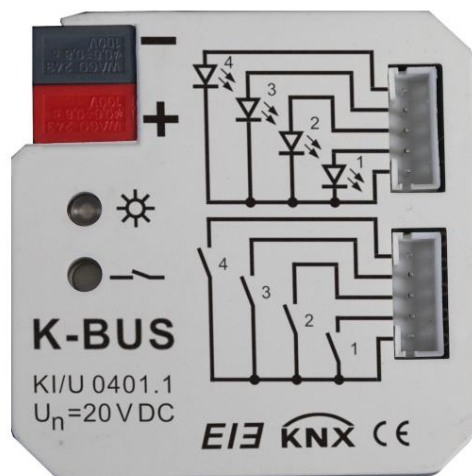# User Manual

K-BUS® Universal Interfaces, 4 fold_V1.1
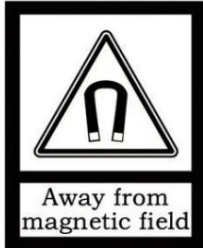
KI/U 0401.1

KNX/EIB Home and Building Control System

Attentions

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

Away from magnetic field	Away from high-temp	Prevent moisture

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

Handle with care

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

Wipe with care

4. Do not disassemble the devices.

Contents

Chapter 1 General

The Universal Interfaces can install to be system with KNX bus and other device, which are mainly use in building control system. The functions are both simple to operate and intuitive, users can program it according to the requirement to implement the function systematically.

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

1.1. Product and functional overview

The Universal Interfaces achieve the functional applications via conventional push buttons/switches, communicate by technical binary, which are used to control the devices such as the Dimmer Actuator/the Switch Actuator, to control domestic appliance indirectly. At the same time, they also enable the control of LEDs. The extremely compact design enables the device to be inserted in a conventional 80mm or 86mm wiring box.

The Universal Interfaces connect to the bus though the KNX connection terminals and have no use for additional supply voltage. It is available to assign the physical address and set the parameters by Engineering design tools ETS with VD4 (higher than edition ETS3).

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

> ÿ **Switching and dimming function.**
>
> ÿ **Control of blinds and shutters.**
>
> ÿ **Sending of values eg temperature** valuesÿwater **line.**
>
> ÿ **Recalling and storing of scenes.**
>
> ÿ **Trigger an LED for reporting an operation.**
>
> ÿ **Operation of various loads by multiple push button actions.**
>
> ÿ **Operation of several loads in a fixed switching sequence.**
>
> ÿ **Standard counting and differential counting.**

Each channel of a device can adopt any of the functions described above.

Chapter 2 Technical data

Power supply Operation voltage		21~30V DC, via the KNX bus
Input/output 4 fold inputs		Can be individually configured per input
	4 fold LED	Can be individually configured per LED
	input scanning voltage	20V DC
	input current	0.5mA
	LED output voltage	5V DC
	LED output current	max.2.5mA, limited via series resistor of 2Kÿ
	Safety	Short-circuit-proof, overload protection, reverse voltage protection
Operating and display	Programming LED and button For assignment of the physical address	
	Green LED flashing	Indicate the application layer running normally
Connections Input/output		2*5-pin cables, approx. 30 cm long, can be extended to max. 10 m
	KNX	via bus connecting terminal
Temperature Operation		-5°C…45°C
	storage	-25°C…55°C
	Transport	-25°C…70°C
CE mark	In accordance with the EMC guideline and the low voltage guideline	
Approvals	EIB/KNX certificate	
Installation	Standard 80mm or 86mm wall box	
Size	46mm×46mm×11.7mm	
Weight	0.05 kg	

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Chapter 3 Dimension and Connection diagram

3.1. Dimension diagram
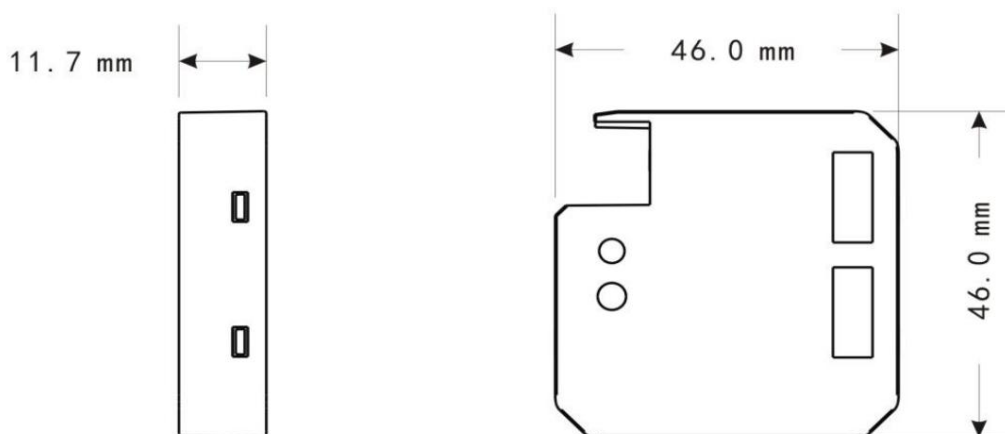
3.2. connection diagram
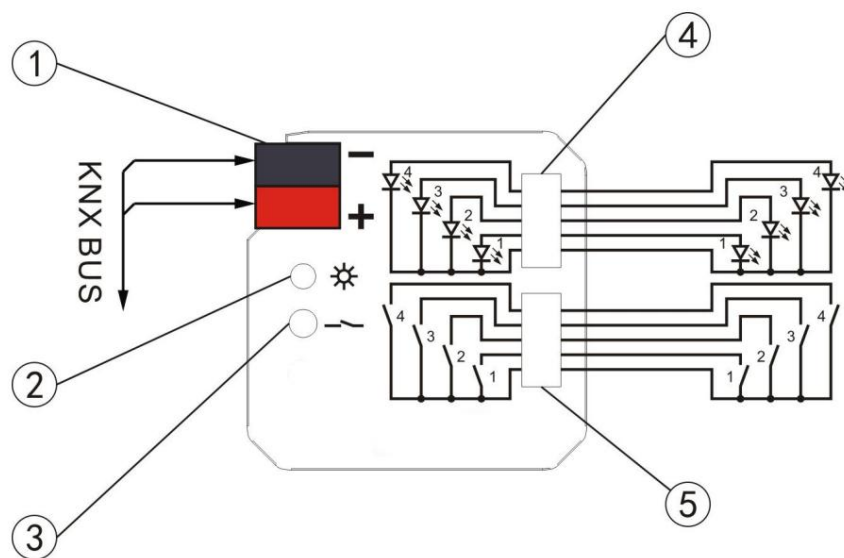
1 KNX bus connection terminal

2 Programming LED

3 Programming button

4 terminal LEDs

5 KEY terminal

Chapter 4 Project design and programming

4.1. Overview of the functions

application program	Number of communication objects	Max. number of group address	Max. number of associations
Universal Interfaces, 4 fold	40	80	80

The following functions can be set separately for each input:

Switch sensor: For switching the lighting or scanning a floating contact; Distinction between short/long operation and cyclical sending of the contact state are possible.

Switch/dimming sensor: For switching/dimming the lighting; There are start/stop dimming and stepwise dimming, as well as dimming via a single push button are possible.

Value/Forced operation: For sending the valued of different data types(eg temperature values). it it is possible to send different values or data types for short/long operation, possible to activate/deactivate the forced operation of actuators.

Control scene: For recalling and storing the states of several actuator groups. The actuator groups can either be controlled via max. 5 individual objects or via an 8 bit scene object.
Switching sequence: For the operation of several actuator groups in a preselected sequence, eg the latching relay.

Counter: For counting input pulses. Various data types of the counter can be set. It is able to set the counting rate, whether to send the current counting values cyclically and the differential counter when enables an additional counter. The differential counter can be reset and run out in report, thereby, it is convenient to count the daily consumption.

Push button with multiple operations: For triggering various functions depending on the frequency of the operation. A long operation can also be detected and a function can be triggered.

Shutter sensor: For movement and adjustment of a shutter or blind. Eight present operation modes are possible in total.

Control LED: For controlling a light-emitting diode, switching and flashing. As the switch, it is with time limit that turns off automatically after a preset time; as the flash, it is able to set the flashing rates.

Chapter 5 Parameter setting description in the ETS

Parameters and objects in the device application are outlined in this section. Parameters and objects which are assigned to each channel, are equivalent and described in the following sections using output A as an example.

5.1. Description of setting parameter in part of device channel

5.1.1. Parameter window "General Setting"

Parameters for the functions which affect the complete device can be set via the Fig.1.

Fig.1 parameter window "General Setting"

Parameter "Limit number of Tele."

It is use to limit the number of sending telegrams to decrease the burthen of bus. It is possible to set how many telegrams can be sent within an adjustment period.Options:

yes

At the

Parameter "Period"

It is able to set the limit time of sending telegrams.Options:

100ms

500ms

1s

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......

1min

10min

It is able to set the Max. number of sending telegrams within a setting period.Options: **1~255**

5.1.2. Parameter window "Switch X"

Parameter window "Switch X" can be shown in Fig.2 and Fig.4. Fig.2 do not distinguish between long and short operation while Fig.4 opposite.

Fig.2 Parameter window "Switch X"(do not distinguish between long and short operation)

Parameter "function of the channel"

The parameter determines the function option in the channel; the current option is "switch". If "No function" is selected, it means the channel is disabled.Options:

No function

switch

Switch/Dimming

Value/Forced output

scene control

> **switching sequence**
>
> **Counter**
>
> **Multiple operations**
>
> **Shutter Control**

Parameter "Distinction between long and short operation"

This parameter sets whether the input distinguishes between a short and long operation. If "yes" is selected, there is a waiting period after the opening/closing of the contact to determine whether the operation is long or short. Only then is a possible reaction triggered. The following drawing clarifies the function:
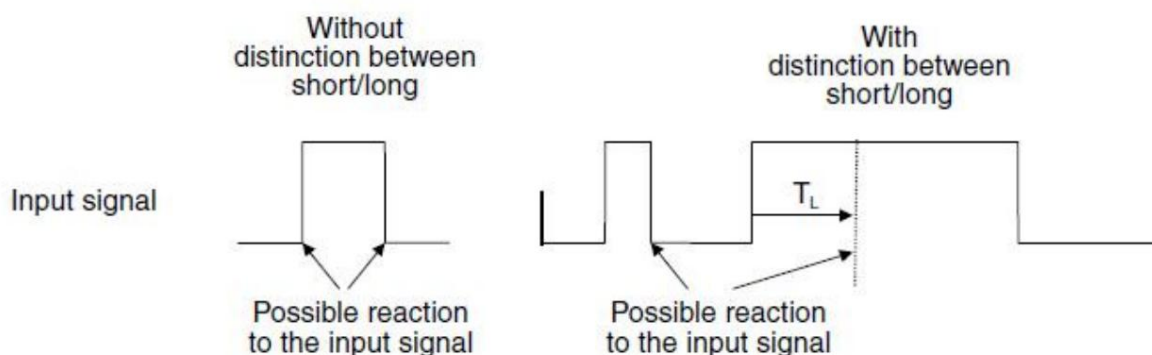
Options:

     At the

     yes

Note: The long operation in the below chapters are the same as here.

Parameter "Cyclic send Tele. 'Tele. Switch'"

This parameter is visible if there is no distinction between a short and long operation. It is able to set whether to send the current value of object "Tele. Switch, X" cyclically on the bus.Options:

     At the

     Always

     if switch off

     If switch on

If the parameter value "always" is selected, the object sends cyclically on the bus, regardless of its value is 0 or 1. If the parameter value "if switch off" or "if switch on" is set, only the corresponding object value is sent cyclically.

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Parameter "Reaction on closing the contact (rising edge)"

Parameter "Reaction on opening the contact (fall edge)"

This parameter is visible if there is no distinction between a short and long operation. It can be set the operation to open and close the contact.Options:

No action

Off

On

toggle

stop cyclic transmission

If the parameter "Toggle" is selected, negate the operation, that means negate the current value. For example, if "On" is selected, when negate it will carry out "Off" operation. If the parameter "Stop cyclic transmission" is selected, it will stop the cyclical sending telegram till there is a new object value to be sit. If the parameter "No action" is selected, it will not implement any operation.

Parameter "Interval of Tele. Cyclic send: Base×Factor"

This parameter is used to set the interval time between two telegrams that are sent cyclically, it is visible if cyclical sending has been set. Transmission cycle time =Base× Factor.

Base options:
1s

10s

…

1h

Factor options:
1…255

Parameter "Send object value after voltage recovery (if yes not equal toggle)"

It can be set whether to send the value of the object "Tele. Switch, X" on the bus after voltage recovery, this parameter is visible if there is no distinction between a short and long operation.Options:

At the

yes

If the parameter "Yes" is selected, it will send the current value of the object "Tele. Switch, X" on the bus. Only when the value "Toggle" has not been set in either of the two parameters "Reaction on opening/closing the contact", the value of the object "Tele. Switch, X" can be sent on the bus. If one of the two parameters have the value "TOGGLE", no values are sent in general on the bus after bus voltage recovery. If "No reaction" or "Stop cyclic transmission" is selected, there is no values are sent on the bus either.

Parameter "LED function set"

This parameter set the LED direction to indicate the status according to the object "Tele. Switch, X". There are A, B, C, D 4 LEDs to choose, each LED has 2 options. If the parameter "LED X accord to switch value" is selected, LED indicate status is the same with the current value of the object "Tele. Switch, X"; if the parameter "LED X toggle by switch value" is selected, LED indicate status is negate to the current value of the object "Tele. Switch, X". Options:

No action

LED A accord to switch value

LED A toggle by switch value

……

LED D accord to switch value

LED D toggle by switch value

Note: If the four channels invoke the same option, the priority of channel A is the highest, it will indicate the status according to the value of the object "Tele. Switch, X" in channel A. Then the priority of channel B is higher, then it's C, the last is D. The priority of LED X in function channel in the device is higher than the LED X channel, the LED X can not be implemented any operation in channel LED X which is used in the function channel in the device. If the parameter "LED function" is set "LED A accord to switch value" or "LED A toggle by switch value" options, the operation had been set in LED A can not be carried out.

Parameter "Debounce time"

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

Min. operation

The "minimum operation" time can only be set when there is no distinction between a short and a long operation. This parameter is different from others, the effective time of the contact operation is not only means the effective time when contact close, but also the contact open. The parameter window can be shown in Fig. 3:

![GVS logo] K-BUS® KNX/EIB Universal Interfaces

Fig. 3 Parameter window "X-Mini Time"

Parameter "Minimum operation time: Base × Factor"

The effective time of the contact operation is: Base × Factor

Base options: **100ms**

                     …..

                     1min

Factor options: **1~255**

Note: The parameter window and the explanation of parameter "Min. operation" in the

"Debounce time" in the below chapters are the same as here.

Fig. 4 Parameter window "Switch X" (distinguish between a short and long operation)

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Parameter "Connect contact type"

This parameter is visible when there is a distinction between a short and long operation, it is used to defines whether the contact is a normally open contact or a normally close contact in general. Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example; the normally close is just opposite.

Parameter "Reaction on short operation" or "Reaction on long operation"

This parameter is visible when there is a distinction between a short and long operation. It is able to set the operation when preset a short and long operation. When the button operation is confirm to a short or a long operation, the object value will be updated immediately.Options:

No action

Off

On

toggle

Parameter "Long operation after: Base× Factor"

This parameter is visible if there is a distinction between a short and long operation. The period TL is defined here, after which an operation is interpreted as "long". TL = Base × Factor

Base options:　　　**100s**

1s......

1h

Factor options:　　**2~255**

Parameter "Number of objects for short/long object operation"
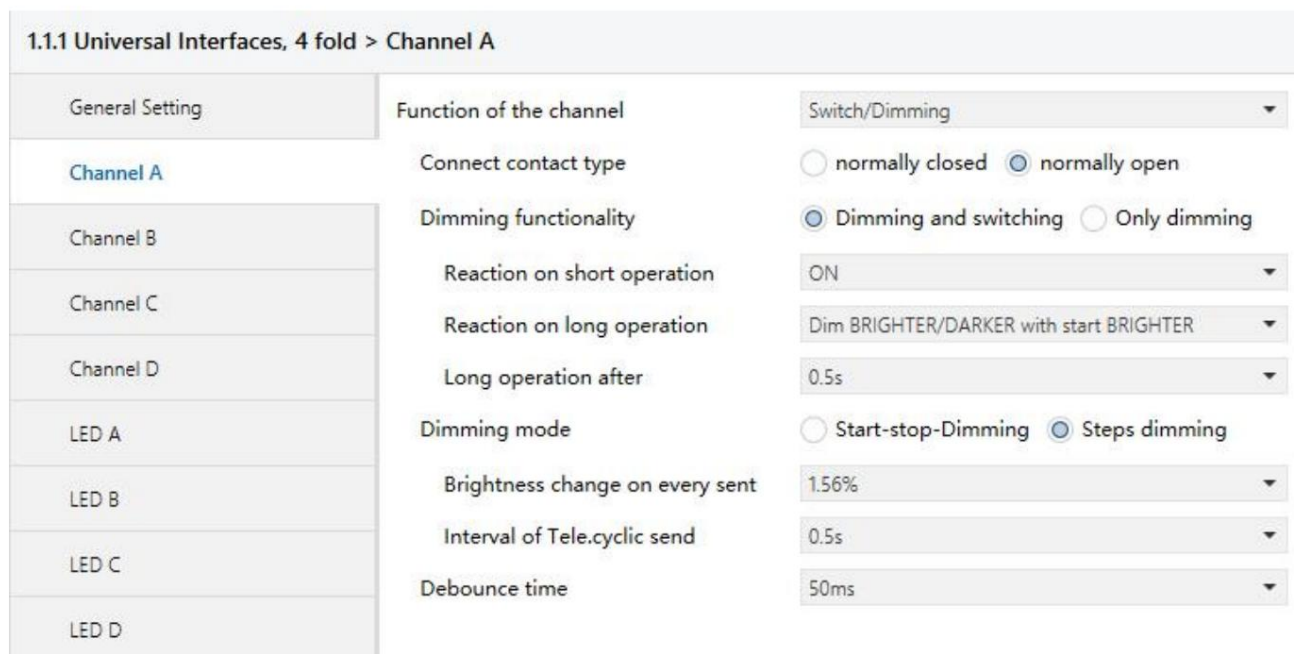
This parameter is visible if there is a distinction between a short and long operation. It is able to set one or two communication objects, when one communication object is set, long and short operation share one communication object; when two communication objects are set, long and short operation use one communication object separately.Options:

1 item

2 objects

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5.1.3. Parameter window "Switch/dimming, X"

Parameter window "Switch/dimming, X" will be shown in Fig. 5, it is visible when Function of the channel "Switch/Dimming" is selected. The function enables the operation of dimmable lighting. 1 button operation is also possible.

Fig. 5 Parameter window "Switch/Dimming"

Parameter "Connect contact type"

This parameter defines whether the contact at the input is a normally open contact or a normally closed contact.Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example, the normally close is just opposite.

Parameter "Dimming functionality"

This parameter determines whether the lighting is only dimmed or whether it should also be switched.Options:

Dimming and switching

only dimming

If the parameter "Only dimming" is selected, there is no distinction between a short and long operation. The dimming command is therefore carried out immediately after the push button action; there is no delay to determine whether the operation is long or short. If the parameter "Dimming and switching"

is selected, the push button action need to delay to determine whether the operation is long or short. in

in this case, the lighting is dimmed via a long operation and switched via a short operation.

Parameter "Reaction on short operation"

This parameter is visible if the value "Dimming and switching" has been set in the parameter

"Dimming functionality". It is able to set the operation after triggered the object "Switch, X", that's a short

operation.Options:

> **No action**
>
> **Off**
>
> **On**
>
> **toggle**

Parameter "Reaction on long operation"

This parameter is visible if the value "Dimming and switching" has been set in the parameter

"Dimming functionality". It is able to set a dim brighter or a dim darker after a long operation.Options:

> **dimming brighter**
>
> **dimming darker**
>
> **Dim brighter/darker with start brighter**
>
> **Dim brighter/darker with start darker**

The parameter "Dim brighter/darker with start darker" is selected, it can be dim brighter or dim

darker after a long operation, it is just dim darker first and the latter operation negate.

Note: The long and short operation is individual; they are not operation on one object.

Parameter "Long operation after"

This parameter is visible if the value "Dimming and switching" has been set in the parameter

"Dimming functionality". The period TL is defined here, after which an operation is interpreted as

"long". Options:

> **0.3s**
>
> **0.5s**
>
> **……**
>
> **10s**

Parameter "Reaction on operation"

This parameter is visible if the value "Only dimming" has been set in the parameter "Dimming

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functionality". There is no distinction between a short and long operation. The operation and the option of

the parameter "Reaction on long operation" are the same. It is able to set a dim brighter or a dim darker

after a long operation.Options:

> **dimming brighter**
>
> **dimming darker**
>
> **Dim brighter/darker with start brighter**
>
> **Dim brighter/darker with start darker**

Parameter "Dimming mode"

This parameter defines the dimming mode is start-stop dimming or steps dimming.Options:

> **Start-stop dimming**
>
> **steps dimming**

If "Start-stop dimming" is selected, the dimming mode is start-stop dimming; it begins the dimming

process with a dim darker or brighter telegram and ends the dimming process with a stop telegram.

Cyclical sending of the dimming telegram is not required in this case.

If "Step dimming" is selected, the dimming mode is step dimming, the telegram dimming is sent cyclically during a long

operation. Once the operation has finished, a stop telegram ends the dimming process.

Parameter "Brightness change on every sent"

This parameter is only visible for "Dimming steps". It can be set, which change in brightness

(percentage value) causes a dimming telegram to be sent cyclically.Options:

> **100%**
>
> **50%**
>
> **……**
>
> **1.56%**

Parameter "Interval of Tele. Cyclic send"

This parameter is only visible for "Dimming steps". It is able to set the interval of telegram cyclic

sending after a long operation.Options:

> **0.3s**
>
> **0.5s**
>
> **……**
>
> **10s**

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It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, that means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

Min. operation

A minimum operation time can only be set if the value"Only dimming" has been set in the parameter "Dimming functionality". The parameter window will be shown in Fig. 3.

5.1.4. Parameter window "Value/force output, X"

Parameter window "Value/force output , X" will be shown in Fig. 6 and Fig. 7, in Fig. 6 there is a distinction between a short and long operation while in Fig.7 is just opposite.

1.1.1 Universal Interfaces, 4 fold > Channel A		
General Setting	Function of the channel	Value/Forced output ▼
Channel A	Connect contact type	○ normally closed ● normally open
Channel B	Distinction between long and short operation	○ No ● Yes
Channel C	Reaction on short operation	1byte value[0..255] ▼
	Output value[0.255]	127
Channel D	Reaction on long operation	1byte value[0..255] ▼
LED A	Output value[0.255]	127
LED B	Long operation after: base	1s ▼
LED C	Factor[2..255]	2
LED D	Debounce time	50ms ▼

Fig. 6 Parameter window "Value/force output, X" (distinguishing with a short and long operation)

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Fig. 7 Parameter window "Value/force output, X" (do not distinguish with a short and long operation)

Parameter "Connect contact type"

This parameter defines whether the contact at the input is a normally open contact or a normally closed contact.Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example; the normally close is just opposite.

Parameter "Distinction between long and short operation"

This parameter sets whether the input distinguishes between a short and long operation. If "yes" is selected, there is a waiting period after the opening/closing of the contact to determine whether the operation is long or short.Options:

At the

yes

Parameter "Reaction on operation"

This parameter is visible if there is no distinction between a short and a long operation. It defines the data type that is sent when the contact is pressed.Options:

no reaction

1 bit value [0, 1]

......

4 byte value [0…4294967295]

![GVS logo] K-BUS® KNX/EIB Universal Interfaces

Parameter "Reaction on short operation"/ "Reaction on long operation"

This parameter is visible if there is no distinction between a short and long operation. It defines the data type that is sent after a short or long operation.Options:

1 bit value [0, 1]

……

4 byte value [0…4294967295]

Parameter "Output value […]"

This parameter defines the value which is sent on operation. The value range is dependent on the selected data type. Two values can be set here when there is a distinction between a short and long operation.

Parameter "Long operation after: Basex Factor [0…255]

This parameter is visible if there is a distinction between a short and long operation. The period TL is defined here, after which an operation is interpreted as "long". TL = Base x Factor.

Base options: **100s**

1s…..

1h

Factor options: **2~255**

Parameter "Send object value after voltage recovery"

This parameter defines whether to send object value of "Tele. Value, X" on the bus after the voltage recovery. This parameter is visible if there is no distinction between a short and long operation. If "yes" is selected, the device sends the object "Tele. Value, X" on the bus after bus voltage recovery.Options:

At the

yes

Parameter "Debounce time"

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

10ms

20ms

……
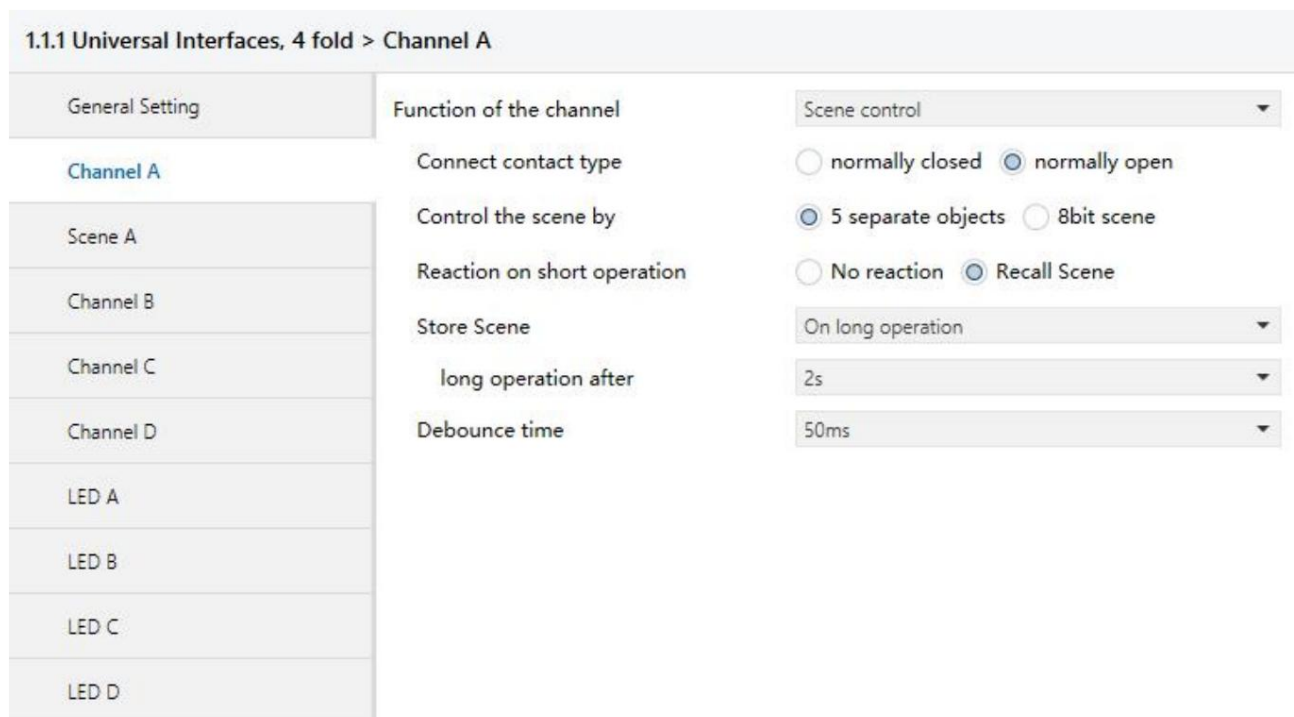
150ms

Min. operation

A minimum operation time can only be set if there is no distinction between a short and long operation. The parameter window will be shown in Fig. 3.

5.1.5. Parameter window "Scene control, X"
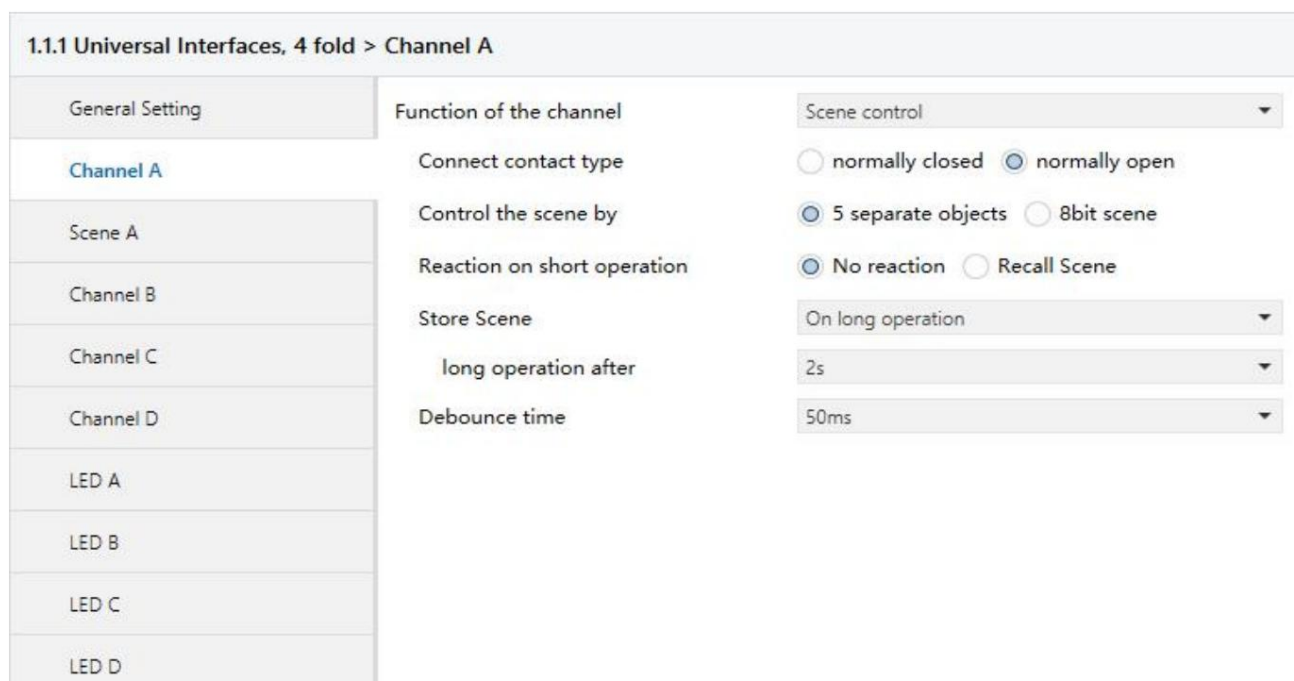
Parameter window "Scene control, X" will be shown in Fig. 8, it will be visible when the function channel "Scene control" is selected. This function enables the states of several actuator groups to be recalled and stored.

Fig. 8 Parameter window "Scene control, X"

Fig. 9 Parameter window "8 bit scene"

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Parameter "Connect contact type"

This parameter defines whether the contact at the input is a normally open contact or a normally closed contact.Options:

         normally closed

         normally open

The parameter introduced in this chapter is use "Normally open" as the example, the normally close is just opposite.

Parameter "Control the scene by"

It is possible to select whether the scene control is carried out via "5 separate objects" or whether values that are stored in the actuators are recalled and saved via an "8 bit scene".Options:

         5 separate objects

         8 bit scene

If the parameter "5separate objects" is selected, it will activate the control of the groups of the actuator, these 5 objects' parameter window will be shown in Fig. 10; If the parameter "8 bit scene" is selected, it can control the scene such as the scene function in dimming actuatorÿswitch actuator, the parameter window will be shown in Fig. 9.

Parameter "No. of scene [0...63]

This parameter will be visible when the scene control is "8 bit scene", it can be set the No. of scene. The No. range is 0~63.

Parameter "Reaction on short operation"

This parameter defines whether a short operation of the input causes a light scene to be recalled or no reaction takes place.Options:

         no reaction

         recall scene

Parameter "Store scene"

This parameter defines how the saving of the current scene.Options:

         At the

         On long operation

         With object value= '1'

         On long operation and object value= '1'

Different type of scene control makes the saving of the current scene different. The following table provides an overview:

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Control the scene via "5 separate objects":

parameter value	behavior
On long operation	As soon as a long operation is detected, the object "Store scene, X" sends the value "1" on the bus and the object "Output 1bit/8bit, group A…E" send read out telegram. The objects "Output 1bit/8bit, group A…E" can be modified via the bus for the duration of the long operation. Once the long operation has finished, the object"Store scene, X" sends the value "0" on the bus and the current object values can't be modified On the long operation, If the object "Store scene, X" receives the value "0" on the bus, even the long operation has not finished ,the current object value also can't be modified
If object value= '1'	If the object "Store scene, X" receives the value "1", the object values "Output 1bit/8bit, group A…E" are read out via the bus. While the object value is "1", the objects "Output 1bit/8bit, group A…E" can be modified via the bus. On receipt of the object value "0", the current object values can't be modified
On long operation and object value= '1'	If the object "Store scene, X" receives the value "1" on the bus, on the next long operation, the object "Output 1bit/8bit, group A…E" reads out the telegram. The objects "Output 1bit/8bit, group A…E" can be modified via the bus for the duration of the long operation. After the end of the long operation, the object values can't be modified the object "store scene, X" will send value '0' On the long operation, If the object "Store scene, X" receives the value "0" on the bus, even the long operation has not finished ,the current object value also can't be modified Provided that a "1" has not been received at the object "Store scene, X", a long operation is interpreted in the same way as a short operation.

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Control the scene via "8 bit scene":

parameter value	behavior
On long operation	After a long operation, the object "8 bit scene" sends a save command on the bus and thereby triggers the storing of the current scene in the actuators eg dimming actuator, switch actuator.
If object value= '1'	If the object "Store scene, X" receives the value "1", the object "8 bit scene" sends a save command on the bus and save the current scene.
On long operation and object value= '1'	If the object "Store scene, X" receives the value "1" on the bus, the next long push button action triggers the sending of a save command via the object "8 bit scene", the current scene will be saved. When the object "store scene, X" receives the value "0", end up the saving the value of current scene. Provided that a "1" has not been received at the object "Store scene" since the last save, a long operation is interpreted in the same way as a short operation.

Parameter "Long operation after"

This parameter is visible when the parameter "Store scene" is "On long operation" or "On long operation and object value= '1'", it is defined the period here, after which an operation is interpreted as "long". Options:

0.3s

0.5s

……

10s

Parameter "Debounce time"

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, that means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

Fig. 10 Parameter window "Scene X"

Parameter window "Scene X"

The parameter window "Scene X" will be shown in Fig. 10, it is visible if the control of the light scenes is carried out via "5 separate objects".

Parameter "Control of actuator group A...E"

It can be set for each actuator group whether the control is carried out via a "1 bit object" or an "8 bit object".Options:

> **1 bit object**
>
> **8 bit object**

Parameter "Preset value actuator group A...E"

This parameter set the preset value of the actuator group. This value can be modified via the bus when save the scene. If the bus voltage recovery this value will be modified as preset value.

5.1.6. Parameter window "Switching sequence, X"

The parameter window "Switching sequence" will be shown in Fig. 11. It is visible if the input is operated with the function "Switching sequence". A switching sequence enables the stepwise modification of several values via a single operation.

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-.-.- Universal Interfaces, 4 fold > Channel A

General Setting	Function of the channel	Switching sequence
Channel A	Connect contact type	○ normally closed ● normally open
Channel B	No. of objects	3 level
Channel C	Type of swiching sequence	Sequentially on/off(several push buttons)
Channel D	Function on operation	● Switch upwards ○ Switch Downwards
LED A	Sequence is: 000,001,011,111	<NOTE Information
	Debounce time/Min Time	50ms

Fig.11 Parameter window "switching sequence, X"

Parameter "Connect contact type"

This parameter defines whether the contact at the input is a normally open contact or a normally closed contact.Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example, the normally close is just opposite.

Parameter "No. of objects"

This parameter defines the number of objects, which is the number of levels, it is identical to the number of communication objects.Options:

2level

3level

4level

5level

For example, parameter "3level" means there are 3 communication objects: "level-1", "level-2", "level-3". The first operation modified the value of "level-1", the second operation modified the value of "level-2", the third operation modified the value of "level-3", the fourth from modified the value of "level-3"……, the switch sequence is: 000,001,011,111,011……The data send on the bus is the value of the communication object that after modified, which is the alterative data. The communication object "level increment/decrement, X" is used to increase or decrease the switch level, '1' means increase 1 level and '0' means decrease.

Different options have different communication objects and different switch levels, but their management are similar in the case of the same switch sequence type.

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The switching sequence can be selected here. Each sequence has other object values for each switching level.Options:

Sequentially on/off (one push button)

Sequentially on/off (several push buttons)

All combinations

Take "3level" as the example to explain the difference between them (send the modified data on the bus, data "0"=OFF, "1"=ON):

Type of switching sequence	Example
Sequentially on/off (one push button)	…-000-001-011-111-011-001-…
Sequentially on/off (several push buttons)	000-001-011-111or 111-011-001-000
All combinations	…-000-001-011-010-110-111-101-100-… (Gray code)

Only visible in the switching sequence "Sequentially on/off (several push buttons)". It can be set whether an operation of the push button switches up or down a level.Options:

switch upwards

switch downwards

The implement direction of the parameter "Switch upwards" is "000-001-011-111", the implement direction of the parameter "Switch downwards" is "111-011-001-000".After the bus voltage recovery, the current value is 000, if the parameter "Switch downwards" is selected, the effect will be invisible when operation, then it is possible to operate after switch up a few levels by the object "level increment/decrement, X".

This parameter indicates the manage process when there are different type of switching sequence.

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

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Min. operation

The parameter window "Min. operation" will be shown in Fig. 3.

5.1.7. Parameter window "Counter, X"

The parameter window "Counter, X" will be shown in Fig. 12. It is visible when the input is operated with the function "Counter".

Using the "Counter" function, the device is able to count the number of pulse edges at the input. A "differential counter" is therefore available if required in addition to the standard counter. Both counters are triggered by counting pulses but otherwise operate independently of each other. The counter always has the same data width as the differential counter.

The function is similar with the differential counter and the standard counter. The difference is the differential counter can reset the counter value (count from 0) and overflow by the bus counter report.

Attention: When disabling the function, both key scanning and object in/out are disabled. any key status change will be ignored.

Fig.12 Parameter window "Counter, X"

Parameter "Pulse detection on"

The type of input signal is defined in this parameter. It can be set whether the contact is a normally open contact (pulse trailing edge) or a normally closed contact (pulse rising edge).Options:

Closing contact (rising edge)

Opening contact (falling edge)

The parameter introduced in this chapter is use "Closing contact (rising edge)" as the example, the operation of opening contact is just opposite.

Parameter "LED status on pulse detection"

This parameter defines the indication of LED, whether to be on, off or no action when detect there is pulse input.Options:

LED A ON

LED A OFF

……

DED OFF

No action

Note: If the four channels invoke the same option, the priority of channel A is the highest, it will carry out the preset operation when detected pulse input. Then the priority of channel B is higher, then it's C, the last is D. The priority of LED X in function channel in the device is higher than the LED X channel, the LED X can not be implemented any operation in channel LED X which is used in the function channel in the device. If the parameter "LED status on pulse detection" is set "LED A ON" or "LED A OFF" options, the operation had been set in LED A can not be carried out.

Parameter "Date width of counter"

The data type of the counter (absolute counter and differential counter) is defined in this parameter. The data type specifies the counting range for the counter.

The type of the objects "Output counter value……" and "Differential counter …" is adapted to the data type of the parameter setting.Options:

8bit [0…255]

16bit [-32768…32767]

16bit [0…65535]

32bit [-2147483648…2147483647]

Parameter "Counter starts at"

The starting value of the absolute counter is defined in this parameter. When the bus power on, it will calculate the new counter value from this preset starting value.

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It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

Min. operation

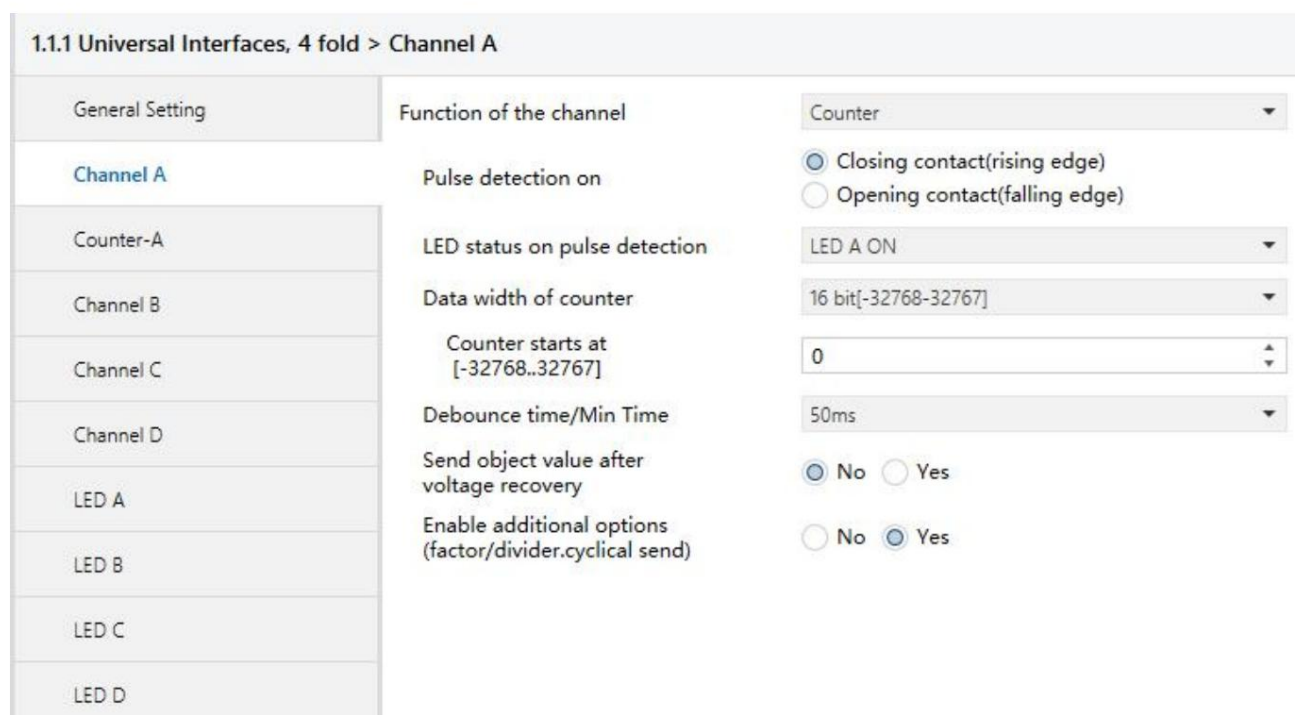The parameter window "Min. operation" will be shown in Fig. 3.

Parameter "Send object value after voltage recovery"

This parameter defines whether to send the current value when the bus voltage recovery. If the differential counter has been enabled, it is also sent on the bus and it is reset to zero. If the bus voltage failure, the standard counter and the differential counter are reset to the starting value, the standard counter will calculate from the preset starting value.Options:

At the

yes

Parameter "Enable additional options (factor/divider, Cyclical send)"

Additional functions are possible here. If this parameter is set to "Yes", the parameter window Fig.13 is displayed.Options:

At the

yes

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Fig.13 Parameter window "Counter-X"

Parameter "Divider: number of input pulse for one counter step[1…32767]"

It can be set via this parameter how many pulses are necessary to generate a counting pulse. The range of pulse import-ability: **1…32767.**

Parameter "Factor: one counter step changes counter value by [-32768…32767]"

This parameter defines how much the counter and differential counter should be increased by in the event of a counting pulse. **Range:-32768…32767**

Parameter "Send counter value cyclically"

This parameter defines whether to send the current value cyclically. If this parameter has the value "Yes", the values of the counter and the differential counter are sent cyclically on the bus.Options:

At the

yes

Parameter "Base"/ "Factor [1…255]"

It is visible if the parameter "Send counter value cyclically" is "Yes". This parameter is used to set the interval time between two telegrams that are sent cyclically, Transmission cycle time =Base× Factor.

Base options: **1s**

10s...

1h

Factor options: **1…255**

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Parameter "Enable different counter"

This parameter defines whether to enable the differential counter function, if "Yes" is selected, it will enable.Options:

At the

yes

Parameter "Over-/under run of differential at […]"

This parameter is visible if the parameter "Enable differential counter" is set to "yes".

It can be set in this parameter which value generates an overflow of the differential counter. The overflow object will send an overflow value "1" on the bus when in the event of an overflow.

Noteÿ

Counting rule (take 16bit [-32768~32767] for example, the standard counter starts at 2500):

When the "factor" is negative, then counting in reverse, the count direction for the standard counter is from 2500 to -32768, the count direction for the differential counter is from 0 to -32768; when the "factor" is positive, counting forward, the count direction for the standard counter is from 2500 to 32767, the count direction for the differential counter is from 0 to 32767.

The counting rule is similar between the differential counter and the standard counter. The difference is that the differential counter can set the overflow value. When the differential counter overflow occurs, then the current count value = the count value - the overflow value.

5.1.8. Parameter window "Multiple operation, X"

The parameter window "Multiple operation, X" will be shown in Fig.14. It is visible if the input is operated with the function "Multiple operation". Enable the function, if the input is operated several times within a certain period, a specified object value can be modified depending on the number of operations. This enables eg different light scenes to be implemented with multiple push button actions.

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Fig.14 Parameter window "Multiple operation"

Parameter "Connect contact type"

This parameter defines whether the contact at the input is a normally open contact or a normally closed contact.Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example, the normally close is just opposite.

Parameter "Max. number of operations [=Num. of objects]"

This parameter specifies the maximum permitted number of operations. This number is identical to the number of communication objects "Output X-fold".Options:

single operation

2-fold operation

3-fold operation

4-fold operation

Parameter "Value send (object "Tele. Operation ...-fold")"

It can be set here which object value should be sent.Options:

On

Off

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toggle

The current object value is inverted in the "Toggle" setting.

Parameter "Value on every operation send"

This parameter defines whether to send the operation value.Options:

At the

yes

If "yes" is entered in this parameter, the associated object value is updated and sent after each operation in the case of multiple push button actions. Example: For three-fold operations, the objects "output 1-fold" (after the first operation), "output 2-fold" (after the second operation) and "output 3-fold" (after the third operation) are sent. If "No" is selected, the current value will be sent on the bus until the last operation delay (the delay time is the interval time between two operations).

Parameter "Max. time between two operations"

This parameter sets the interval between two operations. If there are no further operations within this period, the object "output 1-fold" is sent again.Options:

0.3s

0.5s

…

10s

Parameter "Additional object for long operation"

This parameter defines whether to activate the long operation. If a long operation is carried out after one or several short operations within the maximum period, the short operations are ignored.Options:

At the

yes

Parameter "Long operation after"

This parameter is visible if long operation activate. The period is defined here, after which an operation is interpreted as "long".Options:

0.3s

0.5s

…

10s

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This parameter is visible if long operation activate. This parameter defines the value sent by the object "output long-fold" on the bus when it is set long operation.Options:

On

Off

toggle

The current object value is inverted in the "Toggle" setting.

Parameter "Debounce time"

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

10ms

20ms

……

150ms

5.1.9. Parameter window "Shutter control, X"

The parameter window "Shutter control, X" will be shown in Fig.15. It is visible if the channel function "Shutter control" is selected. When enable this function, it is possible to control the shutter by one button/switch or two button/switch operation.

Fig.15 Parameter window "Shutter control, X"

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This parameter defines whether the contact at the input is a normally open contact or a normally

closed contact.Options:

normally closed

normally open

The parameter introduced in this chapter is use "Normally open" as the example, the normally close

is just opposite.

This parameter defines the types of the shutters operation, detailed description of the type and

function as the following table:

1-push-button,short=stepping, long=moving	
short operation	Alternate implement "Stop/Adjust upward" or "Stop/Adjust downward" operation ÿalternate send the value of the object "0"and"1"ÿ
long operation	Alternate implement "Move up" or "Move down" operation ÿalternate send the value of the object "0"and"1"ÿ
1-push-button, short=moving, long=stepping	
short operation	Alternate implement "Move up" or "Move down" operation ÿalternate send the value of the object "0"and"1"ÿ
long operation	Alternate implement "Stop/Adjust upward" or "Stop/Adjust downward" operation ÿalternate send the value of the object "0"and"1"ÿ
1-push-button-operation, moving	
Operation	When operationÿsend the command in sequenceÿ ……ÿ>Move upÿ>Stop/Adjust upwardÿ>Move downÿ>Stop/Adjust downwardÿ>……
1-switch-operation, moving	
operation start ÿpress the buttonÿ	Alternate implement "Move up" or "Move down" operation ÿalternate send the value of the object "0"and"1"ÿ
operation end ÿRelease the buttonÿ	Stop/Adjust
2-push-button, standard	
short operation	"Stop/Adjust upward" or "Stop/Adjust downward"ÿset by parameterÿ
long operation	"Move up" or "Move down"ÿset by parameterÿ

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2-push-button, moving[shutter]	
Operation	When operationÿsend the command in sequenceÿ
	……ÿ>Move upÿ>Stop/Adjust upwardÿ>……or ……
	ÿ>Move downÿ>Stop/Adjust downwardÿ>……
	ÿMove up/down set by parameterÿ
2-push-button, stepping	
Operation	"Stop/ Adjust upward" or "Stop/ Adjust downward"ÿset by parameterÿ
	ÿkeep pressing the button can send cyclicÿ
2-switch-operation, moving[shutter]	
operation start	"Move up" or "Move down"ÿset by parameterÿ
operation end	"Stop / Adjust upward" or "Stop / Adjust downward"ÿ the sending value
	is identical to the value that the operation startingÿ

parameter "Tele. STOP/adjust adj." Cyclical send"

It is visible if the shutter control type is"1-push-button,short=moving,long=stepping"and"2-push-button, stepping". It is able to set the interval time of sending the object "stop/adjust adj." cyclical.Options:

> **0.3s**
>
> **0.5s**
>
> **…**
>
> **10s**

Parameter "Reaction on short operation"

It is visible if the shutter control type is "2-push-button, standard". This parameter defines the operation with short operation.Options:

> **stop/adjust up**
>
> **stop/adjust down**

Parameter "Reaction on long operation"

It is visible if the shutter control type is "2-push-button, standard". This parameter defines the operation with long operation.Options:

> **move up**
>
> **move down**

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It is visible if the shutter control type is"2-push-button, moving[shutter]" ÿ "2-switch-operation, moving[shutter]" and "2-push-button, stepping". It is defines the action when operation. Different control type makes different operate action. The former two control type is move up and down; the last control type is stop reaction.

Options: **move up**

              move down

Options: **stop/adjust up**

              stop/adjust down

This parameter is visible if long operation activate. The period is defined here, after which an operation is interpreted as "long".Options:

              0.3s

              0.5s

              …

              10s

It can set the vibration time to prevent unwanted multiple operation by bouncing of contacts in vibration time, which means the effective time of the contact operation.Options:

              10ms

              20ms

              ……

              150ms
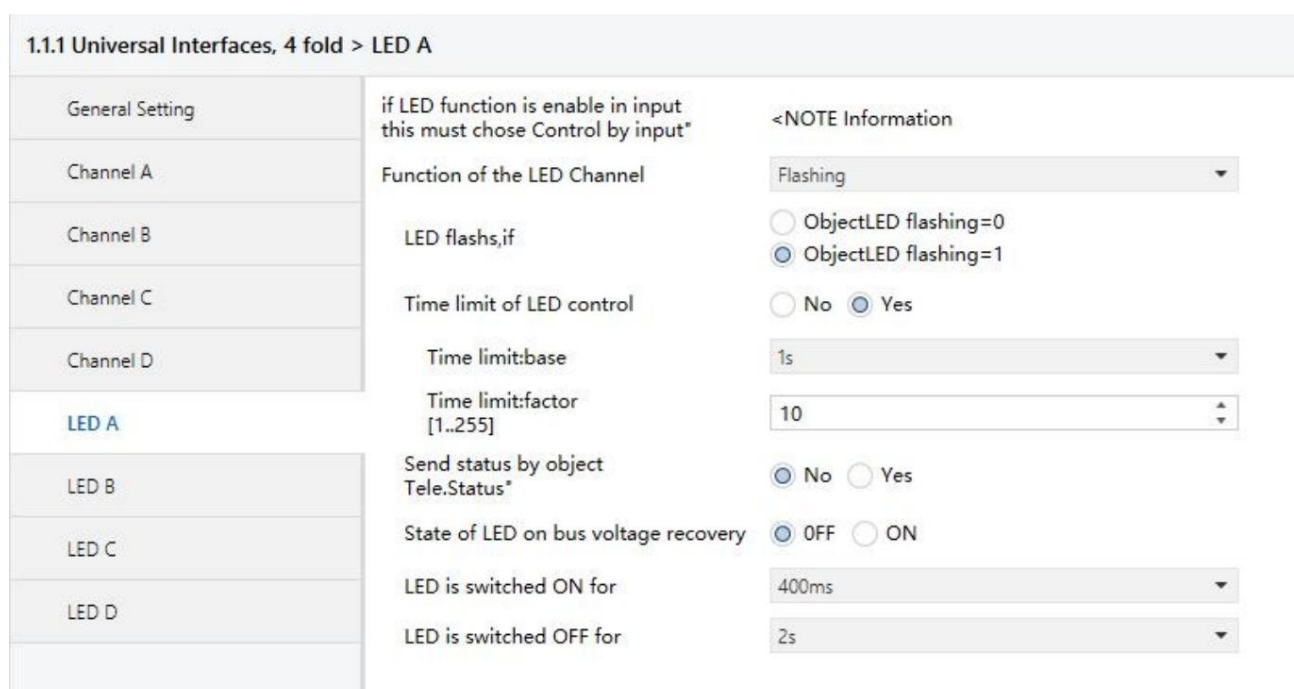
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5.2. Description of setting parameter in part of LED channel

The LED priority in the channel LED part is lower than the LED in device channel. When enable the LED setting in device channel, the LED in LED channel will not act.

5.2.1. Parameter window "Flashing, X"

The parameter window will be shown in Fig.16. It is able to set the LED flash function and turn on the LED for long time simultaneously.

1.1.1 Universal Interfaces, 4 fold > LED A		
General Setting	if LED function is enable in input this must chose Control by input"	<NOTE Information
Channel A	Function of the LED Channel	Flashing ▾
Channel B	LED flashs,if	○ ObjectLED flashing=0 ◉ ObjectLED flashing=1
Channel C	Time limit of LED control	○ No ◉ Yes
Channel D	Time limit:base	1s ▾
LED A	Time limit:factor [1..255]	10 ⏶⏷
LED B	Send status by object Tele.Status"	◉ No ○ Yes
LED C	State of LED on bus voltage recovery	◉ OFF ○ ON
LED D	LED is switched ON for	400ms ▾
	LED is switched OFF for	2s ▾

Fig.16 Parameter window "Flashing, X"

Parameter "Function of the LED channel"

This parameter defines the function of the LED channel. The default parameter is "Flashing" function. If "No action" is selected, it means this channel disable.Options:

No action

flashing

switch

control by input

Indicate object in

Indicate object out

Indicate object in and out

Parameter "LED Flashing, if"

This parameter defines the mode of opening the LED flashing.Options:

Object "LED flashing"=0

Object "LED flashing"=1

Parameter "Time limit of LED control"

This parameter defines whether to enable the function to restrict the flashing of the LED.Options:

At the

yes

Parameter "Time limit: Base× Factor

This parameter is visible if the time limit is active. It is defines the time of LED flashing: Base×

Factor.

Base options: **1s**

10s

…

1h

Factor options: **1…255**

Parameter "Send status by object "Tele. Status""

This parameter defines whether to send the LED status report on the bus.Options:

At the

yes

If "Yes" is selected, the object "Send its status, X" will send value "1" when LED flashing; it will send

value "0" when LED stop flashing.

Parameter "State of LED on bus voltage recovery"

It is defines the state of LED when the bus voltage recovery.Options:

On

Off

Parameter "LED is switched ON/OFF for"

It is defines the time of the LED switched on/off when LED flashing.Options:

600ms

800ms

……

60s
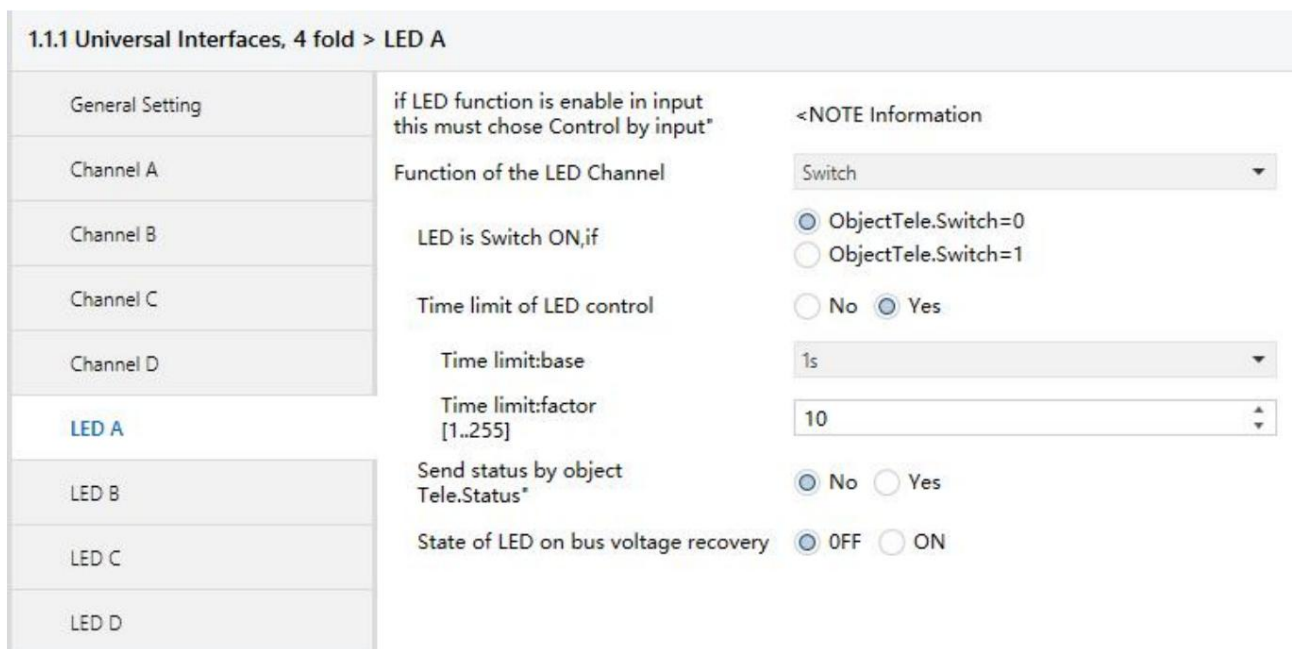
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5.2.2. Parameter window "Switch, X"

The parameter window "Switch, X" will be shown in Fig.17 to define the switch function of LED. The

LED will swit off automatic and it can keep switching on after the LED is swit on for a while.

Fig.17 Parameter window "Switch, X"

Parameter "LED is switch ON, if"

This parameter defines the mode to switch on the LED.Options:

Object "Tele. Switch"=0

Object "Tele. Switch"=1

Parameter "Time limit of LED control"

This parameter defines whether to enable the function to restrict the time to switch on the

LED.Options:

At the

yes

Parameter "Time limit: Base× Factor

This parameter is visible if the time limit is active. It is defines the time of LED flashing: Base× Factor.

After this period, the LED switches off automatically.

Base options: **1s**

10s

…

1h

Factor options: **1…255**

![GVS logo] **K-BUS® KNX/EIB Universal Interfaces**

This parameter defines whether to send the LED status report on the bus.Options:

At the

yes

If "Yes" is selected, the object "Send its status, X" will send value "1" when LED switch on; it will send value "0" when LED switch off.

Parameter "State of LED on bus voltage recovery"

It is defines the state of LED when the bus voltage recovery.Options:

On

Off

5.2.3. Parameter window "Control by Input, X"
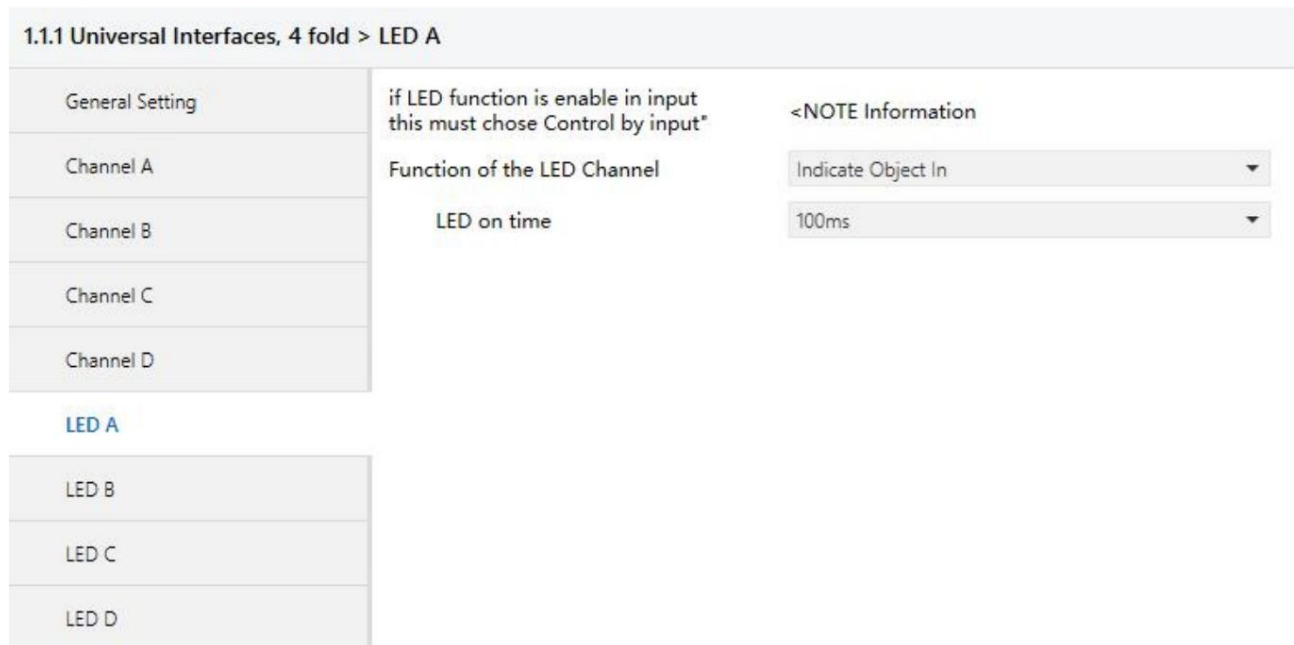
The parameter window "Control by input, X" will be shown in Fig.18, the LED is used to indicate the input button.

Fig.18 Parameter window "Control by input, X"

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5.2.4. Parameter window "Indicate Object In, X"

The parameter window "Indicate object in, X" will be shown in Fig.19, the LED is used to indicate the input of the communication object.

Fig.19 Parameter window "Indicate object, X"

Parameter "LED on time"

This parameter defines the indicative time of LED when there is input of communication object, which means the switch on time.Options:

        100ms

        200ms

        ……

        60s

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5.2.5. Parameter window "Indicate Object Out, X"

The parameter window "Indicate object out, X" will be shown in Fig.20, the LED is used to indicate the output of the communication object.

1.1.1 Universal Interfaces, 4 fold > LED A		
General Setting	if LED function is enable in input this must chose Control by input"	<NOTE Information
Channel A	Function of the LED Channel	Indicate Object Out ▼
Channel B	LED on time	100ms ▼
Channel C		
Channel D		
LED A		
LED B		
LED C		
LED D		
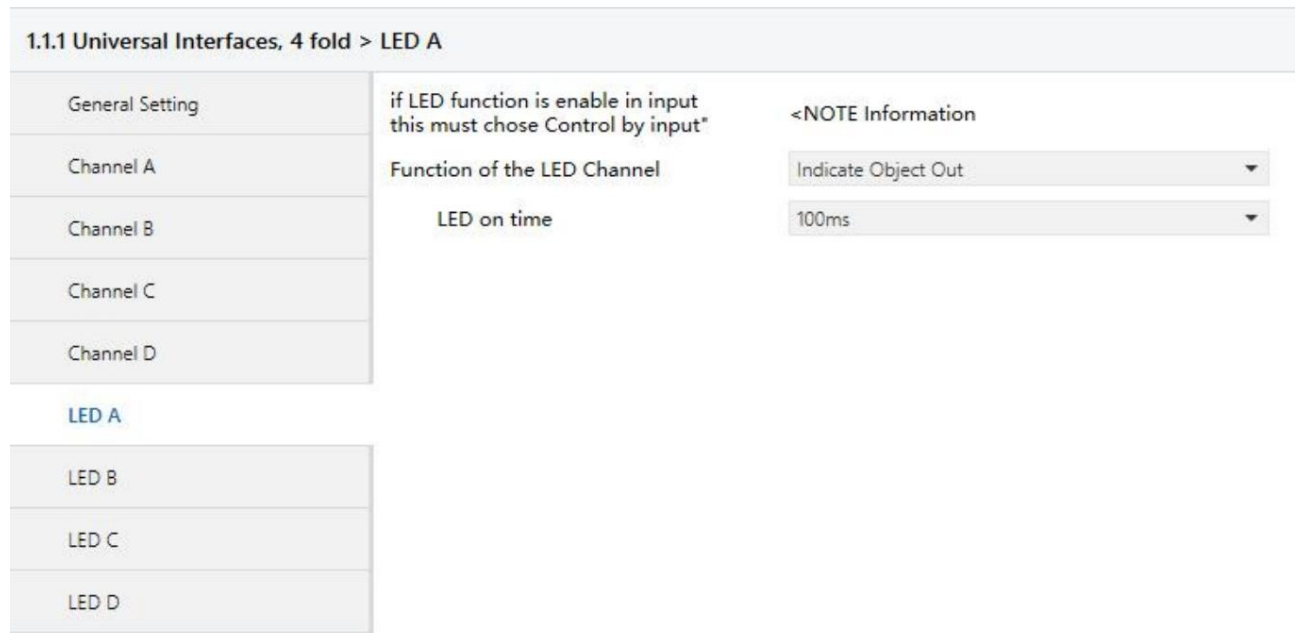
<div align="center">Fig.20 Parameter window "Indicate object out, X"</div>

Parameter "LED on time"

This parameter defines the indicative time of LED when there is output of communication object, which means the switch on time.Options:

100ms
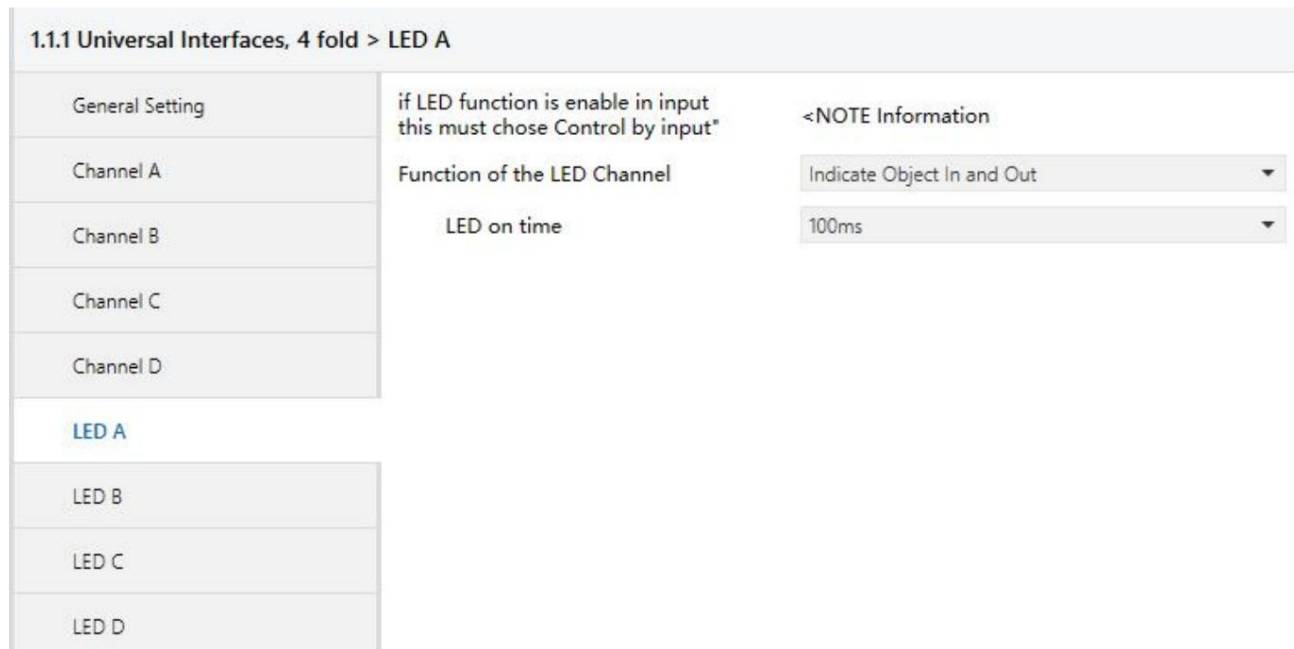
200ms

……

60s

5.2.6. Parameter window "Indicate object In and Out, X"

The parameter window "Indicate object in and out, X" will be shown in Fig. 21, the LED is used to indicate the input and output of the communication object.

Fig.21 Parameter window "Indicate object in and out, X"

Parameter "LED on time"

This parameter defines the indicative time of LED when there is input or output of communication object, which means the switch on time.Options:

100ms

200ms

……

60s

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Chapter 6 Communication object description

The communication object is the medium to communicate other device on the bus, which means only the communication object can communicate with bus. The communication object and the object in each channel are the same, then use channel A as the example to introduce the function of each communication object.

6.1. Communication object "Switch"

Number	Name	Object Function	Des Group Add	Length	C	R	W	T	U	Data Type	Priority
0	Disable , A	CH A Disable		1 bit	C	-	W	-	-	enable	Low
1	Switch , A	CH A Switch		1 bit	C	-	W	T	-	switch	Low
2	Switch-long , A	CH A switch-long		1 bit	C	-	-	T	-	switch	Low

Fig.6.1 Communication object "Switch"

Note: "C" in "Flag" column in the below table means that the object has a normal link to the bus; "W" means the object value can be modified via the bus; "R" means the value of the object can be read via the bus; "T" means that a telegram is transmitted when the object value has been modified; "U" means that value response telegrams are interpreted as a write command, the value of the object is updated.

At the.	function	object name	Date	flags	DPT
0	**CH X Disable**	**Disable, X**	**1Bit**	**C, W**	**1.003 enable**
When enable the channel function, this communication object will be active to disable/enable the channel function. The communication object will disable this function if you receive a telegram with logic value "0" while it will enable the channel function if receive a telegram "1". The control telegram sent by all objects are ineffectiveness when the channel function disable. The channel default function to enable when the bus voltage recovery.(All communication object "Disable" in channel function operate equally.)					
1	**CH X Switch**	**Switch, X**	**1Bit**	**C,W,T**	**1001 switches**
This communication object is visible if the channel function "Switch" is enabled. It is visible no matter to distinguish short/long operation or not. Operate with button input(or a short operation) the object value to carry out the relevant action, such as ONÿOFFÿTOGGLE.					
two	**CH X Switch-long**	**Switch-long, X 1Bit**		**C,T**	**1001 switches**
This communication object is visible if parameter "Number of objects for short/long object operation" is "2 objects" and it is distinguish with long and short operation. Operate with a long operation to input the object value to carry out the relevant action, such as ONÿOFFÿTOGGLE.					

Form 1 Communication object "Switch"

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6.2. Communication object "Switch/dimming"

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
	0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
	1	Switch , A	CH A Switch			1 bit	C	-	W	T	-	switch	Low
	2	Dimming , A	CH A Dimming			4 bit	C	-	W	T	-	dimming control	Low

Fig.6.2 Communication object "Switch/dimming"

At the.	function	object name	Date	flags	DPT
1	CH X Switch	Switch, X	1bit	C,W,T	1001 switches
It is visible if parameter "Dimming functionality" selected "Dimming and switching". Operate with a short operation to input the object value to carry out the relevant action, such as ONÿOFFÿTOGGLE.					
two	CH X Dimming	Dimming, X	4bit	C,W,T	3.007 dimming control
This communication object input by a long operation to send the command to dim up or dim down. It can control the dimming device on bus to carry out relative dimming. It will send a stop command to stop dimming when the long operation is end.					

Form 2 Communication object "Switch/dimming"

6.3. Communication object "Value/Force output"

There are many data types and communication objects, it will not list in Fig.6.3. This different date types communication object have the same operation that are transmit the input object value, which the range of transmit object value are different. It is possible to distinguish a long/short operation or not, the two objects enable when distinguished.

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
	0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
	1	Output 1byte , A	CH A Value 1byte			1 byte	C	-	-	T	-	counter pulses (0..255)	Low
	2	Output 1byte-long , A	CH A Value 1byte-long			1 byte	C	-	-	T	-	counter pulses (0..255)	Low

Fig. 6.3 Communication object "Value/Forced output"

At the.	function	object name	data type	DPT	Flags
1	CH X Value 1bit (1bit/2bit/4bit/ 1byte/2byte/4byte)	Output 1bit, X (1bit/2bit/4bit/ 1byte/2byte/4byte)	1bit (1bit/2bit/…/4byte)	1001 switches 2001 switch control 3.007 dimming control 5,010 counter pulses(0..255) 8,001 pulse difference 7,001 pulses 12,001 counter pulses(unsigned)	C,T
This communication object is used to transmit the input value. It is only transmit the object value in short operation if distinguish a long and short operation. The value range is dependent on the data type, if the data type of the communication object is different, the import-ability range of the object value is different. The data type depends on parameter "Reaction on (short) operation".					

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	CH X Value 1bit-long (1bit/2bit/…/4byte)	Output 1bit-long, X (1bit/2bit/…/4byte)	1bit (1bit/2bit/…/4byte)	C,T	1001 switches 2001 switch control 3.007 dimming control 5,010 counter pulses(0..255) 8,001 pulse difference 7,001 pulses 12,001 counter pulses(unsigned)
two					
This communication object is visible if there is a distinction between long and short operation, it is used to transmit the object input value in long operation. The value range is depending on the data type, if the data type of the communication object is different, the import-ability range of the object value is different. The data type depends on parameter "Reaction on long operation".					

Form 3 Communication object "Value/Forced output"

6.4. Communication object "Scene control"

The communication object "Scene control" will be shown in Fig.6.4; it is including the actuator group and the communication object in the scene control mode. The control mode of actuator group control by 5 independent communication objects, it is control by 1bit and 8bit data. The scene control mode is controlled by an 8 bit data.

Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
1	Output 1bit,Group-A , A	CH A 1bit,Group-A			1 bit	C	-	W	T	U	switch	Low
2	Output 1bit,Group-B , A	CH A 1bit,Group-B			1 bit	C	-	W	T	U	switch	Low
3	Output 1bit,Group-C , A	CH A 1bit,Group-C			1 bit	C	-	W	T	U	switch	Low
4	Output 1bit,Group-D , A	CH A 1bit,Group-D			1 bit	C	-	W	T	U	switch	Low
5	Output 1bit,Group-E , A	CH A 1bit,Group-E			1 bit	C	-	W	T	U	switch	Low
6	Store scene , A	CH A Store scene			1 bit	C	-	W	T	-	boolean	Low

Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
1	Output 8bit,Group-A , A	CH A 8bit,Group-A			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
2	Output 8bit,Group-B , A	CH A 8bit,Group-B			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
3	Output 8bit,Group-C , A	CH A 8bit,Group-C			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
4	Output 8bit,Group-D , A	CH A 8bit,Group-D			1 byte	C	-	W	T	U	counter pulses (0..255)	Low
5	Output 8bit,Group-E , A	CH A 8bit,Group-E			1 byte	C	-	W	T	U	counter pulses (0..255)	Low

Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
1	Output 8bit scene , A	CH A 8bit Scene			1 byte	C	-	-	T	-	scene control	Low

Fig. 6.4 Communication object "Scene control"

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At the.	function	object name	data type	flags	DPT
1~5	CH X 1bit/8bit, Group-A…E	Output 1bit/8bit, Group-A…EÿX	1bit/1byte C,W,T,U		1001 switches 5,010 counter pulses(0..255)
	It is visible if parameter "Control the scene" selected "5 separate". It is used to control the actuator group, it can control by a 1 bit or 8 bit data (set by parameter). When saving the scene, the value of object "output 1bit/8bit, group A…E" will be read and storage by bus. When the bus voltage recovery, the value of the object resumes to the default value and the new storage value will be lost.				
1	CH X 8bit Scene	Output 8bit scene, X	1 byte	C,T	18.001 SceneControl
	This communication object is visible if parameter "Control the scene" selected "8bit scene"ÿit is used to control the scene. It is possible to invoke or save the scene by an 8 bit command sent by this object. The definition of the 8-bit command will be described below (This object is only to communicate "C" and transmit "T", do not have the function modify "W" and update "U"): Assuming an 8-bit command (binary coding) asÿFXNNNNNN F: invoke the scene with "0"; save the scene with "1" Xÿ0 NNNNNNÿscene numberÿ0…63ÿ				
6	CH X Store scene	Store scene, X	1bit	C,W,T	1.002 boolean
	This parameter triggers the scene storage or indicates the accomplishment of the scene by bus, decided by the mode of the scene storage. The detail storage process will be described in the scene storage parameter chapter.				

Form 4 Communication object "Scene control"

6.5. Communication object "Switch sequence"

The communication object "Switching sequence" will be shown in Fig.6.5. It can modify the object value with an operation step by step. Each object corresponding to one switch level.

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
	0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
	1	Output level-1 , A	CH A level-1			1 bit	C	-	-	T	-	switch	Low
	2	Output level-2 , A	CH A level-2			1 bit	C	-	-	T	-	switch	Low
	3	Output level-3 , A	CH A level-3			1 bit	C	-	-	T	-	switch	Low
	4	Output level-4 , A	CH A level-4			1 bit	C	-	-	T	-	switch	Low
	5	Output level-5 , A	CH A level-5			1 bit	C	-	-	T	-	switch	Low
	6	Leve increament/decrement , A	CH A Leve increament/decrement			1 bit	C	-	W	-	-		Low

Fig.6.5 Communication object "Switching sequence"

At the.	function	object name	Data type Flags		DPT
1~5 CH	X level-1(1~5)	Output level-1(1~5), X	1bit	C,T	1001 switches
	The number of the communication object (maximum 5) which the levels of switch set by parameter "No. of object". The communication object sent on bus is the object which is modified, which the value of the communication object had been changed. The detail process will be described in the switching sequence parameter chapter.				

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6	CH X level increment/ decrement	level increment/ decrement, X	1bit	C,W 1.007 step
The communication object "level increment/decrement, X" is used to increase/decrease the level of the switch. It will increase one level when sending "1" and decrease a level when sending "0". The detail process will be described in the switching sequence parameter chapter.				

Form 5 Communication object "Switching sequence"

6.6. Communication object "Counter"

The communication object "Counter" will be shown in Fig.6.6. Including standard counter and differential counter communication object, both these communication objects are initiated counter by one operation and the counter range are the same, but the counting are independent of each other.

Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
1	Output counter value 1byte , A	CH A Counter value			1 byte	C	-	W	T	-	counter pulses (0..255)	Low
2	Differential Count 1byte , A	CH A Differential Counter			1 byte	C	-	W	T	-	counter pulses (0..255)	Low
3	Request counter value , A	CH A Request counter value			1 bit	C	-	W	-	-	enable	Low
4	Differential counter overflow , A	CH A Differential overflow			1 bit	C	-	-	T	-		Low
5	Reset differential counter , A	CH A Rst differential counter			1 bit	C	-	W	-	-		Low

Fig.6.6 Communication object "Counter"

At the.	function	object name	Data type	Flags	DPT
1	CH X Counter value	output counter value 1byte, X ÿ1byte/2byte/4byteÿ	1byte 2byte 4byte	C,W,T	5,010 counter pulses(0..255) 8001 pulse difference 7,001 pulses 13,001 counter pulses(signed)
This communication object is used to transmit the current counting value of the standard counter, and it can modify the counting value simultaneously. Different data type makes the different counting range, it is defined by parameter "Date width of counter".					
two	CH X Differential Counter	Differential Counter 1byte, X ÿ1byte/2byte/4byteÿ	1byte 2byte 4byte	C,W,T	5,010 counter pulses(0..255) 8001 pulse difference 7,001 pulses 13,001 counter pulses(signed)
It is visible if you enable the parameter "Enable differential counter". This communication object is used to transmit the current counting value of the differential counter, and it can modify the counting value simultaneously. Different data type makes the different counting range, it is defined by parameter "Date width of counter".					
3	CH X Request counter value	Request Countervalue, X	1Bit	C, W	1.003 enable
This communication object is used to ask for the current counting value of the standard counter and the differential counter. The communication object "CH X Counter value" and "CH X Differential Counter" will transmit the current counting value if receive a logic value "1", it will no reaction if receive a logic value "0" telegram.					

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4	CH X Differential overflow	differential counter overflow, X	1Bit	C,T	1,005 alarm
It is visible if you enable the parameter "Enable differential counter". Once the counting of the differential counter exceeds the overflow value preset by parameter "Over-/under run of differential at [0…255]"ÿit will send telegram "1" on bus to report the overflow.					
5	CH X Rst Differential Counter	Reset Differential Counter, X	1Bit	C, W	1015 reset
It is visible if you enable the parameter "Enable differential counter". It is used to reset the counting value of the differential counter, which counting from 0.It will reset the counting value if it receives a logic value "1"telegram, and it will no reaction if receive a "0".					

Form 6 Communication object "Counter"

6.7. Communication object "Multiple operation"

The communication object "Multiple Operation" will be shown in Fig.6.7. The value of the designate operation object will be modified if detect multiple operation in period.

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
	0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
	1	Output 1-fold , A	CH A 1-fold			1 bit	C	-	-	T	-	switch	Low
	2	Output 2-fold , A	CH A 2-fold			1 bit	C	-	-	T	-	switch	Low
	3	Output 3-fold , A	CH A 3-fold			1 bit	C	-	-	T	-	switch	Low
	4	Output 4-fold , A	CH A 4-fold			1 bit	C	-	-	T	-	switch	Low
	5	Output Long-fold , A	CH A Long-fold			1 bit	C	-	-	T	-	switch	Low

Fig.6.7 Communication object "Multiple operation"

At the.	function	object name	data type	flags	DPT
1~4	CH X 1-fold(1~4)	Output 1-fold, X(1~4) 1Bit		C,T	1001 switches
The number of the communication object (maximum 4) is set by parameter "Max. number of operations(=Num. of objects)". If there are multiple operation, multiple objects will send the relevant telegram on bus, which the telegram set by parameter "value send (object "Tele. Operation…-fold")". The detail operation process will be described in the multiple operation parameter chapter.					
5	CH X Long-fold	Output Long-fold, X 1Bit		C,T	1001 switches
It is visible if parameter "Additional object for long operation" selected "yes". Once detected a long operation the object will send telegram on bus, the telegram is set by parameter "value send (object "Tele. Long operation")".					

Form 7 Communication object "Multiple operation"

6.8. Communication object "Shutter control"

The communication object "Shutter Control" will be shown in Fig.6.8

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
■‡	0	Disable , A	CH A Disable			1 bit	C	-	W	-	-	enable	Low
■‡	1	Output shutter UP/DOWN , A	CH A shutter UP/DOWN			1 bit	C	-	-	T	-	up/down	Low
■‡	2	Output Stop/lamella adj , A	CH A Stop/lamella adj			1 bit	C	-	-	T	-		Low
■‡	3	Upper limit position , A	CH A Upper limit position			1 bit	C	-	W	-	-	enable	Low
■‡	4	Lower limit position , A	CH A Lower limit position			1 bit	C	-	W	-	-	enable	Low

Fig.6.8 Communication object "Shutter control"

At the.	function	object name	Data type Flags		DPT
1	**CH X shutter UP/DOWN**	**Output shutter UP/DOWN, X 1Bit**		**C,T**	**1,008 up/down**
	This communication object moves up/down the shutter by sending command by bus. It will move down if the communication object send a "1" telegram, it will move up if sending a "0".				
two	**CH X Stop/adjust adj**	**Output Stop/adjust adj, X**	**1Bit**	**C,T**	**1,007 step**
	It will stop/adjust the shutter by sending command by bus. It will stop/ adjust down if sending a "1" telegram, and it will stop/adjust up if sending "0".				
3	**CH X Upper limit position Upper**	**limit position, X**	**1Bit**	**C, W**	**1.003 enable**
	It is used to limit the upper moving. It is limit the upper moving if the object receives a logic value "1", and negate it if receive "0".				
4	**CH X Lower limit position Lower**	**limit position, X**	**1Bit**	**C, W**	**1.003 enable**
	It is used to limit the lower moving. It is limit the lower moving if the object receives a logic value "1", and negate it if receive "0".				

Form 8 Communication object "Shutter control"

6.9. Communication object "LED X-flashing"

The communication object "LED X—Flashing" will be shown in Fig.6.9.

	Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
■‡	28	LED.flashing , A	LED A Flashing			1 bit	C	-	W	-	-	switch	Low
■‡	29	LED permanent on , A	LED A Permanent on			1 bit	C	-	W	-	-	switch	Low
■‡	30	Send its status , A	LED A Send its status			1 bit	C	-	-	T	-	switch	Low

Fig.6.9 Communication object "LED X-Flashing"

At the.	function	object name	data type	flags	DPT
28	**LED X Flashing**	**LED. Flashing, X**	**1Bit**	**C, W**	**1001 switches**
	It is used to control the LED flashing. It will start flashing if receive "1" or "0" telegram (defines by "LED flashing, if"), the flashing time set by parameter. And it will stop LED if receive "0" or "1".				
29	**LED X Permanent on LED**	**permanent on, X 1Bit**		**C, W**	**1001 switches**
	It is used to open LED for a long period and its priority is higher than the communication object "LED. Flashing, X". it will open LED if receive telegram "1", negate priority and the LED resumes the foregoing operation if receive "0".				
30	**LED X Send its status Send**	**its status, X**	**1Bit**	**C,T**	**1001 switches**
	It is visible if "Send status by object "Tele. Status"" selected "Yes"ÿit is used to send the status of LED. Sending "1" means LED open or flashing, and sending "0" means the LED is stop. The object LED. Flashing, X" will send telegram "1" if sending open flashing requirement every time.				

Form 9 Communication object "LED X-Flashing"

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6.10. Communication object "LED X-Switch"

The communication object "LED X—Switch" will be shown in Fig.6.10

Number	Name	Object Function	Des	Group Add	Length	C	R	W	T	U	Data Type	Priority
28	LED.flashing , A	LED A Flashing			1 bit	C	-	W	-	-	switch	Low
29	LED permanent on , A	LED A Permanent on			1 bit	C	-	W	-	-	switch	Low
30	Send its status , A	LED A Send its status			1 bit	C	-	-	T	-	switch	Low

Fig.6.10 Communication object "LED X-Switch"

At the.	function	object name	Date type Flags		DPT
28	**LED X Switch**	**LED. switch, X**	**1Bit**	**C, W**	**1001 switches**
This communication object is used to open LED. It will open LED if the object receives a "1" or "0" telegram (defines by "LED is Switch ONÿif"ÿÿthe open time can be set by parameterÿit will stop LED if receive "0" or "1".					
29	**LED X Permanent on**	**LED permanent on, X 1Bit**		**C, W**	**1001 switches**
It is used to open LED for a long period and its priority is higher than the communication object "LED. switch, X". It will open LED if receive telegram "1", negate priority and the LED resumes the foregoing operation if receive "0".					
30	**LED X Send its status**	**Send its status, X**	**1Bit**	**C,T**	**1001 switches**
It is visible if "Send status by object "Tele. Status"" selected "Yes"ÿit is used to send the status of LED. Sending "1" means LED open, and sending "0" means the LED is stop. The object LED. switch, X" will send telegram "1" if sending open requirement every time.					

Form 10 Communication object "LED X-Switch"