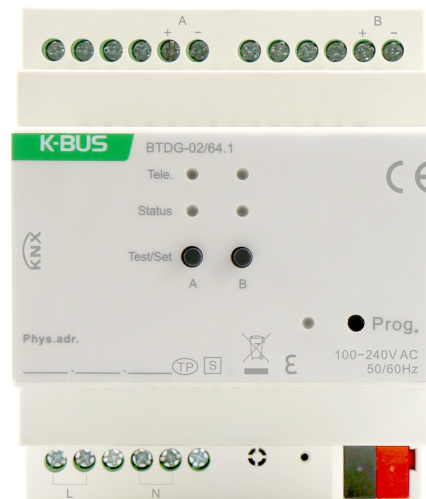


User Manual

K-BUS[®] KNX/DALI Gateway, 1/2-Fold_V1.4

BTDG-01/64.1

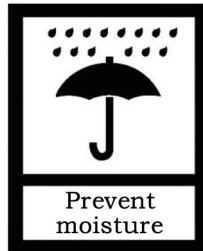
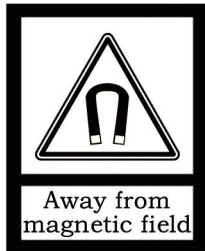
BTDG-02/64.1



KNX/EIB Home and Building Control System

Attentions

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



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



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



4. Please do not disassemble the devices.

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Chapter 1 Summary

KNX/DALI Gateway is designed for KNX intelligent building control system and used to connect KNX bus and DALI bus. As the interface between KNX installation system and DALI network, messages from the KNX bus can be converted into information that can be identified by the DALI device via this gateway. The information contains the DALI device address and command, and send to the DALI network to control the DALI device, thus to realize the functions of switching, dimming and scene, etc. of various lamps with DALI ballasts, while the DALI gateway can request the status of the DALI device, failure detection, and convert the status and failure information into KNX telegrams, and feed back to the KNX bus.

KNX/DALI gateways have two product types with 1-Fold and 2-Fold output. Each channel can connect up to 64 DALI devices. Each DALI device can be controlled by a direct switching, dimming, or brightness value by using a KNX communication object. The assignment of DALI device addresses can be done manually or automatically. At the same time, we provide a commissioning software tool (DCA or PC software) for users to easily modify the address, test, and assign groups and scenes to the DALI device,etc.

Note: DCA is a App plug-in in ETS embedded in the application of the product. PC software is the software (KnxDaliDebug.exe) which runs independently in PC.

This manual provides detailed technical information about the KNX/DALI gateway, including installation and programming details, and explains how to use it in the practical examples.

1.1. DALI System Introduction

In the same DALI network, there are up to 64 slave units, each with a separate address (Short address). It is also possible to assign a slave unit to a group (up to 16 groups can exist at the same time), and one slave unit can belong to a different group. The host can also send information to all slave units. The main features of the DALI protocol: asynchronous serial communication, 1200 baud rate, two-wire differential signal, a DALI bus can be connected to 64 slaves, each slave can be individually addressed, not two-way communication at the same time.

1.2 Product and Function Description

The KNX/DALI gateway is a modular mounting device. For easy installation into the distribution box, it can be mounted on a 35 mm DIN-rail according to EN 60 715. The device is screwed to the electrical connection and the bus connection is directly through the KNX. Connect the terminal block and input the power supply voltage of 100~240V AC. For the assignment of physical addresses and parameter settings, the engineering tool software ETS (version ETS4 or higher) with the .knxprod file can be used.

The main functions of the KNX/DALI gateway are summarized as follows:

- ◆ **Each output channel of KNX/DALI gateway supports 64 DALI devices. Each DALI device can be controlled separately by switching , dimming and brightness value setting.**
- ◆ **Global scene control: There are 16 scenes for each output channel to be recalled or stored. The brightness value of the scene is configured by the debugging software tool (DCA or PC software).**
- ◆ **Group control: Each output channel can be configured with 16 different groups. The allocation of devices in the group is realized by ETS or debugging software tools. It can switch, dim and set the brightness value for each group. At the same time, group control supports color temperature adjustment**
- ◆ **Group scene control: Each group can be assigned 8 KNX scenes or 16 DALI scenes. The brightness of the KNX scene is configured by ETS. The brightness of the DALI scene is configured by the debugging software tool.**
- ◆ **Each operation channel can be configured with 8 operation templates. The switch and dimming control behavior of each DALI device and DALI group can refer to the configuration of the template or the ECG configuration.**
- ◆ **Status request and feedback, such as switch, brightness, running time, etc.**
- ◆ **Error detection of ballasts and lamps for DALI equipment**
- ◆ **Monitoring of DALI bus voltage, DALI bus current and DALI bus short circuit**
- ◆ **Channel broadcast control: Switching, dimming and setting the brightness value of all DALI devices in the channel**

Chapter 2 Technical Data

Power Supply	Operating Voltage	21-30V DC, obtained through KNX bus
	Bus quiescent current	10.1mA/30V DC 12.3mA/24V DC
	Bus standby power	< 360mW
	Auxiliary supply voltage	100~240V AC, 50/60Hz
	Auxiliary power input current	<55mA, 220V AC
	Auxiliary power input power consumption	<12W, 220V AC
DALI Output	1/2 channel	Each channel 64 DALI devices
	Single channel current	≤250mA
	Load voltage	15~19V DC
	Distance between gateway and DALI device: (cross section of cable - distance)	0.5mm ² —100m 1.5 mm ² —300m
Connection	KNX	KNX connection terminal connection, 0.8 mm Ø
	Auxiliary power and output	Screw terminal Use wire diameter 0.5-2.5mm ² Torque 0.5N-m
Operating and Indicating	Programming buttons and red LED	Used to assign physical addresses
	Green LED flash LED (Tele.)	Indicates that the device application layer is working normally. Fast flashing indicates that the DALI bus is being initialized; Flashing during communication, indicating that there is received message data on the DALI bus; Permanent light indicates that DALI bus initialization is complete

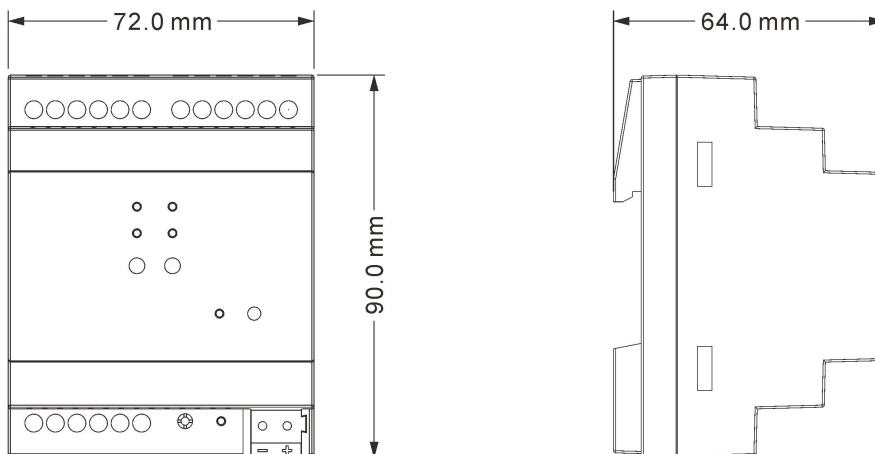
	LED (Status)	The LED indicates that the entire channel switch is on, and the off indicates that the entire channel is off. It is only applicable to the channel A and B control indications and the channel's broadcast switch control indication (single channel device only A)
	Test/Set Button	LED flashes, indicating that the DALI gateway is initializing Short press <5s: for on/off all DALI devices to test unconnected DALI devices; Long press >5s: reinitialize DALI bus
Protection class	IP 20, EN 60 529	
Temperature	Operation	-5°C...+45°C
	Storage	-25°C...+55°C
	Transport	-25°C...+70°C
Ambient	Relative humidity	<93%, Except for condensation
Design	Modular mounting equipment	
Shell, color	Plastic housing, gray	
Mounting	Mounted on a standard 35mm DIN rail, DIN EN 60 715	
Size	72mm ×90mm ×64mm	
Weight	0.25KG	

Application	Maximum number of communication objects	Maximum group address	Maximum number of associations
KNX/DALI Gateway,1/2-Fold	2027	4096	4096

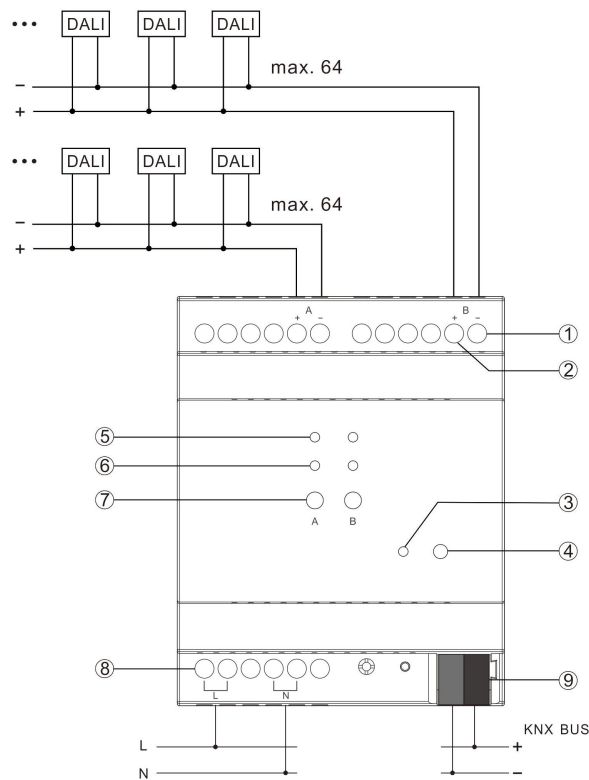
Chapter 3 Dimension and Connection Diagram

Taking dimensional and connection diagram of the 2-Fold KNX/DALI gateway as an example, and the 1-Fold is similar.

3.1 Dimension Diagram



3.2 Connection Diagram



① DALI output negative pole

② DALI output positive pole

③ Red LED indicates programming the physical address; Green LED flashing indicates the application layer works normally

④ Programming button

⑤ LED (Tele.):

Fast flashing indicates initializing DALI bus;

Flashing during communication, indicating that there is received telegram data on the DALI bus;

Permanent on, indicating that DALI bus initialization is complete.

⑥ LED (Status)

LED on indicates that the entire channel switch is on, and the off indicator indicates that the entire channel is off. It is only applicable for the control indication of channel buttons A and B, and the switch control indication of channel broadcast.

LED flashing, indicate that the DALI gateway is initializing the configuration.

⑦ Test/Set button

Short press <5s: for on/off all DALI devices to test unconnected DALI devices

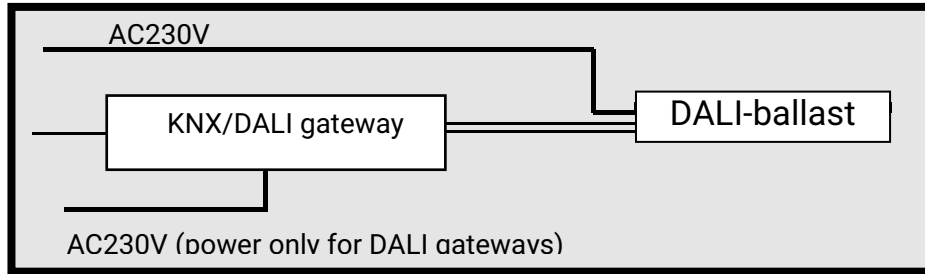
Long press >5s: reinitialize all devices on DALI bus or initialize the DALI devices without a DALI address or no action, according to the parameter "Test/Set button function via long press(>5s)" setting in section 5.2.

⑧ 230V AC auxiliary power input

⑨ KNX bus connection terminal

Chapter 4 Project Design and Application

4.1 Schematic



4.2 Overview of Functions

4.2.1 Control of a Single DALI Device

In the KNX/DALI gateway application, each DALI device for each output channel can be individually switching, dimming or brightness value controlled by an object, and the switch or brightness status can be requested. Such as:

Output X ECG y – Switch (switch control for device y)

Output X ECG y – Relative Dimming (relative dimming control for device y)

Output X ECG y – Brightness Value (brightness value control for device y)

Output X ECG y – Switch Status (request or respond to the switch status of device y)

Output X ECG y – Brightness Status (request or respond to the brightness status of device y)

(X=output channel A, B; y=DALI device 1..64)

4.2.2 Group Control

The KNX/DALI gateway is available in 16 groups, and multiple DALI devices for each output channel can be switching, dimming or brightness value controlled by an object. First, activate the group function in the ETS parameter configuration, configure its parameters, and then use the debugging software tool to group the DALI devices that need to be controlled together. You can also assign groups in ETS, in which only one of the two grouping modes can be selected. The following communication objects can directly switch, dim, and brightness value control:

Output X Group y – Switch (switch control for all devices in group y)

Output X Group y – Relative Dimming (relative dimming of all devices in group y)

Output X Group y – Brightness Value (controls the brightness value of all devices in group y)

Output X Group y – Switch Status (request or respond to the switch status of the y group device)

Output X Group y – Brightness Status (request or respond to the brightness status of the y group device)

(X=output channel A, B; y=group 1..16)

Note: Whether the group is configured via ETS or debugging software tools (DCA or PC software), in order to make the ECG in the group control work normally, it is also necessary to activate the ECGs in the group via ETS, otherwise these ECGs configured in the group are invalid.

4.2.3 Scene Control

The scene control of the KNX/DALI gateway is divided into global scene and group scene. The global scene is used for scene control of the entire channel. Group scene is only used in group control.

The KNX/DALI gateway provides 16 global scene (DALI scene) controls for each output channel, where the scene number is configured via ETS parameters, and the scene brightness values and DALI devices in the scene are configured by the debugging software tool. When the KNX device sends a scene number to the DALI gateway, all DALI devices in the scene will perform an operation to adjust the light to a preset brightness value.

The KNX/DALI gateway also provides 16 DALI scene controls or 8 KNX scene controls for each group. When the KNX scene control is selected, the brightness value and color temperature value of each scene can be configured in the ETS. When the DALI scene is selected, the configuration mode is similar to the global scene, except when the KNX device sends a scene number to call a group of the DALI gateway. The device that performs the action is only the device in which the scene is configured in the group.

The recall and storage of the scene supports 1 byte telegrams.

4.2.4 Broadcast Control

In the broadcast control mode, all DALI devices on the channel can simultaneously switch or set the brightness value operation. In the case of uneven brightness, the change of brightness is not synchronized, and some devices may reach the target brightness value first, some may reach the target brightness value later.

4.2.5 Working Mode

Normal mode: Each DALI device and each DALI group in this mode can be used for switching, relative dimming, and setting brightness values, as well as switching status and brightness status feedback.

Permanent mode: The DALI device or DALI group in this mode is output with a fixed brightness value. After the gateway is reset or programmed, the DALI device or group will automatically set the preset brightness value. **Note: If the DALI device fails (if the ECG is not powered when the gateway is started) and the device cannot output with the preset brightness value, the device brightness value will be automatically corrected within 60 seconds.**

Staircase mode: In this mode, the brightness values of the DALI device and the DALI group can be set by the switching, relative dimming and brightness values. The lamp brightness output is automatically turned off after a certain period of time delaying, or can be directly turned off by the object control. If the telegram of turning on the light is received again within the delay time before the lamp is turned off, the delay time is re-timed.

Normal/Night mode: The night mode control is similar to the staircase mode or the permanent mode. The main difference is that the night mode needs to be activated by activating the night mode object. If the night mode is not activated, the DALI device or the DALI group will work in the normal mode. In night mode, the DALI device or DALI group lights are automatically turned off after a certain period of time delaying, or output at a fixed brightness value.

Burn-in mode: In order to learn about the life of the lamp, many lamps will undergo a burn-in test when first used. During the burn-in phase, the lights cannot be turned off or dimmed, but run at 100% brightness. Therefore, the gateway is equipped with a burn-in function for each ECG and group, and each ECG or each group can activate the burn-in mode through the object. During burn-in, the ECG or group can no longer be controlled separately. If the gateway is out of power during burn-in, the burn-in

mode does not continue when the power supply is restored. It needs to be restarted by the object. When the burn-in mode is normally stopped (if the aging time is completed or turned off by the object), the device will return to the on or off value, or the previous brightness value, depending on the parameter settings, and can be controlled separately.

Note:

Operation mode priority: In addition to the broadcast control, the burn-in mode has the highest priority, and if the ECG or group is in burn-in mode, it cannot be changed to any other mode. Followed by , permanent mode. Finally, normal, normal/night and staircase mode, they have the same priority.

When a DALI device is assigned to group control, it is not recommended for independent control. The main purpose is to avoid the conflict between the single device control mode and the group control mode. And the behaviour of the device will use the behaviour of the group, rather than the behaviour of the single device. In addition, a DALI device can only be assigned to one DALI group.

4.2.6 Operation hour calculation

The gateway provides an operation time recording function for each lamp, unit in seconds, as long as the brightness value is >0% and recorded, and the recorded operation time can also be reset by the object. It is recommended to configure a maximum for each ECG based on the life of the lamp and activate the alarm object to facilitate maintenance when comes to the life end of the lamp.

4.2.7 ECG Failure or Lamp Failure Identification

A major advantage of DALI technology is the ability to individually identify lamp failures or ECG failures. Therefore, the gateway supports this function and offers a variety of analysis possibilities. In order to analysis, the gateway periodically scans all connected ECGs for ECG failures and lamp failures. The scan time can be configured via parameters. For example, if the time is set to 1s (standard setting) and 64 ECGs are connected, the complete process of scanning ECG and lamp failures takes 64s (each ECG and fault type is 1s), so it may be necessary to identify the failure before it has been occurred, it is probably about 1 minute. The failure scans of the two channels do not interfere with each other and can be performed simultaneously. The identified fault information can be sent to the KNX bus via the ECG's fault object (1 byte or 1 bit). In addition, the failure status of all ECGs can also be viewed via the debugging software tool, or the failure status of each ECG and lamp can be queried via object 14.

4.2.8 Device Failures Number and Failure Rate Analysis

On the entire DALI bus, according to the type of equipment failure, it is divided into ECG and lamp failure. The gateway sets the alarm settings for the fault rate for each type of failure, and can obtain their number of failures or failure rates through the communication objects, as well as the number of failures or failure rates in the entire DALI segment. In addition, the debugging software tool can also be used to view the number of failures and failure rates for each fault type, as well as the total number of failures and the total failure rate (all ECGs and lights).

4.2.9 Color Temperature Adjustment

The color temperature determines the light color of the lamp, and the color temperature unit is Kelvin (K). The group control of this gateway supports color temperature adjustment.

Known Kelvin values for light colors:

1500 K - candle

2700 K - incandescent lamp (60W)

2800 K - halogen lamp

4000 K - fluorescent light (natural white)

The table below lists common color temperatures and describes the lighting atmosphere and the scenes that are commonly used.

Color temperature	colour	Atmosphere	Scenes
2700 K	Warm White	Comfortable and warm	Living room, bedroom
3000 K	Bright and warm white	Warm, slightly brighter than warm white	Living space, restaurant
3500 K	Natural white	Objective and friendly	Corridor, office, showroom
4000 K	Natural white	Bright	Bathroom, kitchen, basement, garage
5300 K above	Daylight white	Similar to daylight, the blue ratio is very high	Industrial area, classroom

Note: When selecting lamps that support DALI signal conditioning and color temperature adjustment, pay attention to the type of lamps. There are two types of DT6 and DT8 commonly used on the market, and their control methods are different. DT6 needs to occupy two DALI addresses, while DT8 occupies one DALI address. If two DALI addresses is used to control a lamp, the number of lights that can be controlled on the DALI bus will be reduced by half. For DT8, it currently supports color temperature adjustment. (DT6 occupies a DALI address when no color temperature adjustment)

4.3 Operation Steps

The following steps are required for a newly installed project or a rectified project:

Firstly, test whether any DALI devices are not connected properly by short pressing the Test/Set button.

Secondly, parameter configuration of the device through the ETS software, and download the configured parameters to the gateway.

Thirdly, the device status is read by the commissioning software tool. If the number of devices is correct, the DALI bus initialization is not performed. If it is not correct, the device on the DALI bus needs to be initialized. Initialization: Press and hold the Test/Set button for more than five seconds. The DALI gateway starts to initialize the device on the bus and assigns an address to the DALI device from 0 to 64.

After the address is assigned, the user can test the device number corresponding to each lamps through the commissioning software tool, and adjust it so that the address corresponds to the device number. **It is recommended to connect up to 63 devices on the DALI bus, otherwise it is not convenient to change the DALI address through software.**

Finally, as needed, some parameter configurations, such as scene assignment, can be modified through commissioning software tools, if that configuration of the read device group and the operation of all the configuration are to be perform by the software. After reading, all configuration of the gateway will be updated on the commissioning software tool.

If you do not follow the above steps, the DALI device may not perform the operation according to the preset brightness value.

Note: In the address allocation phase, if there is an incomplete allocation address, start the initialization without address allocation operation (by debugging software operation). If address allocation still fail more than twice, then you need to start the DALI bus initialization operation (general debugging software operation or long press the Test/set button on the device for more than 5 seconds), this operation may cause the DALI device addressed to occur change.

Chapter 5 Parameter Setting Description in the ETS

5.1 Parameter Setting Interface “General”

Parameter setting interface "General" as shown in Figure 5.1, the configured basic parameters are valid for all DALI devices of the gateway.

Figure 5.1 Parameter Setting Interface "General"

Parameter "Device type"

This parameter selects the device type, whether the gateway used is 1-Fold or 2-Fold. Options:

1-Fold

2-Fold

The parameter configuration and functions are the same whether it is 1-Fold or 2-Fold. The following section will take one of the channels as an example.

Parameter "Device Name(max. 30 char)"

This parameter is used to input the device name (up to 30 characters).

Parameter "Send delay after KNX bus recovery"

This parameter defines the time delay for sending status telegrams after the bus recovery reset. Only when the delay is completed can the device send status telegrams to the bus. In a project with multiple gateways installed, different settings for this parameter can prevent all devices from sending status telegrams at the same time. Options:

Immediately

5s

10s

...

60s

This delay time does not include the initialization time of the device. This delay begins when the device is initialized.

After the bus voltage is recovery, the initialization time of the device startup increases with the increase of the connected DALI device. When the device is connected to 128 ECGs, the device startup initialization time will be completed within 2 minutes (excluding initialization time of KNX DALI gateway).

Note: This parameter only affects the status telegrams sent to the bus, and does not affect the operation performed. The operation is completed and may be performed after the device is initialized.

Parameter "Send cycle" "In operation" telegram (1..240, 0=inactive)s"

This parameter sets the interval at which the device periodically sends a telegram through the bus to indicate that the device application layer is operating normally. When set to "0", the object "In operation" will not send a telegram. If the setting is not "0", the object "In operation" will send a telegram with logic "1" to the bus for the set time period. Options: **0...240s, 0=inactive**

The cyclic telegram is monitored by the external device. If the external device does not receive the telegram within the monitoring time, the device is considered to be faulty or the bus transmission is interrupted. In order to reduce the bus load as much as possible, the maximum time interval should be selected according to actual needs.

Note: The time interval is counted from the completion of the device initialization, regardless of the bus power-on delay transmission.

Parameter "Limit number of telegram"

This parameter is used to set the number of telegrams sent by the device to the bus, mainly to reduce the bus load. Options:

No

Yes

Yes: All telegrams sent to the bus are subject to this parameter setting. At the same time, the parameters "Max. number of send telegrams" and the parameter "In period" are visible.

-- Parameter "Max.number of send telegrams"

This parameter sets the maximum number of telegrams that can be sent during the monitoring time. Options: 1...255

-- Parameter "In period"

This parameter sets the monitoring time for limiting the sending of telegrams. Options:

50ms

100ms

...

1min

After the bus voltage is recovery, the device initialization time and the transmission delay complete, the monitoring time starts to be counted, and the sending telegram is started to be counted. Once the maximum number of buffer allowed to be transmitted is reached, no telegram is sent on the bus until the set monitoring time is over.

When this monitoring time is over, a new monitoring time begins and the telegram count starts again. The telegram that was not sent in the last monitoring period will be sent when the bus is idle in the next monitoring period. However, the last monitoring period can buffer up to 2027 telegrams and is the current telegram value of the object.

Note: The above two parameters only affect the telegrams sent to the bus and do not affect the operations performed.

Parameter "Send delay between DALI status objects"

This parameter defines the delay between sending DALI status telegrams, that is, the interval between each status telegram transmission, which can prevent excessive bus load, for example, broadcast switch control. Options:

No delay

1s

2s

...

10s

All status telegrams sent to the bus are affected by this parameter setting, such as switch status, brightness status, DALI failure status, and so on.

Parameter "Cycle time for DALI failure requests"

This parameter sets the time period for sending DALI device (brightness, failure) request. In order to analyze ECG and lamp failures, and to figure out the actual brightness status of the lamp, failure request telegram and brightness query telegram must be sent periodically to the ECG on the DALI bus.

Options:

No request

1s

2s

...

10s

For example, if it is set to 1s and 64 ECGs are connected, the complete process of scanning the ECG and the lamp takes 64s (each ECG and failure type is 1s), so it may take about 1 minute before identifying that a failure has occurred.

Note: If "No request" is set, the gateway will not recognize the ECG and lamp failure or actual brightness, so it is recommended to select this option in special cases, and for this option, there will be no status feedback when recalling group/global scenes.

5.2 Parameter Setting Interface “X: General (X=A, B)”

This interface mainly sets the general parameters of the DALI device in the channel, such as KNX bus power-off or reset action, status transmission mode, failure report and failure analysis. The parameters of the two channels are the same as the objects. The following is an example of one of the channels.

<ul style="list-style-type: none"> – General General – DALI Output A A: General A: Template + A: Group A: ECG A: Global scene A: Group assignment + DALI Output B 	<p>Enable enhance communication (Each DALI command sent twice) <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Enable automatic DALI addressing <input type="radio"/> No <input checked="" type="radio"/> Yes</p> <p>Test/Set button function via long press (>5s) Init all device ▼</p> <p>Dimming curve for broadcast <input checked="" type="radio"/> Logarithmic(DALI) <input type="radio"/> Linear(KNX)</p> <hr/> <p>Reply mode of Lamp status Respond after change ▼</p> <p>Action after Burn In Off value ▼</p> <hr/> <p>Failure Analysis</p> <p>Reply mode of failure status Respond after change ▼</p> <p>Central failure object "Lamp/ECG Failure status" <input checked="" type="radio"/> Disable <input type="radio"/> Enable</p> <p>Function of failure object <input checked="" type="radio"/> Total number of failures <input type="radio"/> Failure rate 0..100%</p> <p>Threshold for Total failures 1% ▼</p> <p>Threshold for Lamp failures 1% ▼</p> <p>Threshold for ECG failures 1% ▼</p>
---	---

Figure 5.2 Parameter Setting Interface “X: General”

Parameter “Enable enhance communication (Each DALI command sent twice)”

This parameter sets whether DALI communication needs to be enhanced to prevent ECG from missing DALI commands from the gateway because of interference or line length. Options:

No

Yes

No: Normal communication;

Yes: Enables enhanced communication, and each DALI command will be sent to ECG twice. **Note:**

as the number of transmissions doubles, the communication rate also slows down.

Parameter “Enable automatic DALI addressing”

This parameter sets whether a DALI device without a DALI address is automatically initialized after the gateway supply voltage recovery or reset, that is, whether the gateway automatically assigns the first free DALI address to it. Options:

No

Yes

No: The gateway does not assign DALI addresses on gateway supply voltage recovery. If a DALI device without an address has been installed, the gateway can only control it using a broadcast telegram. If a DALI device with an existing address has been installed, the gateway will not change it. **(The DALI address can still be assigned via the commissioning software tool or the Test/Set button on the front of the gateway)**

Yes: If the gateway locates a DALI device without a DALI address on supply voltage recovery, the gateway automatically allocates it the first free DALI address.

It is advantage that DALI addressing without gaps makes it possible to replace a defective DALI device without additional addressing or commissioning. All that is required is to connect a new DALI device without a DALI address. The gateway addresses the new device with the first free DALI address of the removed failed device, and transfers its properties to the new device.

Note: The function of automatic DALI addressing is only applicable to database version 1.3 or above.

Parameter "Test/Set button function via long press(>5s)"

The parameter sets the function of the Test/Set button, and it need be performed via a long operation that press the button longer than 5s. Options:

No action

Init no address device

Init all device

No action: It is no action;

Init no address device: The gateway can initialize the DALI devices without a DALI address on the DALI bus via long press the button >5s;

Init all device: The gateway can reinitialize all DALI devices on the DALI bus via long press the button >5s.

Note: The function of the Test/Set button is only applicable to database version 1.3 or above.

Parameter "Dimming curve for broadcast"

This parameter sets the dimming curve for the Broadcast control. Options:

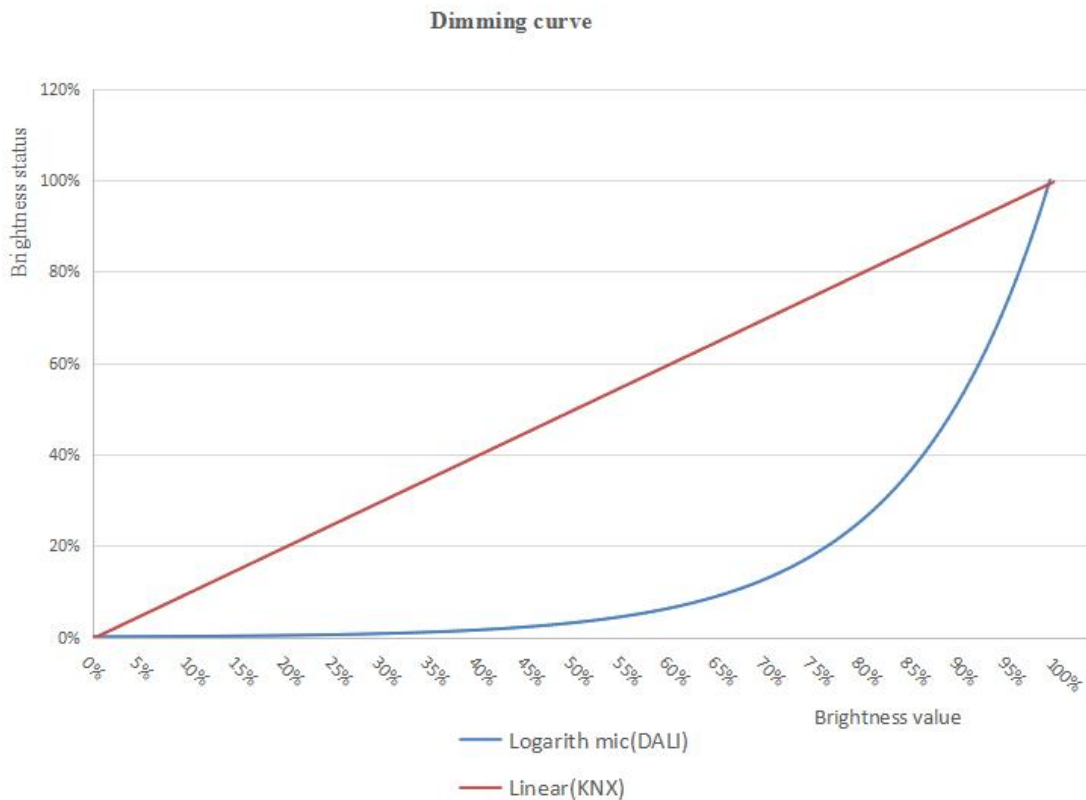
Logarithmic (DALI)

Linear (KNX)

In the DALI standard, all the default lamps are with logarithmic dimming curve, whether it is DALI controller or DALI dimming power supply.

The DALI standard also provides a linear dimming curve method(KNX dimming curve), which is generally used in some special lighting control projects where the logarithmic dimming curve cannot meet the demand. Such as: emergency lighting converter, which is not applicable to the logarithmic dimming curve.

The logarithmic(DALI) and linear (KNX) dimming curves as shown in the following figure:



Note: The function of the dimming curve for the Broadcast control is only applicable to database version 1.3 or above.

Parameter "Reply mode of Lamp status"

This parameter defines the feedback conditions of lamp status when under the group and ECG control, that is, the feedback conditions for the switch status and brightness status. Options:

Respond after read only

Respond after change

Respond after change and bus reset

Respond after read only: Only when the device receives a request from another bus device or bus to read the switch status or brightness status of the group or ECG, does the status object send the current switch or brightness status to the bus.

Respond after change: When the switch status or brightness status changes, the status object sends a telegram to the bus to report the current status;

Respond after change and bus reset: When the switch status, brightness status changes or bus reset, the status object sends a telegram to the bus to report the current status.

Note: The switch status and brightness status of the group can only be feedback locally, and the status of each lamp cannot be accurately fed back. Therefore, it is recommended to use ECG status feedback.

Parameter "Action after Burn In"

This parameter defines the brightness value of the ECG/lamp after burnt in. Options:

On value

Off value

Last brightness value

On value: Outputs the brightness value of "Switch on";

Off value: The outputs are off;

Last brightness value: The brightness value of the ECG/lamp will be saved before burnt in. After the burn in is completed, the ECG/lamp returns to the previous brightness value.

The following parameters are mainly used to analyze ECG and lamp failures:

Parameter "Reply mode of failure status"

This parameter defines the conditions for sending ECG and lamp failure conditions. Options:

Respond after read only

Respond after change**Respond after change and bus reset**

Respond after read only: Only when the device receives a request from another bus device or bus to read the failure status of the group or ECG, does the status object send the current failure status to the bus.

Respond after change: When the failure status changes, the status object sends a telegram to the bus to report the current status;

Respond after change and bus reset: When the failure status changes or bus reset, the status object sends a telegram to the bus to report the current status.

Parameter "Central failure object "Lamp/ECG Failure status"

This parameter sets whether the object for the channel ECG/lamp failure centrally send status is enabled. Options:

Disable**Enable**

Enable: The object "Lamp/ECG Failure status" is visible and is used to send the lamp or ECG failure status. The 1 byte object value is defined as follows:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
ECG failure	Lamp failure	ECG number1..64					

example:

1. 1000 0011 (object value 131) indicates ECG failure of ECG4;

2. 0100 0010 (object value 66) indicates lamp failure of ECG3;

This object can also be used to query the lamp and ECG failure. When the highest two bit value, both Bit7 and Bit6, of the telegram received by the object are 1, indicating to query the ECG x failure, such as:

Query the failure status of ECG3: 1100 0010 (object value 194)

If the ECG of ECG3 is faulty, the gateway will respond: 1000 0010 (object value 130)

Lamp failure: One or more fixtures does not working (damaged) or are not connected.

ECG failure: One or more ballasts on the output of the DALI gateway do not work or are not connected.

Parameter "Function of failure object"

This parameter sets the transmission mode of the lamp and ECG failure, whether to send by the ratio of the faulty device or the number of faulty devices. In different ways, the data types of the failure objects 7, 9, and 11 are also different. Options:

Total number of failures**Failure rate 0..100%**

Total number of failures: The number of faulty devices sent directly by the object to the bus;

Failure rate 0..100%: The failure rate of the faulty device in the total number of devices that is sent to the bus by the objects.

For example, if there are 8 lamps and 1 failure, then the lamp failure rate is 12%.

Parameter "Threshold for Total failures"

This parameter is used to configure the alarm threshold for all (ECG and lamp) failures (object 6) in the channel. The threshold relates to the failure of all ECGs and lamps at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 6 sends an alarm. Options:

1..100%

Parameter "Threshold for Lamp failures"

This parameter is used to configure the alarm threshold for all lamp failures (object 8) of the channel. The threshold relates to the failure of all the lamps at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 8 sends an alarm. Options: **1..100%**

Parameter "Threshold for ECG failures"

This parameter is used to configure the alarm threshold for all ECG failures (object 10) of the channel. The threshold relates to the failure of all ECGs at the DALI end of the channel, and when the total number of failures exceeds the set threshold, the object 10 sends an alarm. Options: **1..100%**

5.3 Parameter Setting Interface “X: Template (X=A, B)”

Parameter setting interface “X: Template(X=A,B)” is shown in Figure 5.3. Here, the group control and ECG control action behaviors are set. A total of 8 parameter setting templates are provided. If the action of the group control and ECG control is as configuration of ECG, then the action behaviors will be configured by the commissioning software tool.

Template	Parameter	Value
Template 1	Switch on value	100%
	Value on DALI Power fail (System Failure Level)	100%
	Value on ECG Power recovery (Power On Level)	100%
	Dimming time	4.0s
	Minimum level	1%
	Maximum level	100%
	Allow switch off via relative dimming	<input checked="" type="radio"/> No <input type="radio"/> Yes
Template 2	Switch on value	100%
	Value on DALI Power fail (System Failure Level)	100%
	Value on ECG Power recovery (Power On Level)	100%
	Dimming time	4.0s
	Minimum level	1%
	Maximum level	100%
	Allow switch off via relative dimming	<input checked="" type="radio"/> No <input type="radio"/> Yes
Use Template 5-8		<input checked="" type="radio"/> No <input type="radio"/> Yes

Figure 5.3 Parameter Setting Interface “X: Template(X=A,B)”

Take one of the templates as an example to illustrate the parameter settings:

Parameter “Switch on value”

This parameter defines the brightness value of “Switch on”. Options:

1%

5%

...

100%

Last brightness value

Last brightness value: The value of the brightness before the lamp is turned off.

Parameter "Value on DALI Power fail (System Failure Level)"

This parameter defines the brightness value of the lamp after the DALI bus is powered off. This value is saved on ECG, and ECG automatically changes the output of the brightness value in the event of power off. Options:

0%

1%

5%

...

100%

Last brightness value

Last brightness value: The output brightness value is the brightness value before power-off of the DALI bus, that is, the lamp brightness does not change.

Parameter "Value on ECG Power recovery (Power On Level)"

This parameter defines the brightness value of the lamp after ECG power-on reset. This value will be saved on the ECG, and the ECG will output the brightness value when the ECG is powered on and reset. Options:

0%

1%

5%

...

100%

Last brightness value

Last brightness value : The output brightness value is the brightness value before the ECG is powered off.

Parameter "Dimming time"

This parameter defines the dimming time of the lamp brightness. That is, the gradual time of the brightness from fully off to fully on. Options:

<0.7s

0.7s

1.0s

...

90.5s

For a dual-color temperature lamp, the adjustment time of the color temperature is the same as the gradual time of the brightness, that is, the brightness is first adjusted to the target brightness, and then the color temperature is adjusted to the target color temperature. For example, if the parameter is set to 2s, for a dual-color temperature lamp, from 0% to 100% and from 1000K to 10000K, it will take 4s to complete this process. But the monochromatic lamp is only 2s. The adjustment time is calculated proportionally, for example, if the brightness is only adjusted to 50%, it is 1s.

Parameter "Minimum level"

This parameter defines the minimum level of the lamp brightness. Options:

0%

1%

2%

...

100%

If the value set by this parameter is lower than the physical minimum brightness value (Physical Minimum level) of the lamp, then output the physical minimum brightness value.

Parameter "Maximum level"

This parameter defines the maximum level of the lamp brightness. Options:

0%

1%

2%

...

100%

Note: Any control command with brightness is limited to the minimum and maximum brightness value output.

Parameter "Allow switch off via relative dimming"

This parameter defines whether to allow the lamp to be switched off by relative dimming .Options:

No

Yes

No: No allow, only dim down to minimum brightness level.

Yes: It can be switched off via relative dimming.

Note: The function is only applicable to database version 1.4 or above.

Parameter "Use Template 5-8"

This parameter is used to activate the parameter setting template 5~8 and becomes available only after activation. Options:

No

Yes

Parameter setting template 1~4 is always displayed.

Note: if the template is not activated but is recalled in a group or ECG, the group or ECG will take the ECG' own settings.

5.4 Parameter Setting Interface “X: Group (X=A, B)”

Parameter setting interface “X: Group” is shown in Figure5.4. Here is to setting the group control of the DALI device.

Each channel of KNX/DALI gateway provides 16 groups. We can group multiple DALI devices that we want to control together by debugging software tools. Then the devices in this group can be switched, dimmed or set the brightness value at the same time. If the properties of the devices in the same group are different, the dimming effects of the DALI devices will be different.

- General	Use Group 1	<input type="radio"/> No <input checked="" type="radio"/> Yes
General	Use Group 2	<input checked="" type="radio"/> No <input type="radio"/> Yes
- DALI Output A	Use Group 3	<input checked="" type="radio"/> No <input type="radio"/> Yes
A: General	Use Group 4	<input checked="" type="radio"/> No <input type="radio"/> Yes
+ A: Template	Use Group 5	<input checked="" type="radio"/> No <input type="radio"/> Yes
- A: Group	Use Group 6	<input checked="" type="radio"/> No <input type="radio"/> Yes
Group NO.1	Use Group 7	<input checked="" type="radio"/> No <input type="radio"/> Yes
- General	Group description (max 30 char.)	Group 1
General	Operating mode	Normal mode
- DALI Output A	Group behaviour select	Template 1
A: General	Enable Burn In function	<input type="radio"/> No <input checked="" type="radio"/> Yes
A: Template	Burn In duration(h)	12
- A: Group	Dimming curve	<input checked="" type="radio"/> Logarithmic(DALI) <input type="radio"/> Linear(KNX)
Group NO.1	Color temperature control by	Via ETS parameter
- A: ECG	Color temperature when switch on	3000
ECG NO.1	Color Temp. after bus recovery or download	<input checked="" type="radio"/> Preset value <input type="radio"/> Last value
A: Global scene	Preset Color temperature	3000
A: Group assignment	Min. color temperature[1000..10000]k	2000
+ DALI Output B	Max. color temperature[1000..10000]k	6000

<p>Note: The scene is invalid in the permanent mode. And the color temperature is invalid if color temperature control is disabled</p>	
Group Scene function	Via Recall KNX scene
1> KNX Scene No.	No assignment
Brightness value[0..100]%	0%
Color temperature[1000..10000]k	3000
2> KNX Scene No.	No assignment
Brightness value[0..100]%	0%
Color temperature[1000..10000]k	3000

<p>Note: The scene is invalid in the permanent mode. And the color temperature is invalid if color temperature control is disabled</p>	
Group Scene function	Via Recall DALI scene
DALI Scene 1: KNX scene number	No assignment
DALI Scene 2: KNX scene number	No assignment
DALI Scene 3: KNX scene number	No assignment
DALI Scene 4: KNX scene number	No assignment
DALI Scene 5: KNX scene number	No assignment

Figure 5.4 Parameter Setting Interface "X: Group"

Parameter "Group description (max 30 char.)"

This parameter is used to describe the group and allows up to 30 characters to be entered.

Parameter "Use Group 1..16"

This parameter is used to activate the group x (x=1..16) control. Options:

No

Yes

Yes: After activation, the parameters of the group control can be set.

Parameter "Operating mode"

This parameter sets the operating mode of the group. Options:

Normal mode

Permanent mode

Normal/Night mode

Staircase mode

Normal mode: Common switch control of the lamp, such as switching, dimming and setting the brightness value of the DALI device in the group.

Permanent mode: The DALI device in the group outputs with a fixed brightness value, the brightness cannot be switched or changed.

Normal/Night mode: Under the normal mode, the control is the same as the first option. After switching to night mode, the lamp can be turned off in a delay time after the lamp is turned on, or output with a fixed brightness value. Activate night mode via object 3.

Staircase mode: Turn on the stair light, the output delays for a while and automatically closes.

5.4.1 "Normal mode" Operating Mode

This section only describes the parameter settings under the normal mode.

Parameter "Group behaviour select"

This parameter sets the action behavior of the group control, which is achieved by recalling the settings of the template, or be configured by the debugging software tool. Options:

As configuration of ECG (must set via DCA or Tool)

Template 1

...

Template 8

As configuration of ECG (must set via DCA or Tool) : Using the ECG configuration, the action behavior must be configured by the debugging software tool.

Debug software tool cannot modify group behaviour when other options are selected, even if it temporarily modify, group behaviour will recover to the parameter configured by ETS when these information that are read by the gateway are different with configured parameters.

The difference between ECG configuration and Template configuration, and their advantages and disadvantages:

1. ECG configuration, the dimming curve is smooth, so the dimming effect is better, but the relative dimming stop function is not supported, the brightness output may be inconsistent. And for the dual color temperature lamp, if the setting is different, it may be interrupted , Causing the actual output to be inconsistent with the target brightness and color temperature.

2. The template configuration supports the stop function of relative dimming, and ensures the consistency of dimming output, but the dimming curve may not be so smooth.

The ECG configuration and Template configuration mentioned below are similar to here, so the description will not be repeated below.

5.4.2 "Permanent mode" Operating Mode

This section only describes the parameter settings under the permanent mode.

Parameter "Lamp Value in Permanent mode"

This parameter sets the brightness value of the DALI device output in the group under the permanent mode. Options:

0%
5%
...
100%

5.4.3 "Normal/Night mode" Operating Mode

This section only describes the parameter settings under the normal/night mode.

Parameter "Action in Night mode"

This parameter sets the action behavior in night mode. Options:

Delay switch off automatically
Activate permanent mode and ignore telegrams

Delay switch off automatically: The lamp will be automatically turned off after a delay time when it is turned on. If the lamp is on before switching to the night mode, after switching, the lamp will be automatically turned off when reach to the delay time. **Note: When switching to normal mode, the light will be turned off.**

Activate permanent mode and ignore telegram: Activates permanent mode and ignores the control telegram, i.e outputs with a fixed brightness value. **Note: When switching to normal mode, the light will be turned off.**

--Parameter "Automatic switch off after"

This parameter is visible when the previous parameter selects "Delay switch off automatically". Set the delay time for the DALI device in the group to automatically turn off the lamp. Options:

1min
2min
...
90min

--Parameter "Lamp Value in Permanent mode"

This parameter is visible when option "Activate permanent mode and ignore telegram" of the parameter "Action in night mode" is selected. Setting the output brightness value of the DALI device in the group when under the permanent mode. Options:

0%

5%

...

100%

Parameter "Group behaviour select"

This parameter sets the action behavior of the group control, which is achieved by recalling the settings of the template, or be configured via debugging software tool. Options:

As configuration of ECG (must set via DCA or Tool)

Template 1

...

Template 8

As configuration of ECG (must set via DCA or Tool) : Using the ECG configuration, the action behavior must be configured by the debugging software tool.

Debug software tool cannot modify group behaviour when other options are selected, even if it temporarily modify, group behaviour will recover to the parameter configured by ETS when these information that are read by the gateway are different with configured parameters.

This parameter setting does not apply to the permanent mode in night mode.

5.4.4 "Staircase mode" Operating Mode

This section only describes the parameter settings under the staircase mode.

Parameter "Automatic switch off after"

This parameter setting the delay time to automatically turn off the lamp after DALI device in the group is turned on. Options:

1min

2min

...

90min

Parameter "Group behaviour select"

This parameter sets the action behavior of the group control, which is achieved by recalling the settings of the template, or be configured via the debugging software tool. Options:

As configuration of ECG (must set via DCA or Tool)

Template 1

...

Template 8

As configuration of ECG (must set via DCA or Tool): Using the ECG configuration, the action behavior must be configured by the debugging software tool.

Debug software tool cannot modify group behaviour when other options are selected, even if it temporarily modify, group behaviour will recover to the parameter configured by ETS when these information that are read by the gateway are different with configured parameters.

Parameter "Enable Burn In function"

This parameter is used to enable the burn in function of the group. Options:

No

Yes

--Parameter "Burn In duration(h)"

After the burn in function is enabled, this parameter is visible and is used to set the duration of the burn in phase of the DALI device in the group. Options: **0..120 h**

The lamp cannot be turned off or dimmed during the burn in duration.

Parameter "Dimming curve"

This parameter sets the dimming curve for the DALI group. Options:

Logarithmic (DALI)

Linear (KNX)

In the DALI standard, all the default lamps are with logarithmic dimming curve, whether it is DALI controller or DALI dimming power supply.

The DALI standard also provides a linear dimming curve method(KNX dimming curve), which is generally used in some special lighting control projects where the logarithmic dimming curve cannot meet the demand. Such as: emergency lighting converter, which is not applicable to the logarithmic dimming curve.

Parameter "Color temperature control by"

This parameter sets the color temperature control type of the group switch. Options:

Disable

Via ETS parameter

Keep last object value

Disable: Disabled;

Via ETS parameter: The color temperature of the group object "Switch" when switch on can be configured via parameter;

Keep last object value: The color temperature of the group object "Switch" when switch on will use the previous color temperature object value.

--Parameter "Color temperature when switch on"

When the "Via ETS parameter" is selected in the previous parameter, this parameter is visible, for setting the color temperature of "Switch" when switch on. Options: **1000..10000**

Parameter "Color Temp. after bus recovery or download"

This parameter sets the color temperature after bus recovery or download. Options:

Preset value

Last value

Preset value: Preset value via parameter.

Last value: The color temperature before the bus is powered off.

--Parameter "Preset Color temperature"

This parameter is visible when the previous parameter selects “Preset value”, it is used to preset the color temperature after bus recovery or download. Options: **1000..10000**

Parameter “Min.color temperature[1000..10000]k”

This parameter defines the lower threshold of color temperature adjustment. Options: **1000..10000**

Parameter “Max.color temperature[1000..10000]k”

This parameter defines the upper threshold of color temperature adjustment Options: **1000..10000**

The upper and lower thresholds of the color temperature determine the adjustable range of the color temperature.

Note: The function is only applicable to database version 1.4 or above.

Parameter “Delay between brightness and color temperature telegram[1..100]s”

This parameter is visible when the option “As configuration of ECG (must set via DCA or Tool)” is selected via the parameter “Group behaviour select” or the option “Permanent mode” is selected via the parameter “Operating mode”, which defines the delay time between performing brightness adjustment and color temperature adjustment. Options: **1..100**

Because in the brightness adjustment process, if there is a command for color temperature adjustment, the brightness adjustment will be interrupted, resulting in the target brightness not being reached. Therefore, it is necessary to set this delay, wait until the brightness execution is completed, and then perform the color temperature adjustment. **It is recommended that this delay setting is greater than or equal to the dimming time.**

This setting is particularly important in the application of KNX scenes. **But this delay is invalid for DALI scene, the configuration of DALI scene is determined by DALI driver.**

Note: The function is only applicable to database version 1.4 or above.

Note: The scene is invalid in the permanent mode. And the color temperature is invalid if color temperature control is disable.

Parameter "Group Scene function"

This parameter sets whether to enable the group scene function, or the recall way of the scene.

Options:

Disable

Via Recall KNX scene

Via Recall DALI scene

Disable: The group scene function is disabled.

Via Recall KNX scene: The KNX device directly recalls the KNX scene number to control the group scene. The brightness value and color temperature value of the scene are configured by ETS. When recall the scene configured in the group through KNX device, all the devices in this group will output the brightness value and color temperature value configured by the scene.

Via Recall DALI scene: The KNX device will indirectly recall the DALI scene to control the group scene through the KNX scene number. The KNX scene number corresponding to each DALI scene is configured by ETS. The scene assignment and scene preset brightness value of the DALI device in the group are configured by debugging software tool. When recall the scene configured in the group through KNX device, all DALI device of this scene will perform this operation, to adjust the lamp to the preset brightness value.

The two control modes of the group scene have their own characteristics: For the "Via Recall KNX scene", the scene configuration is convenient and intuitive with color temperature configuration, which is applicable to the case where all devices in the same scene group use the same output. For the "Via Recall DALI scene", the configuration of the scene is flexible, and is applicable for devices in the same scene group to be configured in different brightness or without scene assignment.

The following three parameters are visible when the "Via Recall KNX scene" is selected in the previous parameter, for setting the brightness value and color temperature value corresponding to the scene.

Parameter "z>KNX Scene No. (z=1..8)"

This parameter is used to set the scene number. Options:

No assignment

1

...

64

No assignment: The scene is not used.

1..64: Scene number 1..64, corresponding to the telegram value 0..63.

Note: After the scene is changed, the new value will be saved when the KNX bus power off.

--Parameter "Brightness value[0..100]%"

Setting the brightness value of the scene. Options:

0%

5%

...

100%

--Parameter "Color temperature when switch on"

Setting the color temperature value of the scene. Options: **1000..10000**

Parameter "DALI Scene x: KNX scene number(x=1..16)"

This parameter is visible when option "Via Recall DALI scene" of the parameter "Group Scene function" is selected, is used to assign a KNX scene number to the DALI scene. Options:

No assignment

1

...

64

No assignment: DALI scene x is not used.

1...64: Assign the KNX scene number y (1..64) to the DALI scene x (1..16).

5.5 Parameter Setting Interface “X: ECG (X=A, B)”

Parameter setting interface “X: ECG” is shown in Figure5.5, here for setting the control of a single DALI device.

Each channel of the KNX/DALI gateway has 64 DALI devices, and each DALI device can be individually switched, dimmed or set a brightness value. At the same time, the gateway also provides functions such as operation hour calculation and burn in for DALI devices.

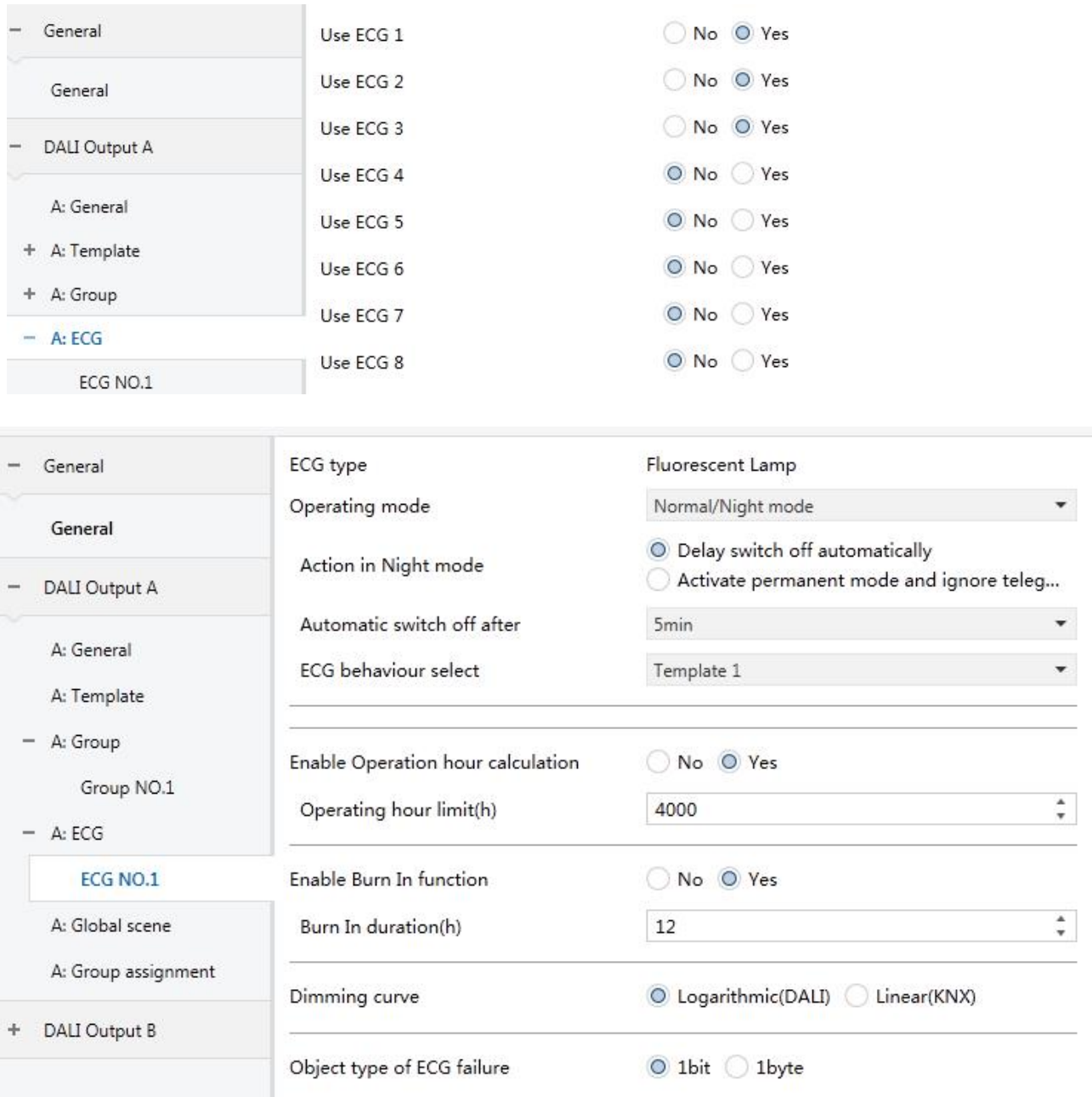


Figure 5.5 Parameter Setting Interface “X: ECG_Fluorescent Lamp”

Parameter "Use ECG 1..64"

This parameter is used to activate the ECG x (x=1..64) control. Options:

No

Yes

Yes: After activation, the ECG control parameters can be set.

Note: This parameter should be configured according to the actual ECG used. If the parameter is configured with ECG x but the device is not connected, the ECG is considered to be faulty. Therefore, it is recommended to activate this parameter based on the ECG actually used.

In addition, the ECG configured in the group also needs to be activated via this parameter, but the control behavior applies to the configuration of the group.

Parameter "ECG type"

This parameter sets the ECG type used. Only supports fluorescent lamps currently.

Parameter "Operating mode"

This parameter setting the operating mode of the group. Options:

Normal mode

Permanent mode

Normal/Night mode

Staircase mode

Normal mode: Common switch control of the lamp, such as switching, dimming and setting the brightness value of the DALI device in the group.

Permanent mode: The DALI device in the group outputs with a fixed brightness value, the brightness cannot be switched or changed.

Normal/Night mode: Under the normal mode, the control is the same as the first option. After switching to night mode, the lamp can be turned off in a delay time after the lamp is turned on, or output with a fixed brightness value. Activate night mode via object 3.

Staircase mode: Turn on the stair light, the output delays for a while and automatically closes.

Parameter description of each mode refers to section 5.4.1, 5.4.2, 5.4.3 and 5.4.4.

Parameter "Enable Operation hour calculation"

This parameter setting whether to enable operation hour calculation function. Options:

No

Yes

--Parameter "Operating hour limit(h)"

This parameter is visible when "Yes" is selected in the previous parameter and is used to set the limit value of the lamp operation hour. When the operation hour of the lamp reaches the limit value, the object "Life time exceeded" sends an alarm to the bus. Options: **1..200000**

Note: The operation hour record is recorded every 5 minutes. When the bus is powered off, the recording may be incomplete due to insufficient capacitance. Therefore, the power failure will cause the time record to have a few minutes of error.

Parameter "Enable Burn In function"

This parameter whether to enable burn in function of the ECG. Options:

No

Yes

--Parameter "Burn In duration(h)"

After the burn in function is enabled, this parameter is visible and is used to set the duration of the burn in phase of the DALI device. Options: **0..120 h**

The lamp cannot be turned off or dimmed during burn in.

Parameter "Dimming curve"

This parameter sets the dimming curve for the DALI group. Options:

Logarithmic (DALI)

Linear (KNX)

In the DALI standard, all the default lamps are with logarithmic dimming curve, whether it is DALI controller or DALI dimming power supply.

The DALI standard also provides a linear dimming curve method(KNX dimming curve), which is generally used in some special lighting control projects where the logarithmic dimming curve cannot meet the demand. Such as: emergency lighting converter, which is not applicable to the logarithmic dimming curve.

Parameter "Object type of failure object"

This parameter setting the data type of the ECG failure object. Options:

1bit

1byte

1bit: Does not distinguish the type of failure, whether it is a lamp failure or ECG failure, the object sends a telegram "1" to the bus;

1byte: Distinguish the failure type, Bit 0 is 1 for lamp failure, and Bit 1 is 1 for ECG failure.

5.6 Parameter Setting Interface "X: Global scene (X=A, B)"

Parameter setting interface "X: Global scene(X=A, B)" is shown in Figure 5.6. Here for setting the global scene control of the DALI device in the channel.

Each channel of the KNX/DALI gateway provides 16 global scenes to correspond to 16 DALI scenes. The KNX scene number corresponding to each scene is configured by ETS. The scene assignment and scene preset brightness values are configured by the debugging software tool. Each scene can be assigned to any ECG, which can also be assigned to multiple scenes at the same time.

General	DALI Scene 1: KNX scene number	No assignment
General	DALI Scene 2: KNX scene number	No assignment
DALI Output A	DALI Scene 3: KNX scene number	No assignment
A: General	DALI Scene 4: KNX scene number	No assignment
A: Template	DALI Scene 5: KNX scene number	No assignment
A: Group	DALI Scene 6: KNX scene number	No assignment
Group NO.1	DALI Scene 7: KNX scene number	No assignment
A: ECG	DALI Scene 8: KNX scene number	No assignment
ECG NO.1	DALI Scene 9: KNX scene number	No assignment
A: Global scene	DALI Scene 10: KNX scene number	No assignment
A: Group assignment	DALI Scene 11: KNX scene number	No assignment
DALI Output B	DALI Scene 12: KNX scene number	No assignment
	DALI Scene 13: KNX scene number	No assignment
	DALI Scene 14: KNX scene number	No assignment
	DALI Scene 15: KNX scene number	No assignment
	DALI Scene 16: KNX scene number	No assignment

Figure 5.6 Parameter Setting Interface "X: Global scene"

Parameter "DALI Scene x: KNX scene number(x=1..16)"

This parameter for setting the assignment of DALI scene to KNX scene number. Options:

No assignment

1

...

64

No assignment: DALI scene x is not used.

1..64: Assign KNX scene number y (1..64) to DALI scene x (1..16).

5.7 Parameter Setting Interface "X: Group assignment (X=A, B)"

Parameter setting interface "X: Group assignment(X=A, B)" as shown in Figure 5.7. Here setting the group assignment of the DALI devices.

There are two ways to assign groups: through debugging software tools, or assign in ETS. Only one of them can be selected, specific assignment defined by parameter.

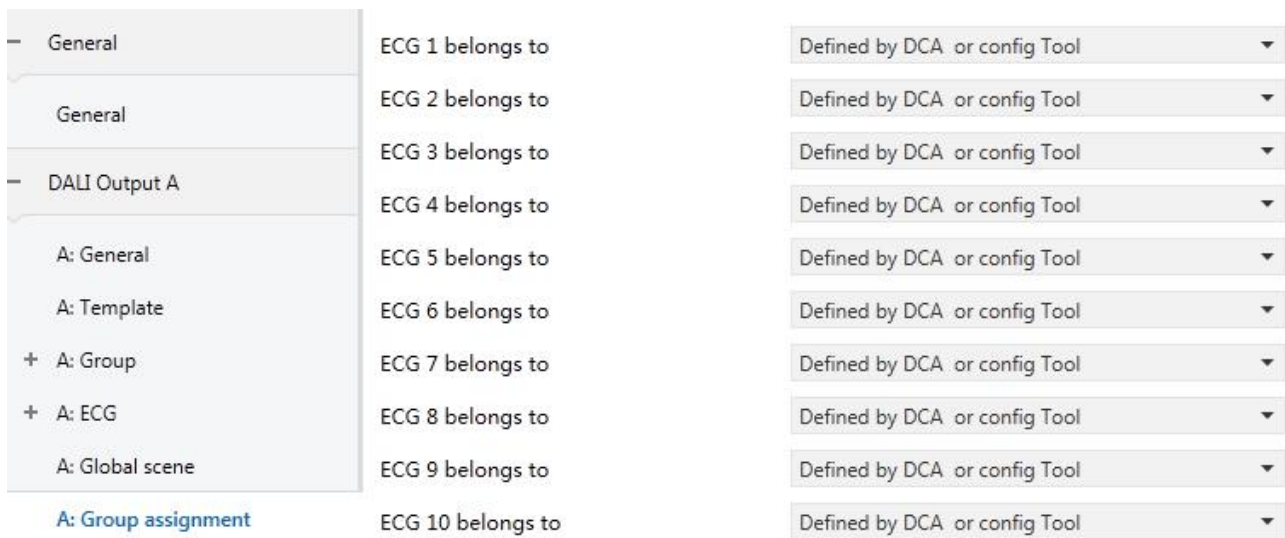


Figure 5.7 Parameter Setting Interface "X: Group assignment"

Parameter "ECG x belongs to (x=1..64)"

This parameter is used to assign DALI devices to a group. Options:

Defined by DCA or config Tool

Group 1

...

Group 16

None

Defined by DCA or config Tool: Group assignment is implemented by the debug software tool. (Debug software tool cannot modify group assignment when other option is selected, even if it temporarily modify, group assignment will recover to the parameter configured by ETS when these information that are read by the gateway are different with configured parameters.)

Group 1..16: Assign DALI device x to the selected group, one device can only be assigned to one group. **Note: This assignment is meaningless if the selected group control is not enabled.**

None: The device is not assigned to any group.

Chapter 6 Description of Communication Objects

The communication object is the medium through which the device communicates with other devices on the bus, that is, only the communication object can perform bus communication. The role of each communication object is described in detail below.

Note: In the following column of the table attribute, "C" means to enable the communication function of the communication object, "W" means that the communication object value can be rewritten by the bus, "R" means that the communication object value can be read by the bus, "T" means that the communication object has a transmission function, "U" means that the communication object value can be updated.

In DALI control, a group address cannot connect too many communication objects, because the DALI protocol baud rate is only 1.2k, relatively low, allowing up to 7 communication objects to be connected to a group address, otherwise the control may be abnormal, such as it takes a few seconds for the control to complete.

6.1 General Communication Object

Number	Name *	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
2027	General	In operation			1 bit	C	R	-	T	-	switch	Low

Fig.6.1 "General" communication object

NO.	Name	Object function	Types	Attributes	DPT
2027	General	In operation	1bit	C,R,T	1.001 switch

This communication object is used to periodically send a telegram "1" to the bus to indicate that the device is functioning properly. This communication object is always enabled.

Table 6.1 "General" communication object table

6.2 Channel General Communication Object

Number *	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
3	Output A - General	Activate Night mode			1 bit	C	-	W	-	-	start/stop	Low
4	Output A - General	General failure			1 bit	C	R	-	T	-	alarm	Low
6	Output A - General	General failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
7	Output A - General	General failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
8	Output A - General	Lamp failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
9	Output A - General	Lamp failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
10	Output A - General	ECG failure exceeds threshold			1 bit	C	R	-	T	-	alarm	Low
11	Output A - General	ECG failure in Total			1 byte	C	R	-	T	-	counter pulses (0..255)	Low
14	Output A - General	Lamp/ECG Failure status			1 byte	C	-	W	T	-	diagnostic value	Low
17	Output A - Broadcast	Switch			1 bit	C	-	W	-	-	switch	Low
18	Output A - Broadcast	Brightness value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
19	Output A - Scene	Scene recall/stored			1 byte	C	-	W	-	-	scene control	Low
20	Output A - General	DALI bus voltage			4 bytes	C	R	-	T	-	electric potential (V)	Low
21	Output A - General	DALI bus current			2 bytes	C	R	-	T	-	current (mA)	Low
22	Output A - General	DALI short circuit			1 bit	C	R	-	T	-	alarm	Low

Figure 6.2 "X: General" communication object

NO.	Name	Object function	Types	Attributes	DPT
3	Output X - General	Activate Night mode	1bit	C,W	1.010 start/stop
This communication object is used to enable or disable night mode via the bus. Telegram: 1—Start 0—Stop					
4	Output X - General	General failure	1bit	C,R,T	1.005 alarm
This communication object is used to report failures on the DALI bus. When any type of failure occurs, the object will send a telegram "1" to the bus, and the failure will be cleared to "0".					
6	Output X - General	General failure exceeds threshold	1bit	C,R,T	1.005 alarm
This communication object is used to report that the total number of all lamps and ECG failures exceeds the set threshold.					
7	Output X - General	General failure in Total	1byte	C,R,T	5.010 counter pulses(0..255)
This communication object is used to report the total number of all lamps and ECG failures. Note: When the ECG fails, the lamp will be faulty at the same time. It will only be counted once. Because the ECG is faulty, the lamp failure cannot be recognized or counted.					
7	Output X - General	General failure in %	1byte	C,R,T	5.001 percentage(0..100%)
This communication object is used to report the failure rate, which is the percentage of the total number of devices on the DALI bus. All lamps and ECGs are taken into account. Note: When the ECG fails, the lamp will be faulty at the same time. It will only be counted once. Because the ECG is faulty, the lamp failure is not recognized or counted.					
8	Output X - General	Lamp failure exceeds threshold	1bit	C,R,T	1.005 alarm
This communication object is used to report that the total number of all lamp failures identified by the gateway exceeds the set threshold.					
9	Output X - General	Lamp failure in Total	1byte	C,R,T	5.010 counter pulses(0..255)
This communication object is used to report the total number of all lamp failures identified by the gateway.					
9	Output X - General	Lamp failure in %	1byte	C,R,T	5.001 percentage(0..100%)
This communication object is used to report the failure rate, which is the percentage of faulty lamps in all lamps on the DALI bus.					

10	Output X - General	ECG failure exceeds threshold	1bit	C,R,T	1.005 alarm																
<p>This communication object is used to report that the total number of all ECG failures identified by the gateway exceeds the set threshold.</p>																					
11	Output X - General	ECG failure in Total	1byte	C,R,T	5.010 counter pulses(0..255)																
<p>This communication object is used to report the total number of all ECG failures identified by the gateway.</p>																					
11	Output X - General	ECG failure in %	1byte	C,R,T	5.001 percentage(0..100%)																
<p>This communication object is used to report the failure rate, i.e the percentage of the faulty ECG to the total number of ECGs on the DALI bus.</p>																					
14	Output X - General	Lamp/ECG Failure status	1byte	C,W,T	238.600 diagnostic value																
<p>This communication object is used to send the lamp or ECG failure status. The bits of the 1byte object are defined as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;">Bit 7</td> <td style="width: 12.5%;">Bit 6</td> <td style="width: 12.5%;">Bit 5</td> <td style="width: 12.5%;">Bit 4</td> <td style="width: 12.5%;">Bit 3</td> <td style="width: 12.5%;">Bit 2</td> <td style="width: 12.5%;">Bit 1</td> <td style="width: 12.5%;">Bit 0</td> </tr> <tr> <td>ECG failure</td> <td>Lamp failure</td> <td colspan="6">ECG Number 1..64(value 0..63)</td> </tr> </table> <p>Example:</p> <ol style="list-style-type: none"> 1. 1000 0011 (object value 131) represents the ECG failure of ECG4; 2. 0100 0010 (object value 66) represents the ECG failure of ECG3; <p>This object can also be used to query the lamp and ECG failure. When the highest two bit value, both Bit7 and Bit6, of the telegram received by the object are 1, indicating to query the ECG x failure, such as:</p> <p>Query the failure status of ECG3: 1100 0010 (object value 194)</p> <p>If the ECG of ECG3 is faulty, the gateway will respond: 1000 0010 (object value 130)</p>						Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	ECG failure	Lamp failure	ECG Number 1..64(value 0..63)					
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0														
ECG failure	Lamp failure	ECG Number 1..64(value 0..63)																			
17	Output X - Broadcast	Switch	1bit	C,W	1.001 switch																
<p>This communication object is used for broadcast control and can turn all connected lights on the channel on or off. All ECGs can be switched at the same time, and the brightness value of the on is 100%, and the brightness value of the off is 0%. Telegram:</p> <p style="text-align: center;">1--ON 0--OFF</p> <p>If the ECG works in the permanent mode, after the broadcast control is turned on, if the ECG brightness read by the gateway from the DALI bus does not match the brightness of the permanent mode, the brightness will become the brightness of the normal mode again.</p>																					

18	Output X - Broadcast	Brightness value	1byte	C,W	5.001 percentage(0..100%)																		
<p>This communication object is used for broadcast control to set a specific brightness value for all connected lamps on the channel.</p> <p>Telegram: 0...100%</p>																							
19	Output X - Scene	Scene recall/stored	1byte	C,W	18.001 scene control																		
<p>This communication object is used to recall or store a global scene. Up to 16 scenes are available for the DALI gateway. The KNX scene number is defined as follows:</p> <p>Set an 8bit instruction as (binary code): FXNNNNNN</p> <p style="padding-left: 40px;">F: call the scene for '0'; store the scene for '1';</p> <p style="padding-left: 40px;">X:0;</p> <p style="padding-left: 40px;">NNNNNN: Scene number (0...63).</p> <p>The parameter setting option is 1~64. In fact, the scene telegram received by the communication object "Scene" corresponds to 0~63. As follows:</p>																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Scene number</th> <th style="width: 33%;">Call the message value of the scene object</th> <th style="width: 33%;">Store the message value of the scene object</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Scene 1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">128</td> </tr> <tr> <td style="text-align: center;">Scene 2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">129</td> </tr> <tr> <td style="text-align: center;">Scene 3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">130</td> </tr> <tr> <td style="text-align: center;">...</td> <td style="text-align: center;">...</td> <td style="text-align: center;">...</td> </tr> <tr> <td style="text-align: center;">Scene 64</td> <td style="text-align: center;">63</td> <td style="text-align: center;">191</td> </tr> </tbody> </table>						Scene number	Call the message value of the scene object	Store the message value of the scene object	Scene 1	0	128	Scene 2	1	129	Scene 3	2	130	Scene 64	63	191
Scene number	Call the message value of the scene object	Store the message value of the scene object																					
Scene 1	0	128																					
Scene 2	1	129																					
Scene 3	2	130																					
...																					
Scene 64	63	191																					
<p>Such as setting the scene 1 of this parameter, the scene telegram received by the communication object "Scene" should be 0.</p>																							
20	Output X - General	DALI bus voltage	4byte	C,R,T	14.027 electric potential(V)																		
<p>This communication object is used to read the DALI bus voltage.</p>																							
21	Output X - General	DALI bus current	2byte	C,R,T	7.012 current(mA)																		
<p>This communication object is used to read the DALI bus current.</p>																							
22	Output X - General	DALI short circuit	1bit	C,R,T	1.005 alarm																		
<p>This communication object is used to report whether there is a short circuit in the connected DALI bus. Telegram:</p> <p style="padding-left: 40px;">1—A short circuit or over-current condition occurs at the DALI communication terminal</p> <p style="padding-left: 40px;">0—DALI communication terminal returns to normal</p>																							

Table 6.2 "X: General" communication object table

6.3 Channel Communication Object of a Single Group

There are 16 groups in the channel. The communication objects of each group are the same and independent of each other. Let's take one of them as an example:

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
23	Output A - Group 1	Switch			1 bit	C	-	W	-	-	switch	Low
24	Output A - Group 1	Relative dimming			4 bit	C	-	W	-	-	dimming control	Low
25	Output A - Group 1	Brightness value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
26	Output A - Group 1	Switch status			1 bit	C	R	-	T	-	switch	Low
27	Output A - Group 1	Brightness status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
28	Output A - Group 1	Activate Burn In			1 bit	C	-	W	-	-	start/stop	Low
29	Output A - Group 1	Color Temperature setting			2 bytes	C	-	W	-	-	absolute colour temperature (K)	Low
30	Output A - Group 1	Color Temperature status			2 bytes	C	R	-	T	-	absolute colour temperature (K)	Low
31	Output A - Group 1	Scene			1 byte	C	-	W	-	-	scene control	Low
32	Output A - Group 1	Relative Color Temperature			4 bit	C	-	W	-	-	dimming control	Low

Fig.6.3 "X: Group" communication object

NO.	Name	Object function	Types	Attributes	DPT			
23	Output X - Group y	Switch	1bit	C,W	1.001 DPT_Switch			
<p>This communication object is used to open or close the group, y=1..16.</p> <p>The value for "Switch on" can be defined by a parameter template. See section 5.3 for details.</p>								
24	Output X - Group y	Relative dimming	4bit	C,W	3.007 DPT_Control Dimming			
<p>This communication object is used for relative dimming of the group. The highest bit Bit4 decides to increase or decrease, Bit 0..3 determines the dimming size, and Bit 0..3 is 0 to stop dimming. The correspondence between the value of the relatively dimming telegram and brightness chance is as follows:</p>								
Telegram value	0	1	2	3	4	5	6	7
Decrease the brightness value	Constant/stop dimming	255 (100%)	128 (50%)	64 (25%)	32 (12%)	16 (6%)	8 (3%)	4 (1%)
Telegram value	8	9	10	11	12	13	14	15
Increase the brightness value	Constant/stop dimming	255 (100%)	128 (50%)	64 (25%)	32 (12%)	16 (6%)	8 (3%)	4 (1%)

Note: In the DALI system, stop dimming is unsupported. When the gateway receives the command of stop dimming, it will send the current brightness status to the DALI bus again.

25	Output X - Group y	Brightness value	1byte	C,W	5.001 percentage(0..100%)
This communication object is used to set the brightness value of the group.					
26	Output X - Group y	Switch status	1bit	C,R,T	1.001 DPT_Switch
This communication object is used to send the switch status of the group. Note: The correct feedback of the status is guaranteed only in the case of group control.					
27	Output X - Group y	Brightness status	1byte	C,R,T	5.001 percentage(0..100%)
This communication object is used to send the brightness status of the group. Note: The correct feedback of the status is guaranteed only in the case of group control.					
28	Output X - Group y	Activate Burn In	1bit	C,W	1.010 start/stop
<p>This communication object is used to enable or disable automatic burn in of the group. During the burn in process, all other switch, dimming or brightness value setting telegrams are ignored and the lamp is all on.</p> <p>Burn in is usually done automatically after the configured burn in time. If the burn in is stopped by this object, the burn in time will also stop timing, and the burn in will need to be re-opened by this object, and the timing will start again.</p>					
29	Output X - Group y	Color Temperature setting	2byte s	C,W	7.600 absolute colour temperature(K)
This communication object is used to set the color temperature of the group(absolute color temperature). Range is 0..65535K.					
30	Output X - Group y	Color Temperature status	2byte s	C,R,T	7.600 absolute colour temperature(K)
This communication object is used to send the current color temperature value of the group and send it after the status is changed.					
31	Output X - Group y	Scene	1byte	C,W	18.001 scene control
<p>This communication object is used to recall or store a group scene.</p> <p>Usage is similar to object 19.</p>					
32	Output X - Group y	Relative Color Temperature	4bit	C,W	3.007 DPT_Control Dimming
<p>The communication object adjusts the color temperature of the group by relative dimming (relative color temperature adjustment). The telegram value refers to object 24. After an access, the new set-value shall be calculated in respect to the last set-value (therefore Relative Control).</p> <p>Note: In the DALI system, stop Relative Control is unsupported.</p>					

Table 6.3 "X: Group" communication object table

6.4 Channel Communication Object of a Single DALI Device

There are 64 DALI devices in the channel. The communication objects of each DALI device are the same and independent of each other. The following is an example of one of the devices:

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
183	Output A - ECG 1	Switch			1 bit	C	-	W	-	-	switch	Low
184	Output A - ECG 1	Relative dimming			4 bit	C	-	W	-	-	dimming control	Low
185	Output A - ECG 1	Brightness value			1 byte	C	-	W	-	-	percentage (0..100%)	Low
186	Output A - ECG 1	Activate Burn In			1 bit	C	-	W	-	-	start/stop	Low
187	Output A - ECG 1	Switch status			1 bit	C	R	-	T	-	switch	Low
188	Output A - ECG 1	Brightness status			1 byte	C	R	-	T	-	percentage (0..100%)	Low
189	Output A - ECG 1	Failure status			1 bit	C	R	-	T	-	alarm	Low
190	Output A - ECG 1	Operating hours			4 bytes	C	R	-	T	-	counter pulses (unsigned), time lag (s)	Low
191	Output A - ECG 1	Life time exceeded			1 bit	C	R	-	T	-	boolean	Low
192	Output A - ECG 1	Reset Operating hours			1 bit	C	-	W	-	-	reset	Low
189	Output A - ECG 1	Failure status			1 byte	C	R	-	T	-	counter pulses (0..255), lighting actua...	Low

Fig. 6.4 "X: ECG" communication object

NO.	Name	Object function	Types	Attribute s	DPT
183	Output X - ECG y	Switch	1bit	C,W	1.001 DPT_Switch
<p>This communication object is used to turn on or off ECG, y=1..64.</p> <p>The values for "Switch on" can be defined by a parameter template. See section 5.3 for details.</p>					
184	Output X - ECG y	Relative dimming	4bit	C,W	3.007 DPT_Control Dimming
<p>This communication object is used for relative dimming of the ECG. The highest bit Bit4 decides to increase or decrease, Bit 0..3 determines the dimming size, and Bit 0..3 is 0 to stop dimming. Refer to object 24 for the correspondence between the value of the relatively dimmed telegram and the change in brightness.</p>					
185	Output X - ECG y	Brightness value	1byte	C,W	5.001 percentage(0..100%)
<p>This communication object is used to set the brightness value of the ECG.</p>					
186	Output X - ECG y	Activate Burn In	1bit	C,W	1.010 start/stop
<p>This communication object is used to enable or disable automatic burn in of the ECG. During the burn in process, all other switch, dimming or brightness value setting telegrams are ignored and the lamp is all on.</p> <p>Burn in is usually done automatically after the configured aging time. If the burn in is stopped by this object, the burn in time will also stop timing, and the burn in will need to be re-opened by this object, and the timing will start again.</p>					

187	Output X - ECG y	Switch status	1bit	C,R,T	1.001 DPT_Switch
This communication object is used to send the switch status of the ECG.					
188	Output X - ECG y	Brightness status	1byte	C,R,T	5.001 percentage(0..100%)
This communication object is used to send the brightness status of the ECG.					
189	Output X - ECG y	Failure status	1bit	C,R,T	1.005 alarm
This communication object is used to send failure status of the lamp and ECG.					
189	Output X - ECG y	Failure status	1byte	C,R,T	5.010 counter pulses(0..255) 21.601 lighting actuator error information
This communication object is a failure status in which the lamp failure and ECG failure are transmitted in a 1-byte data type. Bib0: lamp failure; Bit1: ECG failure;					
190	Output X - ECG y	Operation hours	4byte	C,R,T	13.100 time lag(s) 12.001 counter pulses(unsigned)
This communication object is used to send the operation hours of the light. Time unit: seconds. Send once every hour. Note: This object supports the write count time or the reset count time to 0, but the W attribute needs to be set via ETS. Normally, W does not set.					
191	Output X - ECG y	Life time exceeded	1bit	C,R,T	1.002 boolean
This object sends status information when the operation hours of the lamp exceeds the life time limit of the parameter configuration.					
192	Output X - ECG y	Reset Operating hours	1bit	C,W	1.015 reset
This communication object is used to reset the operating hours of the lamp to 0.					

Table 6.4 "X: ECG" communication object table