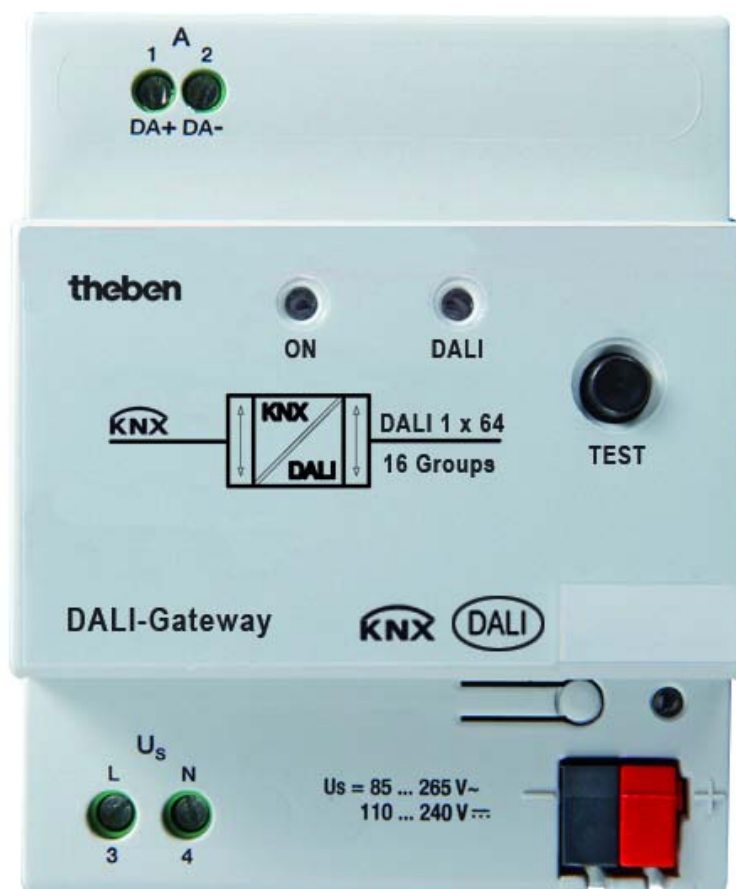


# DALI-Gateway KNX



DALI-Gateway KNX	9070722
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## 1 General

This manual provides you with detailed technical information concerning the group-oriented DALI-Gateway KNX.

The mounting, programming and commissioning including the Software Tool, and the use of the device are described using examples. Furthermore, basic terminology used with DALI technology is explained.

The Gateway is used for control of DALI equipment, e.g. ballasts, transformers or LED converters with DALI interfaces compliant to EN 62386 (formerly EN 60929) via KNX.

The output of the Gateway can be used to connect up to 64 DALI devices. The 64 DALI devices can be individually addressed and allocated as required in up to 16 lighting groups. Overlapping groups are possible. Control using KNX is implemented exclusively via these 16 lighting groups.

The application program offers a range of functions:

- Switching, dimming, setting of brightness values
- Status feedbacks via common or separate objects
- Status response of a lamp and/or ballast malfunction
- Programming of individual maximum and minimum dimming limit values (dimming thresholds)
- Different dimming speeds for switching, setting brightness and dimming
- Behaviour at DALI and KNX voltage failure and recovery
- Programming of the brightness value (power on level) after a ballast operating voltage recovery
- KNX control of all connected DALI devices without prior commissioning (DALI group assignment)

Various operating modes, e.g.:

- Function *Slave* for integration of the lighting groups in an energy efficient lighting control
- 14 independent light scenes, which can be recalled or stored via 1 bit or 8 bit telegrams
- Function *Staircase lighting* including pre-warning
- Function *Sequence* for programming of running lights or colour effects

The Gateway combines both the internationally standardized and open standards in the digital illumination control DALI (EN 62386 or EN 60929) and intelligent installation system KNX (ISO/IEC 14543-3 and EN 50090).



## 1.1 Product and functional overview



The group-oriented DALI-Gateway KNX is a modular installation device. Up to 64 DALI devices that can be controlled in 16 lighting groups may be connected to a DALI output. The DALI power source for the 64 DALI devices is integrated into the Gateway.

Control using KNX is implemented exclusively via 16 lighting groups. Additionally, setting of 14 light scenes is possible which can be recalled or stored via 8 bit or 1 bit KNX telegrams. Up to 16 lighting groups can be integrated into a lighting control if required when the function *Slave* is activated.

Furthermore, the functions *Staircase lighting* and *Sequence* are available. With the function *Sequence*, running lights and colour effects can be programmed without additional logic or timer modules.

The DALI devices connected to the DALI output (max. 64) can also be controlled or recalled together.

As an option, it is possible to control all connected DALI devices without prior commissioning (DALI group assignment) via KNX.

Information relating to a lamp and/or ballast malfunction is available individually for a lamp group or for a DALI device on the KNX.

DALI can be inhibited on the KNX with the assistance of a KNX communication object. Because of this inhibit, the Gateway can for example work together with the emergency lighting monitoring systems, which disconnect the lamps from the DALI, during an emergency lighting test. The resulting system-related ballast malfunction detected by the Gateway is not reported.

Manual switching of all DALI devices with a test button on the front of the device is possible. Furthermore, the correct gateway operating voltage and the error state of the DALI devices are indicated via two status LEDs. A fault is indicated as soon as there is a malfunction on at least one lamp or ballast.

The brightness value (0...100 %) of the ballast after the ballast operating voltage recovery (power on level) is programmable. The DALI address assignment is implemented automatically on the Gateway. It can however be suppressed by a parameter in the application program. Readdressing of the DALI devices and the assignment of the 64 DALI devices into 16 lighting groups is implemented in an ETS independent Gateway Software Tool, so that for example, a facility manager without ETS knowledge is capable of exchanging and reassigning DALI devices should maintenance be required. Furthermore, the error states of the individual DALI devices and/or lighting groups are represented graphically with the Gateway Software Tool.

The setting of the parameters and allocation of the group addresses is implemented primarily with the Engineering Tool Software ETS3. The most up-to-date version should be used. If ETS2 is used, the minimum requirement is version ETS2 V1.3.

## 1.2 DALI general



The requirements for modern lighting technology are extremely varied. While previously lighting was only required for visual tasks, nowadays factors such as comfort, ambience, functionality and energy saving are in the foreground. Furthermore, a modern lighting system is increasingly being incorporated in the Facility Management of the building installation in order to monitor the status of the entire lighting system. Often, a complex lighting management system is needed which meets the uses of the premises. All these requirements are either not adequately met by the traditional 1-10 V electrical installation or only with considerable effort and cost. The DALI standard (EN 60929 previously EN 62386) has emerged against this background in conjunction with leading manufacturers of lamp ballasts. It describes and defines the digital interface DALI (Digital Addressable Lighting Interface) for lighting technology equipment.

DALI has become established as an independent standard in the field of lighting technology. The range of ballasts, transformers, dimmers and relays with DALI interfaces has decisively influenced modern lighting technology.

## 1.2.1 DALI system description

The DALI standard enables the control with status messages of

- Max. 64 devices with a DALI interface
- 16 light scenes
- 16 lighting groups

A two-core control cable that does not need to be shielded is used for the exchange of information and transmission of the digital telegrams. It is not necessary to consider the polarity. The control cable must not have any SELV characteristics (safety extra-low voltage). Thus it is possible to use the two unnecessary cores of the five-core NYM 5 x 1.5 mm<sup>2</sup> mains cable as the DALI control cable.

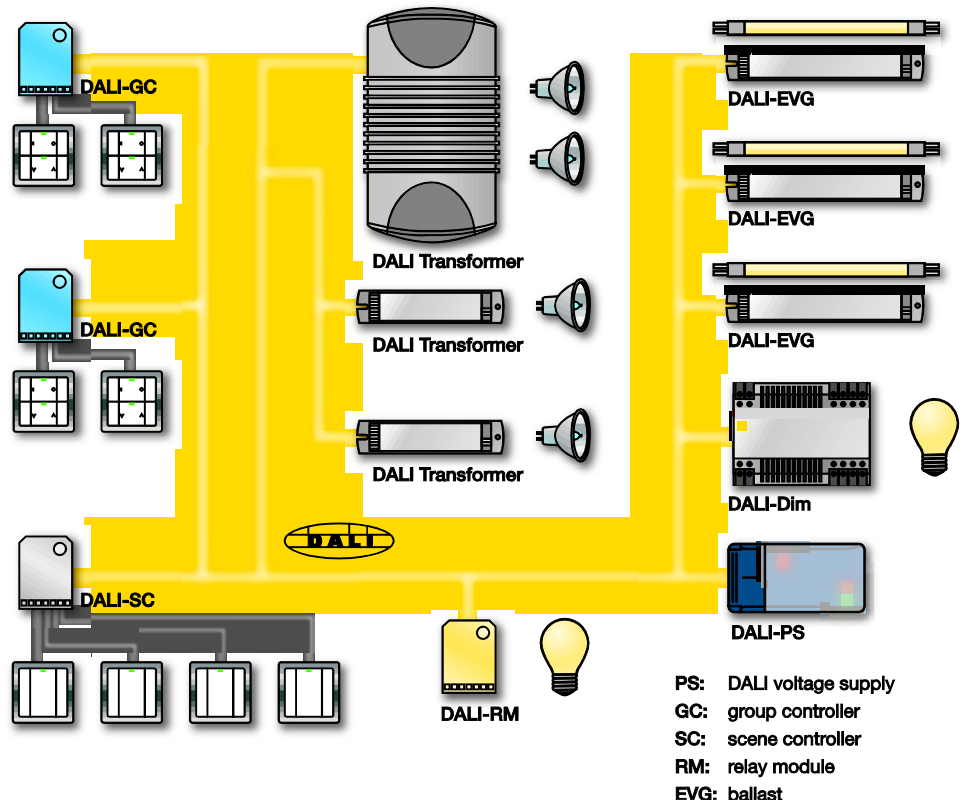
In a conventional DALI line a power source (16 V DC) supplies the individual DALI devices, the DALI processor and controller as well as the DALI control devices or modules, which are responsible for managing the scenes and groups. The power source can be integrated into a DALI master. In this case no further DALI power sources can be installed in the DALI line.

In contrast to 1-10 V technology, an electronic switching relay is integrated in the DALI ballast. Accordingly, a separate relay for switching the ballast is not required, a switching capacity calculations is unnecessary. Noiseless switching is thus enabled by the use of the electronic relay.

<b>Note</b>
<p>The following terminology is used to more easily differentiate between the different operating, DALI and KNX voltages in this product manual:</p> <p>Gateway operating voltage = voltage supply of the Gateway</p> <p>Ballast operating voltage = voltage supply of the DALI devices</p> <p>DALI voltage = voltage on the DALI line (control voltage)</p> <p>KNX voltage = voltage on the KNX line (bus voltage)</p>



1.2.2 DALI block diagram



The conventional DALI system is based on a single master system. This means that just a single master controls different slaves that in the DALI system means up to 64 slaves. However, in exceptional cases, company-specific solutions may include several sub-masters. In the illustration above these are, for example, the group controller (DALI-GC) and scene controller (DALI-SC). In other solutions these controllers may be combined in a single device. If a DALI system is integrated into a higher-level building control system, a gateway, e.g. KNX-Bus Gateway, assumes the master function. Other masters or sub-masters may not be connected to the DALI control line.

Furthermore, the DALI power supply is also integrated into the Gateway so that no further power supplies, e.g. DALI-PS may be connected to the Gateway. Every DALI device (slave) is addressed to ensure that they can be contacted individually. In the conventional DALI system, addressing is implemented using software or via multiple actuation or different time lengths of push button actuation.

Note
<p>There are DALI devices that internally contain several DALI slaves, e.g. REG converters and switch actuators that are only connected via a common DALI input to the DALI control line. The internal DALI devices have different individual DALI addresses and are addressed individually via DALI.</p> <p>However, should a DALI master only send broadcast telegrams, i.e., telegrams that can be received by all DALI slaves, the internal slaves can only be controlled simultaneously. In such cases control of an individual DALI slave, e.g. RGB colour control is not possible.</p> <p>The group-oriented Gateway recognises each individual DALI slave in the DALI device and can monitor each of them individually or control them in a freely programmable lighting group. In this way desired lighting effects can be controlled, e.g. with a DALI-RGB converter where the colour controls for red, green and blue are integrated.</p>

**1.2.3 Behaviour of DALI slaves with ballast operating voltage failure**

Ballast operating voltage failure, which is generally 230 V on DALI devices such as the ballasts, mean that the lamps switch off and the ballasts no longer function.

Note
<p>This state is detected by the KNX-Bus Gateway as a ballast malfunction because the ballast no longer responds.</p>

**1.2.4 Behaviour of DALI slaves with ballast operating voltage recovery**

In the supplied state, the equipment with DALI interfaces generally behaves so that the lamps light to maximum brightness the first time the ballast operating voltage is applied, or after ballast operating voltage recovery. This brightness value (power-on level) is predefined by the ballast manufacturer and represents a type of safety function. The electrician thus has the opportunity to take action in the commissioning phase even without addressed DALI devices or a programmed DALI master, by using just a normal automatic circuit breaker and switching the 230 V operating voltage of the DALI lighting on and off.

Note
<p>The power-on level of the ballast can be programmed via the KNX with the group-oriented Gateway, avoiding unwanted switch on after ballast operating voltage recovery. This can be applied to avoid current peaks caused by the simultaneous switch on of all ballasts at maximum power. This may also reduce or fully eliminate unwanted tripping of circuit-breakers triggered by the inrush current peaks.</p>

### 1.2.5 DALI-gateway KNX (group control)

The KNX-Bus group-oriented DALI-Gateway KNX provides the option of individually addressing 64 DALI devices on a DALI output and making them available via 16 lighting groups on the KNX. The advantage of this concept is that at any time the 64 DALI devices can be assigned individually and without a change to the installation to one lighting group, or if necessary to several lighting groups. As a result, maximum flexibility is retained until final acceptance or when a change is required later to the room usage. At the same time, the programming effort in ETS is considerably reduced by the assignment of 64 individual devices into 16 lighting groups. However, it must be considered that only 16 lighting groups can be controlled with the gateway using the KNX.

For every lighting group, the Gateway can send the status of the group on the KNX. Independently of this fact, with the gateway it is also possible to read the fault status of every DALI device individually via the KNX. Coded telegrams are available for this purpose.

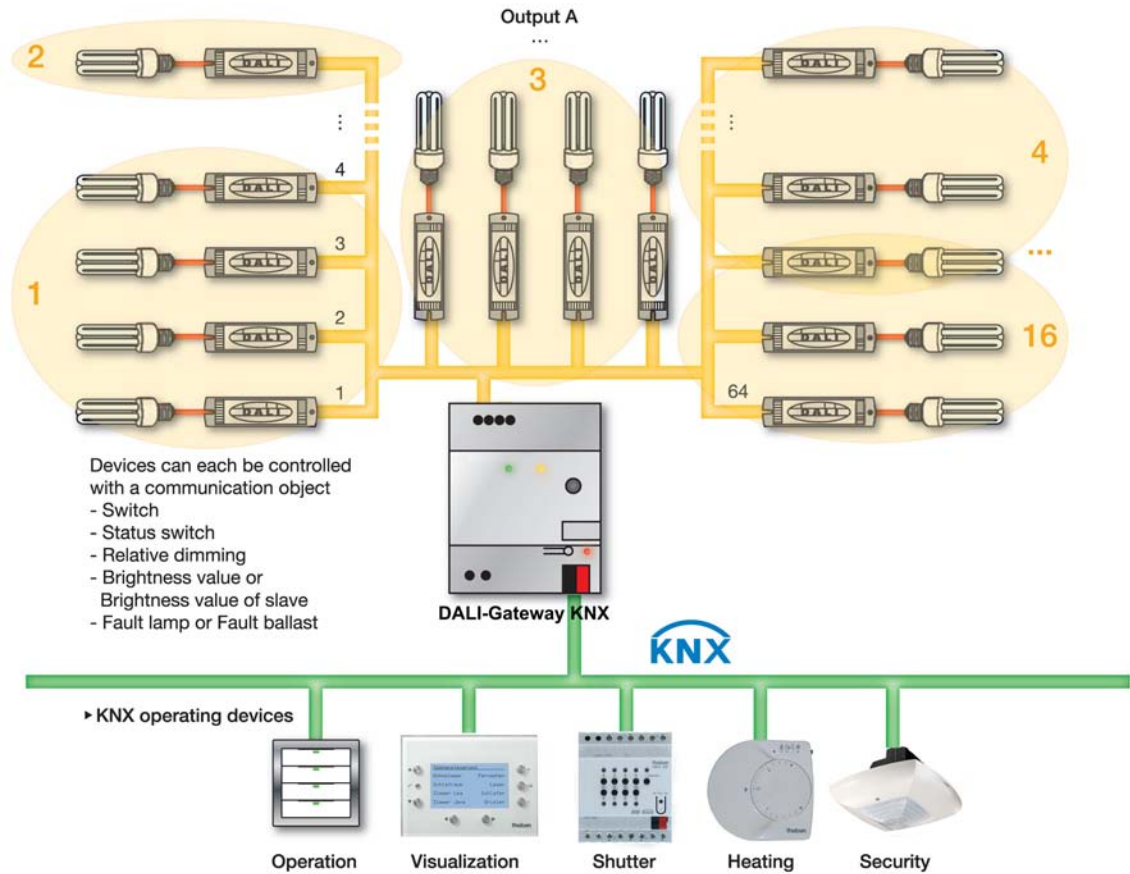
All DALI devices are addressed during an initialising phase automatically undertaken by the Gateway. The assignment to a lighting group that can be controlled and read via the KNX is undertaken with an ETS independent Software Tool, which for example, a facility manager without ETS knowledge and ETS license can operate. The DALI address can also be modified with this tool if necessary.

*For further information see: [Description Software Tool](#).*

It is possible to assign up to 64 DALI devices to a lighting group which can be commonly controlled without delay by a KNX telegram. The Gateway is predestined for controlling large lighting groups as a result.

Based on these features, the Gateway can be used primarily for control of lighting arrays in offices, workshops or warehouses, in which many lamps can be controlled simultaneously in a group.

The following diagram illustrates the function of the group-oriented Gateway.



## 2 Device technology



The KNX-Bus group-oriented DALI-Gateway KNX is a modular installation device (MDRC) for installation in the distribution board on 35 mm mounting rails.

The Gateway can in conjunction with the application program *DALI switch, dim, 16 groups* integrate devices with DALI interfaces into a KNX building installation. The connection to the KNX-Bus is implemented via a KNX connection terminal on the device shoulders.

The DALI output of the Gateway can be used to connect up to 64 DALI devices. The 64 possible DALI devices are assigned into 16 lighting groups represented on the KNX with an ETS independent Software Tool. With the Software Tool, additional and individual project-related DALI addressing is possible, which allows flexible assignment of the every one of the 64 devices, if necessary.

The fault status (lamps and ballasts) of every individual DALI device can be sent via different KNX communication objects on the KNX. The control of the 64 devices is implemented exclusively via the lighting groups. A device can be contained in several lighting groups.

In the Gateway, the function *Staircase lighting* and function *Sequence* are integrated. The 16 lighting groups can also be integrated into any light scenes and recalled or saved via the KNX using 1 bit or 8 bit scene telegrams. If the Gateway is integrated into a constant lighting control with a light controller, the individual lighting groups can be parameterised as slaves.

Using central telegrams (broadcast) all the DALI devices connected to a DALI output can be commonly controlled via the KNX.

The Gateway is a DALI control device (master) and requires an AC or DC auxiliary power supply. A separate DALI power supply\* is not required. The DALI power source for the 64 DALI devices is integrated into the Gateway. As soon as the auxiliary voltage (Gateway operating voltage) is applied, the Gateway can switch on or off all connected DALI devices via a test button, irrespective of the KNX or DALI addressing.

## 2.1 Technical data

<b>Supply</b>	Gateway operating voltage	85...265 V AC, 50/60 Hz 110...240 V DC
	Power consumption total via mains	Maximum 8 W at 230 V AC and max. load
	Current consumption total via mains	Maximum 35 mA at 230 V AC and max. load
	Leakage loss total for device	Maximum 3 W at 230 V AC and max. load
	Current consumption KNX	Maximum 10 mA
	Power consumption via KNX	Maximum 210 mW
<b>DALI outputs (channels):</b>	Number of outputs	1 to EN 60929 and EN 62386 64 DALI devices can be addressed individually and represented via 16 lighting groups on the KNX
	Number of DALI devices	Maximum 64
	Distance between Gateway and last DALI device	100 m <sup>*)</sup>
	Cable cross-section 0.5 mm <sup>2</sup>	150 m <sup>*)</sup>
	0.75 mm <sup>2</sup>	200 m <sup>*)</sup>
	1.0 mm <sup>2</sup>	300 m <sup>*)</sup>
<b>Connections</b>	KNX	KNX connection terminal, 0.8 mm Ø, single core
	DALI outputs and mains voltage	Screw terminal 0.2...2.5 mm <sup>2</sup> stranded 0.2...4 mm <sup>2</sup> single core
	Tightening torque	Maximum 0.6 Nm
	<b>Operating and display elements</b>	Test push button
	LED red and KNX button	For assignment of the physical address
	LED green	Display for operation readiness
	LED yellow	For displaying DALI fault, constant light For displaying test mode, slow flashing For displaying initialisation or more than 64 DALI devices, quick flashing
<b>Enclosure</b>	IP 20	to EN 60529
<b>Safety class</b>	II	to EN 61140
<b>Isolation category</b>	Overvoltage category	III to EN 60 664-1
	Pollution degree	2 to EN 60664-1
<b>KNX safety extra low voltage</b>	SELV 24 V DC	
<b>DALI voltage</b>	Typical 16 V DC (9.5...22.5 V DC)	to EN 60929 and EN 62386
	No-load voltage	16 V DC
	Lowest supply current at 11.5 V	160 mA
	Highest supply current	230 mA

\*) The length relates to the common DALI control cable.  
The maximum values are rounded off and relate to the resistance values. EMC influences are not considered.  
For this reason the values should be considered as absolute maximum values.

<b>Temperature range</b>	Operation	-5 °C...+45 °C
	Storage	-25 °C...+55 °C
	Transport	-25 °C...+70 °C
<b>Environmental conditions</b>	Humidity	Maximum 93 %, moisture condensation should be excluded
<b>Design</b>	Modular installation device (MDRC)	Modular installation device
	Dimensions	90 x 72 x 64.5 mm (H x W x D)
	Mounting width	4 modules at 18 mm
	Mounting depth	68 mm
<b>Installation</b>	On 35 mm mounting rail	to EN 60 715
<b>Mounting position</b>	as required	
<b>Weight</b>	0.16 kg	
<b>Housing, colour</b>	Plastic housing, grey	
<b>Approvals</b>	KNX to EN 50 090-1, -2	Certification
<b>CE mark</b>	in accordance with the EMC guideline and low voltage guideline	

### Note

The Gateway is compliant to the SELV characteristics to IEC 60 364-4-41 (VDE 0100-410).  
 DALI does not need to feature SELV properties, and it is possible to route the DALI control lines together with the mains voltage on a multi-core cable.

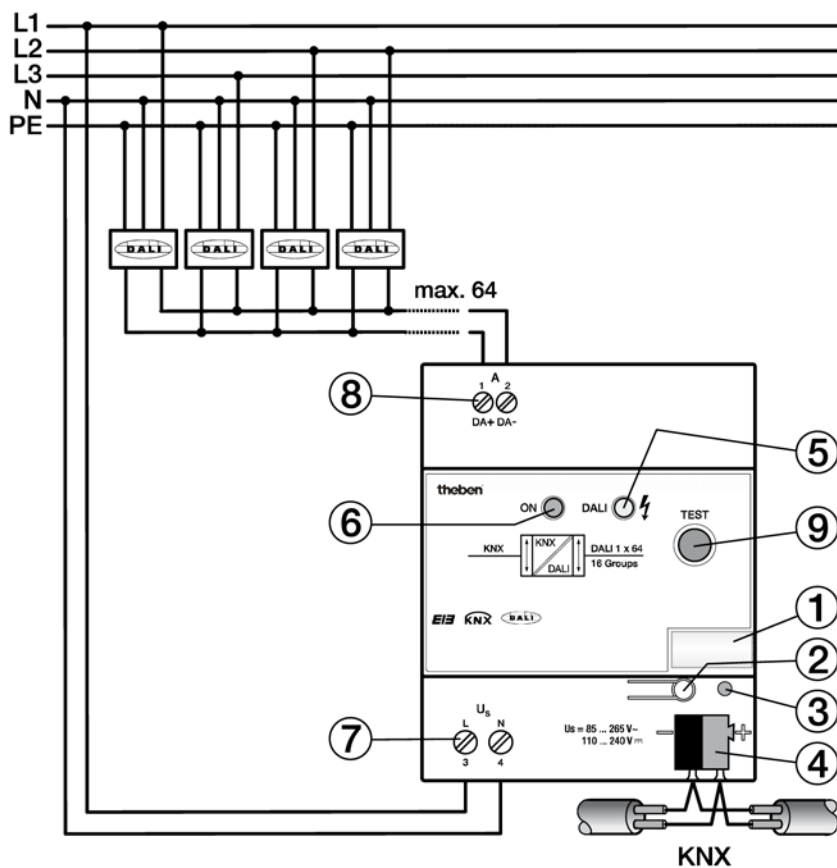
## Application program

Application program	Number Communication objects	Maximum number of group addresses	Maximum number of associations
DALI switch, dim, 16 groups	134	254	255

### Note

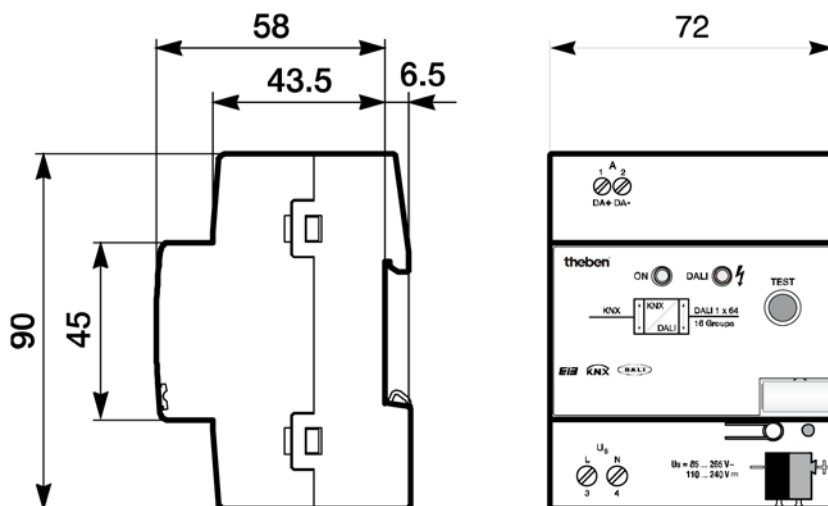
The setting of the parameters and allocation of the group addresses is implemented primarily with the Engineering Tool Software ETS3. The most up-to-date version should be used. If ETS2 is used, the minimum requirement is version ETS2 V1.3.  
 The application program for the ETS2/ETS3 can be found under [www.theben.de/downloads](http://www.theben.de/downloads).  
 The devices do not support the closing function of a project or the KNX devices in the ETS. If you inhibit access to all devices of the project with a *BA password* (ETS2) or a *BCU code* (ETS3), it has no effect on this device.  
 Data can still be read and programmed.

## 2.2 Circuit diagram





2.3 Dimension drawing



## 2.4 Assembly and installation

The DALI-Gateway KNX is a modular installation device for quick installation in the distribution board on 35 mm mounting rails to EN 60 715. The mounting position can be selected as required.

The electrical connection is implemented using screw terminals. The connection to the KNX is implemented using the supplied KNX connection terminal. The terminal designation is located on the housing.

Accessibility of the devices for the purpose of operation, testing, visual inspection, maintenance and repair must be provided compliant to VDE 0100-520).

### Commissioning requirements

In order to commission the device, a PC with ETS (from ETS2 V1.3a or higher) as well as an interface to the KNX-Bus, e.g. via a KNX interface, is required.

The assignment of DALI devices to lighting groups which are controlled in the KNX is undertaken in the Software Tool.

*For further information see: Description [Software Tool](#).*

The device is ready to operate when the KNX voltage and the gateway operating voltage are applied.

The installation and commissioning may only be carried out by qualified electrical specialists. The appropriate norms, guidelines, regulations and specifications should be observed when planning and setting up electrical installations.

- Protect the device from damp, dirt and damage during transport, storage and operation.
- Only operate the device within the specified technical data limits!
- The device should only be operated in an enclosed housing (distribution board)!

The voltage supply to the device must be switched off before mounting work is performed. All-pole disconnection must be observed in order to avoid dangerous touch voltages which originate from feedback from differing phase conductors.

### **Danger**

Touch voltages.  
Danger of injury.  
All-pole disconnection.

### Supplied state

The device is supplied with the physical address 15.15.255. The application program is pre-installed. It is therefore only necessary to load group addresses and parameters during commissioning.

However, the complete application program can be reloaded if required. After a change of application program, after an interrupted download or discharge of the device, a longer downtime may result.

## **Download behaviour**

Depending on the PC which is used, the progress bar for the download may take up to one and a half minutes before it appears due to the complexity of the device.

## **Assignment of the physical address**

The assignment and programming of the physical address is carried out in the ETS.

The device features a programming button located on the edge of the device for assignment of the physical KNX address. The red programming LED lights up after the button has been pushed. It switches off as soon as the ETS has assigned the physical address or the programming button has been pressed again.

## **Cleaning**

If devices become dirty, they can be cleaned using a dry cloth. Should a dry cloth not remove the dirt, the device can be cleaned using a slightly damp cloth and soap solution. Corrosive agents or solutions should never be used.

## **Maintenance**

The device is maintenance-free. No repairs should be carried out by unauthorised personnel if damage occurs, e.g. during transport and/or storage. The warranty expires if the device is opened.

## 2.5 Description of the inputs and outputs

On the DALI output up to 64 devices can be connected with a DALI interface. The Gateway is a DALI master with integrated DALI power supply.

### Important

Other DALI masters may not be connected to the output of the Gateway. The connection of another master to the single master system can cause communication malfunctions.



### Caution

Other DALI power supplies may not be connected to the output of the Gateway.  
The connection of further DALI supply voltages may destroy the Gateway due to voltage summation.  
Connection of 230 V mains voltage to the DALI outputs will destroy the DALI end stage and the output.

A control line on the DALI output with the following maximum length can be used:

Cable length [mm <sup>2</sup> ]	2 x 0.5	2 x 0.75	2 x 1.0	2 x 1.5
Max. cable length [m] from the Gateway to DALI device	100	150	200	300

These values are rounded off and relate to the resistance values. EMC influences are not considered. For this reason the values should be considered as absolute maximum values.

It is possible to assemble the DALI control cable with conventional installation material for mains cables. The two cores of the five-core NYM 5 x 1.5 mm<sup>2</sup> which are not required can be used without consideration of the polarity. It is not mandatory to lay a separate control cable.

The isolation between DALI control cables and the power supply is assured by the simple insulation properties according to EN 410. SELV properties are not featured.

The device is ready for operation after connection of the gateway operating voltage. The green operating LED on the front of the device lights up.

The yellow flashing (10 Hz) DALI LED indicates the maximum 90 second initialisation phase of the Gateway. The DALI system environment is analysed in this phase. If required, new DALI devices are allocated a DALI address and can be assigned to a lighting group with the Software Tool, whereby the lights are integrated into the KNX building automation.

During this phase, it cannot be guaranteed that an incoming telegram will be processed.

Note
The initialisation phase will not end if more than 64 DALI devices are connected.

The initialisation phase starts automatically after download, gateway operating voltage recovery and KNX voltage recovery. The initialisation phase is undertaken if in the parameterisation *Enable automatic DALI addressing* has been activated.

## 2.6 Display elements

Two indicator LEDs are located on the front of the Gateway:



ON



DALI

### ON

- The LED lights up if the gateway operating voltage is available and the device is ready for operation.
- The LED is off should the gateway operating voltage fail. At the same time a DALI voltage is not generated. The DALI-Gateway KNX is still programmable via the KNX. Control of the connected DALI device is no longer possible.

During manual operation in test mode the green LED is off and the yellow LED flashes slowly.

### DALI

- The LED is off if the device is in normal mode.
- The LED lights up if there is a DALI fault.  
A DALI fault is a DALI short circuit, a lamp or a ballast fault.
- The LED flashes slowly (1 Hz) if the device is in test mode.
- The LED flashes quickly (10 Hz) during the initialisation phase.  
The initialisation phase starts after download, KNX voltage recovery or after elimination of a DALI short circuit.  
The initialisation phase may take up to 90 seconds depending on the number of DALI devices.  
If more than 64 DALI devices are connected to an output, the device will not exit the initialisation phase. The yellow LED will continuously flash. An undefined state can be indicated in the Software Tool.

## 2.7 Manual operation

The DALI test push button is used for manual switching of the DALI output without KNX. Test mode is started by pressing the test button for more than two seconds and less than five seconds, or until the green LED switches off. The green LED is off and the yellow LED flashes slowly (1 Hz). The current brightness values are lost and are not set again after exiting manual mode. All DALI devices on the DALI output are switched on with 100 % brightness. The devices are switched off again with a renewed short button push (less than two seconds).

After a second test button push, test mode is exited. The yellow LED switches off and the green LED switches on. The devices retain their brightness state in the test mode.

The full functionality of test mode is assured as soon as the initialisation phase of the Gateway is complete. The initialisation phase starts after gateway operation and KNX voltage recovery or a download and is recognisable by the flashing (10 Hz) yellow LED.

If the DALI test button is pressed for longer than five seconds, the current mode is not exited, but a detection of DALI devices is triggered. The current state of the system is stored as the reference state. If the number of existing DALI devices has reduced in the meantime, the Gateway assumes that there is a ballast fault. The detection can also be activated via the KNX communication object (no. 110) *Detect ballasts*.

A KNX voltage recovery in test mode triggers an initialisation of the DALI devices and ends test mode.

Prerequisite for manual operation is the connection of the gateway operating voltage. If it is not applied, a DALI voltage is not generated and accordingly the DALI devices cannot be controlled.

Note
Test mode is ended automatically, if a button is not pressed within five minutes. The brightness values set in the test mode are retained.

### 3 Commissioning

The parameterisation of the Gateway is implemented with the application program *DALI switch, dim, 16 groups* and the Engineering Tool Software ETS.

*The application program for the ETS2/ETS3 can be found under [www.theben.de/downloads](http://www.theben.de/downloads).*

The Engineering Tool Software ETS3 is preferred for commissioning. The most up-to-date ETS version should be used. If ETS2 is used, the minimum requirement is version ETS2 V1.3.

The following work must be carried out:

- Assignment of the physical KNX device address (ETS)
- Optional re-addressing of the DALI devices (Software Tool)
- Assignment of the DALI devices to lighting groups represented in the KNX. Assignment is undertaken using the Software Tool.

*For further information see: Description [Software Tool](#).*

- Parameterisation of the Gateway (ETS)

A PC or laptop with ETS is required for parameterisation. A connection to the KNX can be implemented via an RS232 interface, USB or Ethernet ports.

The Gateway allocates each connected DALI device, which does not have a DALI address with the first free DALI address. This automatic addressing can be prevented using a parameter in the ETS, see parameter window [General](#), page 29. Readdressing of the DALI devices and the assignment to any lighting group is also possible with the Software Tool without using the ETS, whereby the DALI devices must already have a DALI address (0...63).

#### Note

The Gateway can only control the lamps, which have a DALI address and that are assigned to a lamp group. The only exception is with manual control which is activated using the test button on the front of the device. In test mode, all DALI devices are switched irrespective of whether they are assigned with a DALI address or assigned to a lighting group.

It is possible to parameterise that the Gateway automatically moves all DALI devices not assigned to a lighting group to group 16, see parameter page [A: Group](#), page 56.

However in this case, the DALI device must have a DALI address in a range from 0...63.



3.1 Overview

The group-oriented gateway requires, in addition to the KNX voltage, a gateway operating voltage to generate the DALI voltage for full function capability. The gateway operating voltage range can be found in the [Technical data](#), on page 14. The KNX voltage is sufficient for KNX programming with the ETS.

Thus in an office environment it is possible to pre-program the Gateway exclusively using the KNX voltage without having to resort to a gateway operating voltage (a 230 V AC/DC supply). As the Software Tool is responsible for the compilation of the lighting groups and directly accesses the DALI devices via the Gateway, the gateway operating voltage is required for the task.

The properties of the lighting groups are independent of each other and can be programmed individually. It is thus possible, depending on the application, to freely define every lighting group and to parameterise them accordingly.

The following table provides an overview of the functions used by the Gateway and those possible with the application program *DALI switch, dim, 16 groups*.

Properties/Parameterisation possibilities	Gateway
Installation type	MDRC
Number of outputs	1
Module width (space unit)	4
DALI devices	64
Lighting groups	16
Manual test function	■
Display of DALI fault	■

■ = property applies

Parameterisation options	Per group	All devices	Per device
Minimum and maximum dimming limit values (dimming thresholds)	■	■	
<b>Switch functions</b>			
Brightness value when turned ON	■	■	
Dimming speed for switch on and off	■	■	
Switch telegram and status, common or separate communication objects	■	■	
<b>Dimming</b>			
Dimming speed for 0...100 %	■	■	
Permit channel to be turned ON via relative dimming telegram	■	■	
<b>Brightness value</b>	■	■	
Dimming speed for transition brightness values	■	■	
Permit set switch on and off via value	■	■	
Brightness value and status, common or separate communication objects	■	■	
<b>Fault messages</b>			
Fault gateway supply		■	
DALI malfunction fault		■	
DALI device (ballast) fault via 1 bit communication object	■	■	
Lamp fault via 1 bit object	■	■	
DALI device or lamp fault via 1 bit communication object	■		
Coded error message via 2 byte communication object	■		■
Number of devices or groups with a fault	■		■
Number of devices or group with a fault	■		■
Acknowledge faults	■	■	■
Inhibit fault message via KNX communication object		■	
<b>Other functions</b>			
Reaction on KNX bus voltage failure	■		
Behaviour on KNX voltage recovery	■		
Behaviour on DALI voltage failure	■		
Behaviour on DALI voltage recovery	■		
Power on level	■		
Characteristic adjustment	■		
Function <i>Slave</i> for integration into a lighting control	■		
Function <i>Staircase lighting</i>	■		
Function <i>Sequence</i>	■		
Function <i>Burn-in</i>		■	
<b>Continued overleaf</b>			

Parameterisation options	Per group	All devices	Per device
<b>General functions</b>			
Request status values via 1 bit communication object	■	■	
Automatic DALI address assignment inhibit		■	
Cyclic monitoring telegram ( <i>In operation</i> )		■	
Status telegram limitation		■	
<b>14 scenes</b>			
Recall and save via KNX with 1 bit telegram	■		
Recall and save via KNX with 8 bit telegram	■		

■ = property applies

## 3.2 Parameters

This chapter describes the parameters of the group-oriented Gateway based on the parameter window. The parameter window features a dynamic structure so that further parameters or whole parameter windows may be enabled depending on the parameterisation and the function of the lighting groups.

In the following description the group x or Gx (abbreviated form) represents all lighting groups of a Gateway.

The default values of the parameters are underlined, e.g.

Option:        yes  
                 no

Indented parameter descriptions indicate that this parameter is only visible when the main parameter is parameterised accordingly.

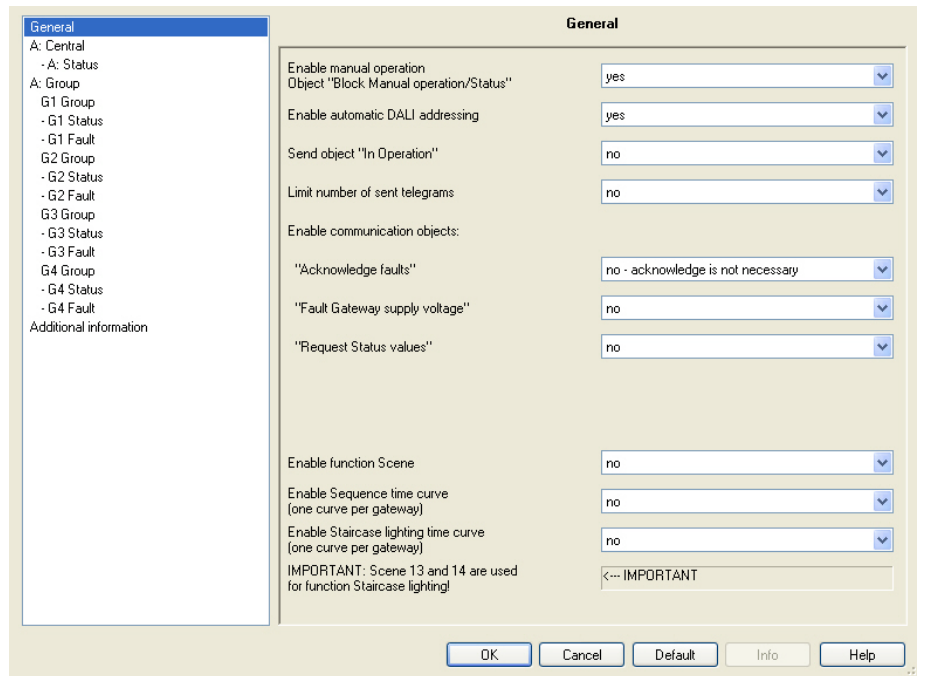
The illustrations of the parameter windows in this manual correspond to the ETS3 parameter windows. The user program is optimised for ETS3. Using the corresponding \*.VD2 file it is also possible to parameterise and engineer the Gateway without problems using ETS2. In the ETS2 it is possible however that the parameter window is automatically split by the ETS user interface if all parameters are used.

### Note

If in the following the communication object *Switch* or *Brightness value* is mentioned, they also apply for the communication objects *Switch/Status* or *Brightness value/Status*.

3.2.1 Parameter window  
*General*

In this parameter window, the main parameter settings relevant for the entire Gateway are undertaken.



**Enable manual operation  
Object “Block manual operation/Status”**

Options:     yes  
                  no

Using this parameter the manual test button on the front of the Gateway can be inhibited or enabled. The communication object *Man. Use disable/status* is available for the purpose

- **yes:** The test button is enabled.  
Using the test button the test mode can be activated by pressing the button for between two and five seconds.  
In this mode all DALI devices can be switched on and off to check the cable connections and verify that they are correct. By pressing the button for longer than five seconds the function *Detect ballasts* is triggered. In this way the current number of connected DALI devices is determined and saved as a reference value. If this number changes in the meantime, the Gateway will assume that there is a ballast fault.
- **no:** The test button is disabled.  
No manual action is possible on the device.

**Enable automatic DALI addressing**

Options:     yes  
              no

Using this parameter the automatic DALI addressing process of the Gateway can be switched off.

- **yes:** If the Gateway locates a DALI device without DALI address assignment, the gateway automatically allocates the first free DALI address to the DALI device.

**Benefits**

If there is DALI addressing without gaps, the exchange of a defective DALI device is possible without additional addressing or commissioning. A new DALI device without a DALI address must only be installed for this purpose.

The Gateway addresses the new devices with the free DALI address of the device which has failed, and transfers the properties that were present in the DALI device removed beforehand. If the DALI device does not yet have a group address (is new directly from the factory), it will also receive the group assignment. If another group assignment exists in the DALI device, a conflict will be indicated in the Software Tool. This can be remedied with the Software Tool by adopting the Gateway or the ballast information.

If the Gateway detects several DALI devices with the same DALI address, these DALI addresses are deleted and the devices automatically receive the first free DALI addresses in the address range from the Gateway.

*For further information see: [Planning and application](#), page 133*

- **no:** The Gateway does not assign DALI addresses, neither in normal mode nor at gateway voltage recovery. Should a non-addressed DALI device be installed, the Gateway can only control this using a broadcast telegram. A DALI address is unnecessary for this purpose. If a DALI device with an existing address has been installed, the Gateway will not be changed by it.

**Send object "In operation"**

Options:     no  
              send value 0 cyclically  
              send value 1 cyclically

The *In operation* communication object indicates the presence of the Gateway on the KNX. This cyclic telegram can be monitored by an external device.

If a telegram is not received, the Gateway may be defective or the KNX cable to the transmitting Gateway may be interrupted.

- **no:** The communication object *In operation* is not enabled.
- **send value 0/1 cyclically:** The communication object *In Operation* is sent cyclically on the KNX.  
An additional parameter appears:

**Telegram will repeated every  
in s [1...65,535]**Options: 1...60...65,535

Here the time interval at which the *In operation* communication object cyclically sends a telegram is set.

**Limit number of sent telegrams**Options: no  
yes

The load on the KNX generated by the device can be limited with the limitation on the number of telegrams sent. This limit relates to all telegrams sent by the device.

- yes: The following parameters appear:

**Time between two response telegrams  
in s [1...255]**Options: 1...20...255**in Period**Options: 50 ms/100 ms...1 s...30 s/1 min

This parameter defines the number of telegrams sent by the device within a period. The telegrams are sent as quickly as possible at the start of a period.

**Note**

It counts the number of telegrams sent within a parameterised period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the KNX until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero and sending of telegrams is allowed again. The current communication object value is always sent at the time of transmission.

The first period (break time) is not predefined exactly. The period can be between zero seconds and the parameterised time. The subsequent sending times correspond with the parameterised time.

Example:

Maximum number of sent telegrams = 5, in period = 5 s.  
20 telegrams are ready to be sent. The device immediately sends 5 telegrams. The next 5 telegrams are sent after maximum 5 seconds. From this point a further 5 telegrams are sent on the KNX every 5 seconds.

**Enable communication objects:****“Acknowledge faults”**

Options:     no - acknowledge is not necessary  
              yes - acknowledgement is required

Should a fault occur (ballast, lamps, DALI, operating supply voltage) the Gateway sends a telegram via the respective communication object on the KNX.

- *no - acknowledge is not necessary*: As soon as the fault is remedied, the Gateway will reset the fault message and automatically sends the status change in dependence on the parameterisation, to the communication object, e.g. *Fault lamp*. A telegram with the value 0 is sent.  
The change in the malfunction state may take 45 seconds and depends on the number of connected DALI devices.
- *yes - acknowledgement is required*: First of all the communication object *Enable communication object* is enabled. As soon as the fault is rectified a telegram with the value 0 is not sent automatically. This fault signal still remains set until the fault is rectified and the fault signal is reset via the communication object *Acknowledge Faults*. Only then is a telegram with the value 0 sent via the corresponding communication object.  
This can be very helpful when detecting sporadic errors or events which take place during unmanned monitoring periods.

**“Fault Gateway supply voltage”**

Option:        no  
               yes

- *no*: Failure of the gateway operating voltage is not reported to the KNX.
- *yes*: The communication object *Fault Gateway supply voltage* is enabled. As soon as the device supply voltage is interrupted, the communication object *Fault Gateway Supply voltage* sends a telegram with the value 1 on the KNX.  
The time at which a telegram is sent can be adjusted using the following parameters.



**Send**

Options:     after a change  
                  after request  
                  after a change or request

- *after a change*: If the status of the gateway supply voltage changes, this is sent by a telegram with the value 0 (no fault) or with the value 1 (Fault Gateway supply) via the communication object.
- *after request*: The status of the gateway supply voltage is only sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*, see following parameters.
- *after a change or request*: The status of the gateway supply voltage is only sent via the KNX if the status of the gateway supply voltage changes or a telegram with the value 1 is received on the communication object *Request status values*.

**“Request Status values”**

Option:        no  
                  yes

Via this communication object all status messages can be requested provided that they have been parameterised with the option *after a change or request* or only *after request*

- *no*: The communication object *Request status values* is not enabled.
- *yes*: The 1 bit communication object *Request status values* is enabled. The following parameter appears:

**Recall with object value**

Options:        0  
                  1  
                  0 or 1

This parameter defines the value at which the communication object *Request status value* is triggered. An opportunity is presented, e.g. to provide up-to-date values to a visualisation system.

- *0*: Sending status messages is requested with the value 0.
- *1*: Sending status messages is requested with the value 1.
- *0 or 1*: Sending status messages is requested with the value 0 or 1.

**Enable function Scene**

Options:     no  
              yes

The parameter window *Scenes* is enabled when the function *Scene* is enabled. Here up to 14 scenes can be enabled.

Any 16 lighting groups can be included in each of these 14 lighting scenes.

**Note**

Generally 16 scenes are available with DALI applications. Scenes 15 and 16 are however reserved for internal applications in the Gateway.

**Important**

If the function *Staircase lighting* is used in the Gateway, the scenes 13 and 14 are used for this function. These are no longer available as "normal" scenes.

- *no*: Parameter window *Scenes* remains inhibited and invisible.
- *yes*: Parameter window *Scenes* appears.

**Enable sequence time curve  
(one curve per gateway)**

Options:     no  
              yes

The Gateway offers the possibility of allowing a sequence to run. A sequence is a string of up to a maximum of ten scenes which are successively recalled. In this way it is possible to program running lights without additional logic or timer modules.

**Note**

Only one sequence can be programmed on the Gateway. The corresponding setting is undertaken in the parameter window - [Gx Sequence](#), page 80. The sequence is recalled by the communication object *Switch* of the lighting groups which are members. This parameterisation is undertaken in the parameter window [Gx Group](#), page 55.

*For further information see: [Sequence](#), page 158*

- *no*: Parameter window *Sequence* remains inhibited and invisible.
- *yes*: Parameter window *Sequence* appears.

**Enable staircase lighting time curve  
(one curve per gateway)**

Options:     no  
              yes

The Gateway has the option of implementing a staircase lighting time curve incorporating a dimming up and pre-warning phase.

**Note**

Only one staircase lighting time curve can be programmed on the Gateway. The setting is undertaken in the parameter window [Staircase lighting](#), page 97 (dimming phase, staircase lighting time, dimming down / warning phase, basis brightness). The function *Staircase lighting* is recalled by an ON telegram of the lighting group if the additional function *Staircase light* is selected for this lighting group. This parameterisation is undertaken in the parameter window [Gx Group](#), page 55.

*For further information see: [Staircase lighting](#), page 150*

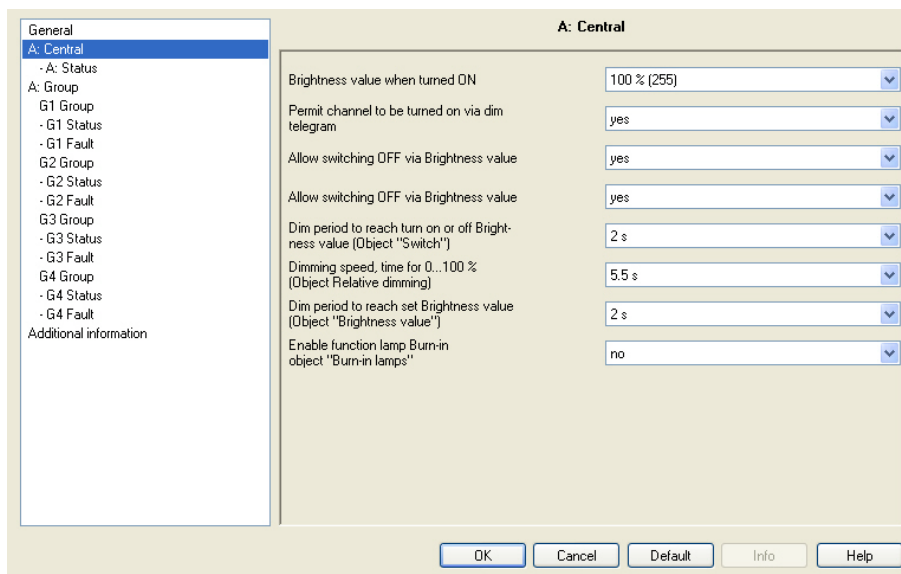
- *no*: Parameter window *Staircase lighting* remains inhibited and invisible.
- *yes*: Parameter window *Staircase lighting* appears.

**Note**

If the function *Staircase lighting* is used in the device, the scenes 13 and 14 are used for this function. These are no longer available as “normal” scenes.

3.2.2 Parameter window  
**A: Central**

In parameter window *A: Central* the settings for simultaneous control of all lighting groups connected to output A are parameterised.



**Note**

If a central telegram is referred to in the following, this is a telegram which is received via one of the communication objects with the name *Output A*. Here you are dealing with communication objects no. 96 to 111. The function of the communication object relates to all of output A with all connected DALI devices.

If DALI devices are connected to the output that is not assigned to lighting groups, they are not controlled via the central telegram *Output A*. In parameter window *A: Group* it is possible to program the Gateway so that all devices which are not assigned to a group are automatically assigned by the device to group 16. In this way, it is possible to commonly control all connected DALI devices even without manual group assignment via the communication objects *Output A*.

If at the time of the incoming central telegram an individual group telegram is implemented, this is immediately interrupted and the central telegram is executed on the output. If all groups (devices) are controlled with a central telegram and if a subsequent telegram is received for a group, this group will execute the group telegram. The telegram received last has a higher priority and is executed.

**Brightness value when turned ON**

Options:      last value  
                  100 % (255)  
                  99 % (252)  
                  ...  
                  1 % (3)

This parameter defines the brightness value which is used to switch on all lighting groups of output A that are switched on when an ON telegram is received.

If a value is set which is outside the dimming value range (*maximum brightness value* or *minimal brightness value*), the threshold is set as the minimum or maximum brightness value.

The dimming thresholds of the individual lighting groups apply with the control of all groups. In this way the brightness values of the individual groups under common control can be differentiated.

If individual lighting groups, e.g. are set to a brightness not equal to the switch on value due to dimming, and then receive an ON telegram (central telegram), the parameterised switch on value of the output is set.

- *last value*: All lighting groups are switched on with the brightness value which they had when switched off centrally via the communication object *Switch* (output A).

**Note**

Saving of the last brightness value is implemented with each central OFF telegram that is received via the communication object *Switch* or *Switch / Status* telegram. At this point the brightness values of the individual lighting groups are saved and switched back on with the next central ON telegram which is received with the communication object *Switch* or *Switch / Status*. If a lighting group is already switched off at the time of the central OFF telegram, the state (brightness value equal to 0) is saved as the last state for the lighting group.

Thus the actual room state at the time of switch off is recreated.

One exception is if all lighting groups on the output are already switched off. In this case with a further central OFF telegram, the OFF state is not saved as the last brightness value for all lighting groups.

If a renewed OFF telegram is received during dimming down, the current brightness value is saved as the last brightness value for the lighting group.

If gateway operating voltage fails, the last brightness value is lost, and after recovery of the gateway operating voltage maximum brightness is set. The last brightness value is retained after a download or KNX voltage failure.

A differentiation is made between the last brightness value with central switching via communication object *Switch (Output A)* and with group-oriented switching via communication objects *Switch (Group x)*. Both values are independent of each other. This means if some lighting groups are dimmed or switched on or off via the group telegrams, the last brightness values for the central telegram is retained without change. When a central ON telegram is received, the brightness values which were set during the last central OFF telegram are set again.

**Permit channel to be turned ON via dim telegram**

Options:     yes  
              no

With this parameter the switch on behaviour of the entire output is parameterised during dimming with the central telegram.

- *yes*: Switch on using the DIM telegram is allowed.
- *no*: Switch on using the DIM telegram is not allowed. The output must be switched on in order to be dimmed.

**Allow switching ON via Brightness value**

Options:     yes  
              no

Using this parameter the switch on behaviour of the output with a received brightness value (communication object *Output A: Brightness value*) is set.

- *yes*: Switch on with a brightness value (8 bit > 0) is permitted.
- *no*: Switch on with a brightness value is not permitted. The output must be switched on in order to execute the brightness value telegram.

**Allow switching OFF via Brightness value**

Options:     yes  
              no

Using this parameter the switch off behaviour of the output is set with a received brightness value.

- *yes*: Switch off with a brightness value is permitted.
- *no*: Switch off with a brightness value is not permitted. The output must be implemented with an OFF telegram via the communication objects *Switch* or *Switch/Status*.

**Dim period to reach turn on or off Brightness value (Object “Switch”)**

Options:        immediate  
                  0.7 s  
                  2 s  
                  ...  
                  90 s  
                  time for dimming changeable via bus

A soft start or soft stop can be set with this parameter. For this purpose, the period is defined in which the Gateway using an ON telegram dims the lighting group from 0 % brightness to the switch on value after receipt of a switch telegram on one of the central communication objects of output A, *Switch* or *Switch/Status*.

The same speed also applies for an OFF telegram.

The dim period is only relevant for central ON/OFF telegrams (1 bit).

- *Immediate*: All devices on output A are immediately ON.
- *0.7 s...90 s*: During this time, the lighting group is dimmed from 0 % brightness to the switch on value.
- *time for dimming changeable via bus*: The time received via the communication object *time for dimming changeable* has an effect on the ON/OFF switching performance. There are 16 discrete values which are defined according to DALI for the *time for dimming changeable via bus*.

*For further information see: [Communication object no. 109](#), page 119 and [Code table for flexible dimming times](#) page 172*

**Note**

Via communication object *time for dimming changeable* of the output, a value between 0...15 is received. These values comply with the specified transition times according to the DALI standard. A value of 0 for example, corresponds with an immediate reaction.

*For further information see: [Communication object no. 109](#), page 119 and [Code table for flexible dimming times](#) page 172*

The switch off time is also considered when the lighting group is at the lower dimming threshold and an OFF telegram is received. In this case the lighting group switches off at the lower dimming value limit only after the programmed dimming time for switch ON/OFF. This ensures that all lighting groups switch off simultaneously.

**Dimming speed, time for 0...100 %  
(Object Relative dimming)**

Options: 0.7 s  
...  
5.5 s  
...  
90 s  
time for dimming changeable via bus

This dimming time only affects DIM telegrams which are received for the Gateway via the central communication object *Relative dimming* for output A.

**Note**

The following must be observed when selecting the dimming times: Depending on the lighting equipment involved, staged dimming can occur with fast dimming speeds and low dimming times. The cause of this is that dimming steps are defined in the DALI standard in order to achieve a logarithmic dimming curve which appears as a linear behaviour to the human eye.

With the central function the defined dimming thresholds (minimal/maximum brightness value) in parameter window [Gx Group](#), page 55, continue to apply as thresholds for the individual group. If the minimum dim value is less than the possible physical dim value of DALI equipment, this device is automatically set to the lowest possible physical dim value (background brightness).

During the activated function *Burn-in*, the lamps are switched on with 100 % brightness independently of the central DIM telegrams and set brightness values.



**Dim period to reach set Brightness value  
(Object "Brightness Value")**

Options:        immediate  
                   0.7 s  
                   2 s  
                   ...  
                   90 s  
                   time for dimming changeable via bus

This parameter determines the time duration in which the Gateway sets the received brightness value for all DALI equipment on output A via the communication objects *Brightness value* or *Brightness value/Status*.

- *Immediate*: All devices on output A immediately switch ON with the received brightness value.
- *0.7 s...90 s*: During this time the lighting group is dimmed down to the received brightness value.
- *time for dimming changeable via bus*: The time received via the communication object *time for dimming changeable* influences the dimming UP/DOWN time set via the brightness value.

**Note**

Via communication object *time for dimming changeable* of the output, a value between 0...15 is received. These values comply with the specified transition times according to the DALI standard. A value of 0 for example, corresponds with an immediate reaction.

*For further information see: [Communication object no. 109, page 119](#) and [Code table for flexible dimming times page 172](#)*

**Enable function lamp Burn-in  
object "Burn-in Lamps"**

Options:        no  
                   yes

The Gateway has the possibility for activation of the function *Burn-in* for all connected DALI devices.

**Note**

Continuous dimming of lamps which are not burnt in can mean that the maximum defined brightness of the lamp may not be achieved, and the required brightness value in the area may not be achievable.

In order to guarantee the maximum lamp life and correct function of the ballast in the dimmed state, some lamps (vapour filled) must be operated for a certain number of hours at 100 % brightness during initial operation before they can be permanently dimmed.

Detailed information should be taken from the technical data of the lamps.

- *no*: The function *Burn-in* is not enabled.
- *yes*: The function *Burn-in* is enabled. The communication object *Burn-In Lamps* appears. At the same time two further parameters appear: *Lamp burn-in period in hours [1...255]* and *Status of burn-in*.

### Response with activated function *Burn-in*

If a telegram with the value 1 is received via the communication object *Burn-In Lamps*, the Gateway activates the function *Burn-in* and sets the programmable burn-in time.

During burn-in only the lighting groups are considered which have been selected with the corresponding parameterisation. The parameterisation is implemented in the parameter window [Gx Group](#), page 55, with the parameter *Enable with burn-in function (Object "Burn-In Lamps/Status")*.

During function *Burn-in*, the lighting group can only assume the state 0 % (OFF) or 100 % (ON). Every device has its own "burn-in counter" which decrements when the device is switched on. The counter has a counting interval of five minutes, i.e. if the lamp has been switched on for five minutes; the burn-in time is reduced by five minutes.

As every device of a lighting group has its own burn-in counter, the burn-in times of the individual devices are determined even with overlapping groups. As soon as a device has completed its burn-in time, it is enabled for normal dimming operation.

The internal burn-in counter has a size of 1 byte and provides a timer with five minute intervals and a maximum value of 254 hours.

*For further information see: [Burning-in of luminaries](#), page 139*

### Reaction on KNX bus voltage failure and gateway operating voltage failure

The elapsed burn-in time is retained and continues to count after KNX voltage recovery and gateway operating voltage recovery. The burn-in process is restarted by a telegram with the value 1 to the communication object *Burn-In Lamps* or *Burn-In Lamps/Status*.

This telegram has an effect on all lighting groups for which the function *Burn-in* has been parameterised. A telegram with the value 0 sets the burn-in counter to 0 and ends function *Burn-in* for all lighting groups.

### Lamp Burn-in period in hours [1...254]

Options: 1...100...254

This parameter determines the time period for function *Burn-in*. As long as this time has not elapsed, the DALI device can only be operated with 100 % and OFF on the DALI output, i.e., at every set brightness value not equal to 0 %, the lamp is switched on with 100 % brightness.

After the burn-in time has elapsed or the function is deactivated (received telegram with the value 0 via communication object *Burn-In Lamps*), the DALI device can be dimmed as usual.

The burn-in time is only counted if a DALI device is connected to the output and ready for operation (supplied with power).

The function of the burn-in time remains activated with a KNX bus voltage failure. The time for the switched on lamps continues to count down.

With a gateway operating voltage failure, the remaining burn-in time is saved and reused after gateway operating voltage recovery. This also applies after an ETS download.

**Status of burn-in**

Options:     no  
              yes: via object "Burn-In Lamps/Status"

The Gateway features the option of sending the status of the function *Burn-in* on the KNX via communication object *Burn-In Lamps/Status*.

- *no*: No status message is sent for the function *Burn-in*.
- *yes*: The communication object *Burn-In Lamps* changes to *Burn-In Lamps/Status*. If this communication object receives an ON telegram the function *Burn-in* is started and the status is sent on the KNX.

Two further parameters appear:

**Send**

Options:     after a change  
              after request  
              after a change or request

- *after a change*: If the status of the function *Burn-in* changes, this is sent by a telegram with the value 0 (no function *Burn-in*) or with the value 1 (function *Burn-in*) via the communication object.
- *after request*: The status of function *Burn-in* can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of function *Burn-in* is only sent via the KNX if the status of the function burn-in changes or a telegram with the value 1 is received on the communication object *Request status values*.

**Status response for different status in the output**

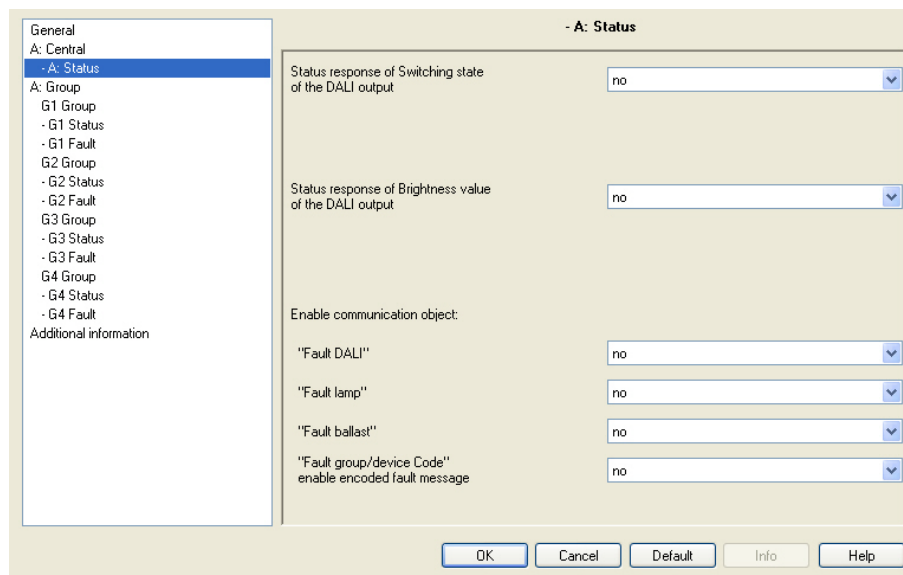
Options:     ON  
              OFF

As every device has a burn-in counter and overlapping lighting groups are also possible, it is possible that a lighting group may contain devices with different burn-in times. If this is the case, this parameter can be used to define which state of the lighting group is reported.

- *ON*: If at least one connected device is in the burn-in state, the burn-in state is displayed via the communication object *Burn-In Lamps / Status* with the value 1. No burn-in is reported (value 0) if no lamps are burnt-in.
- *OFF*: If no lamps or only some of the lamps are burned in, the no burn-in state (value 0) is indicated via the communication object *Burn-In Lamps/Status*.  
Only when all lamps of the group are in the burn-in state is an active burn-in process indicated by the value 1.

3.2.2.1 Parameter window  
A: Status

In this parameter window the status response of the output is parameterised. The status response of the individual lighting group can be set accordingly in the respective group under the parameter window [- Gx Status](#), page 65.



**Status response of Switching state of the DALI output**

Options: no  
 yes: via object "Switch/Status"  
 yes: via separate object "Status switch"

- *no*: The status of the switch state is not actively sent on the KNX.
- *yes: via object "Switch/Status"*: The common communication object *Switch/Status* receives the switch telegram and the current status becomes active and is sent on the KNX.
- *yes: via separate object "Status switch"*: An additional *Status Switch* communication object is enabled. Using it, a 1 bit telegram with the actual switch status is sent on the KNX.

Note
<p>This status message relates to all lighting groups of the DALI output. With a change of the parameterisation or after a subsequent switching of the status object, the assignment of the group's addresses already allocated to the <i>Switch</i> communication object are lost and need to be reprogrammed.</p> <p>If the communication object <i>Switch/Status</i> is used for switching and status feedback, particular care must be taken with the send properties of the communication objects.</p> <p><b>For further information see:</b> <a href="#">Common communication object for control telegram and status, page 149</a></p>

**Important**

Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Switch/Status* communication objects, to eliminate mutual interference of devices as a result of differing status messages.

With the option yes:... two further parameters appear:

**Send**

Options:     after a change  
              after request  
              after a change or request

- *after a change*: If the status of the switch state changes, this is sent by a telegram with the value 0 (OFF) or with the value 1 (ON) via the communication object.
- *after request*: The status of the switch state can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the switch state is only sent via the KNX if the status changes or a telegram with the value 1 is received on the communication object *Request status values*.

**Switch value for different values in the output**

Options:     ON  
              OFF

This parameter defines the status to be sent if DALI devices with different states are present on the output.

- *ON*: The switch status is sent as an ON (telegram with the value 1) if at least one DALI device is switched on.
- *OFF*: The switch status is only sent as an ON (telegram with the value 1) if all DALI devices are switched on.

**Status response of Brightness value of the DALI output**

Options: no  
yes: via object "Brightness value/Status"  
yes: via separate obj. "Status brightness value"

The parameter defines how the current status of the brightness value of the output (the lighting) is sent on the KNX.

- *no*: The brightness value is not actively sent on the KNX.
- *yes: via object "Brightness value/Status"*: The brightness value is sent on the KNX via the object *Brightness value/Status*.
- *yes: via separate object "Status brightness value"*: An additional *Status brightness value* communication object for the status message is enabled.

**Note**

This status message relates to all connected devices of the DALI output. It is possible to parameterise the response of the status messages should differing states occur with the devices.

With a change of the parameterisation or after a subsequent switching of the status object, the assignment of the group's addresses already allocated to the *Brightness value* communication object are lost and need to be reprogrammed.

With the options yes:... two further parameters appear:

**Send**

Options: after a change  
after request  
after a change or request

- *after a change*: If the status of the switch state changes, this is sent by a telegram with the value 0 (OFF) or with the value 1 (ON) via the communication object.
- *after request*: The status of the switch state can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the switch state is only sent via the KNX if the status changes or a telegram with the value 1 is received on the communication object *Request status values*.

**Brightness value for different values in the output**

Options:     average brightness of all lamps in the output  
                  highest brightness value of all lamps in the output  
                  lowest brightness of all lamps on the output

This parameter defines the status to be sent if devices with different states are present on the output.

- *average brightness of all lamps in the output*: The average brightness of all DALI devices (not the lighting groups) is sent as the status of the output on the KNX. Thus a lighting group with many DALI devices has a higher weighting in the calculation of the average brightness.
- *highest brightness value of all lamps in the output*: The highest brightness value of the DALI devices is taken as the status of the output sent on the KNX.
- *lowest brightness of all lamps on the output*: The lowest brightness value of the DALI devices is taken as the status of the output sent on the KNX.

Using the following parameters further communication objects and their associated functions for the output of the Gateway can be enabled.

**Enable communication object****“Fault DALI”**

Options:     no  
                  yes

Using this communication object, a fault of the DALI communication of the output, i.e. a short-circuit > 500 ms or a data collision, can be sent or read, e.g. for diagnostic purposes. Individual fault indication objects are available for a ballast/lamp fault.

- *no*: The communication object *Fault DALI* is not enabled.
- *yes*: The communication object *Fault DALI* is enabled. As soon as there is a DALI fault on the output, it is indicated by a 1 in the communication object *Fault ballast*.

A further parameter appears:

**Send**

Options:     after a change  
                  after request  
                  after a change or request

- *after a change*: If the status of the DALI fault changes, this is sent by a telegram with the value 0 (no fault) or with the value 1 (fault) via the communication object.
- *after request*: The status of the DALI fault can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the DALI fault is sent via the KNX if the status changes or a telegram with the parameterised value is received on the communication object *Request status values*.

**“Fault lamp”**

Options:     no  
                  yes

Via this communication object a fault of a lamp for output A can be sent or read.

- *no*: The communication object *Fault lamp* is not enabled.
- *yes*: The communication object *Fault lamp* is enabled. As soon as there is a lamp fault on the output it is indicated by a 1 in the communication object *Fault lamp*. A further parameter appears:

**Send**

Options:     after a change  
                  after request  
                  after a change or request

- *after a change*: If the status of the lamp fault changes, this is sent by a telegram with the value 0 (no fault) or with the value 1 (fault) via the communication object.
- *after request*: The status of the lamp fault can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the lamp fault is sent via the KNX if the status changes or a telegram with the parameterised value is received on the communication object *Request status values*.

**“Fault ballast”**

Options:     no  
                  yes

Using this communication object a ballast fault can be sent or read.

- *no*: The communication object *Fault ballast* is not enabled.
- *yes*: The communication object *Fault ballast* is enabled. As soon as there is a ballast fault on the output it is indicated by a 1 in the communication object *Fault ballast*.



**Note**

In order to correctly detect the fault of a ballast, the Gateway must have correctly identified all connected DALI devices and thus know the addresses to be monitored. This identification process can be triggered via the communication object *Detect ballast* or with a long actuation on the test button. An automatic detection e.g. after a KNX voltage recovery or gateway operating voltage recovery does not take place. After approx. 90 seconds, all the DALI devices are detected and the failure of a ballast can be correctly established.

The activation should be carried out directly after commissioning or when extending or reducing the DALI devices.

The DALI devices are continually monitored, regardless of whether the lamp is active or not active. The DALI devices must be installed properly and supplied with operating voltage.

If all DALI devices of a lighting group are no longer recognised by the Gateway, e.g. all ballasts have failed, the status values of the lighting group are reset as follows:

Brightness value to 0,  
switch state to 0 (OFF)

and any existing lamp fault is reset as a statement of the state of the lighting group is no longer possible.

With the option *yes* two further parameters appear:

**Send**

Options:     after a change  
                  after request  
                  after a change or request

- *after a change*: If the status of the ballast fault changes, this is sent by a telegram with the value 0 (OFF) or with the value 1 (ON) via the communication object.
- *after request*: The status of the ballast fault can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the ballast fault is sent via the KNX if the status changes or if a telegram with the parameterised value is received on the communication object *Request status values*.

**"Fault Group/device code"  
enable encoded fault message**

Options:     no  
              yes

With this parameter the communication object *Fault Group/device code* must be enabled. The fault status (lamp and ballast fault) of the lighting groups or the individual DALI devices are sent on the KNX.

*For further information see: [communication object no. 104](#), page 116 and [Code table Fault Group/device code \(no. 104\)](#), page 168*

- *no*: The communication object *Fault Group/device code* is not enabled.
- *yes*: The communication object *Fault Group/device code* is enabled. A further parameter appears:

**Send Switch status response  
(Object "Switch/Status")**

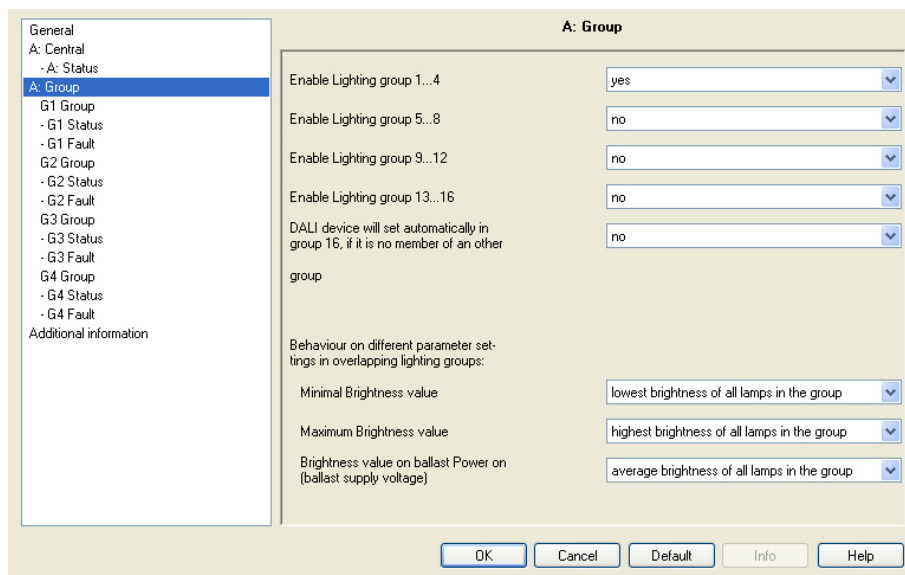
Options:     group oriented  
                  based on DALI device

This parameter determines whether the fault relates to a lighting group or an individual DALI device.

- *group oriented*: The values of the communication objects *Fault Group/device code* (no. 104) and *No. Group/device fault* (no. 106) relate to a lighting group fault.
- *based on DALI device*: The values of the communication objects *Fault Group/device code* (no. 104) and *No. Group/device fault* (no. 106) relate to a DALI device fault.

**3.2.3 Parameter window**  
**A: Group**

In order to simplify the overview in the ETS, the parameter windows for the lighting groups are enabled in four groups of four lighting groups each. For this purpose the parameter window *A: Group* is available as a basis.



**Enable lighting group 1...4**

**Enable lighting group 5...8**

**Enable lighting group 9...12**

**Enable lighting group 13...16**

**Note**

Only lighting groups 1...4 are enabled by default. All other lighting groups can be enabled here.

Options:     yes  
                   no

- *yes*: The parameter windows for the lighting groups x to y are enabled.
- *no*: The parameter windows for the lighting group x to y are not enabled.

**DALI device will set automatically in group 16, if it is no member of another group**

Options:     no  
              yes

- *no*: The lighting group is available as a normal lighting group in the Gateway. It has the same properties and functions as the lighting groups 1 to 15.
- *yes*: The Gateway initially automatically allocates all DALI devices to lighting group no. 16. If the DALI device is assigned to at least one other lighting group, this device will be removed from lighting group 16. Using this procedure it is possible to commonly control all DALI devices via output A in the KNX without any manual DALI group assignment.

**Note**

Lighting group 16 is only used internally by the Gateway. The communication objects of lighting group 16 are still available and can be used for example, to make non-assigned DALI devices visible, by switching on and off without using the Software Tool.

In order to control the lamps on the Gateway via the KNX, they must be assigned to a lighting group. The assignment is undertaken with the help of the [Software Tool](#).

All lighting groups are indicated on the KNX. Control of the individual 64 DALI devices via the KNX is not possible with the DALI-Gateway KNX.

All DALI devices can be controlled via the communication objects *Output A*, if they are already assigned to any lighting group. If this is not the case, it is possible to assign DALI devices, which are not assigned to lighting group 16, using the parameters described here.

This is undertaken automatically by the Gateway. If a lighting group is assigned to another lighting group, the Gateway removes it again from group 16.

The Gateway does not automatically use a DALI broadcast telegram for the telegrams that are received via the communication object of output A. In dependence on different properties of the DALI devices, e.g. minimum and maximum dimming values (dimming thresholds), several DALI group telegrams may be utilised. It is therefore recommended that as many DALI devices as possible with the same physical properties are compiled into a lighting group.

### Behaviour on different parameter settings in overlapping lighting groups

Using the group-oriented Gateway it is possible to integrate a DALI device in several lighting groups. In this case you are dealing with overlapping lighting groups, i.e., a DALI device is a member of two or more lighting groups.

Each DALI device can only internally store one minimum and one maximum dimming value. With this parameter, it is possible to determine this internal DALI value that applies independently of the lighting group by which it is controlled.

#### Note

When controlling overlapping lighting groups it is important to ensure that the last telegram entered is executed. All DALI devices of the lighting group concerned are controlled even when these DALI devices are also assigned to other lighting groups.

*For further information see: [Overlapping lighting groups](#), page 141*

### Behaviour on different parameter settings in overlapping lighting groups:

#### Minimal Brightness value

Options:      lowest brightness value of all lamps in the group  
                 highest brightness value of all lamps in the group  
                 average brightness value of all lamps in the group

- *lowest brightness value of all lamps in the group*: The lamps which are included in several lighting groups, have the lowest minimal brightness value of all lamps included in the lighting group.
- *highest brightness value of all lamps in the group*: The lamps which are included in several lighting groups, have the highest minimal brightness value of all lamps included in the lighting group.
- *average brightness value of all lamps in the group*: The lights, which are included in several lighting groups have the average value of the included minimum brightness value. A mathematical linear mean value – addition of all brightness values divided by the number of lights – is undertaken.

An equivalent parameterisation applies for the *Maximum brightness value*:

*For further information see: [Overlapping lighting groups](#), page 141*

### Maximum Brightness value

Options:     highest brightness value of all lamps in the group  
                  lowest brightness value of all lamps in the group  
                  average brightness value of all lamps in the group

- *highest brightness value of all lamps in the group*: The lamps, which are included in several lighting groups, have the highest maximum brightness value of all lamps included in the lighting group as the maximum brightness value.
- *lowest brightness value of all lamps in the group*: The lamps, which are included in several lighting groups, have the lowest maximum brightness value of all lamps included in the lighting group as the maximum brightness value.
- *average brightness value of all lamps in the group*: The lamps, which are included in several lighting groups have the average value of the included maximum dimming value. A mathematical linear mean value – addition of all brightness values divided by the number of lights – is undertaken.

For further information see: [Overlapping lighting groups](#), page 141

### Brightness value on ballast Power on (ballast supply voltage)

Options:     highest brightness value of all lamps in the group  
                  lowest brightness value of all lamps in the group  
                  average brightness value of all lamps in the group

- *lowest brightness value of all lamps in the group*: The lamps which are included in several lighting groups, have the lowest brightness value of all lamps included in the lighting group as the ballast power-on brightness value.
- *highest brightness value of all lamps in the group*: The lamps which are included in several lighting groups, have the highest brightness value of all lamps included in the lighting group as the ballast power-on brightness value.
- *average brightness value of all lamps in the group*: The lights, which are included in several lighting groups have the average value of all included ballast Power-On brightness values. A linear mean value – addition of all brightness values divided by the number of lamps – is undertaken.

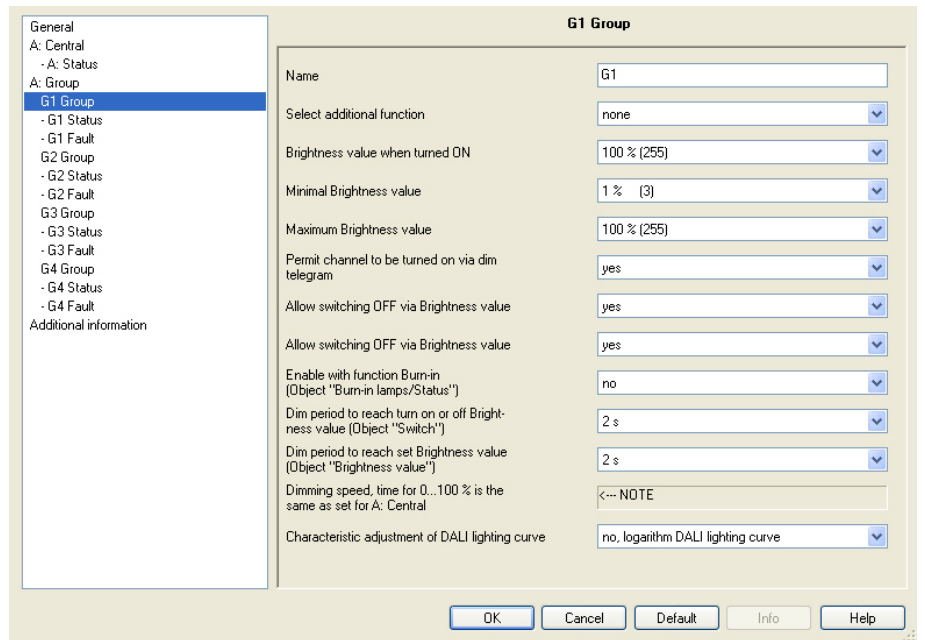
#### Note

With overlapping groups and characteristic adjustments parameterised in different ways, the properties of the higher numbered lighting groups have the higher priority. Its state or properties apply for the DALI device of the overlapping groups.

For further information see: [Overlapping lighting groups](#), page 141

**3.2.3.1 Parameter window  
Gx Group**

In these parameter windows the properties for every lighting group are programmed.



First of all the lighting group to be parameterised is selected by the number of the lighting group G1...G16. The lighting groups are parameterised independently of each other. For this reason we refer to the general lighting group Gx in the following. X can represent any of the 16 lighting groups.

The assignment of the individual DALI lamps to a lighting group is undertaken with the ETS independent Software Tool.

*For further information see: [Software Tool](#).*

It is possible to integrate lamps into several lighting groups. In this case we are referring to an overlapping lighting group. This can lead to all lamps of a lighting group assuming different states.

*For further information see: [Overlapping lighting groups](#), page 141*

**Name**

Options: Gx

Every lighting group can be assigned with a name consisting of a maximum of 40 characters.

The name is stored in the ETS database and also stored in the Gateway by a download. Accordingly, the name is also available in the Software Tool. A uniquely universal designation simplifies the description of the engineering project

**Select additional function**

Options:     none  
              Slave  
              Sequence  
              Staircase lighting

This parameter defines an additional function for this lighting group.

- *none*: This lighting group operates as a “normal” group of the group-oriented Gateway without additional function.
- *Slave*: This lighting group is defined as a slave. This slave lighting group is forcibly operated by a master. This could be, e.g. a KNX-Bus Light Controller LR/S x.16.1. The parameter window - [Gx Slave](#), page 75, is enabled. In these windows the properties for the slave lighting group are programmed. The required brightness value is received via the communication object *Brightness value of Slave*.
- *Sequence*: The lighting group uses the function *Sequence*. In sequence operation up to ten light scenes are automatically run off consecutively. You program how often the sequence compilations are to be repeated. With the function *Sequence*, programming of running lights and colour effects or brightness transitions without additional logic or timer modules is possible. Together with the function *Sequence* the parameter window - [Gx Sequence](#), on page 80 is enabled. In this parameter window the reaction of the lighting group during a sequence recall is set. The sequence operation which applies for the entire Gateway is programmed in the parameter window [Sequence](#) on page 93. This parameter window is enabled if the parameter window [General](#) on page 29, the parameter *Define sequence time curve (one curve per Gateway)* is parameterised with *yes*.
- *Staircase lighting*: With activated function *Staircase lighting*, the lighting group is switched on, and after a defined time it is automatically switched off, or dimmed down slowly as a warning. The basis brightness is the brightness to which the lighting group is set after the staircase lighting time has elapsed. This basis lighting time may also be not equal to zero.

**Example**

This function can ensure, e.g. that a basis brightness level always exists in the hallways in nursing homes or hospitals. Maximum brightness is only activated when someone enters the hallway (detected by a presence detector). It is dimmed down automatically to the basis brightness after the staircase lighting time has timed out and when nobody is in the hallway.

The setting of a warning before the function *Staircase lighting* switches off is possible using dimming down.



**Note**

These three additional functions, *Slave*, *Sequence* and *Staircase lighting* can assume three operating states:

**Additional function is not active:** The additional function has been deactivated via its object *Select additional function*, a telegram with value 0 has been received. In this state, the Gateway reacts like a “normal” group-oriented Gateway.

In this state an ON telegram does not cause the additional function to start. Only after a telegram with the value 1 has been received on the communication object *Select additional function*, is it possible to start the additional function.

**Additional function is in standby mode:** The additional function is active but has however been interrupted, e.g. by the OFF telegram. The lighting group is in standby mode. With an ON telegram (telegram to the communication object *Switch*) the additional function is again triggered, i.e., the *Sequence* or the *Staircase lighting* runs, the slave lighting group again responds to the communication object *Brightness value of slave*.

**Additional function runs:** The *Sequence* or the *Staircase lighting* runs; the function *Slave* receives brightness values from the master. With corresponding parameterisation of the switching telegrams, the additional functions can be set to standby mode.

**State after download:** After a download the additional functions are active and can be found in standby mode. Thus, the additional function can be started immediately after download without any additional activation, exclusively with a corresponding ON telegram.

When the corresponding communication object for the status message of the additional function is enabled via the parameterisation, the status of the additional function (activated / deactivated) is sent via the respective object *Activate additional function/Status* after a download.

If an additional function is selected, the following parameters apply for the time period in which the additional function is inactive.

**Brightness value when turned ON**

- Options:
- last value
  - 100 % (255)
  - 99 % (252)
  - ...
  - 1 % (3)

The parameter name changes if an additional function is selected: *Brightness value when turned ON (only if additional function is not activated)*.

This parameter defines the brightness value which is used to switch on the lighting group when an ON telegram is received.

If a value is set which is outside the dimming value range (*maximum brightness value* or *minimal brightness value*), the threshold is set as the minimum or maximum brightness value.

If for example, the lighting group is at a brightness value which is not equal to the switch on value and it receives an ON telegram, the parameterised switch on value is set.

- *last value:* The lighting group switches on with the brightness value which it had when the OFF telegram was received.

Note
<p>Saving the last brightness value is undertaken with every OFF telegram except for the lighting groups already switched off. In this case, with a further OFF telegram, the OFF state is not saved as the last brightness value.</p> <p>If a renewed switch OFF telegram is received during dimming down, the current brightness value is saved as the last brightness value.</p> <p>If the gateway operating voltage fails, the last brightness value is lost, and after recovery of the gateway operating voltage maximum brightness is set.</p> <p>The last brightness value is retained after a download or KNX voltage failure.</p> <p>A differentiation is made between the last brightness value with central switching via the communication object <i>Switch (Output A)</i>, and group-oriented switching via communication objects <i>Switch (Group x)</i>. Both values are independent of each other. This means if some lighting groups are dimmed or switched on or off via a central telegram, the last brightness values for the lighting group are retained without change.</p> <p>When an ON telegram is received for the lighting group, the brightness value which was set with the last OFF telegram is set again with the lighting group.</p>

**Minimal Brightness value**

- Options:      100 % (255)  
                   99 % (252)  
                   ...  
                   1 % (3)

This parameter defines the minimum brightness value which the lamps of the lighting group assume. This value is stored in the DALI devices and thus applies for all functions.

If a minimum brightness value is set which exceeds the maximum brightness value, the minimal brightness value is set equal to the maximum brightness value.

If the function *Burn-in Lamps* is activated, the lamp group will be operated only with 0 % (OFF) or 100 % brightness, regardless of this setting.

If a brightness value is received via the *Brightness value* and *Brightness value/Status* communication objects which are below the defined minimum dimming value, the minimum dimming value is set.

The *minimal brightness value* also applies in the functions *Staircase lighting*, *Scene* and *Sequence*.

Important
<p>The maximum and minimum dimming values selected for the lighting group are also valid with a central telegram via the communication objects of output A.</p> <p>Example: Lighting group 1 is parameterised with a minimum dimming value of 20 %; lighting group 2 is parameterised with 10 %. If the Gateway receives a central telegram in this constellation: <i>to set the brightness value to 5 %</i>; lighting group 1 is set to 20 % and lighting group 2 is set to 10 %.</p>

**Note**

With overlapping lighting groups, the properties for the dimming limits as parameterised in parameter window [A: Group](#), page 51, apply for the devices contained in both lighting groups.

This is of particular importance if the automatic addressing of group 16 in parameter window [A: Group](#), page 51, changes during commissioning and DALI devices assigned thereafter are no longer automatically removed by the Gateway from lighting group 16. In this case, the DALI devices no longer appear in the required lighting group but are still present in lighting group 16.

The set minimum brightness value for the lighting group has nothing to do with the absolute minimum brightness value (basis brightness) which the ballast lamp combination can assume. This device-specific value is programmed by the manufacturer during the manufacturing process. Typically the values are between 1 % and 5 %.

It is important to note that the % specification does not correlate with the KNX values but relates to the luminous flux.

*For further information see: [DALI dimming curve](#), page 164.*

**Maximum Brightness value**

- Options:     100 % (255)  
                   99 % (252)  
                   ...  
                   1 % (3)

This parameter defines the maximum brightness value which the lamps of the lighting group can assume. This value is stored in the DALI devices and thus applies for all functions.

If a maximum brightness value is set which is below the minimum dimming value, the maximum brightness value is set equal to the minimum brightness value.

If the function *Burn-in Lamps* is activated, the lamp group will be operated only with 0 % (OFF) or 100 % brightness, regardless of this setting.

If a brightness value is received via the *Brightness value* and *Brightness value/Status* communication objects which is above the defined maximum dimming value, the maximum dimming value is set.

The maximum brightness value also applies in the functions *Staircase lighting*, *Scene* and *Sequence*.

**Important**

The maximum and minimum dimming values selected for the lighting group are also valid with a central telegram via the communication objects of output A.

Example: Lighting group 1 is parameterised with a maximum dimming value of 80 %; lighting group 2 is parameterised with 90 %. If the Gateway receives a central telegram in this constellation: *to set the brightness value to 100 %*; lighting group 1 is set to 80 % and lighting group 2 is set to 90 %.

**Note**

With overlapping lighting groups, the properties for the dimming limits as parameterised in parameter window [A: Group](#), page 51, apply for the devices contained in both lighting groups.

This is of particular importance if the automatic addressing of group 16 in parameter window [A: Group](#), page 51, changes during commissioning and DALI devices assigned thereafter are no longer automatically removed by the Gateway from lighting group 16. In this case, the DALI devices no longer appear in the required lighting group but are still present in lighting group 16.

The set minimum brightness value for the lighting group has nothing to do with the absolute minimum brightness value (basis brightness) which the ballast lamp combination can assume. This device-specific value is programmed by the manufacturer during the manufacturing process. Typically the values are between 1 % and 5 %.

It is important to note that the % specification does not correlate with the KNX values but relates to the luminous flux.

*For further information see: [DALI dimming curve](#), page 164.*

**Permit channel to be turned ON via dim telegram**

Options:     yes  
              no

This parameter defines the switch on response of the lighting group at dimming.

- *yes*: Switch on using the DIM telegram is allowed.
- *no*: Switch on using the DIM telegram is not allowed. The output must be switched on in order to be dimmed.

**Allow switching ON via Brightness values**

Options:     yes  
              no

This parameter defines the switch on performance with a received brightness value.

- *yes*: Switch on with a brightness value is permitted.
- *no*: Switch on with a brightness value is not permitted. The output must be switched on in order to execute the brightness value telegram.

**Allow switching OFF via Brightness value**

Options:     yes  
              no

This parameter defines the switch off performance with a received brightness value.

- *yes*: Switch off with a brightness value is permitted.
- *no*: Switch off with a brightness value is not permitted. The output must be implemented with an OFF telegram via the communication objects *Switch* or *Switch/Status*.

**Enable with function Burn-in  
(Object "Burn-in Lamps/Status")**

Options:     yes  
              no

This parameter defines whether the lighting group should be considered with function *Burn-in*. Lighting equipment, e.g. incandescent bulbs, which does not require a burn-in phase can be excluded from the burn-in process. They can always be dimmed independently of the function *Burn-in*.

The function *Burn-in* applies for all lighting groups even with the corresponding burn-in time and is enabled in parameter window [A: Central](#), page 36.

- *yes*: The lighting group is considered during active function *Burn-in* and during the burn-in phase and it can only be switched off with 0 % brightness (OFF) and on with 100 % brightness (ON).
- *no*: The lighting group is not taken into consideration during an activated function *Burn-in* and can also be dimmed during an activated function burn-in.

**Dim period to reach turn on or off Brightness value (Object "Switch")**

Options:        immediate  
                  0.7 s  
                  2 s  
                  ...  
                  90 s  
                  time for dimming changeable via bus

A soft start or soft stop can be set with this parameter. For this purpose, the time duration in which the Gateway dims the lighting group from 0 % brightness to the switch on value with an ON telegram is defined.

The same speed also applies for an OFF telegram.

The dim period is only relevant for ON/OFF telegrams (1 bit).

- *Immediate*: All devices on output A are immediately ON.
- *0.7 s...90 s*: During this time, the lighting group is dimmed from 0 % brightness to the switch on value.
- *time for dimming changeable via bus*: The time received via the communication object *time for dimming changeable* has an effect on the ON/OFF switching performance. There are 16 discrete values which are defined according to DALI for the *time for dimming changeable via bus*.

*For further information see: [Communication object no. 109](#), page 119 and [Code table for flexible dimming times](#) page 172*

**Note**

Via communication object *time for dimming changeable* of the output, a value between 0...15 is received. These values comply with the specified transition times according to the DALI standard. A value of 0 for example, corresponds with an immediate reaction.

*For further information see: [Communication object no. 109](#), page 119 and [Code table for flexible dimming times](#) page 172*

The switch off time is also considered when the lighting group is at the lower dimming threshold and an OFF telegram is received. In this case the lighting group switches off at the lower dimming value limit only after the programmed dimming time for switch ON/OFF. This ensures that all lighting groups switch off simultaneously.

**Dim period to reach set Brightness value  
(Object “Brightness value”)**

Options:        immediate  
                  0.7 s  
                  2 s  
                  ...  
                  90 s  
                  time for dimming changeable via bus

This parameter determines the time duration in which the Gateway sets the received *Brightness value* or *Brightness value/status* brightness set for the lighting group.

- *Immediate*: All devices on output A immediately switch ON with the received brightness value.
- *0.7 s...90 s*: During this time the lighting group is dimmed down to the received brightness value.
- *time for dimming changeable via bus*: The time received via the communication object *time for dimming changeable* influences the dimming UP/DOWN time set via the brightness value.

**Note**

Via communication object *time for dimming changeable* of the output, a value between 0...15 is received. These values comply with the specified transition times according to the DALI standard. A value of 0 for example, corresponds with an immediate reaction.

*For further information see: [Communication object no. 109](#), page 119 and [Code table for flexible dimming times](#) page 172*

**Dimming speed, time for 0...100 % is the same as set for A: Central**

<---- NOTE

**Characteristic adjustment of DALI lighting curve**

Options: no, logarithm DALI lighting curve  
 Linear dimming curve  
 DALI dimming curve, without phys-min brightness value

With this parameter, it is possible to adapt the dimming curve for the control of a lighting group.

The method of adaption of the value range for the brightness values of the KNX (0, 1...255 or 0...100 %) to DALI (0, 1...254 or 0, physical minimum ...254) can be parameterised.

For further information see: [DALI dimming curve](#), page 164

**Note**

The *physical minimum* is the minimum brightness value that the ballast can set based on its physical properties.

The term originates directly from the IEC 62386 and EN 60929.

- *no, logarithm DALI lighting curve*: The dimming curve is not modified. The DALI dimming curve as it is stipulated in the DALI standard (EN 62386 and EN 60929) is used unchanged for the control of DALI devices.

For further information see: [DALI dimming curve](#), page 164

- *linear dimming curve*: The KNX value range is converted to the DALI value range so that a linear relationship between KNX values and DALI values (electronic power on the lighting equipment or luminous flux) results. The logarithmic DALI curve is thus converted to a linear representation.

In this way, ballasts with an applied minimum dimming value (in other words luminous flux) of 3 % can be controlled exactly with this value. Should the logarithmic DALI curve be applied, the KNX value of 50 % would be applied in this case.

For further information see: [DALI dimming curve](#), page 164

- *DALI dimming curve, without phys-min brightness value*: The KNX value range (1...255) is converted to the DALI value range (physical minimum...254) whereby the unusable range of DALI control values (0...physical minimum) which the lighting equipment cannot realise is omitted.

For further information see: [DALI dimming curve](#), page 164

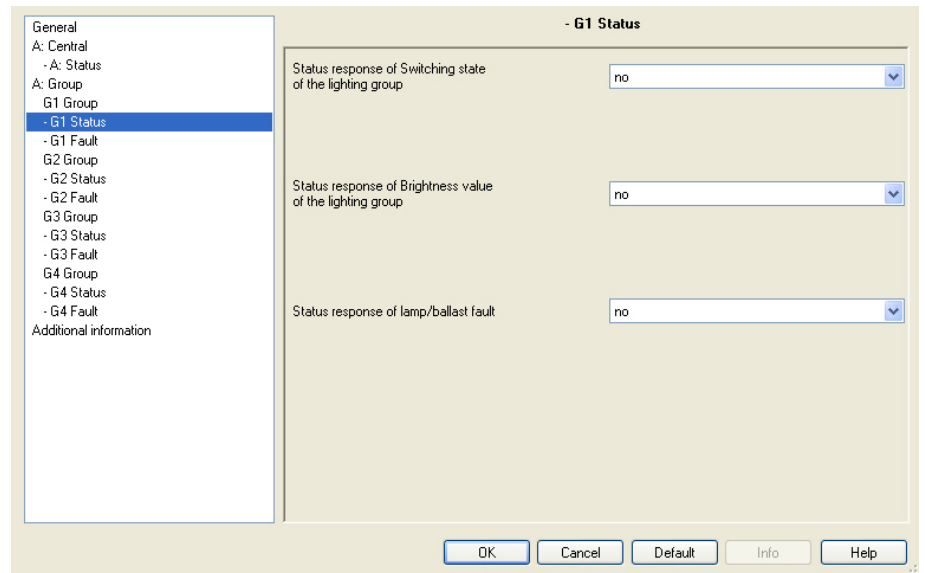
**Note**

With overlapping groups and characteristic adjustments parameterised in different ways, the properties of the higher numbered lighting groups have the higher priority. Its state or properties apply for the DALI device of the overlapping groups.



### 3.2.3.2 Parameter window - Gx Status

In this parameter window the status response of the selected lighting group is parameterised.



Each lighting group is individual and can be programmed independently of the other lighting groups. The parameterisation relates to the communication objects of the lighting group (*Group x*).

The status behaviour of the output, see parameter window [A: Status](#), page 44, is independent of the parameterisation of the status response of the lighting group.

#### Status response of Switching state of the lighting group

Options:     no  
               yes: via object "Switch/Status"  
               yes: via separate object "Status switch"

- *no*: The status of the switch state is not actively sent on the KNX.
- *yes: via object "Switch/Status:"* The common communication object *Switch/Status* receives the switch telegram and the current status becomes active and is sent on the KNX.
- *yes: via separate object "Status switch":* An additional *Status Switch* communication object is enabled. Using it, a 1 bit telegram with the actual switch status is sent on the KNX.

**Note**

This status message relates to all connected devices of the lighting group. With a change of the parameterisation or after a subsequent switching of the status object, the assignment of the group's addresses already allocated to the *Switch* communication object are lost and need to be reprogrammed.

If the communication object *Switch/Status* is used for switching and status feedback, particular care must be taken with the read and write properties (flags) of the communication objects.

*For further information see: [Common communication object for control telegram and status](#), page 149*

**Important**

Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Switch/Status* communication objects, to eliminate mutual interference of devices as a result of differing status messages.

With the option yes:... two further parameters appear:

**Send**

Options:     after a change  
              after request  
              after a change or request

- *after a change*: If the status of the switch state changes, this is sent by a telegram with the value 0 (OFF) or with the value 1 (ON) via the communication object.
- *after request*: The status of the switch state can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the switch state is only sent via the KNX if the status changes or a telegram with the parameterised value is received on the communication object *Request status values*.

**Switch value for different values in the group**

Options:     ON  
              OFF

This parameter defines the status to be sent if DALI devices with different states are present on the output.

- *ON*: The switch status is sent as an ON (telegram with the value 1) if at least one DALI device is switched on.
- *OFF*: The switch status is only sent as an ON (telegram with the value 1) if all DALI devices are switched on.

### Status response of Brightness value of the lighting group

Options: no  
yes: via object "Brightness value/Status"  
yes: via separate obj. "Status brightness value"

The parameter defines how the current status of the brightness value of the output (the lighting) is sent on the KNX.

- *no*: The brightness value is not actively sent on the KNX.
- *yes: via object "Brightness value/Status"*: The brightness value is sent on the KNX via the communication object *Brightness value/Status*.
- *yes: via separate object "Status brightness value"*: An additional *Status brightness value* communication object for the status message is enabled.

#### Note

This status message relates to all connected devices of the lighting group. It is possible to parameterise the response of the status messages should differing states occur with the devices.

With a change of the parameterisation or after a subsequent switching of the status object, the assignment of the group's addresses already allocated to the *Brightness value* communication object are lost and need to be reprogrammed.

With the options *yes*:... two further parameters appear:

#### Send

Options: after a change  
after request  
after a change or request

- *after a change*: Should the status of the brightness value change, this is sent by a telegram via the communication object.
- *after request*: The status of the brightness value can only be sent via the KNX if a telegram with the parameterised value is received on the communication object *Request status values*.
- *after a change or request*: The status of the brightness value is only sent via the KNX if the status changes or a telegram with the parameterised value is received on the communication object *Request status values*.

**Brightness value for different values in the group**

Options:     average brightness value of all lamps in the group  
                  highest brightness value of all lamps in the group  
                  lowest brightness value of all lamps in the group

This parameter defines how you can set the status to be sent if devices with different states are present in a lighting group.

- *average brightness value of all lamps in the group*: The average brightness value of the devices is taken as the status of the lighting group sent on the KNX.  
Thus a lighting group with many devices has a higher weighting in the calculation of the average brightness.
- *highest brightness value of all lamps in the group*: The highest brightness value of the devices is taken as the status of the lighting group sent on the KNX.
- *lowest brightness value of all lamps in the group*: The lowest brightness value of the devices is taken as the status of the lighting group sent on the KNX.

**Status response of lamp/ballast fault**

Options:     yes  
                  no

This parameter defines how the current status of a lamp/ballast fault is sent. The communication object *Fault ballast or lamp* is enabled.

- *yes*: A status message is sent.
- *no*: No status message is sent.

With the option *yes* two further parameters appear:

**Send**

Options:     after a change  
                  after request  
                  after a change or request

- *after a change*: If the status changes, this is sent by a telegram with the parameterised value via the communication object.
- *after request*: The status is only sent via the KNX if a telegram with the parameterised value is received on the communication object.
- *after a change or request*: The status is only sent via the KNX if the status changes or a telegram with the parameterised value is received on the communication object *Request status values*.

**Content of communication object**

Options:      Fault lamp  
                  Fault ballast  
                  Fault lamp or Fault ballast

This parameter determines the equipment fault which is provided on the enabled communication object.

- *Fault lamp*: The communication object *Fault lamp* is enabled. Using this communication object it is possible to provide information on whether the lighting group of a lamp has failed on the KNX. Should there be a fault, the communication object *Fault lamp* is written with a 1 and sent on the KNX in dependence on the parameterisation set beforehand.
- *Fault ballast*: The communication object *Fault ballast* is enabled. Using this communication object it is possible to provide information on whether the lighting group of a ballast has failed on the KNX. Should there be a fault, the communication object *Fault lamp* is written with a 1 and sent on the KNX in dependence on the parameterisation set beforehand.
- *Fault lamp or Fault ballast*: The communication object *Fault ballast* or *Fault lamp* is enabled. Using this communication object it is possible to provide information on the KNX relating to a lamp failure or a ballast failure in the lighting group.

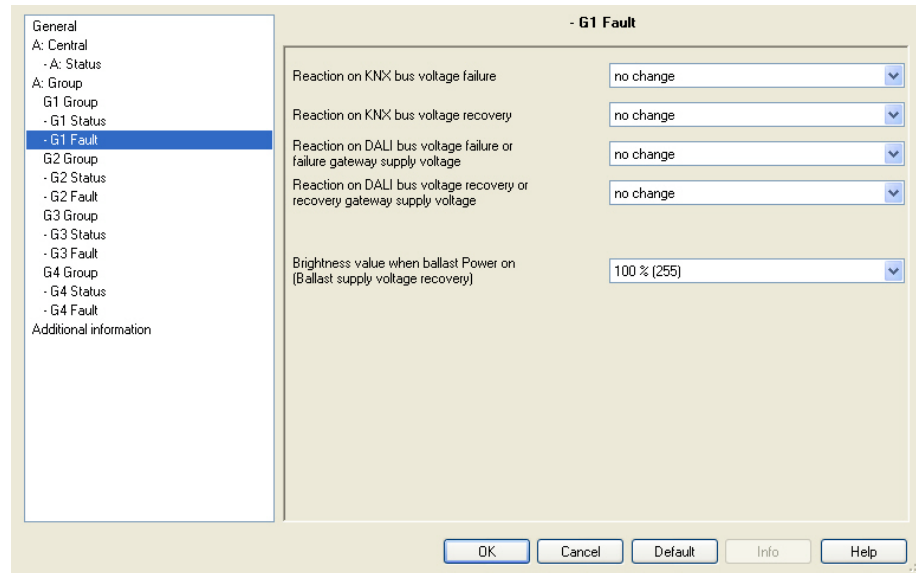
**Note**

In order to correctly detect a ballast fault, the function *Detect ballasts* must however be activated in the Gateway. Using this function, the Gateway notes the exact quantity of DALI devices currently connected to the Gateway as a reference value. Should the detected number of DALI devices diverge from the current reference value; this will be evaluated as a ballast fault and displayed via the communication object, in dependence on the set send parameterisation on the KNX.

The function *Detect ballasts* can be triggered either via the communication object *Detect ballasts*, by a long button push on the test button or by using the separate Software Tool

3.2.3.3 Parameter window  
- Gx Fault

In this parameter window the reaction of the lighting group to failure and recovery of the KNX/DALI voltage or gateway operating voltage is parameterised.



**Reaction on KNX bus voltage failure**

Options:     no change  
                   max. Brightness value (100 %)  
                   min. Brightness value (1 %)  
                   OFF (0 %)

This parameter defines how the DALI devices of the lighting group react if communication with the Gateway via KNX is not possible due to a KNX bus voltage failure.

At the start of a download all DALI devices assume the state which is parameterised at the time of the KNX bus voltage failure. The value for KNX voltage recovery is set at the end of the download.

- *no change*: The brightness of the lighting group does not change. DALI devices which are switched off, remain off. The timer functions, such as *Sequence* and *Burn-in* are not continued.
- *max. Brightness value (100 %)*: The lighting group is switched on or dimmed with the maximum Brightness value.
- *min. Brightness value (1 %)*: The lighting group is switched on or dimmed with the minimum Brightness value.
- *OFF (0 %)*: The lighting group is switched off.

**Note**

The minimum and maximum dimming values (dimming thresholds) still remain valid.

The functions *Scene*, *Staircase lighting*, *Sequence* as well as dimming processes are interrupted. The states of the timer functions after a download or after KNX voltage recovery are to be set separately in the respective parameter windows of the timer function.

The ballast operating voltage is a prerequisite for correct response of the DALI equipment, e.g. ballast.

**Reaction on download or  
KNX bus voltage recovery**

Options:     no change  
                  Status before failure  
                  max. Brightness value (100 %)  
                  min. Brightness value (1 %)  
                  OFF (0 %)

This parameter determines how the DALI device of the lighting group reacts after a download or at KNX bus voltage recovery.

- *no change*: The brightness of the lighting group does not change. DALI devices which are switched off, remain off.
- *Status before failure*: The lighting group is brought to the state which it had before the download or KNX bus voltage failure. The Brightness value must be set for at least two seconds before KNX voltage failure or a download in order to ensure that it is set again after KNX bus voltage recovery.
- *max. Brightness value (100 %)*: The lighting group is switched on or dimmed with the maximum Brightness value.
- *min. Brightness value (1 %)*: The lighting group is switched on or dimmed with the minimum Brightness value.
- *OFF (0 %)*: The lighting group is switched off.

**Note**

The minimum and maximum dimming values (dimming thresholds) still remain valid.

The functions *Scene*, *Staircase lighting*, *Sequence* as well as dimming processes are interrupted. The states of the timer functions after a download or after KNX voltage recovery are to be set separately in the respective parameter windows of the timer function.

The ballast operating voltage is a prerequisite for correct response of the DALI equipment, e.g. ballast.

**Reaction of DALI bus voltage failure  
or failure gateway supply voltage**

Options:     no change  
                  max. Brightness value (100 %)  
                  min. Brightness value (1 %)  
                  OFF (0 %)

This parameter defines how the DALI devices of the lighting group react if communication with the DALI devices via KNX is not possible due to a DALI bus voltage failure or gateway supply voltage failure.

A DALI voltage failure occurs with a cable break on the DALI control line, a short circuit of the line or a failure of the gateway operating voltage.

- *no change*: The brightness of the lighting group does not change. DALI devices which are switched off, remain off. As the information *no change* is stored in the ballast, all DALI devices react immediately after the bus voltage failure.
- *max. Brightness value (100 %)*: The lighting group is switched on or dimmed with the maximum Brightness value.
- *min. Brightness value (1 %)*: The lighting group is switched on or dimmed with the minimum Brightness value.
- *OFF (0 %)*: The lighting group is switched off.

**Note**

The minimum and maximum dimming values (dimming thresholds) still remain valid.

The functions *Scene*, *Staircase lighting*, *Sequence* as well as dimming processes are interrupted. The states of the timer functions after a download or after KNX voltage recovery are to be set separately in the respective parameter windows of the timer function.

The ballast operating voltage is a prerequisite for correct response of the DALI equipment, e.g. ballast.



**Reaction of DALI bus voltage recovery or recovery gateway supply voltage**

- Options:     no change  
                   Status before failure  
                   max. Brightness value (100 %)  
                   min. Brightness value (1 %)  
                   OFF (0 %)

This parameter defines how the DALI devices of the lighting group react at DALI bus voltage recovery or gateway supply voltage recovery.

- *no change*: The brightness of the lighting group does not change. DALI devices which are switched off, remain off.
- *Status before failure*: The lighting group is brought to the state which it had before the DALI voltage failure or gateway operating voltage failure. The Brightness value must be set for at least two seconds before DALI voltage failure or a gateway operating voltage failure, in order to ensure that it is set again after DALI bus voltage recovery or gateway operating voltage recovery.

**Note**

Please note that the current Brightness value is written every two seconds into scene 15 of the DALI device with this parameter setting. It is therefore essential that the connected DALI devices can store the Scene values as often as necessary without being damaged. This may not be the case with some older DALI devices. Please contact the respective manufacturers for information.

- *max. Brightness value (100 %)*: The lighting group is switched on or dimmed with the maximum Brightness value.
- *min. Brightness value (1 %)*: The lighting group is switched on or dimmed with the minimum Brightness value.
- *OFF (0 %)*: The lighting group is switched off.

**Note**

The minimum and maximum dimming values (dimming thresholds) still remain valid.

Scenes, Staircase lighting, sequences as well as dimming processes are interrupted. The states of the timer functions after a DALI voltage recovery or after a gateway supply voltage recovery is to be set separately in the respective parameter windows of the timer function.

The ballast operating voltage is a prerequisite for correct response of the DALI equipment, e.g. ballast.

**Interaction between ballast power on and DALI voltage recovery:**

The power-on level of the ballast is set first of all after ballast operating voltage recovery. This brightness value is stored in the ballast and is thus set immediately after the ballast operating voltage recovery.

Simultaneously, the Gateway on the DALI will once again receive responses from the ballast. As a result the Gateway informs the re-detected ballast again about the lighting group information. According to this procedure the lamps are controlled with the parameterised brightness level at DALI voltage recovery.

**Brightness value when ballast Power on  
(Ballast supply voltage recovery)**

Options:     100 % (255)  
              99 % (252)  
              ...  
              1 % (3)  
              0 % (OFF)

This parameter determines the response of the ballast at ballast operating voltage recovery. A storage location is provided in the ballast for this purpose. The Brightness value used by the ballast at ballast operating voltage recovery to switch on the lamp is stored at this memory location.

The Brightness value of the ballast is set as a factory default value to the maximum brightness (100 %). This has the advantage that without any DALI programming or commissioning requirement, the ballast equipment is switched on and off normally via the operating voltage of the ballast. This can be useful particularly during commissioning. Should no DALI commissioning have been undertaken, the lighting can be switched on and off via the operating voltage of the ballast using a normal miniature circuit-breaker.

In "normal" operation this reaction may not be desirable: At ballast operating voltage failure and ballast operating voltage recovery, all ballasts switch on with the maximum brightness. This can lead to increased inrush current and in the worst case can cause a circuit-breaker to trip. Moreover, the entire building is fully illuminated and must be switched off manually.

In order to allow the user to set the default factory switch on response with ballast operating voltage recovery, the parameter can be used to set any Brightness value between 0 % (OFF) and 100 % maximum Brightness value.

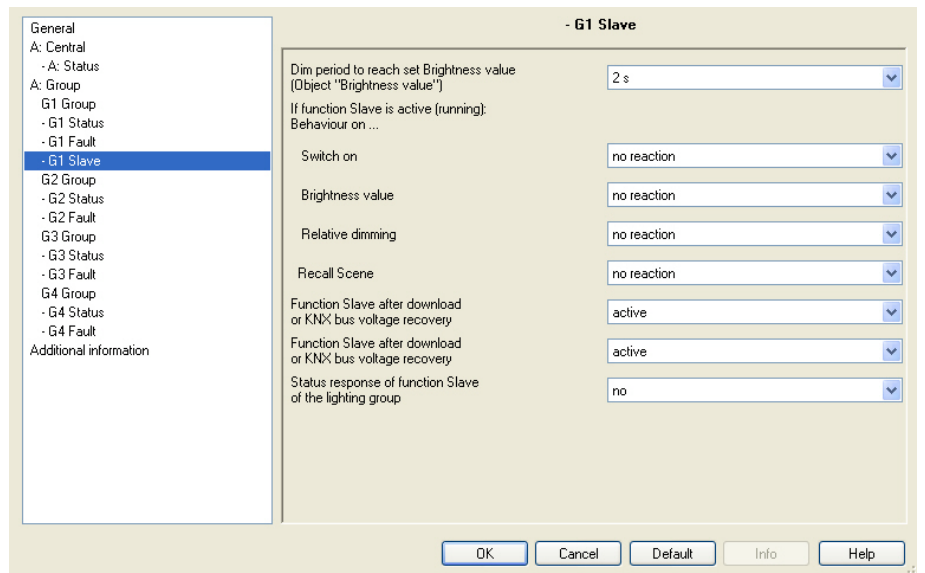
- *100 % (255)...0 % (OFF)*: This is the Brightness value used to switch on the ballast device after ballast operating voltage recovery.

**Important**

The factory default setting of the ballast is changed with this parameter.

3.2.3.4 Parameter window  
- Gx Slave

The parameter window *Gx Slave* is enabled in parameter window [Gx Group](#), page 55, if the parameter *Select additional function* has been set to the option *Slave*.



With operating function *Slave*, the lighting follows the Brightness value provided by the master via the communication object *Brightness value of slave*. The reaction to switch, dim or brightness value telegrams can be parameterised individually.

Using the function *Slave*, every individual lighting group of the Gateway can be integrated into a constant lighting control which is implemented for example, by a KNX-Bus Light Controller LR/S x.16.1 as a master.

If in the following, the communication object *Switch* or *Brightness value* is mentioned, the details apply for the communication objects *Switch/Status* or *Brightness value/Status*.

If the function *Slave* is parameterised, a standby type state exists after a download. The brightness value from the communication object *Brightness value of slave* is used by the Gateway after a switch ON telegram (communication object *Switch*), which is generally sent by a master, read and used for control of a lighting group.

For further information see: [Slave](#), page 156

### Dim period to reach set Brightness value (Object "Brightness value")

Options:     immediate  
              0.7 s  
              2 s  
              ...  
              90 s

This parameter determines the time duration in which the Gateway sets the brightness value from the communication object *Brightness value of slave* for the lighting group when activating the function *Slave*.

- *immediate*: All DALI devices of the lighting group immediately switch on with the received brightness value.
- *0.7 s...90 s*: This is the time duration used by the lighting group to dim to the received brightness value.

### If function Slave is active (running): Behaviour on ...

#### Switch on

Options:     no reaction  
              set function in standby

With activated function *Slave*, the parameter can be used to define the reaction to an ON telegram on the communication object *Switch* or *Switch/Status*.

- *no reaction*: An ON telegram is ignored.
- *Function switches to standby*: An ON telegram ends function *Slave* and the Gateway carries out the switch telegram. The function *Slave* is latent and waits until a renewed activation (standby state) via the communication object function *Activate slave mode* or via a telegram with the value 1 to the communication object *Switch* or *Switch/Status*.

#### Note

The reaction to an OFF telegram on the communication object *Switch* or *Switch/Status* cannot be parameterised. An OFF command always interrupts the function *Slave*. The function *Slave* goes over to standby mode in which the brightness values on the communication object *Brightness value of slave* is ignored. The function *Slave* is reactivated, if an ON telegram is received on the communication object *Switch* or *Switch/Status* or a telegram with the value 1 is received on communication object function *Activate slave mode*. The master/slave unit is separated, for example, by deactivation of the function *Slave* (telegram with the value 0 to communication object function *Activate slave*). If the function *Slave* is not active, the brightness values received from the function *Slave* via the communication object *Brightness value of Slave* are not available on its output.

### Brightness value

Options:     no reaction  
              set function in standby

With activated function *Slave* the parameter can be used to define the reaction to a brightness value telegram.

- *no reaction*: A brightness value telegram is ignored.
- *Function switches to standby*: A brightness telegram ends function *Slave* and the Gateway carries out the brightness telegram via the communication object *Brightness value*. The function *Slave* is latent and waits until a renewed activation via the communication object function *Activate slave* or via an ON telegram to the communication object *Switch*.

#### Relative dimming

Options:     no reaction  
                  set function in standby

With activated function *Slave* the parameter can be used to define the reaction to dimming telegram to the communication object *Relative dimming*.

- *no reaction*: A dimming telegram is ignored.
- *Function switches to standby*: A dimming telegram ends function *Slave* and the Gateway carries out the dimming telegram. The function *Slave* is latent and waits until a renewed activation via the communication object function *Activate slave* or via an ON telegram to the communication object *Switch*.

#### Recall scene

Options:     no reaction  
                  set function in standby

With activated function *Slave* the parameter can be used to define the reaction to a scene recall.

- *no reaction*: A scene recall is ignored.
- *Function switches to standby*: A scene telegram ends function *Slave* and the Gateway carries out the scene recall. The function *Slave* is latent and waits until a renewed activation via the communication object function *Activate slave* or via an ON telegram to the communication object *Switch*.

**Function Slave after gateway supply voltage recovery**

Options:     last status  
              active  
              inactive

This parameter defines if function *Slave* is *active* or *inactive* after gateway supply voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [Gx Fault](#), page 70 is set. The function *Slave* is then undertaken with the option defined here.

- *last status*: The function *Slave* receives the operating state which it had before gateway operating voltage failure.
- *active*: The function *Slave* is reactivated after gateway operating voltage recovery. The lighting group is controlled with the next brightness value which is received via the communication object *Brightness value of Slave*.
- *inactive*: The function *Slave* is not reactivated after gateway operating voltage recovery.

**Function Slave after download or KNX bus voltage recovery**

Options:     last status  
              active  
              inactive

This parameter defines if function *Slave* is *active* or *inactive* after KNX voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [- Gx Fault](#), page 70 is set. The function *Slave* is then undertaken with the option defined here.

- *last status*: The function *Slave* receives the operating state which it had before download or KNX voltage failure.
- *active*: The function *Slave* is activated after a download of after KNX voltage recovery. The lighting group is controlled with the next brightness value which is received via the communication object *Brightness value of Slave*.
- *inactive*: The function *Slave* is not activated after a download of after KNX voltage recovery.

### Status response of function Slave of the lighting group

Options: no  
yes: via object "Activate Slave/Status"

This parameter defines whether the status of the function *Slave* of the lighting group is sent on the KNX. For this purpose the communication object *Activate Slave/Status* is enabled.

- *no*: The state of the function *Slave* is not actively sent on the KNX.
- *yes: via object "Activate Slave/Status"* The common communication object *Activate Slave/Status* receives a telegram with the value 1 to activate function *Slave* and simultaneously sends the current status of the function *Slave* actively on the KNX.

It is possible to parameterise when the status is sent on the KNX.

The following parameters appear for this purpose:

#### Send

Options: after a change  
after request  
after a change or request

- *after a change*: The status is sent via the communication object after a change.
- *after request*: The status is sent after a request by the communication object *Request status values*.
- *after a change or request*: The status is sent via the KNX when the status changes or the status is requested via the communication object *Request status values*.

#### Status response for different Slave fct. in overlapping groups:

Options: Function active  
Function not active

This parameter defines the status to be sent if DALI devices with different states are included in the lighting group.

#### Important

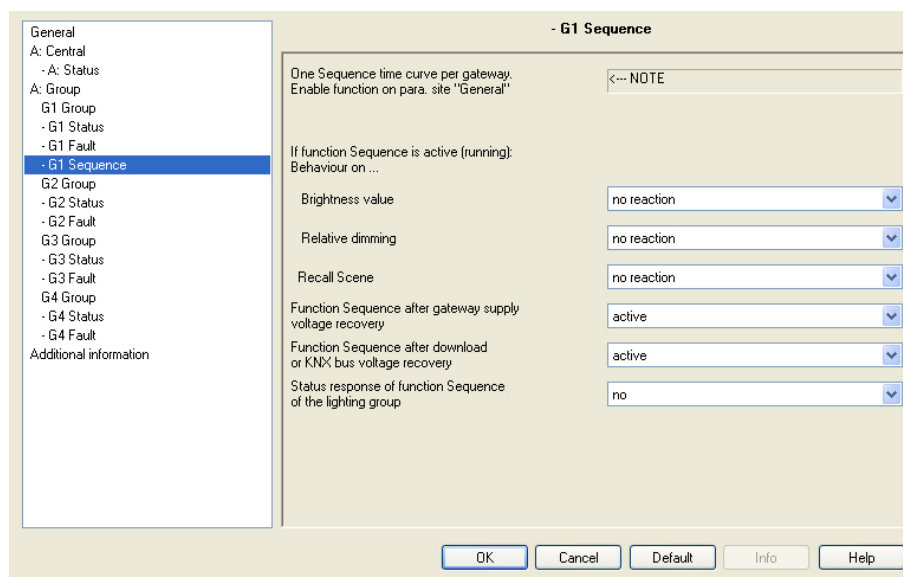
Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Switch/Status* communication objects, to eliminate mutual interference of devices as a result of differing status messages.

*For further information see: [Status response with overlapping lighting groups](#), page 144*

- *Function active*: The status of function *Slave* is sent as active (telegram with the value 1) if at least one device is in activated function *Slave*.
- *Function not active*: The status of function *Slave* is only sent as active (telegram with the value 1) if all devices are in activated function *Slave*.

3.2.3.5 Parameter window  
- Gx Sequence

The parameter window *Gx Sequence* is enabled in parameter window [Gx Group](#), page 55, if the parameter *Select additional function* has been set to the option *Sequence*.



The Gateway offers the possibility of allowing a sequence to run. A sequence is a string of up to a maximum of ten scenes which are successively recalled. The recall of the lighting groups involved is undertaken via the communication object *Switch* or *Switch/Status* of the lighting group. Furthermore, the set sequence can be repeated up to 255 times in this setting. If required, endless repetition of the sequence can be parameterised. In this way, it is possible to program running lights on the device without additional logic or timer modules, for example, for effect lighting, facade lighting, and in shop presentation or exhibition areas.

**Note**

Only one sequence can be programmed on the Gateway. The setting is undertaken in the *Sequence* parameter window. The function *Sequence* is recalled by a switch telegram from the lighting groups which are members. This parameterisation is undertaken in the parameter window [Gx Group](#), page 55.

**For further information see:** [Sequence](#), page 158

With function *Sequence*, the lighting group follows the predefined sequence. The reaction to switch, dimming or brightness value telegrams during function *Sequence* can be parameterised individually:

If in the following, the communication object *Switch* or *Brightness value* is mentioned, the details apply for the communication objects *Switch/Status* or *Brightness value/Status*.



**If function Sequence is active (running):  
Behaviour on ...****Brightness value**

Options:     no reaction  
              set function in standby

With activated function *Sequence* the parameter can be used to define the reaction to a brightness value telegram.

- *no reaction*: A brightness value telegram is ignored.
- *Function switches to standby*: A brightness telegram ends function *Sequence* and the Gateway carries out the brightness telegram via the communication object *Brightness value*. The function *Sequence* is latent and waits until a renewed activation via the communication object function *Sequence* or via an ON telegram to the communication object *Switch*.

**Relative dimming**

Options:     no reaction  
              set function in standby

With activated function *Sequence* the parameter can be used to define the reaction to dimming telegram to the communication object *Relative dimming*.

- *no reaction*: A dimming telegram is ignored.
- *Function switches to standby*: A dimming telegram ends function *Sequence* and the Gateway carries out the dimming telegram. The function *Sequence* is latent and waits until a renewed activation via the communication object function *Sequence* or via an ON telegram to the communication object *Switch*.

**Recall scene**

Options:     no reaction  
              set function in standby

With activated function *Sequence* the parameter can be used to define the reaction to a scene recall.

- *no reaction*: A scene recall is ignored.
- *Function switches to standby*: A scene telegram ends function *Sequence* and the Gateway carries out the scene recall. The function *Sequence* is latent and waits until a renewed activation via the communication object function *Sequence* or via an ON telegram to the communication object *Switch*.

**Function Sequence after gateway supply voltage recovery**

Options:     last status  
              active  
              inactive

This parameter defines if function *Sequence* is *active* or *inactive* after gateway supply voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [- Gx Fault](#), page 70 is set. The function *Sequence* is then undertaken with the option defined here.

- *last status*: The function *Sequence* receives the operating state which it had before gateway operating voltage failure.
- *active*: The function *Sequence* is reactivated after gateway operating voltage recovery. The lighting group is started with the next ON telegram.
- *inactive*: The function *Sequence* is not reactivated after gateway operating voltage recovery.

**Function Sequence after download or KNX bus voltage recovery**

Options:     last status  
              active  
              inactive

This parameter defines if function *Sequence* is *active* or *inactive* after KNX bus voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [- Gx Fault](#), page 70 is set. The function *Sequence* is then undertaken with the option defined here.

- *last status*: The function *Sequence* receives the operating state which it had before download or KNX voltage failure.
- *active*: Function *Sequence* is activated after a download of after KNX voltage recovery. The lighting group is switched on with the brightness value after KNX voltage recovery and restarted after an ON telegram.
- *inactive*: Function *Sequence* is not activated after a download of after KNX voltage recovery.

**Status response of function Sequence of the lighting group**

Options:     no  
                   yes: via object "Activate Sequence/Status"

This parameter defines whether the status of the function *Sequence* of the group is sent on the KNX. For this purpose the communication object *Activate Sequence/Status* is enabled.

- *no*: The state of the function *Sequence* is not actively sent on the KNX.
- *yes: via object "Activate Sequence/Status"*: The common communication object *Activate Sequence/Status* receives a telegram with the value 1 to activate function *Sequence* and simultaneously sends the current status of the function *Sequence* actively on the KNX. It is possible to parameterise when the status is sent on the KNX. The following parameters appear for this purpose:

**Send**

Options:     after a change  
                   after request  
                   after a change or request

- *after a change*: The status is sent via the communication object after a change.
- *after request*: The status is sent after a request by the communication object *Request status values*.
- *after a change or request*: The status is sent via the KNX when the status changes or the status is requested via the communication object *Request status values*.

**Status response for different Sequence fct. in overlapping groups:**

Options:     Function active  
                   Function not active

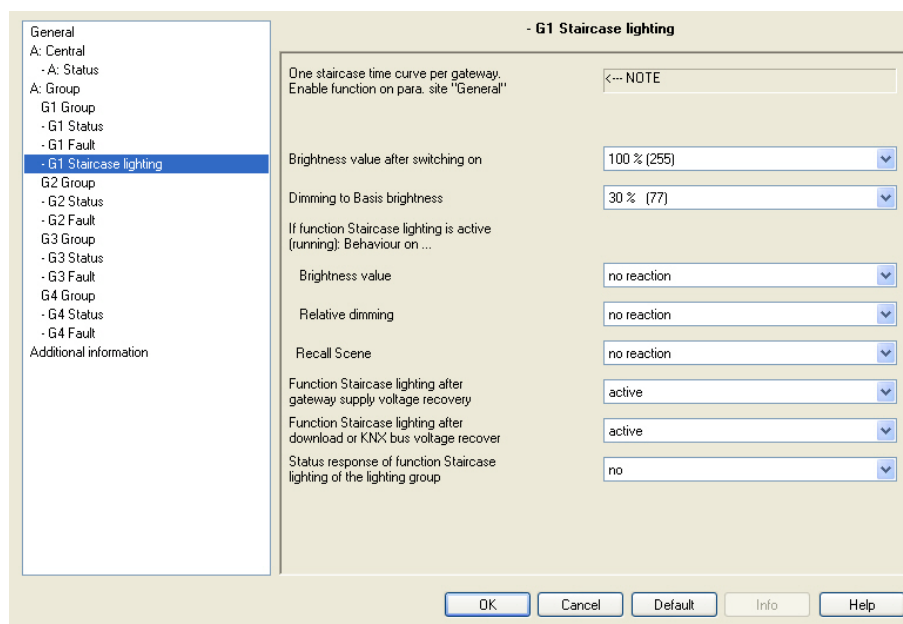
This parameter defines the status to be sent if DALI devices with different states are included in the lighting group.

Important
<p>Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several <i>Switch/Status</i> communication objects, to eliminate mutual interference of devices as a result of differing status messages.</p> <p><i>For further information see: <a href="#">Status response with overlapping lighting groups</a>, page 144</i></p>

- *Function active*: The status of function *Sequence* is sent as active (telegram with the value 1) if at least one device is in activated function *Sequence*.
- *Function not active*: The status of function *Sequence* is sent as active (telegram with the value 1) if all devices are in activated function *Sequence*.

**3.2.3.6 Parameter window**  
**- Gx: Staircase lighting**

The parameter window *Gx Staircase lighting* is enabled in parameter window [Gx Group](#), page 55, if the parameter *Select additional function* has been set with the option *Staircase lighting*.



The Gateway features a function *Staircase lighting* which can be triggered and stopped via individual switch telegrams of the individual lighting groups. For each Gateway a Staircase lighting sequence can be programmed which can be adjusted in the parameter window [Staircase lighting](#), page 97.

**Note**

The function *Staircase lighting* is comprised of two scenes. The Gateway automatically selects the internal scenes 13 and 14 when the function *Staircase lighting* is selected.  
**For further information see: [Staircase lighting](#), page 150**

In parameter window - *Gx Staircase lighting*, the reaction to various KNX telegrams (brightness value, relative dimming, recall scene and voltage recovery) can be parameterised. The reaction to a switch telegram is not explicitly programmable and responds as follows:

The function *Staircase lighting* is triggered by an ON telegram to the communication object *Switch* of a lighting group. With an OFF telegram the lighting group is controlled with the basis brightness of the function *Staircase lighting*. The function *Staircase lighting* remains in standby mode and is started by a renewed ON telegram. Should the Gateway receive a renewed ON telegram during ongoing function *Staircase lighting*, the function *Staircase lighting* is restarted (retriggered).

The function *Staircase lighting* is also started if the Gateway receives a telegram with the value 1 on the communication object *Activate staircase lighting* or *Act. Staircase lighting/Status*.

If in the following the communication object *Switch* (ON telegram) or *Brightness value* are mentioned, it also applies for the communication objects *Switch/Status* or *Brightness value/Status*.

**Brightness value after switching on**

- Options:     100 % (255)  
                   99 % (252)  
                   ...  
                   1 % (3)  
                   0 % (OFF)

This parameter defines the brightness value for operating function *Brightness value* which is set after the dimming up phase and before dimming down (pre-warning phase).

- *100 % (255)...0 % (OFF)*: Brightness value used by the lighting group during the running function *Staircase lighting* after dimming up as its set value.

**Dimming to Basis brightness**

- Options:     100 % (255)  
                   99 % (252)  
                   ...  
                   30 % (77)  
                   ...  
                   1 % (3)  
                   0 % (OFF)

This parameter defines the brightness value after the Staircase lighting time has timed out. It is the brightness value set after the dimming down time (pre-warning phase).

- *100 % (255)...0 % (OFF)*: The brightness value to which the lighting group is set after the *dimming down time*.  
 The *Basis brightness hold time* as well as the *Time for dimming down after illumination (Warning before light turned off)* is programmable in the parameter window [Staircase lighting](#), page 97.

Example
<p>A typical application for a Basis brightness is for example, in nursing homes or residential care homes in hallways where the lighting is never fully switched off. A Basis brightness of approx. 20 % should always exist. If a patient enters the area, it should be illuminated for a certain time (staircase lighting time) with maximum brightness (100 %).</p>

**If function Staircase lighting is active  
(running): Behaviour on ...****Brightness value**

Options: no reaction  
set function in standby

With activated function *Staircase lighting* the parameter can be used to define the reaction to a brightness value telegram.

- *no reaction*: A brightness value telegram is ignored.
- *Function switches to standby*: A brightness telegram ends function *Staircase lighting* and the Gateway carries out the brightness telegram via the communication object *Brightness value*. The function *Staircase lighting* is latent and waits until a renewed activation via the communication object function *Activate Staircase lighting* or via an ON telegram to the communication object *Switch*.

**Relative dimming**

Options: no reaction  
set function in standby

With activated function *Staircase lighting* the parameter can be used to define the reaction to dimming telegram to the communication object *Relative dimming*.

- *no reaction*: A dimming telegram is ignored.
- *Function switches to standby*: A dimming telegram ends function *Staircase lighting* and the Gateway carries out the dimming telegram. The function *Staircase lighting* is latent and waits until a renewed activation via the communication object function *Activate Staircase lighting* or via an ON telegram to the communication object *Switch*.

**Recall scene**

Options: no reaction  
set function in standby

With activated function *Staircase lighting* the parameter can be used to define the reaction to a scene recall.

- *no reaction*: A scene recall is ignored.
- *Function switches to standby*: A scene telegram ends function *Staircase lighting* and the Gateway carries out the scene recall. The function *Staircase lighting* is latent and waits until a renewed activation via the communication object function *Activate Staircase lighting* or via an ON telegram to the communication object *Switch*.

**Function Staircase lighting after gateway supply voltage recovery**

Options: last status  
active  
inactive

This parameter defines if function *Staircase lighting* is *active* or *inactive* after gateway supply voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [- Gx Fault](#), page 70 is set. The function *Staircase lighting* is then undertaken with the option defined here.

- *last status*: The function *Staircase lighting* receives the operating state which it had before gateway operating voltage failure.
- *active*: The function *Staircase lighting* is reactivated after gateway operating voltage recovery. The lighting group is set using the parameterised basis brightness and can be started by an ON telegram or renewed activation via the communication object *Activate Staircase lighting*.
- *inactive*: The function *Staircase lighting* is not reactivated after gateway operating voltage recovery.

**Note**

A Staircase lighting in operation before the gateway supply voltage failure is not automatically restarted. The lighting group is in standby mode with the basis brightness. The function *Staircase lighting* will be started only after an ON telegram with the value 1 has been received on the communication object *Switch*.

**Function Staircase lighting after download or KNX bus voltage recovery**

Options: last status  
active  
inactive

This parameter defines if function *Staircase lighting* is *active* or *inactive* after KNX voltage recovery.

After a gateway supply voltage recovery the parameterised brightness value in the parameter window [- Gx Fault](#), page 70 is set. The function *Staircase lighting* is then undertaken with the option defined here.

- *last status*: The function *Staircase lighting* receives the operating state which it had before download or KNX voltage failure.
- *active*: Function *Staircase lighting* is activated after a download or after KNX voltage recovery. The lighting group is set using the parameterised basis brightness and can be started by an ON telegram or renewed activation via the communication object *Activate Staircase lighting*.
- *inactive*: Function *Staircase lighting* is not activated after a download of after KNX voltage recovery.

**Note**

A Staircase lighting in operation before the download is not automatically restarted. The lighting group is in standby mode with the basis brightness. The function *Staircase lighting* will be started only after an ON telegram with the value 1 has been received on the communication object *Switch*. With KNX voltage failure, the parameterised brightness value at KNX voltage failure is initially set in the parameter window [- Gx Fault](#), page 70. An interrupted Staircase lighting is continued.

**Status response of function Staircase lighting of the lighting group**

Options: no  
yes: via object "Ac. staircase lighting/Status"

This parameter defines whether the status of the function *Staircase lighting* of the lighting group is sent on the KNX. For this purpose the communication object *Act. Staircase lighting/Status* is enabled.

- *no*: The state of the function *Staircase lighting* is not actively sent on the KNX.
- *yes: via object "Act. staircase lighting/Status"*: The common communication object *Act. Staircase lighting/Status* receives a telegram with the 1 to activate function *Staircase lighting* and simultaneously sends the current status of the function *Staircase lighting* actively on the KNX. It is possible to parameterise when the status is sent on the KNX. The following parameters appear:

**Note**

The status of the function *Staircase lighting* indicates whether the lighting groups operates normally and if it can be switched on or off by a switch telegram to the communication object *Switch*, or if a telegram to the communication object *Switch* triggers the function *Staircase lighting*. The status of the function *Staircase lighting* has nothing to do with the state of the function *Staircase lighting*, whether it is currently operating or in standby mode.

**Send**

Options: after a change  
after request  
after a change or request

- *after a change*: The status is sent via the communication object after a change.
- *after request*: The status is sent after a request by the communication object *Request status values*.
- *after a change or request*: The status is sent via the KNX when the status changes or the status is requested via the communication object *Request status values*.



**Status response for diff. Staircase lighting fct. in overlapping groups:**

Options:     Function active  
              Function not active

This parameter defines the status to be sent if DALI devices with different states are included in the lighting group.

**Important**

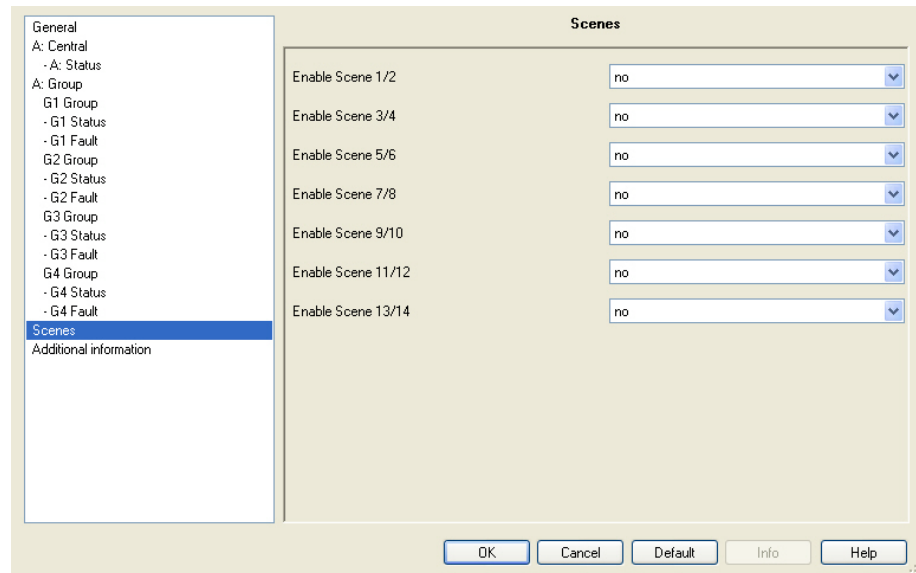
Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Activate Slave/Status* communication objects, to eliminate mutual interference of devices as a result of differing status messages.

*For further information see: [Status response with overlapping lighting groups](#), page 144*

- *Function active*: The status of function *Staircase lighting* is sent as active (telegram with the value 1) if at least one device is in activated function *Staircase lighting*.
- *Function not active*: The status of function *Staircase lighting* is sent as active (telegram with the value 1) if all devices are in activated function *Staircase lighting*.

3.2.4 Parameter window  
Scenes

This parameter window appears if in parameter window [General](#), page 29, the parameter function *Enable Scene* has been set with *yes*.



The Gateway facilitates the integration of the 16 lighting groups in 14 scenes.

In order to parameterise a scene in the ETS, the respective parameter window of the scene must first of all be enabled.

For further information see: [Scene](#), page 153

**Enable Scene x/y (x/y = 1/2, 3/4, 5/6...13/14)**

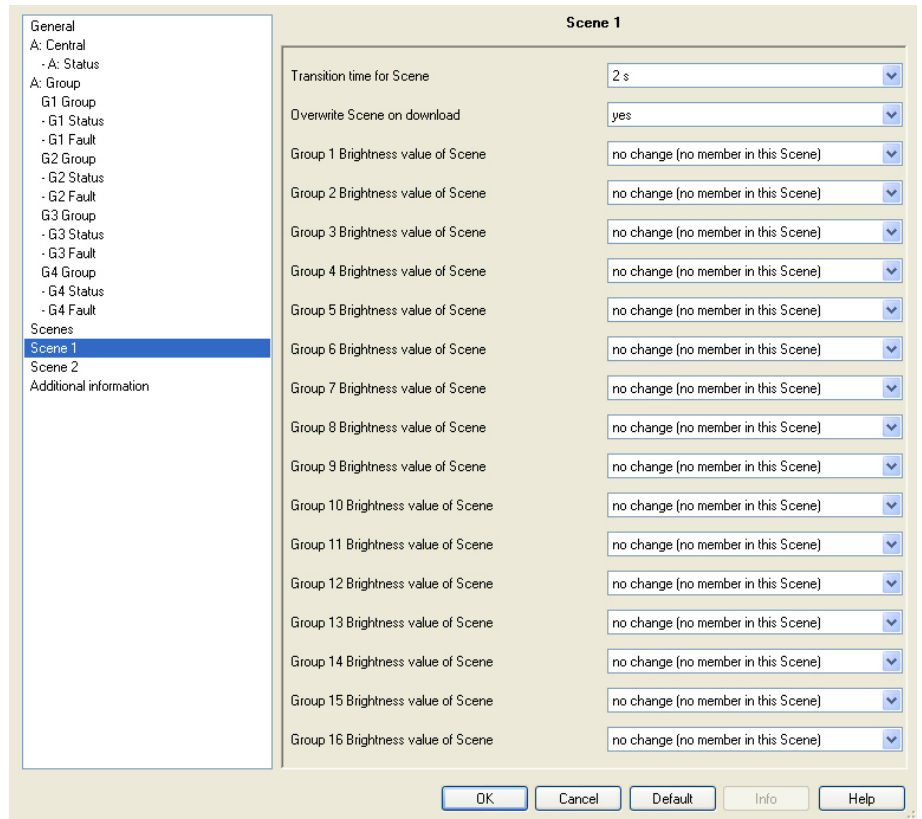
Options:     no  
              yes

This parameter enables different parameter window *Scene x* (x = 1, 2,...14) pairs.

- *no*: No *Scene x* parameter windows are enabled.
- *yes*: *Scene x* parameter windows are enabled in pairs.

**3.2.5 Parameter window  
Scene x**

In parameter window *Scene x* ( $x = 1, 2 \dots 14$ ) the general settings for the light scenes are undertaken. The parameter window *Scene x* is enabled if in parameter window [Scenes](#), page 90, the required scene is enabled.



A scene value must be assigned in order to set a scene value for the lighting group. The scene value complies with the brightness value, which the lighting group assumes when the scene is recalled.

**Transition time for Scene**

- Options:        immediate  
                   0.7 s  
                   2 s  
                   ...  
                   90 s  
                   time for dimming changeable via bus

This parameter sets the duration in which the scene retrieval of the dimming process for all lighting groups of the scene are completed together. If the dimming process is completed, the lighting groups of the scene have achieved the parameterized brightness value of the scene.

<b>Example</b>
Lighting group 1 which is dimmed from 10 % to 100 %, and lighting group 2, which is dimmed from 90 % to 100 %, achieve the parameterised brightness value of the scene simultaneously.

- *immediate*: When a scene is recalled, the lighting groups are switched on immediately with the parameterised brightness value of the scene.
- *0.7 s...90 s*: When a scene is recalled, all lighting groups of the scene are dimmed from their current brightness value to the parameterised brightness value within this time duration.
- *time for dimming changeable via bus*: With a scene recall, all lighting groups of the scene are adjustable from their current brightness value to dim them to the parameterised brightness value, via the *time for dimming changeable via bus* which can be set via the KNX.

For further information see: [Flexible dimming time transition times](#), page 172

**Overwrite Scene on download**

Options:     yes  
                  no

- *yes*: The scene values and the scene transition times in the DALI devices of the lighting group are overwritten after a download or after KNX voltage recovery by the values set in the ETS.
- *no*: The scene values and the scene transition times in the DALI devices of the lighting group are not overwritten after a download or after KNX voltage recovery by the values set in the ETS. If no scene values have been stored, they are parameterized by the Gateway to the maximum brightness.

<b>Note</b>
With a recall scene or with a store scene only the lighting groups which are constituents of the scene are taken into consideration.

**Group x brightness value of scene (x = 1...16)**

Options:     no change (no member in this scene)  
                  100 % (255)  
                  99 % (252)  
                  ...  
                  1 % (3)  
                  0 % (OFF)

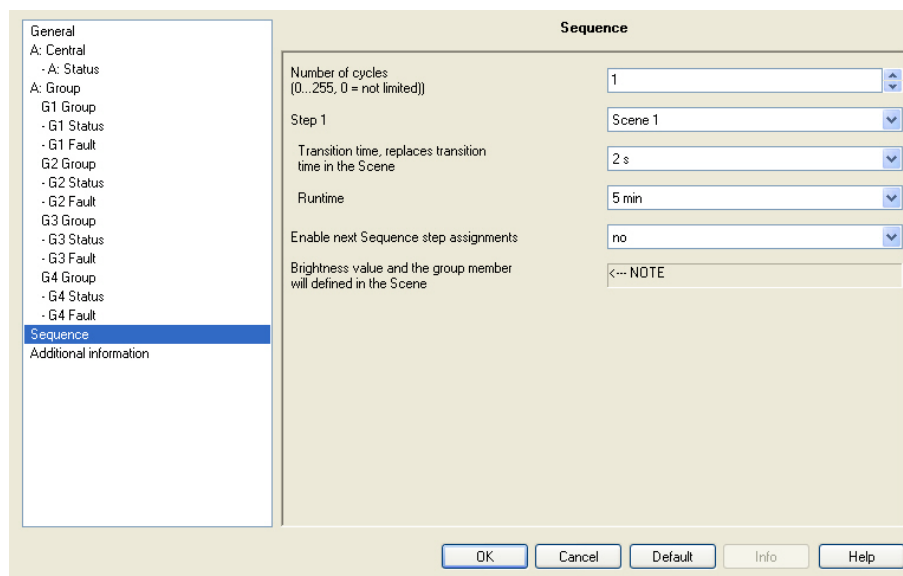
<b>Note</b>
The options <i>100 % (255)</i> to <i>0 % (OFF)</i> are only visible if the parameter <i>Overwrite scene on download</i> is set to <i>yes</i> . With the option <i>no</i> , the possible settings are reduced to <i>no change (no member in this scene)</i> and <i>member in this scene</i> .

This parameter defines the brightness value which is set in the lighting group when a scene is recalled.

- *no change (no member in this scene)* This lighting group does not belong in this scene. During a *Recall scene* the lighting group is not influenced. The current brightness value of the lighting group remains unchanged, even when the scene is stored via the KNX, the brightness value of this group is not stored.
- *100 % (255)...0 % (OFF)*: The lighting group belongs to the scene. During a *Recall scene* the lighting group is set to the parameterised brightness value here.  
If the set brightness value is above or below the set maximum or minimum brightness value of the respective lighting group (see parameter window *Gx group*), the respective brightness value is saved in the scene.

3.2.6 Parameter window *Sequence*

The parameter window *Sequence*, in which the sequence of the scenes and the number of repetitions is set, is enabled if in parameter window [General](#), page 29, the *Enable sequence time curve (one curve per Gateway)* parameter is set with the option *yes*.



The Gateway offers the possibility of allowing a sequence to run. A sequence is a string of up to a maximum of ten scenes which are successively recalled. The recall of the lighting groups involved is undertaken via the communication object *Switch* or *Switch/Status* of the lighting group. Furthermore, the set sequence can be repeated up to 255 times in this setting. If required, endless repetition of the sequence can be parameterised. In this way, it is possible to program running lights on the device without additional logic or timer modules, for example, for effect lighting, facade lighting, in shop presentation or exhibition areas.

**Note**

Only one sequence can be programmed on the Gateway. The setting is undertaken in the *Sequence* parameter window. The sequence is recalled by any lighting group if the additional function *Sequence* is selected for this lighting group. This parameterisation is undertaken in the parameter window [Gx Group](#), page 55.

**For further information see:** [Sequence](#), page 158

The definition of the *Scenes* is undertaken in the parameter window *Scene x*, which is enabled via the parameter function *Enable Scene* in the parameter window [General](#), page 29 and then is subsequently enabled in parameter window *Scenes*.

With running function *Sequence*, the lighting group follows the predefined sequence. The reaction to switch, dimming or brightness value telegrams during ongoing function *Sequence* mode can be parameterised individually in the parameter window [- Gx Sequence](#), page 80.

**Number of cycles  
(0...255, 0 = not limited)**

Options: 0, 1...255

The sequence mode is triggered by an ON telegram with the value 1 on the communication object *Switch* or *Switch/Status* of a lighting group.

This parameter defines how often a sequence should be repeated.

- 0: The sequence is repeated continuously.  
An interruption can be performed in accordance with the parameterisation by an OFF telegram to one of the communication objects of the lighting group. The corresponding setting is undertaken in the parameter window [- Gx Sequence](#), page 80.
- 1...255: This is the number of repetitions of a sequence.  
An interruption can be performed in accordance with the parameterisation by an OFF telegram to one of the communication objects of the lighting group. The corresponding setting is undertaken in the parameter window [- Gx Sequence](#), page 80.

**Step x<sup>1)</sup>**

<sup>1)</sup> x = 1 to 10 and represents a step in the sequence

Options: Scene 1  
Scene 2  
...  
Scene 13  
Scene 14

This parameter determines the scene which is used by the Gateway for step x of the sequence. This scene is recalled during a sequence run or during its repetition as a brightness value for scene x. A scene can be assigned to several sequence stages.

**Note**

In the scene, the brightness value and lighting groups which are controlled with sequence step x, are parameterised. The transition time is the speed at which the brightness value is set, and the runtime is the length of time for which the brightness value is retained, and they are set with both the following parameters (Transition time and Runtime).

The *Transition time for the light scene* parameterised in the parameter window *Scene* does not have an influence on the course of the Sequence.

**Transition time, replace transition time in the scene**

Options:        immediate  
                   0.7 s  
                   2 s  
                   ...  
                   90 s  
                   time for dimming changeable via bus

This parameter determines the time duration in which the Gateway approaches the brightness value for the scene step. The brightness value is defined in the parameter window (Scene value) *Scene*.

- *Immediate*: The lighting groups which are defined for this sequence step, switch on immediately.
- *0.7 s...90 s*: In this period, all lighting groups are dimmed to the parameterised brightness value.
- *time for dimming changeable via bus*: All associated lighting groups are dimmed from their current brightness value using the *time for dimming changeable via bus*, which is set via the KNX, to the parameterised brightness value.

*For further information see: [Flexible dimming time transition times](#), page 172*

**Runtime**

Options:        1 s, 2 s, ...10 s, 20 s, 30 s, 40 s, 50 s,  
                   1 min, 2 min... 5 min...10 min...50 min,  
                   1 h, 2 h...24 h,  
                   no limitation

- *1 s...24 h*: In this period, the lighting groups of this sequence step assume the parameterised brightness values in the scene.
- *no limitation*: The brightness value (scene values of the lighting group) remains set for an unlimited period. The brightness value is only changed if a new telegram is received via the KNX.

**Enable next sequence step assignments**

Options:        no  
                   yes

With this parameter, a further sequence stage can be enabled. A maximum of 10 steps are possible.

- *no*: No further sequence step is enabled.
- *yes*: A further sequence step is enabled.

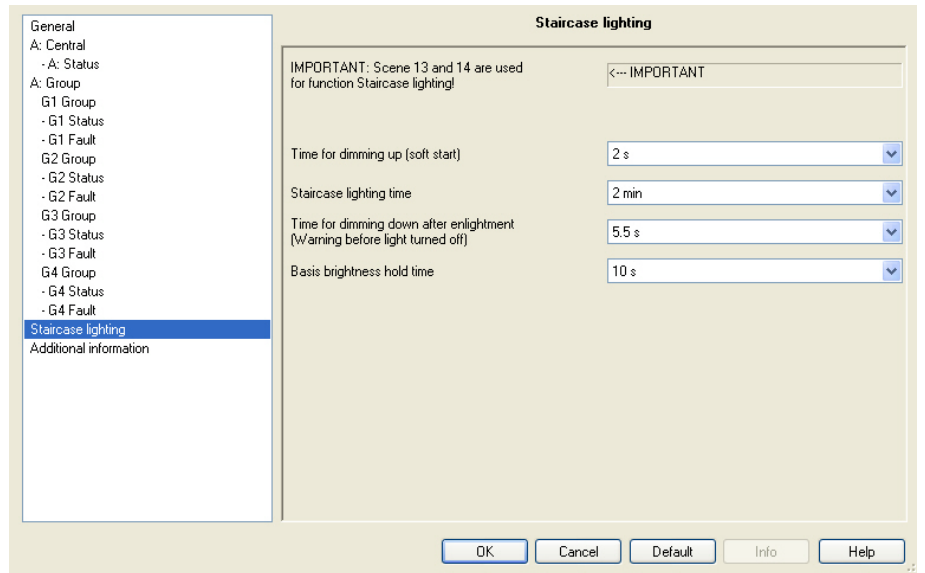
**Brightness value and the group member defined in the Scene**

<--- NOTE



3.2.7 Parameter window *Staircase lighting*

The parameter window *Staircase lighting* is enabled if the parameter window [General](#) on page 29, the parameter *Define sequence time curve (one curve per Gateway)* has been set with the option yes.



The Gateway features a function *Staircase lighting* which can be triggered and stopped via individual switch telegrams of the individual lighting groups.

Important
<p>The function <i>Staircase lighting</i> is comprised of two scenes. The Gateway automatically selects the internal scenes 13 and 14 when the function <i>Staircase lighting</i> is selected.</p> <p><b>For further information see: <a href="#">Staircase lighting</a>, page 150</b></p>

One *Staircase lighting* sequence can be parameterised per Gateway. This can be recalled individually, however, for every lighting group with the switch telegram of the lighting group.

In parameter window [- Gx Staircase lighting](#), page 84, the reaction to various KNX telegrams (brightness value, relative dimming, recall scene) and voltage recovery can be parameterised.

The reaction to a switch telegram is not explicitly programmable and responds as follows:

The function *Staircase lighting* is triggered by an ON telegram with the value 1 to the communication object *Switch* of a lighting group. With an OFF telegram with the value 0, the lighting group is controlled with the basis brightness of the function *Staircase lighting*. The function *Staircase lighting* remains in standby mode and is started by a renewed ON telegram. Should the Gateway receive a renewed ON telegram during ongoing function *Staircase lighting*, the function *Staircase lighting* is restarted (retriggered).

The function *Staircase lighting* is also started if the Gateway receives a telegram with the value 1 on the communication object *Activate Staircase lighting* or *Act. Staircase lighting/Status*.

**Time for dimming up (soft start)**

Options:        immediate  
                  0.7 s  
                  2 s  
                  ...  
                  90 s

This parameter determines the time duration in which the Gateway dims to the brightness value for the staircase lighting time. The function *Staircase lighting* is switched on with a soft start. This brightness value (Staircase lighting) is set with the parameter *Brightness value after dimming* in the parameter window [- Gx Staircase lighting](#), page 84.

- *Immediate*: The lighting groups switches on immediately with the start of the Staircase lighting time.
- *0.7 s...90 s*: This is the time period in which all involved lighting groups are dimmed with the brightness value of the function *Staircase lighting*.

**Staircase lighting time**

Options:        1 s, 2 s, ... 15 s, 20 s, 30 s, 45 s, 50 s,  
                  1 min, 2 min... 5 min...10 min...50 min,  
                  1 h, 2 h...24 h,  
                  no limitation

- *1 s...24 h*: This is the time duration for which the function *Staircase lighting* remains switched on for the lighting group.
- *no limitation*: The function *Staircase lighting* is no longer switched off automatically. The brightness value is changed only if a new telegram is received via the KNX or by forced operation, e.g. with a fault where the brightness value is changed.

**Time for dimming down after enlightenment  
(Warning before light turned off)**

Options:        immediate  
                  0.7 s  
                  2 s  
                  ...  
                  5.5 s  
                  ...  
                  90 s

This parameter determines the time duration in which the Gateway dims down from the function *Staircase lighting* to a Basis brightness. In this way, you indicate that the function *Staircase lighting* will switch off shortly (go out) or will be set to Basis brightness.

- *Immediate*: The lighting groups are immediately set to the Basis brightness after the Staircase lighting time has timed out. The Basis brightness can be set in the parameter window [- Gx Staircase lighting](#), page 84.
- *0.7 s...90 s*: This is the time period in which the lighting group is dimmed to the parameterised Basis brightness at the end of the Staircase lighting time. The Basis brightness can be set in parameter [- Gx Staircase lighting](#), page 84.

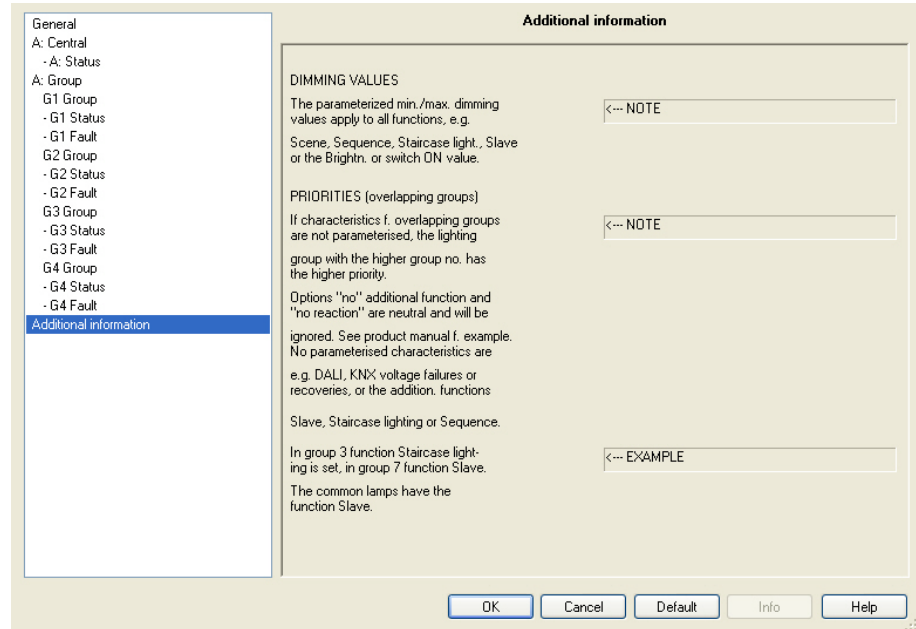
**Basis brightness hold time**

Options: 1 s, 2 s, ... 10 s, 12 s, 15s, 20 s, 30 s, 45 s, 50 s,  
1 min, 2 min... 5 min...10 min...50 min,  
1 h, 2 h...24 h,  
no limitation

- *1 s...24 h*: This is the time duration in which the Basis brightness is switched on.
- *no limitation*: The Basis brightness is not switched off automatically. The brightness value is changed only if a new telegram is received via the KNX or by forced operation, e.g. with a fault where the brightness value is changed.

3.2.8 Parameter window  
*Additional information*

This parameter window contains additional information.



**DIMMING VALUES**

The parameterised min./max. dimming values apply for all functions, e.g.

Scene, Sequence, Staircase light., Slave or the Brightn. or switch ON value.

<--- NOTE

**PRIORITIES (overlapping groups)**

If characteristics f. overlapping groups are not parameterised, the lighting

group with the higher group no. has the higher priority.

Options “no” additional function and “no reaction” are neutral and will be

ignored. See product manual f. example. No parameterised characteristics are

e.g. DALI, KNX voltage failures or recoveries, or the addition. functions

Slave, Staircase lighting or Sequence

In group 3 function Staircase lighting is set, in group 7 function Slave

The common lamps have the function Slave.

<--- EXAMPLE

### 3.3 Communication objects

In this chapter, the communication objects which the group-oriented DALI-Gateway KNX features are described.

The description is divided into blocks which relate to the name of the communication object.

- Group x - Communication objects for lighting groups x
- Output A - Communication objects which relate to the entire output
- Scene x - Communication objects for the function *Scene*
- General - Communication objects for the entire Gateway

In order to obtain a quick overview of the function possibilities of the Gateway, all communication objects are listed in an overview table. The detailed function can be examined in more detail in the subsequent description of the individual communication objects.

Note
Some communication objects are dynamic and are only visible if the corresponding parameters are activated in the application software. In the following description, Group x represents a lighting group and Scene x represents any scene.

3.3.1 Short overview communication objects

Object no.	Function	Name	Length	Flags			
				C	R	W	T
0	Switch	Group 1	1 bit	x		x	
	Switch/Status	Group 1	1 bit	x	x	x	x
1	Status switch	Group 1	1 bit	x	x		x
	Activate function Slave	Group 1	1 bit	x		x	
	Activate Slave/Status	Group 1	1 bit	x	x	x	x
	Activate function Sequence	Group 1	1 bit	x		x	
	Activate Sequence/Status	Group 1	1 bit	x	x	x	x
	Activate Staircase lighting	Group 1	1 bit	x		x	
	Act. Staircase lighting/Status	Group 1	1 bit	x	x	x	x
2	Relative dimming	Group 1	4 bit	x		x	
3	Brightness value	Group 1	1 byte	x		x	
	Brightness value/Status	Group 1	1 byte	x	x	x	x
4	Status Brightness value	Group 1	1 byte	x	x		x
	Brightness value of Slave	Group 1	1 byte	x		x	
5	Fault lamp or ballast	Group 1	1 bit	x	x		x
	Fault ballast	Group 1	1 bit	x	x		x
	Fault lamp	Group 1	1 bit	x	x		x
6...95	Group x, as complete group 1	Group x	ditto				
96	Switch	Output A	1 bit	x		x	
	Switch/Status	Output A	1 bit	x	x	x	x
97	Status switch	Output A	1 bit	x	x		x
98	Relative dimming	Output A	4 bit	x		x	
99	Brightness value	Output A	1 byte	x		x	
	Brightness value/Status	Output A	1 byte	x	x	x	x
100	Status Brightness value	Output A	1 byte	x	x		x
101	Fault lamp	Output A	1 bit	x	x		x
102	Fault ballast	Output A	1 bit	x	x		x
103	Fault DALI	Output A	1 bit	x	x		x
104	Fault Group/device code	Output A	1 byte	x	x		x
105	Number of fault	Output A	1 byte	x	x		x
106	No. Group/device fault	Output A	1 byte	x	x		x
107	Switch up next fault alarm	Output A	1 bit	x		x	
108	Disable sending of fault alarm	Output A	1 bit	x		x	
109	Time for dimming changeable	Output A	1 byte	x		x	
110	Detect ballasts	Output A	1 bit	x		x	
111	Burn-in Lamps	Output A	1 bit	x		x	
	Burn-In Lamps/Status	Output A	1 bit	x	x	x	x

No.	Function	Name	Length	Flags			
				C	R	W	T
112	8 bit Scene	Scene 1...14	1 byte	x		x	
113	Recall Scene	Scene 1 / 2	1 bit	x		x	
114...119	Recall Scene	Scenes x/y	1 bit	x		x	
120	Store Scene	Scene 1 / 2	1 bit	x		x	
121...126	Store Scene	Scenes x/y	1 bit	x		x	
127	Manual use disable/Status	General	1 bit	x	x	x	x
128	Request status values	General	1 bit	x		x	
129	Acknowledge faults	General	1 bit	x		x	
130	Fault Gateway supply	General	1 bit	x	x		x
131	Diagnostics	General	2 byte	x	x		x
132	Request Diagnostics	General	2 byte	x		x	x
133	In operation	General	1 bit	x			x

### 3.3.2 Communication objects Group x

Number	Object Function	Name	Length	C	R	W	T	U
0	Switch	Group 1	1 bit	C	-	W	-	-
2	Relative dimming	Group 1	4 bit	C	-	W	-	-
3	Brightness value	Group 1	1 Byte	C	-	W	-	-

It is possible to parameterise status messages. The communication objects change.

Number	Object Function	Name	Length	C	R	W	T	U
0	Switch	Group 1	1 bit	C	-	W	-	-
1	Status switch	Group 1	1 bit	C	R	-	T	-
2	Relative dimming	Group 1	4 bit	C	-	W	-	-
3	Brightness value	Group 1	1 Byte	C	-	W	-	-
4	Status Brightness value	Group 1	1 Byte	C	R	-	T	-

Depending on the parameterisation, the communications objects change, e.g. for group 1:

No. 0 and 1 separate communication objects or common communication object no. 0

No. 3 and 4 separate communication objects or common communication object no. 3

Number	Object Function	Name	Length	C	R	W	T	U
0	Switch/Status	Group 1	1 bit	C	R	W	T	-
2	Relative dimming	Group 1	4 bit	C	-	W	-	-
3	Brightness value/Status	Group 1	1 Byte	C	R	W	T	-

No.	Function	Object name	Data type	Flags
0, 6... 84, 90 <sup>1)</sup>	<b>Switch</b>	<b>Group x</b>	<b>1 bit (EIS 1) DPT 1.001</b>	<b>C, W</b>

Using this communication object the lighting group is switched on or off with the corresponding brightness value (parameter window *Gx Group*).

Telegram value:           0 = OFF: Lighting group switched off  
                                  1 = ON: Lighting group switched on

When an ON telegram is received, the parameter settings define if a predefined Brightness value or the value before switch off is set.

If the parameterised lighting group is switched on with any brightness value and it receives a renewed ON telegram, the parameterised brightness switch on value is set. Any ongoing function *Burn-in* currently active has a higher priority, so that under certain circumstances individual devices can only assume a brightness of 100 % or OFF.

Other parameter settings define whether the switch on value is dimmed to, or whether it takes immediate effect. Switch on values, which are above or below the maximum/minimum Brightness values, are replaced by the corresponding Brightness values.

If an additional function, *Sequence* or *Staircase lighting* is activated, this function is triggered with an ON telegram (value 1) and the respective timing is started. An inversion is not intended.

It is possible to parameterise that the switch status is fed back via the communication object *Status switch* or via the object *Switch/Status*. Generally the status messages use a separate communication object *Status switch* for this purpose. In parameter window [- Gx Status](#), page 65, this can be parameterised.

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.



No.	Function	Object name	Data type	Flags		
<b>0, 6... 84, 90<sup>1)</sup></b>	<b>Switch/Status</b>	<b>Group x</b>	<b>1 bit (EIS 1) DPT 1.001</b>	<b>C, R, W, T</b>		
<p>The communication object is enabled if in parameter window - <a href="#">Gx Status</a>, page 65, the parameter <i>Status response of switching state of the lighting group</i> is set to <i>yes</i>: parameterised via object "Switch/Status."</p> <p>This communication object has the same functions and properties as the communication object <i>Switch</i>. The status is additionally fed back.</p> <p>Additionally, the value of the communication object is also updated if this is not sent on the KNX.</p> <p>Telegram value:                    0 = OFF or OFF and status: Lighting group switched off     1 = ON or ON and status: Lighting group switched on</p> <table border="1" style="margin: 10px auto;"> <tr> <th style="background-color: #cccccc;">Note</th> </tr> <tr> <td>If several KNX group addresses are assigned to the communication object Switch/Status, the status address should be set as the sending address. In a KNX group with several status messages, it is useful to allow just a single group member to feedback the status.</td> </tr> </table>					Note	If several KNX group addresses are assigned to the communication object Switch/Status, the status address should be set as the sending address. In a KNX group with several status messages, it is useful to allow just a single group member to feedback the status.
Note						
If several KNX group addresses are assigned to the communication object Switch/Status, the status address should be set as the sending address. In a KNX group with several status messages, it is useful to allow just a single group member to feedback the status.						
<b>1, 7 ... 85, 91<sup>1)</sup></b>	<b>Status switch</b>	<b>Group x</b>	<b>1 bit (EIS 1) DPT 1.001</b>	<b>C, R, T</b>		
<p>This communication object is enabled if in parameter window - <a href="#">Gx Status</a>, page 65, the parameter <i>Status response of switching state of the lighting group</i> is set to <i>yes</i>: via a separate object "Status switch".</p> <p>Telegram value:                    0 = OFF and status: Lighting group switched off     1 = ON and status: Lighting group switched on</p> <p>The value of the communication object directly shows the current switch state of the lighting group. The status can be sent after a change and/or a request.</p>						
<b>2, 8... 86, 92<sup>1)</sup></b>	<b>Relative dimming</b>	<b>Group x</b>	<b>4 bit (EIS 2) DPT 3.007</b>	<b>C, W</b>		
<p>Via this communication object, the relative dimming telegram is received for the respective lighting group. They are dimming telegrams BRIGHTER, DARKER and STOP. After a start telegram is received, the Brightness value is changed in the defined direction with the parameterised speed. If a STOP telegram is received before the dim process ends or the maximum or minimum dimming value is reached, the dimming process is interrupted and the received, Brightness value is retained.</p> <p>If the dimming values are above or below the max. or min. dimming values (dimming thresholds), the respective dimming threshold is set.</p> <p>This communication object is not available with a parameterised additional function.</p>						

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
3, 9... 87, 93 <sup>1)</sup>	Brightness value	Group x	1 byte (EIS 6) DPT 5.001	C, W
<p>A defined Brightness value for the corresponding lighting group x is received via this communication object. Any elapsing burn-in time currently active has a higher priority, so that under certain circumstances individual devices can only assume a brightness of 100 % or OFF.</p> <p>In parameter window <a href="#">- Gx Group</a>, page 55, you can parameterise whether this value acts immediately or if it is dimmed to using a dimming speed.</p> <p>If the Brightness values are above or below the max. or min. dimming values (dimming thresholds), the respective dimming threshold is set.</p> <p>Telegram value:            0    = OFF, or min. dimming threshold, if it is parameterised   ...   255 = 100 %</p> <p>It is possible to parameterise that the status of the Brightness value is fed back via the communication object (<i>Brightness value/Status</i>). Generally, a separate communication object <i>Status brightness value</i> is used. This can be enabled in parameter window <a href="#">- Gx Status</a>, page 65.</p>				
3, 9... 87, 93 <sup>1)</sup>	Brightness value/Status	Group x	1 byte (EIS 6) DPT 5.001	C, R, W, T
<p>This communication object is enabled if in parameter window <a href="#">- Gx Status</a>, page 65, the parameter <i>Status response of Brightness value of the lighting group</i> is set with the option <i>yes: parameterised via object "Brightness value/Status"</i></p> <p>This communication object has the same functions and characteristics as the communication object <i>Brightness value</i>. The status is additionally fed back.</p> <p>Additionally, the value of the communication object is also updated if this is not sent on the KNX.</p> <p>Telegram value:            0    = OFF, or minimum dimming threshold   ...   255 = 100 %</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note</b></p> <p>If several KNX group addresses are assigned to the communication object <i>Brightness value/Status</i>, the status address should be set as the sending address.</p> <p>In a KNX groups with several status messages, it is useful to allow just a single group member to feedback the status.</p> </div>				

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
<b>4, 10... 88, 94<sup>1)</sup></b>	<b>Status Brightness value</b>	<b>Group x</b>	<b>1 byte (EIS 6) DPT 5.001</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- Gx Status</a>, page 65, the parameter <i>Status response of Brightness value of the lighting group</i> is set with the option yes: <i>via a separate object "Status Brightness value"</i>.</p> <p>Telegram value:           0    = OFF                                   ...                                   255 = 100 %, max. Brightness value</p> <p>This communication object reports back the current Brightness value of the lighting group. The value of the communication object updates itself during a scene dimming process or sequence.</p> <p>It is possible to parameterise when a status telegram is sent. The status can be sent <i>after a change</i> and/or <i>after request</i>.</p>				

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

**3.3.2.1 Communication objects**  
***Fault***

In addition to the control commands and status responses of the lighting groups, there is the possibility to set the fault status for the lighting group on the KNX via a separate communication object for every lighting group.

Number	Object Function	Name	Length	C	R	W	T	U
5	Fault lamp or ballast	Group 1	1 bit	C	R	-	T	-

Number	Object Function	Name	Length	C	R	W	T	U
5	Fault ballast	Group 1	1 bit	C	-	W	T	-

Number	Object Function	Name	Length	C	R	W	T	U
5	Fault lamp	Group 1	1 bit	C	R	-	T	-



3.3.3 Communication objects  
Output A

Number	Object Function	Name	Length	C	R	W	T	U
96	Switch	Output A	1 bit	C	-	W	-	-
97	Status switch	Output A	1 bit	C	R	-	T	-
98	Relative dimming	Output A	4 bit	C	-	W	-	-
99	Brightness value	Output A	1 Byte	C	-	W	-	-
100	Status Brightness value	Output A	1 Byte	C	R	-	T	-
101	Fault lamp	Output A	1 bit	C	R	-	T	-
102	Fault ballast	Output A	1 bit	C	R	-	T	-
103	Fault DALI	Output A	1 bit	C	R	-	T	-
104	Fault group/device code	Output A	1 Byte	C	R	-	T	-
105	Number of faults	Output A	1 Byte	C	R	-	T	-
106	No. Group/device fault	Output A	1 Byte	C	R	-	T	-
107	Switch up next fault alarm	Output A	1 bit	C	-	W	-	-
108	Disable sending of fault alarm	Output A	1 bit	C	-	W	-	-
109	Time for dimming changeable	Output A	1 Byte	C	-	W	-	-
110	Detect ballasts	Output A	1 bit	C	-	W	-	-
111	Burn-in lamps	Output A	1 bit	C	-	W	-	-

Depending on the parameterisation, the communications objects change, e.g. for output A:

No. 99 and 100 separate communication objects or common communication object no. 99  
 No. 96 and 97 separate communication objects or common communication object no. 96

Number	Object Function	Name	Length	C	R	W	T	U
96	Switch/Status	Output A	1 bit	C	R	W	T	-
98	Relative dimming	Output A	4 bit	C	-	W	-	-
99	Brightness value/Status	Output A	1 Byte	C	R	W	T	-

**Note**

In the following, the communication objects are described which relate to the overall DALI output and thus to the DALI devices connected to it. It is a central function (Broadcast mode) which relates to all devices of the output.  
 The properties of the central telegram are determined in the parameter windows [A: Central](#), page 36, and [-A: Status](#), page 44.

No.	Function	Object name	Data type	Flags
96	Switch	Output A	1 bit (EIS 1) DPT 1.001	C, W
<p>Using this communication object all DALI devices connected to the DALI output are switched on or off with the predefined brightness values in parameter window <a href="#">A: Central</a>, page 36.</p> <p>Telegram value:           0 = OFF: All lamps switched off                                   1 = ON: All lamps switched on</p> <p>When an ON telegram is received, the parameter settings define if a predefined Brightness value or the value before switch off is set. If DALI devices are switched on, they can feature different Brightness values due to the group telegram, and if the Gateway receives an ON telegram, all DALI devices are set with the parameterised switch on threshold value.</p> <p>You can parameterise whether a Gateway dims down to or jumps to the brightness values. If the switch on values are above or below the max. or min. dimming values (dimming thresholds), the respective dimming threshold is set.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note</b></p> <p>For the maximum and minimum dimming values, the individual values of the lighting group remain valid.</p> <p>The activated function <i>Burn-in</i> can influence the brightness of the DALI devices.</p> <p>If an additional function, <i>Staircase lighting</i> or <i>Sequence</i> is activated, this function is triggered with an ON telegram (value 1) and the respective timing is started.</p> </div>				
96	Switch/Status	Output A	1 bit (EIS 1) DPT 1.001	C, R, W, T
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter <i>Status response of switching state of the lighting group</i> is set with the option <i>yes: parameterised via object "Switch/Status."</i></p> <p>This communication object has the same functions and properties as the communication object <i>Switch</i>. The status is additionally fed back.</p> <p>Telegram value:           0 = OFF and status: All DALI devices are switched off                                   1 = ON and status: all DALI devices are switched on</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note</b></p> <p>If several KNX group addresses are assigned to the communication object <i>Switch/Status</i>, the status address should be set as the sending address. In a KNX groups with several status messages, it is useful to allow just a single group member to feedback the status.</p> </div>				

No.	Function	Object name	Data type	Flags
97	<b>Status switch</b>	<b>Output A</b>	<b>1 bit (EIS 1)</b> <b>DPT 1.001</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter <i>Status response of switching state of the lighting group</i> is set with the option <i>yes: via a separate object "Status switch"</i>.</p> <p>Telegram value:           0 = OFF and status: All lamps switched off                                   1 = ON and status: All lamps switched on</p> <p>The value of the communication object directly shows the current switch state of the lamp. You can parameterise whether the ON status is indicated if at least one lamp is on, or if all lamps are on. The status can be sent <i>after a change</i> and/or <i>after request</i>.</p>				
98	<b>Relative dimming</b>	<b>Output A</b>	<b>4 bit (EIS 2)</b> <b>DPT 3.007</b>	<b>C, W</b>
<p>The <i>Relative dimming</i> telegram of all connected DALI devices is received via this communication object. They are dimming telegrams BRIGHTER, DARKER and STOP. After a start telegram is received, the brightness value is changed in the defined direction with the parameterised speed. If a STOP telegram is received before the dim process ends or the maximum or minimum dimming value is reached, the dimming process is interrupted and the received, brightness value is retained.</p> <p>If the dimming values are above or below the max. or min. dimming values (dimming thresholds), the respective dimming threshold is set.</p> <p>The dimming thresholds on the individual lighting groups continue to apply.</p>				
99	<b>Brightness value</b>	<b>Output A</b>	<b>1 byte (EIS 6)</b> <b>DPT 5.001</b>	<b>C, W</b>
<p>A Brightness value for all connected DALI devices is received via this communication object. Any elapsing burn-in time currently active has a higher priority, so that under certain circumstances individual devices can only assume a brightness of 100 % or OFF.</p> <p>In parameter window <a href="#">A: Central</a>, page 36, you can parameterise whether this Brightness value acts immediately or if it is dimmed to using a dimming speed.</p> <p>Brightness values, which are above or below the predefined max. or min. dimming values (dimming thresholds), are not set. The dimming thresholds for the individual groups as set apply.</p> <p>Telegram value:           0   = OFF, or. min. dimming threshold, if parameterised                                   ...                                   255 = 100 %</p>				



No.	Function	Object name	Data type	Flags
99	<b>Brightness value/Status</b>	<b>Output A</b>	<b>1 byte (EIS 6) DPT 5.001</b>	<b>C, R, W, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter <i>Status response of Brightness value of the DALI output</i> is set with the option yes: parameterised via object "Brightness value/Status"</p> <p>This communication object has the same functions and properties as the communication object <i>Brightness value</i>. The status is additionally fed back. At different Brightness values of the DALI devices you can parameterise whether the Gateway indicates the lowest, the highest or the average Brightness value. The parameterisation is implemented in the parameter window <i>A: Status</i></p> <p>Telegram value:                    0 = OFF, or minimum dimming threshold            ...            255 = 100 %</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note</b></p> <p>If several groups are assigned to the communication object <i>Brightness value/Status</i>, the status address should be set as the sending address. In a KNX groups with several status messages, it is useful to allow just a single group member to feedback the status.</p> </div>				
100	<b>Status Brightness value</b>	<b>Output A</b>	<b>1 byte (EIS 6) DPT 5.001</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter <i>Status response of Brightness value of the DALI output</i> is set with the option yes: via a separate object "Status Brightness value".</p> <p>Telegram value:                    0    = OFF            ...            255 = 100 %, max. Brightness value</p> <p>This communication object reports the current Brightness value of the DALI device. At different Brightness values of the DALI devices you can parameterise whether the Gateway indicates the lowest, the highest or the average Brightness value.</p> <p>The value of the communication object updates itself during a scene dimming process or sequence.</p> <p>It is possible to parameterise if the status is sent on <i>after a change</i> and/or <i>after request</i>.</p>				

No.	Function	Object name	Data type	Flags
101	<b>Fault lamp</b>	<b>Output A</b>	<b>1-Bit (EIS 1) DPT 1.005</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter <i>Fault lamp</i> is set with the option <i>yes</i>.</p> <p>Using this communication object of a lamp fault can be sent or read.</p> <p>Telegram value                    1 = lamp fault (at least one of the connected DALI devices has sent a lamp fault)                0 = No lamp fault</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note</b></p> <p>This function must be supported by the DALI devices.              If DALI devices are used, which do not monitor their lighting equipment and which thus do not provide this information on the DALI, the Gateway will also be unable to detect a lamp fault. In order to monitor a lamp fault, the function <i>Detect ballasts</i> does not need to be explicitly activated.              In most cases a lamp fault is only determined or indicated by the Gateway when the lighting equipment should be switched on. For this reason the Gateway cannot report a fault beforehand.</p> </div> <p>Using the communication object <i>Fault lamp</i> (Group x), the state of the lamps for every lighting group can be indicated. Using the communication object (Diagnostics, no. 131) it is possible to request the lamp state for each DALI device.</p>				

No.	Function	Object name	Data type	Flags
102	<b>Fault ballast</b>	<b>Output A</b>	<b>1-Bit (EIS 1) DPT 1.005</b>	<b>C, R, T</b>

This communication object is enabled if in parameter window [- A: Status](#), page 44, the parameter *Fault ballast* is set with the option yes.

Using this communication object a ballast fault can be sent or read.

Telegram value            1 = ballast fault (at least one of the connected ballasts has a fault)  
    0 = No ballast fault

A ballast fault can occur in one of the following situations:

- The ballast is faulty and does not send telegrams on the DALI control line
- The ballast has no ballast operating voltage and does not send telegrams on the DALI control line
- The DALI control line to the ballast is interrupted so that the Gateway does not receive a status response
- The ballast has lost its address, a query from the Gateway remains unanswered

**Note**

In order to guarantee correct evaluation of a ballast fault, the Gateway has to know how many ballasts are to be monitored. This is implemented by activating the communication object *Detect ballasts* (no. 110) just once. Using this function the Gateway independently determines which ballasts (DALI devices / DALI addresses) are connected and uses this state as a reference value. Here not only the number but also the address of the DALI device is registered. If this system has to be modified, the *Detect ballasts* option should be activated.

The process does not need to be repeated when exchanging a DALI device with the same address. The new DALI device receives the old DALI address and assumes the position of the DALI device it replaced.

The function *Detect ballasts* can be triggered not only via the communication object *Detect ballasts*, but also manually by pressing the test button for more than five seconds. Furthermore, this function can be triggered with the soft key *Detect ballasts* in the *Options* window.



No.	Function	Object name	Data type	Flags
<b>105</b>	<b>Number of faults</b>	<b>Output A</b>	<b>1 byte (EIS 6) DPT 5.010</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter "<i>Fault Group/device code</i>" <i>enable encoded fault message</i> is set with <i>yes</i>.</p> <p>Using this communication object, the number of groups or individual DALI devices are displayed which have at least one lamp or ballast fault. The value relates to the lighting group or the individual DALI device in dependence on the <i>group-oriented</i> or <i>device-based</i> parameterisation.</p> <p>Telegram value:                    0...16 = number of lighting groups with fault              0...64 = number of individual DALI devices with fault</p>				
<b>106</b>	<b>No. Group/device fault</b>	<b>Output A</b>	<b>1 byte (EIS 6) DPT 5.010</b>	<b>C, R, T</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter "<i>Fault Group/device code</i>" <i>enable encoded fault message</i> is set with the option <i>yes</i>:</p> <p>With this communication object, the first lighting group or the first DALI device is displayed as a figure value. The value relates directly to the lighting group or the individual DALI device in dependence on the <i>group-oriented</i> or <i>device-based</i> parameterisation. A correction by 1 as required for the values in the communication objects <i>Diagnostics</i> (131) and <i>Fault Group/device code</i> (no. 104) is not necessary in the communication object described here.</p> <p>Telegram value:                    1...16 = number of lighting group with fault              1...64 = number of individual DALI device with fault</p> <p>All lighting groups or DALI devices with a fault can be displayed successively in conjunction with the communication object <i>Switch up next fault alarm</i> (no. 107). If the communication group <i>Number of faults</i> is added, you can recognise how often you will need to switch up in order to view all faults.</p>				
<b>107</b>	<b>Switch up next fault alarm</b>	<b>Output A</b>	<b>1 byte (EIS 1) DPT 1.008</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">- A: Status</a>, page 44, the parameter "<i>Fault Group/device code</i>" <i>enable encoded fault message</i> is set with <i>yes</i>.</p> <p>This communication object should be considered in conjunction with the communication object <i>No. Group/device fault</i> (no. 106). Should there be several group or device faults, this communication object can be used to switch to the next number of the communication object <i>No. Group/device fault</i>. With the value <i>0</i> you can advance by a number and with the value <i>1</i> you can go back by a number.</p> <p>Telegram value:                    0 = "switch up": to the next higher number of the lighting groups or DALI devices with a fault is displayed on the communication object <i>No. Group/device fault</i> (no. 106).              1 = "switch down": to the next lower number of the lighting groups or DALI devices with a fault is displayed on the communication object <i>No. Group/device fault</i> (no. 106).</p> <p>If the next higher number is encountered during switch up or the next lower number is encountered during switching down, the switching up or down telegram will not switch further up or down.</p>				
<b>108</b>	<b>Disable sending of fault alarm</b>	<b>Output A</b>	<b>1 bit (EIS 1) DPT 1.003</b>	<b>C, W</b>
<p>With this communication object, it is possible to disable the fault messages (lamp or ballast</p>				

No.	Function	Object name	Data type	Flags		
<p>fault) of the Gateway. If the fault messages are inhibited, the Gateway will continue to undertake fault message examination regarding lamp and ballast faults.</p> <p>During the inhibit the faults are evaluated, however they are not sent on the KNX. The values of the communication objects are also not updated.</p> <p>The latent time of the system can be minimized at low KNX load when the fault messages are inhibited.</p> <p>When all error messages are enabled, the malfunctions will be sent in accordance with their parameterisation. If a fault still exists after enabling of the error message, this fault is recorded and the information is sent on the KNX in accordance with the parameterisation.</p> <p>Telegram value:                    1 = disabling of fault messages (lamp and ballast fault)                0 = enabling of fault messages (lamp and ballast fault)</p>						
<table border="1"> <thead> <tr> <th data-bbox="625 745 1364 790"><b>Note</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="625 797 1364 1028"> <p>This function can, for example, be useful for systems with emergency lighting applications for daily checking of the lamps of the DALI devices by the DALI control line, and thus disconnect from the DALI master (Gateway). In this case, the Gateway detects the loss of the DALI device and sends a ballast fault even though this is a normal operating state. Should the fault message be disabled before separation from the DALI control line, no fault is reported on the Gateway. Operation can continue as normal. After checking the lighting equipment, normal monitoring can be reactivated via the error message communication object <i>Disable sending of fault alarm</i>.</p> </td> </tr> </tbody> </table>					<b>Note</b>	<p>This function can, for example, be useful for systems with emergency lighting applications for daily checking of the lamps of the DALI devices by the DALI control line, and thus disconnect from the DALI master (Gateway). In this case, the Gateway detects the loss of the DALI device and sends a ballast fault even though this is a normal operating state. Should the fault message be disabled before separation from the DALI control line, no fault is reported on the Gateway. Operation can continue as normal. After checking the lighting equipment, normal monitoring can be reactivated via the error message communication object <i>Disable sending of fault alarm</i>.</p>
<b>Note</b>						
<p>This function can, for example, be useful for systems with emergency lighting applications for daily checking of the lamps of the DALI devices by the DALI control line, and thus disconnect from the DALI master (Gateway). In this case, the Gateway detects the loss of the DALI device and sends a ballast fault even though this is a normal operating state. Should the fault message be disabled before separation from the DALI control line, no fault is reported on the Gateway. Operation can continue as normal. After checking the lighting equipment, normal monitoring can be reactivated via the error message communication object <i>Disable sending of fault alarm</i>.</p>						

No.	Function	Object name	Data type	Flags
109	time for dimming changeable	Output A	1 byte (non EIS) Non DTP	C, W

This communication object is enabled if in parameter window [A: Central](#), page 36, one or more parameters for dimming time are parameterised with the option *time for dimming changeable via bus*.

Using this communication object, it is possible to define the fading time as described in the DALI standard EN 62386-102 via the DALI control by using the KNX, so that the intended DALI devices use the DALI fading times.

Telegram value: 0 to 15 complies to the fading times to DALI

Telegram value	Fading time [s] to EN 62386-102
0	No reaction, is not transferred to DALI
1	0.7
2	1.0
3	1.4
4	2.0
5	2.8
6	4.0
7	5.7
8	8.0
9	11.3
10	16.0
11	22.6
12	32.0
13	45.3
14	64.0
15	90.5
> 15	No reaction, is not transferred to DALI

The fade time is specified as the time duration required for changing the lamp power from the current brightness value to the required target brightness. In the case of a switched off lamp the preheat and ignition time is not included in the fading time.

No.	Function	Object name	Data type	Flags
<b>110</b>	<b>Detect ballasts</b>	<b>Output A</b>	<b>1 bit (EIS 1)</b> <b>DPT 1.010</b>	<b>C, W</b>

Using this communication object the current state for the Gateway can be stored as the reference state.

In order to correctly detect a ballast fault, the Gateway must have correctly identified all connected DALI devices and thus know the number of connected DALI devices to be monitored. This identification process runs autonomously and fully automatically in the background, after the Gateway has received a detection telegram (with value 1 via this communication object. The Gateway notes the current system configuration as a reference state. For this purpose all DALI addresses are stored in the Gateway. Should a DALI address now be lost, e.g. by a ballast fault, cable break, etc., this is interpreted by the Gateway as a ballast fault and sent on the KNX as set in the parameterisation. An automatic detection e.g. after a KNX voltage recovery or gateway operating voltage recovery does not take place.

The detection should be carried out directly after commissioning or when extending or reducing the DALI devices. The DALI devices are continually monitored, regardless of whether the lamp is activated or deactivated.

The DALI devices must be installed properly and supplied with operating voltage if necessary.

Telegram value                    1= start ballast detection process  
    0 = no function

<b>Note</b>
This function can be manually triggered if the test button on the Gateway device is pushed for longer than five seconds. Furthermore, the detection of DALI devices and saving as a reference value is possible in the Software Tool using the soft key <i>Detect ballasts</i> .



No.	Function	Object name	Data type	Flags
111	<b>Burn-in Lamps</b>	<b>Output A</b>	<b>1 bit (EIS 1)</b> <b>DPT 1.010</b>	<b>C, W</b>

This communication object is enabled if in parameter window [A: Central](#) page 36, the parameter *Enable lamp burn-in function object "Burn-In Lamps"* is set with the option *yes*:  
 With this communication object, the function *Burn-In* for protection of the ballasts and the lamp is activated or deactivated at initial use. After receipt of a telegram with the value 1 all lighting groups which are intended for burn-in can only be controlled with 0 % (OFF) or 100 % brightness. Whether a lighting group is considered during burn-in is set in the parameter window [Gx Group](#), page 55, with the parameter *Enable with burn-in function (Object "Burn-In Lamps")*. Incoming telegrams have an effect on all lighting groups which are intended for burn-in purposes.

The time duration for burn-in is defined commonly for all lighting groups.  
 After this burn-in time has elapsed, the lighting group can be dimmed as usual, and the programmed light scene can be recalled. If a telegram with the value 1 is received on the communication object *Burn-In Lamps* during the burn-in time, the period restarts from the beginning.

A telegram with the value 0 deactivates the function *Burn-in* and enables "normal" operation. The burn-in time is only counted if a ballast on the DALI output is connected and supplied with power. The burn-in time counts in five minute steps.

Telegram value:            1 = activate functions  
                                       0 = deactivate functions

**For further information see: [Burn-in of lamps](#), page 139**

3.3.4 Communication objects  
Scene x/y

Number	Object Function	Name	Length	C	R	W	T	U
113	Recall Scene	Scene 1/2	1 bit	C	-	W	-	-
114	Recall Scene	Scene 3/4	1 bit	C	-	W	-	-
115	Recall Scene	Scene 5/6	1 bit	C	-	W	-	-
116	Recall Scene	Scene 7/8	1 bit	C	-	W	-	-
117	Recall Scene	Scene 9/10	1 bit	C	-	W	-	-
118	Recall Scene	Scene 11/12	1 bit	C	-	W	-	-
119	Recall Scene	Scene 13/14	1 bit	C	-	W	-	-
120	Store Scene	Scene 1/2	1 bit	C	-	W	-	-
121	Store Scene	Scene 3/4	1 bit	C	-	W	-	-
122	Store Scene	Scene 5/6	1 bit	C	-	W	-	-
123	Store Scene	Scene 7/8	1 bit	C	-	W	-	-
124	Store Scene	Scene 9/10	1 bit	C	-	W	-	-
125	Store Scene	Scene 11/12	1 bit	C	-	W	-	-
126	Store Scene	Scene 13/14	1 bit	C	-	W	-	-

As soon as the function *Scenes* in parameter window [General](#), page 29, is enabled via parameter *Enable Scene* with the option *yes*, the 8 bit scene communication object is available. The communication objects for the 1 bit control of a scene are only visible when the respective scene has been enabled in the parameter window [Scenes](#), page 90. Enable is always in pairs.

No.	Function	Object name	Data type	Flags
112	8 bit Scene	Output X	1 byte Non EIS DPT 18.001	C, W

This communication object is enabled if in parameter window [General](#), page 29, the parameter *Enable Scene* is set with the option *yes*:

Using this 8 bit communication object, a scene telegram can be sent using a coded telegram which integrates the lighting groups in a KNX scene. The telegram contains the number of the respective scene as well as the information whether the scene is to be retrieved, or if the brightness values in the scene are to be assigned to the lighting group in the scene.

Telegram values (1 byte): M0SS SSSS  
(MSB) (LSB)

M: 0 = scene is recalled  
1 = scene is stored (if allowed)

S: Number of the scene (1...13: 00000000...00001101)

KNX 8 bit telegram value		Meaning
Decimal	Hexadecimal	
00	00h	Recall scene 1
01	01h	Recall scene 2
02	02h	Recall scene 3
...	...	...
13	0Hh	Recall scene 14
128	80h	Store scene 1
129	81h	Store scene 2
130	82h	Store scene 3
...	...	...
141	8Dh	Store scene 14

Other numeric values do not affect the communication objects *Store scene* or *Recall scene*.

For further information see: [Code table scene 8 bit scene](#), page 173

113... 119	Recall Scene	Scene x/y X=1, 3...13 y= 2, 4...12	1 bit (EIS1) DPT 1.022	C, W
---------------	--------------	--	---------------------------	------

This communication object is enabled if in parameter window [Scenes](#), page 90, the respective scenes have been enabled.

A telegram, which is received via the communication object from the Gateway, recalls Scene x or y. Only the lighting groups which belong to the scene are activated.

Telegram value: 0 = recall first scene number (x = odd scene number)  
1 = recall second scene number (y = even scene number)

The standard brightness values of a scene are parameterised in the parameter window [Scene x](#), page 91. If the option *Overwrite Scene on download* is selected with *yes*, the ETS parameterised scene values are written into the DALI devices of the lighting group with a download. Any values saved on the KNX are overwritten and lost.

No.	Function	Object name	Data type	Flags
120 ... 126	<b>Store Scene</b>	<b>Scene x/y</b> <b>X=1, 3...13</b> <b>y= 2, 4...12</b>	<b>1 bit (EIS1)</b> <b>DPT 1.022</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">Scenes</a>, page 90, the respective Scenes have been enabled.</p> <p>A telegram, which is received via this communication object from the Gateway, causes the Gateway to save the current Brightness values of the lighting group, which are part of the Scene as new scene brightness values for the Scene, and to write in the corresponding lighting groups of the devices. The saved scene values received via the ETS during a download are overwritten and are lost.</p> <p>Telegram value:           0 = saving of the scene brightness values   of the first scene no. (x)   1 = saving of the scene brightness values   of the second scene no. (y)</p> <p>The scene which is set manually once via the KNX can be protected against overwriting with a download by setting the option <i>no</i> for <i>Overwrite scene on download</i> in the parameter window <a href="#">Scene x</a>, page 91. In this case, the brightness values parameterised in the ETS are not written into the DALI devices of the lighting group. The scene brightness values set manually via the KNX are retained.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note</b></p> <p>Not all 16 lighting groups are considered when saving. Only the lighting groups which belong to the scene are considered.</p> <p>Thus, for example, the lamp groups in adjacent rooms which are not part of the scene are not changed.</p> </div>				

3.3.5 Communication objects  
*General*

Number	Object Function	Name	Length	C	R	W	T	U
127	Block manual Operation/Status	General	1 bit	C	R	W	T	-
128	Request status values	General	1 bit	C	-	W	-	-
129	Acknowledge faults	General	1 bit	C	-	W	-	-
130	Fault Gateway supply	General	1 bit	C	R	-	T	-
131	Diagnostics	General	2 Byte	C	R	-	T	-
132	Request Diagnostics	General	1 Byte	C	-	W	-	-
133	In Operation	General	1 bit	C	-	-	T	-

No.	Function	Object name	Data type	Flags
127	<b>Block maual Operation/Status</b>	<b>General</b>	<b>1 bit (EIS 1) DPT 1.002</b>	<b>C, R, W, T</b>
<p>The manual operation (test button) is inhibited via this communication object.</p> <p>Telegram value:           0 = manual operation/test button is enabled                                   1 = manual operation/test button is disabled</p> <p>With inhibited manual operation, it is not possible to manually switch the connected DALI devices via the Gateway. Furthermore, the function <i>Detect ballasts</i> is no longer possible via a long button push (&gt; 5 s) of the test button.</p> <p>At the same time, the status of manual operation can be read via this communication object, inhibited (1) and enabled (0) or sent on the KNX.</p>				
128	<b>Request status values</b>	<b>General</b>	<b>1 bit (EIS 1) DPT 1.017</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">General</a>, page 29, the parameter <i>Request status values</i> is set with the option <i>yes</i>:</p> <p>Sending of status values on the KNX can be triggered via this communication object. A prerequisite is that option <i>after a change or request</i> and/or <i>after request</i> has been parameterised to <i>after request</i>.</p> <p>Telegram value:           0 = no sending of the status values, no function                                   1 = all status messages are sent, provided they are programmed with the option <i>after request</i></p>				
129	<b>Acknowledge faults</b>	<b>General</b>	<b>1 bit (EIS 1) DPT 1.015</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">General</a>, page 29, the parameter <i>Acknowledge Faults</i> is set with the option <i>yes - acknowledgement is required</i>:</p> <p>This communication object enables both the reset of the <i>Fault Gateway supply</i> and the <i>lamp, ballast</i> and <i>DALI</i> fault signals of the individual lamp groups. The fault(s) is (are) only reset after an acknowledgement if the corresponding fault(s) has (have) been rectified.</p> <p>Telegram value:           0 = no function                                   1 = reset faults</p>				

No.	Function	Object name	Data type	Flags
130	<b>Fault Gateway supply</b>	<b>General</b>	<b>1 bit (EIS 1) DPT 1.005</b>	<b>C, R, T</b>

This communication object is enabled if in parameter window [General](#), page 29, the parameter *Fault Gateway supply voltage* is set with the option *yes*:  
 If the gateway operating voltage fails for more than five seconds, a fault message telegram is sent immediately.  
 Telegram value:                    0 = no fault  
    1 = fault

131	<b>Diagnostics</b>	<b>General</b>	<b>2 byte (Non EIS) Non DPT</b>	<b>C, R, T</b>
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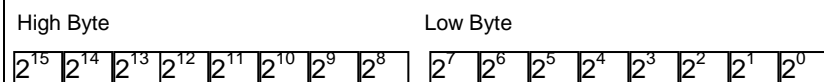
This communication object has the task to make available the function state of the connected DALI system of a lighting group or an individual DALI device on the KNX. The communication object *Diagnostics* should be observed together with the communication object *Request Diagnostics* (no. 132).  
 After receipt of a telegram on the communication object *Request Diagnostics* the Gateway automatically sends the information via the communication object *Diagnostics* on the KNX. In order to guarantee that no information is lost and simultaneously ensure a unique assignment of the sent information, the identical information requested via the communication object *Request Diagnostics* (no. 132) is repeated in bit 0 to bit 7.

Dest. addr	Data	Destination	R	DPT
1/1/132	\$01	Request Diagnostics	6	8-Bit Unsigned Value
1/1/131	14 01	Diagnostics	6	2-Octet Unsigned Value
1/1/132	\$02	Request Diagnostics	6	8-Bit Unsigned Value
1/1/131	04 02	Diagnostics	6	2-Octet Unsigned Value



The hexadecimal representation is received for example, if you select the DTP 7.001 2 octet unsigned. This setting is set via the properties (select communication object, press right mouse button) as a data type.

The following numbering applies for the following list:



The bit number is identical with the exponent of the bit, e.g. number 2 complies with  $2^2$ .  
 Bit 0...7 corresponds with the information as queried in the communication object *Request Diagnostics* (No 132). The content identifies the DALI device or the lighting group for which information has been requested. Bit 6 ( $2^6$ ) - determines if a group (value 1) or an individual device (value 0) has been recalled.  
 Bit 7 contains a 0.  
 Bit 8...15 contains the following coded information concerning the recalled DALI device or recalled lighting group:

No.	Function	Object name	Data type	Flags
<b>continued no. 131</b>				
	Bit 8: Fault lamp:	Value 0 = no fault Value 1 = fault		
	Bit 9: Fault ballast:	Value 0 = no fault Value 1 = fault		
	Bit 10: status of the device monitoring:	Value 0 = there is no monitoring (the DALI devices are not considered with the monitoring of the devices) Value 1 = monitoring available. Bit 11: Status function <i>Burn-in</i> Value 0 = function <i>Burn-in</i> not activated Value 1 = function <i>Burn-in</i> activated (device or lighting group) can only assume state OFF and 100 %		
	Bit 12 Status additional function, slave, Staircase lighting or sequence:	Value 0 = no additional function for the device or the lighting group activated Value 1 = the additional function is activated for the device or lighting group		
	Bit 13 DALI short circuit for the output:	Value 0 = on the DALI output there is no DALI short circuit Value 1 = on the DALI output there is a DALI short circuit		
	Bit 14 DALI collisions for the output:	Value 0 = on the DALI output there are collisions of DALI telegrams. Value 1 = on the DALI output there no are collisions of DALI telegrams.		
	Bit 15 status disable sending of fault alarm:	Value 0 = fault alarm is not inhibited Value 1 = fault alarm is inhibited		
<p>The communication object receives the value FF FF hex after a KNX voltage recovery (power on) on the Gateway. After download or gateway operating voltage failure, the last value called after the KNX bus voltage recovery remains.</p> <p><b>For further information see: <a href="#">Diagnostics code table</a>, page 175</b></p>				

No.	Function	Object name	Data type	Flags
132	<b>Request Diagnostics</b>	<b>General</b>	<b>1 byte (Non EIS) Non DPT</b>	<b>C, W</b>
<p>This communication object is always enabled and together with the communication object <i>Diagnostics</i> (no. 131) has to provide the function state of the DALI output, a lighting group or a DALI device on the KNX. The required information is queried by the Gateway via the communication object <i>Request Diagnostics</i>.</p> <p>The Gateway sends the required information on the KNX via the communication object <i>Diagnostics</i> (no.131).</p> <p>Bit 0 to 5 contains the number of the DALI device (short address) or the number of the lighting group (group address).</p> <p>Bit 6 indicates if the figure in bit 0...5 represents a group number (value 1) or a number of an individual DALI device (value 0).</p> <p>Bit 7 has no further function and must have the value 0.</p> <p>If this bit has the value 1, no sending of the diagnostic byte (no. 131) is triggered.</p> <p>The Diagnostics of the 64 DALI devices is requested via the values 0 / 0 Hex (device 1) to 63/3F Hex (device 64). The Diagnostics of a lighting group is requested via the values 64/40 Hex (lighting group 1) to 79 / 49 Hex (lighting group 16).</p> <p><b>For further information see: <a href="#">Request Diagnostics code table</a>, page 174</b></p>				
133	<b>In operation</b>	<b>General</b>	<b>1 bit (EIS 1) DPT 1.002</b>	<b>C, T</b>
<p>This communication object is enabled, if in parameter window <a href="#">General</a>, page 29, the parameter <i>Send object "In Operation"</i> is parameterised with the option <i>send value 0/1 cyclically</i>:</p> <p>In order to regularly monitor the presence of the Gateway on the KNX, a monitoring telegram can be sent cyclically on the KNX.</p>				



3.3.6 Communication objects function *Slave*

If the additional function *Slave* is selected in the parameter window [Gx Group](#), page 55 the following communication objects appear.

Number	Object Function	Name	Length	C	R	W	T	U
1	Activate function <i>Slave</i>	Group 1	1 bit	C	-	W	-	-
2	Relative dimming	Group 1	4 bit	C	-	W	-	-
3	Brightness value	Group 1	1 Byte	C	-	W	-	-
4	Brightness value of <i>Slave</i>	Group 1	1 Byte	C	-	W	-	-

Number	Object Function	Name	Length	C	R	W	T	U
1	Activate <i>Slave</i> /Status	Group 1	1 bit	C	R	W	T	-

No.	Function	Object name	Data type	Flags
1, 7... 85, 91 <sup>1)</sup>	<b>Activate function <i>Slave</i></b>	<b>Group x</b>	<b>1 bit (EIS1) DPT 1.003</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">Gx Group</a>, page 55, the additional function <i>Slave</i> is enabled.</p> <p>This communication object is used for activation/deactivation of the function <i>Slave</i>. With deactivation the lighting group behaves like a "normal" lighting group of the group-oriented Gateway without function <i>Slave</i>. The function <i>Slave</i> can be reactivated, if a telegram with the value 1 is received on the Gateway via this object.</p> <p>By setting the T flag, the communication object is actively sent after KNX voltage recovery.</p> <p>Telegram value:           0 = <i>Slave</i> not active                               1 = activate <i>Slave</i></p> <p>As long as function <i>Slave</i> is activated, the lighting group is controlled using the brightness value received via communication object <i>Brightness value of slave</i>.</p> <p>In the parameter window <a href="#">- Gx: <i>Slave</i></a> page 75, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function <i>Slave</i>.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note</b></p> <p>With selected function <i>Slave</i>, the Gateway of the switch status can only display the switch status via the common communication objects <i>Switch/Status</i> (no. 0, 6..., 91) on the KNX. There is no separate communication object for the switch status.</p> </div>				
1, 7... 85, 91 <sup>1)</sup>	<b>Activate <i>Slave</i>/Status</b>	<b>Group x</b>	<b>1 bit (EIS1) DPT 1.003</b>	<b>C, W, R, T</b>
<p>This communication object is enabled, if in parameter window <a href="#">Gx Group</a>, page 55, the additional function <i>Slave</i> is enabled and simultaneously in parameter window <a href="#">- Gx <i>Slave</i></a>, page 75, the parameter <i>Status response of slave function</i> has been set with option <i>yes</i>: via object <i>Activate <i>Slave</i>/Status</i>.</p> <p>In this case, the status of the function <i>Slave</i> is sent on the KNX in addition to the functions described above.</p>				

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
<b>3, 9... 87, 93<sup>1)</sup></b>	<b>Brightness value or Brightness value/Status</b>	<b>Group x</b>	<b>1 byte (EIS 6) DPT 5.001</b>	<b>C, W, T C, W, R, T</b>
<p>This communication object is always enabled in order to enable setting of a brightness value without further parameterisation. With activated function <i>Slave</i>, the brightness values received via this communication object are normally ignored.</p> <p>Optionally, however, if a telegram is received on this communication object, function <i>Slave</i> can be deactivated. The respective parameterisation can be set in the parameter window <a href="#">- Gx Slave</a>, page 75.</p>				
<b>4, 10... 88, 94<sup>1)</sup></b>	<b>Brightness value of Slave</b>	<b>Group x</b>	<b>1 byte (EIS 6) DPT 5.001</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">Gx Group</a>, page 55, the additional function <i>Slave</i> is enabled.</p> <p>The Slave output receives the brightness value via this communication object, e.g. from a higher level Light Controller which is parameterised as the master.</p> <p>If the function <i>Slave</i> is not active or is latent (standby), after an OFF telegram with the value 0 to the communication object Switch or Switch/Status, the telegrams to the communication object <i>Brightness value of slave</i> have no effect.</p> <p>In the parameter window <a href="#">- Gx: Slave</a>, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function <i>Slave</i>.</p> <p>Brightness values which are above or below the predefined max. or min. dimming values (dimming thresholds) are not set. In this case the dimming limits are set.</p> <p>Telegram value:           0   = OFF, the output is switched-off, the function Slave remains active.</p> <p>                                  ...                                   255 = 100 %</p>				

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

**3.3.7 Communication objects  
function *Sequence***

If the additional function *Sequence* is selected in the parameter window [Gx Group](#), page 55, the following communication objects appear.

Number	Object Function	Name	Length	C	R	W	T	U
1	Activate Sequence/Status	Group 1	1 bit	C	R	W	T	-

No.	Function	Object name	Data type	Flags
1, 7 ... 85, 91 <sup>1)</sup>	<b>Activate function <i>Sequence</i></b>	<b>Group x</b>	<b>1 bit (EIS1) DPT 1.003</b>	<b>C, W</b>

This communication object is enabled if in parameter window [Gx Group](#), page 55, the additional function *Sequence* is enabled.

This communication object is used for activation/deactivation of the function *Sequence*. With deactivation the lighting group behaves like a “normal” lighting group of the group-oriented Gateway without function *Sequence*. The function *Sequence* can be reactivated if a telegram with the value 1 is received on the Gateway via this object.

By setting the T flag, the communication object is actively sent after KNX voltage recovery.

Telegram value:                   0 = *Sequence* is deactivated, current brightness is retained  
  1 = *Sequence* is activated and started simultaneously

As long as function *Sequence* is activated, the *Sequence operation* is initiated by a telegram with the value 1 to one of both communication objects *Switch* or *Switch/Status*.

In the parameter window - [Gx Sequence](#) page 80, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function *Sequence*.

**For further information see: parameter window [Sequence](#), page 93, or [Sequence](#), page 158.**

No.	Function	Object name	Data type	Flags
1, 7 ... 85, 91 <sup>1)</sup>	<b>Activate Sequence/Status</b>	<b>Group x</b>	<b>1 bit (EIS1) DPT 1.003</b>	<b>C, W, R, T</b>

This communication object is enabled if in parameter window [Gx Group](#), page 55, the additional function *Sequence* is enabled and simultaneously in parameter window - [Gx Sequence](#), page 80, the parameter *Status response of sequence mode of the lighting group* is programmed with the option *yes: via object "Activate Sequence/ Status"*.

In this case the status of the function *Sequence* is sent via this communication object on the KNX in addition to the functions described above.

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

3.3.8 Communication objects  
function *Staircase lighting*

If the additional function *Staircase lighting* is selected in the parameter window [Gx Group](#), page 55, the following communication objects appear.

Number	Object Function	Name	Length	C	R	W	T	U
1	Act. Staircase lighting/Status	Group 1	1 bit	C	R	W	T	-

No.	Function	Object name	Data type	Flags
1, 7 ... 85, 91 <sup>1)</sup>	<b>Activate Staircase lighting</b>	<b>Group x</b>	<b>1 bit (EIS1)</b> <b>DPT 1.003</b>	<b>C, W</b>
<p>This communication object is enabled if in parameter window <a href="#">Gx Group</a>, page 55, the additional function <i>Staircase lighting</i> is enabled.</p> <p>This communication object is used for activation/deactivation of the function <i>Staircase lighting</i>. With deactivation the lighting group behaves like a “normal” lighting group of the group-oriented Gateway without function <i>Staircase lighting</i>. The function <i>Staircase lighting</i> can be reactivated if a telegram with the value 1 is received on the Gateway via this object.</p> <p>By setting the T flag, the communication object is actively sent after KNX voltage recovery.</p> <p>Telegram value:                   0 = <i>Staircase lighting</i> is deactivated   1 = <i>Staircase lighting</i> is activated and started</p> <p>As long as function <i>Staircase lighting</i> is activated, the Staircase lighting is initiated by a telegram with the value 1 to one of both communication objects <i>Switch</i> or <i>Switch/Status</i>.</p> <p>In the parameter window - <a href="#">Gx Staircase lighting</a> page 84, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function <i>Staircase lighting</i>.</p> <p><b>For further information see: parameter window <a href="#">Staircase lighting</a>, page 97, or <a href="#">Staircase lighting</a>, page 150</b></p>				
1, 7... 85, 91 <sup>1)</sup>	<b>Act. Staircase lighting/Status</b>	<b>Group x</b>	<b>1 bit (EIS1)</b> <b>DPT 1.003</b>	<b>C, W, R,</b> <b>T</b>
<p>This communication object is enabled if in parameter window <a href="#">Gx Group</a>, page 55, the additional function <i>Staircase lighting</i> is enabled and simultaneously in parameter window - <a href="#">Gx Staircase lighting</a>, page 84, the parameter <i>Status response of staircase mode of lighting group</i> has been set with option <i>yes</i>: via object <i>Act. Staircase lighting/Status</i>.</p> <p>In this case, the status of the function <i>Staircase lighting</i> is sent via this communication object on the KNX in addition to the functions described above.</p>				

<sup>1)</sup> The numbers of the communication objects apply for lighting groups 1...16.

## 4 Planning and application

In this section you will find some tips and application examples for practical use of the group-oriented DALI-Gateway KNX.

### 4.1 Automatic DALI addressing

In order to better appreciate the functionality of the Gateway, the addressing of the Gateway is described in this chapter.

For the Gateway it is necessary to perform DALI commissioning (configuration).

It automatically detects the connected DALI equipment and assigns an address in ascending order, if no DALI address is available.

Note
The Gateway does not automatically allocated DALI addressing for DALI equipment if in parameter window <a href="#">General</a> on page 29, the parameter <i>Set DALI addressing automatically</i> has been set to <i>no</i> .

As soon as the gateway operating voltage has been applied to the Gateway, it automatically and independently checks the DALI devices connected to the DALI output. This process is also started after a download or KNX voltage recovery or gateway operating voltage recovery, and may take about 60 seconds depending on the number of connected DALI devices. If equipment with DALI interfaces is detected which has not been assigned with a DALI address (default delivery state, DALI short address 255), the gateway will automatically assign a DALI address. The detected DALI devices will be assigned with the first free DALI address (0 to 63) in the DALI. If no DALI services are detected, it is assigned with the first DALI address. The second device is assigned with DALI address 1. The sequence in which the DALI master, e.g. the Gateway, finds a device with DALI interface cannot be influenced. If the connected DALI device already has a DALI address (e.g. exchange device from another system) it will not be changed.

If the new DALI device has a DALI address, which is used in the Gateway, one of both DALI devices with the same addresses will be assigned with a new and unused DALI address. Here, the old DALI device, which is already connected to the Gateway, may receive a new address.

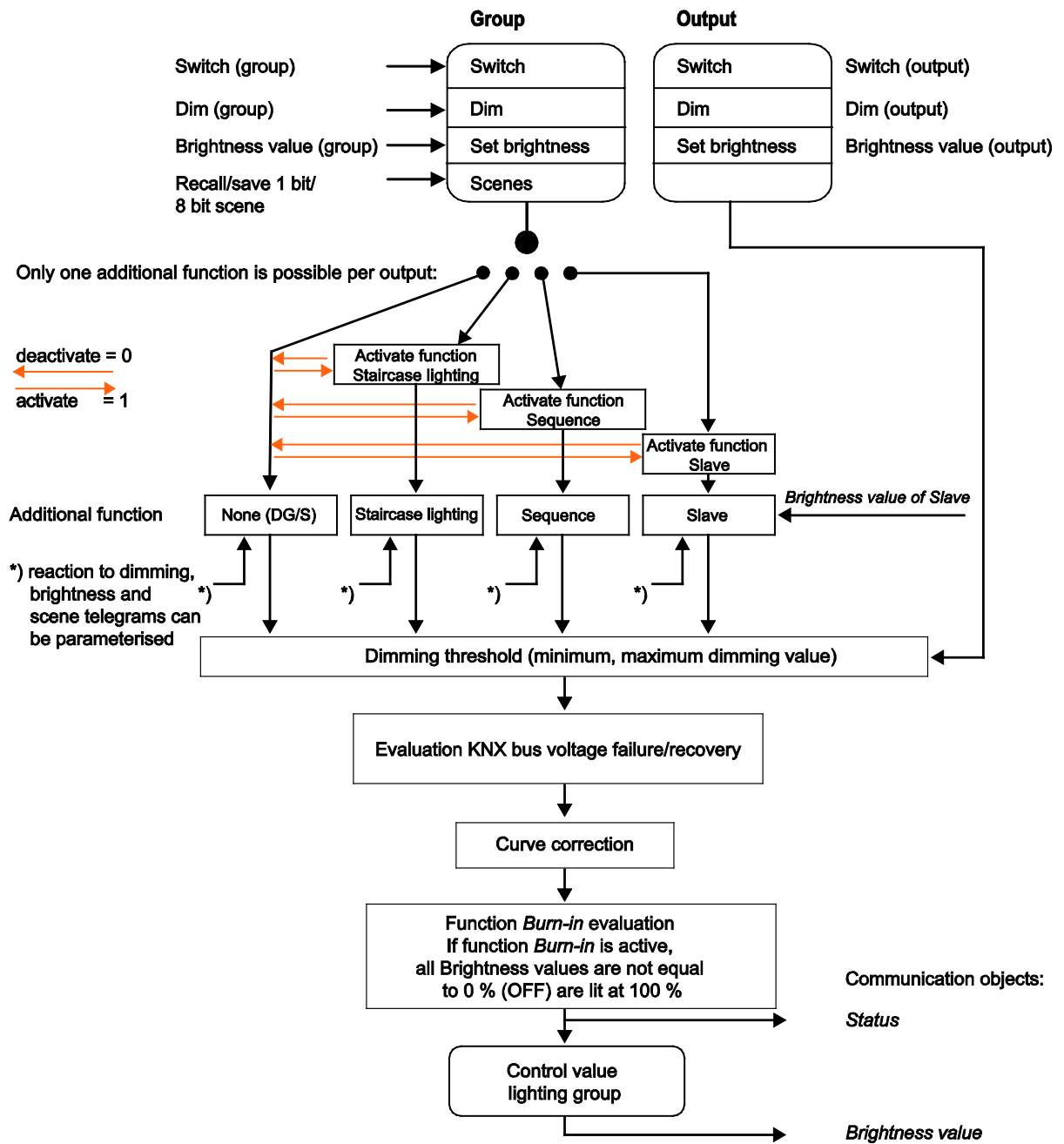
With the Gateway, you can now control the connected DALI devices with the communication objects *Output A* via the KNX without additional DALI group assignment.

The connected DALI devices must be assigned to a lighting group to control individual lighting groups. The assignment is implemented with the external ETS independent Software Tool.

**For further information see: Description [Software Tool](#).**

4.2 Function chart

The function chart indicates the sequence in which the functions of the Gateway are processed. If several communication objects in the function block point to the same function, they have equal priority and are processed in the sequence in which they are received.



### 4.3 Monitoring of lamps and ballasts

With the Gateway the malfunction state of the lighting in the building can be broadcast on the KNX. A control panel or control centre can evaluate or display this information. Required repair measures or corresponding maintenance cycles can be initiated. It is thus possible to integrate the lighting in a higher-order Facility Management system.

The prerequisite is that the lighting equipment is connected to the Gateway and features a DALI interface compliant to EN 62386 or EN 60929. Different possibilities are available for the fault messages:

- A fault on the DALI output is broadcast on the KNX for a lamp and ballast fault. Two separate communication objects (*Fault lamp* no. 101 or *Fault ballast* no. 102) are available for this purpose. This information indicates that at least one DALI device on the output has a fault.
- One communication object (no. 5, 11 etc.) is available for an error message per lighting group. This communication object can contain the information about a lamp fault (*Fault lamp*), ballast fault (*Fault ballast*) or a logical OR combination of lamp and ballast fault (*Fault ballast or lamp*).
- The fault status of the individual DALI device read via
  - a coded communication object (*Fault Group/device code* no. 104). This 1 byte communication object contains the devices or lighting group number (this can be parameterised) and the fault information (Fault ballast or lamp). The function can be taken from the descriptions of the [Communication objects](#), on page 100.
  - The communication object *Diagnostics* (no. 131) is read and provided on the KNX. The function can be taken from the descriptions of the [Communication objects](#), on page 100.
- The number of the DALI device with a fault or a lighting group with a fault (can be parameterised) can be sent as a figure value with the communication object *Send number of the failed group or failed device* (no. 106) on the KNX.  
If several faults exist, the number of the next/previous device or the next/previous lighting group can be displayed via the communication object *Switch up next fault alarm* (no.107). The numbers of devices or lighting groups with a fault are sent via the communication object *Number of faults* (no. 105) on the KNX.

In order to guarantee correct operation the Gateway has to know how many ballasts are to be monitored. This is implemented by activating the communication object *Detect ballasts* (no. 110) just once.

With this function, the Gateway establishes automatically how many ballasts are connected. The Gateway saves this number as a reference value.

If this system has to be extended or reduced, the function *Detect ballasts option* should be reactivated. This process is only necessary if the number of ballasts per output has changed and not when replacing a ballast. Manual detection of the ballasts is also possible by pressing the test button on the Gateway for longer than five seconds. In the Gateway Software Tool it is also possible to trigger detection of the ballasts.

**Note**

In order to detect a lamp malfunction it must be sent by the DALI device on the DALI control line.

This is generally supported by the DALI ballasts. DALI dimmers and DALI switch actuators often do not have this characteristic.

The function can be found in the technical data of the DALI device or by consulting the manufacturer of the lamps.



#### 4.4 Exchange of DALI devices

If a DALI device fails in an existing DALI installation where DALI addresses are assigned without any gaps, a DALI device as provided in the default state from the factory (without a DALI address assignment) can be used for replacement and will avoid the requirement for re-commissioning. The new DALI device automatically receives the first free DALI address, group assignment and scene parameter of the faulty ballast from the Gateway, and can assume the functions of the failed DALI device with the same technical characteristics.

**Note**

The parameter *Set DALI addressing automatically* in parameter window [General](#), page 29, must be enabled.

If multiple DALI devices on an output fail, or there are gaps in the DALI address assignment, it is not possible to guarantee a unique assignment of the replacement device by the Gateway.

The Gateway assigns the new DALI device with the first free DALI address. If the new DALI device already has a DALI address which is used in the Gateway, one of both devices with the same addresses will be assigned with a new and unused DALI address. In this way, the fault-free DALI device, which is already on the Gateway, may receive a new address.

With the [Software Tool](#), a correction or exchange of the DALI address, as with the assignment to a lighting group, can be implemented in a simple manner by “Drag and Drop” even without using the ETS.

#### 4.5 Effect of ageing on lamps

Every fluorescent lamp ages in service. The lighting power of the fluorescent lamps degrades, i.e. a lower brightness is produced at the same control value. This can even mean that the setpoint originally required can no longer be achieved with maximum control. For this reason the lighting is to be dimensioned so that the required setpoint brightness can be achieved until the luminaries are routinely exchanged.

In principle the ageing luminaries have no effect on the control circuit. If a lower brightness level is achieved due to ageing of the luminaries with the same control, the Light Controller, e.g. via a Gateway lighting group, will continue to increase the level of artificial lighting until the setpoint brightness is achieved.

However, it must be considered that the characteristic of the luminaries change with ageing. In this way it is possible that light control discrepancies result.

Note
<p>In order to receive the most stable lighting equipment during lighting control, the burn-in time must be observed. During the burn-in time which usually lasts between 50 and 100 hours, the lighting equipment may not be dimmed. The lighting equipment must be operated at 100 % brightness.</p> <p>The burn-in time of a luminary can be obtained from the manufacturer.</p>

4.6 Burn-in of lamps

In the case of lamps filled with gas, a burn-in time is recommended. This burn-in process is only required once at the start of commissioning.

Only after this burn-in time do fluorescent lamps have a stable operating value which ensures the best possible dimming behaviour and an optimum service life. An optimum pressure level is created in the fluorescent tube by burning-in.

For installations with dimmable ballasts, many lamp manufacturers make a recommendation that a burn-in time of 20 to 100 hours must be observed. The recommended values are about 20 hours for T8 lamps and 100 hours for T5 lamps. The exact values are available from the luminary's manufacturers. During the burn-in time, the lamps are only switched on at maximum capacity. Dimming is not possible.

The information about burn-in times can often not be found in the catalogue of the lamp manufacturer but in the descriptions of the electronic ballasts, as the burn-in time only becomes relevant with dimmable systems. Stable operating values and reproducible brightness values are a prerequisite in these installations. Moreover, only poor evaporation of the solid or fluid additives is possible for dimmed lights due to the reduced capacity so that in certain circumstances the maximum light yield is only achieved at a later date or not at all. This can lead to the complete replacement of the lamps.

According to statements of lighting planners, if fluorescent lamps (particularly T5 lamps) are not burned in, they can even be damaged causing them to fail prematurely.

With the group-oriented Gateway it is possible to activate the burn-in time via the communication object *Burn-In Lamps* and to place individual lighting groups or all lighting groups on the Gateway in a burn-in state. The lighting groups which are considered during function *Burn-in* can be set via parameters.

During this time the lamps can only be switched on with 100 % or switched off. Dimming is not possible.

Nummer	Funktion	Name	Länge	K	L	S	Ü	A
111	Lampen Einbrennen	Ausgang A	1 bit	K	L	S	-	-

The function *Burn-in* can only be activated commonly for all lighting groups. In parameter window [Gx Group](#), on page 55, with the parameter *Enable with burn-in function* (object "*Burn-In lamps/Status*") you can individually determine for each lighting group whether the lighting group should be considered during burn-in.

The Gateway features a counter (1...255 h) for each individual DALI device for the function *Burn-in*. In this way, the burn-in time counting is undertaken for each individual DALI device in the group, even for overlapping groups where the DALI device is contained in several lighting groups. The resolution of the timing is set internally to five minutes even though the time is counted in hours. The Gateway only indicates the burn-in state but not the remaining or elapsed burn-in time.

If the lamp is switched off during the activated burn-in time, the burn-in counter stops the counting process. Should the lamp be switch on again, the counting process will continue and the remaining time will be rounded off to the nearest five minute step.

At gateway operating voltage failure or KNX voltage failure on the Gateway, the elapsed burn-in time is stored and continues to be used after voltage recovery.

The same applies after a download.

#### 4.7 Overlapping lighting groups

In addition to the known and conventional KNX group assignment, which is undertaken in the ETS, lighting groups can also be found with DALI technology. These lighting groups are compiled in the case of group-oriented Gateway using the [Software Tool](#). Using the Gateway, the KNX only controls lamps which belong to at least one lighting group.

It is possible to integrate a lamp (DALI device) in several lighting groups. In this case we refer to several overlapping lighting groups. Here, a DALI device is a member of at least two lighting groups. In the extreme case it can be a member of all 16 groups.

Note
The telegram last entered is carried out with the control of overlapping lighting groups. All DALI devices of the lighting group concerned are controlled even when these DALI devices are also assigned to further lighting groups.

#### 4.7.1 Priorities with overlapping lighting groups

The response of the status feedback with overlapping groups can be parameterised in most cases, e.g. *Switch*, *Brightness value*, *Minimal brightness value* and *Maximum brightness value*. If this is not the case, e.g. for the additional function or for the response at DALI and KNX voltage failure or recovery, the following applies:

The device with the higher lighting group number has the higher priority. Its state or properties apply for the DALI device of the overlapping groups.

##### Note

If the option *none* is set for the parameter *Select additional function* in the parameter window [Gx Group](#), page 55, it has no effect on the priority sequence. In the same way the parameter setting *no reaction* has no effect in the priority sequence in the parameter windows of the additional functions.

##### Example 1

Lighting group 1 features the additional function *Staircase lighting*, lighting group 2 features the additional function *Slave*. All other lighting groups are parameterised with the additional function *none*. Groups 1 and 2 feature common lamps. There is an overlapping lighting group. As lighting group 2 has the higher group number, the lamps which are members of both groups assume the properties of group 2. The common lamps thus feature the property *Slave* as an additional function.

##### Example 2

Lighting groups 1 and 2 have the additional function *Slave*. Lighting group 1 is programmed so that with activated function *Slave*, a *Relative dimming* telegram switches function *Slave* to standby. With lighting group 2 the parameter *Relative dimming* is parameterized with *no reaction*. As the option *no reaction* is neutral in its behaviour, the lamps of the overlapping lighting groups react to a dimming telegram and go to standby mode.

Lighting group 1 (G1) incorporates the lamps 1 (L1) and 2 (L2).  
 Lighting group 2 (G2) incorporates the lamps 2 (L2) and 3 (L3).

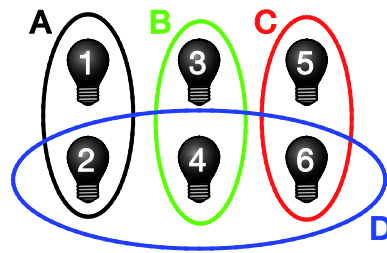
Property	G1	G2	L1	L2	L3
Function <i>Slave</i>	x		X		
Function <i>Staircase lighting</i>		x		X	X
KNX voltage failure	100 %	1 %	100 %	1 %	1 %
KNX voltage recovery	OFF	100 %	OFF	100 %	100 %
Slave	X	X	X	X	X
Reaction to dimming telegram	none	Goes to standby	None	Goes to standby	Goes to standby
Reaction to Brightness value	Goes to standby	none	Goes to standby	Goes to standby	none

4.7.2 Status response with overlapping lighting groups

Calculation of the status brightness values should be explained based on an example with four lighting groups. The status response of the switching state is comparable with the difference that there only the ON and OFF states.

**Example**

All switch states are OFF



- Lighting group A:  
Device 1 and 2
- Lighting group B:  
Device 3 and 4
- Lighting group C:  
Device 5 and 6
- Lighting group D:  
Device 2, 4 and 6

It is parameterised that the brightness status is the average brightness of the individual lamps in the group. The setting is undertaken in the parameter window [- Gx Status](#) on page 65 and can be parameterised in every lighting group.

Initially the entire dimming range is allowed. The dimming thresholds feature their maximum and minimum brightness value.

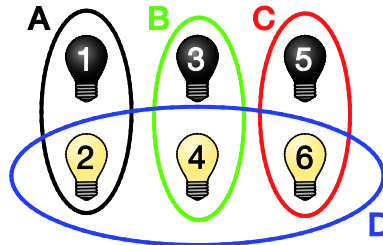
*For further information see: [Dimming thresholds with overlapping lighting groups](#) page 146*

The switch status has been parameterised so that an ON status is displayed if at least one lamp of the lighting group is switched on. Only if all lamps are OFF is the status of the lamp group also OFF. Parameterisation is undertaken individually for every lamp group in the parameter window [- Gx Status](#), page 65.



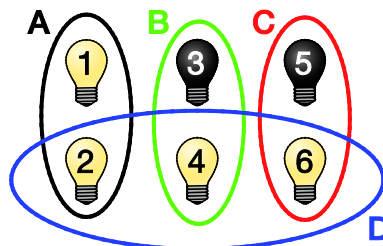
**Example**

**Group D is switched on with 100 %:**



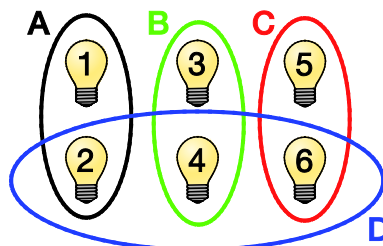
Status Brightness value A: 50 %<sup>\*)</sup>  
 Status Brightness value B: 50 %<sup>\*)</sup>  
 Status Brightness value C: 50 %<sup>\*)</sup>  
 Status Brightness value D: 100 %  
<sup>\*)</sup>  $(0 \% + 100 \%) / 2 = 50 \%$   
 Switching status of all lighting groups is ON

**Group A is switched on with 100 %:**



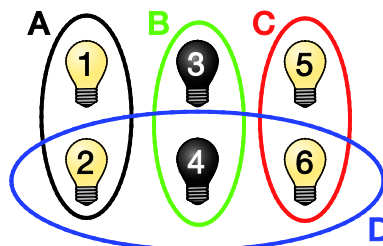
Status Brightness value A: 100 %  
 Status Brightness value B: 50 %  
 Status Brightness value C: 50 %  
 Status Brightness value D: 100 %  
 Switching status of all lighting groups is ON

**Group C and D are switched on with 100 %:**



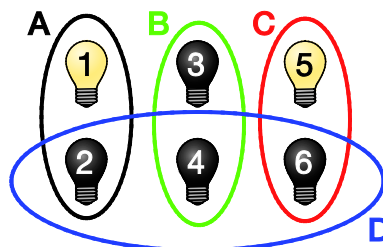
Status Brightness value A: 100 %  
 Status Brightness value B: 100 %  
 Status Brightness value C: 100 %  
 Status Brightness value D: 100 %  
 Switching status of all lighting groups is ON

**Group B is switched off:**



Status Brightness value A: 100 %  
 Status Brightness value B: 0 % (OFF)  
 Status Brightness value C: 100 %  
 Status Brightness value D: 67 %  
 $(100 \% + 100 \% + 0 \%) / 3 = 67 \%$   
 Lighting groups switch status A, C and D are ON; B is OFF

**Group D is switched off:**



Status Brightness value A: 50 %<sup>\*)</sup>  
 Status Brightness value B: 0 % (OFF)  
 Status Brightness value C: 50 %<sup>\*)</sup>  
 Status Brightness value D: 0 % (OFF)  
<sup>\*)</sup>  $(100 \% + 0 \%) / 2 = 50 \%$   
 Lighting groups switch status A and C are ON; B and D are OFF

4.7.3 Dimming thresholds with overlapping lighting groups

In the following, the response of the minimum and maximum dimming values (dimming thresholds) with overlapping lighting groups are described.

A DALI device can only assume one minimum and one maximum dimming value, which are stored in the DALI device. If the DALI device is a member of several lighting groups, which have different dimming thresholds, in the Gateway you can parameterise which dimming limits apply for these DALI devices. Parameterisation is undertaken in the parameter window [A: Group](#), on page 51 and applies for all lighting groups.

The parameter options:

- Lowest brightness of all lamps in the group,
- Highest brightness of all lamps in the group and
- Average brightness of all lamps in the group

are available.

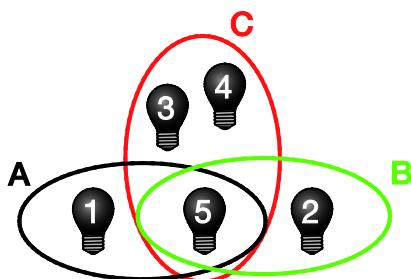
The dimming thresholds (minimum and maximum dimming value) relate to the individual DALI devices of the lighting group and only have an effect on the status response of the lighting group via their brightness value. A direct effect (limitation) on the status feedback of the lighting groups is not present. This means that with lighting groups containing DALI devices of other lighting groups, status values for the lighting groups could result that are less than the minimum dimming value or greater than the maximum dimming value of the lighting group. This becomes evident in the following example.

**Note**

If no overlapping lighting groups are available, the status values of a lighting group are always between the minimum and maximum dimming value.

**Example**

Lighting group A: device 1 and 5, dimming thresholds <sup>*)</sup>	1...100 %
Lighting group B devices 2 and 5, dimming threshold <sup>*)</sup>	20...80 %
Lighting group C: devices 3, 4 and 5, dimming threshold <sup>*)</sup>	30...70 %



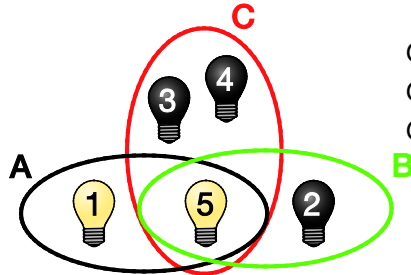
Status Brightness value A: 0 %<sup>\*)</sup>  
 Status Brightness value B: 0 %<sup>\*)</sup>  
 Status Brightness value C: 0 %<sup>\*)</sup>

<sup>\*)</sup> Dimming threshold:  
 min. dimming value...max. dimming value

For the overlapping group (here no. 5) the following are parameterised:  
 Maximum Brightness value = *highest brightness value in the lighting group*  
 Minimal Brightness value = *lowest brightness value in the lighting group*  
 Status Brightness value = *average brightness value in the lighting group*

**Example**

**Group A is switched on with 100 %:**



Group A dimming thresholds: 1...100 %  
 Group B dimming thresholds: 20...80 %  
 Group C dimming thresholds: 30...70 %

	1	2	3	4	5
Min. Brightnessvalue	1 %	20 %	30 %	30 %	1 % <sup>1)</sup>
Max. Brightness value	100 %	80 %	70 %	70 %	100 % <sup>**)</sup>
Brightness value	100 %	OFF	OFF	OFF	100 %

<sup>1)</sup> Minimum of (1 %, 20 % and 70 %) = 1 %

<sup>\*\*)</sup> Maximum of (100 %, 80 % and 70 %) = 100 %

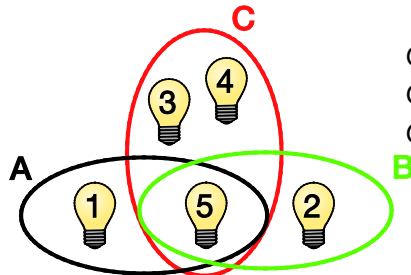
	A	B	C	Output A
Status Brightness value	100 %	50 % <sup>1)</sup>	33 % <sup>2)</sup>	40 % <sup>3)</sup>

<sup>1)</sup> (100 % + 0 %) / 2 = 50 %,

<sup>2)</sup> (100 % + 0 % + 0 %) / 3 = 33 %

<sup>3)</sup> (2x100 % + 3x0 %) / 5 = 40 %

**Group A, B and C are switched on with 100 %:**



Group A dimming thresholds: 1...100 %  
 Group B dimming thresholds: 20...80 %  
 Group C dimming thresholds: 30...70 %

	1	2	3	4	5
Min. Brightnessvalue	1 %	20 %	30 %	30 %	1 % <sup>1)</sup>
Max. Brightness value	100 %	80 %	70 %	70 %	100 % <sup>**)</sup>
Brightness value	100 %	80 %	70 %	70 %	100 %

<sup>1)</sup> Minimum of (1 %, 20 % and 70 %) = 1 %

<sup>\*\*)</sup> Maximum of (100 %, 80 % and 70 %) = 100 %

	A	B	C	Output A
Status Brightness value	100 % <sup>1)</sup>	90 % <sup>2)</sup>	80 % <sup>3)</sup>	84 % <sup>4)</sup>

<sup>1)</sup> (100 % + 100 %) / 2 = 100 %

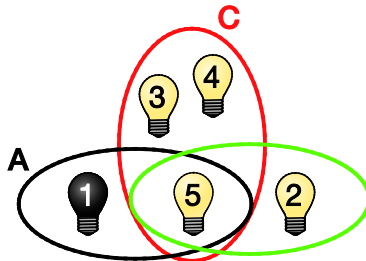
<sup>2)</sup> (80 % + 100 %) / 2 = 90 %

<sup>3)</sup> (70 % + 70 % + 100 %) / 3 = 80 %

<sup>4)</sup> (2x100 % + 2x70 % + 80 %) / 5 = 84 %

**Example**

**Group B and C are switched on with 10 %, group A is OFF:**



Group A dimming thresholds: 1...100 %

Group B dimming thresholds: 20...80 %

Group C dimming thresholds: 30...70 %

	1	2	3	4	5
Min. Brightnessvalue	1 %	20 %	30 %	30 %	1 % <sup>1)</sup>
Max. Brightness value	100 %	80 %	70 %	70 %	100 % <sup>**)</sup>
Brightness value	OFF	20 %	30 %	30 %	10 %

<sup>1)</sup> Minimum of (1 %, 20 % and 70 %) = 1 %

<sup>\*\*)</sup> Maximum of (100 %, 80 % and 70 %) = 100 %

	A	B	C	Output A
Status Brightness value	5 % <sup>1)</sup>	15 % <sup>2)</sup>	23 % <sup>3)</sup>	18 % <sup>4)</sup>

<sup>1)</sup> (0 % + 10 %) / 2 = 5 %

<sup>2)</sup> (20 % + 10 %) / 2 = 15 %

<sup>3)</sup> (2x30 % + 10 %) / 3 = 23 %

<sup>4)</sup> (0 % + 20 % + 2x30 % + 10 %) / 5 = 18 %

**4.8 Common communication object for control telegram and status**

The Gateway allows the option to simultaneously feedback the status (*Switch/Status, Brightness value/Status*) via the control object (*Switch, Brightness value*).

Here it is important to observe that only one device feeds back the status in a KNX group with several control objects.

The device should be programmed as the broadcaster. Otherwise it is possible that there is continuous switching over and back of the control and the status.

**Example**

The lamps to be switched are located in the three lighting groups (group 1, 2 and 3), which are commonly controlled via a KNX group. The status of the lighting group is to be sent via the KNX. The following assignments result:

The state of group 1 is used as the status for the entire lighting group.

<b>Communication object no.</b>	<b>Name</b>	<b>Group assignment</b>
1	Switch/Status	Group 1 1/1/4 <sup>*)</sup> , 1/1/1
6	Switch	Group 2 1/1/1
12	Switch	Group 3 1/1/1

<sup>\*)</sup> Set send

**KNX groups**

1/1/1	Switch lights
1/1/4	Status lights

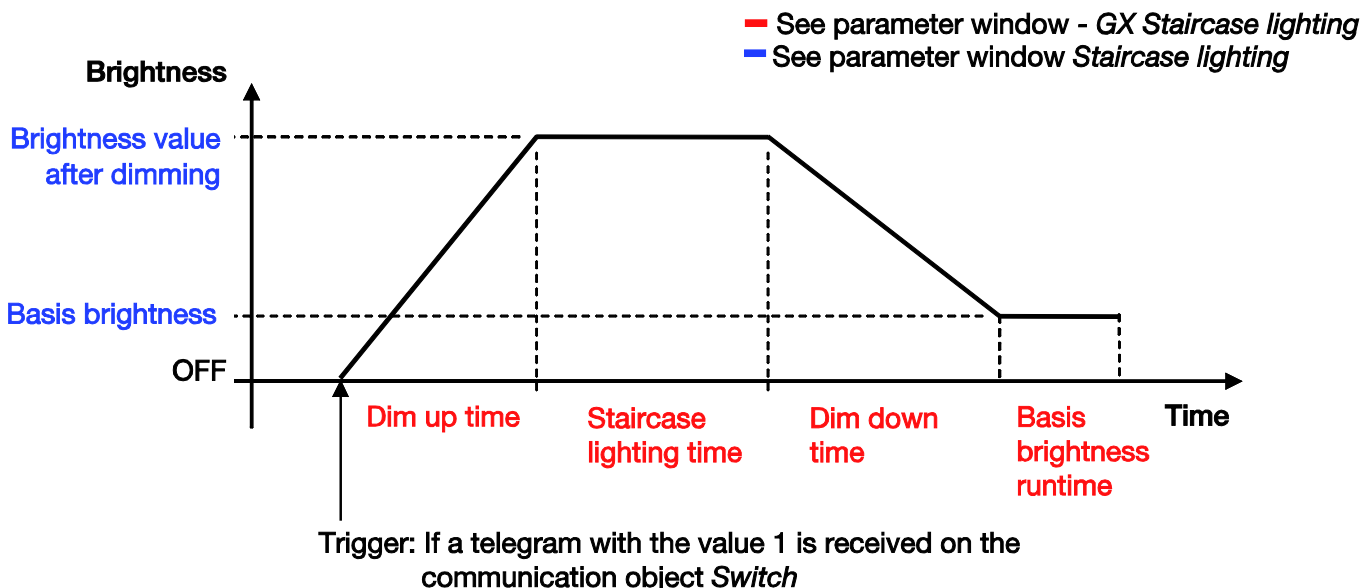
4.9 Staircase lighting

The Gateway features a function *Staircase lighting*, which can be triggered and stopped via individual switch telegrams of the individual lighting groups. It must be considered that the function *Staircase lighting* consists of two scenes. The Gateway automatically selects the internal scenes 13 and 14 if the function *Staircase lighting* is selected.

With function *Staircase lighting* the other additional functions, e.g. *Slave* and *Sequence*, cannot be activated. If the function *Staircase lighting* e.g. is deactivated via the communication object *Activate Staircase lighting* (telegram with the value 0), the lighting group behaves like a “normal” group, which can be switched on and off via the communication object *Switch*. The behaviour of the function *Staircase lighting* is explained in the following.

With active function *Staircase lighting* and receipt of a telegram with the value 1 on the communication object *Switch*, the staircase sequence for the lighting group is started. One Staircase lighting sequence can be set per Gateway. The parameterisation is undertaken in the parameter window [Staircase lighting](#), page 97. This is enabled in parameter window [General](#), page 29, by setting the parameterisation for parameter *Define Staircase lighting time curve* to *yes*. The brightness values during the Staircase lighting sequence are set in the parameter window - [Gx Staircase lighting](#), page 84. This parameter window is enabled if the additional function *Staircase lighting* is selected for the lighting group.

The Staircase lighting sequence is graphically represented in the following illustration:



During the Staircase lighting sequence the maximum and minimum dimming values (dimming thresholds) have an effect.

**Voltage recovery behaviour:**

The behaviour after KNX voltage recovery as well as after gateway operating voltage recovery is parameterised in the parameter window [- Gx Staircase lighting](#), page 84. Is the option *active*, or if before voltage recovery the function *Staircase lighting* was active and *last status* is parameterised, the basis brightness is set.

**Response to switch telegram during the Staircase lighting sequence:**

If the dimming time has not yet been achieved and the Gateway receives an OFF telegram for the lighting group, dimming is started immediately. If the function *Staircase lighting* has already reached the dimming time or is in the process of dimming, when an OFF telegram is received, the basis brightness is immediately activated which can also assume the OFF state.

In the following table with the parameterised function *Staircase lighting*, the response to received telegrams is shown.

Operating situation or Communication objects		Function <i>Staircase lighting</i>				
		Inactive	Active			
			Standby	Dimming up phase	Holding phase	Dimming phase Basis brightness phase
<b>Download (start)</b>		Such as KNX voltage failure				
<b>Download (end)</b>		Such as KNX voltage recovery				
KNX	<b>Voltage failure</b>	Programmable: - Brightness value - <i>Gx Fault</i>	Programmable brightness value - <i>Gx: Fault</i> is set and Staircase lighting sequence is continued from this value.			
	<b>Voltage recovery</b>	Programmable: - Operation: - <i>Gx Staircase lighting</i> - Brightness value: - <i>Gx Fault</i>				
DALI or gateway operation	<b>Voltage failure</b>	Programmable: - Brightness value: - <i>Gx Fault</i>				
	<b>Voltage recovery</b>	Programmable: - Operation: - <i>Gx Slave</i> - Brightness value: - <i>Gx Fault</i>				
Switch	<b>ON</b>	Brightness value when turned ON	→ Active and starts Staircase lighting	no reaction	Holding phase, new start	Staircase lighting is restarted
	<b>OFF</b>	OFF	OFF	Goes to dimming down phase		no reaction
<b>Relative dimming</b>		Dimming	Programmable: - no reaction - goes to standby and brightness value is dimmed down			
<b>Set brightness value</b>		Brightness value	Programmable: - no reaction - goes to standby and brightness value is set			
<b>Activate staircase lighting</b>	<b>0</b>	no reaction	→ goes to inactive	→ goes to inactive, brightness value is retained		
	<b>1</b>	→ Activated, and starts Staircase lighting	→ Activated, and starts Staircase lighting	Restarts Staircase lighting		
<b>Recall scene</b>		Scene is carried out	Scene is carried out	Programmable: - no reaction - goes to standby and scene is carried out		



4.10 Scene

The Gateway facilitates the integration of the 16 lighting groups in 14 scenes.

The scene parameterised once in the ETS can be used in the following functions:

- Normal scene recall via the communication objects *8 bit scene* (1 byte) or *Recall scene* (1 bit)
- With function *Sequence*, the scenes are used as sequence steps and strung together, whereby the scene transition times are replaced by the transition time of the sequence step x.
- In function *Staircase lighting*, scenes 13 and 14 are used directly for parameterisation of the Staircase lighting. If in function *Staircase lighting*, the scenes 13 or 14 are to be parameterised directly via parameter window *Scene 13* and *Scene 14*, the options for *Time for dimming up (soft start)*, *Staircase lighting time* and *Basis brightness hold time* undertaken in the parameter window *Staircase lighting* are lost.

The scene value of a scene can be parameterised in the ETS in parameter window [Scene x](#), page 91, or saved via the KNX. If storing of the scene is triggered via communication objects *Store scene* or the respective 8 bit scene telegram, the currently set brightness values of the lighting group are saved as the new scene value. Only the lighting groups, which are also members of the scene, are used during storage. The other lighting groups are not influenced.

The normal scene can be recalled via the 1 bit communication object *Recall scene* or via a 1 byte communication object *8 bit scene*.

With 1 bit control a received telegram on communication object *Recall scene* (Scene x/y) has the following function:

Telegram value 0 = recall scene x  
 Telegram value 1 = recall scene y

The following function table results with the 1 byte communication object *8 bit scene*:

KNX 1 byte telegram value		Meaning
Decimal	Hexadecimal	
00	00h	Recall Scene 1
01	01h	Recall Scene 2
...	...	...
13	0Ch	Recall Scene 14
128	80h	Store Scene 1
129	81h	Store Scene 2
...	...	...
140	8Ch	Store Scene 14

Other numeric values do not affect the function *Scene*.

For further information see: [Code table scene 8 bit scene](#), page 173

**Note**

The light scene settings remain stored in the Gateway even after a KNX voltage failure or gateway operating voltage failure. If a ballast has to be exchanged, the light scenes are immediately available without further commissioning.

The function *Scene* is not continued with a KNX voltage failure or gateway operating voltage failure. The brightness is set which is selected with voltage failure or recovery on the parameter window

- [Gx Fault](#), page 70.

If the ballast operating voltage fails on an individual DALI device, the brightness value will stop and will not be reintegrated into than *Scene* when the ballast operating voltage recovers. Only after the next scene recall will this DALI device actively participate in the function *Scene*.

A typical function *Scene* could for example, appear as follows and is described using the 8 bit scene telegram as an example:

The task is to implement the room lighting for a presentation with KNX-Bus devices. The following devices are used in the room:

- Switch actuator for the basis lighting,
- Shutter actuator for shading,
- Gateway for dimmable lighting
- 1-10 V light controller for brightness detection and constant lighting control

**Example**

An 8 bit scene (no. 8) comprises of some lamps, which are connected to two switch actuators and a light controller output. Furthermore, two shutters are integrated into the function *Scene* via a shutter actuator. The *Scene* can be retrieved via a single KNX telegram. The prerequisite for this is that all devices have programmed scene 8 accordingly in their devices. After a telegram has been received, the slave switches on its *Scene* number 8. The shutter actuator moves the shutters to the corresponding position; the lighting assumes the predefined brightness values and switching states defined by the *Scene*.

**Benefits**

The 8 bit scene offers some advantages compared to conventional scene programming via several KNX groups. On the one hand, only a single telegram, which is received by all participants in the scene and implemented accordingly, is sent on the KNX to retrieve a scene. On the other hand, the target positions of the shutter, the contact position of the switch actuator outputs and the brightness value of the light controller are each stored in the devices and do not need to be sent via the KNX each time they are to be retrieved.

**Note**

The scene numbering 1 to 64 is retrieved via the KNX with a telegram number 0 to 63. Only the first 14 scenes can be used with the Gateway.

*For further information see: [Code table scene 8 bit scene](#), page 173*

#### 4.11 Slave

If the function *Slave* is activated, the lighting group of the Gateway strictly adheres to the brightness value, which is predefined by the communication object *Brightness value of Slave*. Brightness values on the communication object *Brightness value* are ignored.

A telegram with the value 0 on the communication object function *Activate slave mode* deactivates function *Slave*. A telegram with the value 1 reactivates the function *Slave*. In the non-activated state the lighting group again responds to the brightness values, which are sent via the communications object *Brightness value*. Dimming, switch, scene or sequence telegrams are also undertaken.

An OFF telegram (receipt of a telegram with the value 0 on the communication object *Switch*, e.g. by a presence detector) has the effect that the function *Slave* switches over to standby. During standby mode the lighting group responds to dimming, scene and sequence telegrams. Furthermore, in standby mode the brightness values which the Gateway receives for the communication object *Brightness value* are carried out. Brightness values, which are received via the communication object *Brightness value of Slave* for the lighting group, are ignored by the Gateway. The standby operation is exited if the Gateway receives an ON telegram for the lighting group (receipt of a telegram with the value 1 on the communication object *Switch*, e.g. by a presence detector) or a telegram with the value 1 on the communication object function *Slave*. The lighting group is again in slave mode and only responds to the communication object *Brightness value of Slave*.

The function *Slave* is also put into standby if in parameter window [- Gx: Slave](#), page 75, the reaction to a switch, dimming, brightness value setting telegram, sequence or sequence recall is parameterised with the option *Mode deactivate*. The function *Slave* is in standby operation. The lighting group responds again to the communication object *Brightness value of Slave* if a telegram with the value 1 is received on the communication object *Switch* or via the communication object function *Activate Slave*.

The parameterisation *no reaction* has the effect that no dimming, switch and brightness setting telegram can be executed. In addition, a sequence or scene recall and storing of a scene has no effect.

The parameterised minimum and maximum dimming values also apply in function *Slave* in the parameter window [- Gx: Group](#), page 55.

The undershoot and overshoot of these values are set using the parameterised minimum or maximum brightness value. If the master sends the brightness value 0, the lighting is switched off.

The reaction of the function *Slave* after KNX voltage recovery can be parameterised: The mode (active/inactive) is in the parameter window [- Gx Slave](#), page 75, and the brightness value of the lighting group after KNX voltage recovery can be adjusted in the parameter window [- Gx Fault](#), page 70. If the mode *active* is parameterised, the parameterised brightness value is initially set after KNX voltage recovery. Subsequently, the next brightness value received via communication object *Brightness value of Slave* is then set.

In the following table, the response to received telegrams with the parameterised function *Slave* is shown.

Operating situation or Communication objects		Function Slave		
		Inactive (Activate function Slave = 0)	Standby (Activate slave mode = 1)	Running (active) (Activate function Slave = 1)
Download (start)		Such as KNX voltage failure		
Download (end)		Such as KNX voltage recovery		
KNX	Voltage failure	Programmable: - Brightness value: - Gx Fault		
	Voltage recovery	Programmable: - Operation: - Gx Slave - Brightness value: - Gx Fault		
DALI or gateway operation	Voltage failure	Programmable: - Brightness value: - Gx Fault		
	Voltage recovery	Programmable: - Operation: - Gx Slave - Brightness value: - Gx Fault		
Switch	ON	Brightness value when turned ON	→ Active, current <i>Brightness value of Slave</i> is set	Programmable: - no reaction - goes to standby and sets Switch on value
	OFF	OFF	OFF, remains in standby	OFF and goes to standby
Relative dimming		Dimming	Dimming, remains in standby	Programmable: - no reaction - goes to standby and dims
Brightness value		Brightness value	Brightness value, remains in standby	Programmable: - no reaction - goes to standby and sets brightness value
Brightness value of slave		no reaction	no reaction	Brightness value of Slave is set
Activate function Slave	0	no reaction	→ Inactive	→ Inactive
	1	Current Brightness value of Slave → Active	Current Brightness value of Slave → Active	Current Brightness value of Slave
Recall scene		Scene	Scene	Programmable: - no reaction - goes to standby and starts Scene

4.12 Sequence

The Gateway features a function *Sequence*. A sequence is a string of up to a maximum of 10 scenes. They are recalled successively with their parameterised brightness transitions. The function *Sequence* is controlled or stopped via the group switch telegrams. The set function *Sequence* can be repeated up to 255 times. If required, it is also possible to program continuous repetition. In this way it is possible to program running lights or lighting effects without additional logic or timer modules with the Gateway.

The different brightness values of the sequence are set in the scenes which are used. The setting of the scene occurs in the parameter window [Scene x](#), page 91 which has to be enabled via the parameter *Enable Scene* in the parameter window [General](#), page 29 and [Scenes](#), page 90.

The timing of the function *Sequence* is defined in the parameter window [Sequence](#), page 93. The Sequence in which the Scenes are recalled after one another is also determined there. In Sequence operation a Scene can be used several times. The parameter window [Sequence](#), page 93 is enabled if in parameter window [General](#), page 29, the parameter *Define sequence time curve (one curve per Gateway)* is set. Only one time dependent sequence can be set for each Gateway. Using the switch objects of the lighting group, the course of the sequence can be used for every lighting group as often as required.

In the following a coloured running light is used to describe, for example, how to parameterise the function *Sequence* for a facade or for the lighting in a showroom window.

**Task:**

First of all the three primary colours red, green and blue run consecutively before the mixed colours blue/red (magenta) and red/green (yellow) are set.

The colour sequences should run in the following order:



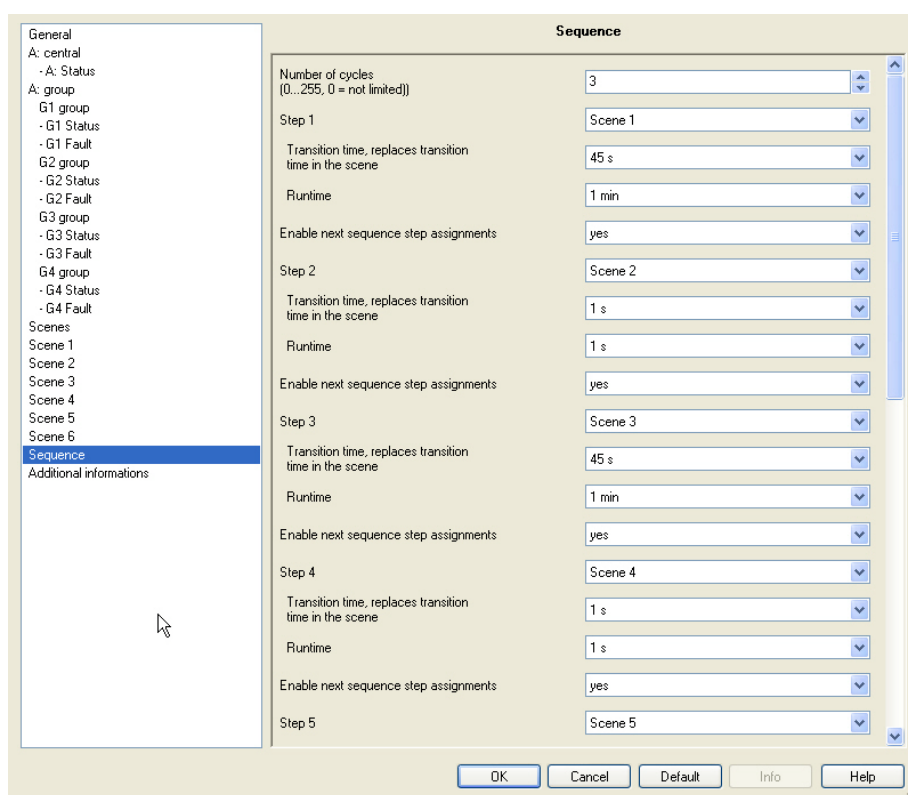
The coloured lamps are divided into 3 lighting groups

- Lighting group 5: red
- Lighting group 6: green
- Lighting group 7: blue

First of all the timing arrangement, the sequence steps with transition time and run time are set in the parameter window [Sequence](#), page 93:

Step	1	2	3	4	5	6	7	8	9
Scene no.	1 red	2 OFF	3 green	2 green OFF	4 blue	5 + red = Magenta	6 blue OFF	7 + green = yellow	2 OFF
Transition time	45 s	1 s	45 s	1 s	45 s	32 s	1 s	32 s	5,5 s
Runtime	1 min	1 s	1 min	1 s	1 min	30 s	1 s	30 s	5 s

The following parameterisation results for the first four steps:



The Brightness values in the sequence steps are set in the Scenes.  
The following Scene value results for the Sequence shown above:

Scene no.	1	2	3	4	5	6	7	8
<b>Group 1 Scene value (red)</b>	100 % (255)	0 % (OFF)	0 % (OFF) or unchanged	0 % (OFF) or unchanged	0 % (OFF) or unchanged	100 % (255)t	100 % (255)	100 % (255) or unchanged
<b>Group 2 Scene value (green)</b>	0 % (OFF)	0 % (OFF)	100 % (255)	0 % (OFF)	0 % (OFF) or unchanged	0 % (OFF) or unchanged	0 % (OFF) or unchanged	100 % (255)
<b>Group 3 Scene value (blue)</b>	0 % (OFF)	0 % (OFF)	0 % (OFF) or unchanged	50 % (128)	100 % (255)	100 % (255)	0 % (OFF)	0 % (OFF)
<b>Function</b>	RED	PAUSE OFF	GREEN	PAUSE BLUE	BLUE	MAGENTA	BLUE OFF	YELLOW

As an example, extracts of the parameter windows for Scene 1 (red) and 6 (magenta) are shown:

The screenshot displays two overlapping software windows for configuring scenes. The top window is titled 'Scene 1' and the bottom window is titled 'Scene 6'. Both windows have a left-hand navigation pane with a tree view containing 'General', 'A: central', 'A: group', 'G1 group', 'G2 group', 'G3 group', 'G4 group', 'Scenes', and 'Additional informations'. The 'Scenes' folder is expanded, and 'Scene 1' is selected in the top window, while 'Scene 6' is selected in the bottom window. The main area of each window contains a list of parameters with dropdown menus. For Scene 1, parameters include 'Transition time for light scene' (2 s), 'Override scene on download' (yes), and 'Group 1-8 brightness value of scene'. For Scene 6, parameters include 'Transition time for light scene' (2 s), 'Override scene on download' (yes), and 'Group 1-10 brightness value of scene'. At the bottom of the windows are buttons for 'OK', 'Cancel', 'Default', 'Info', and 'Help'.



With Scene 6 (magenta), note that the Brightness value of group 7 (blue) was already at 100 % and due to parameterisation *no change (no member in this Scene)* has been retained.

A Sequence is controlled via the communication objects *Switch* or *Switch/Status* of the associated lighting groups. The ON telegram must be sent to each lighting group involved in the Sequence. In our example, the KNX group 1/0/0 is used.

Maingroups		Object	Device	Sending
1 DGS_1161		24: Group 5 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	5
0 extra functions		30: Group 6 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	5
0 sequence call		36: Group 7 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	5
1 sequence active				

Due to the individual control it is possible to extract a lighting group from the sequence operation. In this case the sequence continues with the remaining lighting groups. Should just one lighting group receive an ON telegram, only this lighting group will commence with the sequence. The other lamp groups involved will remain unchanged.

A prerequisite for the start of a sequence is the activated function *Sequence*. After a download of the application the function *Sequence* is parameterised in the state which it has after KNX voltage recovery.

The parameterisation is implemented in the parameter window *Gx Sequence*. If the default values are retained, the sequence is automatically activated after download. The function *Sequence* is in standby and can be started at any time by an ON telegram (value 1) to the communication objects *Switch* or *Switch/Status* of the lighting group which are members of the sequence. Alternatively, the function *Sequence* can be started via the communication objects *Activate function Sequence* of the lighting group's members.

The function *Sequence* is often repeated as parameterised in the parameter window *Sequence*. It is possible to repeat the sequence up to 255 times or to allow it to run endlessly. The function *Sequence* can be interrupted at any time by an OFF telegram (value 0) to the communication object *Switch* of the respective lighting group.

The function *Sequence* jumps with the respective transition time to the final scene and then goes to standby. In this state the function *Sequence* can be restarted by an ON telegram (value 1) at any time. If the function *Sequence* is in standby mode where it is not operating, it can be switched off with an OFF telegram. The function *Sequence* operation remains in standby mode in this case.

If the Gateway receives a telegram with the value 0 on the communication object *Activate function Sequence* for a lighting group, the sequence operation is terminated and the current brightness of the lighting group is retained. This is independent of whether the function *Sequence* is operating or in standby mode. A renewed activation is implemented by a telegram with the value 1 to the communication object *Activate function Sequence*. Function *Sequence* is activated, the function *Sequence* is started simultaneously.

The response to a dimming, set Brightness value and Scene telegram during function *Sequence* can be parameterised in the parameter window [- Gx Sequence](#), page 80. The telegram can be ignored or the function *Sequence* can be deactivated so that the lighting group reacts as a “normal” lighting group and can only be reactivated by a telegram with the value 1 to the communication object function *Sequence*.

Whether the function *Sequence* for a lighting group is activated, is displayed via the communication object *Activate Sequence/Status* or displayed in bit 14 in the diagnostics byte.

The state of function *Sequence* after gateway supply voltage recovery as well as after KNX voltage recovery is parameterized in the parameter window [- Gx Sequence](#), page 80.

In the following table, the response to received telegrams with the parameterised function *Sequence* is shown.

Operating situation or Communication objects		Function <i>Sequence</i>			
		Inactive	Standby	Active	
				Step X	Stopped
<b>Download (start)</b>		Such as KNX voltage failure			
<b>Download (end)</b>		Such as KNX voltage recovery			
<b>KNX</b>	<b>Voltage failure</b>	Programmable: - Brightness value: - <i>Gx Fault</i>			
	<b>Voltage recovery</b>	Programmable: - Operation: - <i>Gx Sequence</i> - Brightness value: - <i>Gx Fault</i>			
<b>DALI or gateway operation</b>	<b>Voltage failure</b>	Programmable: - Brightness value: - <i>Gx Fault</i>			
	<b>Voltage recovery</b>	Programmable: - Operation: - <i>Gx Sequence</i> - Brightness value: - <i>Gx Fault</i>			
<b>Switch</b>	<b>ON</b>	Brightness value when turned ON	Sequence is started	Sequence is restarted	
	<b>OFF</b>	OFF	OFF	Sequence is stopped	→ Standby and OFF
<b>Relative dimming</b>		DIMMING	DIMMING	Programmable: - no reaction - goes to standby and dims	
<b>Set brightness value</b>		Brightness value	Brightness value	Programmable: - no reaction - goes to standby and Brightness value is set	
<b>Activate function Sequence</b>	<b>0</b>	no reaction	→ Inactive, Brightness value unchanged	Sequence remains stationary and state changes to → inactive	
	<b>1</b>	→ Active, Sequence is started	Sequence is started	Sequence is restarted	
<b>Recall scene</b>		Scene is executed	Scene is executed	Programmable: - no reaction - goes to standby and Scene is carried out	

4.13 DALI dimming curve

The DALI dimming curve is adjusted to the sensitivity of the human eye. In this way, a logarithmic characteristic curve results for the luminous flux, which is perceived by the human eye as a linear brightness characteristic.

**Note**

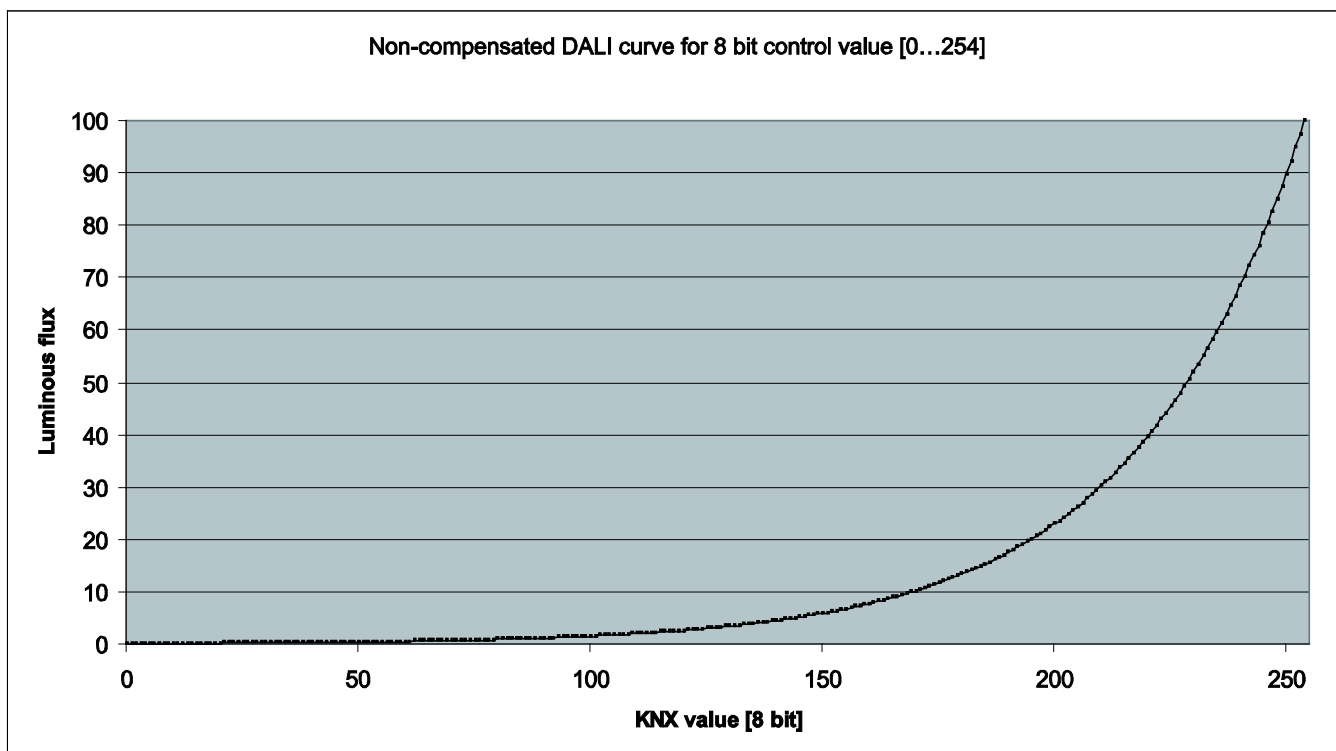
The IEC 62386-102 describes the DALI values as *arc power across the light source*, which in most cases is an almost linear relationship to the luminous flux.  
The luminous flux describes the lighting power emitted from a light source in all directions. The unit is stated in lumens (lm).

For the luminous flux under DALI, the characteristic shown in the following illustration is defined compliant to the DALI standard (EN 60929 or IEC 62386-102):

$$X(n) = 10^{\frac{n-1}{253/3}-1} \quad \left| \frac{X(n) - X(n+1)}{X(n)} \right| = \text{const.} = 2.8 \%$$

n = 1...254 (digital Control value)

The following characteristic thus results:



<b>E</b>	<b>KNX status brightness value</b>	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	255
<b>D</b>	<b>Luminous flux [%]</b>	0	0.1	0.5	1	3	5	10	20	30	40	50	60	70	80	90	100
<b>C</b>	<b>DALI value</b>	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	254
<b>B</b>	<b>KNX value</b>	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	255
<b>A</b>	<b>KNX value [%]</b>	0	0.4	24	33	49	57	67	77	82	86	90	92	95	97	98	100

The table assumes ideal DALI equipment (DALI dimming range 0.1...100 %) and in the Gateway a KNX dimming range of 0.4...100 %.

Row A and B is the brightness value of the Gateway received via the KNX as a digital figure value (0...255) or in % (0...100). This value is implemented by the Gateway on the DALI (row C). It results in the luminous flux which is emitted by the lighting equipment via the DALI characteristic (row D). The Gateway then sends the status of the brightness value (row E) back on the KNX.

The dimmable range printed on the ballast relates to the luminous flux. Typical specifications are 3 % or 0.2 %, which due to the logarithmic nature of the DALI curve, are the KNX values of 49 % (126) or 10 % (26).

The maximum possible dimming range can only be set with DALI equipment which has a dimming range up to 0.1 % (KNX value 1 or  $100/255 \% = 0.4 \%$ ). Other DALI equipment has a limited dimming range. This value is a physical property of the ballast and cannot be changed. This dimming limit has nothing to do with the minimum dimming value parameterised in the application.

As an example, in the following DALI equipment with a minimum physical luminous flux of 3 % can be observed. In the KNX, a dimming range of 126...254 is thus available. This means, the lowest brightness value that can be set and fed back on the KNX is 126 or 50 %. KNX values, which are less than 126 or 50 %, are set by the DALI equipment to the threshold value and fed back by the Gateway on the KNX.

<b>E</b>	<b>KNX status brightness value</b>	0	126	126	126	126	126	126	144	229	235	241	246	250	255
<b>D</b>	<b>Luminous flux [%]</b>	0	3	3	3	3	3	3	5	50	60	70	80	90	100
<b>C</b>	<b>DALI value</b>	0	1	8	26	60	85	126	144	229	235	241	246	250	254
<b>B</b>	<b>KNX value</b>	0	1	8	26	60	85	126	144	229	235	241	246	250	255
<b>A</b>	<b>KNX value [%]</b>	0	0.4	3	10	24	33	49	57	90	92	95	97	98	100

The characteristic curve described in the following section is represented as the useable range of the ballast with the control value range for the brightness value on the KNX. In this way, a higher resolution of the brightness values on the KNX is possible. However, nothing changes in the physical threshold values of the ballast and the light yield.

**4.13.1 Characteristic adjustment of the linear dimming curve**

The DALI characteristic compliant to IEC 62386-102 described in the previous chapter can be modified via the Gateway, so that it provides a linear characteristic from KNX brightness value [%] to luminous flux.

Based on the KNX brightness value (row A or B) the Gateway calculates the corresponding DALI control value (row C), which is required to achieve the same luminous flux (row D) from the figure value.

Thus, a brightness value on the KNX of 3 % (digital value 8) is also provided as a luminous flux of 3 %. This has the benefit that the KNX value range can be used almost completely for the brightness value. In this way, the light yield of the lighting equipment has not changed. Furthermore, it must be considered that the perceived linear brightness response due to the logarithmic DALI curve is no longer available.

In an ideal case the following transformation table results:

<b>E</b>	<b>KNX status Brightness value</b>	0	3	8	13	26	51	77	102	128	153	179	204	230	255
<b>D</b>	<b>Luminous flux [%]</b>	0	1	3	5	10	20	30	40	50	60	70	80	90	100
<b>C</b>	<b>DALI value</b>	0	85	126	144	170	195	210	220	229	235	241	246	250	254
<b>B</b>	<b>KNX value</b>	0	3	8	13	26	51	77	102	128	153	179	204	230	255
<b>A</b>	<b>KNX value [%]</b>	0	1	3	5	10	20	30	40	50	60	70	80	90	100

With the linear characteristic a dimming range of 3...100 % results with a DALI device as featured in the following table:

<b>E</b>	<b>KNX status Brightness value</b>	0	3	8	13	26	51	77	102	128	153	179	204	230	255
<b>D</b>	<b>Luminous flux [%]</b>	0	1	3	5	10	20	30	40	50	60	70	80	90	100
<b>C</b>	<b>DALI value</b>	0	85	126	144	170	195	210	220	229	235	241	246	250	254
<b>B</b>	<b>KNX value</b>	0	3	8	13	26	51	77	102	128	153	179	204	230	255
<b>A</b>	<b>KNX value [%]</b>	0	1	3	5	10	20	30	40	50	60	70	80	90	100

The marked values are again the values, which result for a ballast with a dimming range of 3 %...100 %. It becomes evident that when on the KNX the control values for the brightness value between 3 % and 100 % are used, the emitted light yield range does not change.

**4.13.2 Characteristic adjustment with phys-min Brightness value**

The second possibility for considering the characteristic curve adjustment to the physical minimum dimming value of the ballast. The physical minimum dimming value is calculated so that the complete KNX adjustment range from 1...100 % can be used on the KNX.

In an ideal (ballast with a physical minimum dimming value of 0) case the same transformation table as for normal DALI characteristic adjustment results (4.13).

The following Tabel based on a realistic physical minimum dimming value of 3% (DALI 126). In the KNX value area of 0 up to 50% the ballast can not change the brightness level.

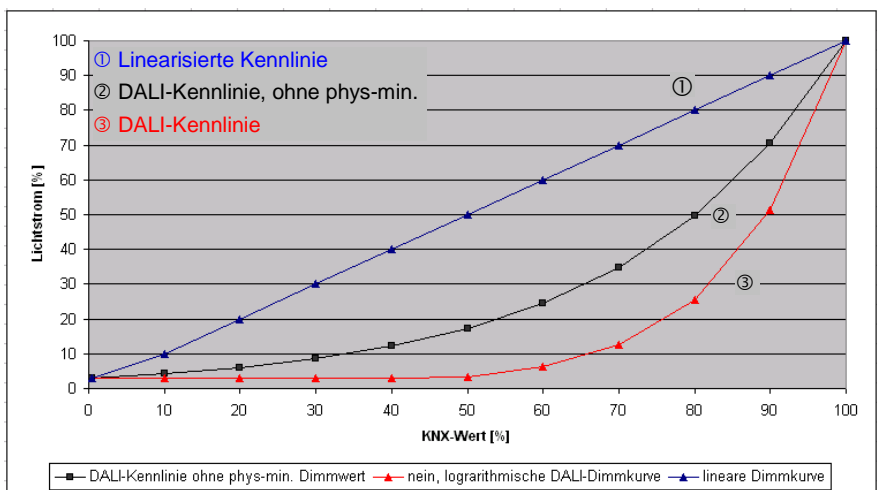
<b>E</b>	<b>KNX status Brightness value</b>	0	126	126	126	126	144	170	195	210	220	229	235	241	246
<b>D</b>	<b>Luminous flux [%]</b>	0	3	3	3	3	5	10	20	30	40	50	60	70	80
<b>C</b>	<b>DALI value</b>	0	1	60	85	126	144	170	195	210	220	229	235	241	246
<b>B</b>	<b>KNX value</b>	0	1	60	85	126	144	170	195	210	220	229	235	241	246
<b>A</b>	<b>KNX value [%]</b>	0	0,4	24	33	49	57	67	77	82	86	90	92	95	97

The following table results with the characteristic correction *DALI dimming curve, without phys-min brightness value* with a DALI device featuring a dimming range of 100 %:

<b>E</b>	<b>KNX status Brightness value</b>	0	3	8	26	51	77	102	128	153	179	204	230	255
<b>D</b>	<b>Luminous flux [%]</b>	0	1	3	4	6	9	12	17	25	35	50	70	100
<b>C</b>	<b>DALI value</b>	0	85	126	138	151	164	177	190	203	215	228	241	254
<b>B</b>	<b>KNX value</b>	0	3	8	26	51	77	102	128	153	179	204	230	255
<b>A</b>	<b>KNX value [%]</b>	0	1	3	10	20	30	40	50	60	70	80	90	100

\*) Theoretically the value 1 is the feedback response as the minimum dimming threshold in the Gateway is 1 % (digital value 3), and only this value can be set and fed back.

The possibilities for an adjustment of a brightness curve are shown in the following figure. The figure based on ballast with a minimum physical dimming value of 3%.



## A Appendix

### A.1 Code table *Fault Group/device code* (no. 104)

Via communication object *Fault Group/device code* there is a possibility to represent coded information concerning the malfunction state of the lighting group or the individual device on the KNX.

*For further information see: [Communication object no. 104](#), page 116*

Lamp and ballast faults are sent in a 1 byte communication object together with the number of the device or the lighting group.

Whether the communication objects contains the fault status of the lighting group, or of an individual device is set in the parameter window [- A: Status](#), page 44 via the parameter *Send number of the failed group or failed device*. This parameter is visible, if the parameter *"Fault Group/device code" enable encoded fault message* has been parameterised with *yes* and the communication object has been enabled.

The following code table shows the relationship between the DALI device and/or the lighting group and its fault status (lamp or ballast fault).



Initially the code table is shown for the fault status of a lighting group:

Bit No.	7	6	5	4	3	2	1	0	
Decimal object value	Hexadecimal object value	Ballast fault	Lamp fault	Lighting group binary code				No. lighting group	Lighting group status
There is no fault.									
0	00								1
1	01								2
2	02								3
3	03								4
4	04								5
5	05								6
6	06								7
7	07								8
8	08								9
9	09								10
10	0A								11
11	0B								12
12	0C								13
13	0D								14
14	0E								15
15	0F								16
There is a lamp fault.									
64	40								1
65	41								2
66	42								3
67	43								4
68	44								5
69	45								6
70	46								7
71	47								8
72	48								9
73	49								10
74	4A								11
75	4B								12
76	4C								13
77	4D								14
78	4E								15
79	4F								16

Bit No.	7	6	5	4	3	2	1	0	
Decimal object value	Hexadecimal object value	Ballast fault	Lamp fault	Lighting group binary code				No. lighting group	Lighting group status
There is a ballast fault.									
128	80								1
129	81								2
130	82								3
131	83								4
132	84								5
133	85								6
134	86								7
135	87								8
136	88								9
137	89								10
138	8A								11
139	8B								12
140	8C								13
141	8D								14
142	8E								15
143	8F								16
There is a ballast and lamp fault.									
192	C0								1
193	C1								2
194	C2								3
195	C3								4
196	C4								5
197	C5								6
198	C6								7
199	C7								8
200	C8								9
201	C9								10
202	CA								11
203	CB								12
204	CC								13
205	CD								14
206	CE								15
207	CF								16

■ = Value 1, applicable  
 empty = Value 0, not applicable





**A.2 Table of transition times  
(*time for dimming  
changeable* (no. 109))**

Using the communication object *time for dimming changeable*, it is possible to define the fading time as described in the DALI standard EN 62386-102 via the DALI control by using the KNX, so that the intended DALI devices use the DALI fading times.

The option *time for dimming changeable via bus* for the lighting groups can be selected in different parameter windows and parameters, e.g. in the parameter window *Group x* under the parameter *Dimming speed, time for 0...100 %*.

The telegram values 0 to 15 correspond with the following DALI transition times:

Telegram value	Fading time [s] to EN 62386-102
0	No reaction, is not transferred to DALI
1	0.7
2	1.0
3	1.4
4	2.0
5	2.8
6	4.0
7	5.7
8	8.0
9	11.3
10	16.0
11	22.6
12	32.0
13	45.3
14	64.0
15	90.5
> 15	No reaction, is not transferred to DALI

**A.3 Code table**  
**8 bit scene (no. 112)**

This code table indicates the telegram code for an 8 bit scene in hexadecimal and binary code.

**Note**

Of the 64 possible scenes in KNX only the first 14 scenes are available with the Gateway.

When retrieving or storing a scene the following 8 bit values are sent.

Bit No.		7	6	5	4	3	2	1	0		
	Decimal object value										
	Hexadecimal object value										
	Recall/ store										
	not defined										
	Scene binary code										
	Scene No.										
	Recall scene										
0	00										1
1	01										2
2	02										3
3	03										4
4	04										5
5	05										6
6	06										7
7	07										8
8	08										9
9	09										10
10	0A										11
11	0B										12
12	0C										13
13	0D										14
64	40										1
65	41										2
66	42										3
67	43										4
68	44										5
69	45										6
70	46										7
71	47										8
72	48										9
73	49										10
74	4A										11
75	4B										12
76	4C										13
77	4D										14

Bit No.		7	6	5	4	3	2	1	0		
	Decimal object value										
	Hexadecimal object value										
	Ballast fault										
	Lamp fault										
	Lighting group binary code										
	No. lighting group										
	Store scene										
128	80										1
129	81										2
130	82										3
131	83										4
132	84										5
133	85										6
134	86										7
135	87										8
136	88										9
137	89										10
138	8A										11
139	8B										12
140	8C										13
141	8D										14
192	C0										1
193	C1										2
194	C2										3
195	C3										4
196	C4										5
197	C5										6
198	C6										7
199	C7										8
200	C8										9
201	C9										10
202	CA										11
203	CB										12
204	CC										13
205	CD										14

■ = Value 1, applicable  
 empty = Value 0, not applicable

A.4 Code table  
Request Diagnostics  
(no. 132)

With the communication object *Request Diagnostics*, the diagnostic information of the communication object no. 131 *Diagnostics* is requested.

The following code table shows the relationship between the value of the communication object and the DALI devices or the lighting group:

Bit No.		7	6	5	4	3	2	1	0		
Decimal object value	Hexadecimal object value	not defined	DALI-device lighting group	Binary code						No. DALI device	No. lighting group
0	00									1	
1	01									2	
2	02									3	
3	03									4	
4	04									5	
5	05									6	
6	06									7	
7	07									8	
8	08									9	
9	09									10	
10	0A									11	
11	0B									12	
12	0C									13	
13	0D									14	
14	0E									15	
15	0F									16	
16	10									17	
17	11									18	
18	12									19	
19	13									20	
20	14									21	
21	15									22	
22	16									23	
23	17									24	
24	18									25	
25	19									26	
26	1A									27	
27	1B									28	
28	1C									29	
29	1D									30	
30	1E									31	
31	1F									32	
32	20									33	
33	21									34	
34	22									35	
35	23									36	
36	24									37	
37	25									38	
38	26									39	
39	27									40	

Bit No.		7	6	5	4	3	2	1	0		
Decimal object value	Hexadecimal object value	not defined	DALI-device lighting group	Binary code						No. DALI device	No. lighting group
40	28									41	
41	29									42	
42	2A									43	
43	2B									44	
44	2C									45	
45	2D									46	
46	2E									47	
47	2F									48	
48	30									49	
49	31									50	
50	32									51	
51	33									52	
52	34									53	
53	35									54	
54	36									55	
55	37									56	
56	38									57	
57	39									58	
58	3A									59	
59	3B									60	
60	3C									61	
61	3D									62	
62	3E									63	
63	3F									64	
64	40									1	
65	41									2	
66	42									3	
67	43									4	
68	44									5	
69	45									6	
70	46									7	
71	47									8	
72	48									9	
73	49									10	
74	4A									11	
75	4B									12	
76	4C									13	
77	4D									14	
78	4E									15	
79	4F									16	

■ = Value 1, applicable  
empty = Value 0, not applicable

**A.5 Code table  
Diagnostics  
Low Byte (no. 131)**

With the 2 byte communication object *Diagnostics*, the information about a DALI device or a lighting group is provided on the KNX. The communication object no. 131 *Diagnostics* is updated via the communication object no. 132 *Request Diagnostics* and sent on the KNX.

For further information see: [Communication objects nos. 131 and 132, page 126](#)

The 2 byte communication object no. 131 can be divided into two 1 byte values: the high byte (bit 8...15) and the low byte (bit 0...7).

In the low byte the information of the communication object no. 132 *Request Diagnostics* is repeated. The [high byte](#) defines the DALI devices or the lighting group.

The following code table shows the relationship between the value of the communication object of the low byte and the DALI devices or the lighting group.

Bit No.	7	6	5	4	3	2	1	0		
Decimal object value	Hexadecimal object value	not defined	DALI-device lighting group	Binary code				No. DALI device	No. lighting group	
0	00								1	
1	01								2	
2	02								3	
3	03								4	
4	04								5	
5	05								6	
6	06								7	
7	07								8	
8	08								9	
9	09								10	
10	0A								11	
11	0B								12	
12	0C								13	
13	0D								14	
14	0E								15	
15	0F								16	
16	10								17	
17	11								18	
18	12								19	
19	13								20	
20	14								21	
21	15								22	
22	16								23	
23	17								24	
24	18								25	
25	19								26	
26	1A								27	
27	1B								28	
28	1C								29	
29	1D								30	
30	1E								31	
31	1F								32	
32	20								33	
33	21								34	
34	22								35	
35	23								36	
36	24								37	
37	25								38	
38	26								39	
39	27								40	

■ = Value 1, applicable  
empty = Value 0, not applicable

Bit No.	7	6	5	4	3	2	1	0		
Decimal object value	Hexadecimal object value	not defined	DALI-device lighting group	Binary code				No. DALI device	No. lighting group	
40	28								41	
41	29								42	
42	2A								43	
43	2B								44	
44	2C								45	
45	2D								46	
46	2E								47	
47	2F								48	
48	30								49	
49	31								50	
50	32								51	
51	33								52	
52	34								53	
53	35								54	
54	36								55	
55	37								56	
56	38								57	
57	39								58	
58	3A								59	
59	3B								60	
60	3C								61	
61	3D								62	
62	3E								63	
63	3F								64	
64	40									1
65	41									2
66	42									3
67	43									4
68	44									5
69	45									6
70	46									7
71	47									8
72	48									9
73	49									10
74	4A									11
75	4B									12
76	4C									13
77	4D									14
78	4E									15
79	4F									16

A.6 Code table  
*Diagnostics*  
High Byte (no. 131)

With the 2 byte communication object *Diagnostics*, the information about a DALI device or a lighting group is provided on the KNX. The communication object no. 131 *Diagnostics* is updated via the communication object no. 132 *Request Diagnostics* and sent on the KNX.

*For further information see: [Communication objects nos. 131 and 132](#), page 126*

The 2 byte communication object no. 131 can be divided into two 1 byte values: the Low byte (bit 0...7) and the High byte (bit 8...15).

In the [low byte](#) the information of the communication object no. 132 *Request Diagnostics* is repeated. The High byte defines the DALI devices or the lighting group.

The following code table shows the relationship between the value of the communication object of the High byte and the status of the DALI system with its DALI devices or the lighting group.





## A.7 Software Tool

The Software Tool is a useful program for the DALI-Gateway KNX. The following functions are integrated into the Software Tool:

- Connection establishment to the Gateway
- Test (switch ON/OFF) of the individual DALI devices or lighting groups
- Readdressing of individual DALI devices (DALI addresses)
- Assignment of the DALI devices to lighting groups
- Display of all lamp and ballast faults (device and lighting group related)
- Display of which DALI devices are monitored for ballast malfunction
- Storage of a reference system state (detect ballast for ballast monitoring)
- Display of different lighting group assignments in the Gateway and in the DALI devices (conflict detection)
- Saving of all DALI devices and their lighting group assignments and inversely the lighting group assignment in a \*.txt file.

The Software Tool has been specially developed for the KNX-Bus KNX-Gateway. Accordingly, the Software Tool functions exclusively with these devices. The functions can be operated without any particular KNX or DALI knowledge. They can be implemented via a PC or Laptop with an RS232 interface, USB port or IP port via the KNX.

A prerequisite however, is that the Falcon driver must be installed on the computer (at least version V1.6). In order to select the required Gateway the physical KNX device address has to be entered in the Software Tool.

In order to establish stable communication between PC and Gateway, it is recommended to install the KNX interface in the same line as the Gateway. This is not mandatory but can positively affect the connection stability.

Processing of conventional DALI systems without Gateway, e.g. via a USB/DALI port, is not possible with the Software Tool.

The Software Tool is divided into two areas:

- Display mode
- Configuration mode

### Display mode

This mode is the core element. It is started as soon as the Software Tool is started. Its task is to indicate the state of the lighting system relative to malfunctions (lamp and ballast faults), and to display the DALI system with its DALI addressing and lighting group assignments at a glance. Also displayed are any existing conflicts, i.e. if there are differences between the group and scene assignment information stored in the Gateway and in the DALI devices, e.g. a Gateway has been exchanged or a pre-programmed DALI device with group assignment has been installed.

Additionally, the number involved and the specific DALI devices of the Gateway which are monitored by the gateway with respect to a ballast fault are indicated.

All this is possible without allowing the system to mistakenly modify itself or to influence the system. Modification of the DALI system is only possible in configuration mode. For this reason, the lighting system is fully functional in display mode (observation).

Thus, the Software Tool in display mode is an ideal tool for a facility manager, who has no KNX or DALI knowledge and who requires immediate information on the state of the lighting system.

### Configuration mode

In this mode, the commissioning engineer or system specialist can access the DALI system and modify it.

Note
Changes made to an existing operating system should be made carefully as they have a direct effect on the system.

The primary task of the configuration mode is in commissioning the system. The required group assignments are to be simply undertaken for later control via the KNX. Furthermore, the individual DALI address of every individual DALI device can be changed.

Note
With the group-oriented Gateway it is possible with the respective parameterisation to control all devices without a group assignment via the KNX. <i>For further information see: parameter window <a href="#">A: Group</a>, page 51.</i>

The lighting group assignment for the group-oriented Gateway is undertaken using the small + (add) or - (remove) operating buttons.

The DALI address can be modified by drag and drop. In this way, an individual, project-dependent sequence of the DALI devices is set.

Furthermore, the assignment of the replacement devices can be manually re-established with an exchange of several DALI devices.

The DALI device or lighting groups can be switched via ON/OFF and tested with any brightness values.

The function *Detect ballasts* is also possible in configuration mode or via an interface. With this function, the number of DALI devices currently connected to the Gateway are detected and stored as the reference value for device monitoring (ballast fault) in the Gateway. This function can also be triggered via the communication object *Detect ballast* or with a long actuation on the test button.

The group as well as the scene membership are stored both in the Gateway as well as in the DALI devices. Should there be a difference between the group assignments stored in the Gateway to the information in the DALI devices, this will be indicated as a conflict.

In configuration mode it is now possible to write the stored information from the Gateway into the DALI device (with the respective DALI address) or inversely to transfer the information from the DALI devices into the Gateway. This second case is necessary if a Gateway must be exchanged. Thus, through an ETS download, the parameter specifications and the group assignments of the old system states read in as a result are restored without any great effort.

**Important**

A permanent connection of the Software Tool to the KNX is not advisable. Continuous refreshing of the display increases the KNX bus load. This can lead to a reduction of the operating speeds.

**A.7.1 System requirements**

The Software Tool requires an IBM or IBM compatible PC/Laptop with Microsoft Windows operating systems Windows XP, 2000 or Vista. The Software Tool has been tested on both German and English operating systems.

There must also be a connection to the KNX established via an RS232 interface, USB port or IP port. It is recommended that you install the KNX interface in the same line as the Gateway in order to establish stable communication between PC and Gateway. It can positively affect the connection stability.

ETS must not be installed on the computer for the Gateway Software Tool. It is sufficient if the Falcon driver is installed on the PC (min. version V1.6). If you have installed ETS3 on your PC/laptop, the Falcon driver is also automatically installed.

To check whether a Falcon driver is installed, simply open the control panel of your PC, select *Software* and simply search the list for *KNX etcC Falcon Runtime v1.6* (most up-to-date version at market launch of the Gateway). If the Falcon driver is not installed or an older version is installed, replace it by the latest version.

The current version of the Falcon driver can be found as an \*.msi file in the setup folder of the Software Tool, *FalconRuntime\_V16.msi*. The Falcon driver is installed by simply running (e.g. double clicking) this \*.msi file. You must have administrator rights for your PC for installation. If necessary contact your system administrator or integrator.

The current Falcon driver can be downloaded on the Internet if required at [www.knx.org/de/knx-tools/falcon/downloads](http://www.knx.org/de/knx-tools/falcon/downloads).

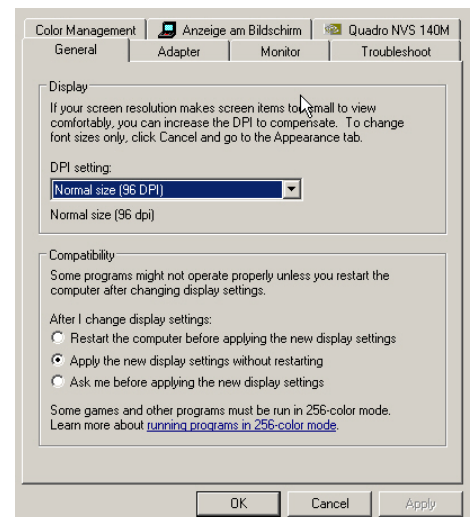
The Gateway to be edited is selected in the Software Tool by entering the physical device address.

The display window of the Gateway Software Tool is 462 (width) x 517 (height) pixels in size. If the monitor has a lower resolution the complete image is not shown.

**The display is optimised for a font size of 96 dpi. Another setting can affect the display and distort the representation.**

The setting of the font size can be found for example in Windows at *Control panel > Display* in the menu *Display Properties > Settings > Advanced > General*, Normal size (96 DPI), or by opening the menu window

*Display Properties* directly with a right mouse click on the desktop.



**A.7.2 Starting the Software Tool**

Once the *DALI-Gateway\_KNX\_Software-Tool\_en.zip* has been unzipped and the setup programm was started, the directory *Software-Tool* will be

Name	Größe	Typ
DALI-Gateway_KNX_Software-Tool de-en.exe	571 KB	Anwendung
FalconRuntime_V18.msi	11.842 KB	Windows Installer-Paket
FalconSupport.dll	526 KB	DLL-Datei
Group_Information.txt	6 KB	Textdokument
help_de.pdf	1.211 KB	Adobe Acrobat Document
help_en.pdf	1.170 KB	Adobe Acrobat Document
settings.cfg	1 KB	Progress .CFG File

- *DALI-Gateway\_KNX\_Software-Tool de-en.exe*: Main program Software Tool is started e.g. by a double click on this file.
- *FalconSupport.dll*: The file contains the required system information of the Falcon driver.

Important
The *.dll file must be in the same folder with the *.cfg file, the *.help files and the *.exe file.

- *Settings.cfg*: This file contains the settings entered manually by the operator. Should this file be deleted accidentally, the Software Tool will independently create a new one.
- *FalconRuntime\_V18.msi*: The Falcon driver can be installed on your computer with this file. If version V1.8 or higher of the Falcon driver is already installed, this file must not be run.
- *help\_de.pdf, help\_en.pdf*: Both these files, de = German and en = English, contain the description of the Software Tool and can be accessed directly when the software is opened via the ? and the menu point *Help*. Both these files must be located in the same directory as the \*.exe file. Otherwise there is no reaction to access to help as the help file is not found. Depending on the language which is set, the German or English Help can be accessed under the *Extra* menu.
- *Group\_Information.txt*: This file contains a list of the group and device assignments. Listed are all DALI devices and their lighting group assignments and inversely the lighting group with the assigned DALI devices.  
This information can be used both for project documentation as well as for analysis of the system state.  
The file is updated if in the Software Tool at menu point *File*, the function *Export group information* is clicked. The menu point can only be activated should there be no conflict detected and if the page *Output A* has been accessed once. The Gateway automatically generates a \*.txt file in the folder in which the Software Tool is located. The storage location and the file name can be freely selected.

By running, e.g. with a double click on the desktop icon, the Software Tool starts.

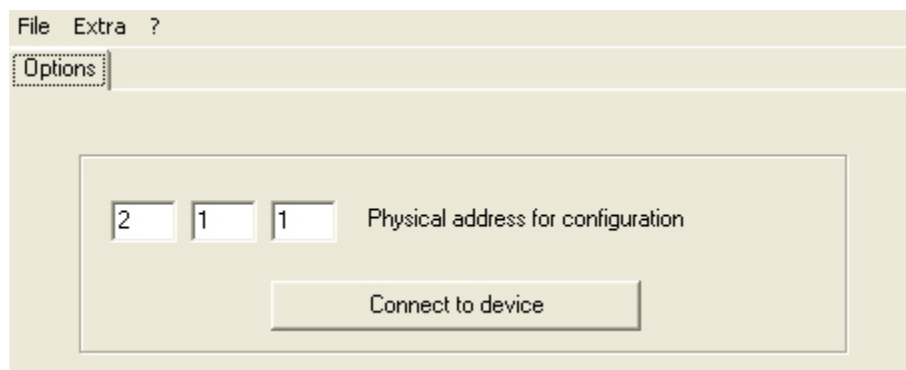
A prerequisite for the connection of the Software Tool with the Gateway is the physical addressing of the Gateway using the ETS. ETS is no longer

required after the physical device address of the Gateway has been assigned.

**A.7.3 Connection to the KNX**

After the Software Tool is started, the user is requested to enter the physical address of the Gateway to which the connection is to be established. In order to establish the connection to the KNX, the PC/laptop must be connected to an RS232 interface, USB port or IP port on the KNX.

The following window appears after invoking the *Software Tool dt-engl.exe*:

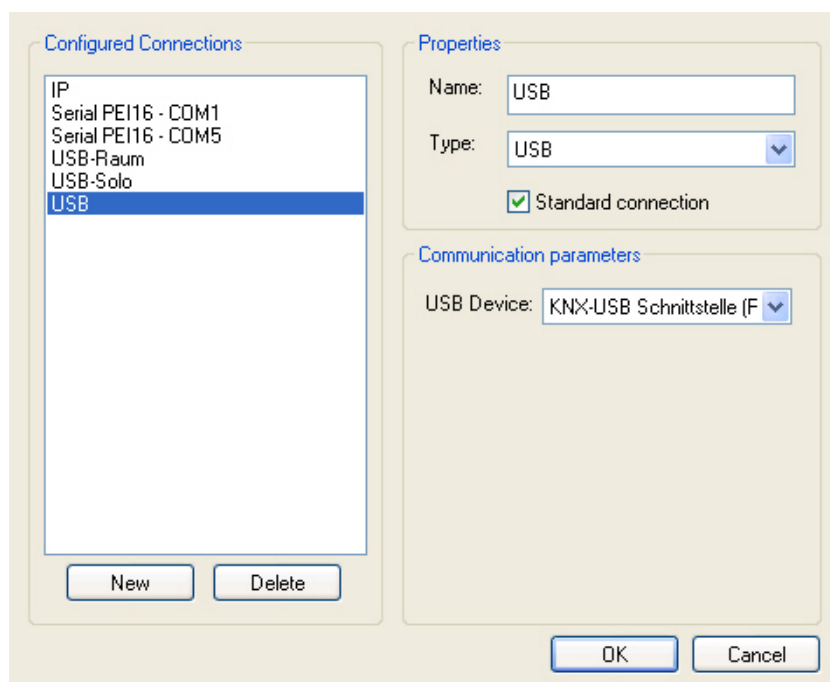


Enter the physical address of the Gateway here.

**Note**

Please ensure that the physical address of the Gateway to be addressed is entered correctly. If another KNX device other than the Gateway has this address, no connection will be established.

By pressing the *Connect with device* button the interface configuration window used in ETS appears:





Set the individual interface parameters in this window and acknowledge the entered data with button *OK*.

When the connection to the KNX has been established and the Gateway recognised, the *Options* window appears.

The system cannot be influenced or changed in this mode. The system continues to operate without interruption and with the full range of functions.

**Note**

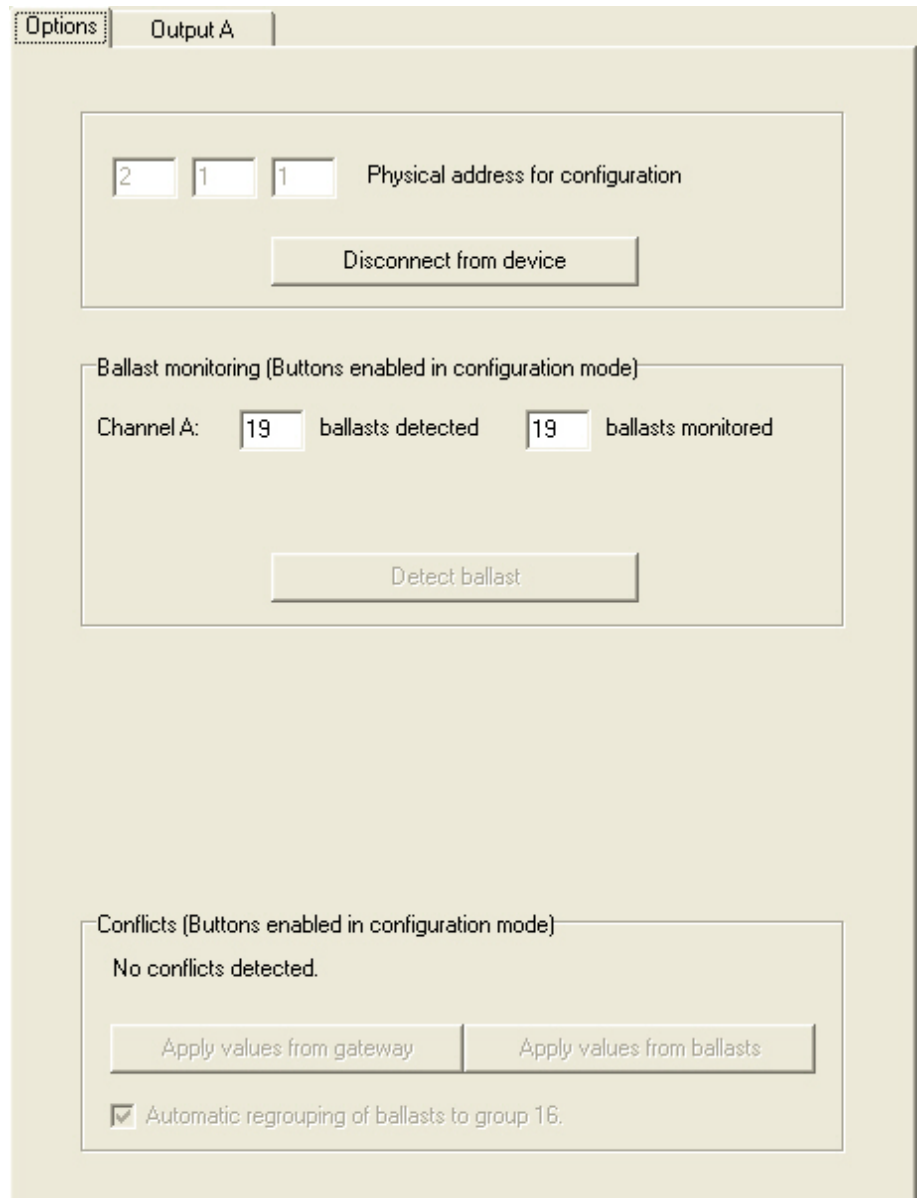
Using an RS232 interface, the connection to the KNX can only be established via a COM port. Should the ETS already use the COM port, the ETS must be exited before the Software Tool is closed and the COM port is thus re-enabled.

The file *FalconSupport.dll*, must be in the same directory as the executing file *DALI-Gateway\_KNX\_Software-Tool de-en.exe* of the Software Tool.

If it is not possible to establish contact regardless of the attempts made, close the Software Tool and the ETS if required, and restart the PC/Laptop or the Falcon driver. It may be necessary to manually terminate it using the *Task Manager > End Task*. The Task Manager can be started with the key combination *Ctrl + Alt + Del*.

A.7.4 Display mode

When the connection to the KNX has been established, the *Options* window of the Software Tool appears. The connection to the Gateway is indicated by the display of the tab output A. The tab will flash briefly for the purpose of simple recognition after the connection has been established.



The field *Device monitoring (fields enabled in configuration mode)* indicates how many DALI devices have been detected by the Gateway and the number being monitored. If the number detected does not correspond with the number of monitored DALI devices, the Gateway cannot undertake correct ballast monitoring.

The DALI devices are monitored if the function *Detect ballasts* is executed for the DALI output. The function *Detect ballasts* can be undertaken in three ways:

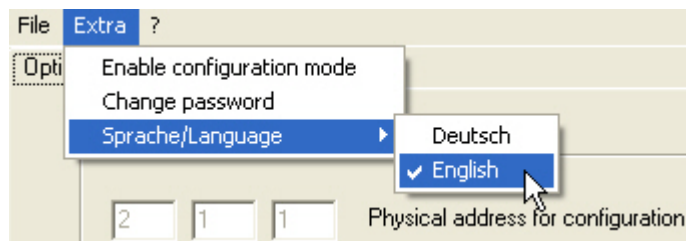
- In configuration mode via the button *Detect ballasts*,
- Via a telegram with the value 1 on the communication object *Detect ballasts*,
- By pressing the test button for longer than five seconds.

The field *Conflicts (enable fields in configuration mode)* is only visible with the group-oriented Gateway. In the Gateway and the DALI devices, e.g. ballasts, the assignment of DALI devices in a lighting group as well as the scene membership information is stored.

Should the information concerning the group assignment in the Gateway and in the DALI devices diverge, this is indicated as a conflict.

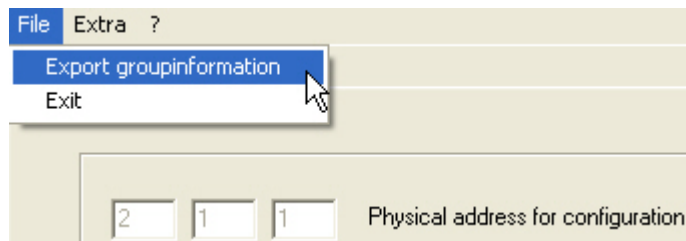
In configuration mode it is possible to write the stored information from the Gateway into the DALI device via the respective DALI address, or inversely to transfer the information from the DALI devices into the Gateway. The transfer of the stored information from the DALI devices to the Gateway is necessary, for example, as soon as a Gateway is exchanged or replaced. Accordingly, the old system state can be easily re-established during conflict elimination using an ETS download which includes the parameterisation, through the transfer of the DALI group and scene assignments. A prerequisite is that the DALI addresses of the DALI devices have not changed.

In the menu line, the menu language can be selected via *Extra >*



*Sprache/Language:*

Using the menu *File a Gruppen\_Information.txt* (group information) file can be generated by selecting *Export group information*. The Gateway generated a \*.txt file. The storage location and the file name can be freely selected.



**Note**

The menu point is only active should there be no conflict detected and if the page *Output A* has been accessed once.

In the file all DALI devices and their lighting group assignments and inversely the lighting group with the assigned DALI devices are listed. This information can be used both for project documentation as well as for analysis of the system state.

The system state is represented by an 8 x 8 grid. Each field represents at least one of the maximum 64 connectable DALI devices. Each DALI device with address is represented by a lamp symbol. Should a DALI device not have a DALI address it is not displayed. The DALI address is normally automatically assigned by the Gateway.

Options								Output A !							
Ⓢ 1	Ⓢ 2	Ⓢ 3	Ⓢ 4	Ⓢ 5	Ⓢ 6	Ⓢ 7	Ⓢ 8	Ⓢ 9	Ⓢ 10	Ⓢ 11	Ⓢ 12	Ⓢ 13	Ⓢ 14	Ⓢ 15	Ⓢ 16
17	18	19	20	21	22	23	24	25	26	27				31	32
33	34	35	36	37	38	39	40								
Ⓢ 41	Ⓢ 42	Ⓢ 43	Ⓢ 44	Ⓢ 45	Ⓢ 46	Ⓢ 47	Ⓢ 48	49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64								
G1	G2	G3	G4	G5	G6	G7	G8	G9	G10		G12	G13	G14	G15	
G11															

**Note**

Should the corresponding parameterisation in the parameter window [General](#), page 29 not permit automatic addressing using the Gateway, no DALI address is assigned and the DALI device does not appear in the representation.

In display mode, the system state is displayed, which is stored in the Gateway and not the current state of the ballast. Should the states in the Gateway and ballast differ, this is indicated in the *Options* view as a conflict. A conflict can be remedied in the [Configuration mode](#), page 192, by comparing the states.

A green check mark indicates that the device is OK.

A lamp fault is indicated by a red X on the lamp symbol. If a ballast fault is detected, the lamp symbol disappears and only the red X is visible. A ballast fault can have several causes:

- The ballast is defective.
- The ballast is not connected to operating voltage.
- The ballast has been exchanged and has another DALI address.



A ballast fault will only be correctly recognised if the function *Detect ballasts* has been implemented beforehand. The number of devices and the DALI addresses are stored when this function is run and used as a reference value by the Gateway. If this state changes, it will be determined as a ballast fault.




As soon as at least one DALI device of a lighting group is assigned, it is indicated by a group symbol with three lamps.




Should there be a fault in the group, this is indicated by the symbols, and it is described in the following. A group fault is indicated when at least one device per lighting group indicates a fault.



A.7.5 Meaning of the symbols

The displayed symbols have the following meaning:

 <b>14</b>	 G10	DALI device or lighting group recognised and status OK (no lamp or ballast fault). In this example, the 14 corresponds with the DALI device and G10 with the lighting group.
--	--	---

  <b>48</b>	 G12	DALI device or lighting group reports a lamp fault.
--	--	---

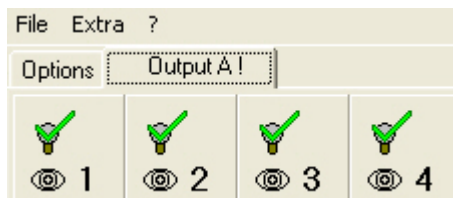
  <b>47</b>	 G13	DALI device or lighting group is no longer present (ballast fault).
--	--	---

  <b>10</b>	The DALI device is monitored, triggered by <i>Detect ballasts</i> . The eye symbol can be combined with every other symbol.
--	--



The monitoring relates to the individual DALI devices and not to the lighting group. For this reason, the lighting group does not have an eye symbol even when the individual DALI devices of the group are monitored.



In the lighting group a fault is displayed, if at least one DALI device of the lighting group exhibits a fault.



A fault on the output is indicated by a ! in the tab of Output A or B. This can be due to a lamp or ballast fault.



The following additional symbols are available in the configuration mode:

 <b>12</b>	 G11	Every DALI device detected is displayed by a lamp symbol. As soon as one DALI device is included in the lighting group it will be displayed.
--	--	--

 <b>12</b>	 G11	If the DALI device or a lighting group is selected it will be displayed by a lighting lamp symbol.
--	--	--

  <b>10</b>	The DALI device is monitored and triggered by <i>Detect ballasts</i> . The eye symbol can be combined with every other symbol. The exceptions are the symbols of the lighting group which relate to detection of the devices and not the group.
--	--

Only two additional symbols are used for the group-oriented Gateway that are only visible in configuration mode and have a function.



By actuating the group symbol with the plus symbol the selected DALI device is added to a lighting group.



If the DALI device is selected by clicking, all devices which belong to this group are displayed.

By a click of the cursor on the group member symbol with the minus tag, this device is removed from the lighting group.

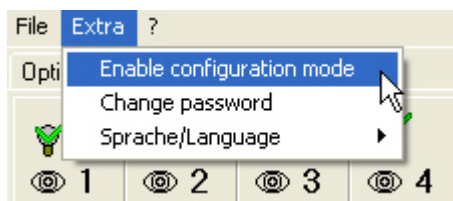
**Note**

The “illuminated” symbol does not indicate that the DALI device or the lighting group is switched on, but rather that the members or the lighting group have been selected.

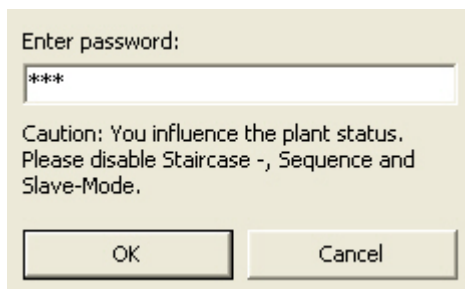
**A.7.6 Configuration mode**

The Software Tool features a configuration mode, in which the DALI devices connected to the Gateway are tested and the DALI address can be changed to suit the project, and the group assignment of the individual DALI devices can be undertaken.

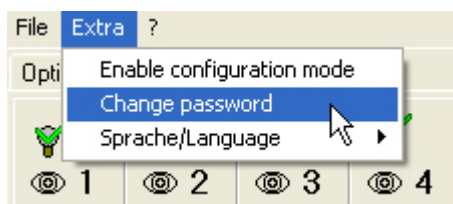
Activation of the configuration mode can be undertaken in menu *Extra > Activate configuration mode*. The program returns to display mode when the configuration mode is deactivated.



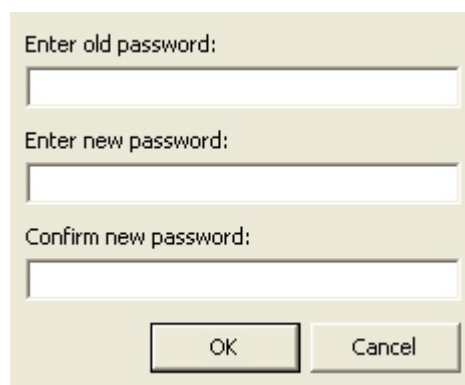
The configuration mode is protected by a password (123) to avoid unwanted readdressing or regrouping of the connected DALI devices on the Gateway.



Enter the password in the *Password dialog* window and acknowledge with OK. If you are in configuration mode, the password can be changed under the menu *Extra > Change password*. Please note that capital and small lettering are differentiated when the password is entered.



A window appears where the new password can be determined. The old password must be entered and the new password must be entered and repeated.





**Note**

Should you forget the password, by deleting the *settings.cfg* file the password is reset to the original setting (123). The file *settings.cfg* can be found in the Software Tools directory. The *settings.cfg* file is generated automatically the next time the Software Tool is invoked.

After the correct password has been entered, you are in the configuration mode.

The screenshot shows a software interface with a top navigation bar containing 'Options' and 'Output A'. Below this, there are four main configuration sections:

- Physical address for configuration:** Three input fields containing the values '2', '1', and '1'. A 'Disconnect from device' button is located below these fields.
- Ballast monitoring (Buttons enabled in configuration mode):** A label 'Channel A:' is followed by an input field with '19', the text 'ballasts detected', another input field with '19', and the text 'ballasts monitored'. A 'Detect ballast' button is positioned below.
- Brightness level (in %):** Two input fields are shown. The top one contains '100' and is labeled 'selected'. The bottom one contains '0' and is labeled 'unselected'.
- Conflicts (Buttons enabled in configuration mode):** The text 'No conflicts detected.' is displayed. Below it are two buttons: 'Apply values from gateway' and 'Apply values from ballasts'. At the bottom of this section is a checked checkbox labeled 'Automatic regrouping of ballasts to group 16.'

In configuration mode, the window in which the user was located in display mode is opened first.

Here you have the option of readdressing the DALI devices connected to the Gateway. All KNX assignments are automatically matched:

- The group number (DALI address) indicated in the Software Tool corresponds with the number of the group in the KNX.

**Note**

The actual DALI address is one less as DALI addressing always commences with address 0. This can be important should a DALI sniffer analyse the DALI telegrams.

On a group-oriented Gateway a device field receives the information of the DALI address and the lighting group assignment of the device. If a DALI device is moved to another place in the 8 x 8 grid, not only will its DALI address change but also its group membership. The DALI device contains the group membership of the field onto which it has been pushed. In this way it is possible in advance to arrange the lighting groups for the project even with DALI devices, and later to just pull the respective DALI devices onto the fields.

In the *Brightness level (in %)* field it is possible to adjust the switch on brightness with the selected DALI device or select the lighting group. The options 0 % (OFF) to 100 % (maximum brightness value) are available.

**Note**

In the DALI environment, the value 255 (100 %) does not mean maximum brightness but rather no change of the brightness value. The maximum DALI value is 254 (100 %)

If the number of detected devices is less than the monitored number, the system no longer complies with the reference state which is monitored by the Gateway. DALI devices have disappeared.

This can be due to a ballast fault, a DALI cable break or due to the failure of the 230 V mains supply on the ballast.

If the number of detected devices is greater than the monitored number, the system no longer complies with the reference state that is monitored by the Gateway. The system has been expanded with DALI devices.

In this case, a *Detect ballasts* should be triggered in order to achieve the correct monitoring and indication of a ballast fault.

*Detect ballasts* can be triggered directly in the Software Tool using the *Detect ballasts* button. If this button is actuated, the Gateway starts to analyse the system, and the current system status is stored as a new reference value. This analysis process is indicated on the Gateway by a yellow LED which flashes quickly.

If the *Output X* tab is selected, all DALI devices of the respective output are displayed:

File Extra ?							
Options Output A !							
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64

In the group-oriented Gateway you will also see the 16 group fields:

G1	G2	G3	G4	G5	G6	G7	G8
G9	G10	G11	G12	G13	G14	G15	G16

The required DALI device or lighting group is selected by a simple mouse click. This is clearly indicated as the *Lamps* screen symbol lights up. The devices switch accordingly with the brightness value for a selected device. The brightness at switch on can be set as the value 0 (OFF) to 254 (max. brightness) in the *Options* parameter window of the Gateway Software Tool.

The next DALI device can be selected by another click with the mouse or by using the "mouse wheel". The newly selected device is switched on and the symbol changes to a lighting lamp. The device selected beforehand switches off and returns to the deselected brightness level.

A change of the DALI address is achieved by simply moving the lamp symbol. Select the device with the mouse and drag it to the new location while holding down the left mouse button for this purpose.

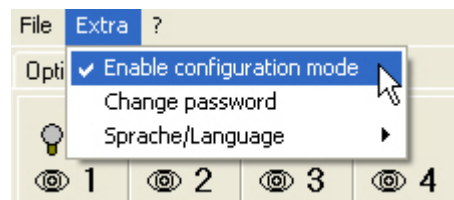
If the function *Detect ballasts* has been actuated beforehand, a red X will appear at the original address location as the ballast has disappeared. With a renewed *Detect ballasts* call the new assignment/addressing is stored as a reference state.

If a device is to be moved to an address which is occupied by another device, the address of both devices will be exchanged. The same applies for the group information which is linked to the field.

Lamp faults or missing ballasts are indicated with symbols as described in the display mode. The DALI devices on the Gateway are monitored continuously. If the fault status changes, it is displayed directly in the Software Tool. A status change can take up to 90 seconds depending on the number of connected DALI devices.

With the Gateway, the faults are also displayed even when this has been suppressed by a telegram with the value 1 on the communication object *Disable sending of fault alarm* (no. 108). This inhibit only relates to the sending of the information via the respective communication objects.

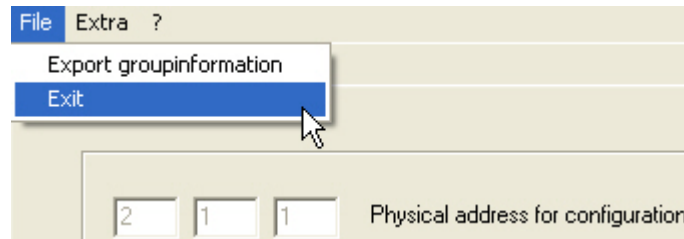
The configuration mode should be deactivated under *Extras* in order to revert to the display mode.



If the configuration mode is exited or the Software Tool is ended, the DALI devices assume the brightness value which is parameterised as the deselected brightness.

### A.7.7 Exiting the Software Tool

The Software Tool can be exited via the *File > Exit* menu.



If the configuration mode is exited or the Software Tool is ended, the DALI devices assume the brightness value which is parameterised as the deselected brightness.

### A.7.8 Automatic addressing

In order to better appreciate the functionality of the Gateway Software Tool, the addressing is described in this section.

The gateway automatically detects the connected DALI equipment and assigns an address in ascending order if no DALI address is available, which is then simultaneously represented on the KNX.

This is the case unless otherwise parameterised in the parameter window [General](#) on page 29, the automatic DALI addressing is suppressed. Furthermore, with the Gateway commissioning must be undertaken independently of the automatic DALI addressing in order to assign the DALI devices to lighting groups. These lighting groups are indicated on the KNX. Control of the individual 64 DALI devices via the KNX is not possible with the Gateway. Only when a DALI device is assigned to any lighting group are the DALI devices controllable via the fields in *Output A*. If this is not the case, in parameter window [A: Group](#), page 51, there are parameterisation options, where the Gateway automatically assigns DALI devices to lighting group 16 if they do not belong to a lighting group. Thus all connected DALI devices are again assigned to at least one lighting group and can be controlled commonly via the fields in *Output A* via the KNX with the Gateway Software Tool even without a manual lighting group assignment.

As soon as the gateway operating voltage is applied, the Gateway checks all outputs for existing DALI devices.

This process is also started after a download or KNX voltage recovery or Gateway operating voltage recovery and may take about 90 seconds, depending on the number of connected DALI devices. If equipment with DALI interfaces is detected which has not been assigned with a DALI address (default delivery state, DALI short address 255), the gateway will automatically assign a DALI address. The detected DALI device receives the first free DALI address (0 to 63) in the Gateway. If no DALI services are detected, the first DALI device is assigned with DALI address 0 and is made available in the Gateway on the KNX as device 1. The second device is assigned with DALI address 1 and is made available on the KNX as device 2.

The sequence in which the DALI master, in our case the Gateway, finds a device with DALI interface cannot be influenced. If the connected DALI device already has a DALI address, e.g. exchange device from another system, it will not be changed. This also applies for the

group information. The Gateway proceeds exactly as an individual DALI device which is not available on the KNX.

If the new DALI device has a DALI address, which is used in the Gateway, one of both DALI devices with the same addresses will be assigned with a new and unused DALI address. Here, the old DALI device, which is already connected to the Gateway, may receive a new address.

### A.7.9 Exchange of DALI equipment

The Software Tool may also be used if more than two ballasts have failed in a DALI output of the Gateway. If only one ballast has failed and the DALI addresses are assigned without any gaps for the DALI devices (normally the case with Gateway), a ballast without a DALI address (default state) can be exchanged without commissioning. The new DALI device automatically receives the free DALI address as well as the group and scene information of the defective ballast from the Gateway. With the Gateway however, the automatic DALI address assignment in parameter window [General](#), page 29, may not be suppressed. If this is the case, the parameter must be enabled beforehand, or the correct DALI addresses must be assigned before installation of the ballast. This can occur for example with another Gateway. If only the DALI address is assigned and the group and scene assignment is not undertaken in the process, the Gateway will detect a conflict between the data in the Gateway and the DALI devices. This conflict is indicated in the Software Tool and can also be remedied there.

It is possible to assume the data of the Gateway or the DALI device.

Should several DALI devices on the output fail, or there are gaps in the DALI address assignment, it is not possible to guarantee a unique assignment of the replacement device by the Gateway. The Gateway assigns the new DALI device with the first free DALI address. If the new DALI device has a DALI address, which is used in the Gateway, one of both DALI devices with the same addresses will be assigned with a new and unused DALI address. In this way, the fault-free DALI device, which is already connected to the Gateway, may receive a new address. A correction or exchange of the address can be implemented with the Software Tool.

## A.8 Further information about DALI

*DALI* manual of the DALI AG which is part of the ZVEI:



This manual and further information about DALI can be found on the DALI AG Internet page under [www.dali-ag.org](http://www.dali-ag.org).