K-BUS® Air Quality Sensor PCR

User Manual-Ver. 1

CSAQ-00/00.2

KNX/EIB Intelligent Installation Systems

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1. Summary

Air quality is related to our life so closely that it will affect our life directly. The Air Quality Sensor is mainly used to detect and evaluate real-time air pollution index including PM2.5/PM10,CO2,AQI, temperature and humidity. It will control the detected pollution index, temperature and humidity accordingly to fresh the air and improve home environment. It has also logic output control. Air Quality Sensor ,together with other bus devices is connected to EIB/KNX bus to form a complete system .

Air Quality Sensor is connected to bus directly by using EIB bus connection terminals. 12-30V DC auxiliary power supply is needed and it'll be installed using a 86*86mm box. It is available to assign the physical address and set the parameters by engineering design tool ETS with VD4 (ETS3 or above).

The functions of Air Quality Sensor can be summarized as follow:

- PM2.3, PM10 particle pollution detection display
- Temperature, humidity detection display
- Air Quality Index (AQI) detection display
- Carbon dioxide (CO2)detection display
- Temperature, humidity detection display
- Air quality level control
- Air pollution level control
- Cooling or heating control
- Humidity level control
- CO2 exceeded control
- Three logic functions

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2. Technical Parameters, Dimensions Structure and Wiring Diagram

2.1. Technical parameters

Power supply	EIB/KNX voltage	21-30V DC
	EIB/KNX current consumption	Max. 12mA
	EIB/KNX power consumption	Max. 360mW
Auxiliary power supply	Voltage	12-30V DC
	Power consumption	<1.5W
Operating and display	Red LED and buttons	Distribution of physical address
	Green LED flashing	Indicates device working properly
Connection	EIB/KNX	Bus connection terminal（red/black）
	Auxiliary power supply	Bus connection terminal (yellow/white）
Installation	Standard 86 wall-mounted installation	
Temperature range	Operating	– 5 °C ... 45 °C
	Storage	– 25 °C ... 55 °C
	Transportation	– 25 °C ... 70 °C
Environmental conditions	Humidity	<80%，No condensation
Size	86*86mm	
weight	0.3KG	
Temperature	Measuring range	-5℃…45℃
	Resolution	0.1℃
	Accuracy	±1℃
Humidity	Measuring range	0…100%RH
	Resolution	0.1%
	Accuracy	3%RH
Particulates density sensor	Measuring range	0-999 μ g/m³
	Counting efficiency	50%@0.3um 98%@>=0.5 um
	Response time	≤ 10s
CO2 Detect	Range and accuracy	400ppm~2000ppm， ±40ppm

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2.2. Dimensions Structure and Wiring Diagram

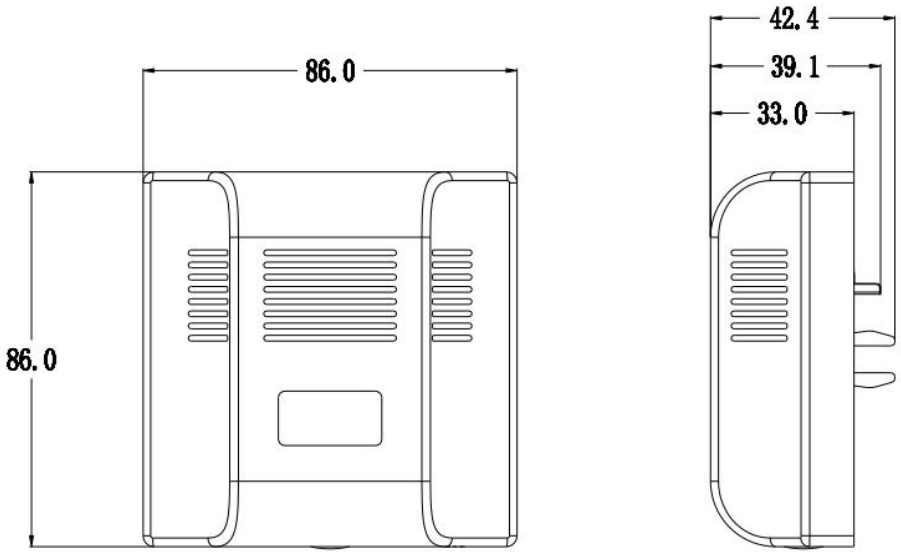

Figure 2.2.1 Air quality sensor dimension

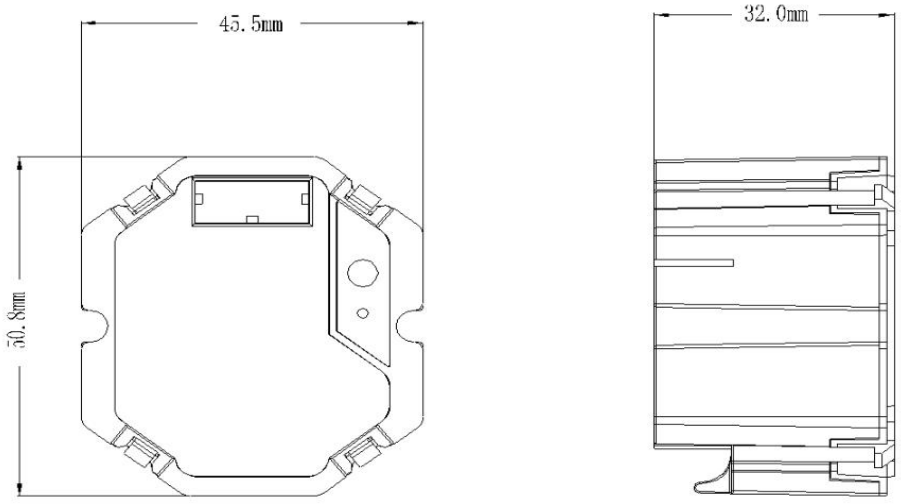

Figure 2.2.2 Air quality sensor of coupler dimension

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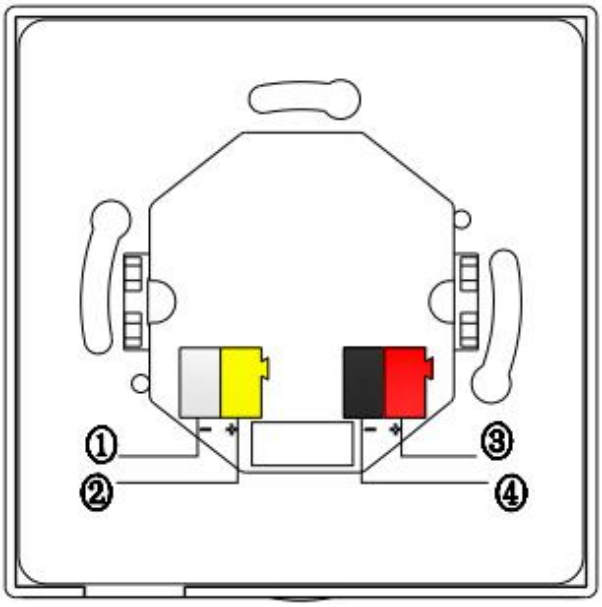

Figure 2.2.3Air quality sensor connection

①、②：KNX/EIB Auxiliary power supply ③、④：KNX/EIB Bus

3. Project design and application

Application program	Maximum number of Communication objects	Maximum number of group address	Maximum number of associations
Air Quality sensor PVR	41	120	120

Feature Overview：

Display various of detection index

It can display the current PM2.5, PM10, AQI levels, temperature, humidity and CO2. Manual switching display or Automatic switching display

Detection index excessive alarm

AQI level exceeded alert，CO2 excessive alert，Over-temperature or humidity alert，the buzzer will be turned on when there is alarm, but this function can only be set to one of the alarm.

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AQI

AQI have six levels, each level can send up to three different types of data values，like 1bit，4bit，1byte，according to the parameter settings.

AQI alarm

You can set the AQI alert level, send three different types of data values when there is alarm or no alarm occurred according to the parameters.

Temperature control

The sensor adds a simple temperature control function, simple heating / cooling, using two-point control mode, heating / cooling switch operated through the object. It can set the sending data values when the heating/cooling is being turned on or stopped，which is determines by the set parameters. The temperature setting values of heating/cooling can be changed by the bus, and the alarm temperature of overheat/over cold is set by the parameters.

Humidity

Three levels in total, each level can send up to three different types of data values, like 1bit，4bit，1byte, set according to the parameters. Meanwhile, humidity alarm can be set.

CO2 alarm

CO2 alarm value is configurable, either alarm or no-alarm situation sens 3 types of telegraph, which is also configurable.

Logic Function

The sensor provides three kinds of logic function, each of them has five logic inputs, they are: AQI sends 1bit value, AQI alarm sends 1bit value, temperature sends 1bit value, humidity sends 1bit value, CO2 alarm sends 1bit value or logic output 1bit value and outside input. It can also provide 6 kinds of logical operation and door function. It can send three types of value according to the logic operation result.

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4. Parameter setting description in the ETS

4.1. Summary

This sensor parameter can be configured differently according to the user's need. The details are as below:

4.2. Parameter setting window "General Setting"

"General Setting" parameter setting interface is shown in figure 4.2. It mainly includes some basic parameter setting.

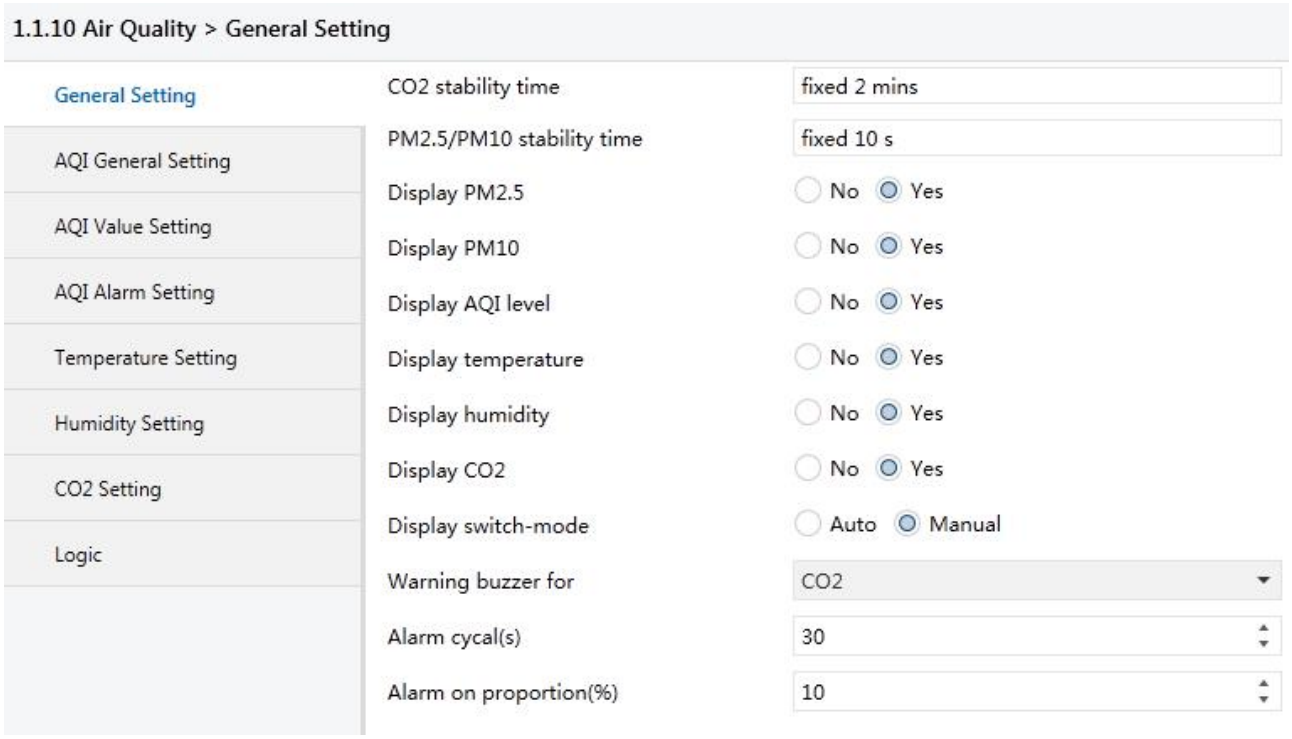

Figure 4.2 "General Settings" parameter setting

Parameter "Display PM2.5"
Parameter "Display PM10"
Parameter "Display AQI level"
Parameter "Display temperature"
Parameter "Display humidity"
Parameter "Display CO2"
Option: No
Yes

These parameters are used to define whether to show the parameters detected or not, "Yes" means Shown, "No" means Not Shown.

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Parameter "Display switch-mode"

Option： Auto

Manul

This parameter is used for setting the switching way of the detection. "Auto"means automatic switch, which enables an automatic switch to the next value every 5 seconds. "Manual"means manual switch, the display will be changed to next value by a short press on the button under the sensor, long press will bring it to automatic display.

Parameter "Warning buzzer for"

Option： Do not used

AQI

Temperature

Humidity

CO2

This parameter is used for setting the buzzer alarm.

The "Do not used" is to disable the buzzer alarm function.

The "AQI"is air quality level alarm. When the detected air quality level is equal to or larger than the "Alarm level"level in parameter page "AQI Alarm Setting", the buzzer will go off.

The "Temperature"is temperature alarm, when the detected temperature value is equal to or larger than the "Heat/Cool alarm temperature(*0.1Celsius)" value in parameter page "Temperature Setting" , the buzzer will go off.

The "Humidity"is humidity alarm, when the detected humidity value is equal to or larger than the Humidity alarm value(%)" value in parameter page "Humidity Setting", the buzzer will go off.

The "CO2" is carbon dioxide alarm, when the detected CO2 value is equal to or larger than the "CO2 alarm value(ppm)" value in parameter page "CO2 Setting", the buzzer will go off.

Parameter "Alarm cycal"

Option：2…255(s)

This parameter indicates the time cycle of the buzzer alarm.

Parameter "Alarm on proportion (%)"

Option：1…100(%)

This parameter indicates the percentage of buzzer alarm within the buzzer alarm time cycle. For example, if the time cycle is 2s and the parameter 50%, then the buzzer will be able for 1s and disabled closed 1s circularly.

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4.3. Parameter setting “AQI General Setting”

“AQI General Settings” parameter setting is shown in figure 4.3. It mainly includes the setting for the general parameters of temperature and humidity.

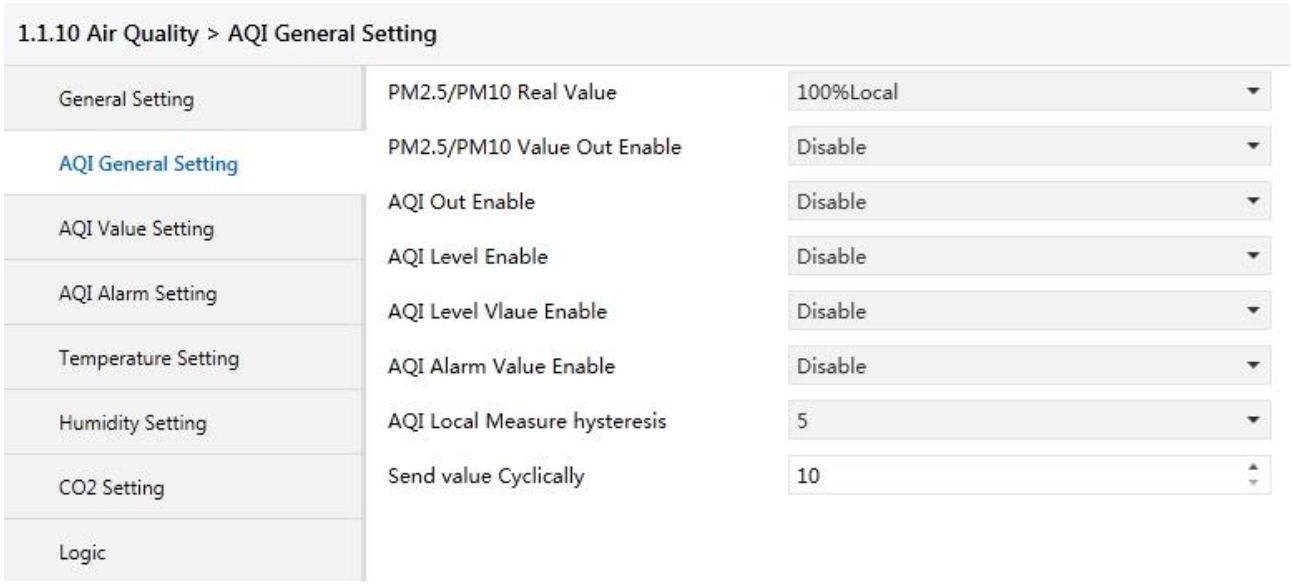

Figure 4.3 “AQI General Settings” Parameter setting

Parameter “PM2.5/PM10 Real Value”

Option： 100%Remote

10%Local+90%Remote

...

100%Local

This parameter is used to set the proportion between the locally detected PM2.5/PM10 value and the one from the KNX bus. For example, if it is “40%Local+60%Remote”, then the local PM2.5/PM10 value （A） occupies 40%, outside sensor（B）takes up 60%, the actual sensor value=（ A×40%）+（B×60%）.

Parameter “PM2.5/PM10 Value Out Enable”

Options： Enable

Enable Cycal

Disable

This Parameter is used to set the mode of sending the measurement of PM2.5/PM10. If selecting “Enable”, the measured value of the PM2.5/PM10 will be sent to the bus when the change amount is up to one of the value of

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parameter “AQI Local Measure hysteresis”.If selecting “Enable Cycal”,the measured value of the PM2.5/PM10 will be sent to the bus in accordance with the cycle,which is set in the parameter of“Send value Cyclically”.If selecting “Disable”,the measured value of the PM2.5/PM10 will not to be sent to the bus.

Parameter “AQI Out Enable”

Options： Enable

Enable Cycal

Disable

This Parameter is used to set the mode of sending Air Quality Index(abbr.AQI). If selecting “Enable”, the value of the AQI will be sent to the bus when the change amount is up to one of the values of parameter of“AQI Local Measure hysteresis”.If selecting “Enable Cycal”,the value of the AQI will be sent to the bus in accordance with the cycle,which is set in the parameter “Send value Cyclically”.If selecting “Disable”,the value of the AQI will not to be sent to the bus.

Parameter “AQI Level Enable”

Options： Enable

Enable Cycal

Disable

This Parameter is used to set the mode of sending AQI Level. The air quality is divided into six levels,respectively 0-50, 51-100,101-150,151-200,201-300 and more than 300. If selecting “Enable”, the level of the AQI will be sent to the bus when the AQI level changes. If selecting “Enable Cycal”,the level of the AQI will be sent to the bus in accordance with the cycle,which is set in the parameter “Send value Cyclically”.If selecting “Disable”,the level of the AQI will not to be sent to the bus.

Parameter “AQI Level Vlaue Enable”

Options： Enable

Enable Cycal

Disable

This Parameter is used to set the mode of sending setting value when in different AQI level. If selecting “Enable”, the corresponded setting value with the parameter page of“AQI Value Setting”will be sent once to the bus when the AQI level changes. If selecting “Enable Cycal”,the corresponded setting value with the parameter page of“AQI Value Setting”will be sent to the bus in accordance with the cycle,which is set in the parameter “Send value Cyclically”.If selecting “Disable”,the corresponded setting value with the parameter page of“AQI Value Setting”will not to be sent to

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the bus.

Parameter "AQI Alarm Value Enable"

Options： Enable

Enable Cycal

Disable

The parameter is for setting of sending way for AQI Level Alarm. "Enable" means send when changed, when AQI level is more than or less than "Alarm Level" in parameter page "AQI Alarm setting", then it will send corresponding setting value to the BUS for once. "Enable Cycle" is for cyclical sending, the corresponding alarm setting value in parameter page "AQI Alarm Setting" will be sent to the BUS according to the set value from parameter "Send value Cyclically". "Disable" means that corresponding alarm value of parameter page "AQI Alarm Setting" won't be sent to the BUS.

Parameter "AQI Local Measure hysteresis"

Options: 5

10

30

50

This parameter is used to set variations, value measured by the sensor will update that of the BUS.

Parameter "Send value Cyclically"

Options： 10..50000

This parameter is used to set cycle sending time, value measured by the sensor will update the value on the BUS according to the set cycle sending time.

4.4. Parameter "AQI Value Setting"

The "AQI Value Setting" here mainly means setting of the value under different Level of Setting AQI Level.

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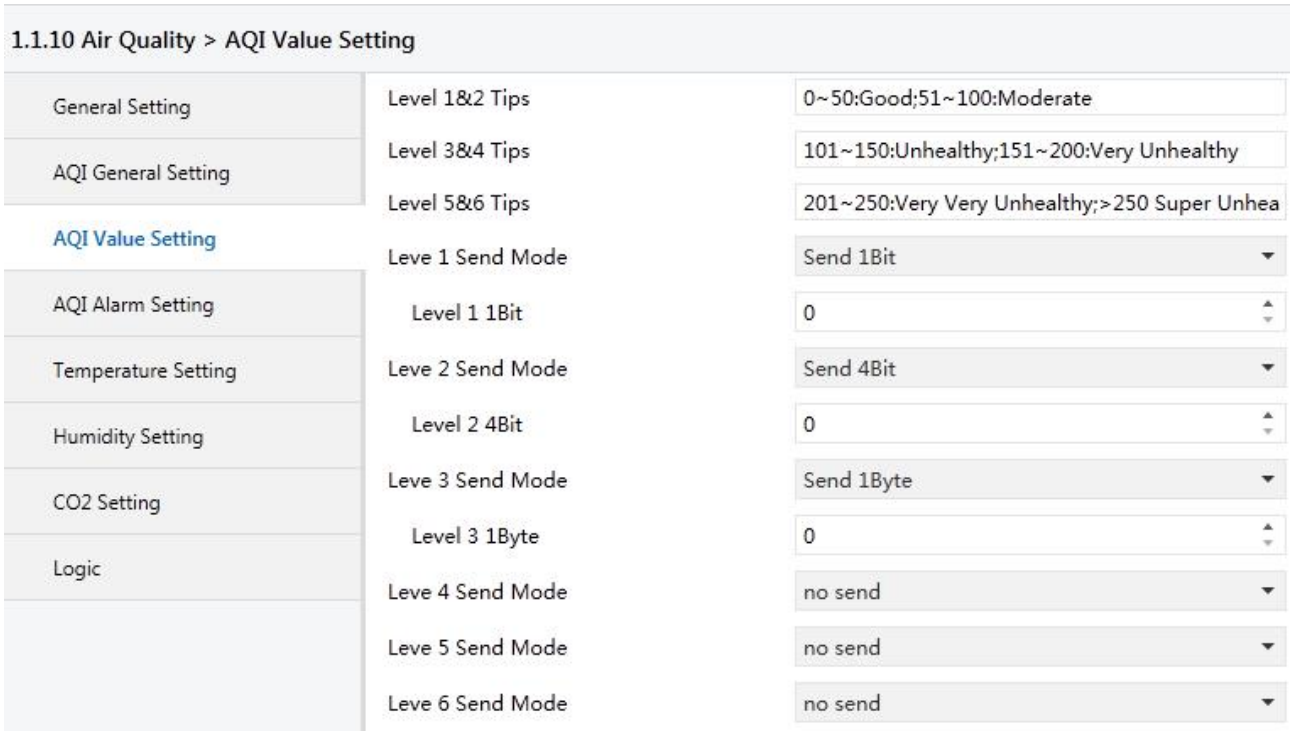

Figure 4.4 “AQI Value Setting” Parameter Setting

Parameter “Level x Send Mode”

Options： no send

Send 1Bit

...

Send 1bit+4Bit+1Byte

This parameter is used to set the data type being sent.

Parameter “Level x 1Bit”

Options：0...1

This parameter is used to set the 1Bit value being sent.

Parameter “Level x 4Bit”

Options：0...15

This parameter is used to set the 4 Bit value being sent.

Parameter “Level x 1Byte”

Options：0...255

This parameter is used to set the 1Byte value being sent.

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4.5. Parameter “AQI Alarm Setting”

“AQI Alarm Setting” parameter is shown below in Figure 4.5, it is used to set the AQI Alarm Setting.

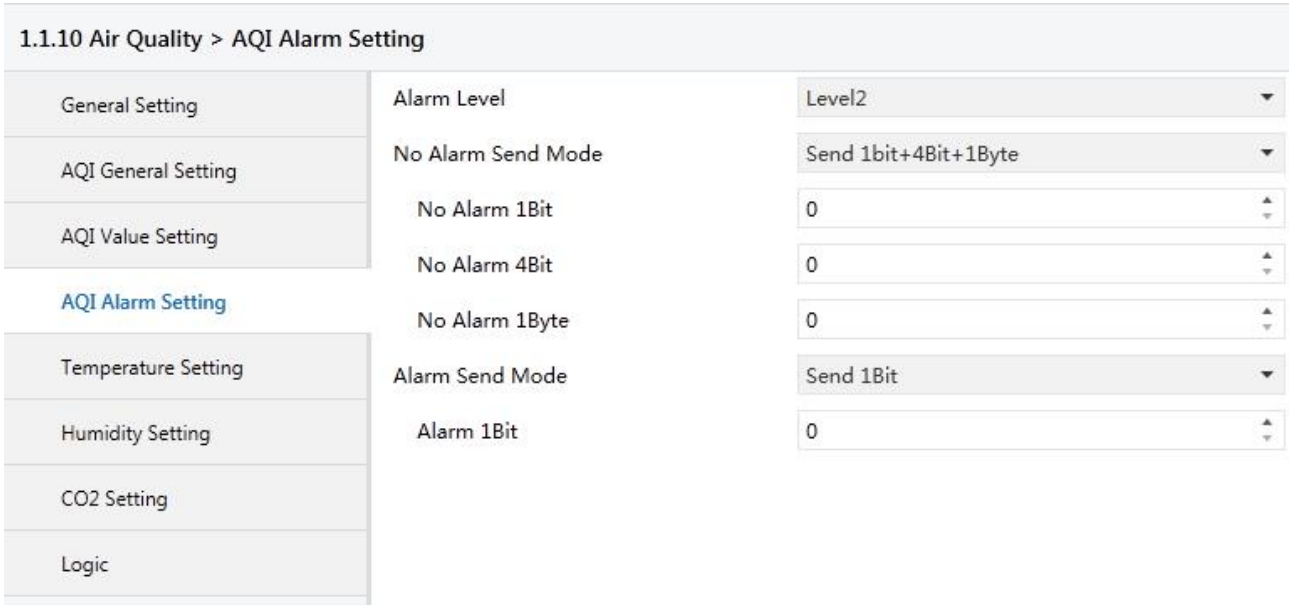

Figure 4.5 “AQI Alarm Setting” Parameter

Parameter “Alarm Level”

Options： Level 2

...

Level 3

This parameter is used to set AQI Level Alarm, when the detected level is larger than the parameter, the value set in parameter “Alarm send Mode” wil be sent; or else the value set in parameter “Alarm send Mode” will be sent.

Parameter “No alarm (Alarm)Send Mode”

Options： no send

Send 1Bit

...

Send 1bit+4Bit+1Byte

This parameter is used to set the data type being sent.

Parameter “No alarm (Alarm) 1Bit”

Options：0...1

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This parameter is used to set the 1Bit value being sent.

Parameter "No alarm (Alarm) 4Bit"

Options：0...15

This parameter is used to set the 4Bit value being sent.

Parameter "No alarm (Alarm) 1Byte"

Options：0...255

This parameter is used to set the 1Byte value being sent.

4.6. Parameter "Temperature Setting"

"Temperature Setting" parameter is shown blow in Figure 4.6, it is used to set the temperature parameter.

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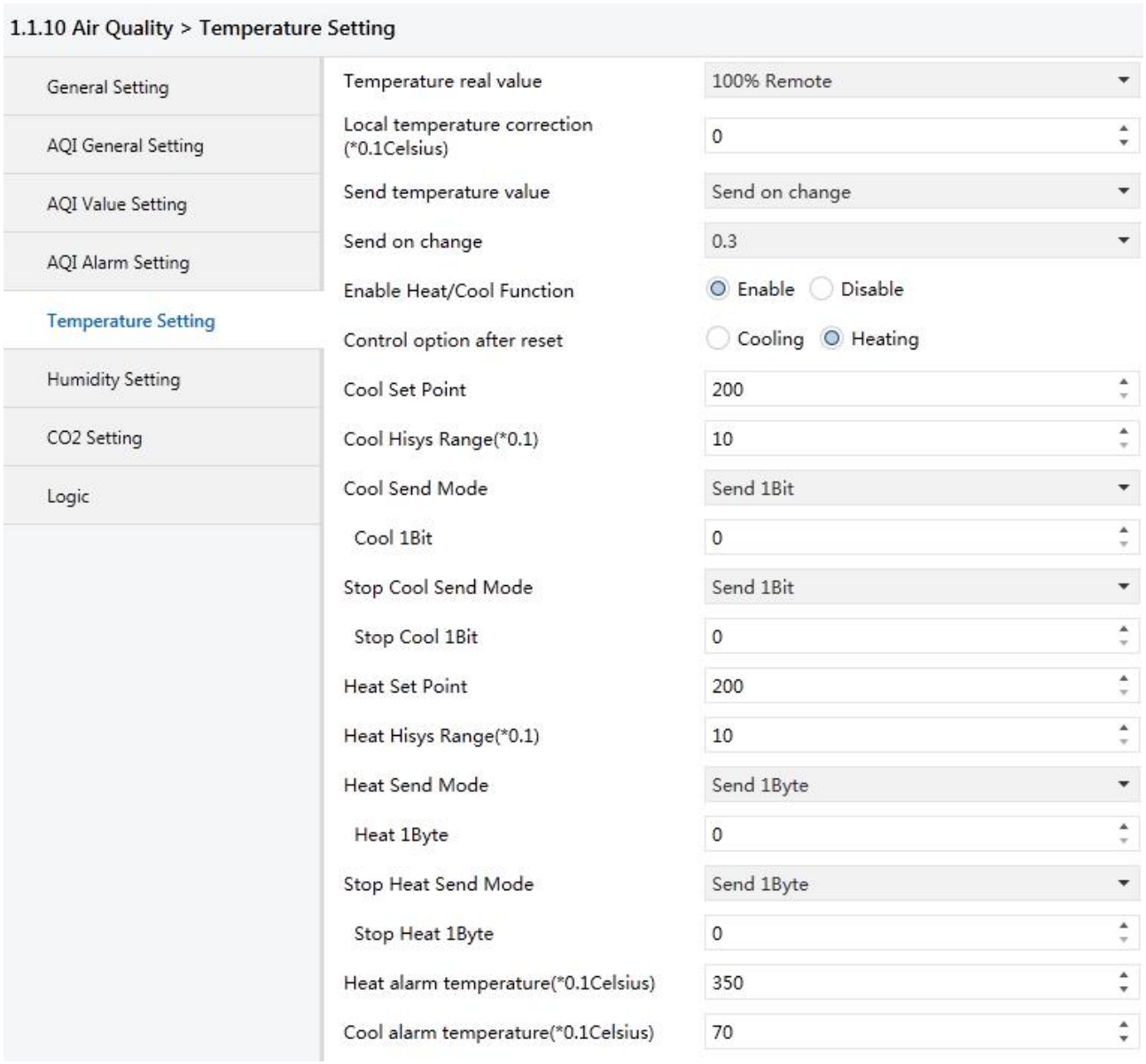

Figure 4.6 “Temperature Setting” Parameter

Parameters “Temperature real value”

Options: 100%Remote

10%Local+90%Remote

...

100%Local

This parameter set the proportion of local temperature measurements with KNX bus uploaded value. For example, options is “40%Local+60%Remote”, then the local temperature measurements (A) occupies the proportion 40%. External sensor (B) occupies the proportion 60%. Sensor actual value =（ A×40%）+（B×60%）.

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Parameters "Local temperature correction(*0.1Celsius)"

Options: -30...30

This parameter set temperature correction value. Temperature actual output value = measured temperature value + the parameter value. The measured temperature value is the actual value of the last parameter of the Sensor. If the last parameter option is 100% remote, will not be amended.

Parameters "Send temperature value"

Options: No send

Send on change

Send cycically

This parameter sets the way to send temperature value, select " no send", Do not send temperature value. Select "Send on change". Only temperature value changed, then sent to the bus. Select"Send cyclically", temperature value cyclical sent to the bus.

Parameters "Send on change"

Options: 0.1

0.2

...

5

This parameter set when the temperature changed a certain amount, send the current temperature value to the bus.

Parameters "Period of send temperature (*1s)"

Options: 10..50000

This parameter sets the time of temperature cycle sent to the bus.

Parameters "Enable Heat/Cool Function"

Options: Enable

Disable

This parameter is set the function whether enable control heating and cooling threshold.If select "enable", the following parameters are visible:

Parameters "Control option after reset"

Options: Cooling

Heating

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This parameter set the power-on reset to perform the heating or cooling function.

Parameters "Cool /Heat Set Point"
Options: 200....350

This parameter set the setpoint of heating and cooling temperature.

Parameters "Cool/Heat Hisys Range"
Options: 10 - 50

This parameter set the hysteresis range of heating and cooling.

This range is used to prevent the small amplitude of temperature drops or rises, frequent moves by the actuator.

Parameters "Cool/Heat(Stop Cool/Heat) Send Mode"
Options: no send
Send 1Bit
...
Send 1bit+4Bit+1Byte

This parameter is used to set open heating and cooling, the object to send data types.

Parameters "Cool/Heat(Stop Cool/Heat) 1Bit"
Options: 0...1

The parameter set to send 1Bit value.

Parameters "Cool/Heat(Stop Cool/Heat) 4Bit"
Options: 0...15

The parameter set to send 4Bit value.

Parameters "Cool/Heat(Stop Cool/Heat) 1Byte"
Options: 0...255

The parameter set to send 1byte value.

Parameters "Heat alarm temperature(*0.1Celsius)"
Options: 0...500

This parameter is used to set the overheating of alarm temperature value.

Parameters "Cool alarm temperature(*0.1Celsius)"
Options: 0...500

This parameter is used to set cold of alarm temperature value.

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4.7. Parameter setting Window “Humidity Setting”

Parameter window “Humidity Setting” can be shown in fig. 4.7.

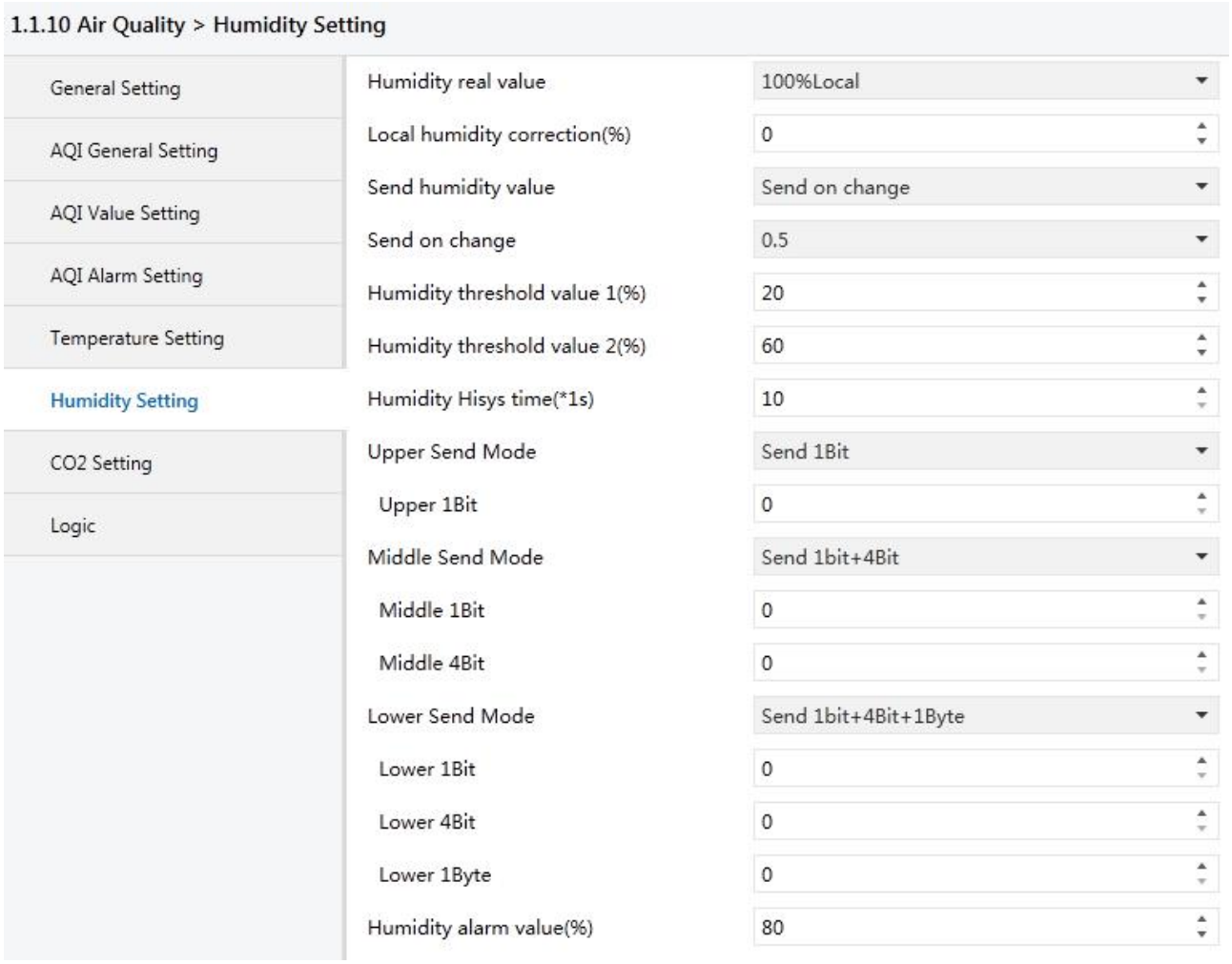

Figure 4.7 Parameter window “Humidity Setting”

Parameter “Humidity real value”

Options：100%Remote

10%Local+90%Remote

...

100%Local

This command is for setting the Proportion between the local humidity value and value sent from the BUS. For example, Option “40%Local+60%Remote”,shows Local humidity value (A) accounts for 40%，and the external sensor value (B) accounts for 60%,The real value of the Sensor =（ A×40%）+（B×60%）.

Parameter “Local humidity correction(%)”

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Options：-30...30

This command is used to set the humidity correction. the actual output Humidity values= Measured humidity value+ this parameter. Measured humidity value is the real value of the Sensor. If the real value of the Sensor is 100%remote, then it is no need to operate the humidity correction.

Parameter "Send humidity value"

Options：No send

Send on change

Send cycically

This command is for setting the ways of sending humidity value. When Choose "No send",It will not sent the measured humidity value. When Choose "Send on change",it will sent the value to the BUS until it was changed.when choose "Send cyclically",the value will be sent to the BUS cyclically.

Parameter "Period of send humidity (*1s)"

Options：10..50000

It is for setting the time of humidity sent cyclically to the Bus.

Parameter "Send on change"

Options：0.1

0.2

...

5

This command is for setting as when humidity is changed, the current humidity measurements is send to the bus.

Parameter "Humidity threshold value 1"

Parameter "Humidity threshold value 2"

Options：1-99(%)

It sets the threshold value of humidity level.

0% ~Humidity threshold value 1 is for lower humidity；

Humidity threshold value 1~Humidity threshold value 2 is for middle humidity；

Humidity threshold value 1~ 100% is for upper humidity。

Note：Humidity threshold value 1<Humidity threshold value 2

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Parameter "Humidity Hisys time(*1s)"

Options：10-50000(s)

This command is for setting the time for confirming the switch level. For example, when the humidity level turns from lower humidity into middle humidity, humidity need to be kept the time of the parameter set in the range of middle humidity. Then it can be confirm to turn into the middle humidity level.

Parameter "Upper/Middle/Lower Send Mode"

Options：no send

Send 1Bit

...

Send 1bit+4Bit+1Byte

This command is for setting the data type which was sent when humidity is in upper/middle/lower level.

Parameter "Upper/Middle/ Lower 1Bit"

Options：0..1

It is used to set that1 Bit was sent when humidity is Upper/Middle/ Lower level.

Parameter "Upper/Middle/Lower 4Bit"

Options：0...15

It is used to set that 4Bit was sent when humidity is Upper/Middle/ Lower level.

Parameter "Upper/Middle/Lower 1Byte"

Options：0...255

It is used to set that 1Byte was sent when humidity is Upper/Middle/ Lower level.

Parameter "Humidity alarm value(%)"

Options：1-99(%)

It sets the threshold value of humidity alarm.

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4.8. Parameter Window “CO2 Setting”

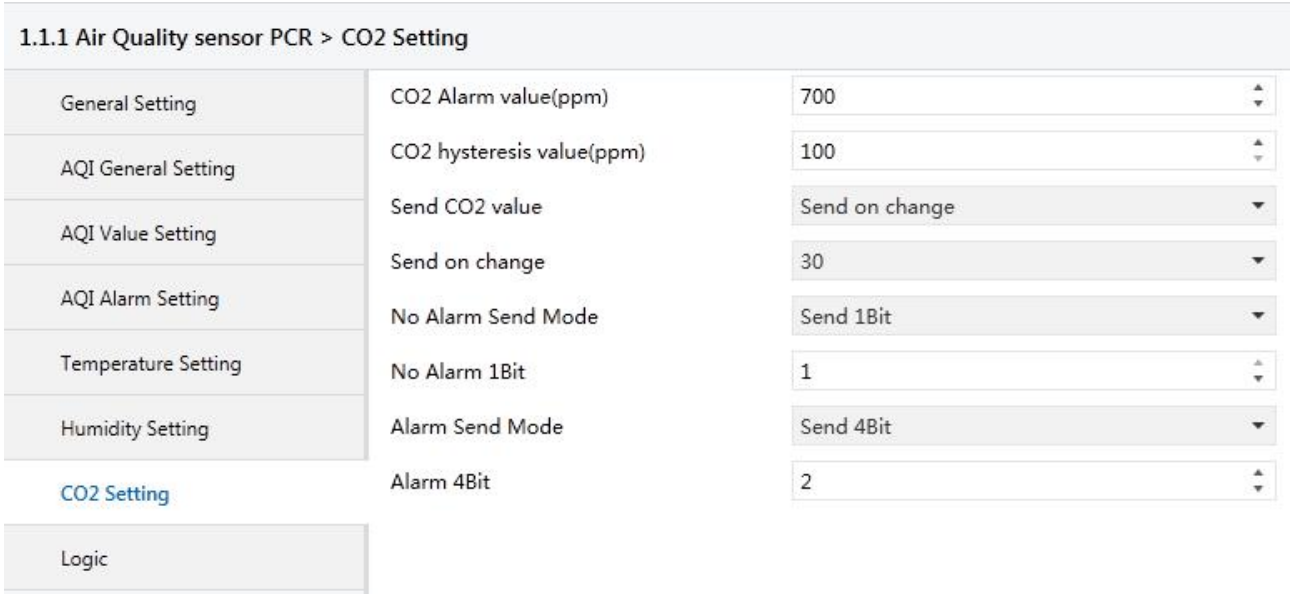

Figure 4.8 “CO2 Setting” Parameter Window

Parameter “CO2 Alarm value(ppm)”

Options：400...2000

This command is for setting threshold value of CO2 alarm.

Parameter“CO2 hysteresis value(ppm)”

Options：100...500

This parameter sets CO2 hysteresis value of alarm. Example, the threshold value of CO2 alarm is 700, the hysteresis value is 100, then when the carbon dioxide concentration reached 700ppm, the alarm active, when it down to 600ppm,the alarm lifted .

Parameter “Send CO2 value”

Options：No send

Send on change

Send cyclically

This command is for setting way of CO2 value sent. When choose “No send”, CO2 measured value did not sent . When choose “Send on change”, the CO2 value is sent to the BUS until the CO2 measured value make some change. when choose “Send cyclically”, CO2 measure value is sent to the BUS.

Parameter “Send on change”

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Options：5

10

30

50

This parameter sets when the CO2 change a certain amount, send the CO2 measurements to the Bus.

Parameter "Period of send CO2 value(*1s)"

Options：10...50000

Parameter sets the time of CO2 cycle send to the Bus.

Parameter "No Alarm(Alarm) Send Mode"

Options：no send

Send 1Bit

...

Send 1bit+4Bit+1Byte

This parameter sets the sending data type when the CO2 alarm or not.

Parameter "No Alarm(Alarm) 1Bit"

Options：0...1

This parameter sets the CO2 sending 1 bit values when alarm or not.

Parameter "No Alarm(Alarm) 4Bit"

Options：0...15

This parameter sets the CO2 sending 4 bit values when alarm or not.

Parameter "No Alarm(Alarm) 1Byte"

Options：0...255

This parameter sets the CO2 sending 1 Byte values when alarm or not.

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4.9. Parameter Settings interface “Logic”

“Logic” parameter Settings interface as shown in figure 4.9.

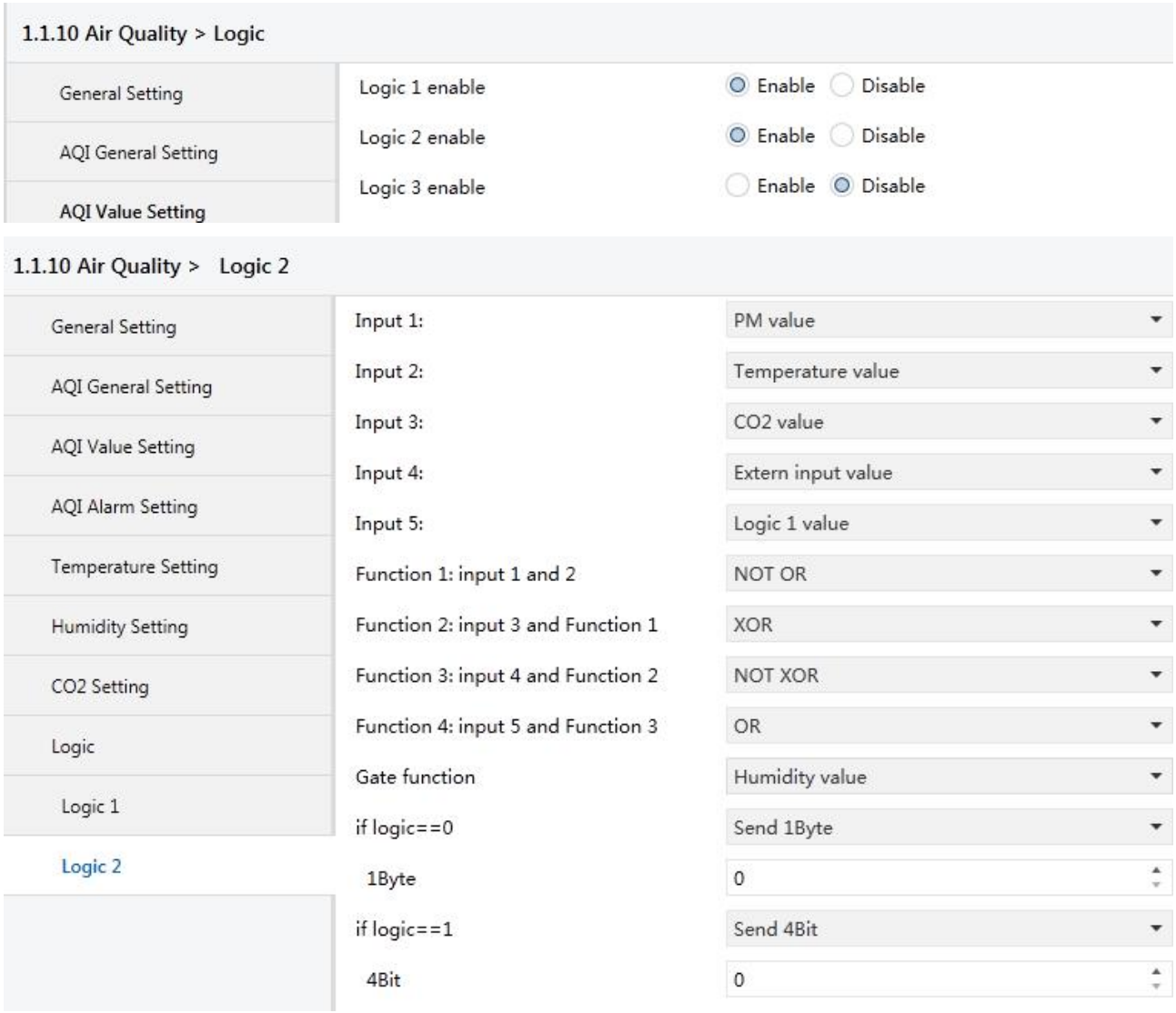

Figure 4.9 “Logic” parameter setting interface

Parameter “Logic x enable”

Options：Enable

Disable

This parameter is the logic functions of “can be”, there are three logical function can choose.

Parameter “Input x:”

Parameter “Gate function”

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Options：Do not use

PM value

PM alarm value

Temperature value

Humidity value

CO2 value

Extern input value

Logic 1 value

Logic 2 value

This parameter is the value of selected to participate in the logical operation, "Do not use" means “not enabling the input”. The "value PM" means “the value of communication object 6 is the input”. The "PM alarm value" means “the value of communication object 9 is the input”. The "Temperature value" means “the value of communication object 15 is the input”.

The "Humidity value" means “the value of communication object 22 is the input”. The "CO2 value" means “the value of communication object 26 is the input”. The "Extern input value" means “the value of communication object 32/36/40 is the input”. The object is not to be transmitted, then this object is not in operation. The parameter of "Gate function" is used as an input, and when it is "1", the result of the logical operation can be sent to the Bus.

Parameter “Function 1: input 1 and 2”

Parameter “Function 2: input 3 and Function 1”

Parameter “Function 3: input 4 and Function 2”

Parameter “Function 4: input 5 and Function 3”

Options：AND

OR

XOR

NOT AND

NOT OR

NOT XOR

This parameter introduces the logical relationship of the logic operation, providing 6 standard logical operations (AND, OR, XOR, NOT AND, NOT OR, NOT XOR)

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Parameter "if logic==0/1"

Options：no send

Send 1Bit

...

Send 1bit+4Bit+1Byte

This parameter is to set the sending value for logical operation result 1 or 0.

Parameter "1bit"

Options：0...1

This parameter is set to send 1 bit value.

Parameter "4bit"

Options：0...15

This parameter is set to send 4 bit value.

Parameter "1byte"

Options：0...255

This parameter is set to send 1 byte value.

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5. Communication objects

Communication objects are media for devices on the bus to communicate with other devices, and only through communication objects can carry out bus communication. Following is the detail description for the communication objects.

Note: "C" means enabling communication functions; "W" means the value of communication objects can be modified through the bus; "R" means the value of communication objects can be read through the bus; "T" means the communication object has a transmission function; "U" means the value of the communication objects can be updated.

5.1. AQI Function objects

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
0	PM2.5	PM2.5 Out			2 bytes	C	R	-	T	-	pulses	Low
1	PM2.5	PM2.5 In			2 bytes	C	-	W	-	-	pulses	Low
2	PM10	PM10 Out			2 bytes	C	R	-	T	-	pulses	Low
3	PM10	PM10 In			2 bytes	C	-	W	-	-	pulses	Low
4	AQI	AQI Out			2 bytes	C	R	-	T	-	pulses	Low
5	AQI Level	AQI Level Out			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
6	AQI Level Out Value	AQI Level Out Value, 1bit			1 bit	C	-	-	T	-	switch	Low
7	AQI Level Out Value	AQI Level Out Value, 4bit			4 bit	C	-	-	T	-	dimming control	Low
8	AQI Level Out Value	AQI Level Out Value, 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
9	AQI Alarm Out Value	AQI Alarm Out Value, 1bit			1 bit	C	-	-	T	-	switch	Low
10	AQI Alarm Out Value	AQI Alarm Out Value, 4bit			4 bit	C	-	-	T	-	dimming control	Low
11	AQI Alarm Out Value	AQI Alarm Out Value, 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Fig 5.1 AQI function objects

NO.	Object	Functions	Data	Flag	DPT
0	PM2.5	PM2.5 Out	2byte	C, R,T	7.001 DPT_Value_2_Ucount
1	PM2.5	PM2.5 In	2byte	C,W	7.001 DPT_Value_2_Ucount
2	PM10	PM10 Out	2byte	C, R,T	7.001 DPT_Value_2_Ucount
3	PM10	PM10 In	2byte	C,W	7.001 DPT_Value_2_Ucount
Object NO.0 is for PM2.5 output and object NO.2 is for PM10 output. The value will be sent to the bus cyclically or only after change. The unit is ug/m^3. Object NO.1 is for PM2.5 input and object NO.3 is for PM10 input. The value will be displayed when the update value is obtain via the bus. The unit is ug/m^3.					
4	AQI	AQI Out	2byte	C, R,T	7.001 DPT_Value_2_Ucount
This object is for sending the air quality index to the bus. Range: 0-500					
5	AQI Level	AQI Level Out	1byte	C, R,T	5.010 DPT_Value_1_Ucount

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This object is for sending the value of air quality levels. There are 6 levels according to the air quality index. 0-50 51-100 101-150 151-200 201-300 >300					
6	AQI Level Out Value	AQI Level Out Value, 1bit	1bit	C,T	1.001 DPT_Switch
7	AQI Level Out Value	AQI Level Out Value, 4bit	4bit	C,T	3.007 DPT_Control_Dimming
8	AQI Level Out Value	AQI Level Out Value, 1byte	1byte	C,T	5.010 DPT_Value_1_Ucount
These objects are for sending different values of the setting level in window AQI Value Setting.					
9	AQI Alarm Out Value	AQI Alarm Out Value, 1bit	1bit	C,T	1.001 DPT_Switch
10	AQI Alarm Out Value	AQI Alarm Out Value, 4bit	4bit	C,T	3.007 DPT_Control_Dimming
11	AQI Alarm Out Value	AQI Alarm Out Value, 1byte	1byte	C,T	5.010 DPT_Value_1_Ucount
These object is for sending different values of the setting alarm in window AQI Alarm Setting.					

5.2. Temperature function objects

12	Temperature	Temperature Out	2 bytes	C	R	-	T	-	temperature (°C)	Low
13	Temperature	Temperature In	2 bytes	C	-	W	-	-	temperature (°C)	Low
14	Heat/cool	Heating/cooling Switchover	1 bit	C	R	W	-	-	switch	Low
15	Heat/Cool output value	Heat/Cool output value, 1bit	1 bit	C	-	-	T	-	switch	Low
16	Heat/Cool output value	Heat/Cool output value, 4bit	4 bit	C	-	-	T	-	dimming control	Low
17	Heat/Cool output value	Heat/Cool output value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low
18	Heating setpoint	Heating setpoint	2 bytes	C	R	W	-	-	temperature (°C)	Low
19	Cooling setpoint	Cooling setpoint	2 bytes	C	R	W	-	-	temperature (°C)	Low

Fig 5.2 Temperature function objects

NO.	Object	Function	Data Type	Flag	DPT
12	Temperature	Temperature Out	2 byte	C, R,T	9.001 DPT_Value_Temp
This object is for temperature output. The temperature will be sent to bus according to the preset mode.					
13	Temperature	Temperature In	2 byte	C, W	9.001 DPT_Value_Temp
This object is for temperature input. The temperature value will be obtained via the bus.					
14	Heat/cool	Heating/cooling Switchover	1bit	C, W,R	9.001 DPT_Value_Temp
This object is for heating/cooling switchover.					

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1——heating 0——cooling					
15	Heat/cool output value	Heat/cool output value,1bit	1 bit	C,T	1.001 DPT_Switch
16	Heat/cool output value	Heat/cool output value,4bit	4 bit	C, T	3.007 DPT_Control_Dimming
17	Heat/cool output value	Heat/cool output value,1byte	1 byte	C, T	5.010 DPT_Value_1_Ucount
These objects are for sending different output values for heating or cooling.					
18	Heating setpoint	Heating setpoint	2 byte	C, W,R	9.001 DPT_Value_Temp
This object is for receiving the setting temperature for heating via the bus.					
19	Cooling setpoint	Cooling setpoint	2 byte	C, W,R	9.001 DPT_Value_Temp
This object is to receive the setting temperature for cooling via the bus.					

5.3. Humidity function objects

20	Humidity	Humidity Out	2 bytes	C	R	-	T	-	temperature (°C)	Low
21	Humidity	Humidity In	2 bytes	C	-	W	-	-	temperature (°C)	Low
22	Humidity output value	Humidity output value, 1bit	1 bit	C	-	-	T	-	switch	Low
23	Humidity output value	Humidity output value, 4bit	4 bit	C	-	-	T	-	dimming control	Low
24	Humidity output value	Humidity output value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Fig 5.3 Humidity function objects

NO.	Object	Function	Data Type	Flag	DPT
20	Humidity	Humidity Out	2 byte	C, R,T	9.007 DPT_Value_Humidity
This object is for humidity output. The humidity value will be sent to the bus according to the preset mode.					
21	Humidity	Humidity In	2 byte	C, W	9.007 DPT_Value_Humidity
This object is for humidity input. The humidity value will be obtained via the bus.					
22	Humidity output value	Humidity output value,1bit	1 bit	C,T	1.001 DPT_Switch
23	Humidity output value	Humidity output value,4bit	4 bit	C, T	3.007 DPT_Control_Dimming
24	Humidity output value	Humidity output value,1byte	1 byte	C, T	5.010 DPT_Value_1_Ucount
These objects are for sending different values for humidity control when it is in different humidity level.					

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5.4. CO2 functions objects

25	CO2 value	CO2 value Out	2 bytes	C	R	-	T	-	pulses	Low
26	CO2 value	CO2 value, 1bit	1 bit	C	-	-	T	-	switch	Low
27	CO2 value	CO2 value ,4bit	4 bit	C	-	-	T	-	dimming control	Low
28	CO2 value	CO2 value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Fig 5.4 CO2 function objects

13	CO2 value	CO2 value Out	2 byte	C, R,T	7.001 DPT_Value_2_Ucount
This object is for CO2 value output. The value will be send to the bus according to the preset mode.					
15	CO2 value	CO2 value,1bit	1 bit	C, T	1.001 DPT_Switch
16	CO2 value	CO2 value,4bit	4 bit	C, T	3.007 DPT_Control_Dimming
17	CO2 value	CO2 value,1byte	1 byte	C, T	5.010 DPT_Value_1_Ucount
These objects are for sending different values for CO2 control whether the CO2 is over range or not.					

5.5. Logic function communication object

29	Logic 1 output value	Logic 1 output value, 1bit	1 bit	C	-	-	T	-	switch	Low
30	Logic 1 output value	Logic 1 output value, 4bit	4 bit	C	-	-	T	-	dimming control	Low
31	Logic 1 output value	Logic 1 output value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low
32	Logic 1 Input	Logic 1 Extern Input	1 bit	C	-	W	-	-	switch	Low
33	Logic 2 output value	Logic 2 output value, 1bit	1 bit	C	-	-	T	-	switch	Low
34	Logic 2 output value	Logic 2 output value, 4bit	4 bit	C	-	-	T	-	dimming control	Low
35	Logic 2 output value	Logic 2 output value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low
36	Logic 2 Input	Logic 2 Extern Input	1 bit	C	-	W	-	-	switch	Low
37	Logic 3 output value	Logic 3 output value, 1bit	1 bit	C	-	-	T	-	switch	Low
38	Logic 3 output value	Logic 3 output value, 4bit	4 bit	C	-	-	T	-	dimming control	Low
39	Logic 3 output value	Logic 3 output value, 1byte	1 byte	C	-	-	T	-	counter pulses (0..255)	Low
40	Logic 3 Input	Logic 3 Extern Input	1 bit	C	-	W	-	-	switch	Low

Fig 5.5 Logic function communication object

No.	Communication object	Function	Data Type	Flag	DPT
29/33/37	Logic x output value(x=1,2,3)	Logic x output value,1bit	1 bit	C, T	1.001 DPT_Switch
30/34/38	Logic x output value(x=1,2,3)	Logic x output value,4bit	4 bit	C, T	3.007 DPT_Control_Dimming
31/35/39	Logic x output value(x=1,2,3)	Logic x output value,1byte	1 byte	C, T	5.010 DPT_Value_1_Ucount
The communication object for the logic page of the corresponding results for 1 or 0, the output of the logic control of corresponding data.					
32/36/40	Logic x Input(x=1,2,3)	Logic x Extern Input	1 bit	C, W	1.001 DPT_Switch
The communication object is for external logic input, get the value from the bus and logic operations.					

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