR/XOR” Parameter window

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:

Disconnected

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"Result is inverted"

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

No

Yes

No: output directly;

Yes: output after inverting.

Parameter"Read input object value after bus recovery"

This parameter is for setting whether to send the read request to the logic input object after bus voltage recovery or finish programming. Options:

No

Yes

Parameter"Output send when"

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

Receiving a 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"Send delay time"

Base: **None**

0.1s

1s

...

10s

25s

Factor: **1..255**

This parameter is for setting the delay time for sending the logic calculation result to the bus. Delay time = Base × Factor, if option "None" of Base is selected, then there is no delay.

5.11.2.“Gate forwarding”

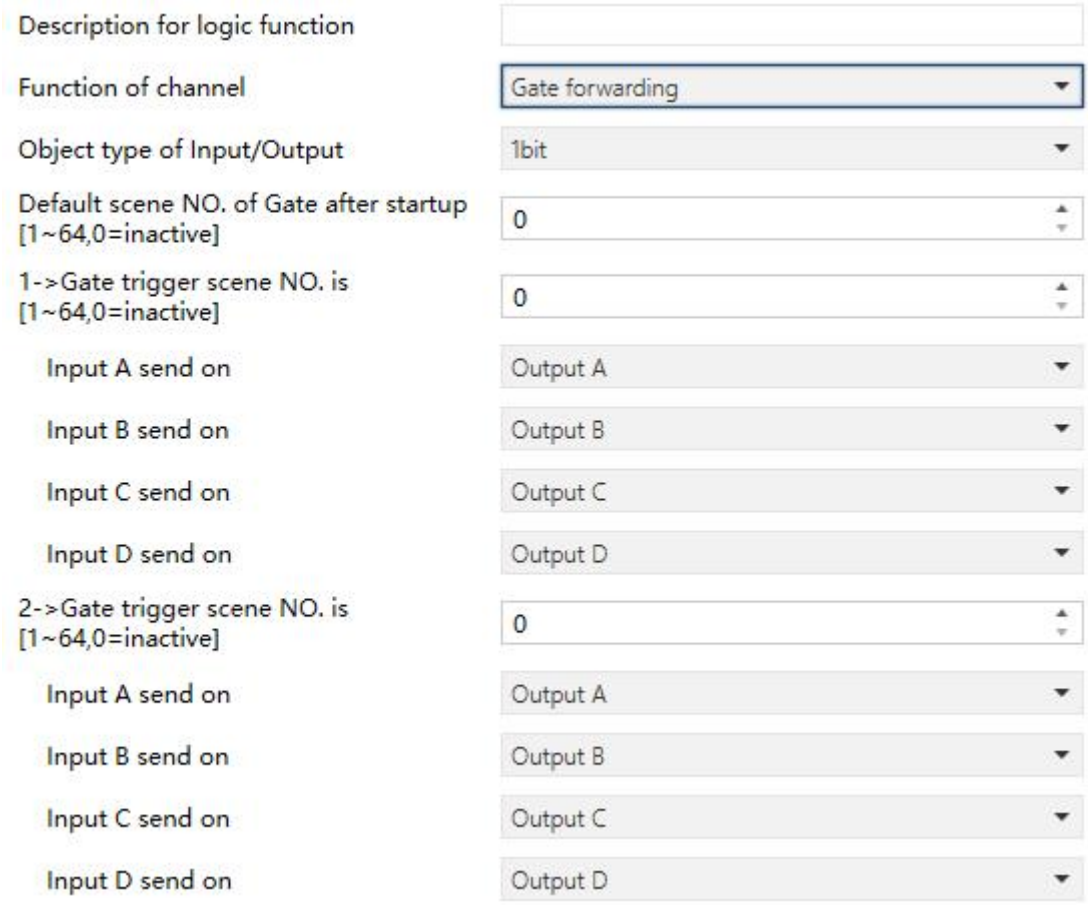


Fig.5.11.2 “Logic function_Gate forwarding” Parameter window

Parameter“Object type of Input/Output”

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

1bit

4bit

1byte

Parameter“Default scene NO. of Gate after startup [1..64, 0=inactive]”

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： **1..64, 0=inactive**

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

Parameter“z->Gate trigger scene NO.[1..64,0=inactive]” (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: **1..64, 0=inactive**

——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:

Output A

Output B

...

Output 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.

5.11.3.“Threshold comparator”

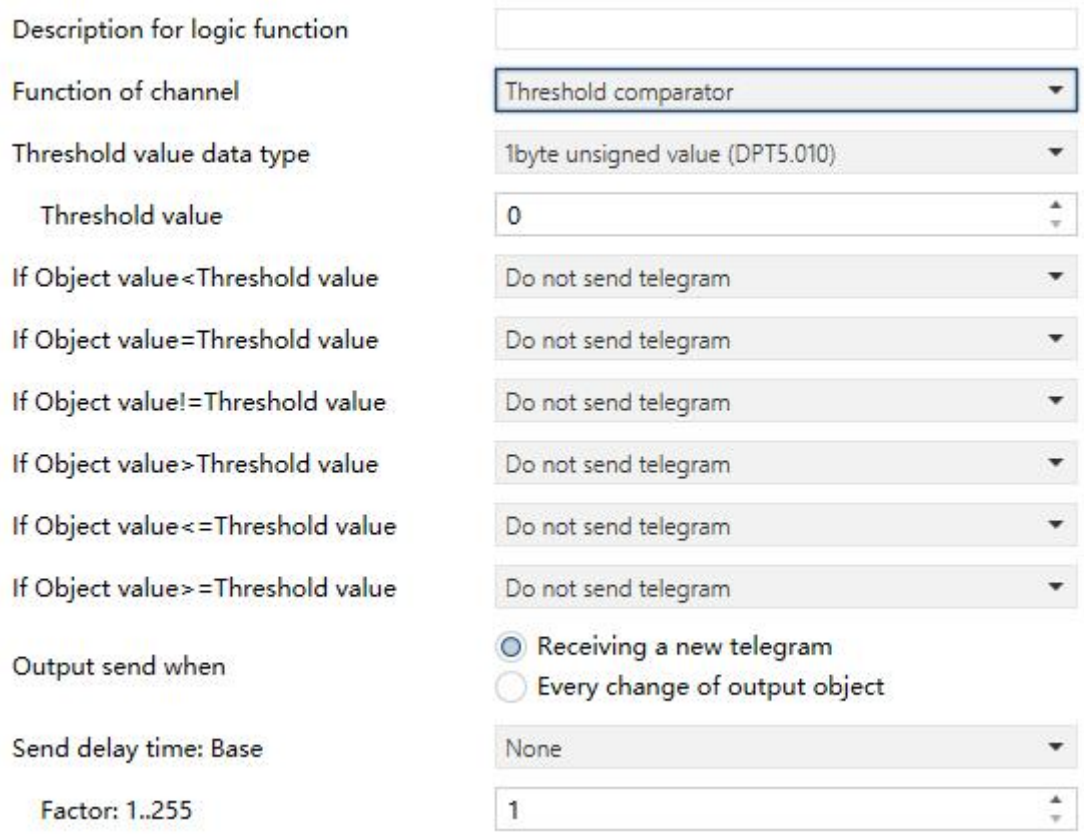


Fig.5.11.3 “Logic function_Threshold comparator” Parameter window

Parameter“Threshold value data byte”

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

4bit value (DPT3.007) **4byte unsigned value[0..4294967295]**

1byte unsigned value (DPT5.010) **Ext. temperature value (DPT 9.001)**

2byte unsigned value (DPT7.001) **Ext. humidity value (DPT 9.007)**

2byte signed value (DPT8.x) **Illuminance value (DPT 9.004)**

2byte float value (DPT9.x)

——Parameter“Threshold value”

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

4bit value (DPT3.007) 0..15 /1byte unsigned value (DPT5.010) 0..255 /

2byte unsigned value (DPT7.001) 0..65535 / 2byte signed value (DPT8.x) -32768..32767 /

2byte float value (DPT9.x) -670760...670760 / 4byte unsigned value[0..4294967295]

0..4294967295 /

Ext. temperature value (DPT 9.001) -20..95℃ / Ext. humidity value (DPT 9.007) 0..100% /

Illuminance value (DPT 9.004) 0..65535lux

Parameter"Hysteresis threshold value"

This parameter is visible when object datatype is selected "2byte float value (DPT9.x)", "Illuminance value (DPT 9.004)". Set the hysteresis threshold value. Options: **0..500**

Parameter"If Object value<Threshold value"

Parameter"If Object value=Threshold value"

Parameter"If Object value!=Threshold value"

Parameter"If Object value>Threshold value"

Parameter"If Object value<=Threshold value"

Parameter"If Object value>=Threshold value"

This parameter is for setting the logic result value that should be sent when threshold value Less than, equal to, not equal to, greater than, less than or equal to the setting valve. When object datatype is selected "2byte float value (DPT9.x)", can only set the object value less than or greater than threshold value. Options:

Do not send telegram

Send value "0"

Send value "1"

Do not send telegram: not consider to select this option;

Send value "0"/"1": when condition is satisfied, send telegram 0 or1.

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. **For example: parameter "If Object value=Threshold value" is set to be "Send value "0" "; parameter "If Object value<=Threshold value" is set to be "Send value "1" "; when object value is equal to the threshold value, then the logic result will send "1".**

Parameter"Output send when"

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

Receiving a 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.

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

Parameter"Send delay time: Base"

Base:

None

0.1s

1s

...

25s

Factor: 1..255

This parameter is for setting the delay time for sending the logic algorithm result to the bus. Delay time = Base x Factor, if option “None” of Base is selected, then there is no delay.

5.11.4.“Format convert”

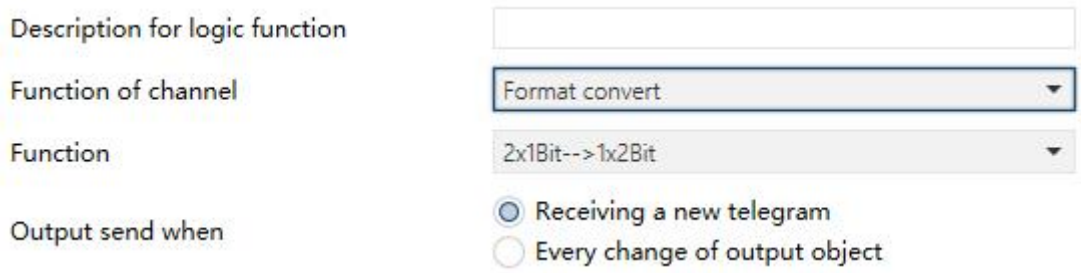


Fig.5.11.4 “Logic function _Format convert” Parameter window

Parameter”Function”

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:

Receiving a 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.

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

5.11.5.“Gate function”

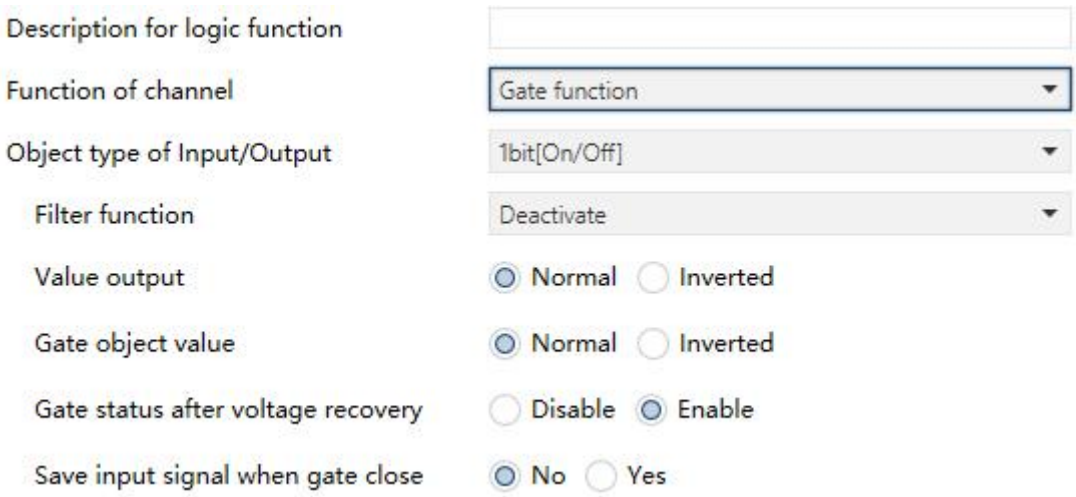


Fig.5.11.5 “Gate function” Parameter window

Parameter”Object type of Input/Output”

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

1bit[On/Off]

1byte[0..100%]

1byte[0..255]

2byte[Float]

2byte[0..65535]

——Parameter”Filter function”

This parameter is visible when “1bit[On/Off]” is selected. Set whether to filter On or Off telegram, only pass one of them or pass all. Options:

Deactivate

On filter out

Off filter out

Deactivate: Do not filter the On or Off telegrams;

On filter out: Off can pass, On cannot pass;

Off filter out: On can pass, Off cannot pass.

——Parameter”Value output”

This parameter is visible when "1bit[On/Off]" is selected. Set whether to invert the value then output it. Options:

Normal

Inverted

——Parameter"Gate object value"

This parameter is for setting whether to invert the gate object value then output it. Options:

Normal

Inverted

——Parameter"Gate status after voltage recovery"

This parameter is for setting the gate status after bus voltage recovery. Options:

Disable

Enable

——Parameter"Save input signal when gate close"

This parameter is for setting whether to save input signal on gate close. Options:

No

Yes

No: disable to save the input, the input values received during the gate closing period are ignored;

Yes: enable to save the input, the input values received during the gate closing period are output when gate is open (whether the input value is changed or not).

5.11.6.“Delay function”

Fig.5.11.6 “Delay function” Parameter window

Parameter"Object type of Input/Output"

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

1bit[On/Off]

1byte[0..100%]

1byte[0..255]

2byte[Float]

2byte[0..65535]

——Parameter"Delay time [0..6500]"

This parameter is for setting the delay time that output object forwards the value when the input object receives the telegram. Options: **0..6500s**

Note: Receive telegram again in delay time, re-timing.

5.11.7.“Staircase lighting”

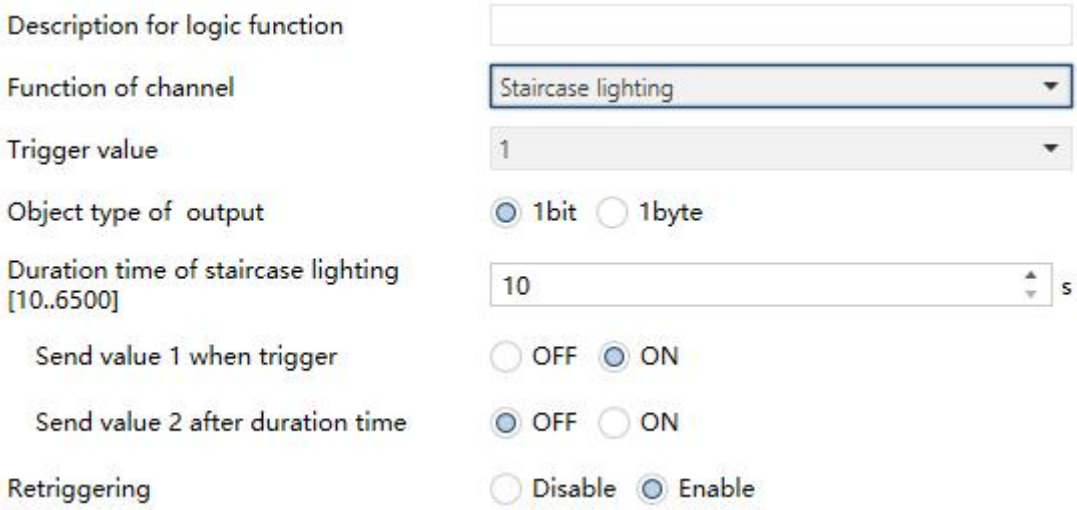


Fig.5.11.7 “Staircase lighting” Parameter window

Parameter“Trigger value”

This parameter is for setting the telegram value of the object “Trigger value”. Options:

0

1

0 or 1

Parameter“Object type of output”

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

1bit

1byte

Parameter“Duration time of staircase lighting[10..6500]”

This parameter is for setting duration time of staircase lighting after the stair light power on.

可选项：**10..6500s**

——Parameter“Send value 1 when trigger”

——Parameter“Send value 2 after duration time”

These parameters are for setting the value to send. Send value 1 when trigger, and then send value 2 after duration time. Options display according to the output object datatype.

When 1 bit, options:

OFF

ON

When 1 byte , options: **0..255**

Parameter"Retriggering"

This parameter is for setting whether to trigger re-timing when received trigger value in delay time.

Options: **Disable / Enable**

5.12.Parameter window"Scene Group function"

Parameter window "Scene Group function", for enable scene group setting, up to 8 scene group functions can be configures, there are 8 outputs of each group, as shown as following.

5.12(1) "Scene Group function"Parameter window

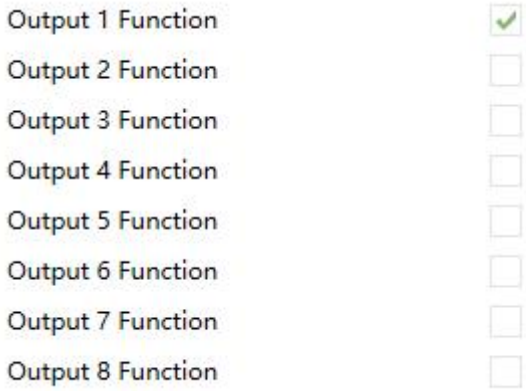


Fig.5.12(2) "Group X"Parameter window

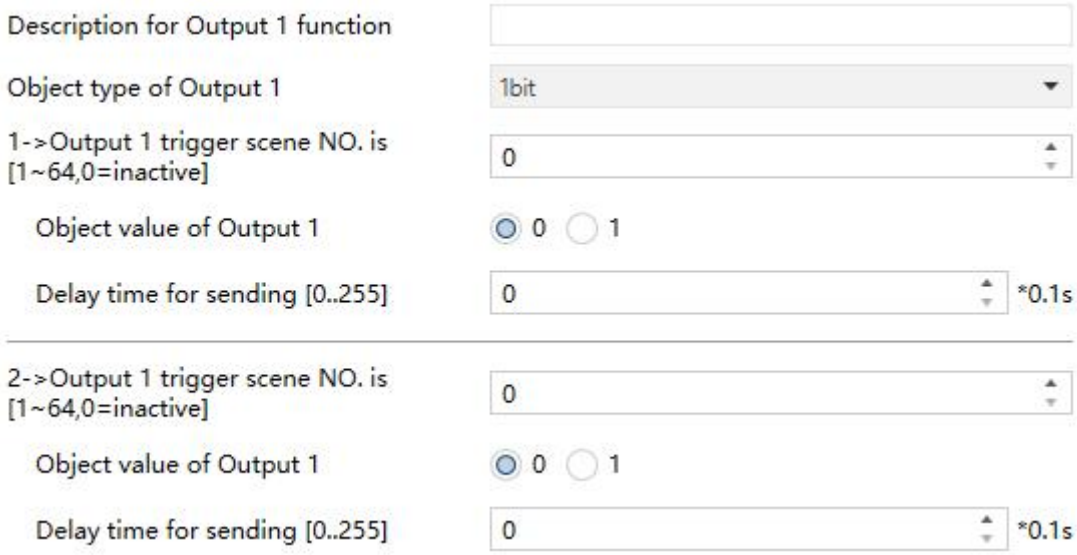


Fig.5.12(3) "Output Y function"Parameter window

Parameter"Scene Group x Function,(X=1-8)"

This parameter is for setting whether to enable scene group x function, up to 8 scene groups.

Parameter"Output y Function,(y=1-8)"

This parameter is for setting whether to enable output y of scene group x, up to 8 output functions for each scene group.

As 8 group functions are the same, and 8 output functions of each group as well, the following description only about one output of a group.

Parameter"Description for Output y function,(y=1-8)"

This parameter is for setting the name description for output y of group x, up to input 30 characters.

Parameter"Object type of Output 1 y,y=(1-8)"

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

1bit

1byte

2byte

RGB

RGBW

——Parameter"Object datatype"

This parameter is for setting the datatype of 1byte or 2byte.

When the datatype is 1byte, options:

1byte unsigned value

HVAC mode

When the datatype is 2byte, options:

2byte unsigned value

Temperature value

Parameter"z->Output 1 trigger scene NO. is [1~64,0=inactive],(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 of Output y"

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-1byte unsigned value, options: **0..255**

When the datatype is 1byte-HVAC mode, options:

Comfort mode

Standby mode

Economy mode

Frost/heat protection

When the datatype is 2byte-2byte unsigned value, options: **0..65535**

When the datatype is 2byte-Temperature value, options:

-5°C

-4°C

...

45°C

——Parameter"RGB value of Output y"

When the datatype is RGB, used to set the RGB value. Options:**#000000...#FFFFFF**

——Parameter"White value of Output y"

When the datatype is RGBW, used to set the white value. Options:**0.255**

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

This parameter is for setting the delay time. Options: **0..255**

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

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	1	General	In operation			1 bit	C	R	-	T	-	switch	低
	443	Extension function	Night mode			1 bit	C	-	W	T	U	day/night	低
	444	Extension function	Alarm LED indication			1 bit	C	-	W	-	-	alarm	低

Fig.6.1 "General"Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
1	In operation	General	1bit	C,R,T	1.001 switch
The communication object is used to periodically send a telegram "1" to the bus to indicate that the device is working properly.					
443	Night mode	Extension function	1bit	C,W,T,U	1.024 day/night
This communication object is used to receive day/night status from the bus. Telegram value: 0 —— Day 1 —— Night					
444	Alarm LED indicator	Extension function	1bit	C,W	1.005 alarm
This communication object triggers the alarm LED indication via an external 1bit object. Telegram: 0—— Disarm 1 —— Alarm					

Table 6.1 "General"Communication Object

6.2.“Internal sensor measurement”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	2	Internal sensor	Brightness value			2 bytes	C	R	-	T	-	lux (Lux)	低
	3	Internal sensor	Brightness correction[-500..500]			2 bytes	C	-	W	-	-	pulses difference	低
	4	Internal sensor	Temperature value			2 bytes	C	R	-	T	-	temperature (°C)	低
	5	Internal sensor	Low temperature alarm			1 bit	C	R	-	T	-	alarm	低
	6	Internal sensor	High temperature alarm			1 bit	C	R	-	T	-	alarm	低
	7	Internal sensor	Humidity value			2 bytes	C	R	-	T	-	humidity (%)	低
	8	Internal sensor	Low humidity alarm			1 bit	C	R	-	T	-	alarm	低
	9	Internal sensor	High humidity alarm			1 bit	C	R	-	T	-	alarm	低
	10	Internal sensor	CO2 value			2 bytes	C	R	-	T	-	parts/million (ppm)	低
	11	Internal sensor	CO2 error report			1 bit	C	R	-	T	-	boolean	低
	12	Internal sensor	Low CO2 alarm			1 bit	C	R	-	T	-	alarm	低
	13	Internal sensor	High CO2 alarm			1 bit	C	R	-	T	-	alarm	低
	14	Internal sensor	PM2.5 value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	15	Internal sensor	PM2.5 error report			1 bit	C	R	-	T	-	boolean	低
	16	Internal sensor	PM2.5 alarm			1 bit	C	R	-	T	-	alarm	低
	17	Internal sensor	PM10 value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	18	Internal sensor	PM10 error report			1 bit	C	R	-	T	-	boolean	低
	19	Internal sensor	PM10 alarm			1 bit	C	R	-	T	-	alarm	低
	20	Internal sensor	TVOC value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	21	Internal sensor	TVOC error report			1 bit	C	R	-	T	-	boolean	低
	22	Internal sensor	TVOC alarm			1 bit	C	R	-	T	-	alarm	低
	23	Internal sensor	Formaldehyde value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	24	Internal sensor	Formaldehyde error report			1 bit	C	R	-	T	-	boolean	低
	25	Internal sensor	Formaldehyde alarm			1 bit	C	R	-	T	-	alarm	低

Fig.6.2 “Internal sensor measurement”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
2	**Brightness value**	**Internal sensor**	**2byte**	**C,R,T**	**9.004 lux**
The communication object is used to send the brightness value detected by the built-in brightness sensor of the device to the bus.					
3	**Brightness correction[-500...500]**	**Internal sensor**	**2byte**	**C,W**	**8.001 pulse difference**
The communication object is used to correct brightness value via bus, the limit value is taken when the calibration value exceeds the range.					
4	**Temperature value**	**Internal sensor**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is used to send the temperature value detected by the built-in temperature sensor of the device to the bus.					
5	**Low temperature alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the low temperature alarm signal to bus, when temperature lower than low threshold that defined by parameter.					
6	**High temperature alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**

The communication object is used to send the high temperature alarm signal to bus, when temperature higher than high threshold that defined by parameter.					
7	**Humidity value**	**Internal sensor**	**2byte**	**C,R,T**	**9.007 humidity**
The communication object is used to receive humidity measurements sent from the humidity sensor on the bus.					
8	**Low humidity alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the low humidity alarm signal to bus, when humidity lower than low threshold that defined by parameter.					
9	**High humidity alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the high humidity alarm signal to bus, when humidity higher than high threshold that defined by parameter.					
10	**CO2 value**	**Internal sensor**	**2byte**	**C,R,T**	**9.008 parts/million(ppm)**
The communication object is used to send the CO2 value measured by the built-in CO2 sensor of the device to the bus.					
11	**CO2 error report**	**Internal sensor**	**1bit**	**C,R,T**	**1.002 boolean**
The communication object is used to send CO2 error report to the bus. Options: 1——Error 0——Normal					
12	**Low CO2 alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the low CO2 alarm signal to bus, when CO2 lower than low threshold that defined by parameter.					
13	**High CO2 alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the high CO2 alarm signal to bus, when CO2 higher than high threshold that defined by parameter.					
14	**PM2.5 value**	**Internal sensor**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)**
The communication object is used to send the PM2.5 value measured by the built-in PM2.5 sensor of the device to the bus.					
15	**PM2.5 error report**	**Internal sensor**	**1bit**	**C,R,T**	**1.002 boolean**

The communication object is used to send PM2.5 error report to the bus. Options: 1——Error 0——Normal					
16	**PM2.5 alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the PM2.5 alarm signal to bus, when PM2.5 higher than high threshold that defined by parameter.					
17	**PM10 value**	**Internal sensor**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)**
The communication object is used to send the PM10 value measured by the built-in PM10 sensor of the device to the bus.					
18	**PM10 error report**	**Internal sensor**	**1bit**	**C,R,T**	**1.002 boolean**
The communication object is used to send PM10 error report to the bus. Options: 1——Error 0——Normal					
19	**PM10 alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the PM10 alarm signal to bus, when PM10 higher than high threshold that defined by parameter.					
20	**TVOC value**	**Internal sensor**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
The communication object is used to send the TVOC value measured by the built-in TVOC sensor of the device to the bus.Object datatype is depending on parameter.					
21	**TVOC error report**	**Internal sensor**	**1bit**	**C,R,T**	**1.002 boolean**
The communication object is used to send TVOC error report to the bus. Options: 1——Error 0——Normal					
22	**TVOC alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the TVOC alarm signal to bus, when TVOC higher than high threshold that defined by parameter.					

23	**Formaldehyde value**	**Internal sensor**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
The communication object is used to send the formaldehyde value measured by the built-in formaldehyde sensor of the device to the bus.Object datatype is depending on parameter.					
24	**Formaldehyde error report**	**Internal sensor**	**1bit**	**C,R,T**	**1.002 boolean**
The communication object is used to send formaldehyde error report to the bus. Options: 1——Error 0——Normal					
25	**Formaldehyde alarm**	**Internal sensor**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the formaldehyde alarm signal to bus, when formaldehyde higher than high threshold that defined by parameter.					

Table 6.2 “Internal sensor measurement”Communication Object

6.3.“Air Quality Level”Communication Object

6.3.1.“AQI Level”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	163	AQI Level	AQI value			2 bytes	C	R	-	T	-	pulses	低
	164	AQI Level	AQI alarm			1 bit	C	R	-	T	-	alarm	低
	165	AQI Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
	166	AQI Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	166	AQI Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
	167	AQI Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
	168	AQI Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
	169	AQI Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低
	170	AQI Level	Output value of level 5			1 bit	C	R	-	T	-	switch	低
	171	AQI Level	Output value of level 6			1 bit	C	R	-	T	-	switch	低

Fig.6.3.1 “AQI Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
163	**AQI value**	**AQI Level**	**2byte**	**C,R,T**	**7.001 pulses**
The communication object is used to send the calculated AQI value to the bus.					
164	**AQI alarm**	**AQI Level**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the AQI alarm signal to bus, when AQI higher than threshold that defined by parameter.					
165	**Alarm message**	**AQI Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
166	**Output value**	**AQI Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number** **232.600 RGB value 3x(0..255)**
166	**Output value of level 1**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**
167	**Output value of level 2**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**
168	**Output value of level 3**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**
169	**Output value of level 4**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**
170	**Output value of level 5**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**

171	**Output value of level 6**	**AQI Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~6.

1bit objects are visible according to the parameter setting :

Object 166——Level 1

Object 167——Level 2

Object 168——Level 3

Object 169——Level 4

Object 170——Level 5

Object 171——Level 6

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 166 sends the telegram to the bus.

Table 6.3.1 “AQI Level”Communication Object

6.3.2.“CO2 Level”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	181	CO2 Level	External sensor value 1			2 bytes	C	-	W	T	U	parts/million (ppm)	低
	182	CO2 Level	External sensor value 2			2 bytes	C	-	W	T	U	parts/million (ppm)	低
	183	CO2 Level	External sensor value 3			2 bytes	C	-	W	T	U	parts/million (ppm)	低
	184	CO2 Level	Actual sensor value			2 bytes	C	R	-	T	-	parts/million (ppm)	低
	185	CO2 Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
	186	CO2 Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	186	CO2 Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
	187	CO2 Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
	188	CO2 Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
	189	CO2 Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低

Fig.6.3.2 “CO2 Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
181	**External sensor value 1**	**CO2 Level**	**2byte**	**C,W,T,U**	**9.008 parts/million(ppm)**
182	**External sensor value 2**	**CO2 Level**	**2byte**	**C,W,T,U**	**9.008 parts/million(ppm)**
183	**External sensor value 3**	**CO2 Level**	**2byte**	**C,W,T,U**	**9.008 parts/million(ppm)**
These communication objects are used to receive the CO2 value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.					
184	**Actual sensor value**	**CO2 Level**	**2byte**	**C,R,T**	**9.008 parts/million(ppm)**
The communication object is used to send the calculated CO2 value to the bus.					
185	**Alarm message**	**CO2 Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
186	**Output value**	**CO2 Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number** **232.600 RGB value 3x(0..255)**
186	**Output value of level 1**	**CO2 Level**	**1bit**	**C,R,T**	**1.001 switch**
187	**Output value of level 2**	**CO2 Level**	**1bit**	**C,R,T**	**1.001 switch**
188	**Output value of level 3**	**CO2 Level**	**1bit**	**C,R,T**	**1.001 switch**
189	**Output value of level 4**	**CO2 Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~4.

1bit objects are visible according to the parameter setting :

Object 186——Level 1

Object 187——Level 2

Object 188——Level 3

Object 189——Level 4

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 186 sends the telegram to the bus.

Table 6.3.2 “CO2 Level”Communication Object

6.3.3.“Relative humidity Level”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
172	Relative humidity Level	External sensor value 1			2 bytes	C	-	W	T	U	humidity (%)	低
173	Relative humidity Level	External sensor value 2			2 bytes	C	-	W	T	U	humidity (%)	低
174	Relative humidity Level	External sensor value 3			2 bytes	C	-	W	T	U	humidity (%)	低
175	Relative humidity Level	Actual sensor value			2 bytes	C	R	-	T	-	humidity (%)	低
176	Relative humidity Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
177	Relative humidity Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
177	Relative humidity Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
178	Relative humidity Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
179	Relative humidity Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
180	Relative humidity Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低

Fig.6.3.3 “Relative humidity Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
172	**External sensor value 1**	**Relative humidity Level**	**2byte**	**C,W,T,U**	**9.007 humidity**
173	**External sensor value 2**	**Relative humidity Level**	**2byte**	**C,W,T,U**	**9.007 humidity**
174	**External sensor value 3**	**Relative humidity Level**	**2byte**	**C,W,T,U**	**9.007 humidity**
These communication objects are used to receive the humidity value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.					
175	**Actual sensor value**	**Relative humidity Level**	**2byte**	**C,R,T**	**9.007 humidity**
The communication object is used to send the calculated humidity value to the bus.					
176	**Alarm message**	**Relative humidity Level**	**14 byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
177	**Output value**	**Relative humidity Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number** **232.600 RGB value 3x(0..255)**
177	**Output value of level 1**	**Relative humidity Level**	**1bit**	**C,R,T**	**1.001 switch**
178	**Output value of level 2**	**Relative humidity Level**	**1bit**	**C,R,T**	**1.001 switch**
179	**Output value of level 3**	**Relative humidity Level**	**1bit**	**C,R,T**	**1.001 switch**

180	**Output value of level 4**	**Relative humidity Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~4.

1bit objects are visible according to the parameter setting :

Object 177——Level 1

Object 178——Level 2

Object 179——Level 3

Object 180——Level 4

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 180 sends the telegram to the bus.

Table 6.3.3 “Relative humidity Level”Communication Object

6.3.4.“PM2.5 Level”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
190	PM2.5 Level	External sensor value 1			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
191	PM2.5 Level	External sensor value 2			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
192	PM2.5 Level	External sensor value 3			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
193	PM2.5 Level	Actual sensor value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
194	PM2.5 Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
195	PM2.5 Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
195	PM2.5 Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
196	PM2.5 Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
197	PM2.5 Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
198	PM2.5 Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低
199	PM2.5 Level	Output value of level 5			1 bit	C	R	-	T	-	switch	低
200	PM2.5 Level	Output value of level 6			1 bit	C	R	-	T	-	switch	低

Fig.6.3.4 “PM2.5 Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
190	**External sensor value 1**	**PM2.5 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
191	**External sensor value 2**	**PM2.5 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
192	**External sensor value 3**	**PM2.5 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
These communication objects are used to receive the PM2.5. value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.					
193	**Actual sensor value**	**PM2.5 Level**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)**
The communication object is used to send the calculated PM2.5 value to the bus.					
194	**Alarm message**	**PM2.5 Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
195	**Output value**	**PM2.5 Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number** **232.600 RGB value 3x(0..255)**
195	**Output value of level 1**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**
196	**Output value of level 2**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**
197	**Output value of level 3**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**

198	**Output value of level 4**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**
199	**Output value of level 5**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**
200	**Output value of level 6**	**PM2.5 Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~6.

1bit objects are visible according to the parameter setting :

Object 195——Level 1

Object 196——Level 2

Object 197——Level 3

Object 198——Level 4

Object 199——Level 5

Object 200——Level 6

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 195 sends the telegram to the bus.

Table 6.3.4 “PM2.5 Level”Communication Object

6.3.5.“PM10 Level”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	201	PM10 Level	External sensor value 1			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	202	PM10 Level	External sensor value 2			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	203	PM10 Level	External sensor value 3			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	204	PM10 Level	Actual sensor value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	205	PM10 Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
	206	PM10 Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	206	PM10 Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
	207	PM10 Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
	208	PM10 Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
	209	PM10 Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低

Fig.6.3.5 “PM10 Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
201	**External sensor value 1**	**PM10 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
202	**External sensor value 2**	**PM10 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
203	**External sensor value 3**	**PM10 Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)**
These communication objects are used to receive the PM10 value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.					
204	**Actual sensor value**	**PM10 Level**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)**
The communication object is used to send the calculated PM10 value to the bus.					
205	**Alarm message**	**PM10 Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
206	**Output value**	**PM10 Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number** **232.600 RGB value 3x(0..255)**
206	**Output value of level 1**	**PM10 Level**	**1bit**	**C,R,T**	**1.001 switch**
207	**Output value of level 2**	**PM10 Level**	**1bit**	**C,R,T**	**1.001 switch**
208	**Output value of level 3**	**PM10 Level**	**1bit**	**C,R,T**	**1.001 switch**

209	**Output value of level 4**	**PM10 Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~4.

1bit objects are visible according to the parameter setting :

Object 206——Level 1

Object 207——Level 2

Object 208——Level 3

Object 209——Level 4

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 206 sends the telegram to the bus.

Table 6.3.5 “PM10 Level”Communication Object

6.3.6.“TVOC Level”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	210	TVOC Level	External sensor value 1			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	211	TVOC Level	External sensor value 2			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	212	TVOC Level	External sensor value 3			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	213	TVOC Level	Actual sensor value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	214	TVOC Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
	215	TVOC Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	215	TVOC Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
	216	TVOC Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
	217	TVOC Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
	218	TVOC Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低

Fig.6.3.6 “TVOC Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
210	**External sensor value 1**	**TVOC Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
211	**External sensor value 2**	**TVOC Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
212	**External sensor value 3**	**TVOC Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
These communication objects are used to receive the TVOC value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.Object datatype is depending on parameter.					
213	**Actual sensor value**	**TVOC Level**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
The communication object is used to send the calculated TVOC value to the bus. Object datatype is depending on parameter.					
214	**Alarm message**	**TVOC Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
215	**Output value**	**TVOC Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number**

					232.600 RGB value 3x(0..255)
215	**Output value of level 1**	**TVOC Level**	**1bit**	**C,R,T**	**1.001 switch**
216	**Output value of level 2**	**TVOC Level**	**1bit**	**C,R,T**	**1.001 switch**
217	**Output value of level 3**	**TVOC Level**	**1bit**	**C,R,T**	**1.001 switch**
218	**Output value of level 4**	**TVOC Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~4.

1bit objects are visible according to the parameter setting :

Object 215——Level 1

Object 216——Level 2

Object 217——Level 3

Object 218——Level 4

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 215 sends the telegram to the bus.

Table 6.3.6 “TVOC Level”Communication Object

6.3.7.“Formaldehyde Level”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	219	Formaldehyde Level	External sensor value 1			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	220	Formaldehyde Level	External sensor value 2			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	221	Formaldehyde Level	External sensor value 3			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	222	Formaldehyde Level	Actual sensor value			2 bytes	C	R	-	T	-	concentration (µg/m³)	低
	223	Formaldehyde Level	Alarm message			14 bytes	C	-	-	T	-	Character String (ISO 8859-1)	低
	224	Formaldehyde Level	Output value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	224	Formaldehyde Level	Output value of level 1			1 bit	C	R	-	T	-	switch	低
	225	Formaldehyde Level	Output value of level 2			1 bit	C	R	-	T	-	switch	低
	226	Formaldehyde Level	Output value of level 3			1 bit	C	R	-	T	-	switch	低
	227	Formaldehyde Level	Output value of level 4			1 bit	C	R	-	T	-	switch	低

Fig.6.3.7 “Formaldehyde Level”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
219	**External sensor value 1**	**Formaldehyde Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
220	**External sensor value 2**	**Formaldehyde Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
221	**External sensor value 3**	**Formaldehyde Level**	**2byte**	**C,W,T,U**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
These communication objects are used to receive the formaldehyde value measured by external sensors from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery. Object datatype is depending on parameter.					
222	**Actual sensor value**	**Formaldehyde Level**	**2byte**	**C,R,T**	**9.030 concentration (ug/m3)** **9.008 parts/million (ppm)**
The communication object is used to send the calculated formaldehyde value to the bus. Object datatype is depending on parameter.					
223	**Alarm message**	**Formaldehyde Level**	**14byte**	**C,T**	**16.001 character string (ISO 8859-1)**
The communication object is visible when 1bye or 3byte is selected. Used to send alarm massage of each levels to the bus.					
224	**Output value**	**Formaldehyde Level**	**1byte** **3byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)** **17.001 scene number**

					232.600 RGB value 3x(0..255)
224	**Output value of level 1**	**Formaldehyde Level**	**1bit**	**C,R,T**	**1.001 switch**
225	**Output value of level 2**	**Formaldehyde Level**	**1bit**	**C,R,T**	**1.001 switch**
226	**Output value of level 3**	**Formaldehyde Level**	**1bit**	**C,R,T**	**1.001 switch**
227	**Output value of level 4**	**Formaldehyde Level**	**1bit**	**C,R,T**	**1.001 switch**

These communication objects are used to send telegram value of level 1~4.

1bit objects are visible according to the parameter setting :

Object 224——Level 1

Object 225——Level 2

Object 226——Level 3

Object 227——Level 4

Send corresponding telegram value when change to a certain level, the telegrams are set by parameters.

1byte: the corresponding telegram value of each levels is defined by the parameter. Change to a level, object 224 sends the telegram to the bus.

Table 6.3.7 “Formaldehyde Level”Communication Object

6.4.“Air Quality Controller”Communication Object

6.4.1.“Relative humidity controller”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	228	Relative humidity controller	Controller on/off			1 bit	C	-	W	-	-	switch	低
	230	Relative humidity controller	External sensor value			2 bytes	C	-	W	T	U	humidity (%)	低
	231	Relative humidity controller	Controller status			1 bit	C	R	-	T	-	switch	低
	232	Relative humidity controller	Actual sensor value			2 bytes	C	R	-	T	-	humidity (%)	低
	233	Relative humidity controller	Control value			1 byte	C	R	-	T	-	percentage (0..100%)	低
	234	Relative humidity controller	Control stop			1 byte	C	-	W	-	-	percentage (0..100%)	低

Fig.6.4.1 “Relative humidity controller”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
228	**Controller on/off**	**Relative humidity controller**	**1bit**	**C,W**	**1.001 switch**
The communication object is used to receive the telegram from the bus to control humidity controller power on/off. Telegrams: 1——Controller on 0——Controller off					
230	**External sensor value**	**Relative humidity controller**	**2byte**	**C,W,T,U**	**9.007 humidity**
The communication object is used to receive the humidity value measured by external sensor from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery.					
231	**Controller status**	**Relative humidity controller**	**1bit**	**C,R,T**	**1.001 switch**
The communication object is used send the status of controller to the bus, send telegram once status is changed. Telegrams: 1——Controller on 0——Controller off					
232	**Actual sensor value**	**Relative humidity controller**	**2byte**	**C,R,T**	**9.007 humidity**
The communication object is used to send the calculated humidity value to the bus.					
233	**Control value**	**Relative humidity controller**	**1byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)**
The communication object is used to send control value operated via step control, value is set by parameters.					

234	**Control stop**	**Relative humidity controller**	**1byte**	**C,W**	**5.010 counter pulses** **5.001 percentage(0..100%)**
The communication object is visible when stop function is enabled. Controller becomes off when receive stop telegram, and send telegram OFF of controller at the same time, but not send output telegrams (that is, maintain the current status).					

Table 6.4.1 “Relative humidity controller”Communication Object

6.4.2.“CO2 controller”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	235	CO2 controller	Controller on/off			1 bit	C	-	W	-	-	switch	低
	236	CO2 controller	Setpoint adjustment			2 bytes	C	R	W	-	-	parts/million (ppm)	低
	237	CO2 controller	External sensor value			2 bytes	C	-	W	T	U	parts/million (ppm)	低
	238	CO2 controller	Controller status			1 bit	C	R	-	T	-	switch	低
	239	CO2 controller	Actual sensor value			2 bytes	C	R	-	T	-	parts/million (ppm)	低
	240	CO2 controller	Control value			1 byte	C	R	-	T	-	counter pulses (0..255)	低
	241	CO2 controller	Control stop			1 byte	C	-	W	-	-	counter pulses (0..255)	低

Fig.6.4.2 “CO2 controller”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
235	**Controller on/off**	**CO2 controller**	**1bit**	**C,W**	**1.001 switch**
The communication object is used to receive the telegram from the bus to control CO2 controller power on/off. Telegrams: 1——Controller on 0——Controller off					
236	**Setpoint adjustment**	**CO2 controller**	**2byte**	**C,W,R**	**9.008 parts/million(ppm)**
The communication object is used to modify the setpoint value of CO2 from bus, the received value should be limited in 400~1500ppm, otherwise it is ignored. **Current CO2 setpoint value can respond to bus via a read request telegram, the value will take the parameter setting value as reference after ETS downloading, and the current value will be restored when bus failure.**					
237	**External sensor value**	**CO2 controller**	**2byte**	**C,W,T,U**	**9.008 parts/million(ppm)**
The communication object is used to receive the CO2 value measured by external sensor from the bus, and send read request cyclically (if configured). When status request is enabled, that is request time is not 0, send read request to the bus after bus voltage recovery					
238	**Controller status**	**CO2 controller**	**1bit**	**C,R,T**	**1.001 switch**
The communication object is used send the status of controller to the bus, send telegram once status is changed. Telegrams: 1——Controller on 0——Controller off					
239	**Actual sensor value**	**CO2 controller**	**2byte**	**C,R,T**	**9.008 parts/million(ppm)**

The communication object is used to send the calculated CO2 value to the bus.					
240	**Control value**	**CO2 controller**	**1byte**	**C,R,T**	**5.010 counter pulses** **5.001 percentage(0..100%)**
The communication object is used to send control value operated via step control or PI control, value is set by parameters.					
241	**Control stop**	**CO2 controller**	**1byte**	**C,W**	**5.010 counter pulses** **5.001 percentage(0..100%)**
The communication object is visible when stop function is enabled. Controller becomes off when receive stop telegram, and send telegram OFF of controller at the same time, but not send output telegrams (that is, maintain the current status).					

Table 6.4.2 “CO2 controller”Communication Object

6.5.“Presence function”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	242	Presence control 1	Slave input			1 bit	C	-	W	T	U	switch	低
	243	Presence control 1	Begin of presence, A			1 bit	C	-	-	T	-	switch	低
	244	Presence control 1	Begin of presence, B			1 bit	C	-	-	T	-	switch	低
	245	Presence control 1	Begin of presence, C			1 bit	C	-	-	T	-	switch	低
	246	Presence control 1	End of presence, D			1 bit	C	-	-	T	-	switch	低
	247	Presence control 1	End of presence, E			1 bit	C	-	-	T	-	switch	低
	248	Presence control 1	End of presence, F			2 bytes	C	-	-	T	-	pulses	低
	249	Presence control 1	Follow-up time[10..65535]s			2 bytes	C	R	W	-	-	time (s)	低
	250	Presence control 1	External input			1 bit	C	-	W	-	-	trigger	低
	251	Presence control 1	Auto.mode/Semi-Auto. mode			1 bit	C	-	W	-	-	enable	低
	252	Presence control 1	End presence (only off telegram)			1 bit	C	-	W	-	U	switch	低
	253	Presence control 1	Brightness independent			1 bit	C	-	W	-	-	enable	低
	254	Presence control 1	External brightness			2 bytes	C	-	W	T	U	lux (Lux)	低
	255	Presence control 1	Actual brightness			2 bytes	C	R	-	T	-	lux (Lux)	低
	256	Presence control 1	Brightness threshold for presence[1...2000]			2 bytes	C	R	W	T	-	lux (Lux)	低
	257	Presence control 1	Dis/En presence function			1 bit	C	-	W	-	-	enable	低
	258	Presence control 1	Preset output of Dis/En function			1 byte	C	-	-	T	-	HVAC mode	低

Presence function-Master

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	243	Presence control 1	Slave output			1 bit	C	R	-	T	-	switch	低
	252	Presence control 1	End presence (only off telegram)			1 bit	C	-	W	-	-	switch	低
	253	Presence control 1	Brightness independent			1 bit	C	-	W	-	-	enable	低
	254	Presence control 1	External brightness			2 bytes	C	-	W	T	U	lux (Lux)	低
	255	Presence control 1	Actual brightness			2 bytes	C	R	-	T	-	lux (Lux)	低
	256	Presence control 1	Brightness threshold for presence[1...2000]			2 bytes	C	R	W	T	-	lux (Lux)	低
	257	Presence control 1	Dis/En presence function			1 bit	C	-	W	-	-	enable	低

Presence function-Slave

Fig.6.5 “Presence function”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
242	**Slave input**	**Presence control 1**	**1bit**	**C,W,T,U**	**1.001 switch**
The communication object is applied to master type. It is visible when slave input is enabled. Used for slave detector to detect input signal, telegram 1 is valid. Send read request to the slave after bus reset or programming.					
243	**Slave output**	**Presence control 1**	**1bit**	**C,R,T**	**1.001 switch**
The communication object is applied to slave type. Used for slave detector to send detection status to the bus.					
243	**Begin of presence, A**	**Presence control 1**	**1bit**	**C,T**	**1.001 switch**
244	**Begin of presence, B**	**Presence control 1**	**1byte**		**5.001 percentage**
245	**Begin of presence, C**	**Presence control 1**	**2byte**		**5.010 counter pulses**

					17.001 scene number **20.102 HVAC mode** **9.001 temperature**

These communication objects are applied to master type.

They are not visible when “No telegram” is selected. Used to send the telegram for begin of presence, object datatype and range is depending on the parameters.

246	**End of presence, D**	**Presence control 1**	**1bit** **1byte** **2byte**	**C,T**	**1.001 switch** **5.001 percentage** **5.010 counter pulses** **17.001 scene number** **20.102 HVAC mode** **9.001 temperature**
247	**End of presence, E**	**Presence control 1**			
248	**End of presence, F**	**Presence control 1**			

These communication objects are applied to master type.

They are not visible when “No telegram” is selected. Used to send the telegram for end of presence, object datatype and range is depending on the parameters.

249	**Follow-up time[1...65535]s**	**Presence control 1**	**2byte**	**C,W, R**	**7.005 time(s)**

The communication object is applied to master type.

Used to modify follow-up time via the bus, the modified range according to parameter define, the limit value is taken when the modified value exceeds the range.

And also support to be read, when the device starts, the current Follow-up time is written to the object (restart after download or bus voltage recovery).

250	**External input**	**Presence control 1**	**1bit**	**C,W**	**1.017 trigger**

The communication object is applied to master type.

Used for external input, object value is defined by parameter.

When automatic mode, it is used to simulate action of begin or end of presence; when semi-automatic mode, it is used to trigger begin or end of presence.

251	**Auto.mode/Semi-Auto.**	**Presence control 1**	**1bit**	**C,W**	**1.003 enable**

	mode				
The communication object is applied to master type. Used to change to automatic mode or semi-automatic mode, object value is defined by parameter.					
252	**End presence (only off telegram)**	**Presence control 1**	**1bit**	**C,W,U** **C,W**	**1.001 switch**
The communication object is applied to master and slave type. When master type, flag is C,W,U; when slave type, flag is C,W. Used to receive the switch status of actuator, enter dead time when receive telegram OFF, and suppress presence detection, reset the follow-up time. Telegram ON is no meaning.					
253	**Brightness independent**	**Presence control 1**	**1bit**	**C,W**	**1.003 enable**
The communication object is applied to master and slave type. Used to set the detector is depending on or independent of brightness via bus, object value is defined by parameter.					
254	**External brightness**	**Presence control 1**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
The communication object is applied to master and slave type. Used to receive brightness of external sensor, and circularly send read request (if configured).					
255	**Actual brightness**	**Presence control 1**	**2byte**	**C,R,T**	**9.004 lux(lux)**
The communication object is applied to master and slave type. Used to send brightness value detected by combination of internal and external sensors to the bus.					
256	**Brightness threshold for presence[1...2000]**	**Presence control 1**	**2byte**	**C,W,R,T**	**9.004 lux(lux)**
The communication object is applied to master and slave type. Used to modify brightness threshold for presence, the modified range according to parameter define, the limit value is taken when the modified value exceeds the range. And also support to be read, when the device starts, the current brightness threshold value is written to the object					

(restart after download or bus voltage recovery).					
257	**Dis/En presence function**	**Presence control 1**	**1bit**	**C,W**	**1.003 enable**
The communication object is applied to master and slave type. Used to disable / enable presence function, object value is defined by parameter.					
258	**Preset output of Dis/En function**	**Presence control 1**	**1bit** **1byte** **2byte**	**C,T**	**1.001 switch** **5.001 percentage** **5.010 counter pulses** **17.001 scene number** **7.001 pulses**
The communication object is applied to master type. Used to send preset value defined by parameter when parameter “Disable presence function” is enabled. Object datatype and range is depending on the parameters.					

Table 6.5 “Presence function”Communication Object

6.6.“Light control”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
310	Light control	External brightness 1			2 bytes	C	-	W	T	U	lux (Lux)	低
311	Light control	External brightness 2			2 bytes	C	-	W	T	U	lux (Lux)	低
312	Light control	External brightness 3			2 bytes	C	-	W	T	U	lux (Lux)	低
313	Light control	Actual brightness			2 bytes	C	R	-	T	-	lux (Lux)	低
314	Light control	Light control			1 bit	C	-	-	T	-	switch	低
315	Light control	Lower brightness threshold[1..2000]			2 bytes	C	R	W	-	-	lux (Lux)	低
316	Light control	Upper brightness threshold[50..2000]			2 bytes	C	R	W	-	-	lux (Lux)	低
317	Light control	Dis./En. function			1 bit	C	-	W	-	-	enable	低

Fig.6.6 “Light control”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
310	**External brightness 1**	**Light control**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
311	**External brightness 2**	**Light control**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
312	**External brightness 3**	**Light control**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
These communication objects are visible according to number of external brightness sensor, up to 3 sensors, they are not visible when number is 0. Used to receive brightness value of external sensors, and circularly send read request (if configured).					
313	**Actual brightness**	**Light control**		**C,R,T**	**9.004 lux(lux)**
The communication object is visible when there are 2 referenced sensors or above. Used to send brightness value detected by combination of sensors to the bus.					
314	**Light control**	**Light control**	**1bit** **1byte**	**C,T**	**1.001 switch** **17.001 scene number**
The communication object is used to send control value according to compare the current brightness with lower and upper threshold. Object datatype and range is depending on the parameters.					
315	**Lower brightness threshold[1...2000]**	**Light control**	**2byte**	**C,W, R**	**9.004 lux(lux)**
The communication object is used to modify lower threshold via bus. **Note: if the lower threshold is greater than or equal to the upper threshold, ignore this modification.** And also support to be read, when the device starts, the current lower brightness threshold value is written to the object (restart after download or bus voltage recovery).					
316	**Upper brightness threshold[50...2000]**	**Light control**	**2byte**	**C,W, R**	**9.004 lux(lux)**
The communication object is used to modify upper threshold via bus. **Note: if the upper threshold is lower than or**					

equal to the lower threshold, ignore this modification. And also support to be read, when the device starts, the current upper brightness threshold value is written to the object (restart after download or bus voltage recovery).					
317	**Dis./En. function**	**Light control**	**1bit**	**C,W**	**1.003 enable**
The communication object is used to disable or enable light control function via bus, object value is defined by parameter.					

Table 6.6 “Light control”Communication Object

6.7.“Constant Lighting”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	318	Constant lighting	External brightness 1			2 bytes	C	-	W	T	U	lux (Lux)	低
	319	Constant lighting	External brightness 2			2 bytes	C	-	W	T	U	lux (Lux)	低
	320	Constant lighting	External brightness 3			2 bytes	C	-	W	T	U	lux (Lux)	低
	321	Constant lighting	Actual brightness			2 bytes	C	R	-	T	-	lux (Lux)	低
	322	Constant lighting	Controller On/Off			1 bit	C	-	W	-	-	switch	低
	323	Constant lighting	Controller status			1 bit	C	R	-	T	-	switch	低
	324	Constant lighting	Brightness setpoint			2 bytes	C	R	W	T	-	lux (Lux)	低
	326	Constant lighting	Dimming output for main			1 byte	C	R	-	T	-	percentage (0..100%)	低
	327	Constant lighting	Dimming output for sub 1			1 byte	C	R	-	T	-	percentage (0..100%)	低
	328	Constant lighting	Dimming output for sub 2			1 byte	C	R	-	T	-	percentage (0..100%)	低
	329	Constant lighting	Dimming output for sub 3			1 byte	C	R	-	T	-	percentage (0..100%)	低
	330	Constant lighting	Dimming output for sub 4			1 byte	C	R	-	T	-	percentage (0..100%)	低
	331	Constant lighting	Control stop, switch			1 bit	C	-	W	-	-	switch	低
	332	Constant lighting	Control stop, dimming			4 bit	C	-	W	-	-	dimming control	低
	333	Constant lighting	Control stop, dimming value			1 byte	C	-	W	-	-	percentage (0..100%)	低
	325	Constant lighting	Current main dimming value status			1 byte	C	-	W	T	U	percentage (0..100%)	低

Fig.6.7 “Constant lighting”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
318	**External brightness 1**	**Constant lighting**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
319	**External brightness 2**	**Constant lighting**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
320	**External brightness 3**	**Constant lighting**	**2byte**	**C,W,T,U**	**9.004 lux(lux)**
These communication objects are visible according to number of external brightness sensor, up to 3 sensors, they are not visible when number is 0. Used to receive brightness value of external sensors, and circularly send read request (if configured).					
321	**Actual brightness**	**Constant lighting**	**2byte**	**C,R,T**	**9.004 lux(lux)**
The communication object is visible when there are 2 referenced sensors or above. Used to send brightness value detected by combination of sensors to the bus.					
322	**Controller On/Off**	**Constant lighting**	**1bit**	**C,W**	**1.001 switch**
The communication object is visible when controller is triggered via external object. Used to turn on / off the controller via bus. When receive telegram 0, turn off the controller, that is the setpoint value and actual value are no longer compared, and output brightness 0, so constant lighting control is stopped at this time. When receive telegram 1, turn on the controller.					
323	**Controller status**	**Constant lighting**	**1bit**	**C,R,T**	**1.001 switch**

The communication object is used to send controller status, send the telegram when changed. Telegrams: 0 —— Controller off 1 —— Controller on					
324	**Brightness setpoint**	**Constant lighting**	**2byte**	**C,W,R,T**	**9.004 lux(lux)**
The communication object is used to modify brightness setpoint value via bus, the modified range is defined by parameter, the limited value is taken when exceed the range. Also support to be read (it is convenient for the screen device to display the current setpoint value). When the device starts, the current brightness setpoint value is written to the object (restart after download or bus voltage recovery).					
325	**Current master dimming value status**	**Constant lighting**	**1byte**	**C,W,T,U**	**5.001 percentage**
The communication object is used to send a read request to bus when controller is turn on, to read the current status of master dimmer.					
326	**Dimming output for main**	**Constant lighting**	**1byte**	**C,R,T**	**5.001 percentage**
The communication object is used to send the dimming value of main device, to control each group brightness.					
327	**Dimming output for sub 1**	**Constant lighting**	**1byte**	**C,R,T**	**5.001 percentage**
328	**Dimming output for sub 2**	**Constant lighting**	**1byte**	**C,R,T**	**5.001 percentage**
329	**Dimming output for sub 3**	**Constant lighting**	**1byte**	**C,R,T**	**5.001 percentage**
330	**Dimming output for sub 4**	**Constant lighting**	**1byte**	**C,R,T**	**5.001 percentage**
When main/sub operation is enabled, these communication objects are visible according to number of subs, up to 4 sub devices. Used to send the dimming value of sub devices, to control each group brightness.					
331	**Control stop, switch**	**Constant lighting**	**1bit**	**C,W**	**1.001 switch**
332	**Control stop, dimming**	**Constant lighting**	**4bit**	**C,W**	**3.007 dimming**
333	**Control stop, dimming value**	**Constant lighting**	**1byte**	**C,W**	**5.001 percentage**
These communication objects are visible when stop function is enabled. Controller becomes inactive when receive					

control telegrams, and send telegram OFF of controller at the same time, but not send output telegrams (that is, maintain the current status).

Table 6.7 “Constant lighting”Communication Object

6.8.“Room temperature controller”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	334	RTC 1 - ...	Power on/off			1 bit	C	R	W	-	-	switch	低
	335	RTC 1 - ...	External temperature sensor			2 bytes	C	-	W	T	U	temperature (°C)	低
	336	RTC 1 - ...	Current setpoint adjustment			2 bytes	C	-	W	-	-	temperature (°C)	低
	340	RTC 1 - ...	Heating/Cooling mode			1 bit	C	-	W	-	-	cooling/heating	低
	341	RTC 1 - ...	Operation mode			1 byte	C	-	W	-	-	HVAC mode	低
	342	RTC 1 - ...	Comfort mode			1 bit	C	-	W	-	-	enable	低
	343	RTC 1 - ...	Economy mode			1 bit	C	-	W	-	-	enable	低
	344	RTC 1 - ...	Frost/Heat protection mode			1 bit	C	-	W	-	-	enable	低
	345	RTC 1 - ...	Standby mode			1 bit	C	-	W	-	-	enable	低
	346	RTC 1 - ...	Extended comfort mode			1 bit	C	-	W	-	-	acknowledge	低
	347	RTC 1 - ...	Fan automatic operation			1 bit	C	-	W	-	-	enable	低
	348	RTC 1 - ...	Window contact			1 bit	C	-	W	T	U	window/door	低
	349	RTC 1 - ...	External presence detector			1 bit	C	-	W	T	U	occupancy	低
	350	RTC 1 - ...	Actual temperature, status			2 bytes	C	R	-	T	-	temperature (°C)	低
	353	RTC 1 - ...	Current temperature setpoint, status			2 bytes	C	R	-	T	-	temperature (°C)	低
	354	RTC 1 - ...	Heating/Cooling mode, status			1 bit	C	R	-	T	-	cooling/heating	低
	355	RTC 1 - ...	Operation mode, status			1 byte	C	R	-	T	-	HVAC mode	低
	356	RTC 1 - ...	Comfort mode, status			1 bit	C	R	-	T	-	enable	低
	357	RTC 1 - ...	Economy mode, status			1 bit	C	R	-	T	-	enable	低
	358	RTC 1 - ...	Frost/Heat protection mode, status			1 bit	C	R	-	T	-	enable	低
	359	RTC 1 - ...	Standby mode, status			1 bit	C	R	-	T	-	enable	低
	360	RTC 1 - ...	Heating control value			1 bit	C	R	-	T	-	switch	低
	361	RTC 1 - ...	Cooling control value			1 bit	C	R	-	T	-	switch	低
	362	RTC 1 - ...	Fan speed			1 byte	C	-	-	T	-	percentage (0..100%)	低
	363	RTC 1 - ...	Fan speed low			1 bit	C	-	-	T	-	switch	低
	364	RTC 1 - ...	Fan speed medium			1 bit	C	-	-	T	-	switch	低
	365	RTC 1 - ...	Fan speed high			1 bit	C	-	-	T	-	switch	低
	366	RTC 1 - ...	Fan speed off			1 bit	C	-	-	T	-	switch	低
	367	RTC 1 - ...	Additional heating control value			1 bit	C	R	-	T	-	switch	低
	368	RTC 1 - ...	Additional cooling control value			1 bit	C	R	-	T	-	switch	低

Absolute

	337	RTC 1 - ...	Setpoint offset			1 bit	C	-	W	-	-	step	低
	338	RTC 1 - ...	Float offset value			2 bytes	C	-	W	-	-	temperature difference (K)	低
	339	RTC 1 - ...	Setpoint offset reset			1 bit	C	-	W	-	-	reset	低
	351	RTC 1 - ...	Base temperature setpoint, status			2 bytes	C	R	-	T	-	temperature (°C)	低
	352	RTC 1 - ...	Setpoint offset, status			2 bytes	C	R	-	T	-	temperature difference (K)	低

Relative

Fig.6.8 “RTC function”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
334	Power on/off	RTC controller	1bit	C,W,R	1.001 switch
The communication object is used to receive the telegram from the bus to control RTC power on/off. Telegrams: 1——On 0——Off					

335	**External temperature sensor**	**RTC controller**	**2byte**	**C,W,T,U**	**9.001 temperature**
The communication object is used to receive the temperature value detected by the temperature sensor of the device form the bus.					
336	**Current setpoint adjustment** **Base setpoint adjustment**	**RTC controller**	**2byte**	**C,W**	**9.001 temperature**
"Current setpoint adjustment" is visible when operation mode is not enabled, and under absolute adjustment. Used to modify the base value of the set temperature; and to modify set temperature value of current room operation mode when absolute adjustment. "Base setpoint adjustment" is visible only when relative adjustment, used to modify the base value of the set temperature, that is, the temperature setting value of the comfort mode, and the setting temperature of the standby mode and the economy mode changes according to the relative change. In the protection mode, only the temperature setting value of the protection mode is modified.					
337	**Setpoint offset**	**RTC controller**	**1bit**	**C,W**	**1.007 step**
The communication object is visible only when absolute adjustment, and offset function enabled. Used to adjust the offset to adjust setpoint temperature indirectly. The step value set according to the parameter. Telegrams: 1 ——Increase the offset in the forward direction 0 ——Decrease the offset in the negative direction					
338	**Float offset value**	**RTC controller**	**2byte**	**C,W**	**9.002 temperature difference**
The communication object is visible only when absolute adjustment, and offset function enabled. Used to modify the accumulated offset via 2 byte float value.					
339	**Setpoint offset reset**	**RTC controller**	**1bit**	**C,W**	**1.015 reset**
The communication object is visible only when absolute adjustment, and offset function enabled. Reset offset value when telegram is 1.					
340	**Heating/Cooling mode**	**RTC controller**	**1bit**	**C,W**	**1.100 cooling/heating**
The communication object is used for switching the heating and cooling via the bus. Telegrams: 1 ——Heating 0 ——Cooling					

341	**Operation mode**	**RTC controller**	**1byte**	**C,W**	**20.102 HVAC mode**
342	**Comfort mode**	**RTC controller**	**1bit**	**C,W**	**1.003 enable**
343	**Economy mode**	**RTC controller**	**1bit**	**C,W**	**1.003 enable**
344	**Frost/Heat protection mode**	**RTC controller**	**1bit**	**C,W**	**1.003 enable**
345	**Standby mode**	**RTC controller**	**1bit**	**C,W**	**1.003 enable**

These communication objects are used to control the RTC operation mode via the bus.

When 1 byte: object 341 is visible, telegrams: 1-comfort, 2-standby, 3-economy, 4-protection, other reserved.

When 1bit:

Object 342—— Comfort mode

Object 343—— Standby mode

Object 344—— Economy mode

Object 345—— Protection mode

When the object receives the telegram “1”, the corresponding mode is activated. When 1 bit standby object is not enable, and the telegrams of comfort, economy, protection mode are 0, is standby mode. When 1 bit standby object is enable, standby object receives “1” activates standby mode, 0 is no processing.

346	**Extended comfort mode**	**RTC controller**	**1bit**	**C,W**	**1.016 acknowledge**

The communication object is used for triggering time to extended comfort mode. Telegrams:

1——Activate comfort mode

0——No sense

Activate comfort mode when the object receives telegram 1. If receive again telegram 1 in delay time, time will be timed again. And return the previous operation mode from comfort mode once finish timing. If there is a new operation mode in delay time, exit the comfort mode.

If a switch operation, exit the timing, but switch the heating/cooling will not.

347	**Fan automatic operation**	**RTC controller**	**1bit**	**C,W**	**1.003 enable**

The communication object is used to activate the fan automatic operation via the bus. Telegram:

1——Auto

0——Exit auto

348	**Window contact**	**RTC controller**	**1bit**	**C,W,T,U**	**1.019 Window/door**
The communication object is used to receive the switch status of window contact. Telegrams: 1——Open window 0——Close window					
349	**External presence detector**	**RTC controller**	**1bit**	**C,W,T,U**	**1.018 occupancy**
This object is visible when use external presence sensor to detect input. Used to receive presence status of external sensor. Options: 1——Occupied 0——Unoccupied					
350	**Actual temperature, status**	**RTC controller**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is visible when temperature reference of RTC function is combination of internal and external sensor. Used to send the actual temperature after the combination to the bus.					
351	**Base temperature setpoint, status**	**RTC controller**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is visible only when relative adjustment. Used to send the current base set temperature to the bus. Current base set temperature value = parameter set value (or object 150 base value)+accumulated offset value					
352	**Setpoint offset, status**	**RTC controller**	**2byte**	**C,R,T**	**9.002 temperature difference**
The communication object is visible only when relative adjustment. Used to send the accumulated offset value of base set temperature to the bus.					
353	**Current temperature setpoint, status**	**RTC controller**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is used to send current set temperature to the bus.					
354	**Heating/Cooling mode, status**	**RTC controller**	**1bit**	**C,R,T**	**1.100 cooling/heating**
The communication object is used to feedback the telegram of switching cooling and heating function to the bus.					
355	**Operation mode, status**	**RTC controller**	**1byte**	**C,R,T**	**20.102 HVAC mode**
356	**Comfort mode, status**	**RTC controller**	**1bit**	**C,R,T**	**1.003 enable**
357	**Economy mode, status**	**RTC controller**	**1bit**	**C,R,T**	**1.003 enable**
358	**Frost/Heat protection mode, status**	**RTC controller**	**1bit**	**C,R,T**	**1.003 enable**

359	**Standby mode, status**	**RTC controller**	**1bit**	**C,R,T**	**1.003 enable**

These communication objects are used to send RTC operation mode status to the bus.

When 1 byte: object 355 is visible, telegrams: 1-comfort, 2-standby, 3-economy, 4-protection, other reserved.

When 1bit:

Object 356—— Comfort mode

Object 357—— Economy mode

Object 358—— Protection mode

Object 359—— Standby mode

When a mode is activated, the corresponding object only sends telegram “1”. When 1 bit standby object is not enable, activate standby mode when comfort, economy, protection objects send telegram 0 together. When 1 bit standby object is enable, activate standby mode only when standby object send 1.

360	**Heating control value** **Heating/Cooling control value**	**RTC controller**	**1bit** **1byte**	**C,R,T**	**1.001 Switch** **5.001 percentage**
361	**Cooling control value**	**RTC controller**	**1bit** **1byte**	**C,R,T**	**1.001 Switch** **5.001 percentage**

These communication objects are used to send control value of heating or cooling function to the bus. Object datatype is according to parameter setting.

362	**Fan speed**	**RTC controller**	**1byte**	**C,T**	**5.001 percentage** **5.100 fan stage**
363	**Fan speed low**	**RTC controller**	**1bit**	**C,T**	**1.001 switch**
364	**Fan speed medium**	**RTC controller**	**1bit**	**C,T**	**1.001 switch**
365	**Fan speed high**	**RTC controller**	**1bit**	**C,T**	**1.001 switch**
366	**Fan speed off**	**RTC controller**	**1bit**	**C,T**	**1.001 switch**

These communication objects are used to send control telegrams of the fan speed to the bus.

1bit object is visible according to the parameter setting :

Object 363——Low fan speed

Object 364——Medium fan speed

Object 365——High fan speed

Object 366——Fan speed off

Only the corresponding object sends telegram “1” when switch to a certain fan speed. When 1bit-off object is not enable, all objects send telegrams “0” when switch to fan speed off (The situation apply to connect with fan actuator of GVS);

When 1bit-off object is enable, only 1bit-off object send telegram “1” (The situation apply to connect with fan actuator of other manufacturers).

1byte: the corresponding telegram value of each fan speed is defined by the parameter. Activate the corresponding fan speed on the screen, and object 362 sends the corresponding telegram value of the fan speed to the bus.

367	**Additional heating control value** **Additional heating/cooling control value**	**RTC controller**	**1bit** **1byte**	**C,R,T**	**1.001 switch** **5.001 percentage**
368	**Additional cooling control value**	**RTC controller**	**1bit** **1byte**	**C,R,T**	**1.001 switch** **5.001 percentage**

These communication objects are used to send additional control value of heating or cooling function to the bus. Object datatype is according to parameter setting.

If 1bit is selected, when open valve, send telegram 1 to the bus, while close valve, send telegram 0;

If 1byte is selected, when open valve, send 100% to the bus, while close valve, send 0%.

Table 6.8 “RTC function”Communication Object

6.9.“Ventilation controller”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	439	Ventilation controller	Fan automatic operation			1 bit	C	R	W	-	-	enable	低
	440	Ventilation controller	External PM 2.5 value			2 bytes	C	-	W	T	U	concentration (µg/m³)	低
	441	Ventilation controller	Fan speed			1 byte	C	-	-	T	-	percentage (0..100%)	低
	442	Ventilation controller	Actual PM2.5, status			2 bytes	C	R	-	T	-	concentration (µg/m³)	低

Fig.6.9 “Ventilation controller”Communication Object

NO.	功能	Name	Data Type	Flag	DPT
439	**Fan automatic operation**	**Ventilation controller**	**1bit**	**C,R,W**	**1.003 enable**
The communication object is used to activate the fan automatic operation via the bus. Telegram: 1——Activate auto 0——Exit auto					
440	**External PM 2.5 value** **External TVOC value** **External CO2 value**	**Ventilation controller**	**2byte**	**C,W,T,U**	**9.030 concentration(ug/m3)** **9.008 parts/million(ppm)**
These objects are visible when there is External sensor. Used to receive the input of the PM2.5/VOC/CO2 value and get the corresponding value from the bus to be updated to the display in ug/m3/ppm. The data type of the object is set by the parameter. Range: 0~999ug/m3 or 0~4000ppm For example, control value of auto operation is PM2.5, it will auto adjust fan speed according to concentration of the PM2.5 when set ventilation system.					
441	**Fan speed**	**Ventilation controller**	**1byte**	**C,R,T**	**5.001 percentage** **5.100 fan stage**
The object is visible when the fan speed type is “1byte”. Used to send 1byte fan speed telegrams to the bus when auto control. The specific telegram value corresponding to each fan speed is defined by the parameter.					
442	**Actual PM2.5, status**	**Ventilation controller**	**2byte**	**C,R,T**	**9.030 concentration(ug/m3)**
442	**Actual TVOC, status**	**Ventilation controller**	**2byte**	**C,R,T**	**9.030 concentration(ug/m3)** **9.008 parts/million(ppm)**
442	**Actual CO2, status**	**Ventilation controller**	**2byte**	**C,R,T**	**9.008 parts/million(ppm)**
These objects are visible when “PM2.5/TVOC/CO2 reference from” is “Internal sensor combine with External sensor” . Used to send PM2.5/TVOC/CO2 value detected by combination of sensors to the bus.					

Table 6.9“Ventilation controller”Communication Object

6.10.“Logic function”Communication Object

6.10.1.“AND/OR/XOR”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input a			1 bit	C	-	W	T	U	boolean	低
	27	1st Logic-...	Input b			1 bit	C	-	W	T	U	boolean	低
	28	1st Logic-...	Input c			1 bit	C	-	W	T	U	boolean	低
	29	1st Logic-...	Input d			1 bit	C	-	W	T	U	boolean	低
	30	1st Logic-...	Input e			1 bit	C	-	W	T	U	boolean	低
	31	1st Logic-...	Input f			1 bit	C	-	W	T	U	boolean	低
	32	1st Logic-...	Input g			1 bit	C	-	W	T	U	boolean	低
	33	1st Logic-...	Input h			1 bit	C	-	W	T	U	boolean	低
	34	1st Logic-...	Logic result			1 bit	C	-	-	T	-	boolean	低

Fig.6.10.1 “AND/OR/XOR”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26/.../33	**Input x**	**{{1st Logic}}**	**1bit**	**C,W,T,U**	**1.002 boolean**
The communication object is used to receive the value of logical input Input x. The name in parentheses changes with the parameter “Description for logic function”. If description is empty, display “1st Logic” by default. The same below.					
34	**Logic result**	**{{1st Logic}}**	**1bit**	**C,T**	**1.002 boolean**
The communication object is used to send the results of logical operation.					

Table 6.10.1 “AND/OR/XOR”Communication Object

6.10.2.“Gate forwarding”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Gate value select			1 byte	C	-	W	-	-	scene number	低
	27	1st Logic-...	Input A			1 bit	C	-	W	-	-	switch	低
	28	1st Logic-...	Input B			1 bit	C	-	W	-	-	switch	低
	29	1st Logic-...	Input C			1 bit	C	-	W	-	-	switch	低
	30	1st Logic-...	Input D			1 bit	C	-	W	-	-	switch	低
	31	1st Logic-...	Output A			1 bit	C	-	-	T	-	switch	低
	32	1st Logic-...	Output B			1 bit	C	-	-	T	-	switch	低
	33	1st Logic-...	Output C			1 bit	C	-	-	T	-	switch	低
	34	1st Logic-...	Output D			1 bit	C	-	-	T	-	switch	低

Fig.6.10.2 “Gate forwarding”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26	**Gate value select**	**{{1st Logic}}**	**1byte**	**C,W**	**17.001 scene number**
The communication object is used to select the scene of logical gate forwarding.					
27/.../30	**Input x**	**{{1st Logic}}**	**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.					
31/../34	**Output x**	**{{1st Logic}}**	**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 6.10.2 “Gate forwarding”Communication Object

6.10.3.“Threshold comparator”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			4 bit	C	-	W	-	U	dimming control	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			1 byte	C	-	W	-	U	counter pulses (...	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	pulses	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	2-byte signed value	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	2-byte float value	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			4 bytes	C	-	W	-	U	counter pulses (unsigned)	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	temperature (°C)	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	humidity (%)	低
序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Threshold value input			2 bytes	C	-	W	-	U	lux (Lux)	低
34	1st Logic-...	Logic result			1 bit	C	-	-	T	-	boolean	低

Fig.6.10.3 “Threshold comparator”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26	**Threshold value input**	**{{1st Logic}}**	**4bit** **1byte** **2byte** **4byte**	**C,W, U**	**3.007 dimming** **5.010 counter pulses** **7.001 pulses** **12.001 counter pulses** **8.x signed value** **9.x float value** **9.001 temperature** **9.007 humidity** **9.004 lux**
The communication object is used to input threshold value.					
34	**Logic result**	**{{1st Logic}}**	**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 6.10.3 “Threshold comparator”Communication Object

6.10.4.“Format convert”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	低
27	1st Logic-...	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	低
34	1st Logic-...	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

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	低
27	1st Logic-...	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	低
28	1st Logic-...	Input 1bit-bit2			1 bit	C	-	W	-	U	boolean	低
29	1st Logic-...	Input 1bit-bit3			1 bit	C	-	W	-	U	boolean	低
30	1st Logic-...	Input 1bit-bit4			1 bit	C	-	W	-	U	boolean	低
31	1st Logic-...	Input 1bit-bit5			1 bit	C	-	W	-	U	boolean	低
32	1st Logic-...	Input 1bit-bit6			1 bit	C	-	W	-	U	boolean	低
33	1st Logic-...	Input 1bit-bit7			1 bit	C	-	W	-	U	boolean	低
34	1st Logic-...	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

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	低
34	1st Logic-...	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.

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	低
27	1st Logic-...	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	低
34	1st Logic-...	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)

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Input 2byte-low			2 bytes	C	-	W	-	U	pulses	低
27	1st Logic-...	Input 2byte-high			2 bytes	C	-	W	-	U	pulses	低
34	1st Logic-...	Output 4byte			4 bytes	C	-	-	T	-	counter pulses (unsigned)	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)

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	低
	27	1st Logic-...	Output 1bit-bit0			1 bit	C	-	-	T	-	boolean	低
	28	1st Logic-...	Output 1bit-bit1			1 bit	C	-	-	T	-	boolean	低
	29	1st Logic-...	Output 1bit-bit2			1 bit	C	-	-	T	-	boolean	低
	30	1st Logic-...	Output 1bit-bit3			1 bit	C	-	-	T	-	boolean	低
	31	1st Logic-...	Output 1bit-bit4			1 bit	C	-	-	T	-	boolean	低
	32	1st Logic-...	Output 1bit-bit5			1 bit	C	-	-	T	-	boolean	低
	33	1st Logic-...	Output 1bit-bit6			1 bit	C	-	-	T	-	boolean	低
	34	1st Logic-...	Output 1bit-bit7			1 bit	C	-	-	T	-	boolean	低

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

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input 2byte			2 bytes	C	-	W	-	U	pulses	低
	33	1st Logic-...	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	低
	34	1st Logic-...	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	低

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

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input 4byte			4 bytes	C	-	W	-	U	counter pulses (unsigned)	低
	33	1st Logic-...	Output 2byte-low			2 bytes	C	-	-	T	-	pulses	低
	34	1st Logic-...	Output 2byte-high			2 bytes	C	-	-	T	-	pulses	低

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

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input 3byte			3 bytes	C	-	W	-	U	RGB value 3x(0..255)	低
	32	1st Logic-...	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	低
	33	1st Logic-...	Output 1byte-middle			1 byte	C	-	-	T	-	counter pulses (0..255)	低
	34	1st Logic-...	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)

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	低
	27	1st Logic-...	Input 1byte-middle			1 byte	C	-	W	-	U	counter pulses (0..255)	低
	28	1st Logic-...	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	低
	34	1st Logic-...	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.6.7.4 “Format convert”Communication Object

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

Table 6.10.4 “Format convert”Communication Object

6.10.5.“Gate function”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 bit	C	-	W	-	-	switch	低
	27	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	低
	34	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	低

Input/Output - 1bit[On/Off]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 byte	C	-	W	-	-	percentage (0..100%)	低
	27	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	低
	34	1st Logic-...	Output			1 byte	C	-	-	T	-	percentage (0..100%)	低

Input/Output - 1byte[0..100%]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 byte	C	-	W	-	-	counter pulses (0..255)	低
	27	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	低
	34	1st Logic-...	Output			1 byte	C	-	-	T	-	counter pulses (0..255)	低

Input/Output - 1byte[0..255]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			2 bytes	C	-	W	-	-	temperature (°C)	低
	27	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	低
	34	1st Logic-...	Output			2 bytes	C	-	-	T	-	temperature (°C)	低

Input/Output - 2byte[Float]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			2 bytes	C	-	W	-	-	pulses	低
	27	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	低
	34	1st Logic-...	Output			2 bytes	C	-	-	T	-	pulses	低

Input/Output - 2byte[0..65535]

Fig.6.10.5 “Gate function”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26	**Input**	**{{1st Logic}}**	**1bit** **1byte** **2byte**	**C,W**	**1.001 switch** **5.001 percentage** **5.010 counter pulses** **9.001 temperature** **7.001 pulses**
The communication object is used to input a value that needs to gate filter.					
27	**Gate input**	**{{1st Logic}}**	**1bit**	**C,W**	**1.002 boolean**
The communication object is used to control the switch status of gate input. Input signal is allowed to pass when gate open, then output, and the current input status is still sent if there is a change; Can not pass when gate close.					
34	**Output**	**{{1st Logic}}**	**bit**	**C,T**	**1.001 switch**

			1byte **2byte**		**5.001 percentage** **5.010 counter pulses** **9.001 temperature** **7.001 pulses**
The communication object is used to output the value after gate filtering. Only when gate input status is open, output is available, defined by the object “Gate input”.。					

Table 6.10.5 “Gate function”Communication Object

6.10.6.“Delay function”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 bit	C	-	W	-	-	switch	低
	34	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	低

Input/Output - 1bit[On/Off]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 byte	C	-	W	-	-	percentage (0..100%)	低
	34	1st Logic-...	Output			1 byte	C	-	-	T	-	percentage (0..100%)	低

Input/Output - 1byte[0..100%]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			1 byte	C	-	W	-	-	counter pulses (0..255)	低
	34	1st Logic-...	Output			1 byte	C	-	-	T	-	counter pulses (0..255)	低

Input/Output - 1byte[0..255]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			2 bytes	C	-	W	-	-	temperature (°C)	低
	34	1st Logic-...	Output			2 bytes	C	-	-	T	-	temperature (°C)	低

Input/Output - 2byte[Float]

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	26	1st Logic-...	Input			2 bytes	C	-	W	-	-	pulses	低
	34	1st Logic-...	Output			2 bytes	C	-	-	T	-	pulses	低

Input/Output - 2byte[0..65535]

Fig.6.10.6 “Delay function”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26	**Input**	**{{1st Logic}}**	**1bit** **1byte** **2byte**	**C,W**	**1.001 switch** **5.001 percentage** **5.010 counter pulses** **9.001 temperature** **7.001 pulses**
The communication object is used to input a value that needs to delay.					
34	**Output**	**{{1st Logic}}**	**1bit** **1byte** **2byte**	**C,T**	**1.001 switch** **5.001 percentage** **5.010 counter pulses** **9.001 temperature** **7.001 pulses**
The communication object is used to output that needs to delay converted value, delay time is defined by the parameter.					

Table 6.10.6 “Delay function”Communication Object

6.10.7.“Staircase lighting”Communication Object

序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
26	1st Logic-...	Trigger value			1 bit	C	-	W	-	-	trigger	低
27	1st Logic-...	Light-on duration time			2 bytes	C	-	W	-	-	time (s)	低
34	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	低
34	1st Logic-...	Output			1 byte	C	-	-	T	-	counter pulses (0..255)	低

Fig.6.7.7 “Staircase lighting”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
26	**Trigger value**	**{{1st Logic}}**	**1bit**	**C,W**	**1.017 trigger**
The communication object is used to receive the value to trigger staircase lighting.					
27	**Light-on duration time**	**{{1st Logic}}**	**2byte**	**C,W**	**7.005 time(s)**
The communication object is used to modify the staircase light-on duration time, the modified range is referenced from the range defined by the parameter, take the limit value if exceeded.					
34	**Output**	**{{1st Logic}}**	**1bit** **1byte**	**C,T**	**1.001 switch** **5.010 counter pulses**
The communication object is used to output value 1 when trigger, and send value 2 after duration time. Telegram value is determined by the parameter setting datatype.					

Table 6.10.7 “Staircase lighting”Communication Object

6.11.“Scene group function”Communication Object

	序号	名称	对象功能	描述	群组地址	长度	C	R	W	T	U	数据类型	优先级
	98	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	低
	99	1 Scene Group-Output 1	1bit value			1 bit	C	-	-	T	-	switch	低
	100	1 Scene Group-Output 2	1byte unsigned value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
	101	1 Scene Group-Output 3	HVAC mode			1 byte	C	-	-	T	-	HVAC mode	低
	102	1 Scene Group-Output 4	2byte unsigned value			2 bytes	C	-	-	T	-	pulses	低
	103	1 Scene Group-Output 5	Temperature			2 bytes	C	-	-	T	-	temperature (°C)	低
	104	1 Scene Group-Output 6	RGB value			3 bytes	C	-	-	T	-	RGB value 3x(0..255)	低
	105	1 Scene Group-Output 7	RGBW value			6 bytes	C	-	-	T	-	RGBW value 4x(0..100%)	低
	106	1 Scene Group-Output 8	1bit value			1 bit	C	-	-	T	-	switch	低

Fig.6.11 “Scene Group”Communication Object

NO.	Object Function	Name	Data Type	Flag	DPT
98	**Main scene trigger**	**Scene Group**	**1byte**	**C,W**	**17.001 scene number**
This 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					
99/../106	**1bit value** **1byte unsigned value** **HVAC mode** **2byte unsigned value** **Temperature** **RGB value** **RGBW value**	**1st Scene Group-{{Output x}}**	**1bit** **1byte** **2byte**	**C,T**	**1.001 switch** **5.010 counter pulses** **20.102 HVAC mode** **7.001 pulses** **9.001 temperature** **232.600 RGB value 3x(0..255)** **251.600 DPT_Colour_RGBW**
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 8 scene groups can be set up, with 8 outputs per group. The name in parentheses changes with the parameter “Description for Output x function”. If description is empty, display “1st Scene Group-Output x” by default.					

Table 6.11 “Scene Group”Communication Object