BSMART

TECHNICHAL DOCUMENT

DIMMER ACTUATOR 2 GANG

BSD02-01

CONTENTS

1.PREFACE

The dimmer actuator is a device dimming the luminaries directly by the data in the memory, and the data is processed in advance in the programming software according to the distribution characteristics of the luminaries' brightness. The controller transfers the brightness data value to output voltage to control the brightness of the luminaries;

And also can through our manual operating button to control the luminaries' brightness value directly.

The dimmer actuator is a programmable scene dimmer module, the user can adjust the brightness to any value of each channel between the dimming range 1%-100%, and can be set the duration time and gradual rate to achieve the target brightness value, let the light of the changes are a process, it not only to extend the life of the lamp, but also energy conservation. Also you can use multiple channels to create any combination of the scene.

2. TECHNICAL PARAMETER

Power Supply:
Operating Voltage: 21-30V DC，made available by the EIB-BUS
Input Voltage: 230 V AC（50/60Hz）

Output:
Dimming Output:
BSD02-01-----2 channel

Output Voltage: 230 V AC (50/60H

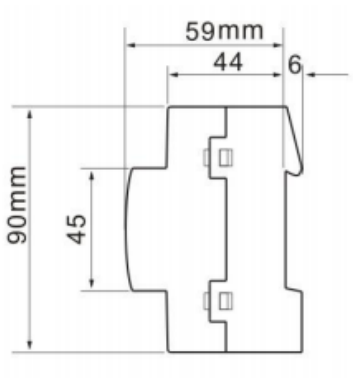
Max. Output Capacity:
400W per channel

Max. Leakage Loss: 5W
BUS Connection: 1 EIB-BUS connection terminal

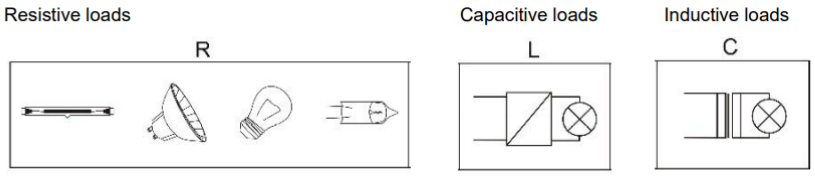
Load Circuits: 2 connection terminals per output
Cable Cross-section: Single core 0.2~4.0mm2
Multi core 0.2~2.5 mm2
Operation Display: LED and push button for assigning the physical address
IP Grade: IP 20, EN 60 529
Temperature Range: Operation -5˚C~45˚C
Storage -25˚C~55˚C
Transport -25˚C~70˚C
Housing and Color: Plastic, white
Mounting: Standard 35mm DIN mounting rail installation
Dimension: 144 x 90 × 65mm (H×W×D)

Test norm: In accordance with the EMC guideline and the low voltage guideline EN50090/EN60669

3.DIMENSIONS



3.1 LOAD TYPE



Note: *it is however not permitted to connect inductive and capacitive loads together at the same output, but connect resistive loads with one of both.*

Lagging edge dimmer's load type:

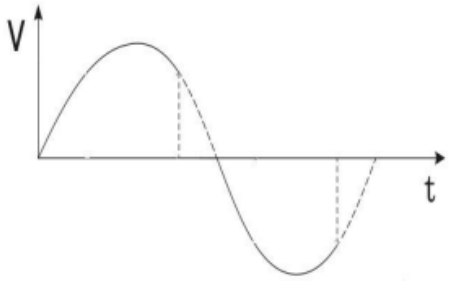
Incandescent, halogen lamps, low-voltage halogen lamps with electronic transformers or traditional transformer;

Leading edge dimmer's load types: incandescent, halogen

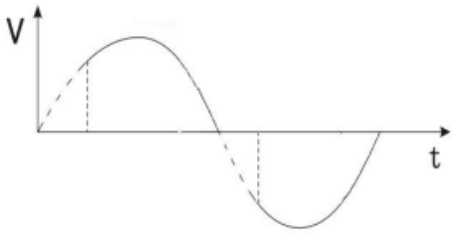
4 Dimming operation mode

Lagging edge dimmer with leading edge turn-on, lagging edge turn-off dimming mode; And the leading edge dimmer with leading edge turn-on, at the zero-crossing point shut-off automatically.

Lagging edge dimmer dimming principle: dimmer will be on at the zero-crossing point, seen below Figure. During this moment, the voltage is very low, and there is no current impact to the load, which is able to not only extend the lamp life, but also create no interfere to the power grid; Reach the target brightness value shut-off.



Lagging edge dimmer dimming principle: dimmer will be on at the specified brightness value, seen below Figure, dimmer at the zero-crossing point shut-off automatically.



5 Application Programming Introduction

It is able to set different parameters to every output channel, and control various targets by modifying the setup of the internal parameters.

5.1 Switch

The output can be switched ON or OFF by 1 bit data. It is able to set the brightness value as the last one or a defined one (1%-100%) when switching on the luminaries. It is able to set a delay time (changing time) to dim UP the luminaries or dim UP gradually in the default period. When receiving the *OFF* message, the dimmer will be switched off immediately, or dim DOWN gradually after a delay time (changing time) or in the default changing period.

5.2 Switch status

1bit data bits; when the output state value change, dimmer can report the latest brightness value to the other devices via "switch status" object, or report data to the bus.

5.3 Relative dimming

4 data bits control: the relative dimming command means it is possible to dim UP or DOWN to the needed brightness value during the set brightness threshold range. It is only valid to dim UP when the brightness value is smaller than the low threshold value and dim DOWN when the brightness value is greater than the high threshold value. It is also able to set whether to switch on the luminaries by the message "*dim UP to a certain value*" when the output is 0 by this function. The relative dimming is used to control the relative changes of the brightness by 4 data bits: the lowest 3 bits are controlling-bit and the highest bit is----- "1" means dim UP, "0" means dim DOWN.

Explanation of setting relative dimming: (1-7: dim DOWN; 0-8 remain unchanged (stop dimming); 9-15 dim UP)

Parameter Value	0	1	2	3	4	5	6	7
Dim DOWN	Unchange/stop dimming Down	255	128	64	32	16	8	4

Parameter Value	8	9	10	11	12	13	14	15
Dim UP	Unchange/stop dimming UP	255	128	64	32	16	8	4

5.4 Brightness

8 data bits control: it is able to dim to the needed brightness value by changing the brightness parameters. The setting of the parameters is similar as relative dimming with the brightness value range:

one low threshold value and one high threshold value. And it is not allowed to change the brightness value beyond the set range, the max. range is from 0 to 255. This function offers the possibility to dim UP or DOWN to 0 gradually to the target value by setting the delay time or the default time.

The high and low threshold value limits the total output of the dimmer; any brightness value beyond the range is not valid.

When the output is 0, it is able to set switching off the luminaries or remaining to a lower brightness value; and also in this status it is optional to switch on the luminaries by receiving the message "brightness dimming".

5.5 Brightness status

8bit data bits; when the brightness state value change, dimmer can report the latest brightness value to the other devices via "brightness status" object, or report data to the bus.

5.6 Scene

8bit data bits control: the dimmer offers 16 (1-16) scenes for selection. It is possible to set ONE brightness value and the gradual change time of ON for each scene. After setting, it is easy to call any favorite scene. 1 in the highest bit of the scene command it means "saving" command, to save the current brightness value to the relevant scene.

5.7 Preset1, Preset 2

The dimmer can preset scene, the object directly through 1bit data to transfer the preset scene or through 1bit data to let favorite scene to replace original preset scene. There are two preset values per output, there are two brightness values can be transfer for each preset value. Such as in theater, we need a relatively bright lighting effect when coming in, we can through transfer the first brightness value to be achieved this effect, when the movie starts playing, we need a relatively dark lighting effect, we can through transfer the second brightness value to be achieved. We can return to the previous brightness value when the movie ended.

5.8 Set preset1, Set preset2

1 data bit, usually the default value is set with the software, in order to make operate user-friendly and conveniently, can use the relative dimming of brightness adjustment, you use the default settings (set preset) object to make changes to the default values. Each dimming channel can be set two default values, correspondingly there are two default value setting objects to the current brightness of the dimmer setting to save to the default value.

5.9 Staircase lighting

Switch、Permanent on both are 1bit data, The dimmer offers the function of staircase lighting control besides the normal lighting control.

The staircase lighting function serves to switch off the lighting directly until dimming DOWN to 20% of the brightness value after a set period. It is able to set the brightness of the luminaries, the duration of the light ON, the time to dim down to 20% separately.

In this function, it uses 1 data bit control the targets directly by setting a permanent fixed value to the output of the staircase luminaries.

The steps of staircase lighting control: the staircase luminaries will be switched on for a certain time (this time can be set) if the controlled target receives the message of "*1*"; these luminaries will be switched on again when receiving another message "*1*" during this period. The luminaries will be switched off when they are dimmed down to 20% of the brightness value (the dim down time can be set) after this period, or switch off the luminaries by sending message "*0*" to the controlled target. The luminaries will be off after dimming down to 20% when receiving the message "*0*" (the same dimming down time as above). When enabling the function "*On receiption switch OBJ=0 switch off*", it is able to use the function "*switch off*" to turn off the output in the status of "*permanent on*", or change the status from "switch on" to "*permanent on*" (message "*1*" means ON, "*0*" means OFF).

On the staircase lighting mode, can use this function OBJ suspended the staircase lighting function into normal use.

Note: when the device reset, the default function of the staircase lighting is effective.

5.10 Reset

When the BUS is power off, all the outputs are switched off; the current brightness value will be saved to the memory of the dimmer. When the BUS voltage is recovered, the brightness status may be the last brightness value, or the preset brightness value.

When the BUS is power off, it may have the following situation occurring:

In the normal mode, 2 optional behaviors after the BUS voltage recovery are: the last brightness value before power off, or the set value.

In the staircase lighting mode, the behavior after the BUS voltage recovery is: ON or OFF. No output when it is OFF; start the behavior "*switch=1*" when it is ON.

5.11 Error report

The dimmer offers the possibility of reporting the error status of the system; the data type is 1 byte:

Data bit	Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6
Target	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	heat sink
Function	Short circuit, over load	Short circuit, over load	Short circuit, over load	Short circuit, over load	Short circuit/ over load	Short circuit/ over load	over temperature

5.12 In operate

1 bit data. The sign will be report periodically to the Bus when the dimmer is working normally.

6 ETS-3.0f Parameters Setup Description

6.1 Introduction

2 operation modes (main function) per output:

Normal dimming
This mode is mainly used to control the normal luminaries system, which can set the output time and the brightness value of the dimmer, dim UP or DOWN with the function of "*relative dimming*", and also call the set brightness values from the scene function, until dim to the required environment.

Staircase lighting
The mode is mainly used to control the staircase luminaries. Switch ON the staircase luminaries and switch OFF automatically after a certain period, or switch OFF by manually.

6.2 Parameter Window "Device general"

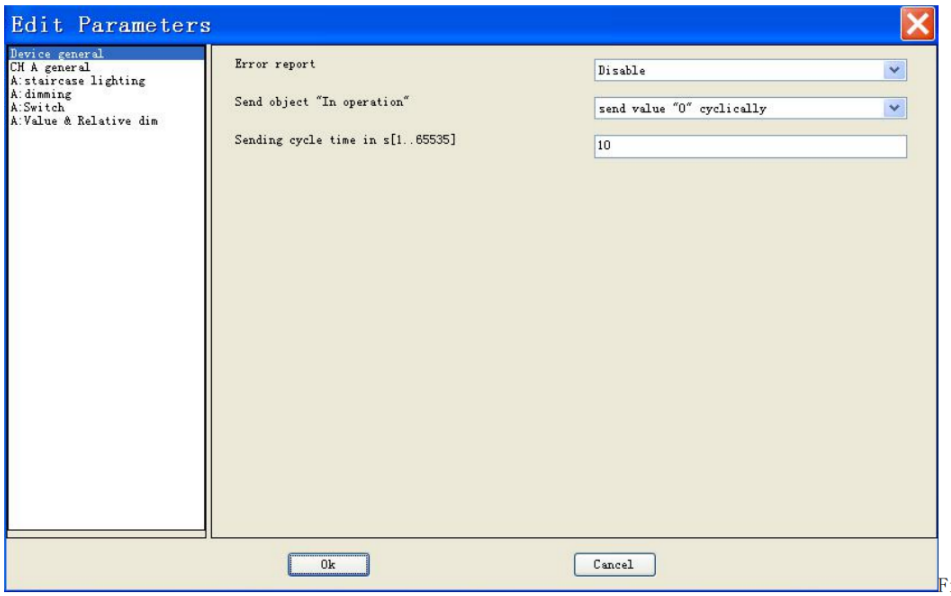


Fig. 6.2-1 parameter window "Device general"

Parameter "Error report"

This parameter defines the error report status of the system, controlled by 1 byte data bit. Options:

Disable

Enable

There is an error report after the malfunction in the system when selecting "*enable*", otherwise, there is no report when selecting "disable". It will send an alarm to switch off the device if with over temperature, overload or short circuit.

Parameter "Sending cycle time in s [1...65535]"

This parameter defines the time interval that the dimmers send the error report by the bus, which will be started when enabling the error report.

Options:

1.....65535s

Parameter "Send object 'in operation'"

This command is used to send messages "1" or "0" to the BUS periodically to check the device whether is working or not.

Options:

No

Send value "0" cyclically

Send value "1" cyclically

It will not send any telegram with "*No*"; and show the following parameters with "*Send value '0' cyclically*" or "*Send value '1' cyclically*" to define the time interval of sending telegram.

Parameter "Sending cycle time in s [1...65535]"

This parameter defines the time interval of the telegram to report the normal working condition of the dimmer.

Options:

1...65535s

6.3 Parameter Window "CH X general"

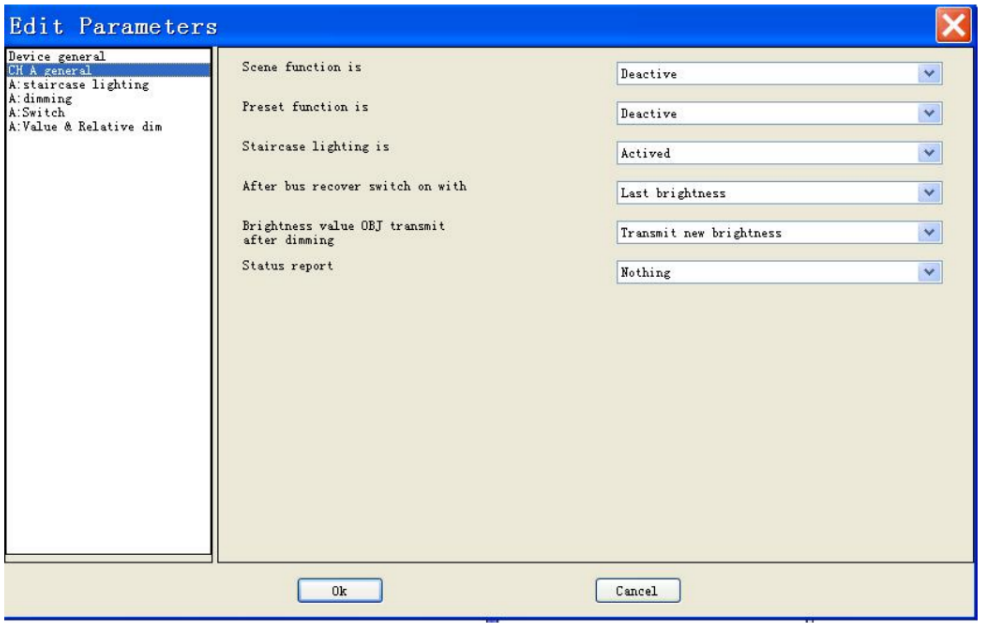


Fig. 6.3-1 parameter window "CH X general"

The parameter window of "CH X general" can be seen in Fig. 6.3-1, which activate or deactivate the function of Channel X. The "CH X" or "X" in the following text means any one output of the dimmers. The functions are describes as below and all the channels have them same functions setup.

Parameter "Scene function is"

Options:

Actived

Deactive

Enable dimmer scene function of channel X with *"Actived"*; Disable channel X scene function with *"Deactive"*.

Parameter "Preset function is"

Options:

Actived

Deactive

Enable dimmer preset function of channel X with *"Actived"*; Disable channel X preset function with *"Deactive"*.

Parameter "Staircase lighting is"

Options:

Actived

Deactive

It is in the status of staircase lighting control with "*Actived*" and in the normal dimming control with "*Deactive*".

Parameter "After bus recover switch on with"

It means in the normal situation, the behavior after the BUS reset is the brightness value before power off or the preset value.

Options:

Last brightness

Preset brightness value

The option "*Preset brightness value*" means the brightness value after the BUS power recovers is the input preset brightness value in the "*bus recover preset brightness value (0%~100%)*". If the input preset

value is smaller than the low threshold, the value after the BUS power recovery is the low threshold; if the preset input value is greater than the high threshold, the value after the BUS power recovery is the high threshold. The high and low threshold are shown in the parameter window "CH X : Value & Relative dim"

The option "*Last brightness value*" means the brightness value is the last value before power off after BUS power recovery.

Parameter "Bus recover preset brightness value(0%～100%)"

It is used to set the brightness value during the BUS power recovery, and the range is 0%～100%.

Parameter "brightness value OBJ transmit after dimming"

This function is used to report the latest brightness value. When enable this function, it will send a frame to the BUS no matter what happen to make the brightness value changed.

Options:

Nothing
Transmit new brightness

It will not send any report of the current brightness value with "*Nothing*". And send a frame to the BUS to report the current brightness value no matter what happens to make the brightness value changed with "*Transmit new brightness*".

Parameter "Status report"

This function defines whether report the switch status to the BUS when the setup object "*switch*" is changed. Send "*1*" to the BUS when the current brightness value is greater than 0; send "*0*" when the value is equal to 0.

Options:

Nothing
It's new status

It will not send any report of the current switch status with "*Nothing*". And send a status changed report of switch to the BUS with "*its new status*".

6.4 Normal Dimming Mode

6.4.1 Parameter Window"X: dimming"

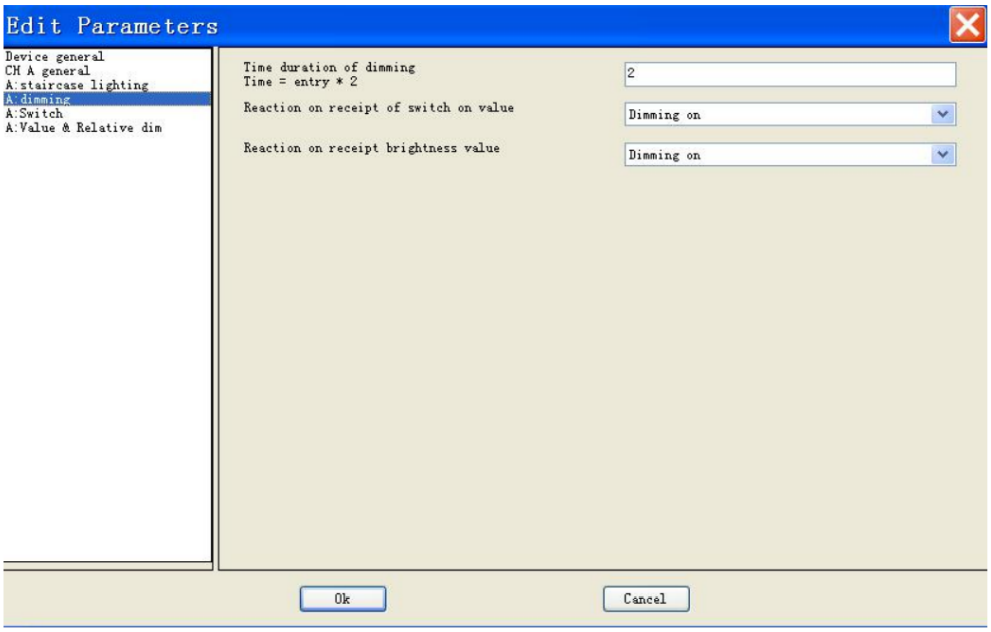


Fig. 6.4.1-1 parameter window "X: dimming general"

Parameter "time duration of dimming time=entry*2"

It is used to set the dimming time duration. No matter it is brightness dimming or switch dimming, when choosing the dimming time duration for dimming on or dimming off, the time is equal to this input value multiply 2 seconds, and the maximum input time is 255s.

Parameter "reaction on receipt of switch on value"

It shows the time duration to switch on the luminaries in switch mode.

Options:

Dimming on
Switch on softly

The option "*Dimming on*" means the switch dimming time is the input time multiplies 2. Then option "*Switch softly*" means the default dimming time is 4s.

Parameter "reaction on receipt brightness value"

It is used to set the brightness value in the brightness dimming mode.

Options:

Dimming on
Switch on softly

The option "*Dimming on*" means the brightness dimming time is the input time multiplies 2. Then option "*switch softly*" means the default dimming time is 4s.

6.4.2 Parameter Window "X: Switch"

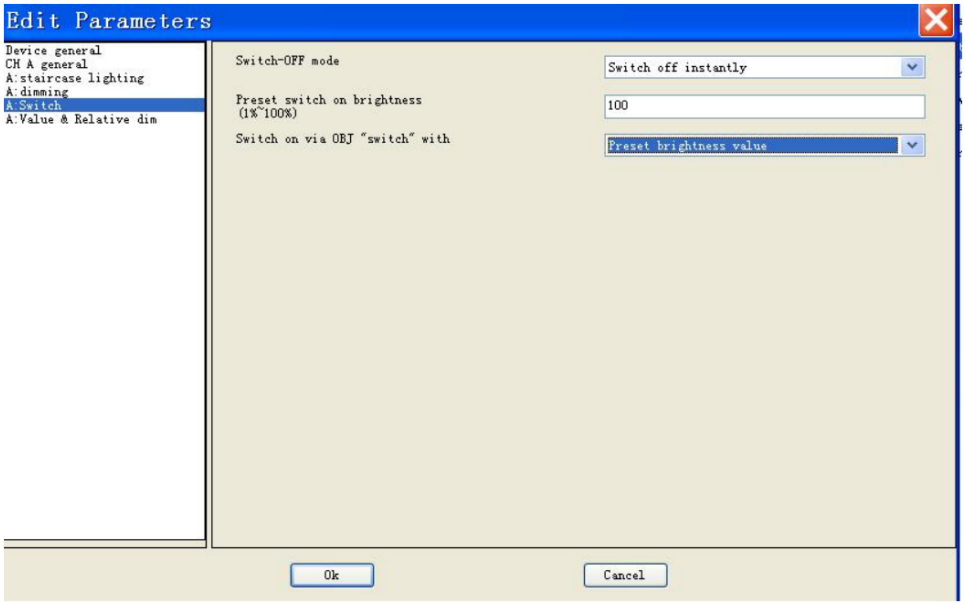


Fig. 6.4.2-1 parameter window "X: switch"

Parameter "Switch-off mode"

It shows the time duration to switch off the luminaries in switch dimming mode.

Options:

Dimming off
Switch off softly
Switch off instantly

The option "*Dimming off*" means the switch dimming time is the input time multiplies 2. The option "*switch softly*" means the default dimming time is 4s.

The option "*switch off instantly*" means the luminaries are switch off immediately.

Parameter "Preset switch on brightness(1%～100%)"

It is used to set the brightness value when switch on the luminaries in switch mode, with the setting range 1%~100%.

Parameter "Switch on via OBJ "switch" with"

It is used to select the brightness value is the last one or the preset one when using the switch mode to switch on the luminaries.

Options:

Preset brightness value

Last brightness value

The option "*Preset brightness value*" means the brightness value is the preset value when switching on the luminaries by switch mode. When the brightness low threshold value is greater than the switch preset value, the brightness value of the luminaries is the low threshold value after switching on; when the switch preset value is greater than the high threshold, the brightness value is the high threshold one after switching on. The high and low threshold of the brightness are shown in the parameter window "CH X : Value & Relative dim".

The option "*Last brightness value*" means the brightness value is the last status' value which is not equal to 0. If the behavior of switching on the luminaries in switch mode after the BUS reset, and the luminaries during BUS reset are off, so the brightness value is the default brightness value 128; Other cases, the brightness value is the last status' value which is not equal to 0 on switching mode.

6.4.3 Parameter Window "X: Value & Relative dimming"

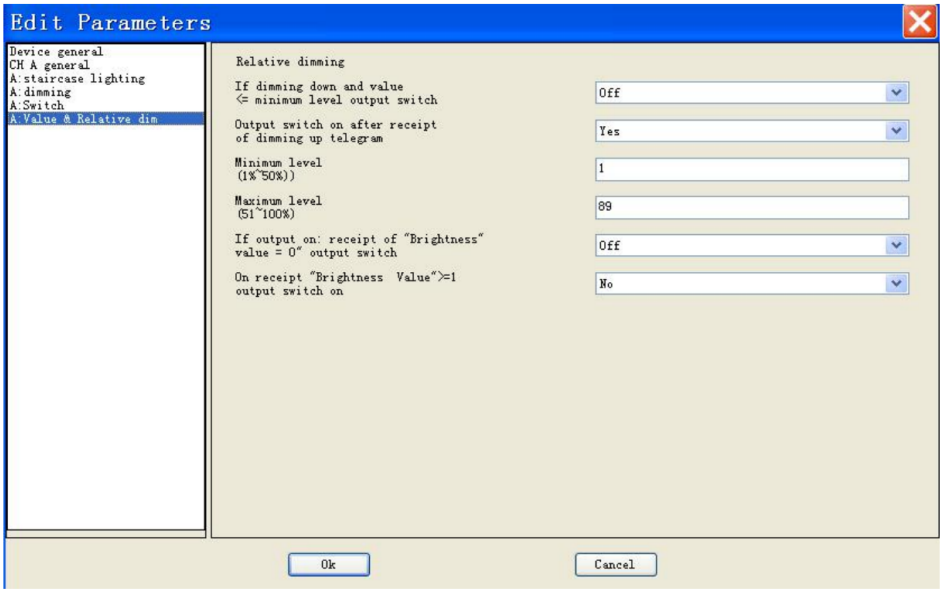


Fig. 6.4.3-1 parameter window "X:dimming"

This window is used to set the parameters in the brightness dimming mode. There are 2 type of brightness dimming mode: *Relative dimming* and *Brightness value*:

Relative dimming

Parameter "If dimming down and value <=minimum level output switch"

This parameter defines the action after relative dimming, whether it will be off or stay in the low threshold value.

Options:

Off
To low threshold value

Supposing the low threshold is 50. If it is "*Off*", it will switch off the luminaries when dim DOWN to 50; if it is "*To low threshold value*", the value of the luminaries will remain the same even when dimming DOWN to 50. However, no matter whether it is "*Off*" or "*To low threshold value*", if the low threshold of the relative dimming is smaller than that of the brightness, it will switch off the luminaries automatically when dimming DOWN to the low threshold of the brightness value; if the high threshold of the brightness is greater than relative high threshold, it is only possible to dim UP to the high threshold of the brightness. (The high and low threshold value will limit the total brightness value of the dimmer, see more details in the below description.)

Parameter "Output switch on after receipt of dimming up telegram"

It tells that whether it is possible to switch on the luminaries when receiving the "*dimming up*" message from relative dimming if the output is 0.

Options:

No
Yes

Supposing the current output is 0. If it is "*NO*", the output still remain 0 even when the target receives the message "*dimming UP*"; if it is "*YES*", it will dim the luminaries to the modified value when receiving the "*dimming up*" message. If the value after dimming up is smaller than the brightness low threshold, it will be dimmed to the low threshold directly. If the value after dimming up is greater than the brightness high

threshold, it will be dimmed to the high threshold directly.

Brightness value

The high and low threshold value limits the high and low output value. It is not allowed to change the brightness value if it is beyond the high and low threshold which will be invalid. For example in Fig. 6.4.3-1 the value is set as 1~255. If the low threshold value is set as 50 and the high threshold is 200, the brightness value "210" will be invalid. The luminaries will be dimmed from the low threshold directly when the brightness value goes up from 0; the luminaries will be dimmed from the high threshold directly when the brightness values goes down from 255.

Parameter "Minimum level（1%～50%)"

This function defines the low threshold of the dimmer, and the range is 1~50%. It is going to start dimming from the low threshold. Supposing the current brightness value is 0; the low threshold is 30% and the high threshold is 90%. If receiving the message "15%", the brightness value will go to 30% directly without gradual change; if receiving the message "60%", so the brightness value will first go to 30% and then go up to 60% gradually; if the current value is 80% and the target value is 15%, so the value will go from 80% to 30% and the brightness value is 30%.

Parameter "Maximum（51%～100%)"

This function defines the high threshold of the dimmer, and the range is 51~100%. Supposing the low threshold is 30%, and the high threshold is 90%. If the input brightness value is greater than 90%, it will go to 90% directly.

Parameter "If output on : receipt of "brightness value=0"output switch"

This function defines it is available or not to switch off the output by the defined brightness vale "*0*".

Options:

Off

To minimum level

The option "Off" means the output is 0 when the brightness value is 0.

The option "*To minimum level* e" means the output is the low threshold when the value is 0.

Parameter "On receipt "brightness value">=1 output switch on"

This function defines it is available or not to switch on the output by brightness dimming mode when the output is 0.

Options:

No

Yes

The option "*No*" means the dimmer remains the output "*0*" when receiving the message of 100 if the output is 0. The option "*Yes*" means the output is the input brightness value when the receiving value is greater or equals to 1; if the input brightness value is smaller than the brightness low threshold.

6.4.4 Parameter Window "X: scene page"

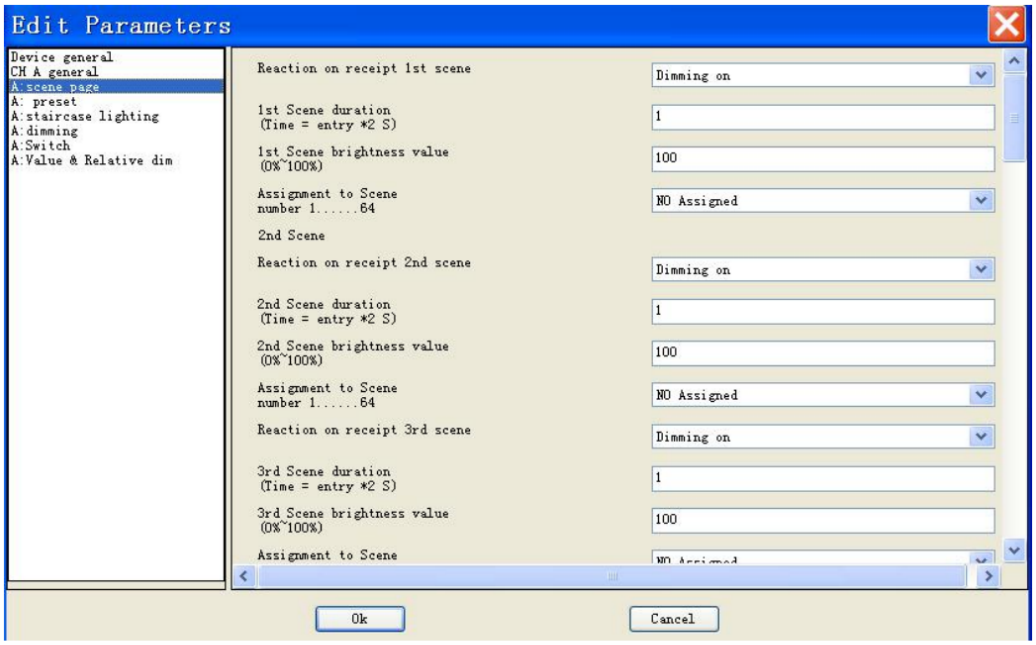


Fig. 6.4.4-1 parameter "X: scene page"

This parameter window "CH X scene page" show in Fig. 6.4.4-1, here set the scene function, totally 16 scenes from 1 to 16.

It is able to set 15 scenes simultaneously and call any one of them by control panel when needed.

Parameter "Reaction on receipt Y scene"

The function defines the dimming mode of the set scene. Y means the scene that needs setting, from 1~16. The Y shown as below has the same meaning.

Options:

Dimming on
Switch on softly

The option "*Dimming on*" means the set scene dimming time is the set time of the parameter "*Scene Y duration (time=entry*2s)*": the input time multiplies 2. The option "*Switch on softly*" means the scene dimming time is the default time "*4S*".

Parameter "Scene Y duration（time=entry*2 S）"

This function defines the dimming time of the set scene, which is the input value multiplies 2s; the maximum input time is 255s.

Parameter "Scene Y brightness value（0%~100%）"

This function defines the brightness value of the set scene, with range from 0% to 100%.

Parameter "Assignment to Scene number 1…64"

This function distributes the scene number of the set scene, that means the communication object "*Scene/save X*" will call the scene by the allocated scene number.

Options:

Not assignment
Assignment to scene 1
Assignment to scene 2
……
Assignment to scene 64

Note: the parameter setting option is 1~64 field number or unallocated.

6.4.5 Parameter Window "X: preset"

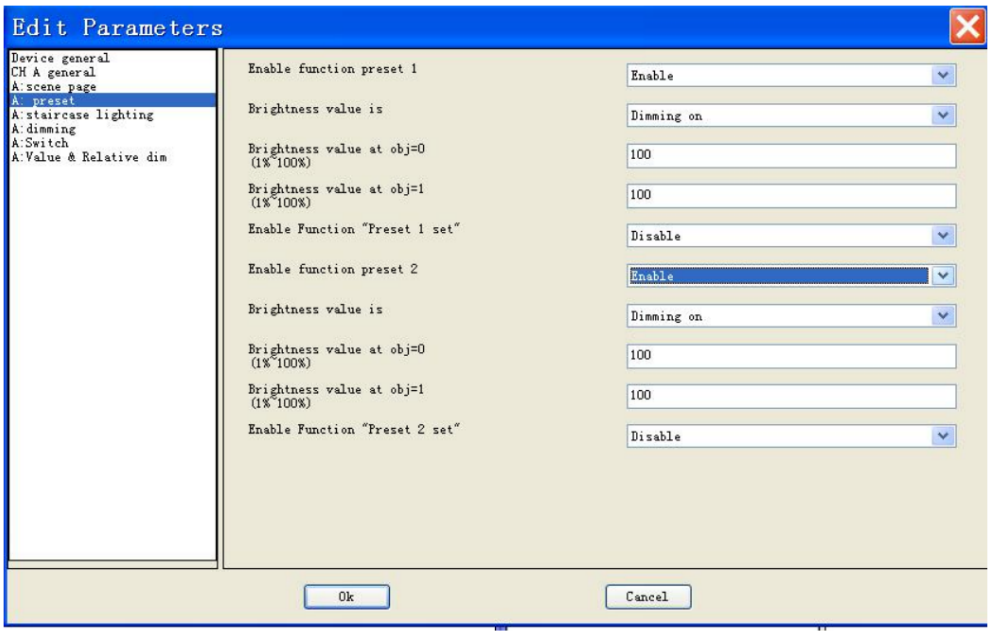


Fig. 6.4.5-1 parameter window "X: preset"

It is able set the brightness value in "X: preset" shown in Fig. 6.4.5-1. There are two preset objects per output: "*preset 1*" and "*preset 2*" which are used to realize the lighting control. It is also able to save the current brightness status as the new preset value. These 2 preset values have the same parameters setup, so here take one as an example.

Parameter "Active preset 1 via bus telegram"

This parameter is used to activate preset 1.

Options:

Active

Deactive

It will not activate the preset 1 with "*Deactive*", and show the following parameter with "*Active*".

Parameter "Brightness value is"

This parameter defines the time when starting the dimming by "*preset 1*", and there is 1 bit data to control "*X preset 1*": "*0*" and "*1*", which is able to call 2 different brightness values.

Options:

Dimming on

Switching on softly

When select "*dimming on*", the dimming time of object "*X preset 1*" is the input time of "*Time duration of dimming Time =entry*" multiplied by 2;

When select "*switching on softly*", the dimming time of "*X preset1*" is the default value: 4 seconds.

Parameter "Brightness value at obj=0(1%~100%)"

This parameter defines the brightness value when receiving "*0*" by "*X preset 1*".

Option: *1~100%*

Parameter "Brightness value at obj=1(1%~100%)"

This parameter defines the brightness value when receiving "*1*" by "*X preset 1*".

Option: *1~100%*

Parameter "Preset 1 can be set via the bus"

Options:

Enable

Disable

This parameter defines the possibility to change the preset value. It is able change the preset value with "*enable*" and also start the communication object "*Set preset 1*", which is used to save the current switch status as the new preset value. It will save the current brightness status to the "*brightness value at obj=0*" and replace that value with "*0*"; will save the current brightness status to the "*brightness value at obj=1*" and replace that value with "*1*".

6.5 Staircase Lighting Mode

It is able to set the parameters of staircase lighting mode in Fig. 6.5-1.

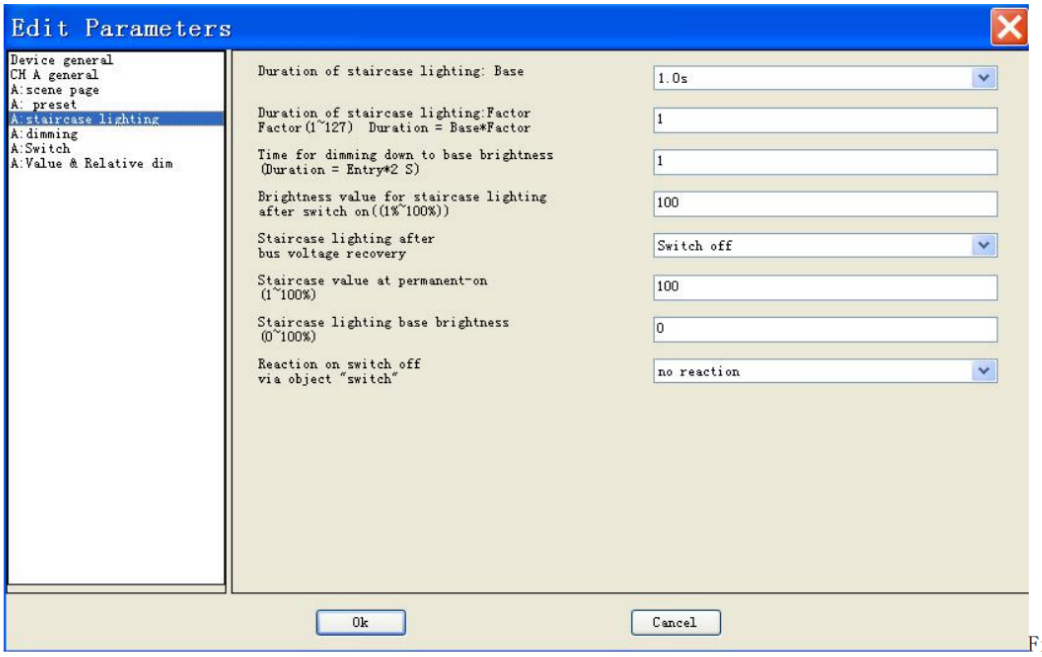


Fig. 6.5-1 parameter window "CH X staircase lighting"

Parameter "Duration of staircase lighting : Base"

Set the time of base: 1.0 s / 2.1 s / … / 1.1 min / … / 1.2 h.

Parameter "Duration of staircase lighting : Factor"

Set the time of factor: 1~255 S

When switch on the staircase luminaries by "*switch*" mode, the ON duration time is: *duration=base*factor*. It will switch off the luminaries when the brightness goes down to the base brightness value gradually after the ON duration time.

Parameter "Time for dimming down to base brightness (Duration=Entry*2s)"

This function defines the time that the brightness value of the staircase lamps goes down to base brightness value: *Duration=Entry*2*. The maximum input value is 255s.

The luminaries will be switched off when the brightness value of the staircase goes down to base brightness value

.

Parameter "brightness value for staircase lighting after switch on"

The function defines the brightness value of the staircase when switching on the luminaries by "*switch*" mode. Brightness range is 1~100%, this brightness must be higher than staircase lighting base brightness value.

Parameter "Staircase lighting after bus voltage recovery"

The function defines the status of the staircase luminaries after the BUS power recovery.

Options:

Switch on

Switch off

The option "*Switch on*" means switch on the staircase luminaries after the BUS power recovery; *duration=base*factor*.

The option "*Switch off*" means switch off the staircase lamps after the BUS power recovery, the brightness value is staircase lighting base brightness value.

Parameter "Staircase value at permanent-on(1%～100%)"

The function defines the output status of the staircase luminaries as a fixed brightness value. It will not switch off the staircase luminaries without receiving the OFF message from "*permanent on*". "*permanent on*" is another output mode of the staircase luminaries. The DOWN time of turning off the luminaries is set by the parameter "*Time for dimming down to base brightness (Duration=Entry*2)*". It will switch off the luminaries when going down to base brightness. The range is 1%~100%.

Parameter "Staircase lighting base brightness (0%～100%)"

The parameter defines the staircase lighting minimum value; it can be set to off, can also set a minimum value of the low brightness.

Parameter "Reaction on switch off VIA OBJ 'switch' "

Options:

No reaction

To base brightness immediately

Dimming to base brightness

The option is “No reaction”，without response to the switch off action；

The option is “To base brightness immediately”，go to staircase lighting base brightness directly；

The option is “Dimming to base brightness”，go to staircase lighting base brightness on setting time；

7 Communication Object Description

Communication object is the media of devices on the bus communicate with other device, that is, just communication object can communicate with the BUS. The role of each communication objects as following.

7.1 Communication object of “Device General”

There are 2 communication objects in "Device General" in Fig. 7.1-1 and functions are shown in table 7.1-1.

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
18	Error report	Report error of deivce			1 Byte	C	-	-	T	-		Low
19	In operate	In operate			1 bit	C	-	-	T	-		Low

Fig. 7.1-1 Communication object of Device General

Note:
“C” in “Flag” column in the below table means enable the communication function of the object;
“W” means it is able to modify the other devices’ value by the communication objects;
“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 modified by other devices.

No.	Function	Object Name	Data Type	Flags
19	**In operate**	**In operate**	**1bit**	**C,T**
This object is used to declare the working condition by sending “1” or “0” to the bus cyclically, which is enabled when selecting “send value '0' cyclically” or “send value '1' cyclically” in the parameter “Send object 'in operation'” and disabled when selecting “no”. It will send “0” with option “send value '0' cyclically” and “1” with “send value '1' cyclically”.				
18	**Report error of device**	**Error report**	**1byte**	**C,T**
This object is used to report the error status of the system. It will be disabled with “Error report”, and report error information when the system has the malfunction with the option “Enable”. It will also send an alarm to switch off the device with over temperature, overload or short circuit.				

Table 7.1-1 Communication object of Device General

7.2 General communication object of "Dimming Actuator"

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
0	OUTPUT A	Switch / status A			1 bit	C	R	W	T	-		Low
2	OUTPUT A	Brightness / status A			1 Byte	C	R	W	T	-		Low
1	OUTPUT A	Relative dimming A			4 bit	C	-	W	-	-		Low

Fig. 7.2-1 general communication object of each load (1)

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
0	OUTPUT A	Switch A			1 bit	C	-	W	-	-		Low
2	OUTPUT A	Brightness A			1 Byte	C	-	W	-	-		Low
1	OUTPUT A	Relative dimming A			4 bit	C	-	W	-	-		Low

Fig. 7.2-2 general communication object of each load (2)

No.	Function	Object Name	Data Type	Flags
0	**Switch/status X**	**OUTPUT X**	**1bit**	**C,R,W,T**
This object is not only used to receive the switch command to switch the dimmer actuator, but also report the status of the current switch to the bus. The dimmer is switched on with "1", off with "0". It will send "1" to the bus when the value of the switch is larger than 0, "0" to the bus with value of "0". It will enable the "Switch X" in Fig. (2) when selecting "nothing" in the parameter "Status report".				
0	**Switch X**	**OUTPUT X**	**1bit**	**W,C**
This object is only used to receive the switch command to switch the dimmer actuator. It will switch on the dimmer actuator with "1", off with "0".				
2	**Brightness/status X**	**OUTPUT X**	**1byte**	**W,C,R,T**
This object is used to receive the brightness value to switch the dimmer actuator. It will switch on the actuator when the received value is larger than 0, off or stay to the lower threshold value with "0", which is defined by the parameter setup in the brightness value dimming. It is also sending the brightness report of the current output to the bus whatever causes the changes of the value. It will enable "Brightness X" when selecting "nothing" in the parameter "Brightness value OBJ transmit after dimming".				
2	**Brightness X**	**OUTPUT X**	**1byte**	**W,C**
It is used to receive the brightness value to switch the dimmer actuator, switching on the actuator when the received value is larger than 0, off or stay to the lower threshold value with "0", which is defined by the parameter setup in the brightness value dimming.				
1	**Relative dimming X**	**OUTPUT X**	**4bit**	**W,C**
This object is used to dim up or down the outputs. It will dim down when the input value is from 1 to 7. During this				

range, smaller amplitude of dimming down with larger value; that means it will dim down to the biggest amplitude with 1, while to the smallest amplitude with 7, and 0 means stop dimming. It will dim up when the input value is from 9-15. During this range, smaller amplitude of dimming up with larger value; that means it will dim up to the biggest amplitude with 9, while to the smallest amplitude with 15, and 8 means stop dimming.

Table 7.2-1 communication table for each load

7.3 Scene function communication object of "Dimming Actuator"

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
4	OUTPUT A	Scene / save A			1 Byte	C	-	W	-	-		Low

Fig. 7.3-1 Scene function communication object

No.	Function	Object Name	Data Type	Flags
4	**Scene /save X**	**OUTPUT X**	**1Byte**	**W,C**
This object is used to send an 8bit command to transfer or save the scene. This object is opening when on enable scene function. The mean of 8bit as following: Set up an 8bit command (binary code) as: FXNNNNNN F: "0" transfer scene; F: "1" save scene; X：Un-used, not affect the results; NNNNNN：scene number（1...64）				

Table 7.3-1 Scene function communication object

7.4 Preset value function communication object of "Dimming Actuator"

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
8	OUTPUT A	Set preset 2			1 bit	C	-	W	-	-		Low
7	OUTPUT A	A Preset 2			1 bit	C	-	W	-	-		Low
6	OUTPUT A	Set preset 1			1 bit	C	-	W	-	-		Low
5	OUTPUT A	A Preset 1			1 bit	C	-	W	-	-		Low

Fig. 7.4-1 preset function communication object

No.	Function	Object Name	Data Type	Flags
5	**X preset 1**	**OUTPUT X**	**1bit**	**W,C**
It is the communication object of preset 1 and call the preset value. When the object receives the logical value of "0", the brightness value of dimming are defined by "Brightness value at obj=0"; when the object receives the logical value of "1", the brightness value of dimming are defined by "Brightness value at obj=1". This object will be started after activating preset1.				
6	**Set preset 1**	**OUTPUT X**	**1bit**	**W,C**
This object is used to modify brightness value of preset1. It will start the parameter "preset1 can be set via the bus" with "Enable". Via this object can save current brightness status as new preset value. It will save the current brightness value to "brightness value at obj=0" with "0", that is to replace the is value; It will save the current brightness value to "brightness value at obj=1" with "1", that is to replace the is value.				
7	**X preset 2**	**OUTPUT X**	**1bit**	**W,C**
It is the communication object of preset 2 and call the preset value. When the object receives the logical value of "0", the brightness value of dimming are defined by "Brightness value at obj=0"; when the object receives the logical value of "1", the brightness value of dimming are defined by "Brightness value at obj=1". This object will be started after activating preset1.				
8	**Set preset 2**	**OUTPUT X**	**1bit**	**W,C**
This object is used to modify brightness value of preset 2. It will start the parameter "preset 2 can be set via the bus" with "Enable". Via this object can save current brightness status as new preset value. It will save the current brightness value to "brightness value at obj=0" with "0", that is to replace the is value; It will save the current brightness value to "brightness value at obj=1" with "1", that is to replace the is value.				

Table 7.4-1 Preset value function communication object

7.5 Staircase Lighting Function communication object of "Dimming Actuator"

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
0	OUTPUT A	Switch / status A			1 bit	C	R	W	T	-		Low
2	OUTPUT A	Brightness / status A			1 Byte	C	R	-	T	-		Low
3	OUTPUT A	Permanent on A			1 bit	C	-	W	-	-		Low

Fig. 7.5-1 Staircase Lighting Function communication object (1)

N...	Name	Object Function	Descr...	Group Addresses	Le...	C	R	W	T	U	Data Type	Prio...
0	OUTPUT A	Switch A			1 bit	C	-	W	-	-		Low
3	OUTPUT A	Permanent on A			1 bit	C	-	W	-	-		Low

Fig. 7.5-2 Staircase Lighting Function communication object (2)

Fig. (1) is the communication objects when activating both switch and brightness status;
while Fig. (2) is the unable communication objects.

No.	Function	Object Name	Data Type	Flags
0	**Switch/status X**	**OUTPUT X**	**1bit**	**C,R,W,T**
The communication object is used to switch the staircase light function of dimmer. It will switch off the staircase lighting after a certain on time, and the starting staircase lighting time are defined by "Duration of staircase lighting: Base" and				

"Duration of staircase lighting: Factor" and lights on duration is: duration=base*factor. It will be off automatically after some time. It will switch off the lights with "0", and also report the current switch status to the BUS. When the brightness value of switch is greater than 0, it will send "1" to BUS; When the current brightness value is 0, it will send "0" to the BUS. Enable the communication object is Fig (2) "Switch X" with "nothing" in "Status report".				
0	**Switch X**	**OUTPUT X**	**1bit**	**W,C**
The object is only used to switch staircase light function of dimmer. It will switch off the staircase lighting after a certain on time, and the starting staircase lighting time are defined by "Duration of staircase lighting: Base" and "Duration of staircase lighting: Factor" and lights on duration is: duration=base*factor. It will be off automatically after some time. It will switch off the lights with "0".				
2	**Brightness/status X**	**OUTPUT X**	**1byte**	**C,R,T**
The object reports the current output value to the BUS. It will send the data to the bus no matter of changed reason and report the current brightness value. It is unable with "nothing" in "Brightness value OBJ transmits after dimming".				
3	**Permanent on X**	**OUTPUT X**	**1bit**	**C,W**
The object receives the logical value "1" to open staircase light for a long time, receives the logical value "0" to end the staircase light.				
4	**Staircase lighting Enable X**	**OUTPUT X**	**1bit**	**C,W**
The object receives the logical value "1" to enable the staircase light function, receives the logical value "0" to suspend the staircase light.				