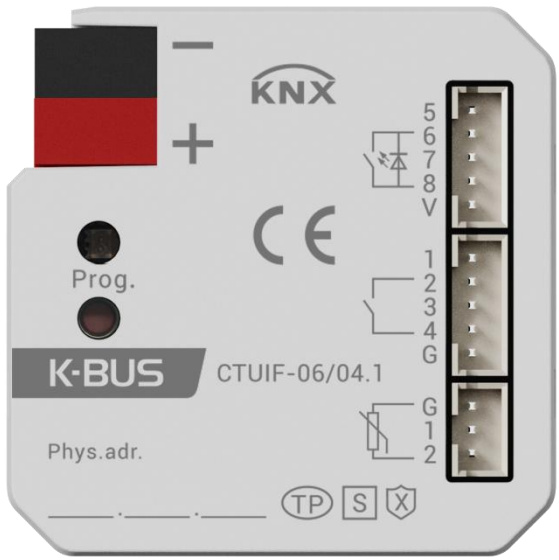
User manual

K-BUS® Universal Interface with NTC Input, 4-Fold_V1.4

CTUIF-06/04.1



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

KNX Secure Universal Interface with NTC, 4-Fold(hereinafter being referred as Universal Interface) is mainly used in building control system. Via connection of KNX terminals, the device will be connected to the KNX BUS system to realize different functions in KNX system, and their functions are both simple to operate and intuitive, users can program it according to the requirement to implement the function systematically.

This module is compact and small in design, Flush mounted, and can be installed in a 86 type wall-mounted box or European 80 type wall-mounted box. The output adopts screw terminal to realize electrical connection, and the bus connection is directly connected via KNX terminal. The additional power supply is not required except KNX bus.

This manual provides technical information about the Universal Interfaces in detail for users as well as assembly and programming, and explains how to use it by the application examples.

The universal interface is powered via the KNX bus. Programmers are able to use the Engineering Tool Software ETS (ETS5.7 version or above) with a .knxprod file to allocate the physical address and set the parameters.

The Universal Interface have many functions that can be used in a wide variety of application areas. The following list provides an overview:

- **Dry contact input detection: support the functions of switch, dimming, value output, scene control, blind, shift register, multiple operation , RGB/RGBW send value and delay mode**
- **NTC input:support connect 2-fold NTC 10K temperature sensors to realize temperature detection and high/low temperature warning functions**
- **RTC temperature controller: connect with 2 pipes or 4 pipes room temperature control system, support 2-point or PI control type, 4 operation mode, 3 fan speed control and auto. control**
- **Logic function: support AND, OR, XOR, Gate forwarding, Threshold comparator, Format convert, Gate function, Delay function and Staircase lighting**

- **Scene Group functions: 8 groups of scene functions are available for setting, each group with 8 configurable outputs**
- **Drive LED indicator: connect type supports common-anode, can be 5V or 12V**
- **Support KNX Data Secure**

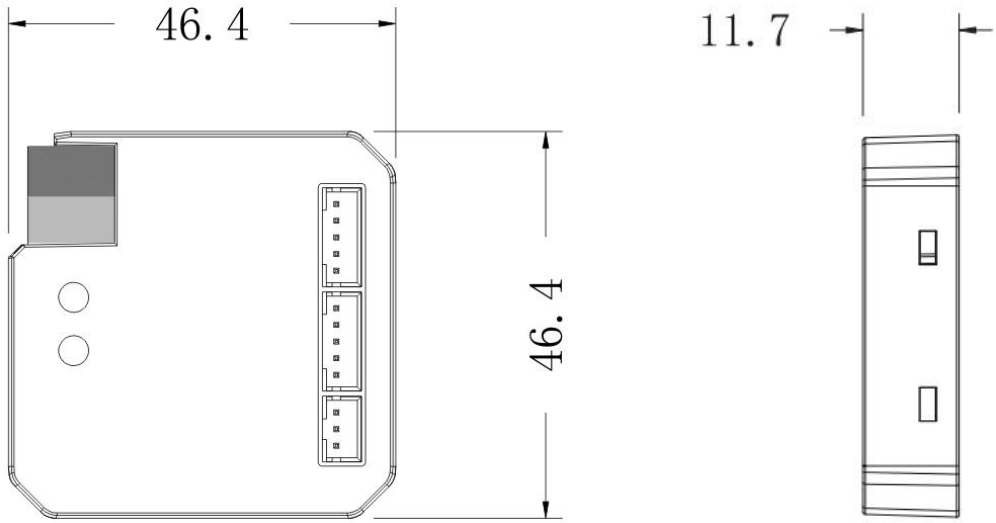
Chapter 2 Technical Date

Power supply	**Bus voltage**	**21-30V DC, via KNX bus**
	Bus current	<18.5mA/24V，<15.0mA/30V（work）
		<7.0mA/24V，<6.0mA/30V（standby）
	Bus consumption	<450.0mW（work）
		<180.0mW（standby）
Inputs/Output	**4-Fold dry contact input**	**Can be individually configured function of dry contact input**
	4-Fold LED outputs/ dry contact input	Can be individually configured function of LED output/dry contact input
	2-Fold NTC input	Can be individually configured function of NTC 10K temperature detection
Output LED	**5V or 12V, current limiting with 4 mA**	
Connection	**KNX**	**Via bus connecting terminal (Diameter 0.8mm)**
	Connection for input/output	⩽10M
Operation and display	**Red LED and push button**	**For assigning the physical address**
	Green LED flashing	For displaying application layer running normally
Temperature	**Operation**	**–5 °C ... 45 °C**
	Storage	– 25 °C ... 55 °C
	Transport	– 25 °C ... 70 °C
Environment	**Humidity**	**<93%,except condensation**
Mounting	**86 type wall-mounted box or European 80 type wall-mounted box**	
Dimension/Weight	46.4mm×46.4mm×11.7mm / 0.05KG	

Application	Maximum of communication objects	Maximum number of group addresses	Maximum number of associations	Secure group addresses
Binary input/LED output/NTC input/1.0	**257**	**500**	**350**	**350**

Chapter 3 Dimension and Structural Diagram

3.1 Dimension Diagram



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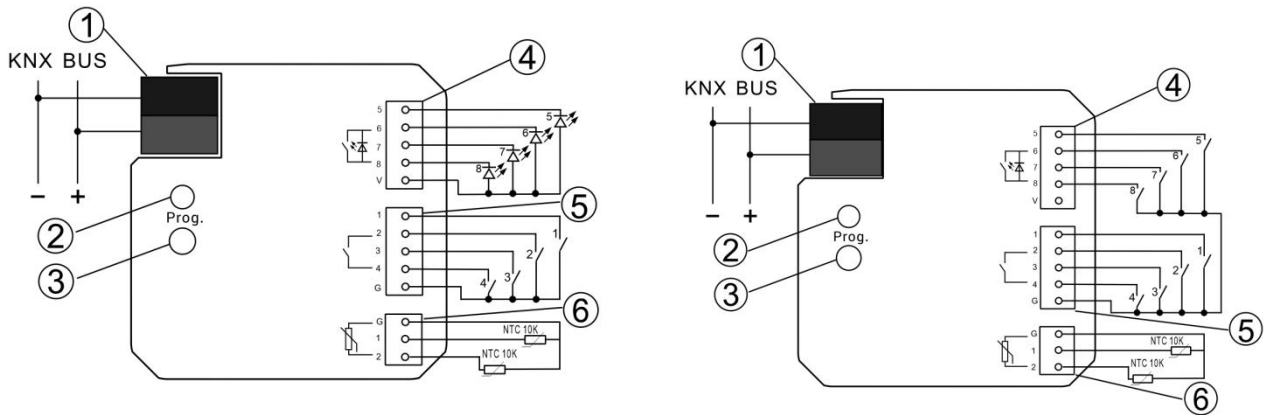
3.2 Structural Diagram



④⑤Terminal wiring identifier:

1/5: red; 2/6: brown; 3/7: green; 4/8: yellow; G/V:black

①KNX bus connection terminal

②③LED and Programming button

④Output LED/Dry contact input

⑤Dry contact input

⑥NTC 10K input

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

Chapter 4 Parameter setting description in the ETS

4.1 KNX Secure

KNX Secure Universal Interface with NTC, 4-Fold is a KNX device that complies with the KNX secure standard. That is, you can run the device in safe way.

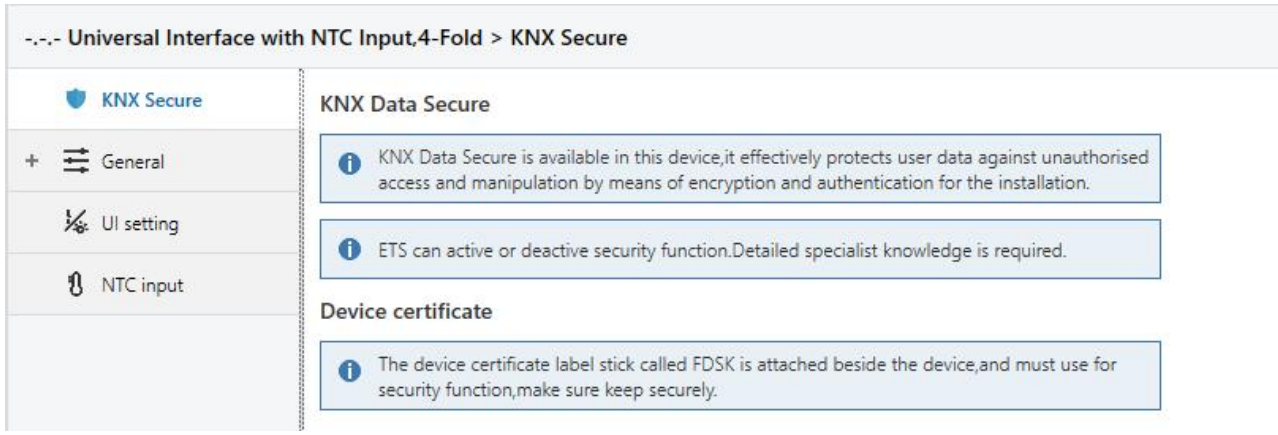


Fig.4.1 (1) "KNX Secure" parameter window

The device with KNX secure will be displayed notes on ETS, as shown as Fig.4.1(1).

If secure commissioning is activated 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.4.1 (2) below.

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

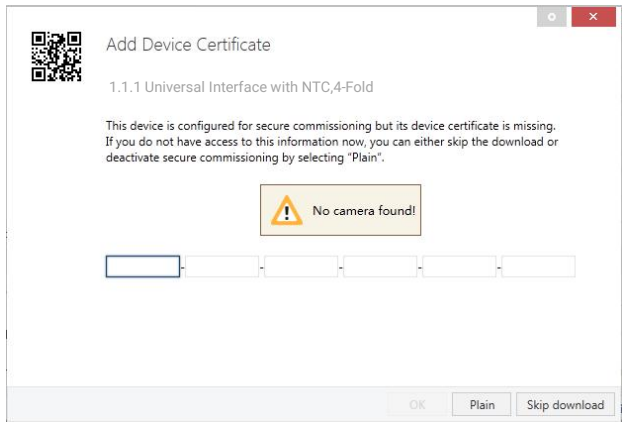


Fig.4.1(2) Add Device Certificate window

✧ 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.4.1(3) below.

The certificates can be also added to the selected device in the project, as shown in Fig.4.1(4).

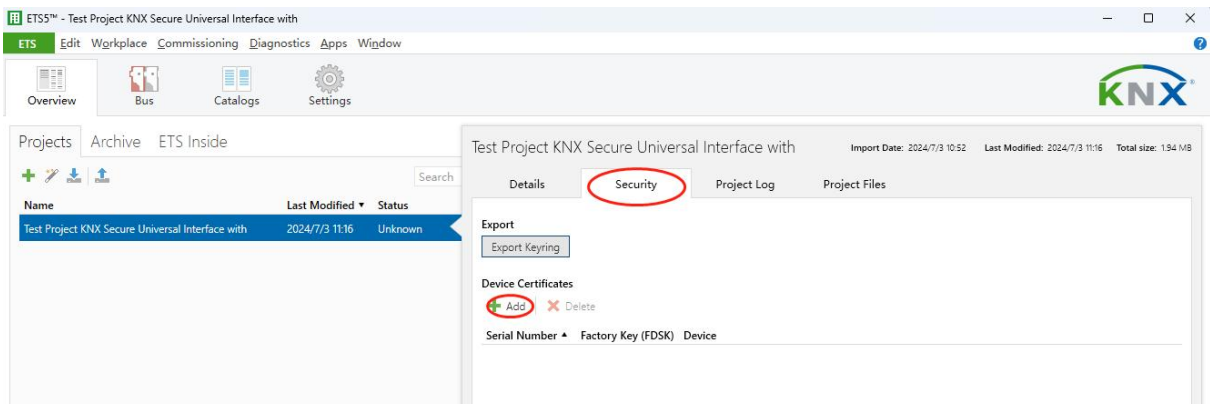


Fig.4.1(3) Add Device Certificate

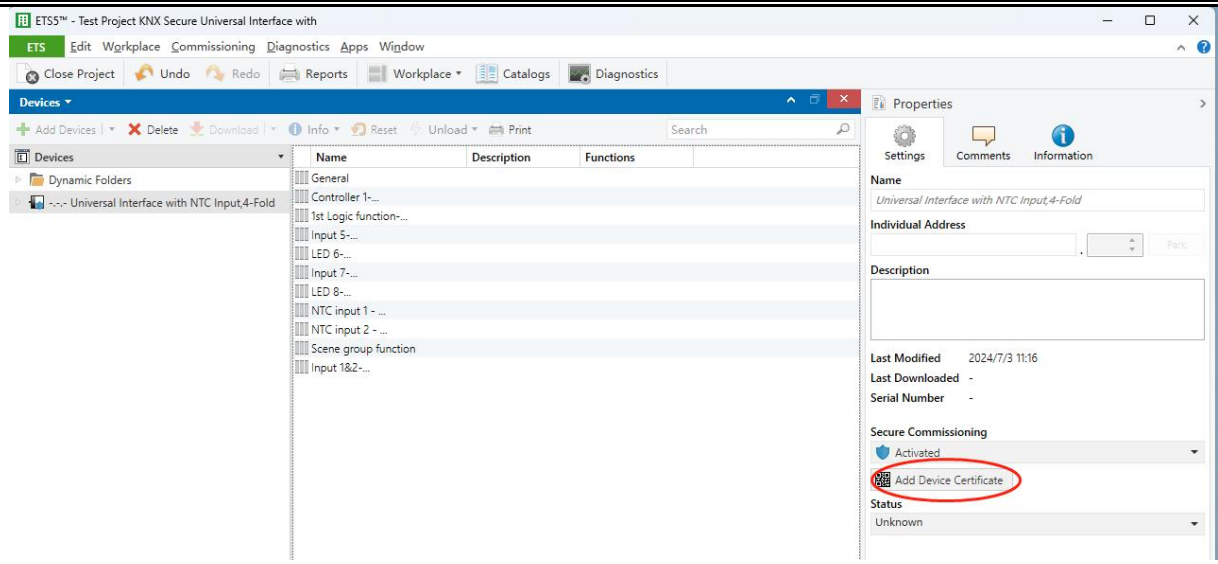


Fig.4.1(4) Add Device Certificate

✧ 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.4.1(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).

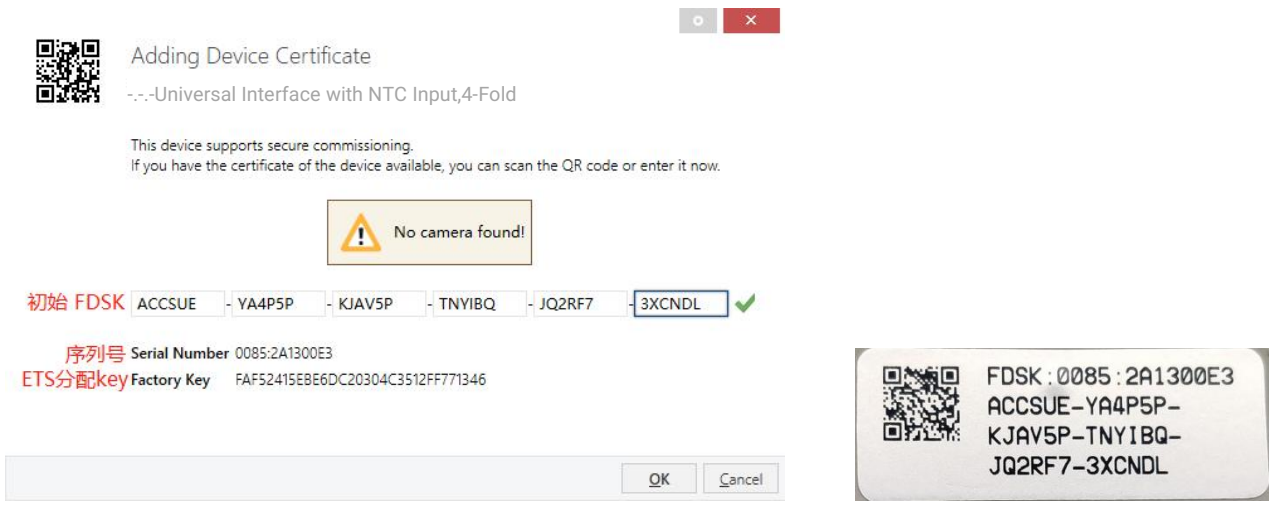


Fig.4.1(5)

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.4.1(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.4.1(6)), and then the device can be successfully downloaded again.

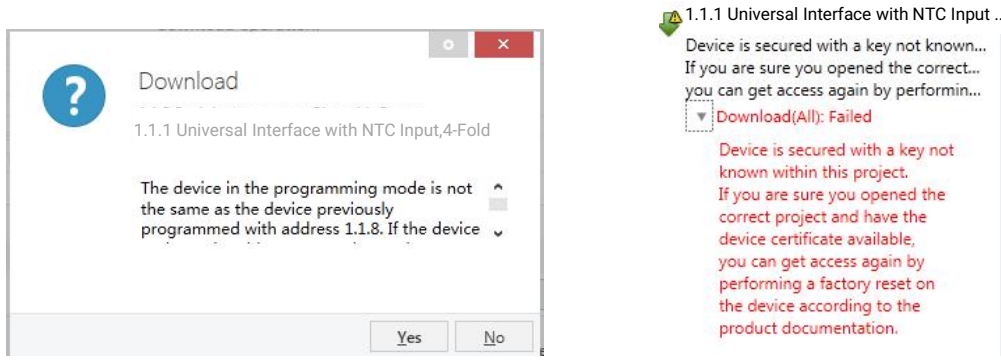


Fig.4.1(6) Example

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.4.1(7) below.

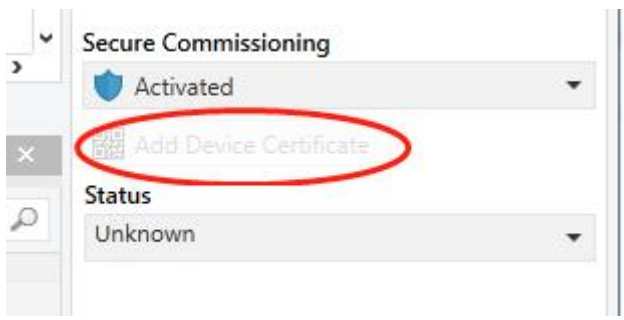


Fig.4.1(7)

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.4.1(8) below, the file extension is .knxkeys.

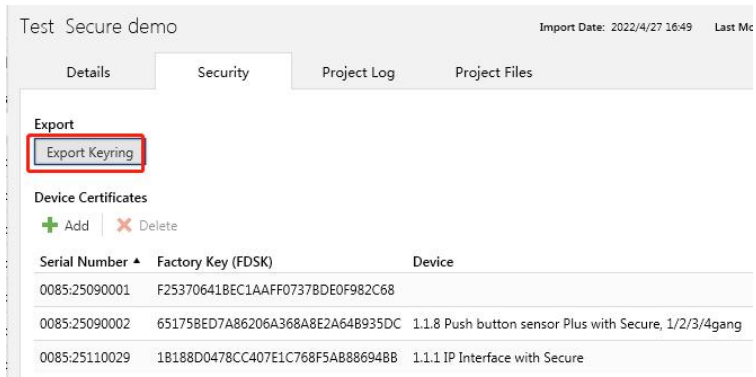


Fig.4.1(8)

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.

4.2 Parameter window “General”

4.2.1 Parameter window “General setting”

Parameter window “General” shown as Fig.4.2.1, it is mainly for the general setting of the device.

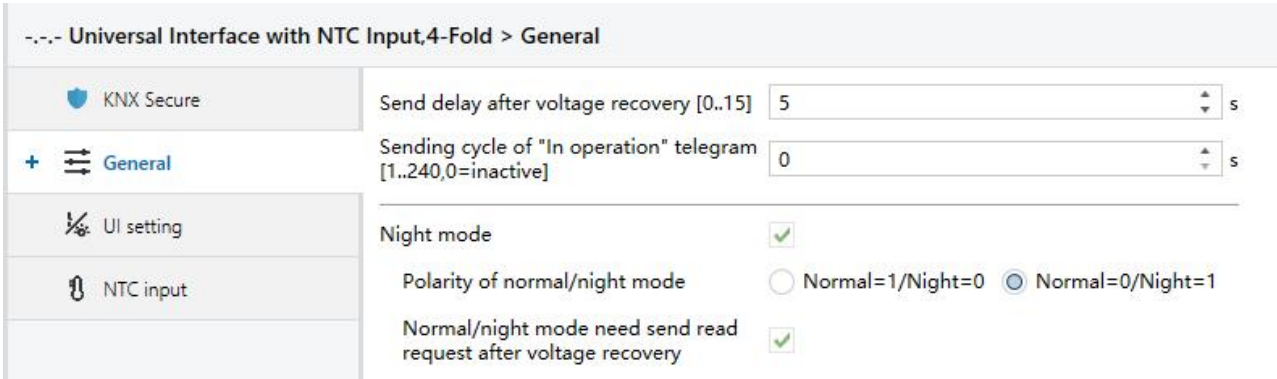


Fig.4.2.1 “General setting” parameter window

Parameter "Send delay after voltage recovery [0..15]"

This parameter is for setting the delay time to send to bus after the device voltage recovery.

Options: **0..15s**

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 this device cycle send telegrams through the bus to indicate this module 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 set period time with logic “1” to the bus. Options: **0...240s, 0= inactive**

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

Parameter "Night mode"

This parameter is for setting whether “Night mode”.

When “Night mode” is enable, the following parameter is visible.

--Parameter "Polarity of normal/night mode”

This parameter for setting object value of normal/night mode. Options:

Normal=1/Night=0

Normal=0/Night=1

--Parameter "Normal/night mode need send read request after voltage recovery”

This parameter for setting whether the object “Night mode” to send read request when bus recovery or finish programming. If send the read request, LED indicates according to setting brightness of responded normal/night mode.

4.2.1 Parameter window “Advance function”

Parameter window “Advance function” shown as Fig.4.2.1.Used to enable Room temperature controller, logic function, and scene group function.More details refer to chapter 4.3-4.5.

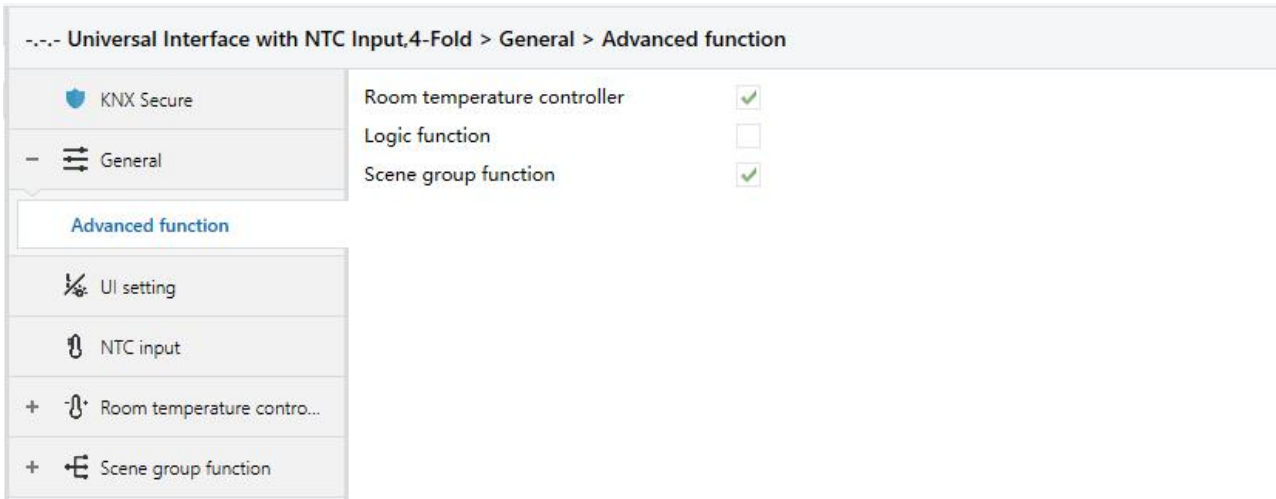


Fig.4.2.1 “Advanced setting” parameter window

4.3 Parameter window “Room temperature controller”

The parameter "Room temperature controller" is visible when enabled in the "Advance function" interface shown in Figure 4.2.1 as shown in Figure 4.3.

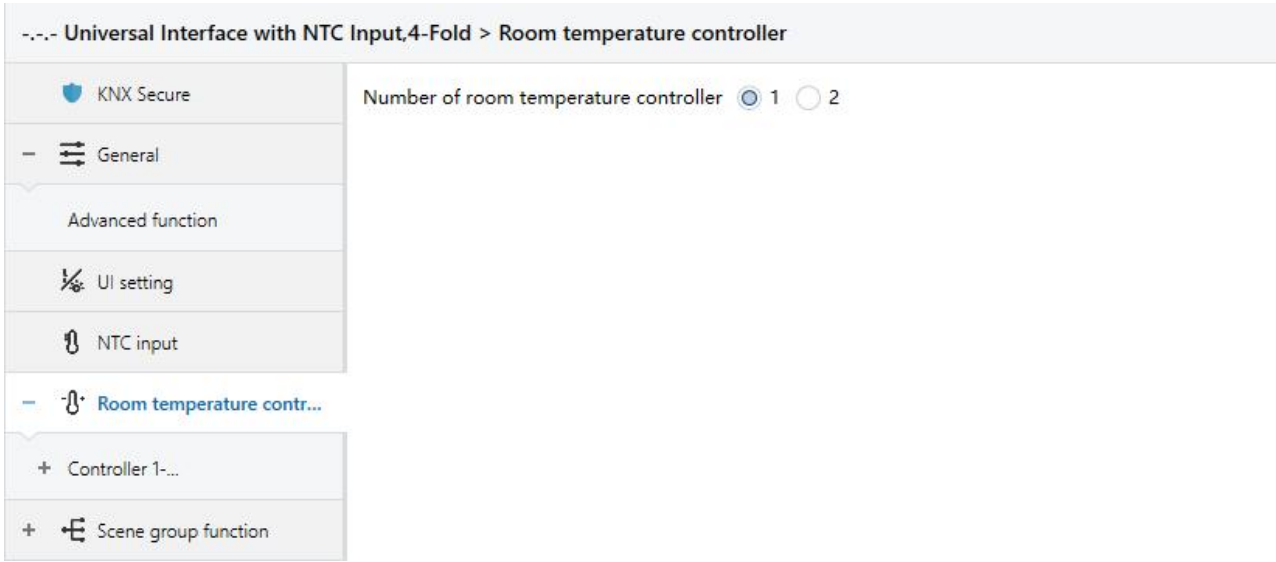


Fig.4.3 “Room temperature controller” parameter window

Parameter 'Number of controllers'

This parameter sets the number of controllers.Options:

1

2

4.3.1 Parameter window “Controller x-Room temperature controller(RTC)” (x=1/2)

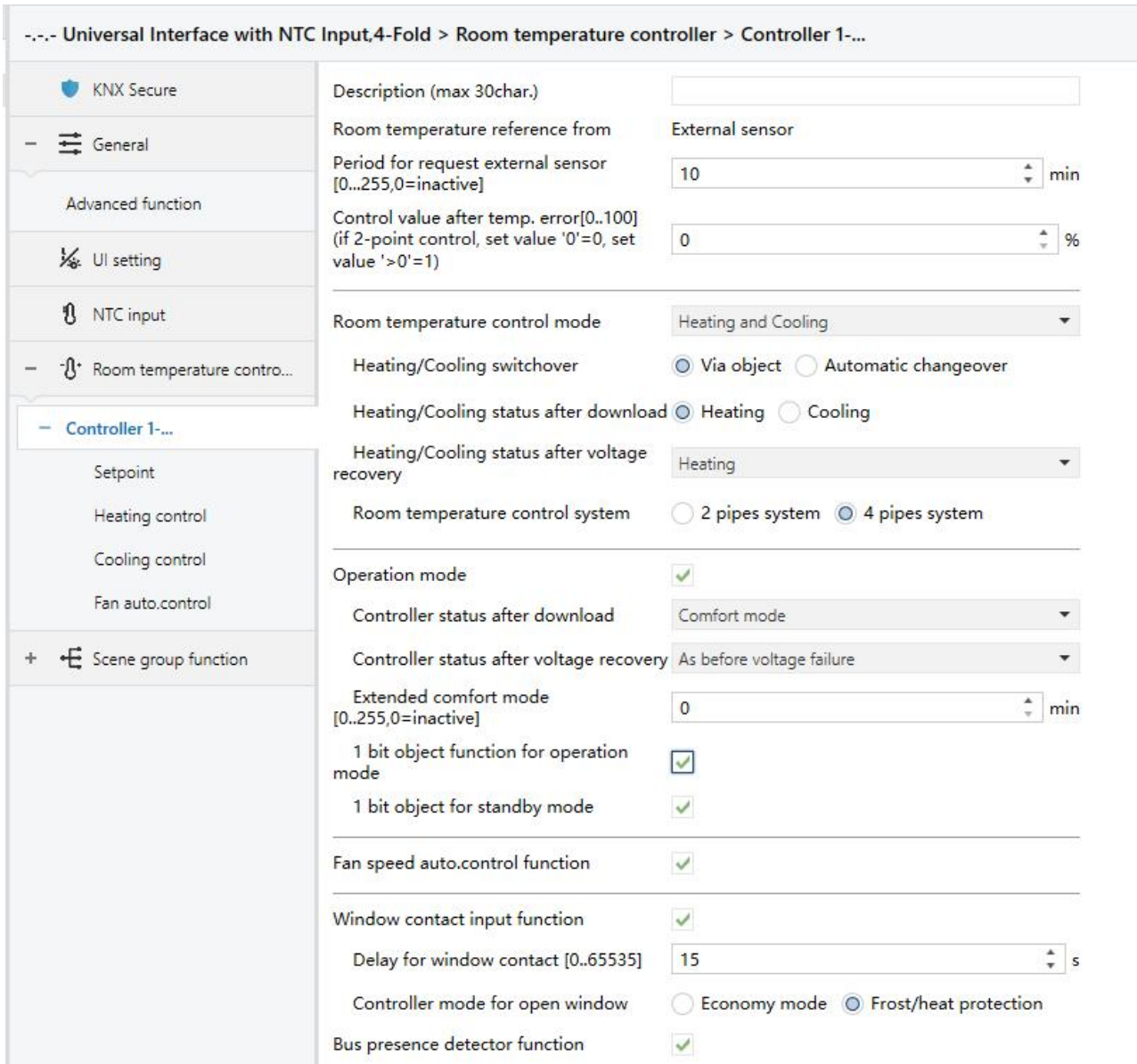


Fig.4.3.1 “Controller x”(x=1/2) parameter window

Parameter "Description (max 30char.)"

This parameter is for setting the name description for controller x,up to input 30 characters.

Parameter "Room temperature reference from--External sensor"

This parameter is for setting the room temperature reference from external sensor.

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

This parameter is for setting the time period for read request external temperature sensor. Options: **0..255min**

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 when power on RTC after download.Options:

Heating

Cooling

--Parameter "Heating/Cooling status after voltage recovery"

This parameter is for setting the heating/cooling control mode of device when power on RTC after 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. If it is the first time the device is used or a newly enabled device function, the control mode after the device is started is in an uncertain state, and it needs to be manually selected at this time.

--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.

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

10.5

...

35.0

--Parameter "Min./Max. setpoint temperature [5..37] "

This parameter is for setting 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

Parameters as follow are visible when "Heating/Cooling switchover" and "Automatic changeover" is selected:

--Parameter "Upper /Lower dead zone"

This parameter is for setting the dead zone range of auto switchover heating/cooling. Options:

0.5K

1.0K

...

10.0K

Under heating control, when the actual temperature(T) > or = the setpoint temperature + the upper dead zone, then mode heating switch to cooling;

Under cooling control, when the actual temperature(T) < or = the setpoint temperature + the upper dead zone, then mode cooling switch to heating.

Parameters as follow are visible when "operation mode" enabled:

--Parameter " Controller status after download"

This parameter is for setting the operation mode when power on RTC after download. Options:

Standby mode

Comfort mode

Economy mode

--Parameter "Controller status after voltage recovery"

This parameter is for setting the operation mode when power on RTC after voltage recovery. Options:

Comfort mode

Standby mode

Economy mode

Frost/heat protection

As before voltage failure

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

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**

When object receives telegram 1, comfort mode activation. If receive telegram 1 again during the delay time, the time is retiming. 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.

Switch operation 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.

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 RTC operation mode enabled. Set whether to link to window contact status.

Parameters as follow are visible when"Window contact input function" enabled:

--Parameter "Delay for window contact [0..65535]"

This parameter is visible when RTC operation mode and window contact input function are enabled. Set the delay time to window contact detection. That is, when the window is open within the set value, the window is not open. If the time is out of the set value, the window is open. Options:

0..65535s

--Parameter "Controller mode for open window"

This parameter is visible when RTC operation mode and window contact input function are enabled. If window status is open, perform corresponding operation according to configuration. (For the operation mode, the Switch and Setpoint temperature, as well as Heating/Cooling mode are recorded in the background if a control telegram is received, and performed after the window is closed. If no logging is received, return to the mode before the window was opened.) Options:

Economy mode

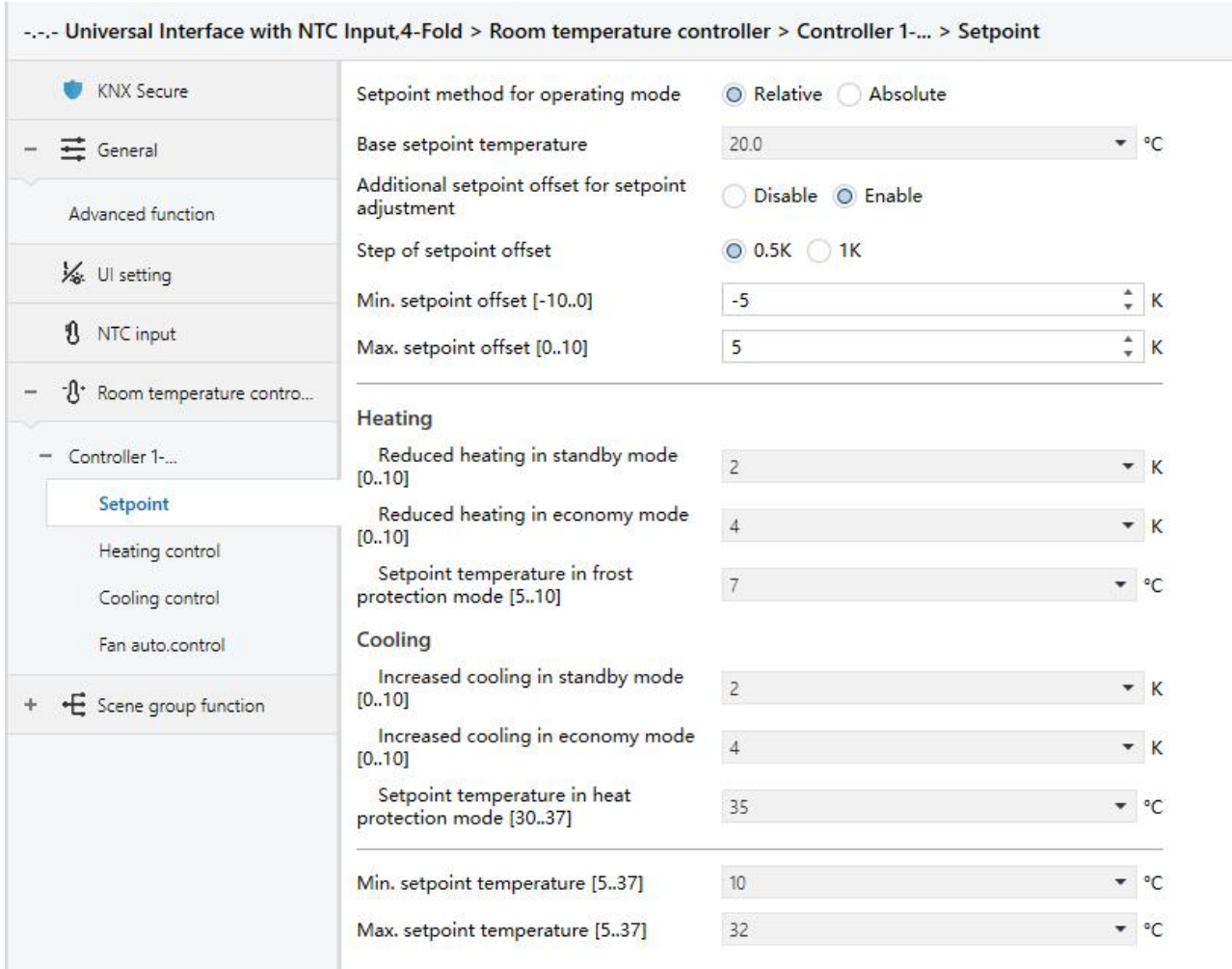
Frost/heat protection

Parameter "Bus presence detector function"

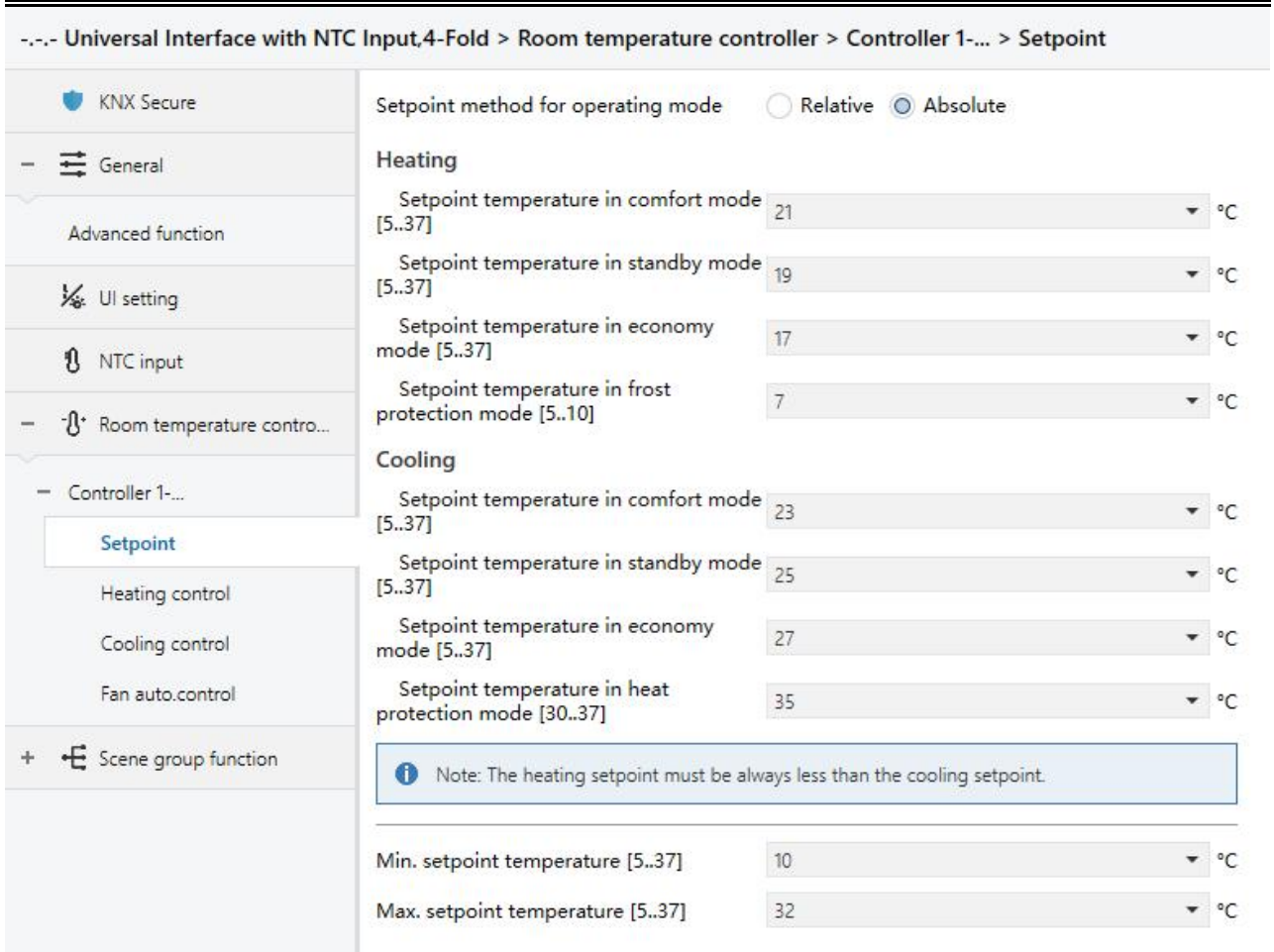
This parameter is visible when RTC operation mode enabled. Set whether to link to bus presence detector status.

If presence is detected, enter the comfort mode and recovery original mode after leaving. If there is a telegram/manual to adjust the mode, it will not recovery the previous mode after leaving. (If receive presence status cyclically, no comfort mode retriggered, and only can be after leaving.)

4.3.1.1 Parameter window “Setpoint”



Relative



Absolute

Fig.4.3.1.1"Setpoint" parameter window

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.

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, form witch the initial setpoint temperature of the room comfort mode is obtained. Options:

10.0°C

10.5°C

...

35.0°C

The setpoint value will be modified through object "Base setpoint adjustment", 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.

Parameters as follow are visible when"Additional setpoint offset for setpoint adjustment" 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..0K**

--Parameter "Max. setpoint offset [0..10]"

This parameter is for setting the maximum offset allowed when forward offset (setpoint temperature is increased). Options: **0..10K**

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) > or = the setpoint temperature + the upper dead zone, then mode heating switch to cooling;

Under cooling control, when the actual temperature(T) < or = the setpoint temperature + the upper dead zone, then mode cooling switch to heating.

Parameter "Reduced heating in standby mode [0...10]K"

Parameter "Increased cooling in standby mode [0...10]K"

These two parameters are for setting the setpoint of standby mode. Options:

0K

1K

...

10K

Heating：The setpoint of standby mode is the temperature setpoint minus the reference value.

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

Parameter "Reduced heating in economy mode [0...10]K"

Parameter "Increased cooling in economy mode [0...10]K"

These two parameters are for setting the setpoint of economy mode. Options:

0K

1K

...

10K

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

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

Parameter "Setpoint temperature in frost protection mode [5...10]°C"

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

5°C

6°C

...

10°C

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

Parameter 'Setpoint temperature in heat protection mode [30...37]°C"

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

30°C

31°C

...

37°C

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

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

Parameter " Setpoint temperature in comfort [5···37]°C"

Parameter 'Setpoint temperature in standby mode [5...37]°C"

Parameter 'Setpoint temperature in economy mode [5...37]°C"

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, "Heating and Cooling" and "Automatic changeover" are selected, the note is visible. The heating setpoint value must be less than or equal to the cooling of the same operation mode, if not, it can not be configured on ETS. It is also applied to "Via object"

1.When the ambient temperature is higher than the setpoint temperature of current mode, it is changed to cooling mode; When the ambient temperature is lower than the setpoint temperature of current mode, 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 from 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.For the abnormal configuration where the heating setpoint value is greater than the cooling, it is depend on the setpoint temperature and ambient temperature to adjust heating/cooling mode, that is, change to cooling when ambient temperature is higher than the setpoint temperature in the current operation mode of cooling, while change to heating when ambient temperature is lower than the setpoint temperature in the current operation mode of cooling.

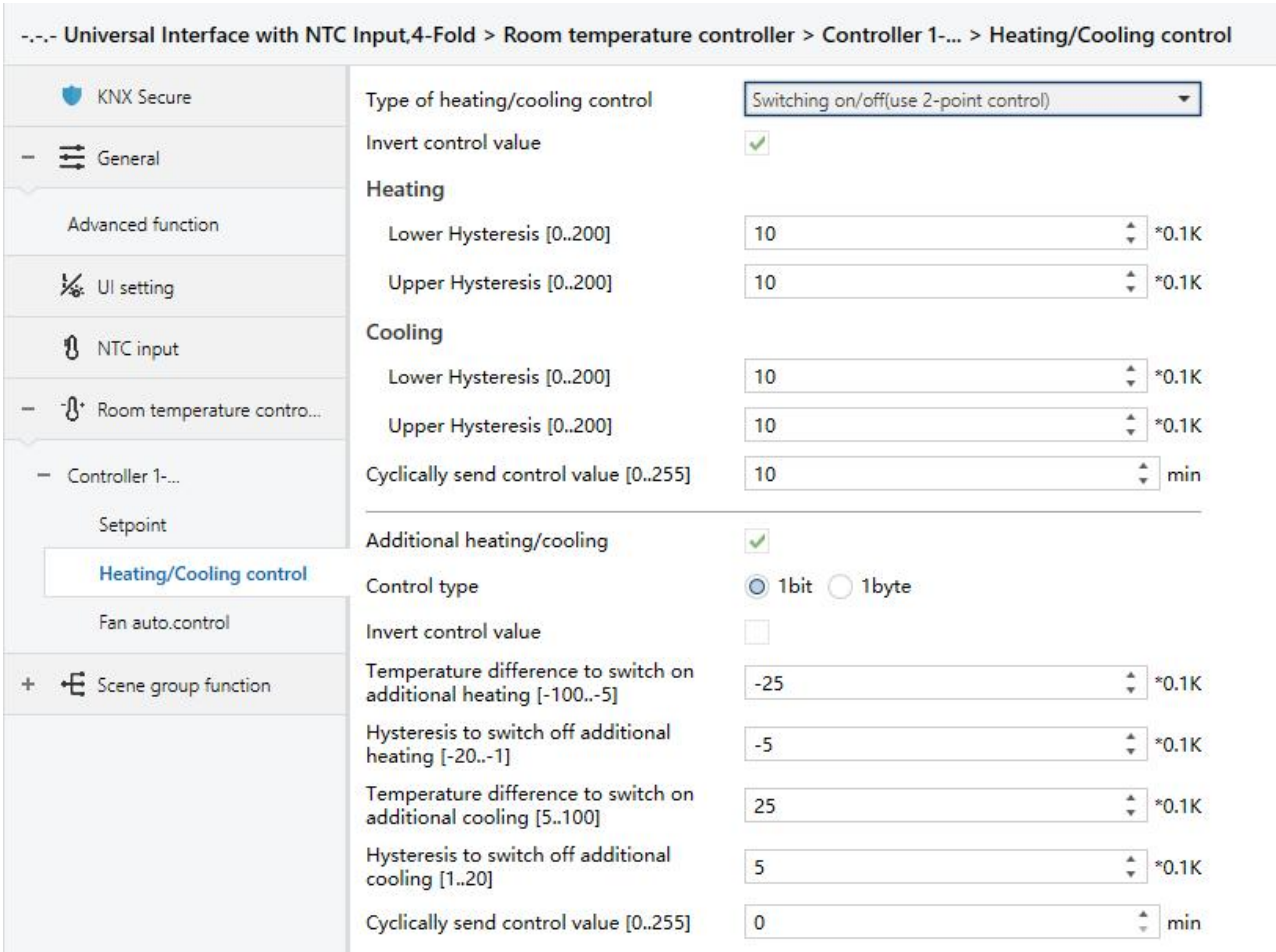
4.When receiving setpoint temperature from bus, it is still necessary to limit the value according to the high and low thresholds, that is heating and cooling temperature neither can not be lower than the min., or can not be higher than the max..

Points 2 and 4 also apply to “Via object”.

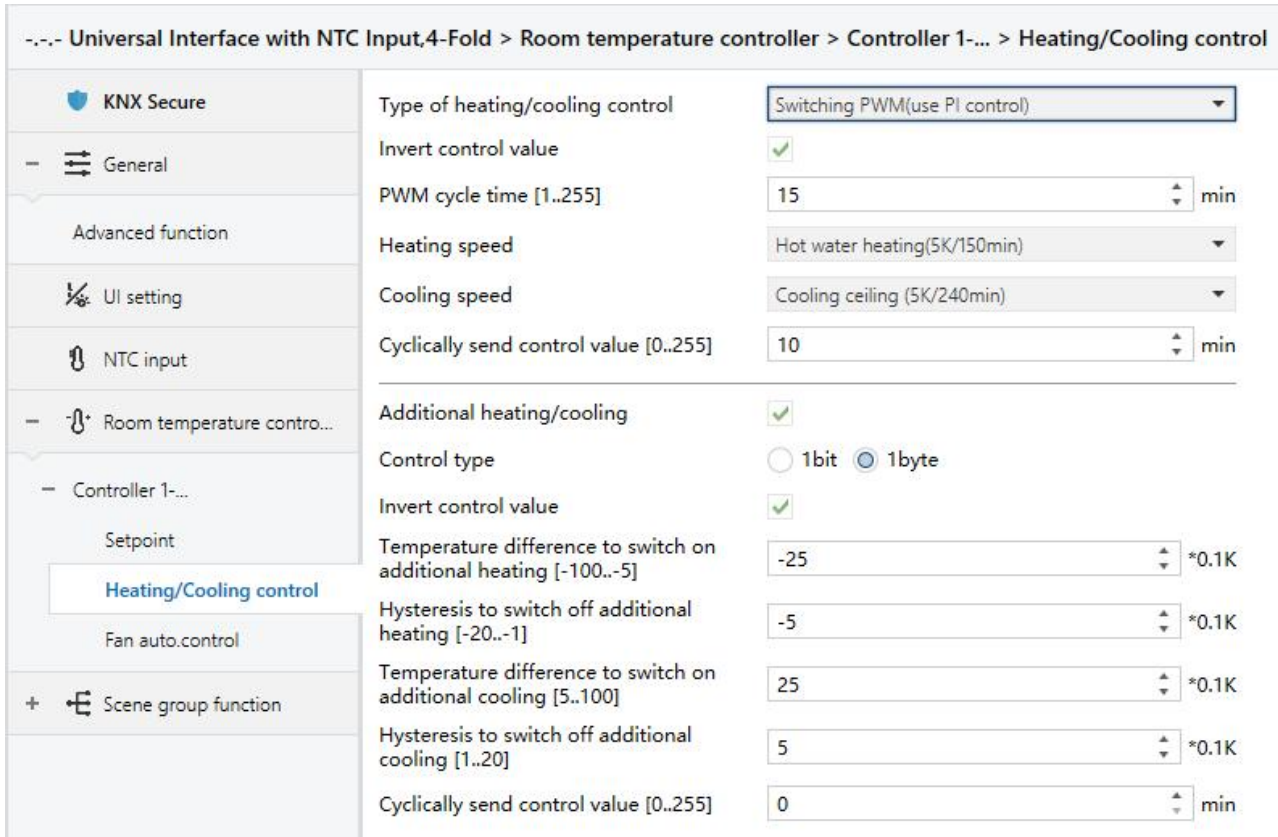
Note: for relative/absolute adjustment, in protection mode, the setpoint temperature is only configured via ETS. When the received setpoint value from bus is different from the ETS configuration, the value is not updated and returned to the current setpoint temperature, to update synchronously to other devices on the bus.

4.3.1.2 Parameter window “Heating control/Cooling control/Heating/Cooling control”

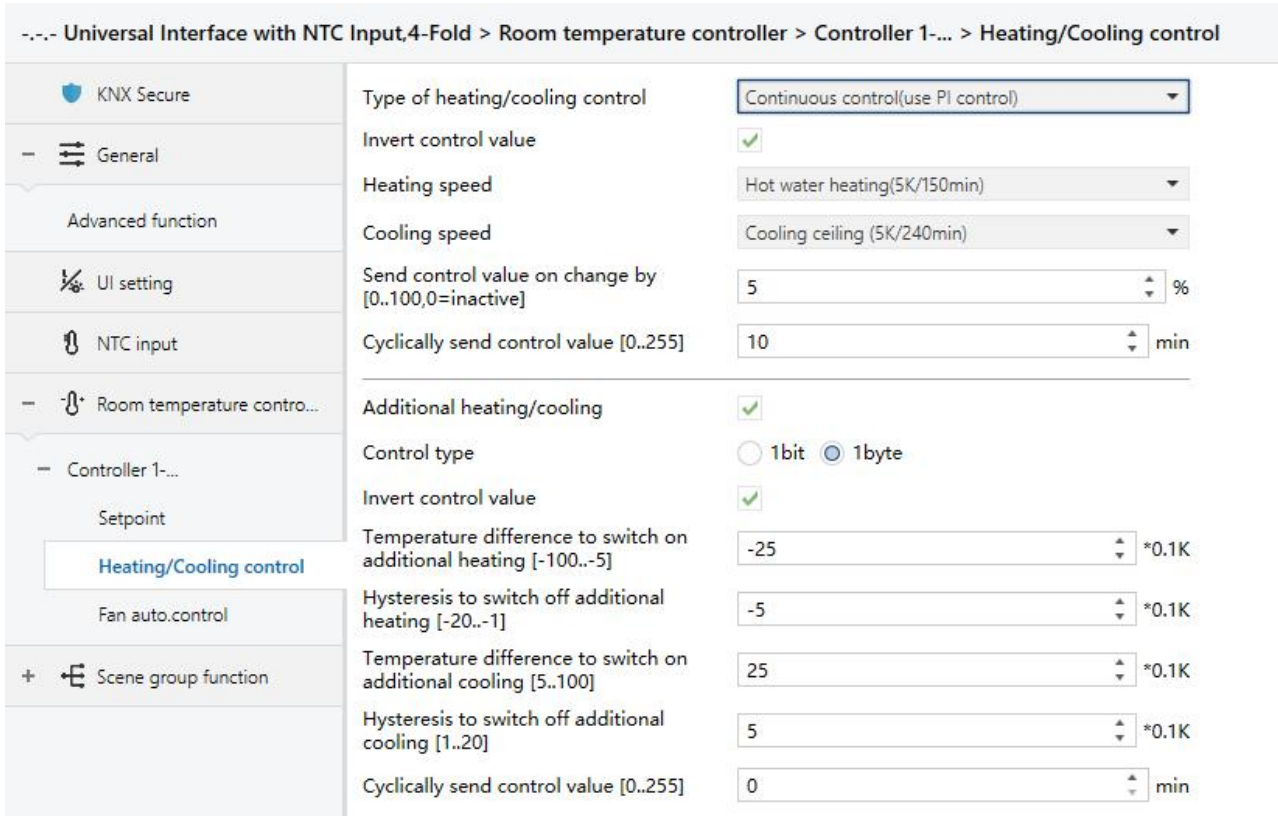
This parameter window is visible when “Room temperature controller(RTC)” is selected as the controller type and is displayed according to the control mode,as shown in Fig.4.3.1.2.



Switching on/off(use 2-point control)



Switching PWM(use PI control)



Continuous control(use PI control)

Fig.4.3.1.2"Heating control/Cooling control/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 visible when selecting "Heating and Cooling & 2-pipe" option,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 HVAC heating or cooling. Options: **[0..200]*0.1K**

Under heating control,

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

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

For example, the lower hysteresis temperature is 1K, the upper hysteresis temperature is 2K, the setting 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 setting temperature -the lower hysteresis temperature, then will stop cooling;

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

For example, the lower hysteresis temperature is 1K, the upper hysteresis temperature is 2K, the setting 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.

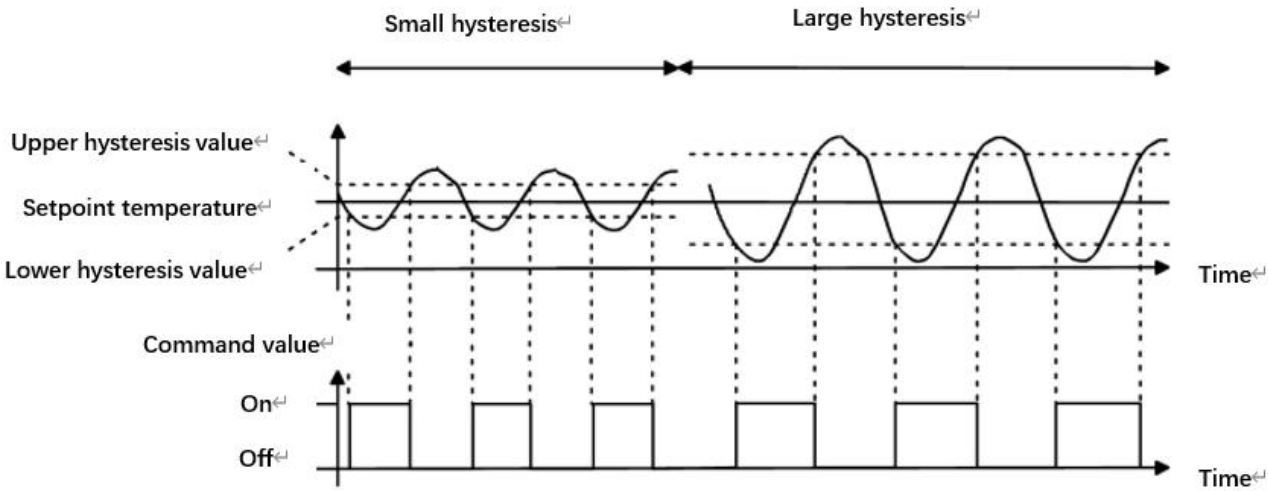


Fig4.3.1.2(2) Effects of hysteresis on control value switch action(heating) under2-point control mode

Parameters as follow are suitable for PWN control

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..255min**

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.

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]"

--Parameter "Reset time [0..255]"

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

Options: **[10..100]*0.1K (P value)**

Options: **0..255min (I 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**

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.

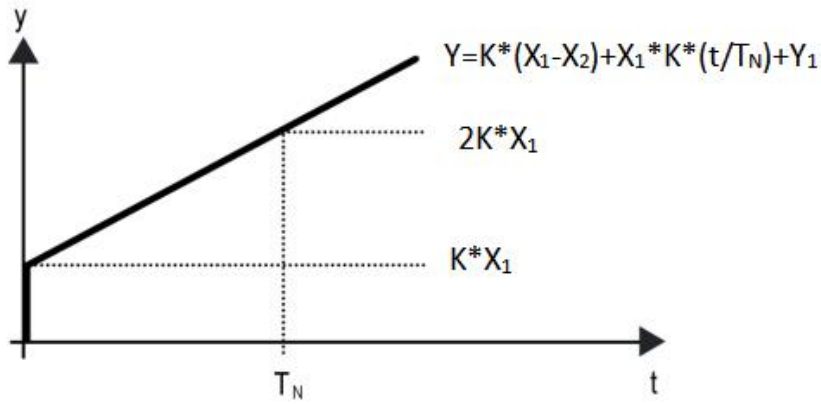


Fig.4.3.1.2 (3) control value of PI control mode

Y: control value

Y1: last control value

X1: temperature deviation = set temperature - actual temperature

X2: last temperature deviation = set temperature - actual temperature

T_N: integration time

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

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

When the integration time is set to zero, the PI control algorithm is: Y = K (X1-X2) + 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 "Cyclically send control value [0..255]"

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

0..255min

Parameter "Additional heating"

This parameter is for setting whether to enable additional heating.

Parameter as follow are visible when "Additional heating" is enable.

--Parameter "Control type"

This parameter is for setting the control type for the additional heating.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. Options:

No

Yes

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

For additional heating valve:

--Parameter "Temperature difference to switch on additional heating [-100..-5]"

This parameter is for setting the temperature difference to switch on additional heating valve.

When the actual temperature (T) < (Setpoint temperature + Temperature difference), start heating.

. Options:**[-100...-5]*0.1K**

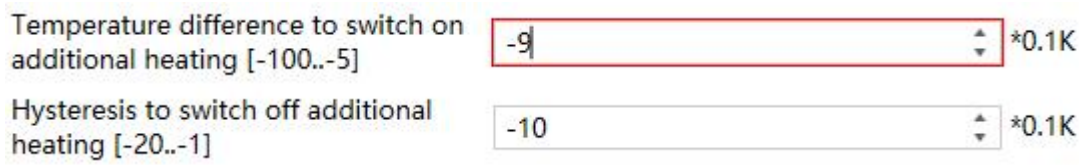
--Parameter "Hysteresis to switch off additional heating [-20..-1]"

This parameter is for setting the hysteresis to switch off additional heating.

When the actual temperature (T) > (Setpoint temperature + Temperature difference - Hysteresis), then will stop heating.

Options:**[-20..-1]*0.1K**

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 to switch on additional cooling valve.

When the actual temperature (T) > (Setpoint temperature + Temperature difference), start cooling.

Options:**[5..100]*0.1K**

--Parameter "Hysteresis to switch off additional cooling [1..20]"

This parameter is for setting the hysteresis to switch off additional cooling.

When the actual temperature (T) < (Setpoint temperature + Temperature difference - Hysteresis), then will stop cooling.

Options:**[1..20]*0.1K**

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 control value to the bus. Options: **[0..255]min**

4.3.1.3 Parameter window “Fan auto.control”

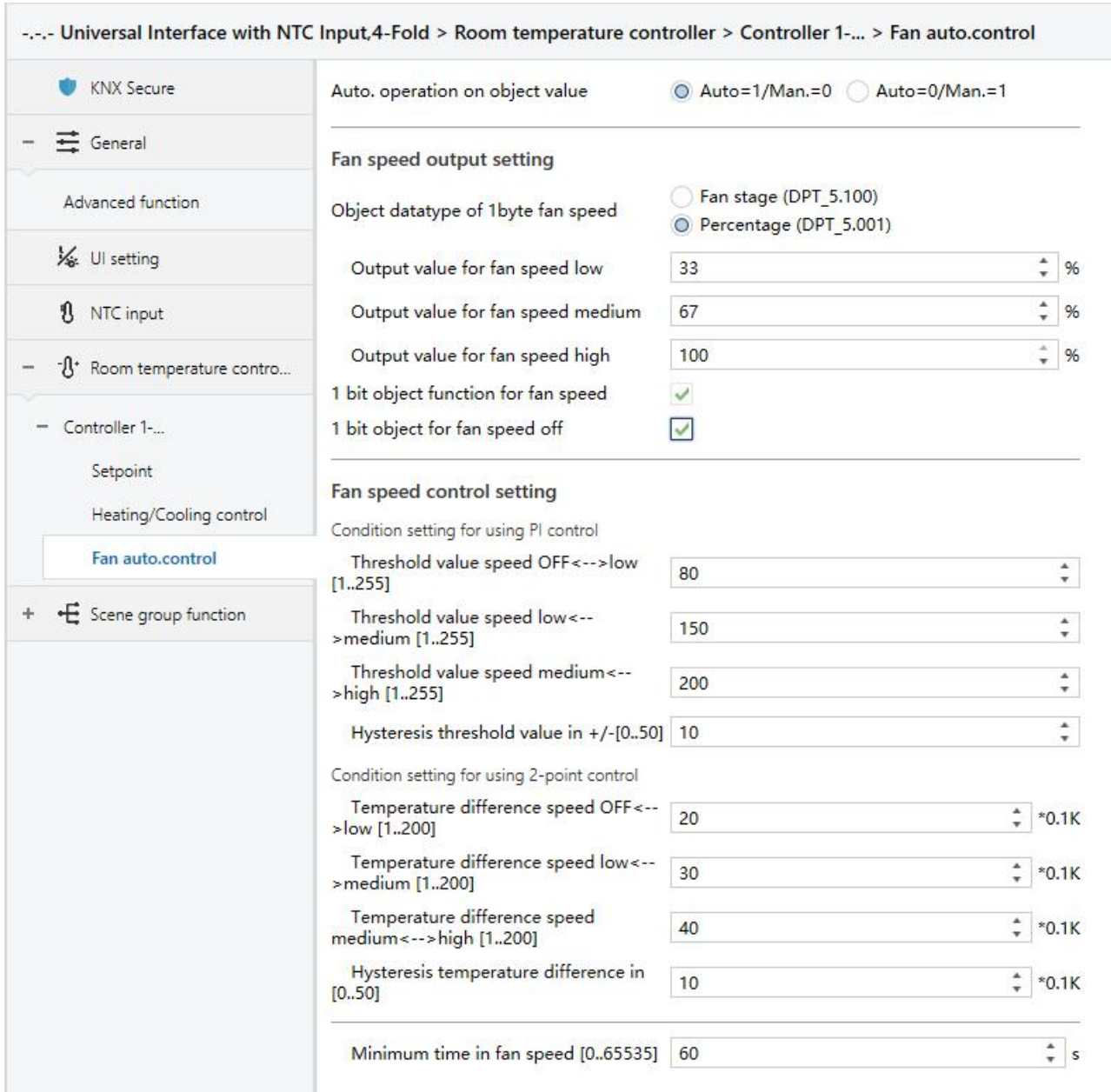


Fig.4.3.1.3”Fan” parameter window

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 “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.

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)

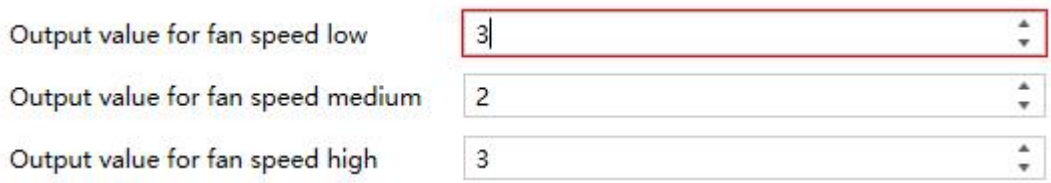
Fan stage (DPT_5.100)

--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 according to fan object datatype:**1..255 /1..100%**

Note: the output 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**

Tip: 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 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**

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**

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.

4.4 Parameter window “Logic function”

The parameter "Logic function" is visible when enabled in the "Advance function" interface shown in Fig.4.2.1, as shown in Fig.4.4. It is mainly setting logic function, up to 8 logic functions can be configured.

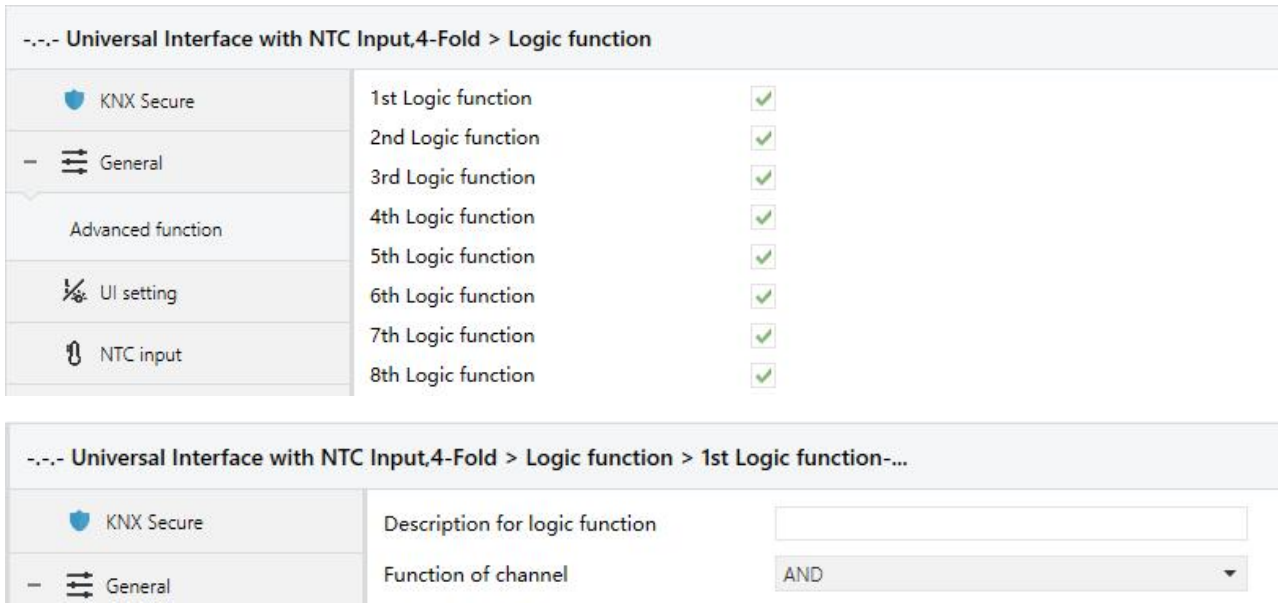


Fig.4.4 “Logic function”parameter window

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.

4.4.1 Parameter window “AND/OR/XOR”

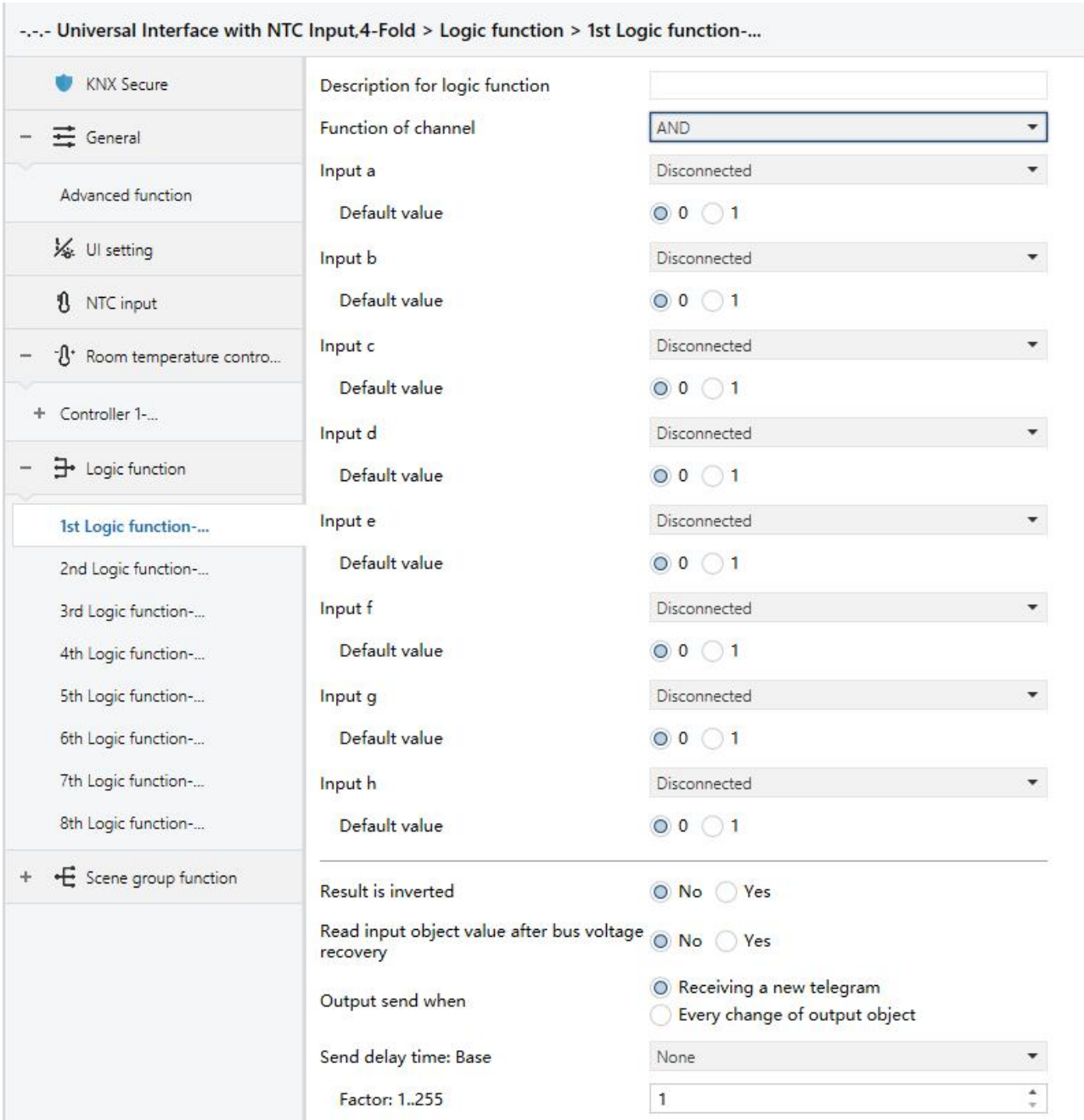


Fig.4.4.1 “Logic function_AND/OR/XOR” parameter window

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 voltage recovery"

This parameter is for setting whether to send the read request to the logic input object after device bus recovery or finish programming.

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.

4.4.2 Parameter window "Gate forwarding"

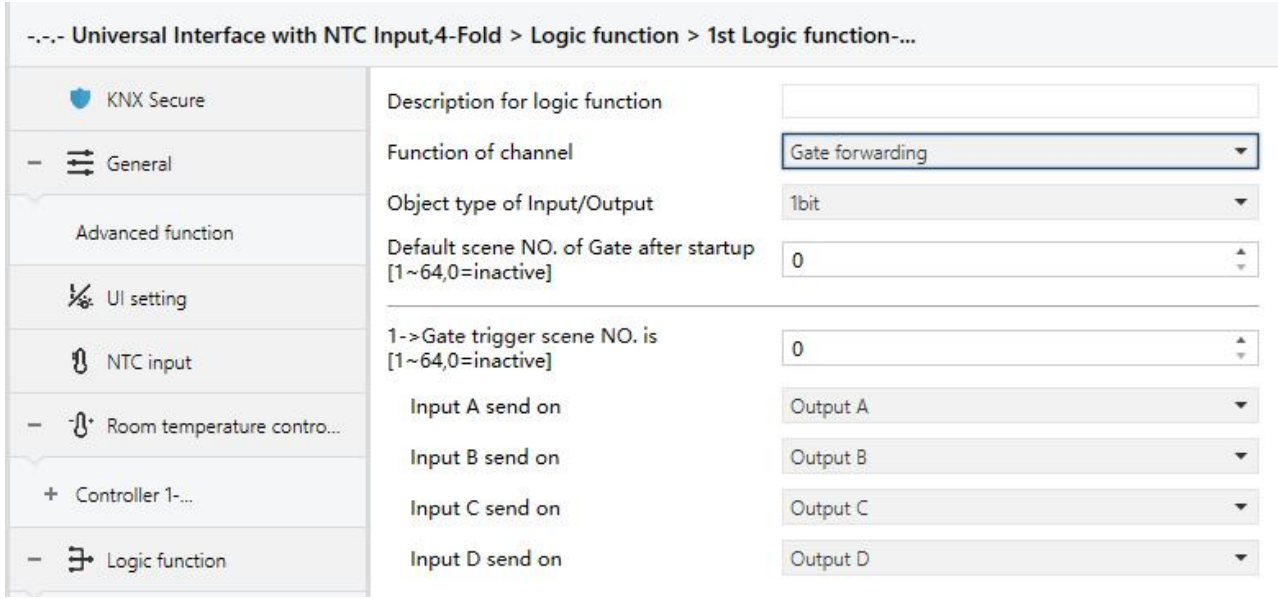


Fig.4.4.2 "Logic function_Gate forwarding" parameter window

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 'x->Gate trigger scene NO.[1..64,0=inactive]' (x: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.

4.4.3 Parameter window "Threshold comparator"

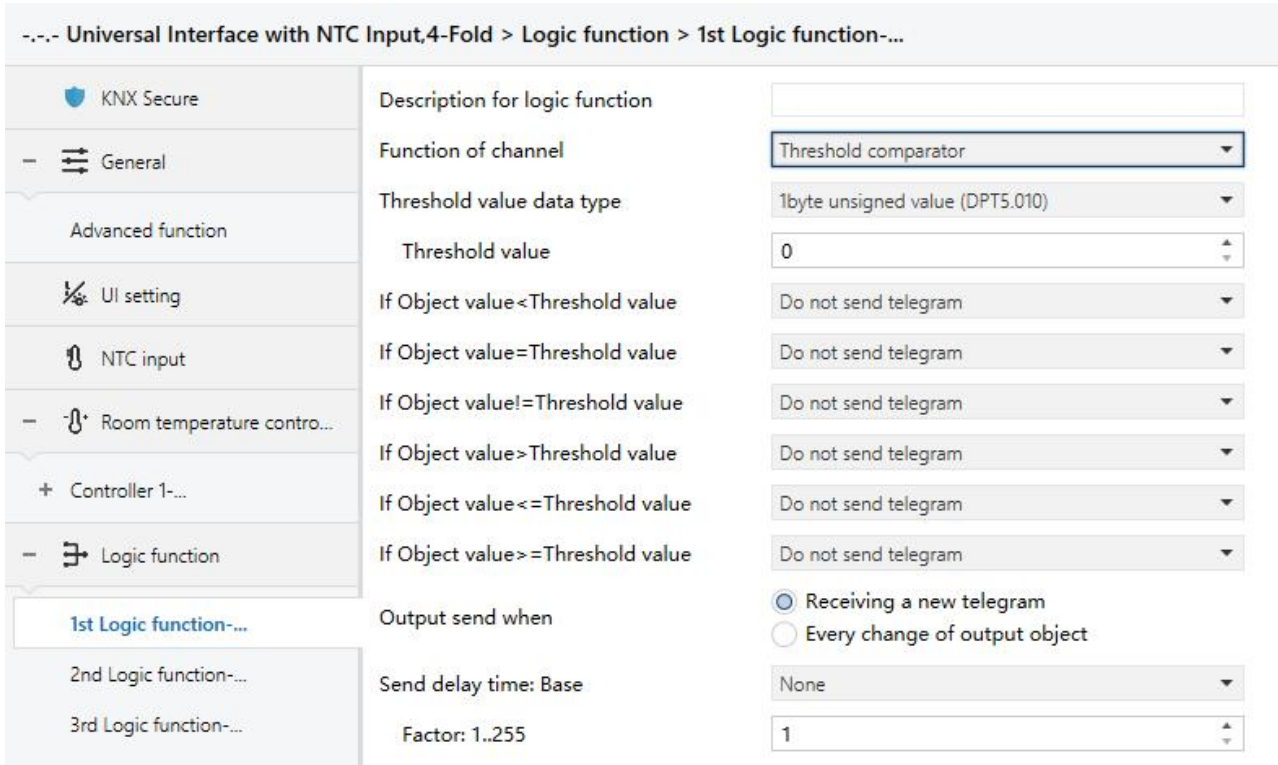


Fig.4.4.3 "Logic function_Threshold comparator"parameter window

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 "If Object value<Threshold value"

Parameter "If Object value=Threshold value"

Parameter "If Object value!=Threshold value"

Parameter "If Object value>Threshold value"

Parameter "If Object value<=Threshold value"

Parameter "If Object value>=Threshold value"

These parameters are for setting the logic result values that should be sent when threshold value less than, equal to, not equal to, greater than, less than and equal to, or greater and equal to the setting valve. When object datatype is selected “2byte float value (DPT9.x)” or “Illuminance value (DPT 9.004)”, 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 of the parameters, it is based on the value that should be sent, which meets 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.

Tip: 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:

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.

4.4.4 Parameter window “Format convert”

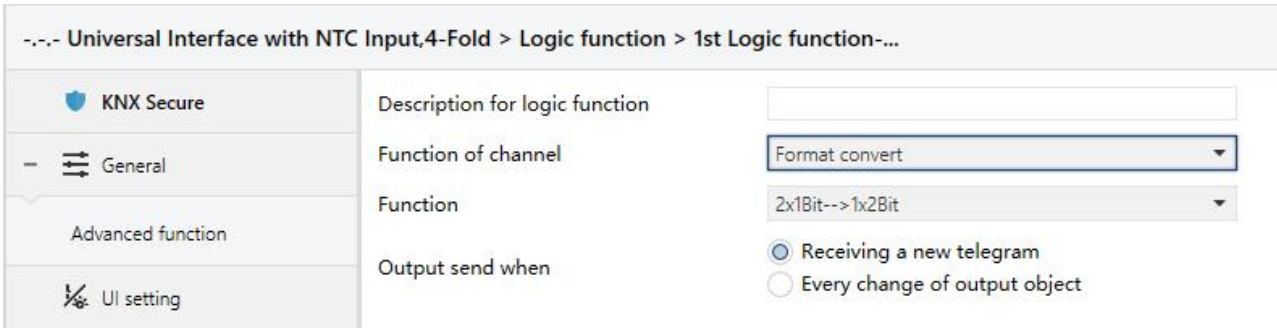


Fig.4.4.4 “Logic function _Format convert” parameter window

Parameter 'Format convert type'

This parameter is for setting the format convert type. Options:

2x1bit-->1x2bit

8x1bit-->1x1byte

1x1byte-->1x2byte

2x1byte-->1x2byte

2x2byte-->1x4byte

1x1byte-->8x1bit

1x2byte-->2x1byte

1x4byte-->2x2byte

1x3byte-->3x1byte

3x1byte-->1x3byte

Parameter 'Output send when'

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

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 algorithm, the logic result will be sent even if it has no change.

4.4.5 Parameter window "Gate function"

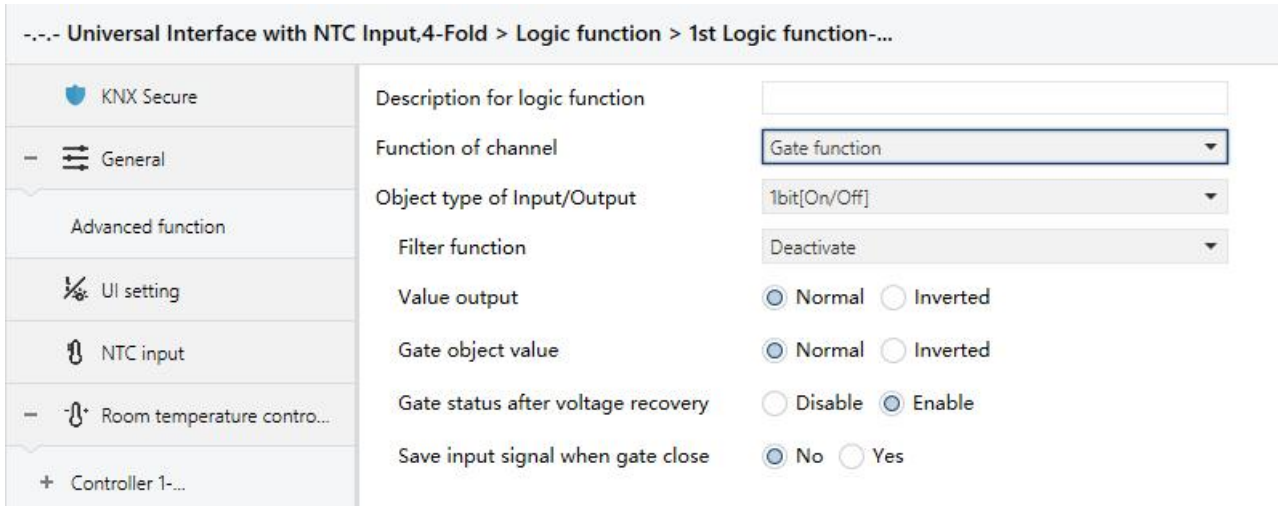


Fig.4.4.5 "Gate function"parameter window

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 as follow are visible when "1bit[On/Off]" is selected:

--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 for setting 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 power on. 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).

4.4.6 Parameter window “Delay function”

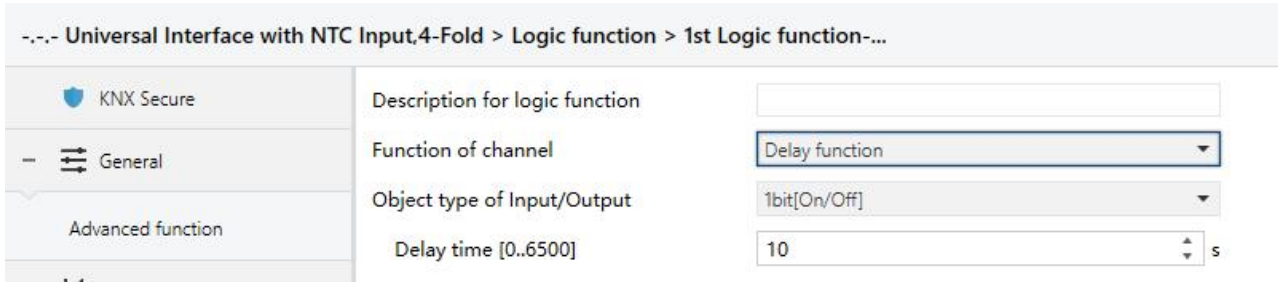


Fig.4.4.6 “Delay function”parameter window

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]s'

This parameter is for setting the delay time that output object forwards the value when the input object receives the telegram. Options: **0..6500**

Note: Receive telegram again in delay time, re-timing.

4.4.7 Parameter window “Staircase lighting”

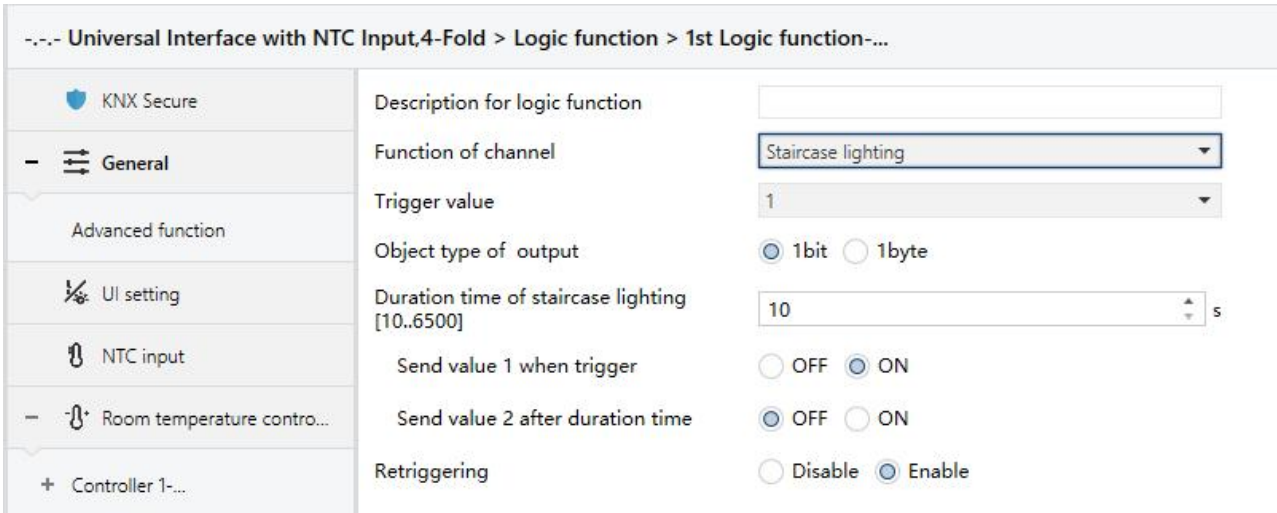


Fig.4.4.7 “Staircase lighting”parameter window

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 light is turned 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

4.5 Parameter window “Scene group function”

The parameter "Scene group function" is visible when enabled in the "Advance function" interface shown in Fig. 4.2.1, as shown in Fig.4.5(1) ,Fig.4.5(2)and Fig.4.5(3). It is mainly setting scene group function, up to 8 scene group functions can be configured,each group with 8 outputs.

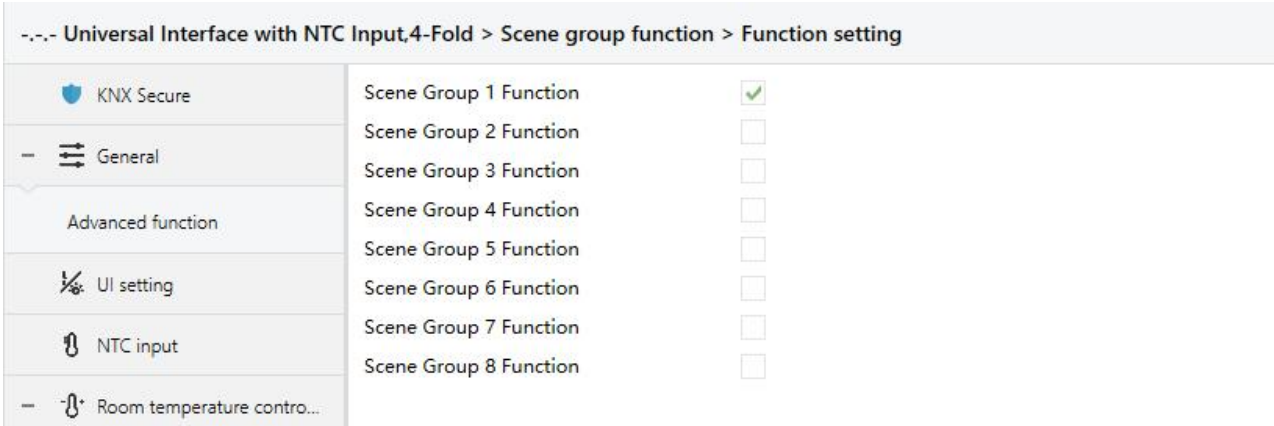


Fig.4.5(1) “Scene Group function”parameter window

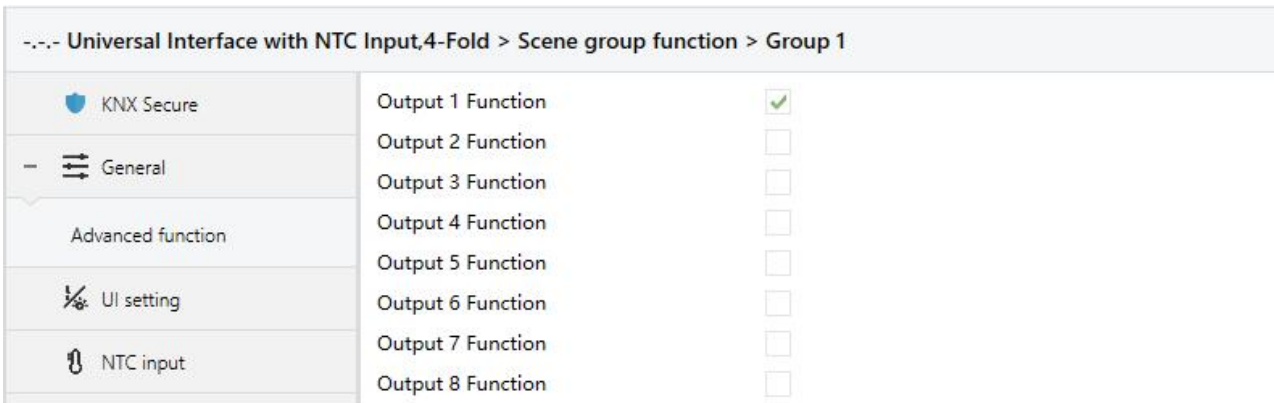


Fig.4.5(2) “Group X”parameter window

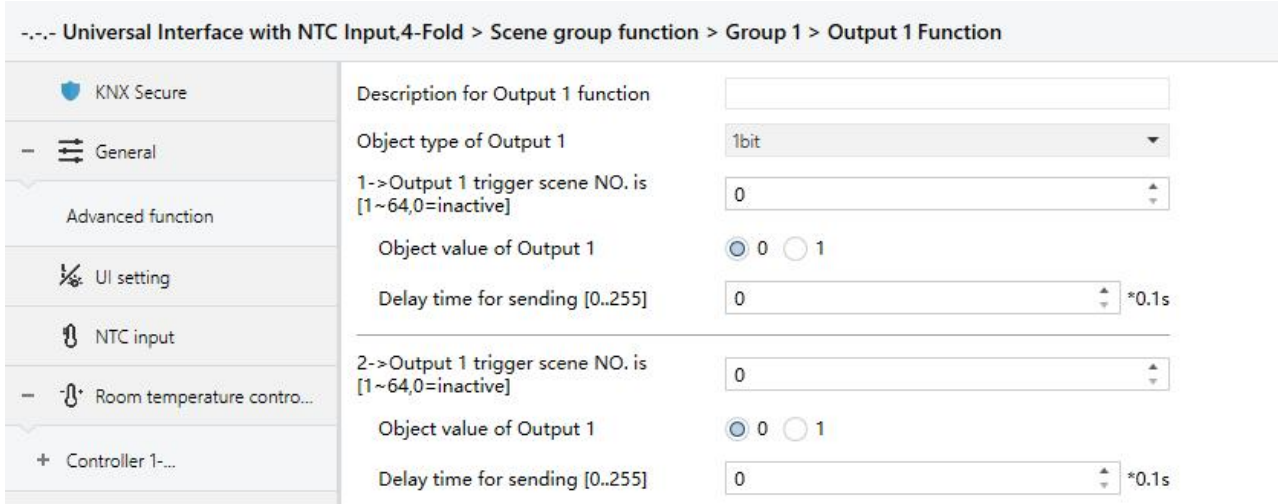


Fig.4.5(3) “Output Y function”parameter window

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 " Delay time for sending [0...255]"

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

[0...255]*0.1s

4.6 Parameter window “UI setting”

The parameter setting interface “UI setting” is shown as in Fig.4.6, here you can set the universal interface function, including dry contact input detection and LED output indicator. Generally, dry contact input detection is used to connect a conventional push button or switch panel or sensor, and LED output is used to connect with LED indicator. The combination of the two function can make the LED output to indicate the input status.

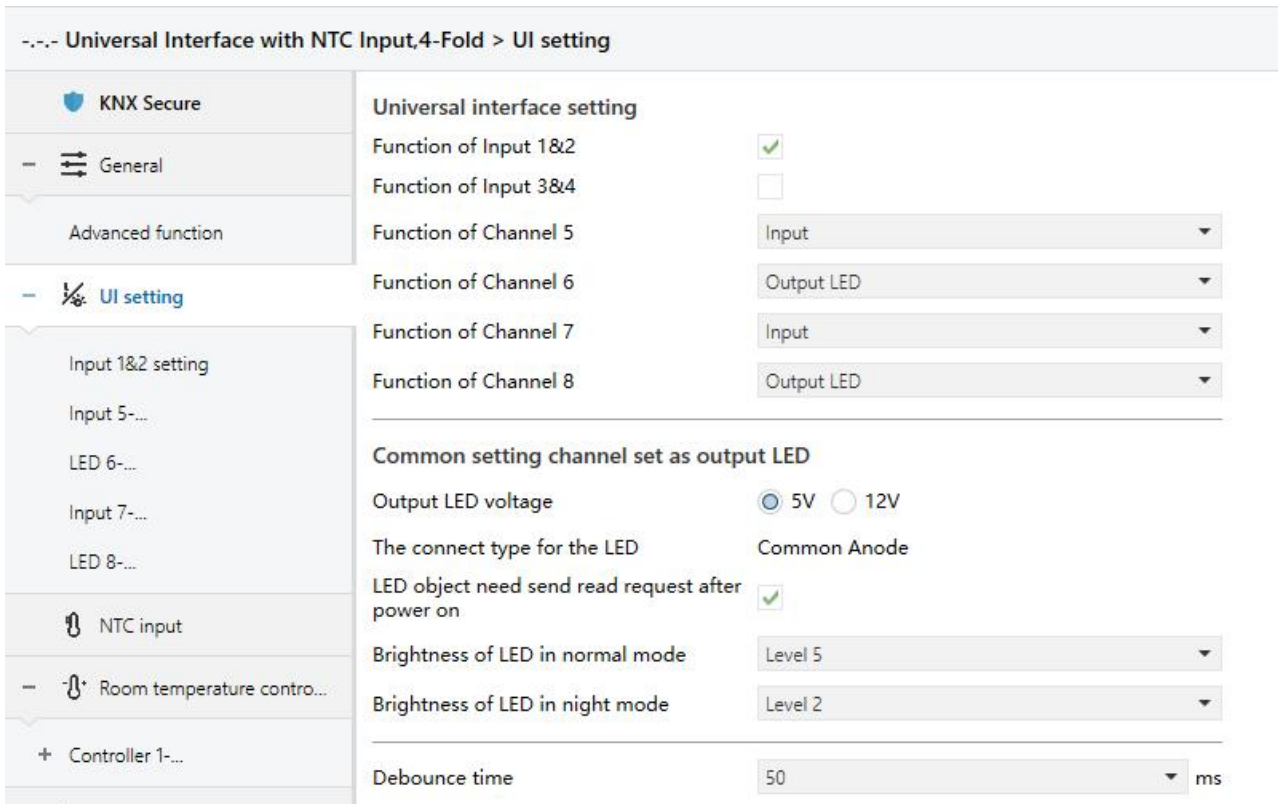


Fig.4.6 parameter window “UI setting”

Universal interface setting

Parameter "Function of Input 1&2"

Parameter "Function of Input 3&4"

This Parameter is used to set whether to enable the 1&2, 3&4 dry contact input function.

Parameter 'Function of Channel X,(X=5-8)"

This parameter is to set the function of channel. Options:

Disable

Input

Output LED

Common setting channel set as output LED

Parameter 'Output LED voltage"

This parameter is for setting the voltage of the output LED and the selection according to the power supply voltage of the connected LED. Options:

5V

12V

Parameter 'The connect type for the LED--Common Anode"

This parameter is for setting the connect type for the LED, option is only **Common Anode**

Parameter "LED object need send read request after power on"

This parameter is to set whether the LED object will send a read request after bus recovery or ETS downloading.

When this parameter is disabled: Do not send. And the following parameter “Initial LED status” is visible when you choose “No”.

When this parameter is enabled: Send a read request. And the LED will indicate accordingly to the responded value.

--Parameter "Initial status indication”

This parameter is visible when disable in the parameter “LED status object need send read request when power on”, it is to set the initial LED status. Options:

No

As status as object value “0”

No：No indication.

As status as object value “0”： To indicate accordingly to the status when LED object value is 0. If the function of LED x selects "control by external object, and 1byte", there is no indication.

Parameter 'Brightness of LED'

When the "Night mode" parameter is disabled, it is visible for setting the brightness of the LED output indicator.Options:

Level 1

Level 2

Level 3

Level 4

Level 5

Parameter 'Brightness of LED in normal mode'

When the "Night mode" parameter is enabled, it is visible for setting the brightness of the LED output indicator in normal mode.Options:

Level 1

Level 2

Level 3

Level 4

Level 5

Parameter 'Brightness of LED in night mode'

When the "Night mode" parameter is enabled, it is visible for setting the brightness of the LED output indicator in night mode. If no indicator, it is off. Options:

OFF

Level 1

Level 2

Level 3

Level 4

Level 5

Parameter "Debounce time"

This parameter is for setting the debounce time to avoid the unnecessary operations which is caused by the contact triggered multiple times in bouncing time, debounce time is the valid time of the contact operation. Options:

50ms

70ms

100ms

150ms

4.6.1 Parameter window “Input x&y setting” （x=1/3,y=2/4）

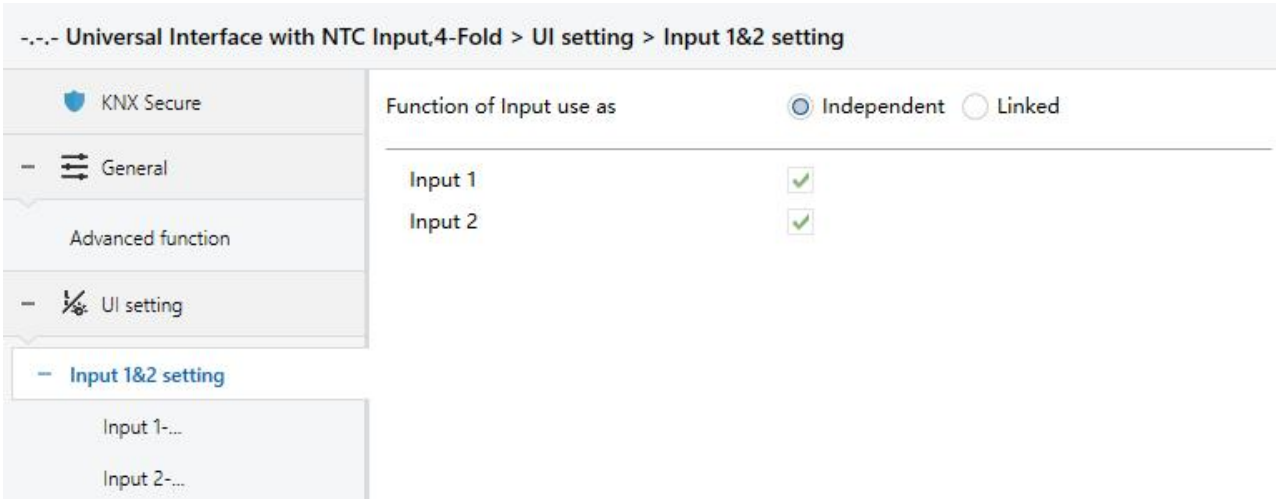


Fig.4.6.1parameter window ”Input x&y setting”(x=1/3,y=2/4)

Parameter "Function of Input use as"

This parameter is used to set whether to associate two input channels. Options:

Independent

Linked

Next chapter 4.6.2 and 4.6.3 we will take one of input channels (Independent mode)or one of rockers (linked mode) as example to introduce the parameters of each function and communication objects under different applications.

When “Independent” is selected, the following parameter is visible:

--Parameter "Input 1/2/3/4”

This parameter sets whether to enable input channels 1/2/3/4.

4.6.2 Parameter window “Input x-Independent” (x=1~8)

Fig.4.6.2 parameter window ”Input x-Independent”(x=1~8)

Parameter "Description (max 30char.)"

This parameter is for setting the name description of the input channel, up to 30 characters.

Parameter "Function of channel"

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

No function

Switch

Dimming

Value output

Scene control

Blind

Shift register

Multiple operation

RGB/RGBW send value

Delay mode

4.6.2.1 “Switch” Function

"Switch" parameter setting interface is shown as in Fig.4.6.2.1, user can close or open the contact to send a switch telegram with this application.

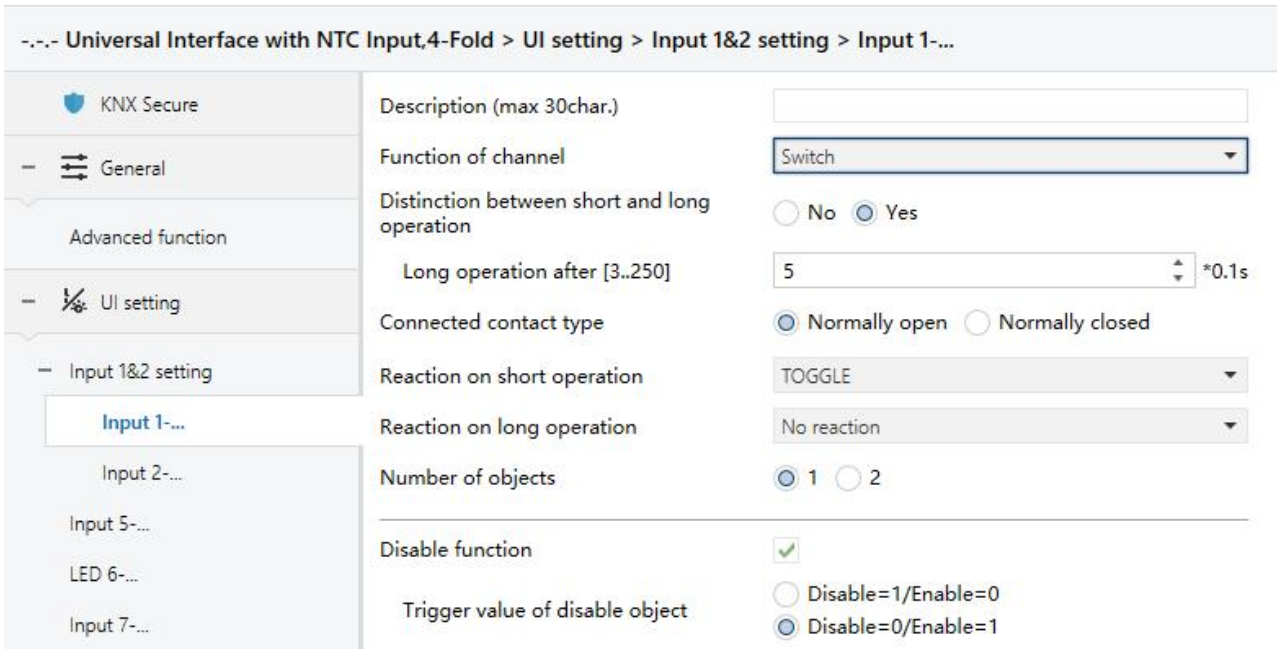


Fig.4.6.2.1parameter window “Input x-Switch”

Parameter "Distinction between short and long operation"

This parameter defines whether the contact use long/short operation or not. If select to distinguish, you should close the contact for a certain time, so it can be identified as long operation and execute corresponding action.

--Parameter "Long operation after [3..250]"

This parameter is visible when select to distinguish long/short operation. Set the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation. Options: **[3...250] *0.1s**

Parameter "Connect contact type"

This parameter is for setting the type of connected contacts. Options:

Normally open

Normally closed

Parameters explained in this chapter is taken **Normally open** as an example, operation of **Normally closed** is reversed.

Parameter "Reaction on short operation" /"Reaction on close the contact"

Parameter "Reaction on long operation"/"Reaction on open the contact"

These parameters are for setting the reaction on close/open the contact or on short/long operation. The object values are updated immediately when the input is confirmed. Options:

No action

ON

OFF

TOGGLE

No action: no telegram to be sent.

ON: send on telegram.

OFF: send off telegram.

TOGGLE: each operation will toggle the switch between on and off. For example, if send an On telegram(or received) at the last, then the next operation will trigger an Off telegram. When the contact is operated again, it will send an On telegram, etc. So the contact will always remember the previous status and covert to opposite value during next operation.When the device is powered on for the first time or restarted after downloading, the default value for “Switch” is 0, meaning the first operation will be ON.

Parameter "Interval of tele.cyclic send [0...60000](0=send once)"

This parameter is visible when select to not distinguish long/short operation. Set the interval for cyclically sending the telegram of switch. Options: **0...60000s**

Parameter "Send object value after bus recovery (valid if reaction is not toggle)"

This parameter is visible when select to not distinguish long/short operation. Set whether to send the current value of object "Switch" to the bus after bus recovery.

If enabled, send the current value of object "Switch" to the bus after bus recovery, but it is only applied to the parameter “Reaction on close /open the contact”option is not "Toggle" or "No reaction", and if any one of the parameters select these two options can not send value to the bus.

Parameter "Number of objects"

This parameter is for setting the number of objects to control switch, 1 common object or 2 separate objects. Options:

1

2

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

Without distinction between short and long operation：If the channel is disabled before release, no telegram is sent when released; Also,when the channel switches from disabled to enabled, no telegram is sent for the current contact state.

Distinction between short and long operation：When the channel switches from disabled to enabled, no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when parameter “disable function”is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

--Parameter “Behaviour from disable to enable(valid if reaction is not toggle)”

This parameter is visible when parameter “disable function”is enabled and not distinguish long/short operation.Set whether to send the current status when the channel switches from disabled to enabled. Options:

No reaction

Send the current status

4.6.2.2 “Dimming” Function

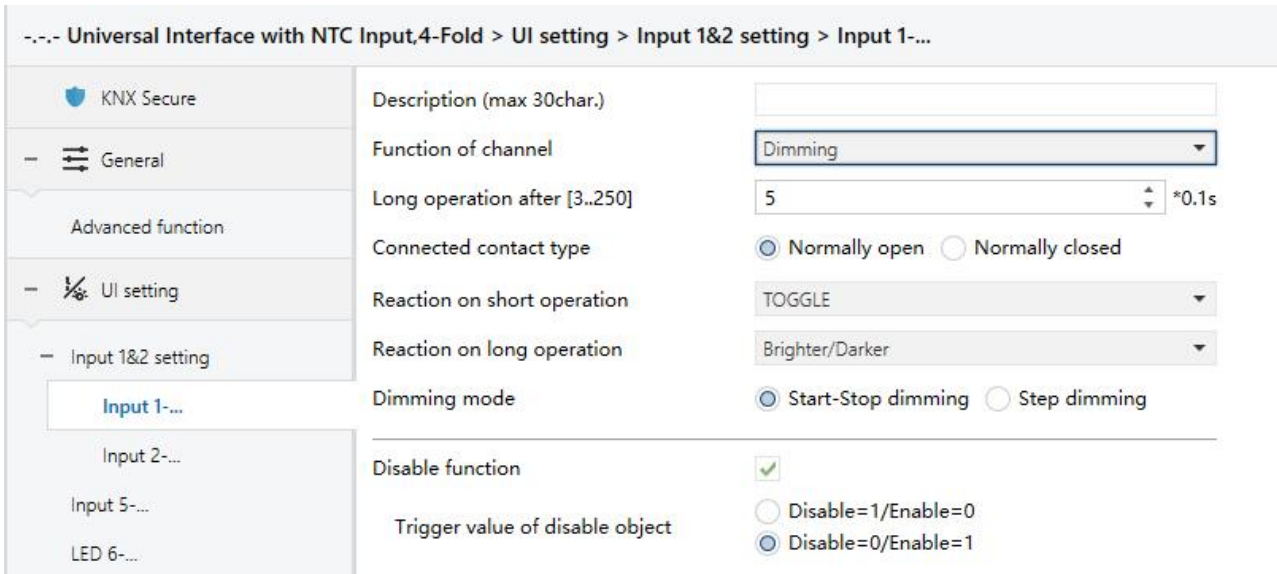


Fig.4.6.2.2 parameter window “Input x- Dimming”

Parameter "Reaction on short operation"

This parameter is for setting the reaction on short operation. Options:

No action

ON

OFF

TOGGLE

No action: no telegram to be sent.

ON: send on telegram.

OFF: send off telegram.

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

Parameter "Reaction on long operation"

This parameter is used to send the relative dimming value (up or down) during long operation, releasing the contact will stop the dimming, Options:

Options:

No action

Brighter

Darker

Brighter/Darker

No action: no telegram to be sent.

Brighter: send the dimming up value.

Darker: send the dimming down value.

Brighter/darker: each operation will toggle the dimming between up and down. When the device is powered on for the first time or restarted after downloading, the default value for ”Dimming” is 0, meaning the first operation is dim up the brightness.

Note: In the options of "TOGGLE" and "Brighter/Darker", there are a linkage between the received switch status and the dimming. For example, if receive an On value from object "Switch" at the last, then it will dim down the brightness in next dimming operation. If receive an Off value first, then it will dim up the brightness in next dimming operation.

Parameter "Dimming mode"

This parameter is for setting the mode of relative dimming. Options:

Start-stop dimming

Step dimming

Start-stop dimming: the dimming mode is start-stop, i.e. a telegram of dimming up or down will be sent when the dimming starts, and a stop telegram will be sent when dimming ends. The dimming telegram is no need to be sent cyclically.

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

--Parameter "Step size"

This parameter is visible when "Step dimming" is selected. Set the brightness (%) that can be changed by the dimming telegrams sent cyclically. Options:

100%

50%

...

1.56%

--Parameter "Interval of tele. Cyclic send [0..25] (0=send once)"

This parameter is visible when "Step dimming" is selected. Set the interval for cyclically sending the telegram of dimming. Options: **[0..25] *0.1s, 0=send once**

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state; The channel is disable when pressed, the cyclically sent telegram will stop, and even if the channel is enabled before release,no more long operation telegram will be sent.However, if the long operation was triggered before the channel was disable, a stop dimming telegram will be sent at this case.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.3 “Value output” Function

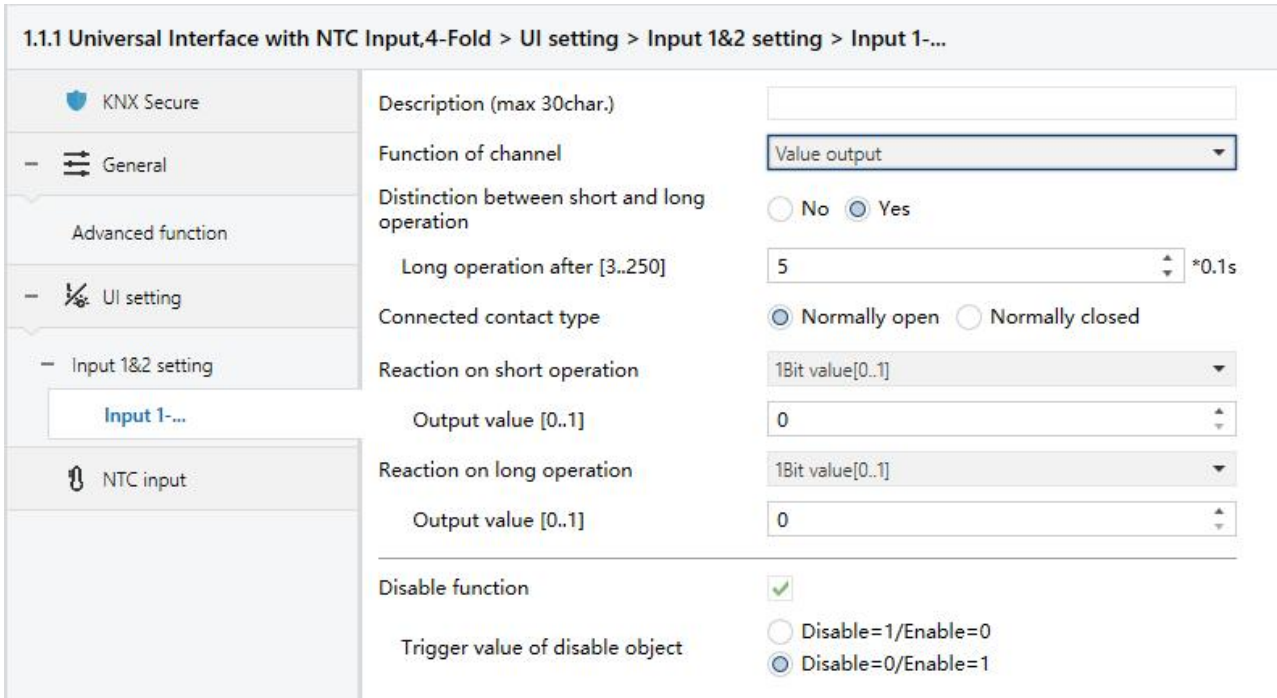


Fig.4.6.2.3 parameter window “Input x- Value output”

Parameter 'Reaction on short operation' /'Reaction on close the contact'

Parameter 'Reaction on long operation'/'Reaction on open the contact'

These parameters are for setting the object datatype to be sent when on close/open the contact or on short/long operation. Options:

No reaction

1bit value [0..1]

2bit value [0..3]

4bit value [0..15]

1byte value [0..255]

2byte value [0..65535]

4byte value[0...4294967295]

4byte float value

--Parameter "Output value [...]"

These parameters are for setting the output value when execute the operation. Range of value is according to the selection of previous parameter.

参数 "Send object value after bus recovery"

This parameter is visible when select to not distinguish long/short operation. Set whether to send object value after bus recovery.

Options:

No

Yes

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

Without distinction between short and long operation：If the channel is disabled before release, no telegram is sent when released; Also, when the channel switches from disabled to enabled,no telegram is sent for the current contact state.

Distinction between short and long operation： When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when parameter “disable” is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

--参数“Behaviour from disable to enable”

This parameter is visible when parameter “disable function”is enabled and not distinguish long/short operation.Set whether to send the current status when the channel switches from disabled to enabled. Options:

No reaction

Send the current status

4.6.2.4 “Scene control” Function

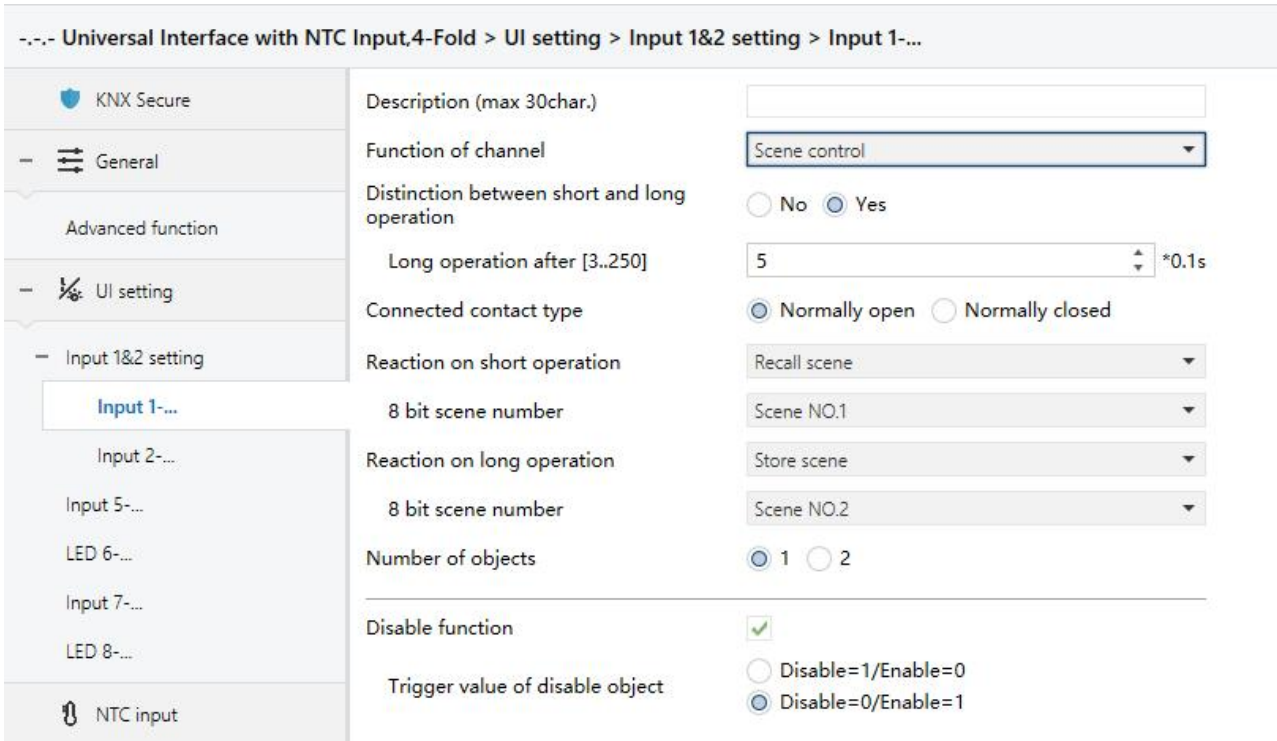


Fig.4.6.2.4 parameter window “Input x- Scene control”

Parameter "Reaction on short operation" /"Reaction on close the contact"

Parameter "Reaction on long operation"/"Reaction on open the contact"

These parameters are for setting the reaction on close/open the contact or on short/long operation, to recall or store scene. Options:

No reaction

Recall scene

Store scene

--Parameter "8 bit scene number"

This parameter is for setting the scene number. Options: **Scene NO.1~64**, corresponding telegram is 0~63.

Parameter "Number of objects"

This parameter is able to set one or two communication objects, when one communication object is set, close and open or long and short operation share one communication object; when two communication objects are set, close and open or long and short operation use one communication object separately. Options:

1

2

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

Without distinction between short and long operation：If the channel is disabled before release, no telegram is sent when released; Also, when the channel switches from disabled to enabled,no telegram is sent for the current contact state.

Distinction between short and long operation：When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.5 “Blind” Function

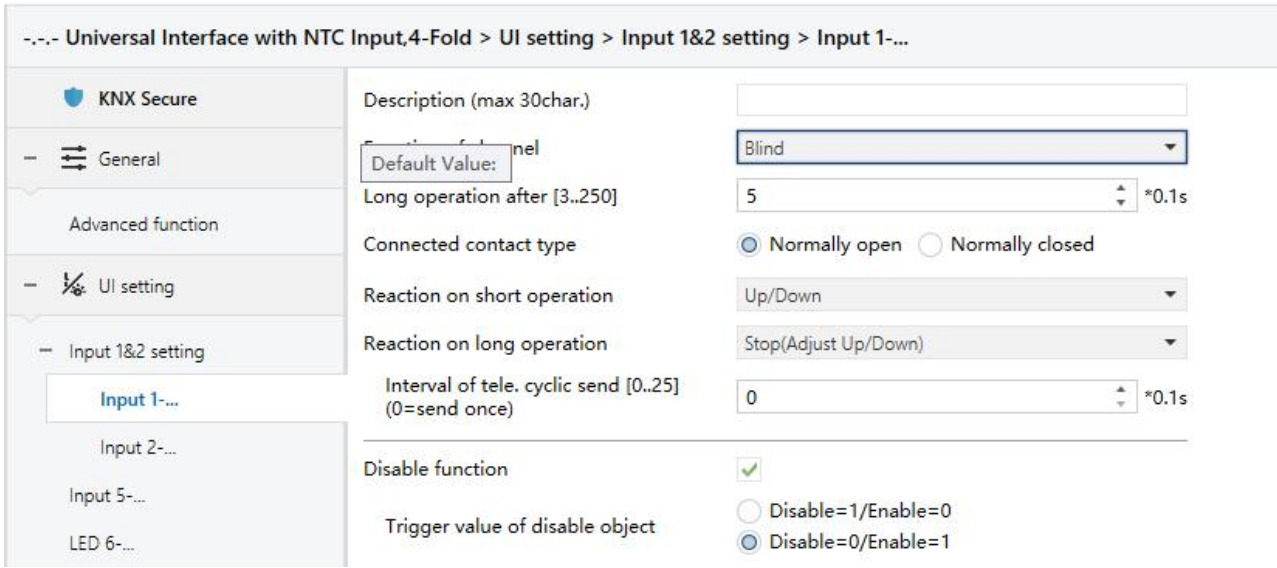


Fig.4.6.2.5parameter window “Input x- Blind”

Parameter 'Reaction on short/long operation'

These parameters are for setting the reaction on short/long operation. Options:

No action

Up

Down

Up/Down

Stop (Adjust Up)

Stop (Adjust Down)

Stop (Adjust Up/Down)

No action: no telegram to be sent.

Up: the blinds will be opened or moved up.

Down: the blinds will be closed or moved down.

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

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

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

Stop (Adjust Up/Down): stop the blind movement or move up/down the angle of blinds alternately. When the device is powered on for the first time or restarted after downloading, the default value for ” Stop/Adjust Blind” is 0, meaning the first operation will be stop or move down the angle of blinds.

--Parameter "Interval of tele. cyclic send [0..25] (0=send once)"

This parameter is visible when previous parameter is selected "Stop...". Set the interval for cyclically sending the telegram of blinds angle adjustment. Options: **[0..25],0=send once**

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state; If the channel is disable before release,no more long operation telegram will be sent periodically.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.6 “Shift register” Function

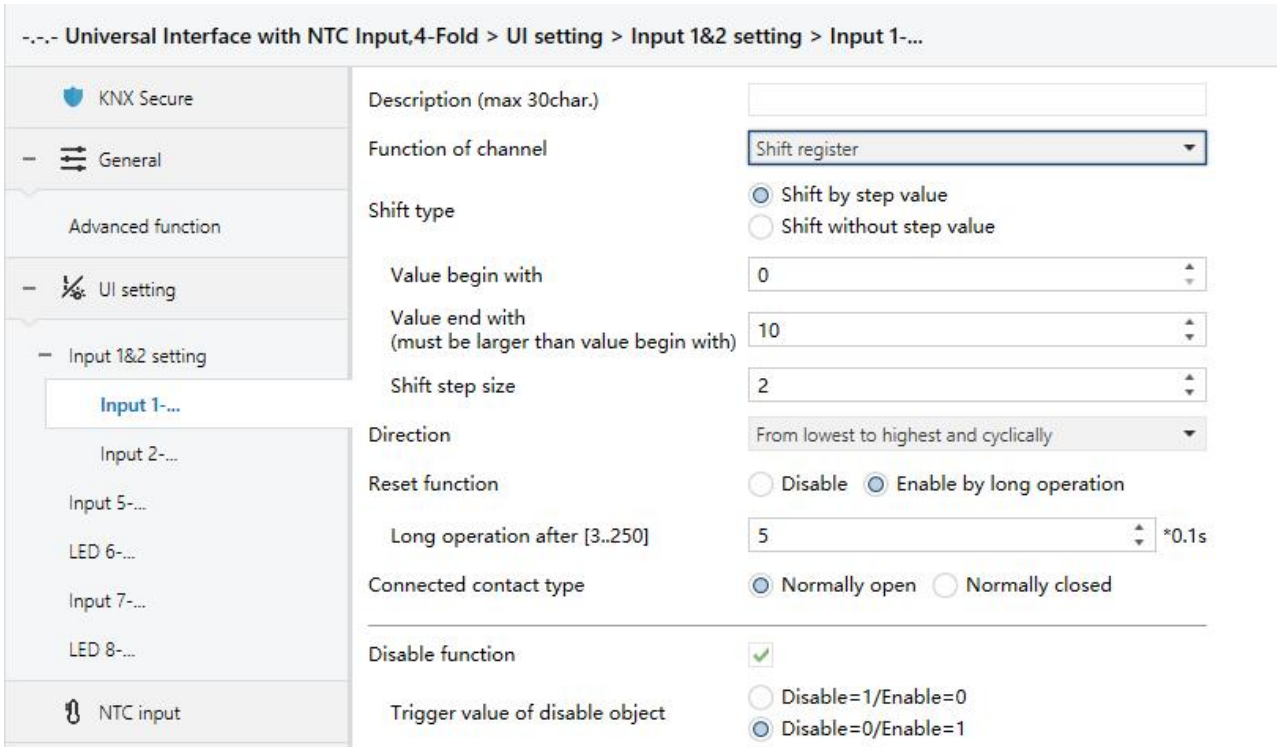


Fig.4.6.2.6 parameter window “Input x- Shift register”

Parameter 'Shift type'

This parameter is for setting the shift type. Options:

Shift by step value

Shift without step value

Shift by step value: set the lowest and highest value of shift, as well as the value increased (from lowest to highest) or decreased (from highest to lowest) from each shift.

Shift without step value: when there is no step value, set the actual value sent by each shift (max. 10 values), operate a time and send a value.

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

--Parameter "Value begin with"

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

--Parameter "Value end with(must be larger than value begin with)"

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

Note: the highest value must be larger than lowest value, if not, it can not set on the ETS and display the red box, as shown as following:

--Parameter "Step size"

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

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

--Parameter "Object datatype"

This parameter is for setting the object datatype for the shift object. Options:

1byte unsigned value

Scene number

HVAC mode

--Parameter "Shift number"

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

When "1byte unsigned value", "Scene number" or "1byte percentage" is selected, options: **0/1/2/.../10**

When "HVAC mode" is selected, options: **1/2/3/4**

--Parameter "Value x"(x=1~10 或 x=1~4)

This parameter is for setting the value when each shift operation to send.

When "1byte unsigned value" is selected, options: **0...255**

When "Scene number" is selected, options:

Scene NO.1

Scene NO.2

Scene NO.3

...

Scene NO.64

When "HVAC mode" is selected, options:

Comfort mode

Standby mode

Economy mode

Frost/heat protection

Parameter "Direction"

This parameter is for setting the shift direction. Options:

From lowest to highest and stop to the end

From highest to lowest and stop to the begin

From lowest to highest and cyclically

From highest to lowest and cyclically

From lowest to highest and stop to the end: Shift from low to high.

From highest to lowest and stop to the begin: Shift from high to low.

From lowest to highest and cyclically: once to the end value, shift direction starts over again and constantly cycling from low to high operation.

From highest to lowest and cyclically: once to the start value, shift direction starts over again and constantly cycling from high to low operation.

Parameter "Reset function"

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

Disable

Enable by long operation

Disable: not possible to reset shift;

Enable by long operation: possible to reset shift by long operation, when reset, shift will be restarted.

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

Without distinction between short and long operation：If the channel is disabled before release, no telegram is sent when released; Also, when the channel switches from disabled to enabled,no telegram is sent for the current contact state.

Distinction between short and long operation：When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.7 “Multiple operation” Function

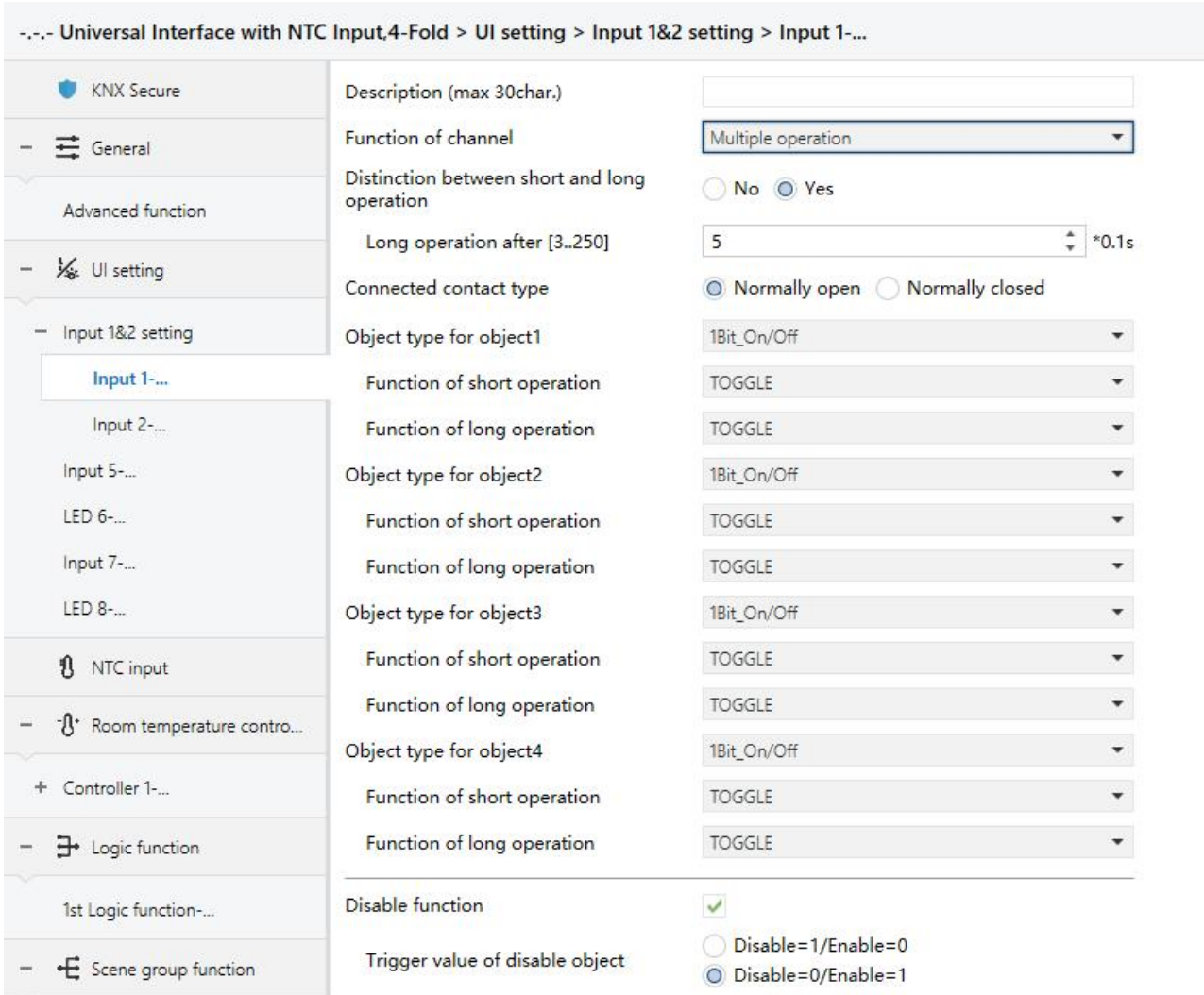


Fig.4.6.2.7parameter window“Input x- Multiple operation”

Parameter 'Object type for object x'(x=1...4)

These parameters are for setting the object datatype to be sent when on close the contact or on short/long operation. Options:

Disable

1Bit_On/Off

1Bit_Up/Down

1Byte_RecallScene

1Byte_StoreScene

1Byte_Percentage

1Byte_Unsigned value

1Bit_On/Off: When the device is powered on for the first time or restarted after downloading, the default value for ”On/Off” is 0, meaning the first operation will be ON.

1Bit_Up/Down: When the device is powered on for the first time or restarted after downloading, the default value for ”Up/Down” is 0, meaning the first operation will be closing or moving down the blinds.

Parameter "Function of short operation" /"Function of close the contact"

Parameter "Function of long operation"

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

--Parameter "Value 1/2（...）"

These parameters are visible when "1Byte_RecallScene","1Byte_StoreScene","1Byte_Percentage"or "1Byte_Unsigned value" is selected. Set the sending values when perform operations. The ranges of value 1/2 are depending on the datatype selected by the parameter before last one.

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.8 “RGB/RGBW send value” Function

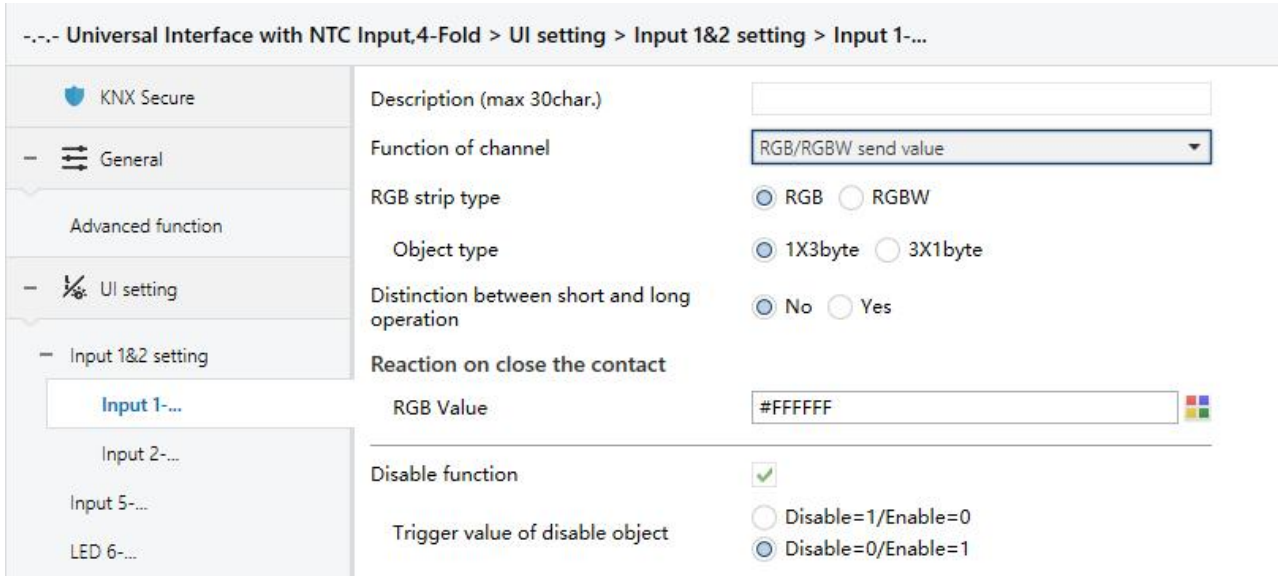


Fig.4.6.2.8(1)parameter window “Input x- RGB dimming”

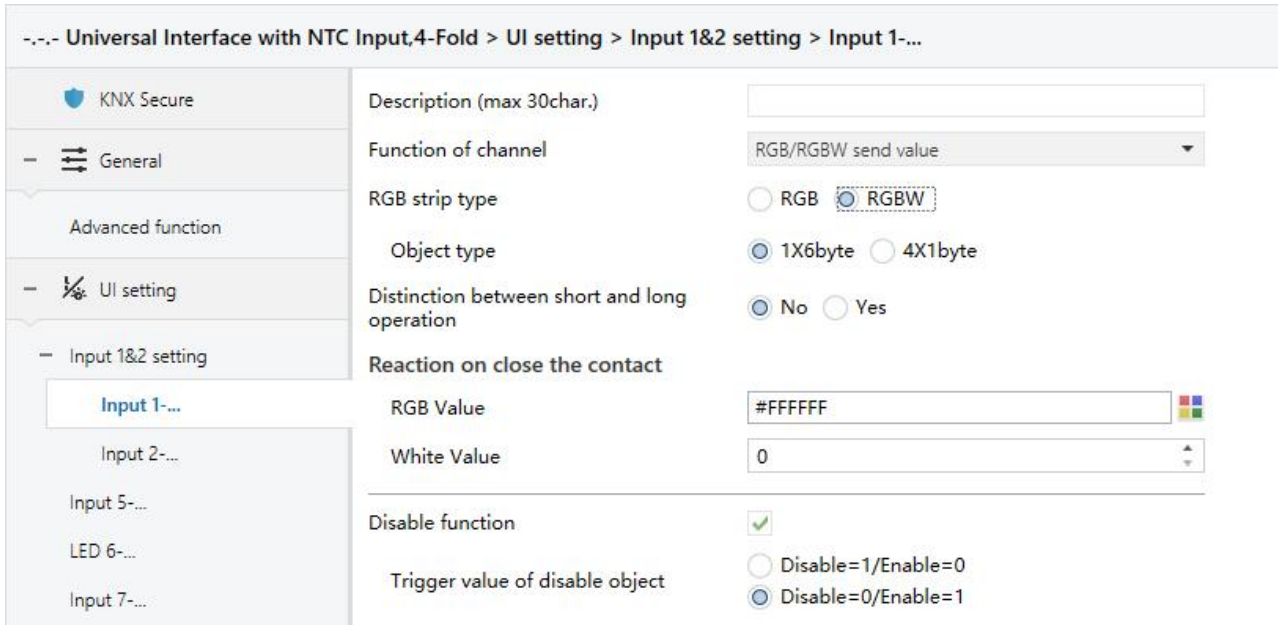


Fig.4.6.2.8(2) parameter window“Input x- RGBW dimming”

Parameter 'RGB strip type'

The parameter is used to set the type of RGB strip lights, Options:

RGB

RGBW

RGB：Apply to adjust RGB these three colors lights;

RGBW：Apply to adjust RGBW these four colors lights.

Parameter "object type"

The parameter is used to object type, Options:

Applicable to RGB type:

1x3byte **Perform the RGB dimming by a 3byte object**

3x1byte **Execute the RGB dimming by three 1byte objects**

Applicable to RGBW type:

1x6byte **Perform the RGBW dimming by a 6byte object**

4x1byte **Execute the RGBW dimming by four 1byte objects**

Parameter "Distinction between short and long operation"

The parameter is used to set the operation of rocker switch whether to distinguish long or short operation. If selecting the “yes” option, long or short operation can be confirmed only after a certain amount of time, and the contact will execute setup actions. Options:

Yes

No

--Parameter "Long operation after（*0.1s）"

This parameter can be seen under “Distinction between long and short operation”, you can set the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation. Options: **3...25**

Parameter "Reaction on short/long operation—— RGB Value"

When setting the operational contact or long/short operation here, the brightness value of sending RGB value of strip lights. Options: #**00000...#FFFFF**

Parameter "Reaction on short/long operation—— White Value"

This parameter is visible when “RGBW” is selected and sets the brightness value of sending white value of strip lights.Options: **0...255**

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.2.9 “Delay mode” Function

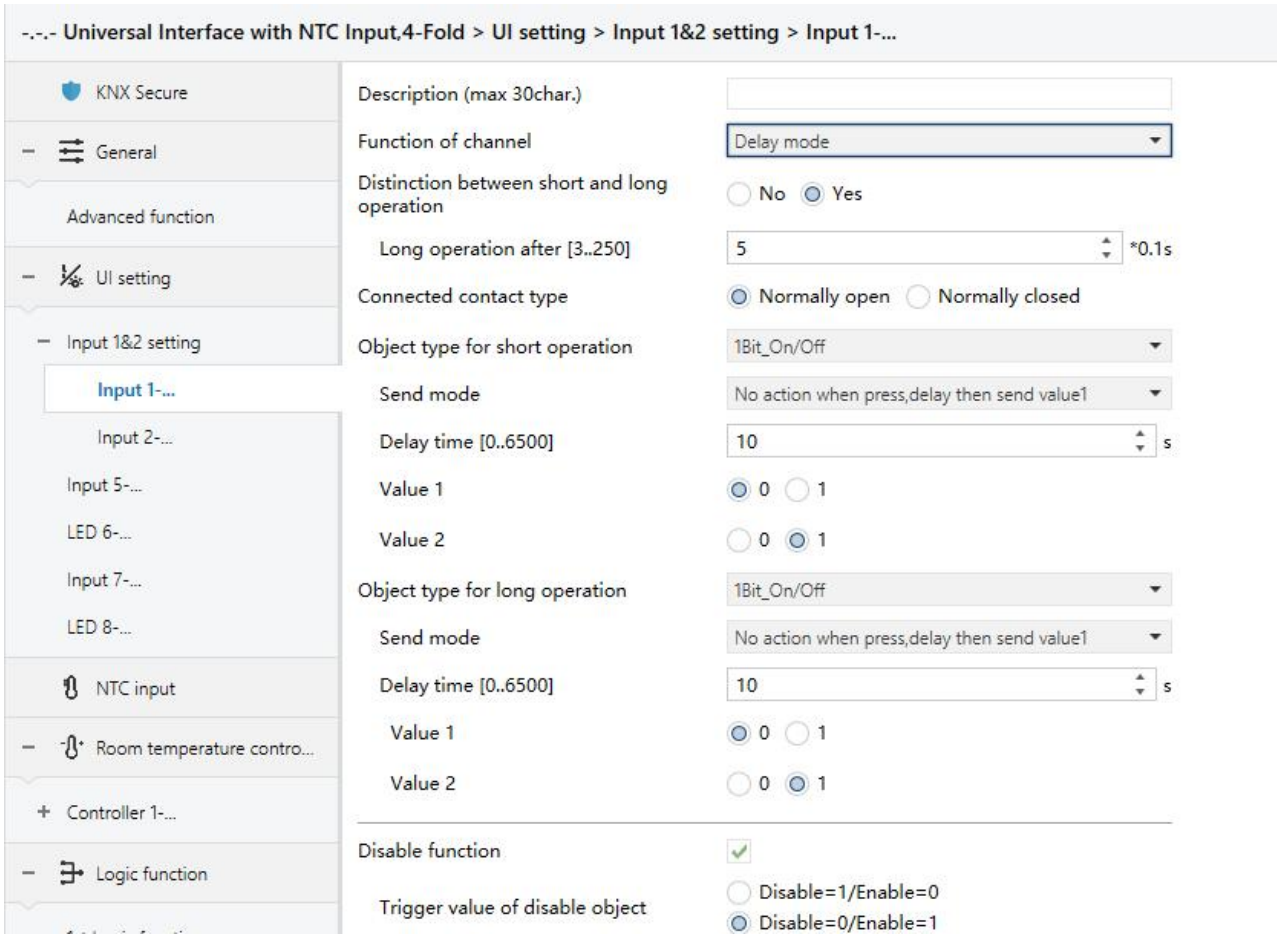


Fig.4.6.2.9parameter window“Input x- Delay mode”

Parameter "Object type for close the contact"

Parameter "Object type for short operation"

Parameter "Object type for long operation"

These parameters are for setting the object datatype to be sent when on close the contact or on short/long operation. Options:

Disable

1Bit_On/Off

4Bit_Dimming

1Byte_Unsigned value

--Parameter "Send mode"

This parameter is for setting the send mode. Options:

No action when press, delay then send value 1

No action when press, delay then send value 2

Send value 1 when press, delay then send value 2

Send value 2 when press, delay then send value 1

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

This parameter is for setting the delay time. Options: **0..6500 s**

--Parameter "value1/2 [...]"

This parameter is for setting the value 1/2 to send. The ranges of value 1/2 are depending on the datatype selected by the parameter before last one.

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled, no telegram is sent for the current contact state.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.3 Parameter window “Input x-Linked” (x=1~8)

In the way, the input 1 and input 2 are linked.

Fig.4.6.3 parameter window “Input -Linked”

Parameter "Description (max 30char.)"

This parameter is for setting the name description of the input channel, up to 30 characters.

Parameter "Function of channel"

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

No function

Switch

Dimming

Scene control

Blind

4.6.3.1 “Switch” Function

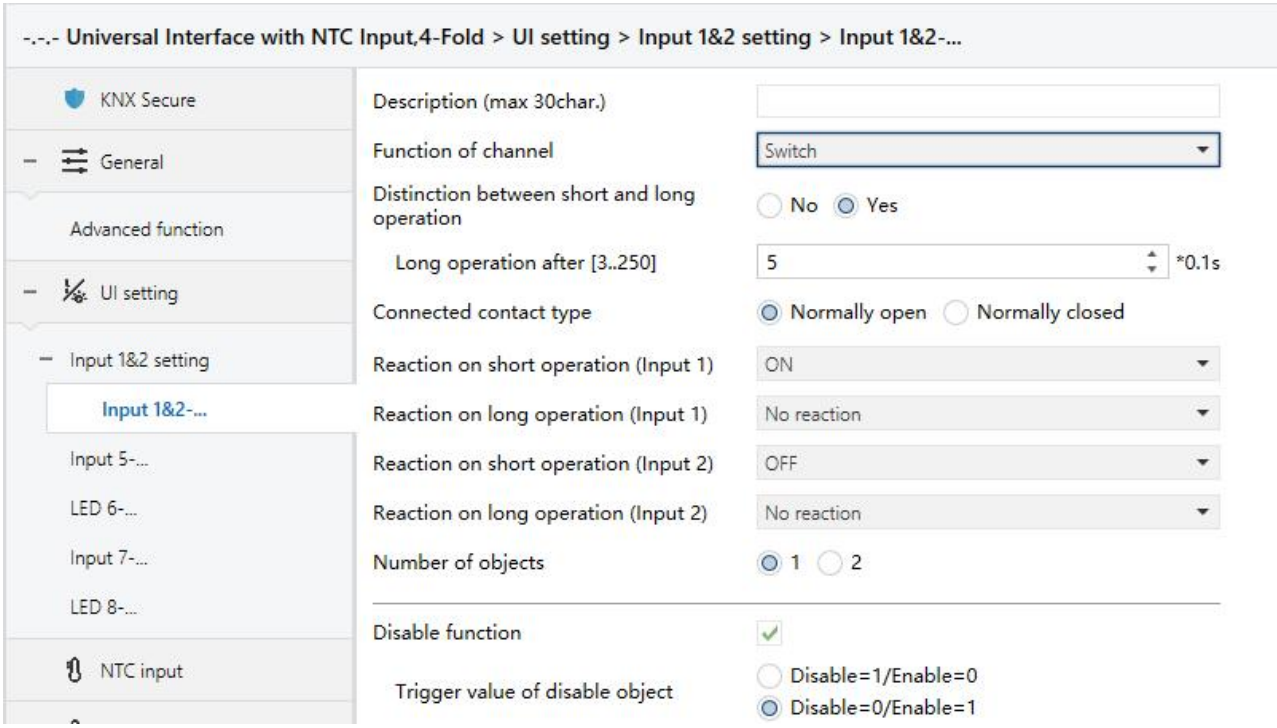


Fig.4.6.3.1parameter window “Linked- Switch”

Parameter "Distinction between short and long operation"

This parameter defines whether the contact use long/short operation or not. If select to distinguish, you should close the contact for a certain time, so it can be identified as long operation and execute corresponding action.

--Parameter "Long operation after [3...250]"

This parameter is visible when select to distinguish long/short operation. Set the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation. Options: **[3..250]*0.1s**

Parameter "Connect contact type"

This parameter is for setting the type of connected contacts. Options:

Normally open

Normally closed

Parameters explained in this chapter is taken **Normally open** as an example, operation of **Normally closed** is reversed.

Parameter "Reaction on short operation/close the contact（Input 1/Input 2）"

Parameter "Reaction on long operation/ open the contact（Input 1/Input 2）"

These parameters are for setting the reaction on close/open the contact or on short/long operation. The object values are updated immediately when the input is confirmed. Options:

No action

OFF

ON

TOGGLE

No action: no telegram to be sent.

ON: send on telegram.

OFF: send off telegram.

TOGGLE: each operation will toggle the switch between on and off. For example, if send an On telegram(or received) at the last, then the next operation will trigger an Off telegram. When the contact is operated again, it will send an On telegram, etc. So the contact will always remember the previous status and covert to opposite value during next operation.When the device is powered on for the first time or restarted after downloading, the default value for ”Switch” is 0, meaning the first operation will be ON.

※ “Send object value after bus recovery (valid if reaction is not toggle)"

This parameter is visible when select to not distinguish long/short operation. Set whether to send the current value of object "Switch" to the bus after bus recovery.

If enabled, send the current value of object "Switch" to the bus after bus recovery, but it is only applied to the parameter “Reaction on close /open the contact”option is not "Toggle" or "No reaction", and if any one of the parameters select these two options can not send value to the bus.

Parameter "Number of objects"

This parameter is for setting the number of objects to control switch, 1 common object or 2 separate objects. Options:

1

2

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

Without distinction between short and long operation：If the channel is disabled before release, no telegram is sent when released; Also, when the channel switches from disabled to enabled,no telegram is sent for the current contact state.

Distinction between short and long operation： When the channel switches from disabled to enabled,no telegram is sent for the current contact state.

Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.3.2 “Dimming” Function

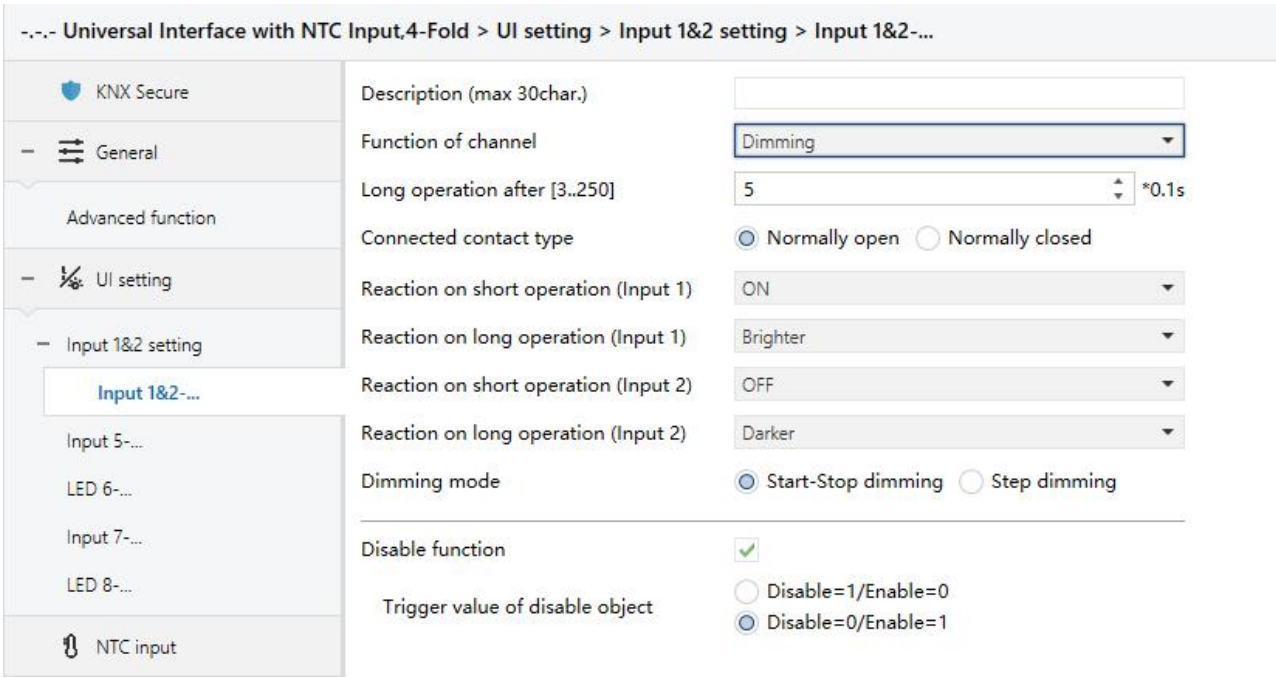


Fig.4.6.3.2parameter window“Linked- Dimming”

Parameter 'Long operation after [3...250]'

This parameter is visible when select to distinguish long/short operation. Set the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation. Options:**[3..250]*0.1s**

Parameter 'Reaction on short operation (Input 1/Input 2)'

This parameter is for setting the reaction on short operation. Options:

No action

OFF

ON

TOGGLE

No action: no telegram to be sent.

ON: send on telegram.

OFF: send off telegram.

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

Parameter "Reaction on long operation (Input 1/Input 2)"

This parameter is used to send the relative dimming value (up or down) during long operation, releasing the contact will stop the dimming, Options:

No reaction

Brighter

Darker

Brighter/Darker

No action: no telegram to be sent.

Brighter: send the dimming up value.

Darker: send the dimming down value.

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

Note: In the options of "TOGGLE" and "Brighter/Darker", there are a linkage between the received switch status and the dimming. For example, if receive an On value from object "Switch" at the last, then it will dim down the brightness in next dimming operation. If receive an Off value first, then it will dim up the brightness in next dimming operation.

Parameter "Dimming mode"

This parameter is for setting the mode of relative dimming. Options:

Start-stop dimming

Step dimming

Start-stop dimming: the dimming mode is start-stop, i.e. a telegram of dimming up or down will be sent when the dimming starts, and a stop telegram will be sent when dimming ends. The dimming telegram is no need to be sent cyclically.

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

--Parameter "Step size"

This parameter is visible when "Step dimming" is selected. Set the brightness (%) that can be changed by the dimming telegrams sent cyclically. Options:

100%

50%

…

1.56%

--Parameter "Interval of Tele. Cyclic send（*0.1s，0＝send once）"

This parameter is visible when "Step dimming" is selected. Set the interval for cyclically sending the telegram of dimming. Options: **0..25 *0.1s, 0=send once**

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state; The channel is disable when pressed, the cyclically sent telegram will stop, and even if the channel is enabled before release,no more long operation telegram will be sent.However, if the long operation was triggered before the channel was disable, a stop dimming telegram will be sent at this case.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.3.3 "Scene control" Function

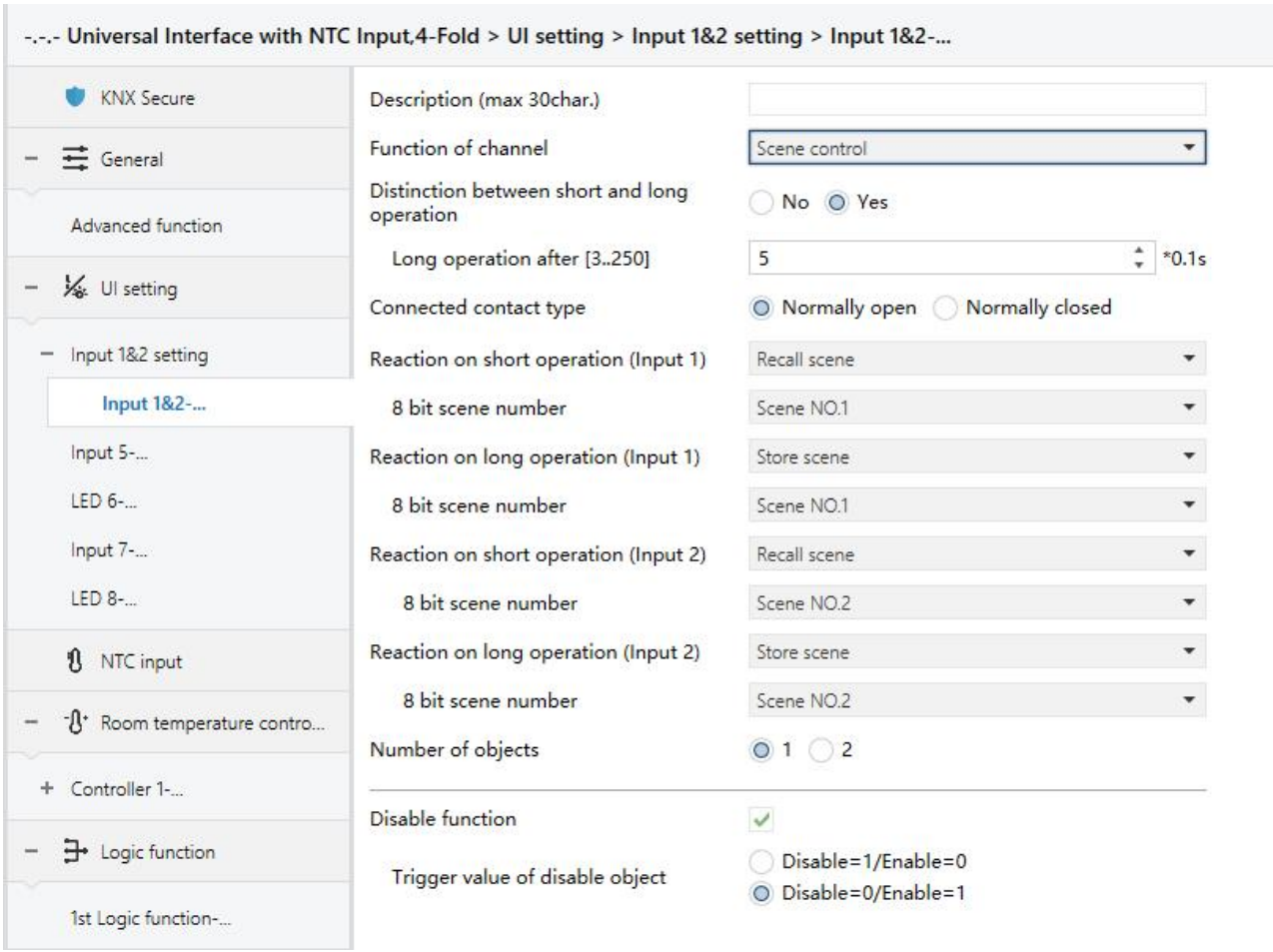


Fig.4.6.3.3parameter window "Linked- Scene control"

Parameter "Distinction between short and long operation"

This parameter defines whether the contact use long/short operation or not. If select to distinguish, you should close the contact for a certain time, so it can be identified as long operation and execute corresponding action.

Yes

No

--Parameter "Long operation after"

This parameter is visible when select to distinguish long/short operation. Set the valid time for long operation. So, when you press longer than the time set here, it will be identified as long operation, otherwise, it will be taken as short operation. Options: **[3..250]*0.1s**

Parameter "Reaction on short operation/ close the contact" (Input 1/Input 2)

Parameter "Reaction on long operation/ open the contact" (Input 1/Input 2)

These parameters are for setting the reaction on close/open the contact or on short/long operation, to recall or store scene. Options:

No reaction

Recall scene

Store scene

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

This parameter is for setting the scene number. Options: **Scene NO.1~64**, corresponding telegram is 0~63.

Parameter "Number of objects"

This parameter is able to set one or two communication objects, when one communication object is set, close and open or long and short operation share one communication object; when two communication objects are set, close and open or long and short operation use one communication object separately. Options:

1

2

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

4.6.3.4 "Blind" Function

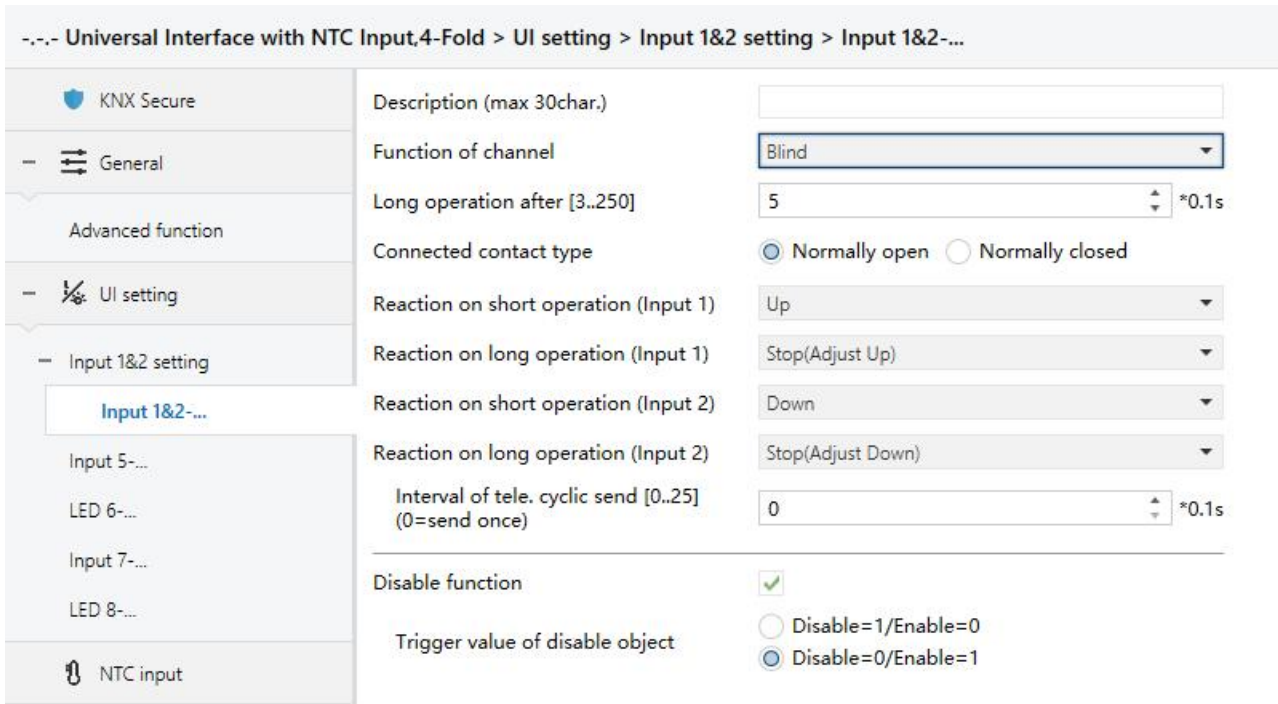


Fig.4.6.3.4parameter window "Linked- Blind"

Parameter "Long operation after [3...250]"

This parameter is used to set the activation time of long operation. If the contact is pressed longer than the time set here, the operation will be defined as long operation, or else short operation.Options: **[3..250]*0.1s**

Parameter "Reaction on short/long operation (for Input 1/Input 2)"

This Parameter is used to set the actions when the contact is operated in short/long operation, Options:

No action

Up

Down

Up/Down

Stop (Adjust Up)

Stop (Adjust Down)

Stop (Adjust Up/Down)

No action: no telegram to be sent.

Up: the blinds will be opened or moved up.

Down: the blinds will be closed or moved down.

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

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

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

Stop (Adjust Up/Down): stop the blind movement or move up/down the angle of blinds alternately. When the device is powered on for the first time or restarted after downloading, the default value for " Stop/Adjust Blind" is 0, meaning the first operation will be stop or move down the angle of blinds.

Parameter "Interval of tele. cyclic send [0..25] (0=send once)"

This parameter is visible when previous parameter is selected "Stop...". Set the interval for cyclically sending the telegram of blinds angle adjustment. Options: **[0..25]*0.1s,0=send once**

Parameter "Disable function"

This parameter for setting whether to enable the disable function of the contact. The disable status is activated be default after download.

When the channel switches from disabled to enabled,no telegram is sent for the current contact state; If the channel is disable before release,no more long operation telegram will be sent periodically.

--Parameter "Trigger value of disable object"

This parameter is visible when previous parameter is enabled. Set the trigger value of disable object. Options:

Disable=1/enable=0

Disable=0/enable=1

4.6.4 “LED x” (x=5~8)Function

This parameter window is used to set the LED function. Each input provide a LED indication.Each LED can be set separately.Take one of the LED for detailed explanation.

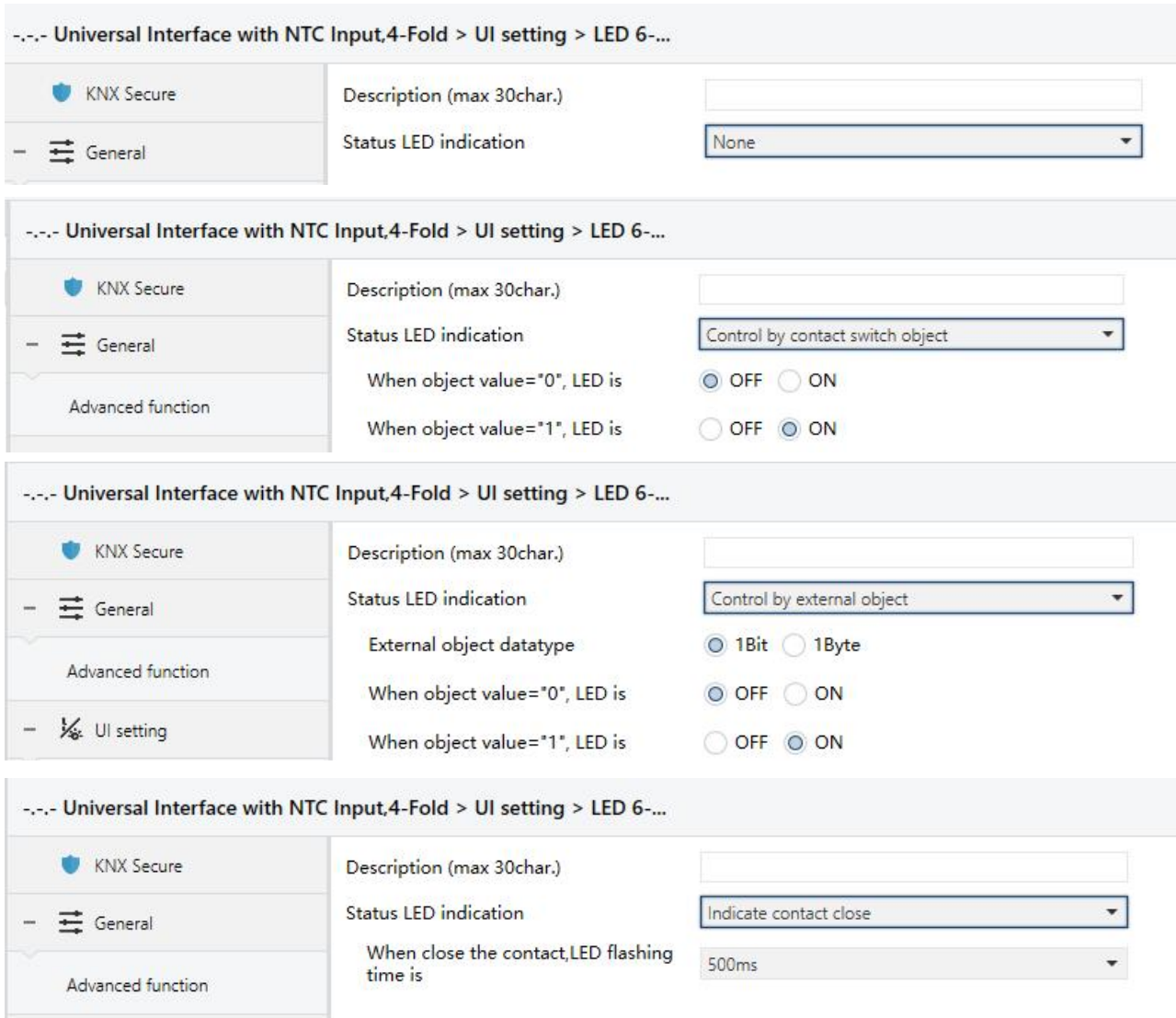


Fig.4.6.4 parameter window “LED”

Parameter 'Status LED indication'

This parameter is for setting the LED indication status. Options:

None

Control by contact switch object

Control by external object

Indicate contact close

Disable: deactivating LED function;

Control by contact switch object: the LED indication is determined by the switch object of the contact,no matter there is long/short operation,close or open the contact;Under the switch function,it is determined by the "switch object";Under dimming function,it is determined by the"short,switch"object.Under others function,the LED indication cannot be controlled.

Control by external object: the LED indication can be controlled independently;It will be not influenced by the contact functions.

Indicate contact close: when there is an operation of the contact,the LED will flash at the set time intervals.But if the contact is set "No function",the LED will not flash.

Parameter "External object datatype"

This parameter is available when LED function "*Control by external object* "is activated. It is used for setting the data type of the LED object, Options:

1bit

1byte

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

This parameter is visible when parameter "status LED indication" is selected "Control by contact switch object" or "Control by external object and 1bit".

When "Control by contact switch object" is selected, the LED5~8 indicate the switch object value of the contacts in dry contact inputs1~4.

When "Control by external object and 1bit" is selected, the LED5~8 indicates the value of the value of the telegram received by the LED object, "1" or "0".

Options:

OFF

ON

Parameter "Threshold value is"

This parameter is available when the LED function "*Control by external object and 1byte*"is activated. It is used for setting the threshold value of the LED indication. Options:**1...255**

--Parameter "If object value<threshold value, LED is"

This parameter is available when the LED function "Control by external object and 1byte"is activated. It is used for setting the status of the LED indication when the object value is smaller than the threshold value. Options:

OFF

ON

--Parameter "If object value=threshold value, LED is"

This parameter is available when the LED function "Control by external object and 1byte"is activated. It is used for setting the status of the LED indication when the object value is the same with the threshold value. Options:

OFF

ON

--Parameter "If object value>threshold value, LED is"

This parameter is available when the LED function "Control by external object and 1byte"is activated. It is used for setting the status of the LED indication when the object value is larger than the threshold value. Options

OFF

ON

Parameter "When press the contact, LED flashing time is"

This parameter is available when the LED function "Indicate contact press" is activated. It is used for setting the LED flashing time when there is contact operation. Options:

500ms

1s

2s

3s

4.7 Parameter window “NTC input”

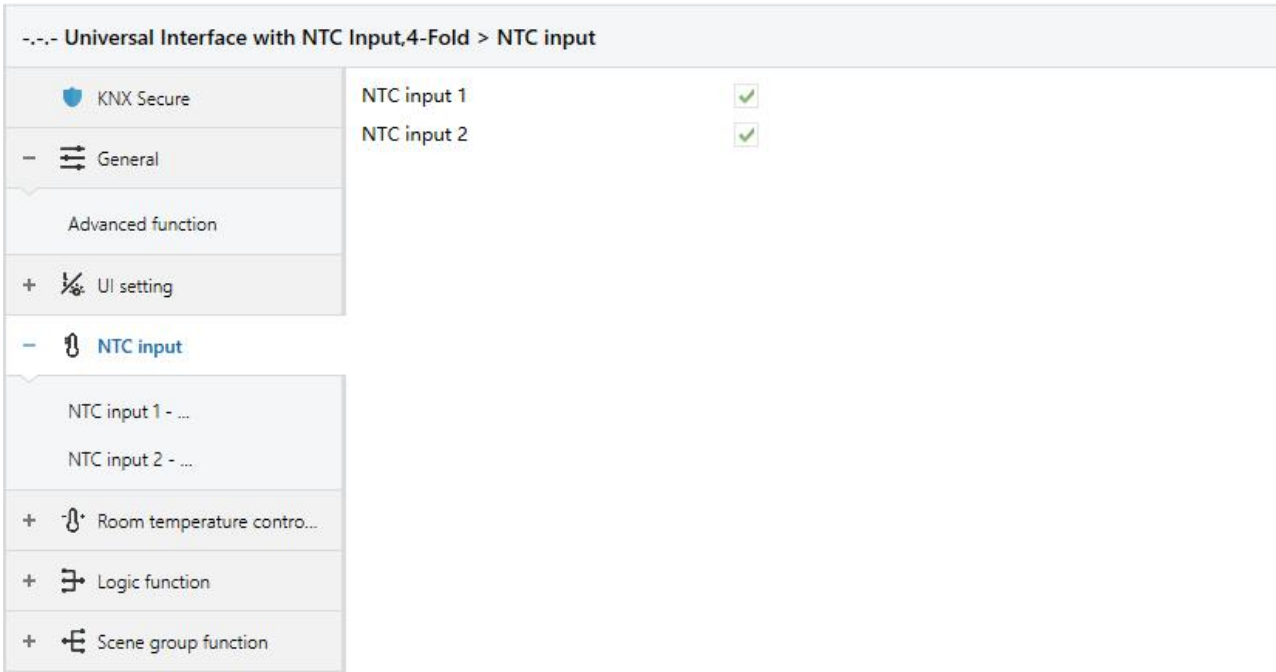


Fig.4.7 parameter window ”NTC input”

Parameter 'NTC input 1/2'

This parameter sets whether to enable NTC input channels 1/2.

4.7.1 Parameter window “NTC input x” (x=1/2)

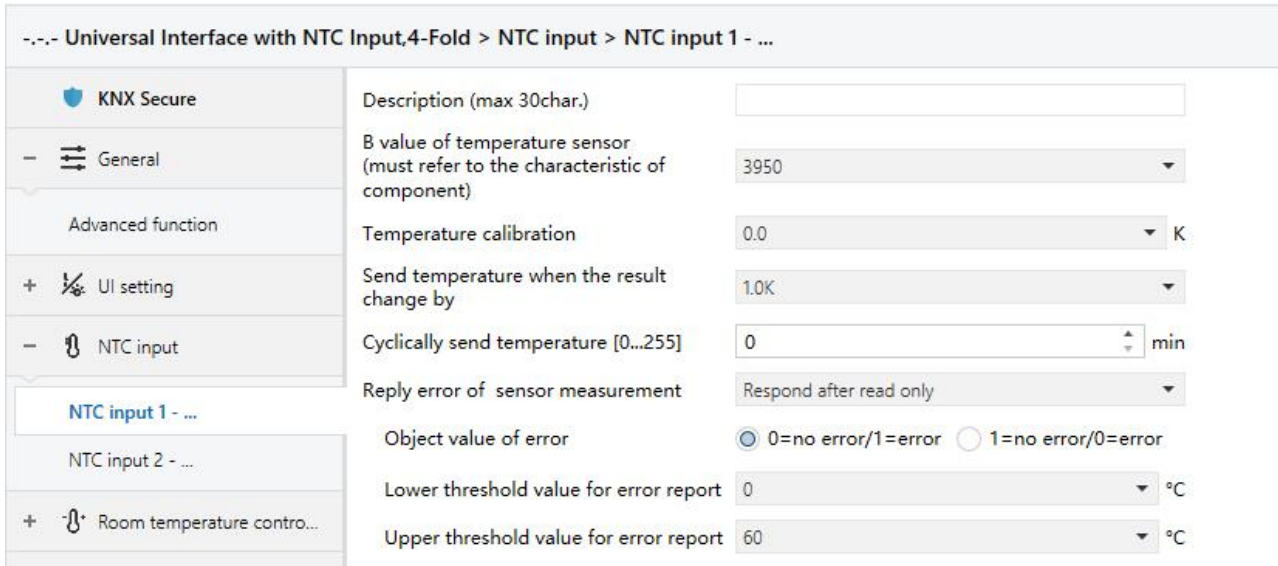


Fig.4.7.1parameter window ”NTC input x”(x=1/2)

Parameter "Description (max 30char.)"

This parameter is for setting the name description of temperature probe.

Parameter "B value of temperature sensor(must refer to the characteristic of component)"

This parameter is for setting the B value of temperature sensor. Options:

3275

3380

...

4200

Note: This value must refer to the characteristic of component, available from the instruction manual. If selected B value is different from used sensor, it will effect detection result directly.

Parameter "Temperature calibration"

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

Options:

-5.0K

...

0.0K

...

5.0K

Parameter "Send temperature when the result change by"

This parameter is for setting when temperature turns to a certain value, whether to enable to send the current temperature value to the bus. Not send when disable. Options:

Disable

0.5K

1.0K

...

10.0K

Parameter "Cyclically send temperature [0...255]"

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

Parameter "Reply error of sensor measurement"

This parameter for setting the condition of sending error status report when temperature exceeds the valid detection. Options:

No respond

Respond after read only

Respond after change

Respond after read only: Only when the device receives a read error from other bus device or bus will the object " Temperature error report, Sensor" send the error status to the bus;

Respond after change: The object " Temperature error report, Sensor" will immediately send the telegram to the bus to report the error value when the error status has changed.

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

--Parameter "Object value of error"

This parameter for defining object value of error. Options:

0=no error/1=error

1=no error/0=error

0=no error/1=error: The object value for which sensor no error occurs is 0, and the object value for which sensor error occurs is 1;

1=no error/0=error: It has the opposite meaning.

--Parameter "Upper threshold value for error report"

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

Options: **40°C / 45°C / 50°C / 55°C / 60°C / 70°C**

--Parameter "Lower threshold value for error report"

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

Options: **10°C / 5°C / 0°C / -5°C / -10°C / -20°C**

Chapter 5 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.

5.1 "General" Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	In operation			1 bit	C	-	-	T	-	switch	Low
2	General	Night mode			1 bit	C	-	W	T	U	switch	Low

Fig.5.1 "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.					
2	Night mode	General	1bit	C,W,T,U	1.024 day/night
The communication object is used to send day/night status to the bus.					

Table 5.1 "General"communication object

5.2 “HVAC controller” Communication Object

5.2.1 “Room temperature controller (RTC) ” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
188	Controller 1 - ...	Power on/off			1 bit	C	R	W	-	-	switch	Low
189	Controller 1 - ...	External temperature sensor			2 bytes	C	-	W	T	U	temperature (°C)	Low
190	Controller 1 - ...	Base setpoint adjustment			2 bytes	C	-	W	-	-	temperature (°C)	Low
191	Controller 1 - ...	Setpoint offset			1 bit	C	-	W	-	-	step	Low
192	Controller 1 - ...	Float offset value			2 bytes	C	-	W	-	-	temperature difference (K)	Low
193	Controller 1 - ...	Setpoint offset reset			1 bit	C	-	W	-	-	reset	Low
194	Controller 1 - ...	Heating/Cooling mode			1 bit	C	-	W	-	-	cooling/heating	Low
195	Controller 1 - ...	Operation mode			1 byte	C	-	W	-	-	HVAC mode	Low
196	Controller 1 - ...	Comfort mode			1 bit	C	-	W	-	-	enable	Low
197	Controller 1 - ...	Economy mode			1 bit	C	-	W	-	-	enable	Low
198	Controller 1 - ...	Frost/Heat protection mode			1 bit	C	-	W	-	-	enable	Low
199	Controller 1 - ...	Standby mode			1 bit	C	-	W	-	-	enable	Low
200	Controller 1 - ...	Extended comfort mode			1 bit	C	-	W	-	-	acknowledge	Low
201	Controller 1 - ...	Fan automatic operation			1 bit	C	-	W	-	-	enable	Low
202	Controller 1 - ...	Window contact			1 bit	C	-	W	T	U	window/door	Low
203	Controller 1 - ...	Presence detector			1 bit	C	-	W	T	U	occupancy	Low
205	Controller 1 - ...	Base temperature setpoint, status			2 bytes	C	R	-	T	-	temperature (°C)	Low
206	Controller 1 - ...	Setpoint offset, status			2 bytes	C	R	-	T	-	temperature difference (K)	Low
207	Controller 1 - ...	Current temperature setpoint, status			2 bytes	C	R	-	T	-	temperature (°C)	Low
208	Controller 1 - ...	Heating/Cooling mode, status			1 bit	C	R	-	T	-	cooling/heating	Low
209	Controller 1 - ...	Operation mode, status			1 byte	C	R	-	T	-	HVAC mode	Low
210	Controller 1 - ...	Comfort mode, status			1 bit	C	R	-	T	-	enable	Low
211	Controller 1 - ...	Economy mode, status			1 bit	C	R	-	T	-	enable	Low
212	Controller 1 - ...	Frost/Heat protection mode, status			1 bit	C	R	-	T	-	enable	Low
213	Controller 1 - ...	Standby mode, status			1 bit	C	R	-	T	-	enable	Low
214	Controller 1 - ...	Heating/Cooling control value			1 byte	C	R	-	T	-	percentage (0..100%)	Low
216	Controller 1 - ...	Fan speed			1 byte	C	-	-	T	-	percentage (0..100%)	Low
217	Controller 1 - ...	Fan speed low			1 bit	C	-	-	T	-	switch	Low
218	Controller 1 - ...	Fan speed medium			1 bit	C	-	-	T	-	switch	Low
219	Controller 1 - ...	Fan speed high			1 bit	C	-	-	T	-	switch	Low
220	Controller 1 - ...	Fan speed off			1 bit	C	-	-	T	-	switch	Low
221	Controller 1 - ...	Additional Heating/Cooling control val...			1 bit	C	R	-	T	-	switch	Low

221	Controller 1 - ...	Additional Heating control value			1 bit	C	R	-	T	-	switch	Low
222	Controller 1 - ...	Additional Cooling control value			1 bit	C	R	-	T	-	switch	Low

221	Controller 1 - ...	Additional Heating/Cooling control value			1 bit	C	R	-	T	-	switch	Low

Fig.5.2.1 “Room temperature controller(RTC)”communication object

NO.	Object Function	Name	Data Type	Flag	DPT
188	**Power on/off**	**Controller X-{{...}}**	**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 The name in parentheses changes with the parameter “Description (max 30 char.)”. If description is empty, display “Controller 1 - ...” by default. The same below.					
189	**External temperature sensor**	**Controller X-{{...}}**	**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. Range:-50~99.8℃					
190	**Current setpoint adjustment** **Base setpoint adjustment**	**Controller X-{{...}}**	**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 any case, the temperature setting value of the protection mode cannot be modified by the bus.					
191	**Setpoint offset**	**Controller X-{{...}}**	**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

192	**Float offset value**	**Controller X-{{...}}**	**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.

193	**Setpoint offset reset**	**Controller X-{{...}}**	**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.

194	**Heating/Cooling mode**	**Controller X-{{...}}**	**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

195	**Operation mode**	**Controller X-{{...}}**	**1byte**	**C,W**	**20.102 HVAC mode**
196	**Comfort mode**	**Controller X-{{...}}**	**1bit**	**C,W**	**1.003 enable**
197	**Economy mode**	**Controller X-{{...}}**	**1bit**	**C,W**	**1.003 enable**
198	**Frost/Heat protection mode**	**Controller X-{{...}}**	**1bit**	**C,W**	**1.003 enable**
199	**Standby mode**	**Controller X-{{...}}**	**1bit**	**C,W**	**1.003 enable**

These communication objects are visible when the “operation mode” and “1-bit object function for operation mode” are enabled.They are used to control the RTC operation mode via the bus.

Object 196—— Comfort mode

Object 197—— Standby mode

Object 198—— Economy mode

Object 199—— 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.

200	**Extended comfort mode**	**Controller X-{{...}}**	**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.

201	**Fan automatic operation**	**Controller X-{{...}}**	**1bit**	**C,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

202	**Window contact**	**Controller X-{{...}}**	**1bit**	**C,W,T,U**	**1.019 Window/door**

The communication object is used to receive the switch status of window contact. Telegrams:

1——The window is open

0——The window is close

203	**Presence detector**	**Controller X-{{...}}**	**1bit**	**C,W,T,U**	**1.018 occupancy**

The communication object is used to receive the room occupancy status from presence detector. Telegrams: 1——Occupied 0——Unoccupied					
204	**Actual temperature, status**	**Controller X-{{...}}**	**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.					
205	**Base temperature setpoint, status**	**Controller X-{{...}}**	**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.					
206	**Setpoint offset, status**	**Controller X-{{...}}**	**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.					
207	**Current temperature setpoint, status**	**Controller X-{{...}}**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is used to send current set temperature to the bus.					
208	**Heating/Cooling mode, status**	**Controller X-{{...}}**	**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.					
209	**Operation mode, status**	**Controller X-{{...}}**	**1byte**	**C,R,T**	**20.102 HVAC mode**
210	**Comfort mode, status**	**Controller X-{{...}}**	**1bit**	**C,R,T**	**1.003 enable**
211	**Economy mode, status**	**Controller X-{{...}}**	**1bit**	**C,R,T**	**1.003 enable**

212	**Frost/Heat protection mode, status**	**Controller X-{{...}}**	**1bit**	**C,R,T**	**1.003 enable**
213	**Standby mode, status**	**Controller X-{{...}}**	**1bit**	**C,R,T**	**1.003 enable**

These communication objects are visible when the “operation mode” and “1-bit object function for operation mode” are enabled.They are used to send RTC operation mode status to the bus.

Object 210—— Comfort mode

Object 211—— Economy mode

Object 212—— Protection mode

Object 213—— 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.

Note: no requirement to send mode status to the bus when switchover via bus. The same is fan speed and other operation.

214	**Heating control value Heating/Cooling control value**	**Controller X-{{...}}**	**1bit/1byte**	**C,R,T**	**1.001 switch/5.001 percentage**
215	**Cooling control value**	**Controller X-{{...}}**	**1bit/1byte**	**C,R,T**	**1.001 switch/5.001 percentage**

The communication object is used to send control value of heating or cooling function to the bus. Object datatype is according to parameter setting.

216	**Fan speed**	**Controller X-{{...}}**	**1byte**	**C,T**	**5.001 percentage 5.100 fan stage**
217	**Fan speed low**	**Controller X-{{...}}**	**1bit**	**C,T**	**1.001 switch**
218	**Fan speed medium**	**Controller X-{{...}}**	**1bit**	**C,T**	**1.001 switch**

219	**Fan speed high**	**Controller X-{{...}}**	**1bit**	**C,T**	**1.001 switch**
220	**Fan speed off**	**Controller X-{{...}}**	**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 217——Low fan speed

Object 218——Medium fan speed

Object 219——High fan speed

Object 220——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).

211	**Additional heating control value** **Additional heating/cooling control value**	**Controller X-{{...}}**	**1bit/1byte**	**C,R,T**	**1.001 switch/5.001 percentage**
222	**Additional cooling control value**	**Controller X-{{...}}**	**1bit/1byte**	**C,R,T**	**1.001 switch/5.001 percentage**

These communication object is used to send control value of additional heating or cooling function to the bus.

1bit：telegrams: 1-switch on the valves,0-switch off the valve

1byte: telegrams: 100%-switch on the valves, 0%-switch off the valve

Table 5.2.1 “Room temperature controller(RTC)”communication object

5.3 “Logic” Communication Object

5.3.1 “AND/OR/XOR” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input a			1 bit	C	-	W	T	U	boolean	Low
4	1st Logic-...	Input b			1 bit	C	-	W	T	U	boolean	Low
5	1st Logic-...	Input c			1 bit	C	-	W	T	U	boolean	Low
6	1st Logic-...	Input d			1 bit	C	-	W	T	U	boolean	Low
7	1st Logic-...	Input e			1 bit	C	-	W	T	U	boolean	Low
8	1st Logic-...	Input f			1 bit	C	-	W	T	U	boolean	Low
9	1st Logic-...	Input g			1 bit	C	-	W	T	U	boolean	Low
10	1st Logic-...	Input h			1 bit	C	-	W	T	U	boolean	Low
11	1st Logic-...	Logic result			1 bit	C	-	-	T	-	boolean	Low

Fig.5.3.1 “AND/OR/XOR”communication object

NO.	Name	Object Function	Data Type	Flag	DPT
3/.../10	Input X	1st Logic- {{...}}	1 bit	C,W,T,U	1.002 boolean
The name in parentheses changes with the parameter “Description for logic function”. If description is empty, display “1st Logic- {{...}}” by default. The same below. The communication object is used to receive the value of logical input Input x.					
11	Logic result	1st Logic- {{...}}	1 bit	C,T	1.002 boolean
The communication object is used to send the results of logical operation.					

Table 5.3.1 “AND/OR/XOR”communication object

5.3.2 “Gate forwarding” Communication Object

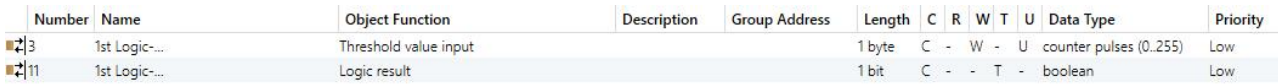
Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Gate value select			1 byte	C	-	W	-	-	scene number	Low
4	1st Logic-...	Input A			1 bit	C	-	W	-	-	switch	Low
5	1st Logic-...	Input B			1 bit	C	-	W	-	-	switch	Low
6	1st Logic-...	Input C			1 bit	C	-	W	-	-	switch	Low
7	1st Logic-...	Input D			1 bit	C	-	W	-	-	switch	Low
8	1st Logic-...	Output A			1 bit	C	-	-	T	-	switch	Low
9	1st Logic-...	Output B			1 bit	C	-	-	T	-	switch	Low
10	1st Logic-...	Output C			1 bit	C	-	-	T	-	switch	Low
11	1st Logic-...	Output D			1 bit	C	-	-	T	-	switch	Low

Fig.5.3.2 “Gate forwarding”communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	**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.					
4/.../7	**Input X**	**1st Logic- {{...}}**	**1bit/4bit/1byte**	**C,W**	**1.001 switch 3.007 dimming 5.010 counter**
The communication object is used to receive the value of the logic gate input Input x.					
8/.../11	**Output X**	**1st Logic- {{...}}**	**1bit/4bit/1byte**	**C,T**	**1.001 switch 3.007 dimming 5.010 counter**
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 5.3.2 “Gate forwarding”communication object

5.3.3 “Threshold comparator” Communication Object



Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Threshold value input			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
11	1st Logic-...	Logic result			1 bit	C	-	-	T	-	boolean	Low

Fig.5.3.3 “Threshold comparator”communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	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.					
11	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 5.3.3 “Threshold comparator”communication object

5.3.4 “Format convert” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	Low
4	1st Logic-...	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	Low
11	1st Logic-...	Output 2bit			2 bit	C	-	-	T	-	switch control	Low

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

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1bit-bit0			1 bit	C	-	W	-	U	boolean	Low
4	1st Logic-...	Input 1bit-bit1			1 bit	C	-	W	-	U	boolean	Low
5	1st Logic-...	Input 1bit-bit2			1 bit	C	-	W	-	U	boolean	Low
6	1st Logic-...	Input 1bit-bit3			1 bit	C	-	W	-	U	boolean	Low
7	1st Logic-...	Input 1bit-bit4			1 bit	C	-	W	-	U	boolean	Low
8	1st Logic-...	Input 1bit-bit5			1 bit	C	-	W	-	U	boolean	Low
9	1st Logic-...	Input 1bit-bit6			1 bit	C	-	W	-	U	boolean	Low
10	1st Logic-...	Input 1bit-bit7			1 bit	C	-	W	-	U	boolean	Low
11	1st Logic-...	Output 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

“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

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
11	1st Logic-...	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

“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.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
4	1st Logic-...	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
11	1st Logic-...	Output 2byte			2 bytes	C	-	-	T	-	pulses	Low

“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)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 2byte-low			2 bytes	C	-	W	-	U	pulses	Low
4	1st Logic-...	Input 2byte-high			2 bytes	C	-	W	-	U	pulses	Low
11	1st Logic-...	Output 4byte			4 bytes	C	-	-	T	-	counter pulses (unsigned)	Low

“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)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1byte			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
4	1st Logic-...	Output 1bit-bit0			1 bit	C	-	-	T	-	boolean	Low
5	1st Logic-...	Output 1bit-bit1			1 bit	C	-	-	T	-	boolean	Low
6	1st Logic-...	Output 1bit-bit2			1 bit	C	-	-	T	-	boolean	Low
7	1st Logic-...	Output 1bit-bit3			1 bit	C	-	-	T	-	boolean	Low
8	1st Logic-...	Output 1bit-bit4			1 bit	C	-	-	T	-	boolean	Low
9	1st Logic-...	Output 1bit-bit5			1 bit	C	-	-	T	-	boolean	Low
10	1st Logic-...	Output 1bit-bit6			1 bit	C	-	-	T	-	boolean	Low
11	1st Logic-...	Output 1bit-bit7			1 bit	C	-	-	T	-	boolean	Low

"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

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 2byte			2 bytes	C	-	W	-	U	pulses	Low
10	1st Logic-...	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
11	1st Logic-...	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

"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)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 4byte			4 bytes	C	-	W	-	U	counter pulses (unsigned)	Low
10	1st Logic-...	Output 2byte-low			2 bytes	C	-	-	T	-	pulses	Low
11	1st Logic-...	Output 2byte-high			2 bytes	C	-	-	T	-	pulses	Low

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

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 3byte			3 bytes	C	-	W	-	U	RGB value 3x(0..255)	Low
9	1st Logic-...	Output 1byte-low			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
10	1st Logic-...	Output 1byte-middle			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
11	1st Logic-...	Output 1byte-high			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

"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)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input 1byte-low			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
4	1st Logic-...	Input 1byte-middle			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
5	1st Logic-...	Input 1byte-high			1 byte	C	-	W	-	U	counter pulses (0..255)	Low
11	1st Logic-...	Output 3byte			3 bytes	C	-	-	T	-	RGB value 3x(0..255)	Low

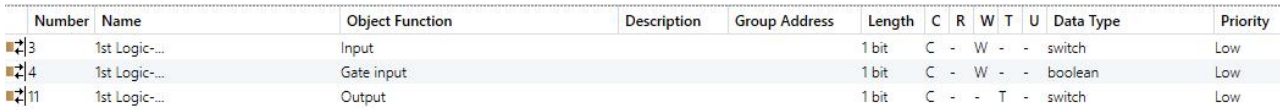
"3x1byte --> 1x3byte"function: converts three 1byte values to a 3byte value, such as Input 1byte-low = 150 ($96), Input 1byte-middle = 100 ($64), Input 1byte-high = 50 ($32)--> Output 3byte = $32 64 96

Fig.5.3.4 "Format convert"communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	Input ...	1st Logic- {{...}}	1bit 1byte 2byte 3byte 4byte	C,W,U	1.002 boolean 5.010 counter pulses 7.001 pulses 12.001 counter pulses 232.600 RGB value 3x(0..255)
The communication object is used to input a value that needs to be converted.					
11	Output ...	1st Logic- {{...}}	1bit 2bit 1byte 2byte 3byte 4byte	C,T	1.002 boolean 2.001 switch control 5.010 counter pulses 7.001 pulses 12.001 counter pulses 232.600 RGB value 3x(0..255)
The communication object is used to output the converted value.					

Table 5.3.4 “Format convert”communication object

5.3.5 “Gate function” Communication Object



Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			1 bit	C	-	W	-	-	switch	Low
4	1st Logic-...	Gate input			1 bit	C	-	W	-	-	boolean	Low
11	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	Low

Fig.5.3.5 “Gate function”communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	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.					
4	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.					
11	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 the value after gate filtering. Only when gate input status is open, output is available, defined by the object “Gate input”.					

Table 5.3.5 “Gate function”communication object

5.3.6 “Delay function” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			1 bit	C	-	W	-	-	switch	Low
11	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	Low

Input/Output - 1bit[On/Off]

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			1 byte	C	-	W	-	-	percentage (0..100%)	Low
11	1st Logic-...	Output			1 byte	C	-	-	T	-	percentage (0..100%)	Low

Input/Output - 1byte[0..100%]

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			1 byte	C	-	W	-	-	counter pulses (0..255)	Low
11	1st Logic-...	Output			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Input/Output - 1byte[0..255]

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			2 bytes	C	-	W	-	-	temperature (°C)	Low
11	1st Logic-...	Output			2 bytes	C	-	-	T	-	temperature (°C)	Low

Input/Output - 2byte[Float]

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Input			2 bytes	C	-	W	-	-	pulses	Low
11	1st Logic-...	Output			2 bytes	C	-	-	T	-	pulses	Low

Input/Output - 2byte[0..65535]

Fig.5.3.6 ”Delay function”communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	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.					
11	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 5.3.6 ”Delay function”communication object

5.3.7 “Staircase lighting” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	1st Logic-...	Trigger value			1 bit	C	-	W	-	-	trigger	Low
4	1st Logic-...	Light-on duration time			2 bytes	C	-	W	-	-	time (s)	Low
11	1st Logic-...	Output			1 bit	C	-	-	T	-	switch	Low

Fig.5.3.7 “Staircase lighting”communication object

NO.	Name	Object Function	Data Type	Flag	DTP
3	**Trigger value**	**1st Logic- {{...}}**	**1bit**	**C,W**	**1.017 trigger**
The communication object is used to receive the value to trigger staircase lighting.					
4	**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.					
11	**Output**	**1st Logic- {{...}}**	**1bit/1byte**	**C,T**	**1.001 switch** **5.010 counter pulses**
The communication object is used to output telegram values when triggered. Telegram value is determined by the parameter setting datatype.					

Table 5.3.7 “Staircase lighting”communication object

5.4 “Scene Group setting” Communication Object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	1bit value			1 bit	C	-	-	T	-	switch	Low

1 bit

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	1byte unsigned value			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

1 byte_1 byte unsigned

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	HVAC mode			1 byte	C	-	-	T	-	HVAC mode	Low

1byte_HVAC mode

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	2byte unsigned value			2 bytes	C	-	-	T	-	pulses	Low

2byte_2byte unsigned value

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	Temperature			2 bytes	C	-	-	T	-	temperature (°C)	Low

2byte_Temperature

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	RGB value			3 bytes	C	-	-	T	-	RGB value 3x(0..255)	Low

RGB value

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
75	Scene Group	Main scene trigger			1 byte	C	-	W	-	-	scene number	Low
76	1 Scene Group-Output 1	RGBW value			6 bytes	C	-	-	T	-	RGBW value 4x(0..100%)	Low

RGBW value

Fig.5.4 “Scene Group setting”communication object

NO.	Name	Object Function	Data Type	Flag	DPT
75	**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					
76	**1bit value** **1byte unsigned value** **HVAC mode** **2byte unsigned value** **Temperature** **RGB value** **RGBW value**	**1st Scene Group-{{Output X}}**	**1bit** **1byte** **2bytes** **3bytes** **6bytes**	**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.					

Table 5.4 “Scene Group setting”communication object

5.5 “UI setting” Communication Object

5.5.1 “Input x” (x=1~8) 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
140	Input 1-...	Close, Switch			1 bit	C	-	W	T	U	switch	低
141	Input 1-...	Open, Switch			1 bit	C	-	W	T	U	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	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
140	Input 1-...	Short, Switch			1 bit	C	-	W	T	U	switch	低
141	Input 1-...	Long, Switch			1 bit	C	-	W	T	U	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Switch

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
140	Input 1-...	Short, Switch			1 bit	C	-	W	T	U	switch	低
141	Input 1-...	Long, Dimming			4 bit	C	-	W	T	-	dimming cont...	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Dimming

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
140	Input 1-...	Close, 1bit value			1 bit	C	-	-	T	-	switch	低
141	Input 1-...	Open, 1bit value			1 bit	C	-	-	T	-	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	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
140	Input 1-...	Short, 1bit value			1 bit	C	-	-	T	-	switch	低
141	Input 1-...	Long, 1bit value			1 bit	C	-	-	T	-	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Value output

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
140	Input 1-...	Scene			1 byte	C	-	-	T	-	scene control	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	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
140	Input 1-...	Close, Scene			1 byte	C	-	-	T	-	scene control	低
141	Input 1-...	Open, Scene			1 byte	C	-	-	T	-	scene control	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	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
140	Input 1-...	Short, Scene			1 byte	C	-	-	T	-	scene control	低
141	Input 1-...	Long, Scene			1 byte	C	-	-	T	-	scene control	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Scene control

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
140	Input 1-...	Up/Down, Blind			1 bit	C	-	W	T	-	up/down	低
141	Input 1-...	Stop/Adjust, Blind			1 bit	C	-	W	T	-	step	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Blind

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
140	Input 1-...	Register value			1 byte	C	-	W	T	-	HVAC mode	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Shift register

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
140	Input 1-...	Object1-On/Off			1 bit	C	-	W	T	-	switch	低
141	Input 1-...	Object2-Up/Down			1 bit	C	-	W	T	-	up/down	低
142	Input 1-...	Object3-SceneControl			1 byte	C	-	-	T	-	scene control	低
143	Input 1-...	Object4-SceneControl			1 byte	C	-	-	T	-	scene control	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Multiple operation

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
140	Input 1-...	RGB dimming value			3 bytes	C	-	-	T	-	RGB value 3x(0..255)	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

RGB_1x3byte

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
140	Input 1-...	Red dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
141	Input 1-...	Green dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
142	Input 1-...	Blue dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

RGB_3x1byte

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
140	Input 1-...	RGBW dimming value			6 bytes	C	-	-	T	-	RGBW value 4x(0..100%)	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

RGBW_1x6byte

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
140	Input 1-...	Red dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
141	Input 1-...	Green dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
142	Input 1-...	Blue dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
143	Input 1-...	White dimming value			1 byte	C	-	-	T	-	counter pulses (0..255)	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

RGBW_4x1byte

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
140	Input 1-...	Close, Delay mode			1 bit	C	-	-	T	-	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	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
140	Input 1-...	Short, Delay mode			1 bit	C	-	-	T	-	switch	低
141	Input 1-...	Long, Delay mode			1 bit	C	-	-	T	-	switch	低
144	Input 1-...	Disable			1 bit	C	-	W	-	-	enable	低

Delay mode

Fig.5.5.1 “Input x”(x=1 · 8)communication object

编号	功能	名称	类型	属性	DPT
140	**Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
140	**Close, Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
140	**Short, Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
141	**Open, Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
141	**Long, Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
These communication objects are used to trigger a switching operation. Use a common object or two separate objects is according to the parameter setting when close/open and long/short operation. Only the object "Switch" is visible when use a common object. If use two separate objects, "Close/Open" is visible when there is no distinction for short/long operation; "Short/Long" is visible when there is distinction for short/long operation. Telegrams: 0 — Off 1 — On After the bus recovery or programming, the default value is “0”. The name in parentheses changes with the parameter "Description (max 30char.)". If description is empty, display "Input x - ..." by default. The same below.					
140	**Short, Switch**	**Input X-{{...}}**	**1bit**	**C,W, T,U**	**1.001 DPT_Switch**
141	**Long, Dimming**	**Input X-{{...}}**	**4bit**	**C,W,T**	**3.007 DPT_Dimming control**
These two communication objects are used to switch/dimming operation, with distinction for long/short operation.					

Obj.140：Used to trigger switch operation. Telegrams:

0——OFF

1——ON

After the bus recovery or programming, the default value is “0”.

Obj.141：Used to trigger a relative dimming operation.

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

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

140	**Close, 1bit/.../4byte value**	**Input X-{{...}}**	**1bit**	**C,T**	**1.001 DPT_Switch**
140	**Short, 1bit/.../4byte value**	**Input X-{{...}}**	**2bit**	**C,T**	**2.001 DPT_Switch control**
191	**Open, 1bit/.../4byte value**	**Input X-{{...}}**	**4bit**	**C,T**	**3.007 DPT_Dimming control**
191	**Long, 1bit/.../4byte value**	**Input X-{{...}}**	**1byte** **2byte** **4byte**	**C,T**	**5.010 DPT_counter pulses** **7.001 DPT_pulses**

These two communication objects are used for sending a fixed value to the bus, "Close/Open" is visible when there is no distinction for short/long operation; "Short/Long" is visible when there is distinction for short/long operation. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.

140	**Scene**	**Input X-{{...}}**	**1byte**	**C,T**	**18.001 DPT_SceneControl**
140	**Close, Scene**	**Input X-{{...}}**	**1byte**	**C,T**	**18.001 DPT_SceneControl**
140	**Short, Scene**	**Input X-{{...}}**	**1byte**	**C,T**	**18.001 DPT_SceneControl**

141	**Open, Scene**	**Input X-{{...}}**	**1byte**	**C,T**	**18.001 DPT_SceneControl**
141	**Long, Scene**	**Input X-{{...}}**	**1byte**	**C,T**	**18.001 DPT_SceneControl**

These communication objects are used to send a 8 bit command to recall or storage scene. Use a common object or two separate objects is according to the parameter setting when Close/Open and long/short operation.

Only the object "Scene" is visible when use a common object. If use two separate objects, "Close/Open" is visible when there is no distinction for short/long operation; "Short/Long" is visible when there is distinction for short/long operation.

Detailed 8bit the meaning of the directive.

Set up a 8bit Orders for the (Binary code): FXNNNNNN

F: '0' recall scene; '1' for storage scene;

X : 0 ;

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

As follows:

Object message value	Description
0	Recall scene 1
1	Recall scene 2
2	Recall scene 3
…	…
63	Recall scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
…	…
191	Store scene 64

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

140	**Up/Down, Blind**	**Input X-{{...}}**	**1bit**	**C,W,T**	**1.008 DPT_up/down**
141	**Stop/Adjust, Blind**	**Input X-{{...}}**	**1bit**	**C,W,T**	**1.007 DPT_Step**

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

Obj.140: Used for sending the telegram to the bus, to control blind up/down. Telegrams:

1——Move down

0——Move up

After the bus recovery or programming, the default value is “0”.

Obj.141: Used for sending the telegram to the bus, to stop curtain movement. Telegrams:

1——Stop blind move down

0——Stop blind move up

After the bus recovery or programming, the default value is “0”.

140	**Register value**	**Input X-{{...}}**	**1byte**	**C,W,T**	**5.010 counter pulses** **17.001 scene number** **20.102 HVAC mode**

The communication object is used to send the value of shift register. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.

140/ 141/ 142/ 143/	**Object x-On/Off**	**Input X-{{...}}**	**1bit**	**C,W,T**	**1.001 DPT_Switch**
	Object x-Up/Down		**1bit**	**C,W,T**	**1.008 DPT_up/down**
	Object x-SceneControl		**1byte**	**C,T**	**18.001 DPT_SceneControl**
	Object x-Percentage		**1byte**	**C,T**	**5.001 DPT_Scaling**
	Object x-Unsigned value		**1byte**	**C,T**	**5.010 DPT_counter pulses**

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

After the bus recovery or programming, the default value for “On/Off” and “Up/Down” is “0”.

140	**RGB dimming value**	**Input X-{{...}}**	**3byte**	**C,T**	**232.600 RGB value 3x(0..255)**

This communication objects is visible when 1x3byte for the RGB object type is selected.Apply to

control brightness of colorful lamp, used for sending brightness value of RGB lamp to the bus.

3-byte Code for RGB Dimming Object Data Type: U8 U8 U8, as follows:

3_{MSB}	2	1_{LSB}
R	G	B
UUUUUUUU	UUUUUUUU	UUUUUUUU

R: red dimming value; G: green dimming value; B: blue dimming value.

140	**RGBW dimming value**	**Input X-{{...}}**	**6byte**	**C,T**	**251.600 DPT_Colour_RGBW**

These two communication objects are visible when 1x6byte for the RGBW object type is selected. Apply to control brightness of colorful lamp, used for sending brightness value of RGBW lamp to the bus.

Encoding of the data type of the 6-byte RGBW dimming object: U8 U8 U8 U8 R8 R4 B4, as follows:

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

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

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

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

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

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

140	**Red dimming value**	**Input X-{{...}}**	**1byte**	**C,T**	**5.010 counter pulses**
141	**Green dimming value**	**Input X-{{...}}**	**1byte**	**C,T**	**5.010 counter pulses**
142	**Blue dimming value**	**Input X-{{...}}**	**1byte**	**C,T**	**5.010 counter pulses**

These three communication objects are visible when 3x1byte for the RGB object type or 4x1byte for the RGBW object type is selected. Apply to control brightness of lamp. Telegrams: 0...100%

Obj.140：Used for sending brightness value of the control R (red) channel to the bus. Obj.141：Used for sending brightness value of the control G (green) channel to the bus. Obj.142：Used for sending brightness value of the control B (blue) channel to the bus.					
143	**White dimming value**	**Input X-{{...}}**	**1byte**	**C,T**	**5.010 counter pulses**
This communication objects are visible when 4x1byte for the RGBW object type is selected. Apply to control brightness of lamp, used for sending brightness value of the control W (white) channel to the bus. Telegrams: 0...100%					
140	**Close, Delay mode**	**Input X-{{...}}**	**1bit**	**C,T**	**1.001 DPT_Switch**
140	**Short, Delay mode**	**Input X-{{...}}**	**4bit**	**C,T**	**3.007 DPT_Dimming control**
141	**Long, Delay mode**	**Input X-{{...}}**	**1byte**	**C,T**	**5.010 DPT_counter pulses**
These two communication objects are used to send the value of delay mode to the bus, "Close" is visible when there is no distinction for short/long operation; "Short/Long" is visible when there is distinction for short/long operation. Range of values that can be sent are determined by the datatype, and the datatype is determined by the parameter setting.					
144	**Disable**	**Input X-{{...}}**	**1bit**	**C,W**	**1.003 DPT_enable**
The communication object is used to disable/enable the function of contact input, the telegram value is decided by the parameter.					

Table 5.5.1 “Input x”(x=1~8)communication object

5.5.2 “LED x”（x=5~8） 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
180	LED 5-...	Status			1 bit	C	-	W	T	U	switch	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
180	LED 5-...	Status			1 byte	C	-	W	T	U	counter pulses (0..255)	低

Fig.5.5.2 “LED x”(x=5~8)communication object

编号	对象功能	名称	类型	属性	DPT
180...183	**Status**	**LED X-{{...}}**	**1bit** **1byte**	**C,W,T,U**	**1.001 DPT_Switch** **5.010 DPT_counter pulses**
The communication object is used to receive the telegrams of 1bit/1byte, LED indicates according to the telegrams and parameter setting. The name in parentheses changes with the parameter "Description (max 30char.)". If description is empty, display "LED X-..." by default.					

Table 5.5.2 “LED x”communication object

5.6 “NTC input x”（x=1/2） 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
184	NTC input 1 - Temperature probe	Actual temperature, Sensor			2 bytes	C	R	-	T	-	temperature (°C)	低
185	NTC input 1 - Temperature probe	Temperature error report, Sensor			1 bit	C	R	-	T	-	alarm	低

Fig.5.6 “NTC input x”(x=1/2)communication object

编号	对象功能	名称	类型	属性	DPT
184	**Actual temperature, Sensor**	**NTC input X - {{Temperature probe}}**	**2byte**	**C,R,T**	**9.001 temperature**
The communication object is used for transmitting the temperature value detected by the external temperature sensor of the device to the bus. Range:-50~99.8℃ The name in parentheses changes with the parameter “Description (max 30 char.)”. If description is empty, display “Input x - ...” by default. The same below.					
185	**Temperature error report, Sensor**	**NTC input X - {{Temperature probe}}**	**1bit**	**C,R,T**	**1.005 alarm**
The communication object is used to send the error report of the external temperature sensor, and the object value is defined according to the parameters.					

Table 5.6 “NTC input x”(x=1/2)communication object