



Product Manual

ABB i-bus[®] KNX DALI Gateway DG/S 1.16.1

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1 General

This manual provides you with detailed technical information concerning the group-orientated ABB i-bus® KNX DALI Gateway DG/S 1.16.1. The mounting, programming and commissioning including the DGS Software Tool, and the use of the device are described using examples. Furthermore, basic terminology used with DALI technology is explained.

The DG/S 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 DG/S 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 DG/S 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-orientated KNX DALI Gateway DG/S 1.16.1 is a modular installation device in ProM design. 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 DG/S.

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 DG/S 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 DG/S 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 DG/S. 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 DG/S 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 DG/S 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

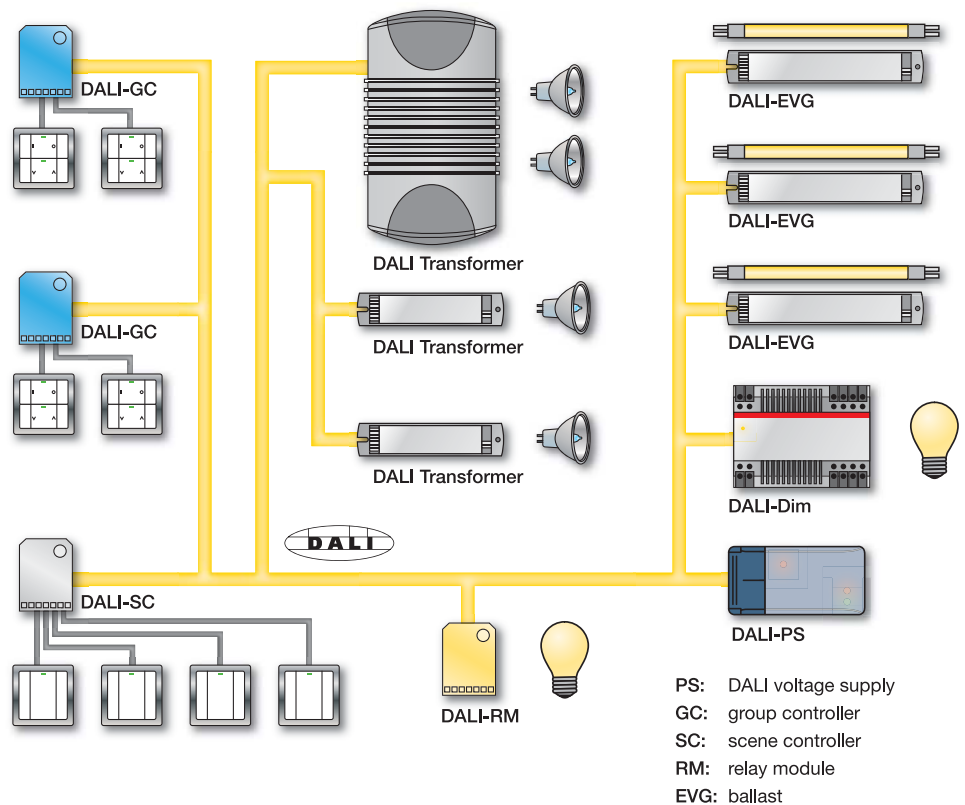
A two-core control cable that does not need to be shielded is used for the exchange of information and transmission of the digital telegrams. It is not necessary to consider the polarity. The control cable must not have any SELV characteristics (safety extra-low voltage). Thus it is possible to use the two unnecessary cores of the five-core NYM 5 x 1.5 mm² 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.

Note
<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 DG/S</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. ABB i-bus® DG/S, 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 DG/S so that no further power supplies, e.g. DALI-PS may be connected to the DG/S. 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

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.

However, should a DALI master, e.g. DG/S 8.1, 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.

The DG/S 1.1 as well as the group-orientated DG/S 1.16.1 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.

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

This state is detected by the ABB i-bus® DG/S as a ballast malfunction because the ballast no longer responds.

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

The power-on level of the ballast can be programmed via the KNX with the group-orientated DG/S 1.16.1, 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.

1.3 ABB i-bus® DG/S in comparison

ABB Stotz Kontakt GmbH currently has three KNX-DG/S devices in the ABB i-bus® range, for integration of DALI interfaces into a KNX building installation. Every gateway has benefits that can be specifically utilised on different project types.

These differences are described in the following.

The differences are listed briefly below in the table. A detailed description can be found in the chapters that follow.

Property	DG/S 8.1 Central control	DG/S 1.1 Individual control	DG/S 1.16.1 Group control
Design	MDRC	MDRC	MDRC
Mounting width	6	4	4
DALI outputs	8 (A...H)	2 (A & B)	1 (A)
DALI devices (ballast) per DG/S	128 (max. 16 per output)	128 (max. 64 per output)	64
Lighting groups per DG/S	8 (installation)	A max. 255 (KNX) B: 1	16*) (DALI)
Lighting groups established via	Cable installation	A KNX B: cable installation	DALI
DALI devices (e.g. ballasts) per lighting group	Max. 16	A max. 64 B: max. 64	Max. 64
DALI addressing	Not necessary	A 64 individual B: 64 individual	64 individual
Number of DALI telegrams per KNX telegram of the group	1 telegram	A max. 64 telegrams B: 1 telegram	1 telegram per group
Power supply to the KNX processor via	KNX	KNX	KNX
DALI voltage	Integrated power supply	Integrated power supply	Integrated power supply

*) As an option the 16 lighting groups of the DG/S 1.16.1 may also be used internally. The DG/S assigns the DALI devices that do not belong to any other lighting group to group 16. In this way commissioning of all devices using the KNX via the communication objects *Output A* is also possible without prior group assignment.

1.3.1 DG/S 8.1 (Broadcast)

With the ABB i-bus® 8-fold DALI Gateway DG/S 8.1 it is possible to utilise the benefits of the DALI standards in KNX intelligent installation systems without separate commissioning. Extensive addressing procedures for the individual DALI devices or group assignment are not necessary.

Up to 128 DALI devices can be connected to eight outputs on the DG/S.

On each of the eight independent DALI outputs (channels) of the DG/S you can connect a maximum of 16 devices, and 128 DALI devices can be connected to the entire DG/S. As no individual addressing of the DALI devices is undertaken, the 16 devices per output can only be controlled and monitored as a group. One lamp and/or ballast malfunction per output can be detected and signalled on the KNX. The DALI device on the output, which causes the error message, is not evident.

These properties make the DG/S ideally suited for the control of lighting arrays in offices, workshops or warehouses as well as several lamps in one area.

The omission of the complex addressing procedure becomes particularly evident in offices leading off corridors, hotel rooms or patient's rooms in hospitals or old people's homes, where individual lamps are not visible. In this case, commissioning requires a lot of time walking around buildings or may even require two people using radio communication.

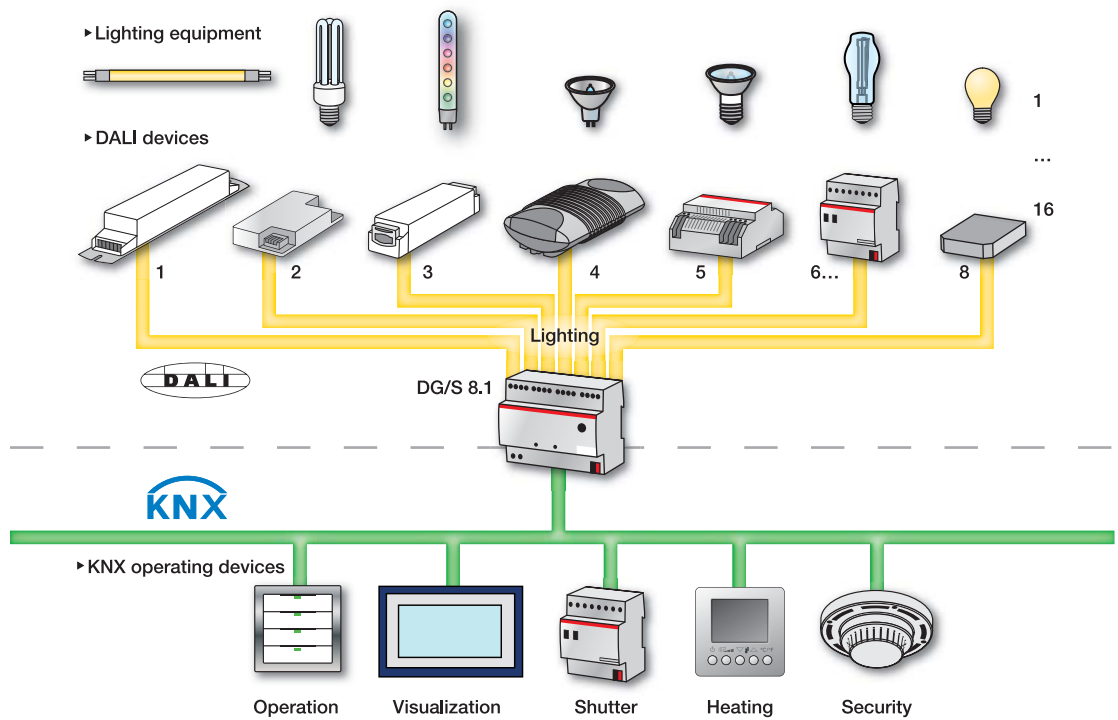
With the DG/S 8.1, installation and group assignment of the DALI devices via the wiring is implemented in the same way as 1-10 V technology. The electrician does not need to change his installation habits and can still benefit from the advantages of digital DALI lighting control.

Individual control and monitoring for eight devices with DALI interface is possible if only one device is connected per output.

Note
<p>The detailed function of the eight-fold DALI Gateway will not be dealt with in this manual.</p> <p><i>For further information see: Product manual DALI Gateway DG/S 8.1</i> <i>This can be found in the download area of our website www.abb.de/knx.</i></p>

The following diagram illustrates the output-based function of the 8-fold DG/S 8.1.

Differing DALI ballasts can be connected to a DALI output.



1.3.2 DG/S 1.1 (individual control)

The ABB i-bus® 1-fold DALI Gateway DG/S 1.1 provides the possibility of individually addressing two 64 DALI devices individually and make them available on the KNX. Two outputs (main and auxiliary output) are available for this purpose. The DALI installation is implemented per output for each of the 64 DALI devices using a single conductor pair. Thus a minimum cable length is assured. The use of individual addressing offers the maximum level of flexibility with a redesign or change in the usage of a room or building.

During an initialisation phase automatically implemented by the DG/S, all of the DALI slaves are addressed in an ascending and non-arranged sequence to the KNX communication objects. The DGS Software Tool is available to implement and provide for manual and individual re-addressing and a test of the DALI slaves.

A communication object for switching, dimming and setting brightness values is available for each of the individual 64 DALI devices connected to the main output. Every individual DALI device can be switched, dimmed or controlled with a brightness value directly via the KNX with these communication objects. A status message is possible via the same switching or brightness communication object.

The group assignment is implemented with the KNX group functions via the ETS. Theoretically 254 groups are possible, because of the maximum of 255 assignments in the ETS.

Note
In KNX groups consisting of more than 7 DALI devices, the devices in a group are switched on consecutively because of the relatively low DALI transmission speeds of 1200 baud. It must be considered that a KNX telegram can trigger up to 64 individual DALI telegrams, which have to be sent consecutively on the DALI control cable. As the influence also depends on the lighting equipment and the status feedbacks, a final statement of the performance can only be determined during real time operation. This behaviour is irrelevant in broadcast operation.

Scanning of the individual lamp and ballast malfunction, as well as the activation of a function *Burn-in* or *Slave* for every device is implemented using address control or coded control with two communication objects.

A further 64 DALI devices on a second auxiliary output can be individually controlled using broadcast mode. Every device of the auxiliary output can also be individually controlled with external logic or visualisation via coded address-based control using two communication objects.

Every channel can also be controlled and monitored in broadcast mode, i.e. all devices together.

Note

The detailed function of the one-fold DALI Gateway will not be dealt with in this manual.

*For further information see: Product manual DALI Gateway DG/S 1.1
This can be found in the download area of our website www.abb.de/knx.*

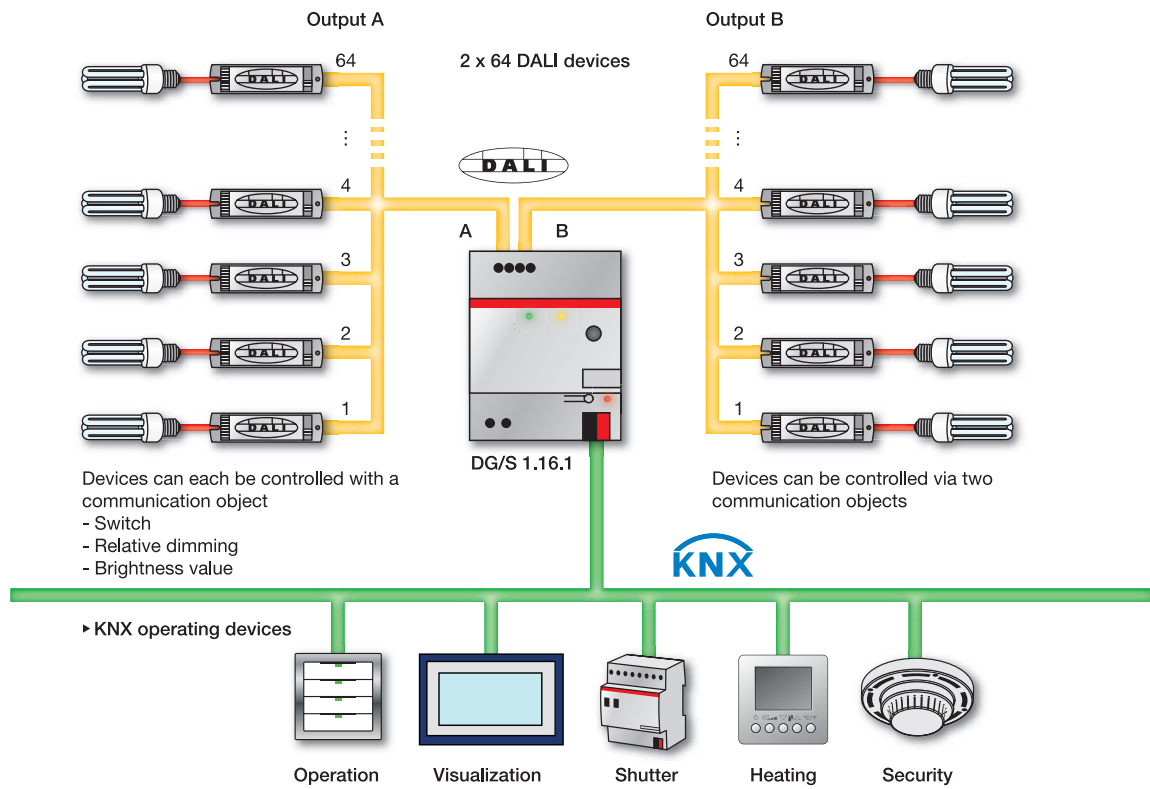
If individual addressing is required, every individual device must be switched on and the assignment determined during the commissioning and test phase. The person performing commissioning must be able to see the operation of the lamps for this purpose. If necessary, assignment through readdressing of the devices will be necessary. The test phase can be implemented with an ETS independent DGS Software Tool.

For further information see: Description [DGS Software Tool](#), page 185

These circumstances indicate the project types for which the 1-fold DG/S 1.1 is particularly suited. They are projects with so-called multipurpose areas. They can be exhibition halls, museums, event centres, sports arenas, open-plan offices or similar areas and rooms. All these projects usually require that most of the lighting is switched on directly from a single location. It is not possible in this case to forgo the test / commissioning phase, but it can be quickly implemented from a single location without the need for radio or the requirement to walk through the entire building.

The DG/S 1.1 can of course be used for every other project. This can be necessary; particularly where the highest levels of flexibility or individual status information for every individual device is required.

The following diagram illustrates the function of the DG/S 1.1.



1.3.3 DG/S 1.16.1 (group control)

The ABB i-bus® group-orientated DALI Gateway DG/S 1.16.1 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. In comparison to DG/S 1.1 the programming effort is reduced by a factor of 4. However, it must be considered that only 16 lighting groups can be controlled with DG/S 1.16.1 using the KNX. With DG/S 1.1 a theoretical maximum of 254 lighting groups is possible. This number is only limited by the maximum group assignment in the ETS.

For every lighting group, the DG/S can send the status of the group on the KNX. Independently of this fact, with DG/S 1.16.1 it is also possible to read the fault status of every DALI device individually via the KNX. Coded telegrams are available for this purpose.

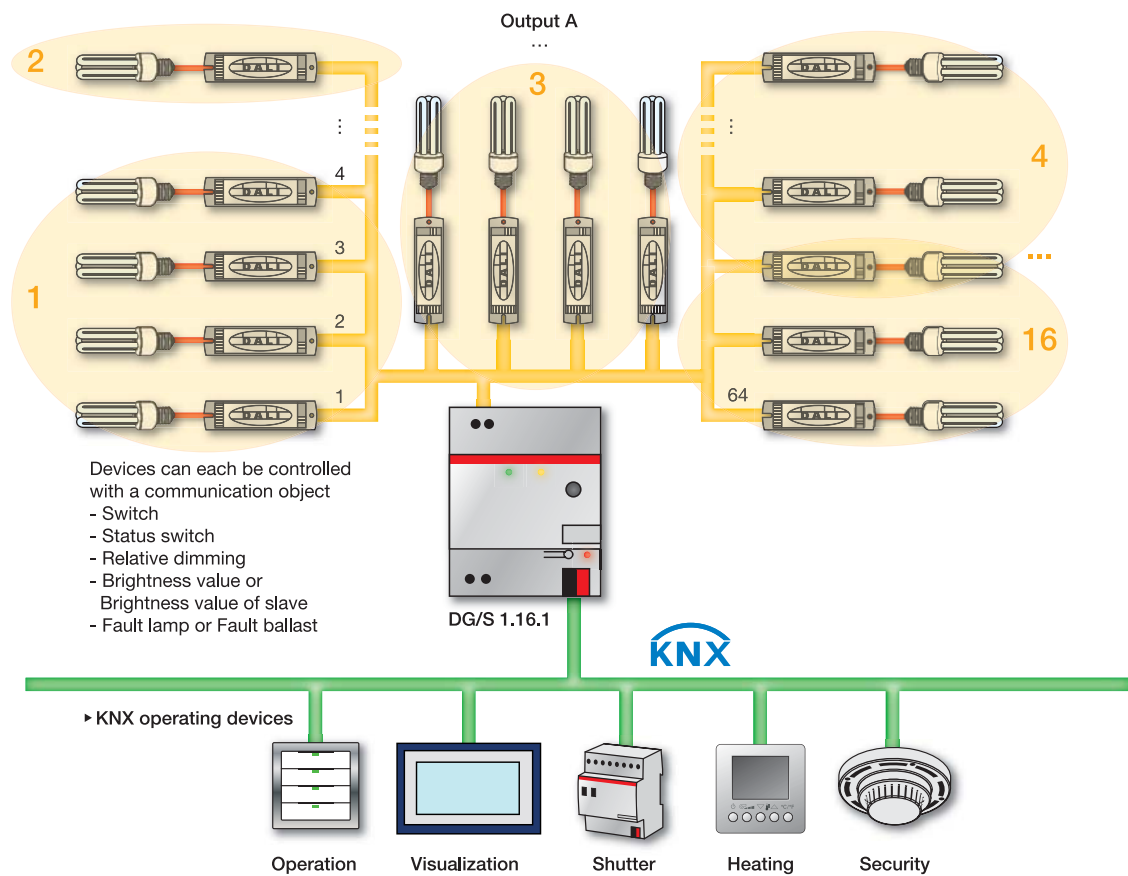
All DALI devices are addressed during an initialising phase automatically undertaken by the DG/S. The assignment to a lighting group that can be controlled and read via the KNX is undertaken with an ETS independent DGS Software Tool, which for example, a facility manager without ETS knowledge and ETS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

For further information see: Description [DGS Software Tool](#), page 185

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 DG/S 1.16.1 is predestined for controlling large lighting groups as a result.

Based on these features, the DG/S 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-orientated DG/S 1.16.1.



2 Device technology



2CDC 071 121 F0008

DG/S 1.16.1

The ABB i-bus® group-orientated DALI Gateway DG/S 1.16.1 is a modular installation device (MDRC) in ProM design for installation in the distribution board on 35 mm mounting rails.

The DG/S can in conjunction with the application program *Switch Dim Groups 1f DALI/1.0* integrate devices with DALI interfaces into a KNX building installation. The connection to the ABB i-bus® is implemented via a KNX connection terminal on the device shoulders.

The DALI output of the DG/S 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 DGS Software Tool. With the DGS 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 DG/S, 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 DG/S 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 DG/S 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 DG/S. As soon as the auxiliary voltage (Gateway operating voltage) is applied, the DG/S can switch on or off all connected DALI devices via a test button, irrespective of the KNX or DALI addressing.

2.1 Technical data

Supply	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
DALI outputs (channels):	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 DG/S and last DALI device	
	Cable cross-section 0.5 mm ²	100 m ^{*)}
	0.75 mm ²	150 m ^{*)}
	1.0 mm ²	200 m ^{*)}
Connections	KNX	KNX connection terminal, 0.8 mm Ø, single core
	DALI outputs and mains voltage	Screw terminal 0.2...2.5 mm ² stranded 0.2...4 mm ² single core
	Tightening torque	Maximum 0.6 Nm
Operating and display elements	Test push button	DALI output test
	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
Enclosure	IP 20	to EN 60529
Safety class	II	to EN 61140
Isolation category	Overvoltage category	III to EN 60 664-1
	Pollution degree	2 to EN 60664-1
KNX safety extra low voltage	SELV 24 V DC	
DALI voltage	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.

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

Note

The DG/S 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.

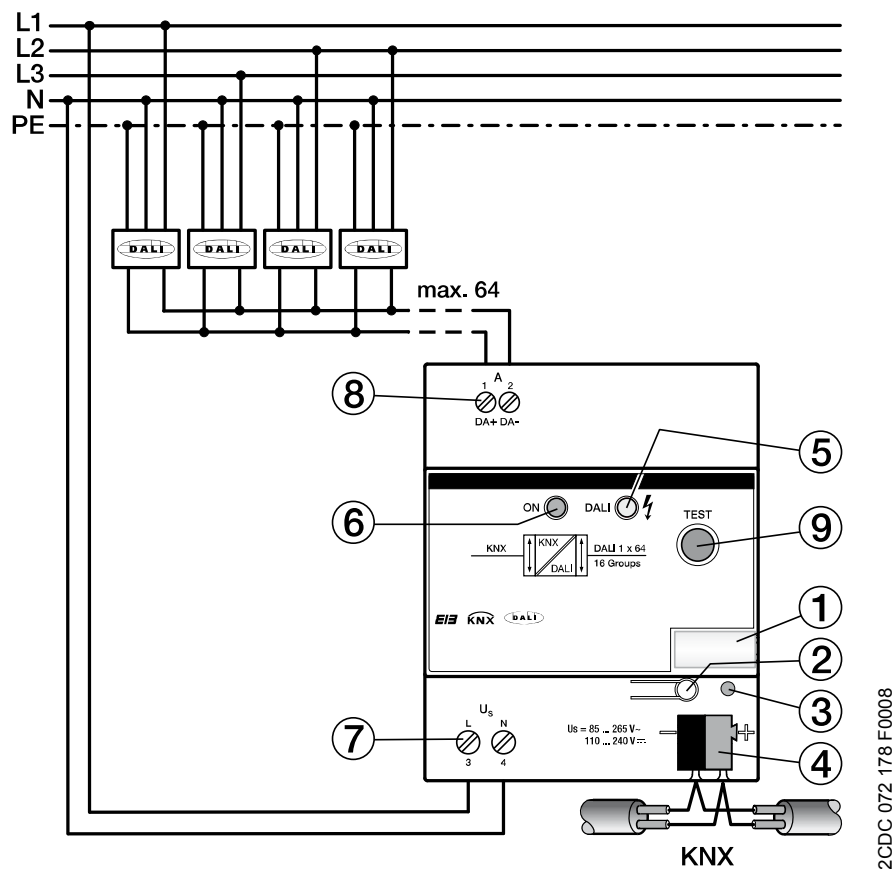
Application program

Application program	Number Communication objects	Maximum number of group addresses	Maximum number of associations
Switch Dim Groups 1f DALI/1.0	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 *ABB/Lighting/ DALI/ Switch Dim Groups 1f DALI/1*.
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.

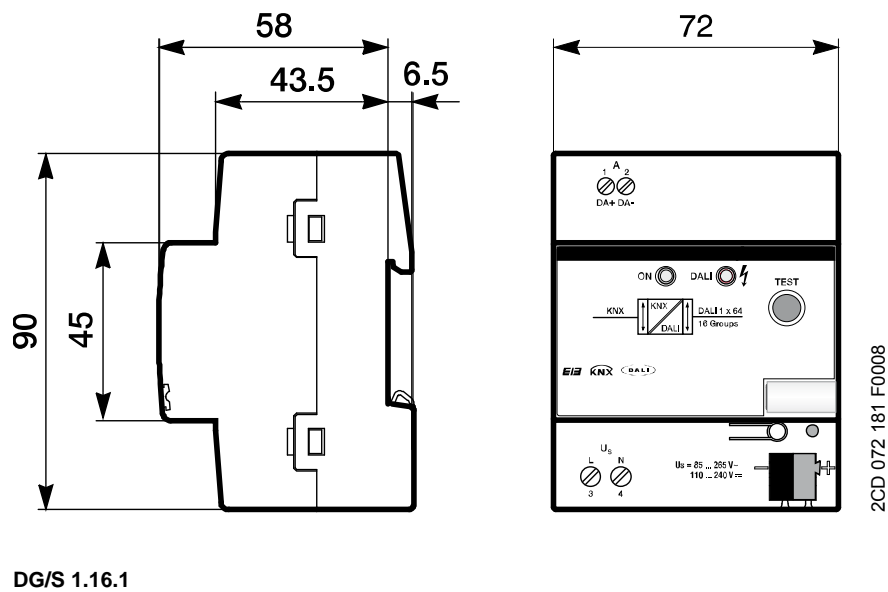
2.2 Circuit diagram



DG/S 1.16.1

- 1 Label carrier
- 2 KNX programming button
- 3 KNX programming LED red
- 4 KNX connection terminal
- 5 DALI LED yellow
- 6 Operation LED green
- 7 Gateway operating voltage
- 8 DALI output
- 9 DALI test push button

2.3 Dimension drawing



2.4 Assembly and installation

The DG/S 1.16.1 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 ABB i-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 DGS Software Tool.

For further information see: Description [DGS Software Tool](#), page 185

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 DG/S is a DALI master with integrated DALI power supply.

Important

Other DALI masters may not be connected to the output of the DG/S. 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 DG/S.
The connection of further DALI supply voltages may destroy the DG/S 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 ²]	2 x 0.5	2 x 0.75	2 x 1.0	2 x 1.5
Max. cable length [m] from the DG/S 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 mm² 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 DG/S. 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 DGS 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 DG/S:



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 DG/S 1.16.1 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 DGS 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 DG/S 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 DG/S 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 DG/S is implemented with the application program *Switch Dim Groups 1f DALI/1.0* and the Engineering Tool Software ETS.

The application program for the ETS2/ETS3 can be found under ABB/Lighting/ DALI/.

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 (DGS Software Tool)
- Assignment of the DALI devices to lighting groups represented in the KNX. Assignment is undertaken using the DGS Software Tool.

For further information see: Description [DGS Software Tool](#), page 185

- Parameterisation of the DG/S (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 DG/S 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 34. Readdressing of the DALI devices and the assignment to any lighting group is also possible with the DGS Software Tool without using the ETS, whereby the DALI devices must already have a DALI address (0...63).

Note
<p>The DG/S 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.</p> <p>It is possible to parameterise that the DG/S automatically moves all DALI devices not assigned to a lighting group to group 16, see parameter page A: Group, page 56.</p> <p>However in this case, the DALI device must have a DALI address in a range from 0...63.</p>

3.1 Overview

The group-orientated DG/S 1.16.1 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 18. The KNX voltage is sufficient for KNX programming with the ETS.

Thus in an office environment it is possible to pre-program the DG/S exclusively using the KNX voltage without having to resort to a gateway operating voltage (a 230 V AC/DC supply). As the DGS Software Tool is responsible for the compilation of the lighting groups and directly accesses the DALI devices via the DG/S, 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 DG/S 1.16.1 and those possible with the application program *Switch Dim Groups 1f DALI/1.0*.

Properties/Parameterisation possibilities	DG/S 1.16.1
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)	■	■	
Switch functions			
Brightness value when turned ON	■	■	
Dimming speed for switch on and off	■	■	
Switch telegram and status, common or separate communication objects	■	■	
Dimming			
Dimming speed for 0...100 %	■	■	
Permit channel to be turned ON via relative dimming telegram	■	■	
Brightness value	■	■	
Dimming speed for transition brightness values	■	■	
Permit set switch on and off via value	■	■	
Brightness value and status, common or separate communication objects	■	■	
Fault messages			
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	■		
Other functions			
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>		■	
Continued overleaf			

Parameterisation options	Per group	All devices	Per device
General functions			
Request status values via 1 bit communication object	■	■	
Automatic DALI address assignment inhibit		■	
Cyclic monitoring telegram (<i>In operation</i>)		■	
Status telegram limitation		■	
14 scenes			
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-orientated DG/S 1.16.1 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 DG/S.

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 DG/S 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 <i>Switch</i> or <i>Brightness value</i> is mentioned, they also apply for the communication objects <i>Switch/Status</i> or <i>Brightness value/Status</i> .

3.2.1 Parameter window General

In this parameter window, the main parameter settings relevant for the entire DG/S 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 DG/S 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 DG/S 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 DG/S can be switched off.

- **yes:** If the DG/S 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 DG/S 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 DGS Software Tool. This can be remedied with the DGS Software Tool by adopting the DG/S or the ballast information.

If the DG/S 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 DG/S.

For further information see: [Planning and application](#), page 139

- **no:** The DG/S does not assign DALI addresses, neither in normal mode nor at gateway voltage recovery. Should a non-addressed DALI device be installed, the DG/S 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 DG/S 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 DG/S on the KNX. This cyclic telegram can be monitored by an external device. If a telegram is not received, the DG/S may be defective or the KNX cable to the transmitting DG/S 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 telegramsOptions: 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 DG/S sends a telegram via the respective communication object on the KNX.

- *no - acknowledge is not necessary:* As soon as the fault is remedied, the DG/S 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 DG/S.

Important

If the function *Staircase lighting* is used in the DG/S, 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 DG/S 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 DG/S. The corresponding setting is undertaken in the parameter window [- Gx Sequence](#), page 85. 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 60.

For further information see: [Sequence](#), page 165

- *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 DG/S 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 DG/S. The setting is undertaken in the parameter window [Staircase lighting](#), page 102 (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 60.

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

- *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.

The screenshot shows the 'A: Central' parameter window. On the left is a tree view with the following items: General, A: Central (selected), - A: Status, A: Group, G1 Group, - G1 Status, G2 Group, - G2 Status, G3 Group, - G3 Status, - G3 Fault, G4 Group, - G4 Status, - G4 Fault, and Additional information. The main area on the right is titled 'A: Central' and contains the following settings:

Brightness value when turned ON	100 % (255)
Permit channel to be turned on via dim telegram	yes
Allow switching OFF via Brightness value	yes
Allow switching OFF via Brightness value	yes
Dim period to reach turn on or off Brightness value (Object "Switch")	2 s
Dimming speed, time for 0...100 % (Object Relative dimming)	5.5 s
Dim period to reach set Brightness value (Object "Brightness value")	2 s
Enable function lamp Burn-in object "Burn-in lamps"	no

At the bottom of the window are buttons for OK, Cancel, Default, Info, and Help.

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 DG/S 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-orientated 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 DG/S 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 124 and [Code table for flexible dimming times](#) page 179

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 124 and [Code table for flexible dimming times](#) page 179

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 DG/S 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 60, 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 DG/S 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 124 and [Code table for flexible dimming times](#) page 179

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

Options: no
 yes

The DG/S 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 DG/S 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 60, 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 145

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 DG/S 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 70.

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

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 *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 send properties of the communication objects.

For further information see: [Common communication object for control telegram and status](#), page 155

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 DG/S 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 DG/S 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 DG/S, 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 121 and [Code table Fault Group/device code \(no. 104\)](#), page 175

- *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 orientated
 based on DALI device

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

- *group orientated*: 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.

A: Group

Enable Lighting group 1...4: yes

Enable Lighting group 5...8: no

Enable Lighting group 9...12: no

Enable Lighting group 13...16: no

DALI device will set automatically in group 16, if it is no member of an other group: no

Behaviour on different parameter settings in overlapping lighting groups:

Minimal Brightness value: lowest brightness of all lamps in the group

Maximum Brightness value: highest brightness of all lamps in the group

Brightness value on ballast Power on (ballast supply voltage): average brightness of all lamps in the group

Buttons: OK, Cancel, Default, Info, Help

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 DG/S. It has the same properties and functions as the lighting groups 1 to 15.
- *yes*: The DG/S 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 DG/S. 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 DGS Software Tool.

In order to control the lamps on the DG/S via the KNX, they must be assigned to a lighting group. The assignment is undertaken with the help of the [DGS Software Tool](#), page 185.

All lighting groups are indicated on the KNX. Control of the individual 64 DALI devices via the KNX is not possible with the DG/S 1.16.1.

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 DG/S. If a lighting group is assigned to another lighting group, the DG/S removes it again from group 16.

The DG/S 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-orientated DG/S 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 147

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 147

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 147

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 147

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 DGS Software Tool.

For further information see: [DGS Software Tool](#), page 185

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 147

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 DG/S by a download. Accordingly, the name is also available in the DGS 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-orientated DG/S 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. an ABB i-bus® Light Controller LR/S x.16.1. The parameter window [- Gx Slave](#), page 80, 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 85 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 DG/S is programmed in the parameter window [Sequence](#) on page 98. This parameter window is enabled if the parameter window [General](#) on page 34, 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 DG/S reacts like a “normal” group-orientated DG/S.

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*, it is 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

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.

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

If the 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 the communication object *Switch (Output A)*, and group-orientated 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 a central telegram, the last brightness values for the lighting group are retained without change.

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.

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

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 minimum dimming value of 20 %; lighting group 2 is parameterised with 10 %. If the DG/S receives a central telegram in this constellation: *to set the brightness value to 5 %*; lighting group 1 is set to 20 % and lighting group 2 is set to 10 %.

Note

With overlapping lighting groups, the properties for the dimming limits as parameterised in parameter window [A: Group](#), page 56, 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 56, changes during commissioning and DALI devices assigned thereafter are no longer automatically removed by the DG/S 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 171.

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 DG/S 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 56, 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 56, changes during commissioning and DALI devices assigned thereafter are no longer automatically removed by the DG/S 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 171.

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 41.

- *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 DG/S 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 124 and [Code table for flexible dimming times](#) page 179

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 124 and [Code table for flexible dimming times](#) page 179

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 DG/S 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 124 and [Code table for flexible dimming times](#) page 179

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
 linear 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 171

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 171

- *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 171

- *linear 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 171

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.

The screenshot shows the 'G1 Status' parameter window. On the left, a tree view lists various parameters, with 'G1 Status' highlighted. The main window area contains three dropdown menus, each currently set to 'no':
1. 'Status response of Switching state of the lighting group'
2. 'Status response of Brightness value of the lighting group'
3. 'Status response of lamp/ballast fault'
At the bottom of the window, there are five buttons: 'OK', 'Cancel', 'Default', 'Info', and 'Help'.

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 49, 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 155

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.

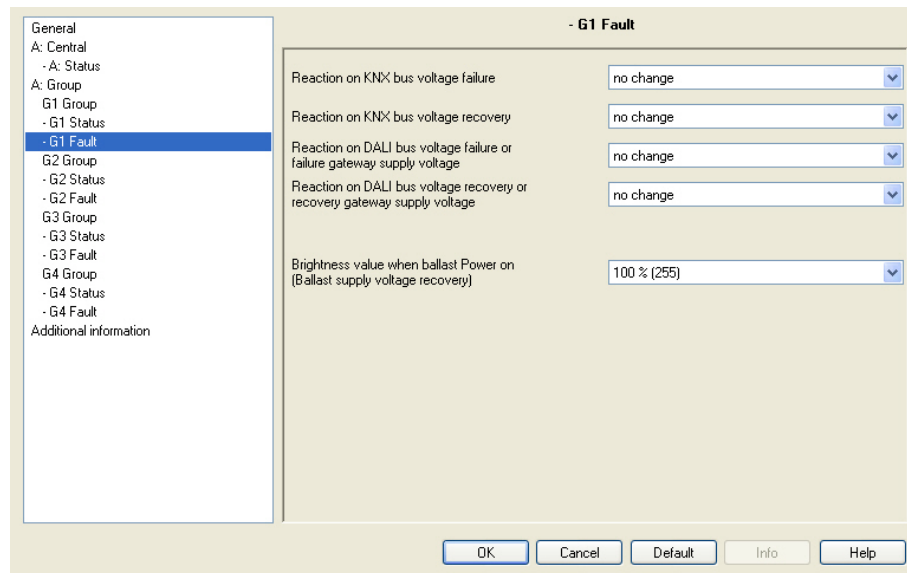
Note

In order to correctly detect a ballast fault, the function *Detect ballasts* must however be activated in the DG/S. Using this function, the DG/S notes the exact quantity of DALI devices currently connected to the DG/S 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 DGS 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 DG/S 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 DG/S on the DALI will once again receive responses from the ballast. As a result the DG/S 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 60, 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 DG/S can be integrated into a constant lighting control which is implemented for example, by an ABB i-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 DG/S 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 162

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 DG/S 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 DG/S 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 DG/S 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 DG/S 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 DG/S 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 75 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 75 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

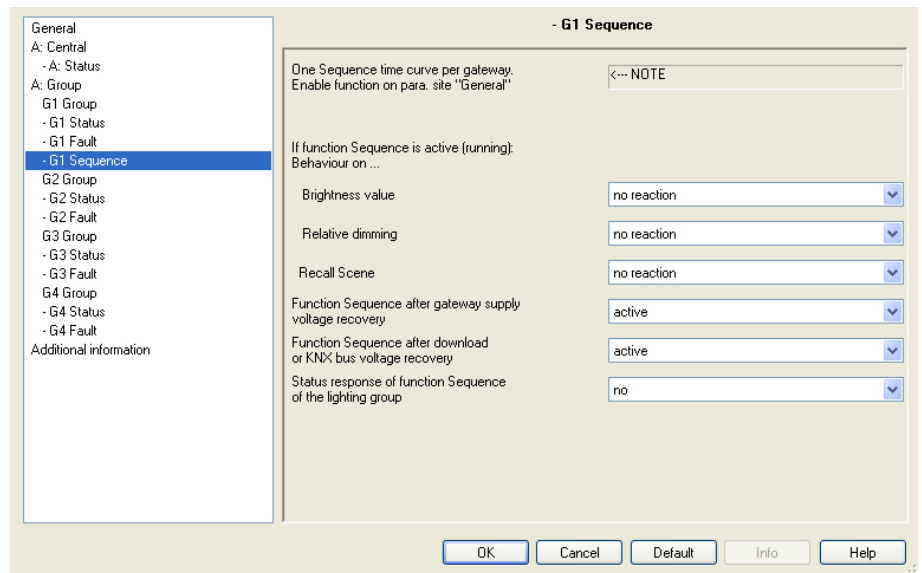
Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Switch/Status* communication objects, to eliminate mutual interference of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

For further information see: [Status response with overlapping lighting groups](#), page 150

- *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 60, if the parameter *Select additional function* has been set to the option *Sequence*.



The DG/S 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 DG/S. 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 60.

For further information see: [Sequence](#), page 165

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 DG/S 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 DG/S 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 DG/S 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 75 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 75 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

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 150

- *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 60, if the parameter *Select additional function* has been set with the option *Staircase lighting*.

The DG/S features a function *Staircase lighting* which can be triggered and stopped via individual switch telegrams of the individual lighting groups. For each DG/S a Staircase lighting sequence can be programmed which can be adjusted in the parameter window [Staircase lighting](#), page 102.

Note

The function *Staircase lighting* is comprised of two scenes. The DG/S automatically selects the internal scenes 13 and 14 when the function *Staircase lighting* is selected.

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

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 DG/S 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 DG/S 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 102.

Example

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 %).

**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 DG/S 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 DG/S 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 DG/S 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 75 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 75 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 75. 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

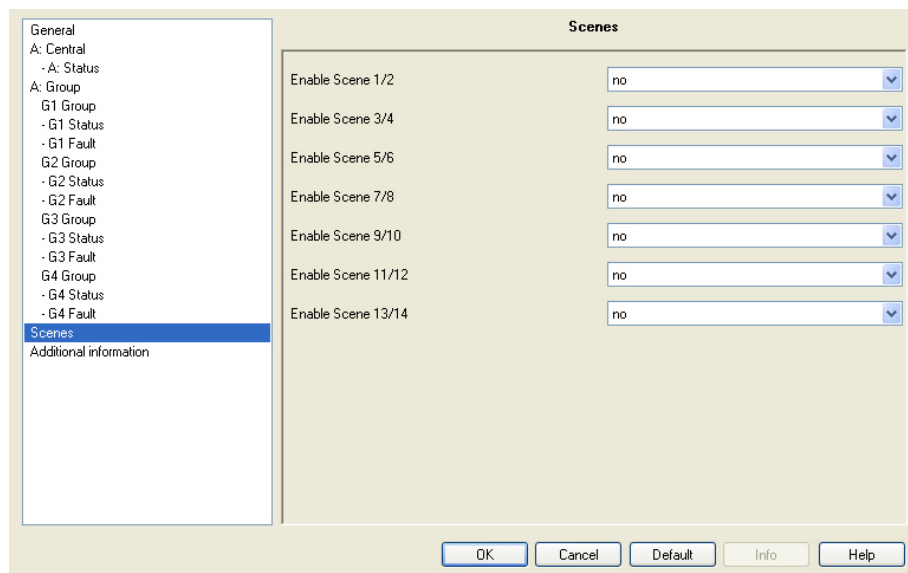
Unwanted switching states may result for lighting group devices due to differing status messages within a lighting group. For this reason, only one communication object should report the status in a lighting group with several *Activate Slave/Status* communication objects, to eliminate mutual interference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

For further information see: [Status response with overlapping lighting groups](#), page 150

- *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 34, the parameter function *Enable Scene* has been set with *yes*.



The DG/S 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 159

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 95, 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.

Example

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 179

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 DG/S to the maximum brightness.

Note
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)

Note
The options 100 % (255) to 0 % (OFF) 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 34, the *Enable sequence time curve (one curve per Gateway)* parameter is set with the option yes.

The DG/S 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 DG/S. 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 60.

For further information see: [Sequence](#), page 165

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 34 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 85.

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 85.
- 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 85.

Step x¹⁾

¹⁾ 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 DG/S 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 DG/S 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 179

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.

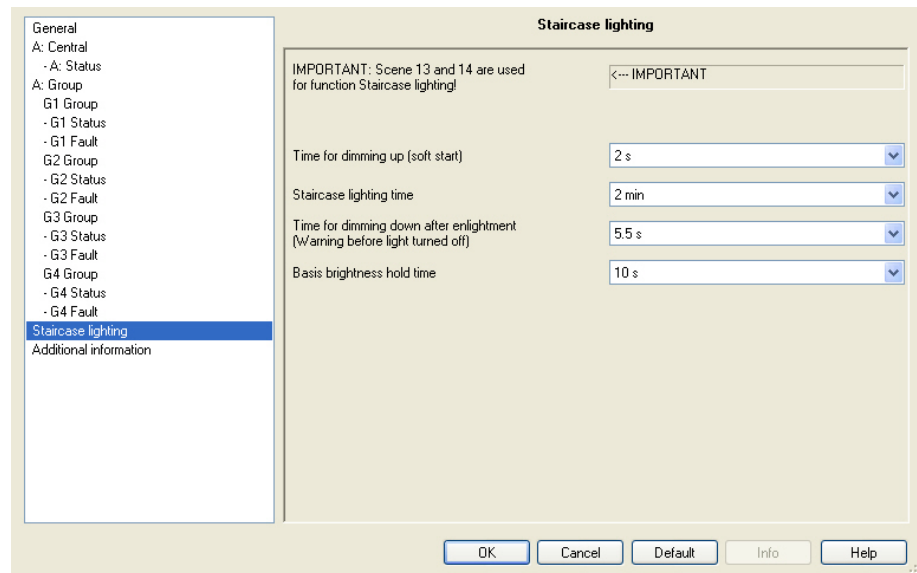
- *no*: No further sequence step is enabled.
- *yes*: A further sequence step is enabled.

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 34, the parameter *Define sequence time curve (one curve per Gateway)* has been set with the option *yes*.



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

Important

The function *Staircase lighting* is comprised of two scenes. The DG/S automatically selects the internal scenes 13 and 14 when the function *Staircase lighting* is selected.

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

One *Staircase lighting* sequence can be parameterised per DG/S. 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 89, 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 DG/S 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 DG/S 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 DG/S 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 89.

- *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 DG/S 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 89.
- *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 89.

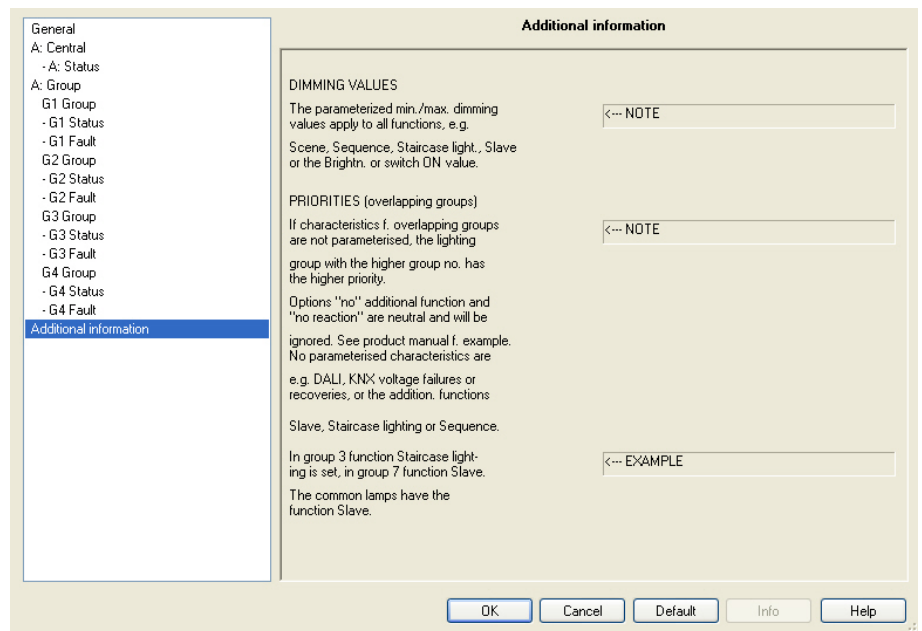
Basis brightness hold time

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-orientated DALI Gateway DG/S 1.16.1 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 DG/S

In order to obtain a quick overview of the function possibilities of the DG/S, 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 ¹⁾	Switch	Group x	1 bit (EIS 1) DPT 1.001	C, W

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 70, this can be parameterised.

¹⁾ The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
0, 6... 84, 90¹⁾	Switch/Status	Group x	1 bit (EIS 1) DPT 1.001	C, R, W, T
<p>The communication object is enabled if in parameter window - Gx Status, page 70, 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> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>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.</p> </div>				
1, 7 ... 85, 91¹⁾	Status switch	Group x	1 bit (EIS 1) DPT 1.001	C, R, T
<p>This communication object is enabled if in parameter window - Gx Status, page 70, 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>				
2, 8... 86, 92¹⁾	Relative dimming	Group x	4 bit (EIS 2) DPT 3.007	C, W
<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>				

¹⁾ The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
3, 9... 87, 93¹⁾	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 - Gx Group, page 60, 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</p> <p> ...</p> <p> 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 - Gx Status, page 70.</p>				
3, 9... 87, 93¹⁾	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 - Gx Status, page 70, the parameter <i>Status response of Brightness value of the lighting group</i> is set with the option yes: parameterised via object "<i>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</p> <p> ...</p> <p> 255 = 100 %</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</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>				

¹⁾ The numbers of the communication objects apply for lighting groups 1...16.


No.	Function	Object name	Data type	Flags
4, 10... 88, 94¹⁾	Status Brightness value	Group x	1 byte (EIS 6) DPT 5.001	C, R, T
<p>This communication object is enabled if in parameter window - Gx Status, page 70, the parameter <i>Status response of Brightness value of the lighting group</i> is set with the option <i>yes: via a separate object "Status Brightness value"</i>.</p> <p>Telegram value: 0 = OFF</p> <p> ...</p> <p> 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>				


¹⁾ 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	-

No.	Function	Object name	Data type	Flags
5, 11... 89, 95 ¹⁾	Fault lamp or ballast Fault ballast Fault lamp	Group x	1 bit (EIS 1) DPT 1.005	C, R, T
<p>Via this communication object, a fault can be displayed in lighting group x on the KNX via this communication object in parameter window - Gx Status page 70.</p> <p>This communication object is a variable communication object, which contains, according to its parameterisation, information about a ballast fault, a lamp fault or a combination of both faults.</p> <p>Telegram value 1 = fault of one or more DALI devices in the lighting group x 0 = no fault</p> <p><i>Ballast fault:</i> The failure of ballast in the lighting group is displayed.</p> <p>Loss of a ballast can be due to one of the following situations:</p> <ul style="list-style-type: none"> • 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 DG/S does not receive a status response • The ballast has lost its address, a query from the DG/S remains unanswered <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>In order to guarantee correct evaluation of a ballast fault, the DG/S has to know how many ballasts are to be monitored. This is implemented by activating the communication object <i>Detect ballasts</i> (no. 110) just once. Using this function the DG/S 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 <i>Detect ballasts</i> option should be activated.</p> <p>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.</p> <p>The function <i>Detect ballasts</i> can be triggered not only via the communication object <i>Detect ballasts</i>, but also manually by pressing the test button for more than five seconds. Furthermore, this function can be triggered with the soft key <i>Detect ballasts</i> in the <i>Options</i> window.</p> </div> <p><i>Lamp fault:</i> A defective lamp in the lighting group is indicated.</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 DG/S 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.</p> <p><i>Fault lamp or Fault ballast:</i> A fault in the lighting group is displayed if at least one lamp or ballast exhibits a fault. Both faults are logically linked in the DG/S with <i>OR</i>.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>The information about an individual DALI device is provided with a fault by the DG/S via coded diagnostics communication objects (no. 131).</p> </div>				

¹⁾ The numbers of the communication objects apply for lighting groups 1...16.

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 41, and [- A: Status](#), page 49.

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: Central, page 41.</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 DG/S receives an ON telegram, all DALI devices are set with the parameterised switch on threshold value.</p> <p>You can parameterise whether a DG/S 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-top: 10px;"> <p>Note</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: Status, page 49, 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-top: 10px;"> <p>Note</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	Status switch	Output A	1 bit (EIS 1) DPT 1.001	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>Status response of switching state of the lighting group</i> is set with the option yes: <i>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	Relative dimming	Output A	4 bit (EIS 2) DPT 3.007	C, W
<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	Brightness value	Output A	1 byte (EIS 6) DPT 5.001	C, W
<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: Central, page 41, 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	Brightness value/Status	Output A	1 byte (EIS 6) DPT 5.001	C, R, W, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>Status response of Brightness value of the DALI output</i> is set with the option <i>yes</i>: 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 DG/S 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>Note</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	Status Brightness value	Output A	1 byte (EIS 6) DPT 5.001	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>Status response of Brightness value of the DALI output</i> is set with the option <i>yes</i>: 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 DG/S 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	Fault lamp	Output A	1-Bit (EIS 1) DPT 1.005	C, R, T

This communication object is enabled if in parameter window [-A: Status](#), page 49, the parameter *Fault lamp* is set with the option *yes*.

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

Telegram value 1 = lamp fault (at least one of the connected DALI devices has sent a lamp fault)
 0 = No lamp fault

Note

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 DG/S will also be unable to detect a lamp fault. In order to monitor a lamp fault, the function *Detect ballasts* does not need to be explicitly activated. In most cases a lamp fault is only determined or indicated by the DG/S when the lighting equipment should be switched on. For this reason the DG/S cannot report a fault beforehand.

Using the communication object *Fault lamp* (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.

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

This communication object is enabled if in parameter window [-A: Status](#), page 49, 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 DG/S does not receive a status response
- The ballast has lost its address, a query from the DG/S remains unanswered

Note

In order to guarantee correct evaluation of a ballast fault, the DG/S 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 DG/S 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
103	Fault DALI	Output A	1-Bit (EIS 1) DPT 1.005	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>Fault DALI</i> is set with the option yes:</p> <p>Using this communication object, a DALI fault can be sent or read.</p> <p>There is a DALI fault if the short circuit persists for more than 500 ms.</p> <p>Telegram value: 1 = DALI fault of the DALI communication 0 = no DALI fault</p>				
104	Fault group/ device code	Output A	1 byte (Non EIS) Non DPT	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter "<i>Fault Group/device code</i>" enable encoded fault message is set with the option yes:</p> <p>Via this communication object the DG/S transfers the status of a fault or every lighting group or of each individual DALI device on the KNX. It can be parameterised whether the bit combination complies to a lighting group (0...15) or an individual DALI device (0...63).</p> <p style="padding-left: 40px;">Bit 0 to 5 = contains a binary number (0 to 15 or 0 to 64). This number corresponds to 1 added, to the number of the faulty lighting group or the faulty or the faulty DALI device.</p> <p style="padding-left: 40px;">Bit 6 = indicates a lamp fault</p> <p style="padding-left: 40px;">Bit 7 = indicates a ballast fault</p> <p>A logical 1 indicates the fault.</p> <p>For further information see: Code table Fault Group/device code, page 175</p> <p>The telegrams are sent immediately after detection of the fault. Should several faults occur at the same time, the telegrams are sent consecutively on the KNX. If a fault is remedied, this will also be indicated on the communication object <i>Fault Group/device code</i> (no. 104). The information will be retained in the communication object until the error status changes or a telegram with the value 1 is received on the object <i>Request status values</i> (no. 128). In this case, the fault state of the DALI device or the lighting group is displayed as contained in the communication object <i>No. Group/device fault</i> (no. 106).</p> <p>Note: The detection of the error state can take up to 90 seconds, depending on the situation.</p>				

No.	Function	Object name	Data type	Flags
105	Number of faults	Output A	1 byte (EIS 6) DPT 5.010	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>"Fault Group/device code" 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-orientated</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>				
106	No. Group/device fault	Output A	1 byte (EIS 6) DPT 5.010	C, R, T
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>"Fault Group/device code" 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-orientated</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>				
107	Switch up next fault alarm	Output A	1 byte (EIS 1) DPT 1.008	C, W
<p>This communication object is enabled if in parameter window - A: Status, page 49, the parameter <i>"Fault Group/device code" 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>				

No.	Function	Object name	Data type	Flags
108	Disable sending of fault alarm	Output A	1 bit (EIS 1) DPT 1.003	C, W
<p>With this communication object, it is possible to disable the fault messages (lamp or ballast fault) of the DG/S. If the fault messages are inhibited, the DG/S 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.</p> <p>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> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</p> <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 (DG/S). In this case, the DG/S 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 DG/S. 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> </div>				

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 41, 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
110	Detect ballasts	Output A	1 bit (EIS 1) DPT 1.010	C, W

Using this communication object the current state for the DG/S can be stored as the reference state.

In order to correctly detect a ballast fault, the DG/S 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 DG/S has received a detection telegram (with value 1 via this communication object. The DG/S notes the current system configuration as a reference state. For this purpose all DALI addresses are stored in the DG/S. Should a DALI address now be lost, e.g. by a ballast fault, cable break, etc., this is interpreted by the DG/S 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

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

No.	Function	Object name	Data type	Flags
111	Burn-in Lamps	Output A	1 bit (EIS 1) DPT 1.010	C, W
<p>This communication object is enabled if in parameter window A: Central page 41, the parameter <i>Enable lamp burn-in function object "Burn-In Lamps"</i> is set with the option <i>yes</i>: With this communication object, the function <i>Burn-In</i> 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 60, with the parameter <i>Enable with burn-in function (Object "Burn-In Lamps")</i>. Incoming telegrams have an effect on all lighting groups which are intended for burn-in purposes.</p> <p>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 <i>Burn-In Lamps</i> during the burn-in time, the period restarts from the beginning.</p> <p>A telegram with the value 0 deactivates the function <i>Burn-in</i> 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.</p> <p>Telegram value: 1 = activate functions 0 = deactivate functions</p> <p>For further information see: Burn-in of lamps, page 145</p>				

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 34, 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 95. 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 34, 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): MOSS 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 180

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

This communication object is enabled if in parameter window [Scenes](#), page 95, the respective scenes have been enabled.

A telegram, which is received via the communication object from the DG/S, 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 96. 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	Store 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 95, the respective Scenes have been enabled.

A telegram, which is received via this communication object from the DG/S, causes the DG/S 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.

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)

The scene which is set manually once via the KNX can be protected against overwriting with a download by setting the option *no* for *Overwrite scene on download* in the parameter window [Scene x](#), page 96. 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.

Note

Not all 16 lighting groups are considered when saving. Only the lighting groups which belong to the scene are considered.


Thus, for example, the lamp groups in adjacent rooms which are not part of the scene are not changed.

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	Block manual Operation/Status	General	1 bit (EIS 1) DPT 1.002	C, R, W, T
<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 DG/S. Furthermore, the function <i>Detect ballasts</i> is no longer possible via a long button push (> 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	Request status values	General	1 bit (EIS 1) DPT 1.017	C, W
<p>This communication object is enabled if in parameter window General, page 34, 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	Acknowledge faults	General	1 bit (EIS 1) DPT 1.015	C, W
<p>This communication object is enabled if in parameter window General, page 34, 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	Fault Gateway supply	General	1 bit (EIS 1) DPT 1.005	C, R, T																																									
<p>This communication object is enabled if in parameter window General, page 34, the parameter <i>Fault Gateway supply voltage</i> is set with the option <i>yes</i>:</p> <p>If the gateway operating voltage fails for more than five seconds, a fault message telegram is sent immediately.</p> <p>Telegram value: 0 = no fault 1 = fault</p>																																													
131	Diagnostics	General	2 byte (Non EIS) Non DPT	C, R, T																																									
<p>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 <i>Diagnostics</i> should be observed together with the communication object <i>Request Diagnostics</i> (no. 132).</p> <p>After receipt of a telegram on the communication object <i>Request Diagnostics</i> the DG/S automatically sends the information via the communication object <i>Diagnostics</i> 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 <i>Request Diagnostics</i> (no. 132) is repeated in bit 0 to bit 7.</p> <table><thead><tr><th>Dest. addr</th><th>Data</th><th>Destination</th><th>R</th><th>DPT</th></tr></thead><tbody><tr><td>1/1/132</td><td>\$01</td><td>Request Diagnostics</td><td>6</td><td>8-Bit Unsigned Value</td></tr><tr><td>1/1/131</td><td>14 01</td><td>Diagnostics</td><td>6</td><td>2-Octet Unsigned Value</td></tr><tr><td>1/1/132</td><td>\$02</td><td>Request Diagnostics</td><td>6</td><td>8-Bit Unsigned Value</td></tr><tr><td>1/1/131</td><td>04 02</td><td>Diagnostics</td><td>6</td><td>2-Octet Unsigned Value</td></tr></tbody></table> <div><div></div><div>High Byte Low Byte</div></div> <p>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.</p> <p>The following numbering applies for the following list:</p> <div><div>High Byte</div><div>Low Byte</div></div> <table><tr><td>2¹⁵</td><td>2¹⁴</td><td>2¹³</td><td>2¹²</td><td>2¹¹</td><td>2¹⁰</td><td>2⁹</td><td>2⁸</td><td>2⁷</td><td>2⁶</td><td>2⁵</td><td>2⁴</td><td>2³</td><td>2²</td><td>2¹</td><td>2⁰</td></tr></table> <p>The bit number is identical with the exponent of the bit, e.g. number 2 complies with 2².</p> <p>Bit 0...7 corresponds with the information as queried in the communication object <i>Request Diagnostics</i> (No 132). The content identifies the DALI device or the lighting group for which information has been requested. Bit 6 (2⁶) - determines if a group (value 1) or an individual device (value 0) has been recalled.</p> <p>Bit 7 contains a 0.</p> <p>Bit 8...15 contains the following coded information concerning the recalled DALI device or recalled lighting group:</p>					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	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
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																																									
2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰																														

No.	Function	Object name	Data type	Flags
continued no. 131				
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		
The communication object receives the value FF FF hex after a KNX voltage recovery (power on) on the DG/S. After download or gateway operating voltage failure, the last value called after the KNX bus voltage recovery remains.				
For further information see: Diagnostics code table, page 182				

No.	Function	Object name	Data type	Flags
132	Request Diagnostics	General	1 byte (Non EIS) Non DPT	C, W
<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 DG/S via the communication object <i>Request Diagnostics</i>.</p> <p>The DG/S 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>For further information see: Request Diagnostics code table, page 181</p>				
133	In operation	General	1 bit (EIS 1) DPT 1.002	C, T
<p>This communication object is enabled, if in parameter window General, page 34, 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 DG/S 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 60 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 ¹⁾	Activate function <i>Slave</i>	Group x	1 bit (EIS1) DPT 1.003	C, W
<p>This communication object is enabled if in parameter window Gx Group, page 60, 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-orientated DG/S without function <i>Slave</i>. The function <i>Slave</i> can be reactivated, if a telegram with the value 1 is received on the DG/S 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 - Gx: Slave page 80, 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-top: 10px;"> <p>Note</p> <p>With selected function <i>Slave</i>, the DG/S 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 ¹⁾	Activate <i>Slave</i>/Status	Group x	1 bit (EIS1) DPT 1.003	C, W, R, T
<p>This communication object is enabled, if in parameter window Gx Group, page 60, the additional function <i>Slave</i> is enabled and simultaneously in parameter window - Gx Slave, page 80, the parameter <i>Status response of slave function</i> has been set with option yes: via object <i>Activate Slave/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>				

¹⁾ The numbers of the communication objects apply for lighting groups 1...16.

No.	Function	Object name	Data type	Flags
3, 9... 87, 93¹⁾	Brightness value or Brightness value/Status	Group x	1 byte (EIS 6) DPT 5.001	C, W, T C, W, R, T
<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 - Gx Slave, page 80.</p>				
4, 10... 88, 94¹⁾	Brightness value of Slave	Group x	1 byte (EIS 6) DPT 5.001	C, W
<p>This communication object is enabled if in parameter window Gx Group, page 60, 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 - Gx: Slave, page 80 Fehler! Es wurde kein Textmarkenname vergeben., 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> ...</p> <p> 255 = 100 %</p>				

¹⁾ 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 60, 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 ¹⁾	Activate function Sequence	Group x	1 bit (EIS1) DPT 1.003	C, W
<p>This communication object is enabled if in parameter window Gx Group, page 60, the additional function <i>Sequence</i> is enabled.</p> <p>This communication object is used for activation/deactivation of the function <i>Sequence</i>. With deactivation the lighting group behaves like a “normal” lighting group of the group-orientated DG/S without function <i>Sequence</i>. The function <i>Sequence</i> can be reactivated if a telegram with the value 1 is received on the DG/S 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>Sequence</i> is deactivated, current brightness is retained 1 = <i>Sequence</i> is activated and started simultaneously</p> <p>As long as function <i>Sequence</i> is activated, the <i>Sequence operation</i> 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 - Gx Sequence page 85, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function <i>Sequence</i>.</p> <p>For further information see: parameter window Sequence, page 98, or Sequence, page 165.</p>				
1, 7 ... 85, 91 ¹⁾	Activate Sequence/Status	Group x	1 bit (EIS1) DPT 1.003	C, W, R, T
<p>This communication object is enabled if in parameter window Gx Group, page 60, the additional function <i>Sequence</i> is enabled and simultaneously in parameter window - Gx Sequence, page 85, the parameter <i>Status response of sequence mode of the lighting group</i> is programmed with the option <i>yes: via object "Activate Sequence/ Status"</i>.</p> <p>In this case the status of the function <i>Sequence</i> is sent via this communication object on the KNX in addition to the functions described above.</p>				

¹⁾ 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 60, 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 ¹⁾	Activate Staircase lighting	Group x	1 bit (EIS1) DPT 1.003	C, W
<p>This communication object is enabled if in parameter window Gx Group, page 60, 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-orientated DG/S 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 DG/S 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 - Gx Staircase lighting page 89, you can parameterise if a switch, brightness value, relative dimming or scene telegram interrupts the function <i>Staircase lighting</i>.</p> <p>For further information see: parameter window Staircase lighting, page 102, or Staircase lighting, page 156</p>				
1, 7... 85, 91 ¹⁾	Act. Staircase lighting/Status	Group x	1 bit (EIS1) DPT 1.003	C, W, R, T
<p>This communication object is enabled if in parameter window Gx Group, page 60, the additional function <i>Staircase lighting</i> is enabled and simultaneously in parameter window - Gx Staircase lighting, page 89, the parameter <i>Status response of staircase mode of lighting group</i> has been set with option yes: 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>				

¹⁾ 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-orientated DALI Gateway DG/S 1.16.1.

4.1 Automatic DALI addressing

In order to better appreciate the functionality of the DG/S, the addressing of the DG/S is described in this chapter.

For the DG/S 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 DG/S 1.16.1 does not automatically allocated DALI addressing for DALI equipment if in parameter window General on page 34, 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 DG/S, 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 DG/S, 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 DG/S, 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 DG/S, may receive a new address.

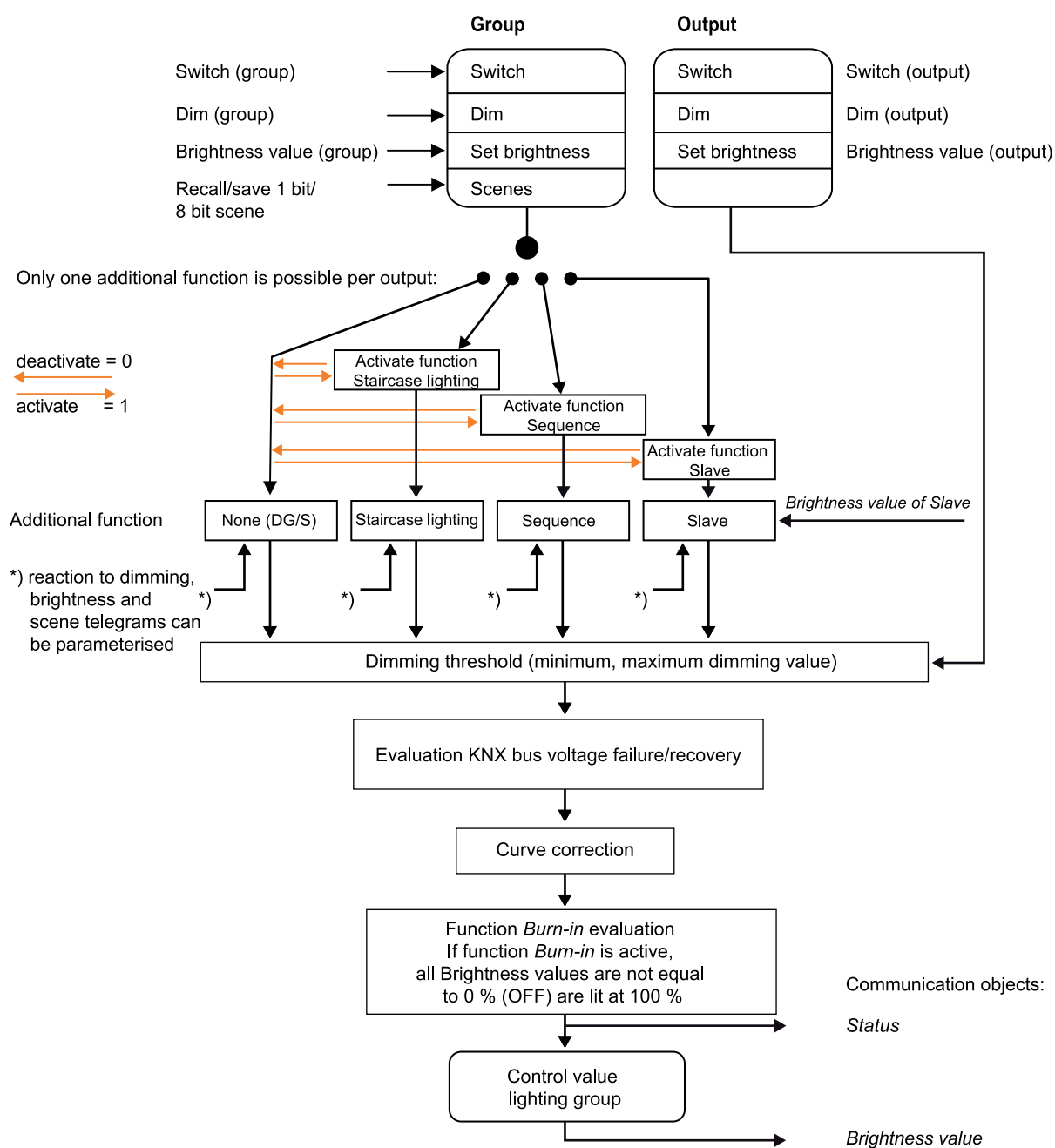
With the DG/S 1.16.1, you can now control the connected DALI devices with the communication objects *Output A* via the KNX without additional DALI group assignment.

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 DGS Software Tool.

For further information see: Description [DGS Software Tool](#), page 185

4.2 Function chart

The function chart indicates the sequence in which the functions of the DG/S 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 DG/S 1.16.1 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 DG/S 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 105.
 - 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 105.
- 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 DG/S 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 DG/S establishes automatically how many ballasts are connected. The DG/S 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 DG/S for longer than five seconds. In the DG/S Software Tool it is also possible to trigger detection of the ballasts.

Note
<p>In order to detect a lamp malfunction it must be sent by the DALI device on the DALI control line.</p> <p>This is generally supported by the DALI ballasts. DALI dimmers and DALI switch actuators often do not have this characteristic.</p> <p>The function can be found in the technical data of the DALI device or by consulting the manufacturer of the lamps.</p>

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 DG/S, and can assume the functions of the failed DALI device with the same technical characteristics.

Note
The parameter <i>Set DALI addressing automatically</i> in parameter window General , page 34, 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 DG/S 1.16.1.

The DG/S 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 DG/S, 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 DG/S, may receive a new address.

With the [DGS Software Tool](#), page 185, 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 DG/S 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 DG/S 1.16.1 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 DG/S 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 60, 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 DG/S 1.16.1 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 DG/S 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 DG/S, 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 DG/S 1.16.1 using the [DGS Software Tool](#) on page 185. Using the DG/S, 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 60, 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).

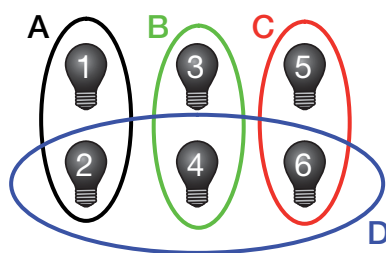
Property	G1	G2	L1	L2	L3
Function <i>Slave</i>	x		X		
Function <i>Staircase lighting</i>		x		X	X
KNX voltage failure	100 %	1 %	100 %	1 %	1 %
KNX voltage recovery	OFF	100 %	OFF	100 %	100 %
Slave	X	X	X	X	X
Reaction to dimming telegram	none	Goes to standby	None	Goes to standby	Goes to standby
Reaction to 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:

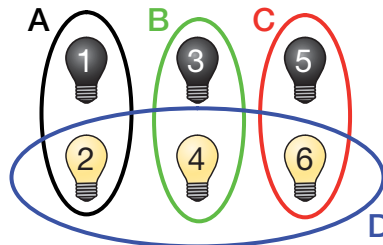
Device 2, 4 and 6

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 70 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 152

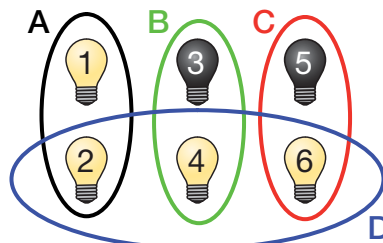
The switch status has been parameterised so that an ON status is displayed if at least one lamp of the lighting group is switched on. Only if all lamps are OFF is the status of the lamp group also OFF. Parameterisation is undertaken individually for every lamp group in the parameter window [- Gx Status](#), page 70.

Example**Group D is switched on with 100 %:**

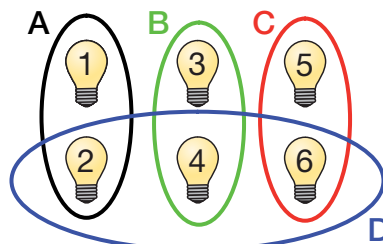
Status Brightness value A: 50 %^{*)}
 Status Brightness value B: 50 %^{*)}
 Status Brightness value C: 50 %^{*)}
 Status Brightness value D: 100 %

^{*)} $(0 \% + 100 \%) / 2 = 50 \%$

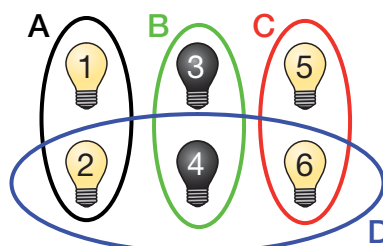
Switching status of all lighting groups is ON

Group A is switched on with 100 %:

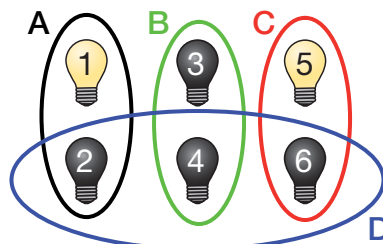
Status Brightness value A: 100 %
 Status Brightness value B: 50 %
 Status Brightness value C: 50 %
 Status Brightness value D: 100 %
 Switching status of all lighting groups is ON

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 %^{*)}
 Status Brightness value B: 0 % (OFF)
 Status Brightness value C: 50 %^{*)}
 Status Brightness value D: 0 % (OFF)

^{*)} $(100 \% + 0 \%) / 2 = 50 \%$

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 DG/S you can parameterise which dimming limits apply for these DALI devices. Parameterisation is undertaken in the parameter window [A: Group](#), on page 56 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.

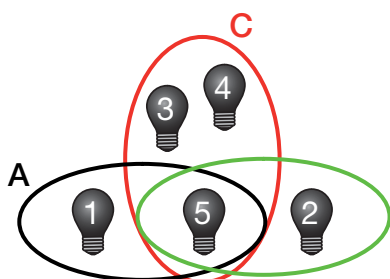
The dimming thresholds (minimum and maximum dimming value) relate to the individual DALI devices of the lighting group and only have an effect on the status response of the lighting group via their brightness value. A direct effect (limitation) on the status feedback of the lighting groups is not present. 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

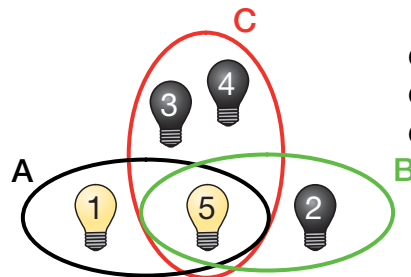
Lighting group A: device 1 and 5, dimming thresholds ^{*)}	1...100 %
Lighting group B devices 2 and 5, dimming threshold ^{*)}	20...80 %
Lighting group C: devices 3, 4 and 5, dimming threshold ^{*)}	30...70 %



Status Brightness value A: 0 %^{*)}
 Status Brightness value B: 0 %^{*)}
 Status Brightness value C: 0 %^{*)}

^{*)} 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 % ^{*)}
Max. Brightness value	100 %	80 %	70 %	70 %	100 % ^{**)}
Brightness value	100 %	OFF	OFF	OFF	100 %

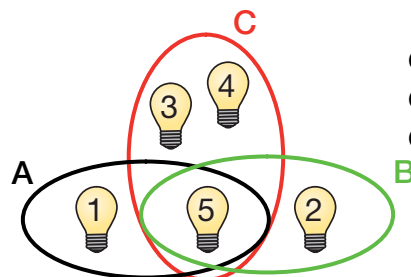
^{*)} Minimum of (1 %, 20 % and 70 %) = 1 %

^{**)} Maximum of (100 %, 80 % and 70 %) = 100 %

	A	B	C	Output A
Status Brightness value	100 %	50 % ¹⁾	33 % ²⁾	40 % ³⁾

¹⁾ (100 % + 0 %) / 2 = 50 %, ²⁾ (100 % + 0 % + 0 %) / 3 = 33 %

³⁾ (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 % ^{*)}
Max. Brightness value	100 %	80 %	70 %	70 %	100 % ^{**)}
Brightness value	100 %	80 %	70 %	70 %	100 %

^{*)} Minimum of (1 %, 20 % and 70 %) = 1 %

^{**)} Maximum of (100 %, 80 % and 70 %) = 100 %

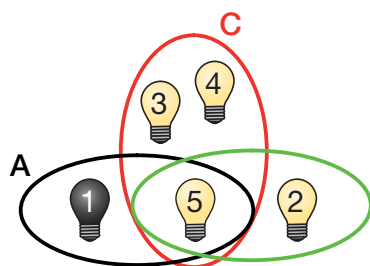
	A	B	C	Output A
Status Brightness value	100 % ¹⁾	90 % ²⁾	80 % ³⁾	84 % ⁴⁾

¹⁾ (100 % + 100 %) / 2 = 100 %

²⁾ (80 % + 100 %) / 2 = 90 %

³⁾ (70 % + 70 % + 100 %) / 3 = 80 %

⁴⁾ (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 %

Min. Brightnessvalue	1 %	20 %	30 %	30 %	1 % ^{*)}
Max. Brightness value	100 %	80 %	70 %	70 %	100 % ^{**)}
Brightness value	OFF	20 %	30 %	30 %	10 %

^{*)} Minimum of (1 %, 20 % and 70 %) = 1 %^{**)} Maximum of (100 %, 80 % and 70 %) = 100 %

	A	B	C	Output A
Status Brightness value	5 % ¹⁾	15 % ²⁾	23 % ³⁾	18 % ⁴⁾

¹⁾ (0 % + 10 %) / 2 = 5 %²⁾ (20 % + 10 %) / 2 = 15 %³⁾ (2x30 % + 10 %) / 3 = 23 %⁴⁾ (0 % + 20 % + 2x30 % + 10 %) / 5 = 18 %

4.8 Common communication object for control telegram and status

The DG/S 1.16.1 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.

Communication object no.	Name	Group assignment
1	Switch/Status	Group 1 1/1/4 ^{*)} , 1/1/1
6	Switch	Group 2 1/1/1
12	Switch	Group 3 1/1/1
*) Set send		

KNX groups

1/1/1	Switch lights
1/1/4	Status lights

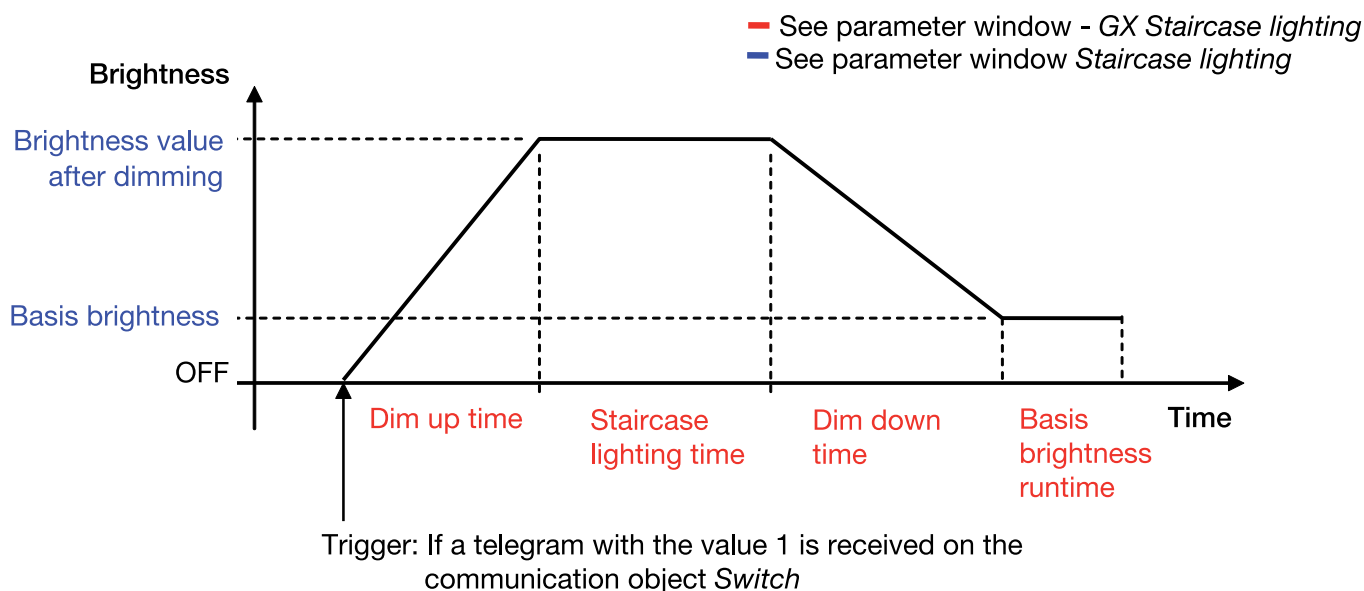
4.9 Staircase lighting

The DG/S 1.16.1 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 DG/S 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 DG/S. The parameterisation is undertaken in the parameter window [Staircase lighting](#), page 102. This is enabled in parameter window [General](#), page 34, 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 89. 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 89. 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 DG/S 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
Download (start)			Such as KNX voltage failure				
Download (end)			Such as KNX voltage recovery				
KNX	Voltage failure	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.			
	Voltage recovery	Programmable: - Operation: - <i>Gx Staircase lighting</i> - Brightness value: - <i>Gx Fault</i>					
DALI or gateway operation	Voltage failure	Programmable: - Brightness value: - <i>Gx Fault</i>					
	Voltage recovery	Programmable: - Operation: - <i>Gx Slave</i> - Brightness value: - <i>Gx Fault</i>					
<i>Switch</i>		ON	Brightness value when turned ON	→ Active and starts Staircase lighting	no reaction	Holding phase, new start	Staircase lighting is restarted
		OFF	OFF	OFF	Goes to dimming down phase		no reaction
<i>Relative dimming</i>			Dimming	Programmable: - no reaction - goes to standby and brightness value is dimmed down			
<i>Set brightness value</i>			Brightness value	Programmable: - no reaction - goes to standby and brightness value is set			
<i>Activate staircase lighting</i>		0	no reaction	→ goes to inactive	→ goes to inactive, brightness value is retained		
		1	→ Activated, and starts Staircase lighting	→ Activated, and starts Staircase lighting	Restarts Staircase lighting		
<i>Recall scene</i>			Scene is carried out	Scene is carried out	Programmable: - no reaction - goes to standby and scene is carried out		

4.10 Scene

The DG/S 1.16.1 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 96, 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 180

Note

The light scene settings remain stored in the DG/S 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

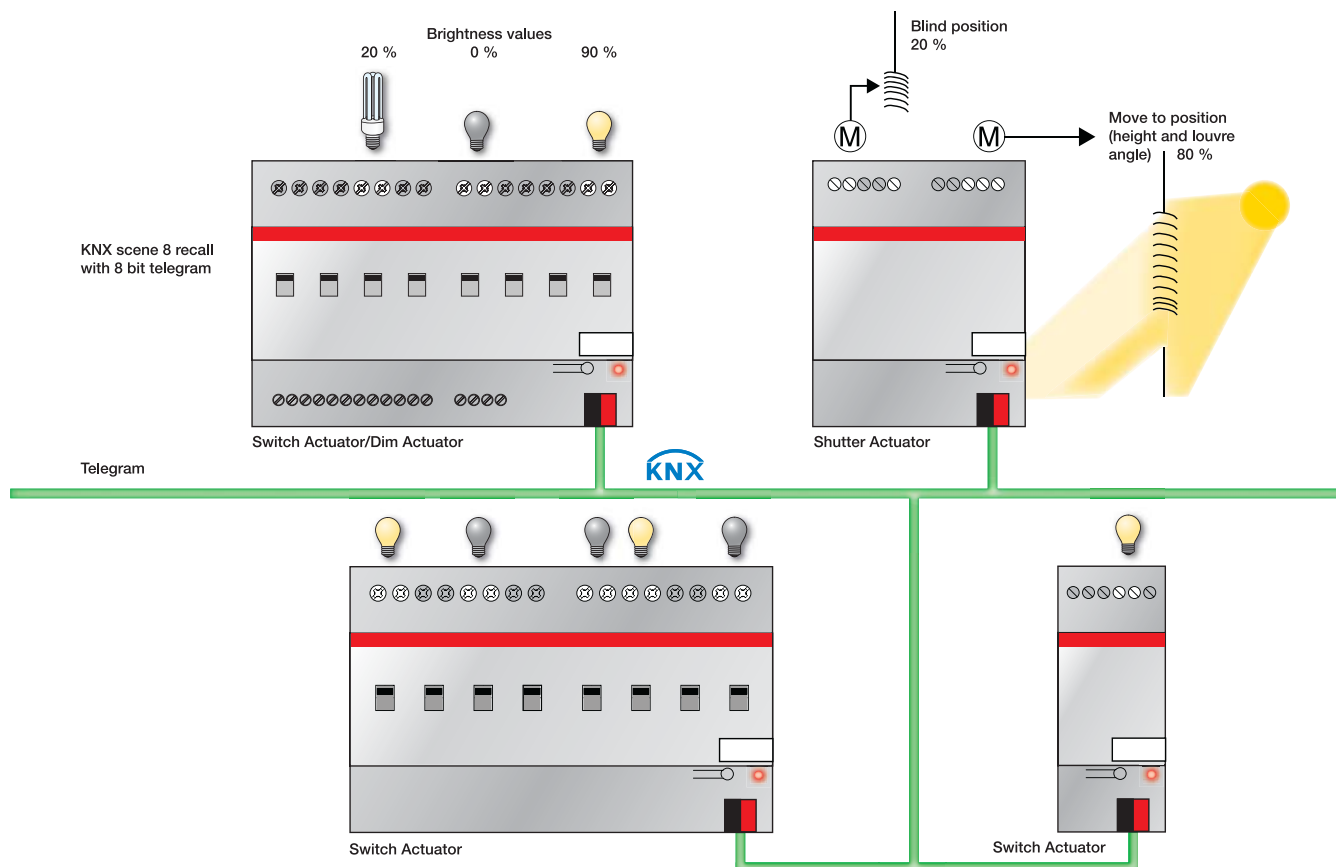
- **Gx Fault**, page 75.

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 ABB i-bus® devices. The following devices are used in the room:

- Switch actuator for the basis lighting,
- Shutter actuator for shading,
- DG/S 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 DG/S 1.16.1.

For further information see: [Code table scene 8 bit scene](#), page 180

4.11 Slave

If the function *Slave* is activated, the lighting group of the DG/S 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 DG/S 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 DG/S. The standby operation is exited if the DG/S 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 80, 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 60.

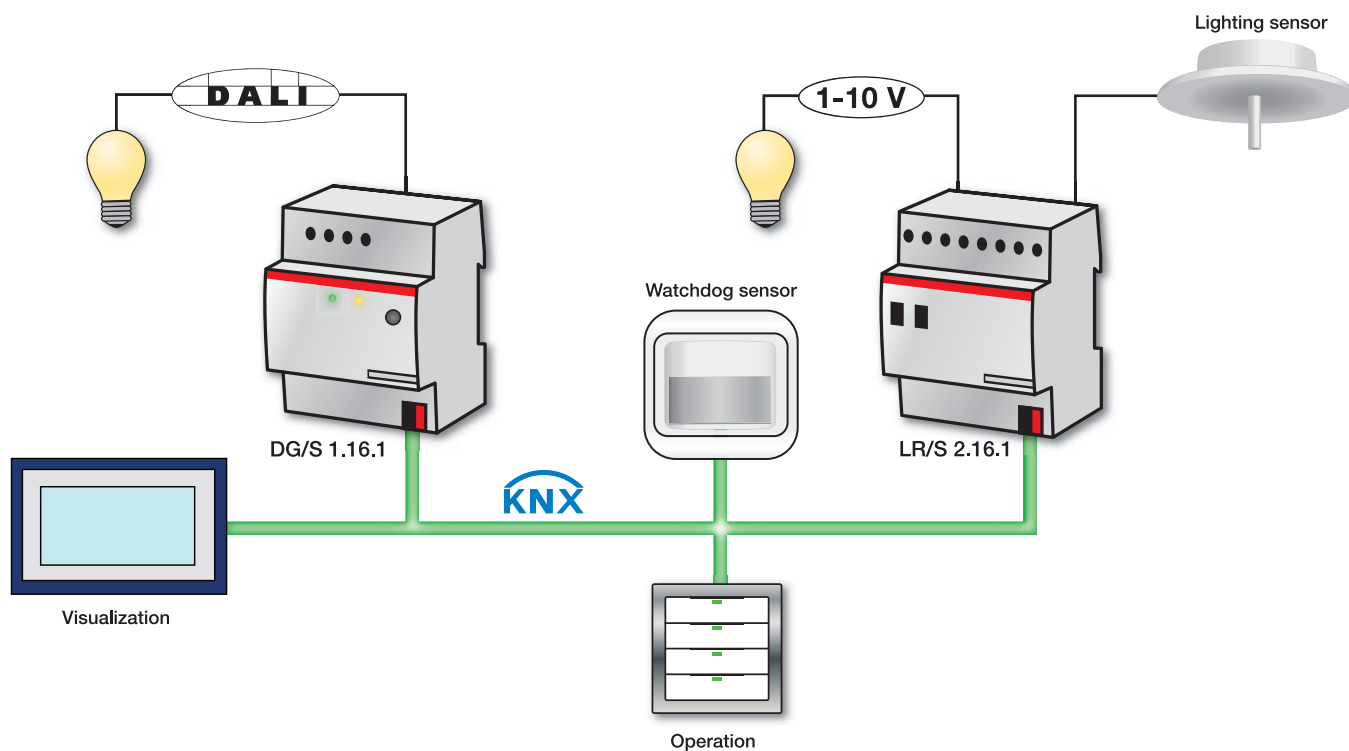
The undershoot and overshoot of these values are set using the parameterised minimum or maximum brightness value. If the master sends the brightness value 0, the lighting is switched off.

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 80, and the brightness value of the lighting group after KNX voltage recovery can be adjusted in the parameter window [- Gx Fault](#), page 75. 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

An integration of further ABB i-bus® components in the light controller can typically appear as follows:



4.12 Sequence

The DG/S 1.16.1 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 DG/S.

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 96 which has to be enabled via the parameter *Enable Scene* in the parameter window [General](#), page 34 and [Scenes](#), page 95.

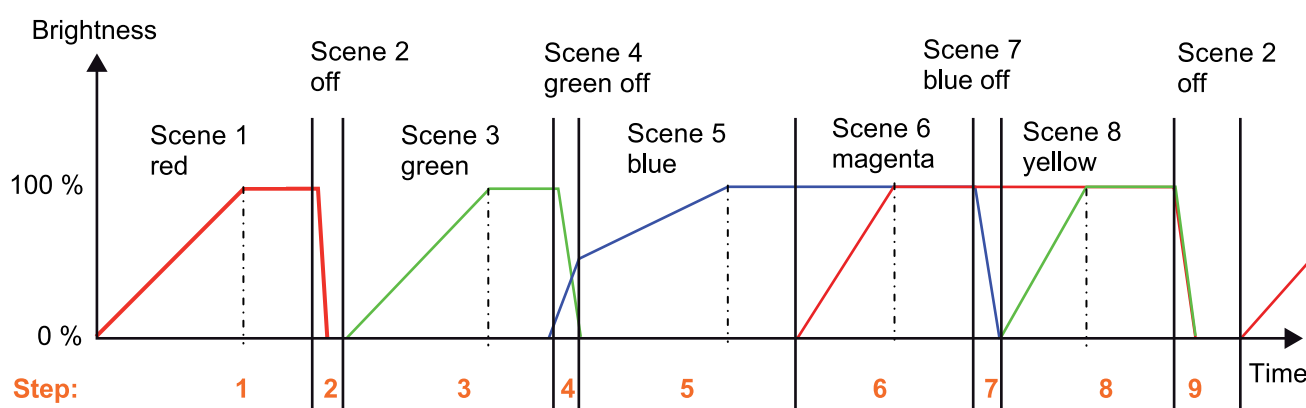
The timing of the function *Sequence* is defined in the parameter window [Sequence](#), page 98. The Sequence in which the Scenes are recalled after one another is also determined there. In Sequence operation a Scene can be used several times. The parameter window [Sequence](#), page 98 is enabled if in parameter window [General](#), page 34, the parameter *Define sequence time curve (one curve per Gateway)* is set. Only one time dependent sequence can be set for each DG/S. 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 98:

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:

Sequence

Number of cycles (0...255, 0 = not limited): 3

Step 1: Scene 1, Transition time: 45 s, Runtime: 1 min, Enable next sequence step assignments: yes

Step 2: Scene 2, Transition time: 1 s, Runtime: 1 s, Enable next sequence step assignments: yes

Step 3: Scene 3, Transition time: 45 s, Runtime: 1 min, Enable next sequence step assignments: yes

Step 4: Scene 4, Transition time: 1 s, Runtime: 1 s, Enable next sequence step assignments: yes

Step 5: Scene 5

Buttons: OK, Cancel, Default, Info, Help

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
Group 1 Scene value (red)	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
Group 2 Scene value (green)	0 % (OFF)	0 % (OFF)	100 % (255)	0 % (OFF)	0 % (OFF) or unchanged	0 % (OFF) or unchanged	0 % (OFF) or unchanged	100 % (255)
Group 3 Scene value (blue)	0 % (OFF)	0 % (OFF)	0 % (OFF) or unchanged	50 % (128)	100 % (255)	100 % (255)	0 % (OFF)	0 % (OFF)
Function	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 image shows two screenshots of the KNX scene configuration software. The top screenshot is for 'Scene 1' and the bottom screenshot is for 'Scene 6'. Both windows have a left sidebar with a tree view containing 'General', 'A: central', 'A: group', 'G1 group', 'G1 Status', 'G1 Fault', 'G2 group', 'G2 Status', 'G2 Fault', 'G3 group', 'G3 Status', 'G3 Fault', 'G4 group', 'G4 Status', 'G4 Fault', 'Scenes', and 'Additional informations'. The 'Scenes' folder is expanded, and the selected scene is highlighted. The main area of each window contains the following parameters:

- Transition time for light scene: 2 s
- Overwrite scene on download: yes
- Group 1 brightness value of scene: no change (no member in this scene)
- Group 2 brightness value of scene: no change (no member in this scene)
- Group 3 brightness value of scene: no change (no member in this scene)
- Group 4 brightness value of scene: no change (no member in this scene)
- Group 5 brightness value of scene: 100 % (255)
- Group 6 brightness value of scene: 0 % (OFF)
- Group 7 brightness value of scene: 0 % (OFF)
- Group 8 brightness value of scene: no change (no member in this scene)

At the bottom of each window 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

1 DG5_1161

0 extra functions

0 sequence call

1 sequence active

Object	Device	Sending
24: Group 5 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	S
30: Group 6 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	S
36: Group 7 - Switch	2.1.1 DG/S 1.16.1 DALI-Gateway, 16 Groups, 1f	S

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 DG/S 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 85. 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 85.

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
Download (start)			Such as KNX voltage failure			
Download (end)			Such as KNX voltage recovery			
KNX	Voltage failure		Programmable: - Brightness value: - <i>Gx Fault</i>			
	Voltage recovery		Programmable: - Operation: - <i>Gx Sequence</i> - Brightness value: - <i>Gx Fault</i>			
DALI or gateway operation	Voltage failure		Programmable: - Brightness value: - <i>Gx Fault</i>			
	Voltage recovery		Programmable: - Operation: - <i>Gx Sequence</i> - Brightness value: - <i>Gx Fault</i>			
<i>Switch</i>		ON	Brightness value when turned ON	Sequence is started	Sequence is restarted	
		OFF	OFF	OFF	Sequence is stopped	→ Standby and OFF
<i>Relative dimming</i>			DIMMING	DIMMING	Programmable: - no reaction - goes to standby and dims	
<i>Set brightness value</i>			Brightness value	Brightness value	Programmable: - no reaction - goes to standby and Brightness value is set	
<i>Activate function Sequence</i>		0	no reaction	→ Inactive, Brightness value unchanged	Sequence remains stationary and state changes to → inactive	
		1	→ Active, Sequence is started	Sequence is started	Sequence is restarted	
<i>Recall scene</i>			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.

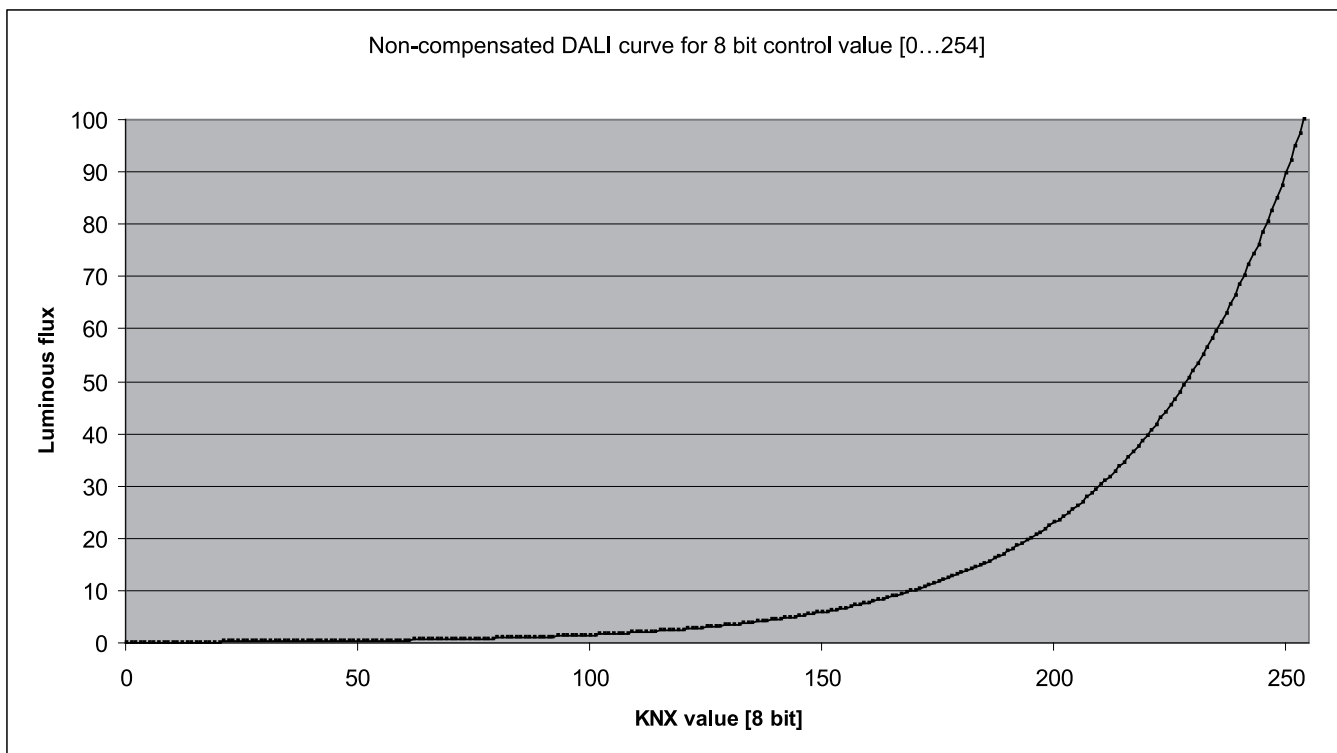
The luminous flux describes the lighting power emitted from a light source in all directions. The unit is stated in lumens (lm).

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):

$$X(n) = 10^{\frac{n-1}{253/3}-1} \quad \left| \frac{X(n) - X(n+1)}{X(n)} \right| = \text{const.} = 2.8 \%$$

$n = 1 \dots 254$ (digital Control value)

The following characteristic thus results:



E	KNX status brightness value	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	255
D	Luminous flux [%]	0	0.1	0.5	1	3	5	10	20	30	40	50	60	70	80	90	100
C	DALI value	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	254
B	KNX value	0	1	60	85	126	144	170	195	210	220	229	235	241	246	250	255
A	KNX value [%]	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 DG/S a KNX dimming range of 0.4...100 %.

Row A and B is the brightness value of the DG/S received via the KNX as a digital figure value (0...255) or in % (0...100). This value is implemented by the DG/S 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 DG/S 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 DG/S on the KNX.

E	KNX status brightness value	0	126	126	126	126	126	126	144	229	235	241	246	250	255
D	Luminous flux [%]	0	3	3	3	3	3	3	5	50	60	70	80	90	100
C	DALI value	0	1	8	26	60	85	126	144	229	235	241	246	250	254
B	KNX value	0	1	8	26	60	85	126	144	229	235	241	246	250	255
A	KNX value [%]	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 DG/S 1.16.1, 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 DG/S 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:

E	KNX status Brightness value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
D	Luminous flux [%]	0	1	3	5	10	20	30	40	50	60	70	80	90	100
C	DALI value	0	85	126	144	170	195	210	220	229	235	241	246	250	254
B	KNX value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
A	KNX value [%]	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:

E	KNX status Brightness value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
D	Luminous flux [%]	0	1	3	5	10	20	30	40	50	60	70	80	90	100
C	DALI value	0	85	126	144	170	195	210	220	229	235	241	246	250	254
B	KNX value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
A	KNX value [%]	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 of phys-min Brightness value

The second possibility for considering the characteristic curve adjustment in addition 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 case the same transformation table as for linear characteristic adjustment results.

E	KNX status Brightness value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
D	Luminous flux [%]	0	1	3	5	10	20	30	40	50	60	70	80	90	100
C	DALI value	0	85	126	144	170	195	210	220	229	235	241	246	250	254
B	KNX value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
A	KNX value [%]	0	1	3	5	10	20	30	40	50	60	70	80	90	100

The following table results with the characteristic correction for physical minimum dimming value with a DALI device featuring a dimming range of 3...100 %:

E	KNX status Brightness value	0	3	8 ^{*)}	13	26	51	77	102	128	153	179	204	230	255
D	Luminous flux [%]	0	1	3	5	10	20	30	40	50	60	70	80	90	100
C	DALI value	0	85	126	144	170	195	210	220	229	235	241	246	250	254
B	KNX value	0	3	8	13	26	51	77	102	128	153	179	204	230	255
A	KNX value [%]	0	1	3	5	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 DG/S is 1 % (digital value 3), and only this value can be set and fed back.

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 121

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 49 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	There is no fault.
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	There is a lamp fault.
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

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	There is a ballast fault.
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	There is a ballast and lamp fault.
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	

The next code table shows the relationship between the value of the communication object and the fault state of a device:

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	
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	
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	

There is no fault.

■ = Value 1, applicable
 empty = Value 0, not applicable

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 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	
80	50		■		■					17	
81	51		■		■				■	18	
82	52		■					■		19	
83	53		■					■	■	20	
84	54		■				■			21	
85	55		■				■		■	22	
86	56		■				■	■		23	
87	57		■				■	■	■	24	
88	58		■			■				25	
89	59		■			■			■	26	
90	5A		■			■		■		27	
91	5B		■			■			■	28	
92	5C		■			■	■			29	
93	5D		■			■	■		■	30	
94	5E		■			■	■	■		31	
95	5F		■			■	■	■	■	32	
96	60		■	■						33	
97	61		■	■					■	34	
98	62		■	■				■		35	
99	63		■	■					■	36	
100	64		■	■			■			37	
101	65		■	■					■	38	
102	66		■	■			■	■		39	
103	67		■	■				■	■	40	
104	68		■	■						41	
105	69		■	■		■			■	42	
106	6A		■	■		■		■		43	
107	6B		■	■		■		■	■	44	
108	6C		■	■		■	■			45	
109	6D		■	■		■	■		■	46	
110	6E		■	■		■	■	■		47	
111	6F		■	■		■	■	■	■	48	
112	70		■	■	■					49	
113	71		■	■	■				■	50	
114	72		■	■	■			■		51	
115	73		■	■	■			■	■	52	
116	74		■	■	■					53	
117	75		■	■	■				■	54	
118	76		■	■	■			■		55	
119	77		■	■	■			■	■	56	
120	78		■	■	■	■				57	
121	79		■	■	■	■			■	58	
122	7A		■	■	■	■		■		59	
123	7B		■	■	■	■		■	■	60	
124	7C		■	■	■	■	■			61	
125	7D		■	■	■	■			■	62	
126	7E		■	■	■	■		■		63	
127	7F		■	■	■	■	■	■	■	64	

There is a lamp fault.

There is a lamp fault.

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	
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	
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	

■ = Value 1, applicable

empty = Value 0, not applicable

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 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	
80	50		■		■					17	
81	51				■				■	18	
82	52							■		19	
83	53							■	■	20	
84	54		■				■			21	
85	55		■				■		■	22	
86	56							■		23	
87	57				■		■	■	■	24	
88	58		■		■	■				25	
89	59				■	■			■	26	
90	5A				■	■				27	
91	5B				■	■		■	■	28	
92	5C		■		■	■	■			29	
93	5D				■				■	30	
94	5E				■			■		31	
95	5F				■	■	■	■	■	32	
96	60			■						33	
97	61		■						■	34	
98	62		■	■				■		35	
99	63		■						■	36	
100	64		■				■			37	
101	65			■					■	38	
102	66		■	■				■		39	
103	67		■				■		■	40	
104	68					■				41	
105	69		■	■					■	42	
106	6A			■		■		■		43	
107	6B		■	■				■	■	44	
108	6C		■			■	■			45	
109	6D			■		■			■	46	
110	6E		■	■		■	■	■		47	
111	6F		■			■	■	■	■	48	
112	70		■	■	■					49	
113	71		■		■				■	50	
114	72		■	■	■			■		51	
115	73		■	■	■			■	■	52	
116	74		■	■	■		■			53	
117	75		■	■	■		■		■	54	
118	76		■	■	■			■		55	
119	77		■	■	■		■	■	■	56	
120	78		■	■		■				57	
121	79		■	■		■			■	58	
122	7A		■	■	■			■		59	
123	7B		■	■	■	■		■	■	60	
124	7C		■	■	■	■	■			61	
125	7D		■	■	■	■			■	62	
126	7E		■	■	■	■	■	■		63	
127	7F		■	■	■	■		■	■	64	

There is a lamp fault.

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 DG/S.

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	Call
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	Call
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	

■ = Value 1, applicable
empty = Value 0, not applicable

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	Save
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	Save
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	

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	

■ = 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.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 131](#)

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 131

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.

Bit No.		7	6	5	4	3	2	1	0
Decimal object value	Hexadecimal object value	Disable sending of fault alarm	DALI telegram collision	DALI short-circuit	Additional function	Function burn-in	Device monitoring	Ballast fault	Lam fault
0	00								
1	01								
2	02								
3	03								
4	04								
5	05								
6	06								
7	07								
8	08								
9	09								
10	0A								
11	0B								
12	0C								
13	0D								
14	0E								
15	0F								
16	10								
17	11								
18	12								
19	13								
20	14								
21	15								
22	16								
23	17								
24	18								
25	19								
26	1A								
27	1B								
28	1C								
29	1D								
30	1E								
31	1F								
32	20								
33	21								
34	22								
35	23								
36	24								
37	25								
38	26								
39	27								
40	28								
41	29								
42	2A								
43	2B								
44	2C								
45	2D								
46	2E								
47	2F								
48	30								
49	31								
50	32								
51	33								
52	34								
53	35								
54	36								
55	37								
56	38								
57	39								
58	3A								
59	3B								
60	3C								
61	3D								
62	3E								
63	3F								
64	40								
65	41								
66	42								
67	43								
68	44								
69	45								
70	46								
71	47								
72	48								
73	49								
74	4A								
75	4B								
76	4C								
77	4D								
78	4E								
79	4F								
80	50								
81	51								
82	52								
83	53								
84	54								
85	55								

■ = Value 1, applicable
empty = Value 0, not applicable

Bit No.		7	6	5	4	3	2	1	0
Decimal object value	Hexadecimal object value	Disable sending of fault alarm	DALI telegram collision	DALI short-circuit	Additional function	Function burn-in	Device monitoring	Ballast fault	Lam fault
86	56								
87	57								
88	58								
89	59								
90	5A								
91	5B								
92	5C								
93	5D								
94	5E								
95	5F								
96	60								
97	61								
98	62								
99	63								
100	64								
101	65								
102	66								
103	67								
104	68								
105	69								
106	6A								
107	6B								
108	6C								
109	6D								
110	6E								
111	6F								
112	70								
113	71								
114	72								
115	73								
116	74								
117	75								
118	76								
119	77								
120	78								
121	79								
122	7A								
123	7B								
124	7C								
125	7D								
126	7E								
127	7F								
128	80								
129	81								
130	82								
131	83								
132	84								
133	85								
134	86								
135	87								
136	88								
137	89								
138	8A								
139	8B								
140	8C								
141	8D								
142	8E								
143	8F								
144	90								
145	91								
146	92								
147	93								
148	94								
149	95								
150	96								
151	97								
152	98								
153	99								
154	9A								
155	9B								
156	9C								
157	9D								
158	9E								
159	9F								
160	A0								
161	A1								
162	A2								
163	A3								
164	A4								
165	A5								
166	A6								
167	A7								
168	A8								
169	A9								
170	AA								
171	AB								

Bit No.		7	6	5	4	3	2	1	0
Decimal object value	Hexadecimal object value	Disable sending of fault alarm	DALI telegram collision	DALI short-circuit	Additional function	Function burn-in	Device monitoring	Ballast fault	Lam fault
172	AC	■		■		■	■		
173	AD								■
174	AE			■		■		■	
175	AF						■	■	
176	B0			■	■				
177	B1	■							■
178	B2	■		■				■	
179	B3			■				■	■
180	B4			■					
181	B5		■	■			■		■
182	B6		■	■				■	
183	B7		■	■			■	■	
184	B8		■	■		■			
185	B9			■	■				■
186	BA		■	■	■			■	
187	BB			■	■			■	■
188	BC		■	■	■	■	■		
189	BD			■	■				■
190	BE							■	
191	BF			■	■	■	■	■	
192	C0		■						
193	C1	■							■
194	C2	■	■					■	
195	C3		■					■	■
196	C4		■				■		
197	C5		■						■
198	C6						■	■	
199	C7		■				■	■	
200	C8	■				■			
201	C9								■
202	CA					■		■	
203	CB							■	■
204	CC	■				■	■		
205	CD	■	■						■
206	CE					■	■	■	
207	CF						■	■	■
208	D0				■				
209	D1	■	■		■				
210	D2							■	
211	D3							■	■
212	D4						■		
213	D5						■		■
214	D6						■	■	
215	D7						■	■	■
216	D8	■	■		■	■			
217	D9					■			■
218	DA				■			■	
219	DB				■			■	
220	DC	■			■	■	■		
221	DD				■		■		■
222	DE	■			■	■	■	■	
223	DF				■	■		■	■
224	E0	■	■	■					
225	E1	■		■					■
226	E2							■	
227	E3							■	■
228	E4						■		
229	E5		■						■
230	E6		■	■			■	■	
231	E7							■	■
232	E8	■	■	■		■			
233	E9					■			■
234	EA			■				■	
235	EB			■				■	■
236	EC	■	■	■		■	■		
237	ED	■	■	■					■
238	EE		■	■				■	
239	EF	■	■	■		■	■	■	■
240	F0			■	■				
241	F1	■	■	■					■
242	F2		■	■				■	
243	F3	■	■	■				■	■
244	F4			■					
245	F5	■	■	■	■		■		■
246	F6	■	■	■	■			■	
247	F7	■	■	■	■		■	■	■
248	F8		■	■	■	■			
249	F9		■	■	■				■
250	FA	■	■	■		■		■	
251	FB	■	■	■	■				■
252	FC		■	■	■	■	■		
253	FD	■	■	■	■	■			■
254	FE	■	■	■	■			■	
255	FF	■	■	■	■	■	■	■	■

A.7 DGS Software Tool

The DGS Software Tool is a useful program for the ABB i-bus® KNX DALI Gateway DG/S 1.1 (based on DALI device) and DG/S 1.16.1 (group-orientated). The following functions are integrated into the DGS Software Tool:

- Connection establishment to the DG/S
- 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 (DG/S 1.16.1)
- 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 DG/S 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 DGS Software Tool has been specially developed for the ABB i-bus® KNX-DG/S. Accordingly, the DGS 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 DG/S the physical KNX device address has to be entered in the DGS Software Tool. In order to establish stable communication between PC and DG/S, it is recommended to install the KNX interface in the same line as the DG/S. This is not mandatory but can positively affect the connection stability.

Processing of conventional DALI systems without DG/S, e.g. via a USB/DALI port, is not possible with the DGS Software Tool.

The DGS 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 DGS 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 DG/S and in the DALI devices, e.g. a DG/S 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 DG/S 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 DGS 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-orientated DG/S 1.16.1 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: Group, page 56.</i>

The lighting group assignment for the group-orientated DG/S 1.16.1 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 DG/S are detected and stored as the reference value for device monitoring (ballast fault) in the DG/S. 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 DG/S as well as in the DALI devices. Should there be a difference between the group assignments stored in the DG/S 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 DG/S into the DALI device (with the respective DALI address) or inversely to transfer the information from the DALI devices into the DG/S. This second case is necessary if a DG/S 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 DGS 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.

Note

In the following, the functionality of the DGS Software Tools is explained using the DG/S 1.16.1.
The setting possibilities of the DG/S 1.16.1 and DG/S 1.1 only differ in terms of group-orientated functions:
DG/S 1.1: Output A and output B can be adjusted and monitored.
DG/S 1.16.1: There is only one adjustable and monitored output A, in addition, group-orientated functions are contained, e.g. group assignment, display of conflicts.

A.7.1 System requirements

The DGS Software Tool requires an IBM or IBM compatible PC/Laptop with Microsoft Windows operating systems Windows XP, 2000 or Vista.

The DGS 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 DG/S in order to establish stable communication between PC and DG/S. It can positively affect the connection stability.

ETS must not be installed on the computer for the DG/S 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 eteC Falcon Runtime v1.6* (most up-to-date version at market launch of the DG/S 1.16.1). 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 ZIP file of the DGS 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.

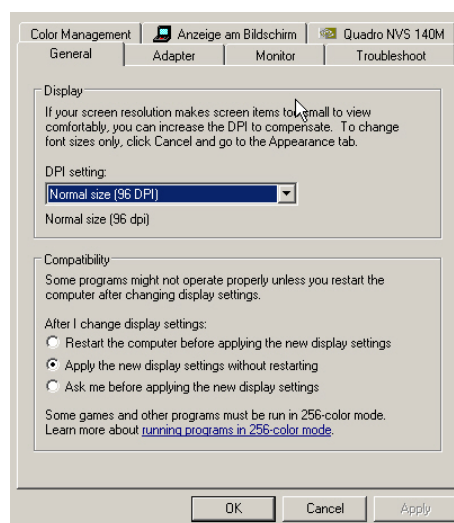
The DG/S to be edited is selected in the DGS Software Tool by entering the physical device address.

The display window of the DG/S 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 DGS Software Tool

By running the application, e.g. with a double click the self-extracting Zip file *DGS-Software-Tool dt-engl.exe* creates the directory DGS-Software-Tool. You can unpack the file at any location. The following files are contained in the folder:

Name	Size	Type
 DGS-Software-Tool dt-engl.exe	571 KB	Application
 FalconRuntime_V16.msi	11.609 KB	Windows Installer Package
 FalconSupport.dll	526 KB	Application Extension
 Group_Information.txt	7 KB	Text Document
 help_de.pdf	624 KB	Adobe Acrobat Document
 help_en.pdf	624 KB	Adobe Acrobat Document
 settings.cfg	1 KB	CFG File

- *DGS-Software-Tool dt-engl.exe*: Main program DGS 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 DGS Software Tool will independently create a new one.
- *FalconRuntime_V16.msi*: The Falcon driver can be installed on your computer with this file. If version V1.6 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 DGS 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 DGS 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 DGS automatically generates a *.txt file in the folder in which the DGS Software Tool is located. The storage location and the file name can be freely selected.

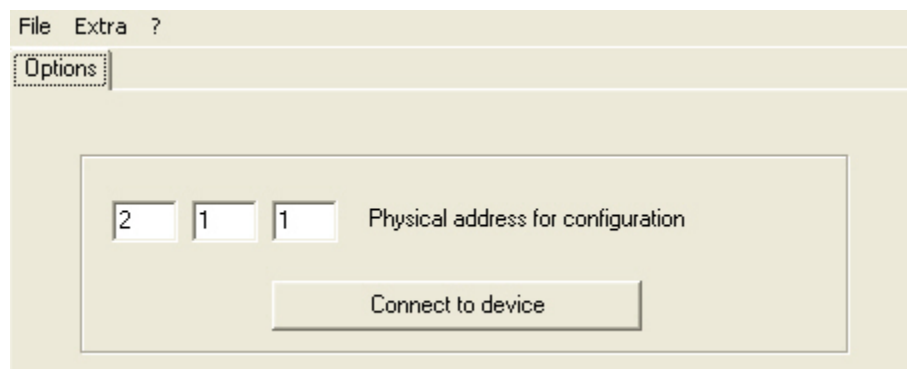
By running, e.g. with a double click on the *.exe file the DGS Software Tool starts. It does not need to be installed beforehand.

A prerequisite for the connection of the DGS Software Tool with the DG/S is the physical addressing of the DG/S using the ETS. ETS is no longer required after the physical device address of the DG/S has been assigned.

A.7.3 Connection to the KNX

After the DGS Software Tool is started, the user is requested to enter the physical address of the DG/S 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 *DGS Software Tool dt-engl.exe*:

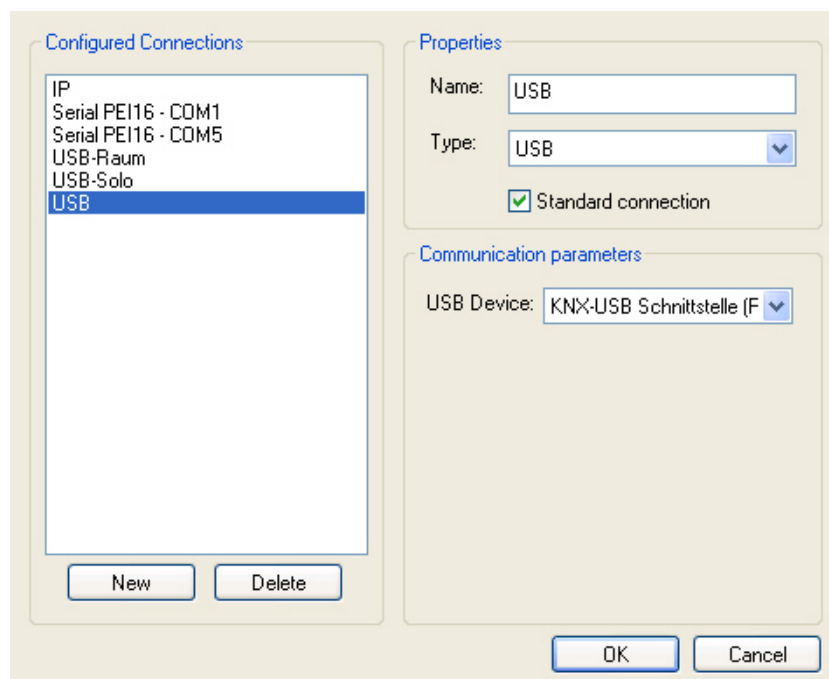


Enter the physical address of the DG/S here.

Note

Please ensure that the physical address of the DG/S to be addressed is entered correctly. If another KNX device other than the DG/S 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 DG/S 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 DGS Software Tool is closed and the COM port is thus re-enabled.

The *.dll file in the Zip file of the DGS Software Tool, i.e. *FalconSupport.dll*, must be in the same directory as the executing file dt-engl.exe of the DGS Software Tool.

If it is not possible to establish contact regardless of the attempts made, close the DGS 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 DGS Software Tool appears. The connection to the DG/S is indicated by the display of the tab (DG/S 1.16.1) output A, or two tabs (DG/S 1.1) output A and output B. The tabs will flash briefly for the purpose of simple recognition after the connection has been established.

The screenshot shows the 'Options' window of the DGS Software Tool. At the top, there are two tabs: 'Options' (selected) and 'Output A'. The main area is divided into three sections:

- Physical address for configuration:** Three input fields containing the values '2', '1', and '1'. Below them is a button labeled 'Disconnect from device'.
- Ballast monitoring (Buttons enabled in configuration mode):** This section contains 'Channel A:' followed by two input fields, both containing the value '19'. The first field is labeled 'ballasts detected' and the second is labeled 'ballasts monitored'. Below these fields is a button labeled 'Detect ballast'.
- Conflicts (Buttons enabled in configuration mode):** This section displays the text 'No conflicts detected.' Below this text 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'.

The field *Device monitoring (fields enabled in configuration mode)* indicates how many DALI devices have been detected by the DG/S and the number being monitored. If the number detected does not correspond with the number of monitored DALI devices, the DG/S 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:

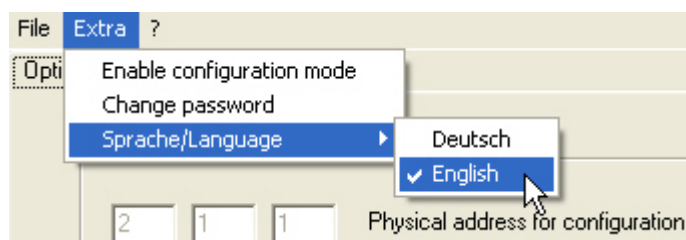
- In configuration mode via the button *Detect ballasts*,
- Via a telegram with the value 1 on the communication object *Detect ballasts*,
- By pressing the test button for longer than five seconds.

The field *Conflicts (enable fields in configuration mode)* is only visible with the group-orientated DG/S 1.16.1. In the DG/S 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 DG/S and in the DALI devices diverge, this is indicated as a conflict.

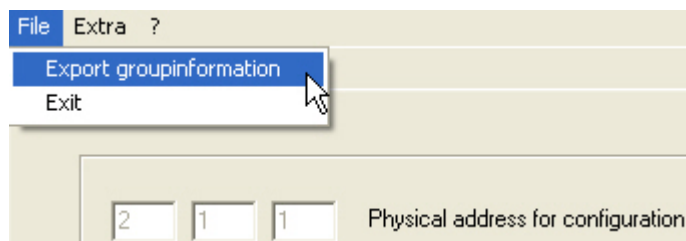
In configuration mode it is possible to write the stored information from the DG/S into the DALI device via the respective DALI address, or inversely to transfer the information from the DALI devices into the DG/S. The transfer of the stored information from the DALI devices to the DG/S is necessary, for example, as soon as a DG/S 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 DG/S 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 DG/S.

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
G1 	G2 	G3 	G4 	G5 	G6 	G7 	G8 
G9	G10	G11 	G12	G13	G14	G15	G16 

In DG/S 1.1 you will only see the upper 64 fields. Additionally, using the tabs *Output A* and *Output B* you can display their display or configuration modes. For the group-orientated DG/S 1.16.1, additional 16 fields for the maximum of 16 controllable lighting groups are displayed.

Note

Should the corresponding parameterisation in the parameter window [General](#), page 34 not permit automatic addressing using the DG/S, 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 DG/S and not the current state of the ballast. Should the states in the DG/S and ballast differ, this is indicated in the *Options* view as a conflict. A conflict can be remedied in the [Configuration mode](#), page 199, 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 DG/S. 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.

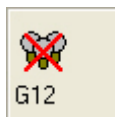
A.7.5 Meaning of the symbols

The displayed symbols have the following meaning:

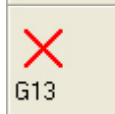
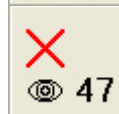


DALI device or lighting group recognised and status OK (no lamp or ballast fault).

In this example, the 14 corresponds with the DALI device and G10 with the lighting group.



DALI device or lighting group reports a lamp fault.



DALI device or lighting group is no longer present (ballast fault).

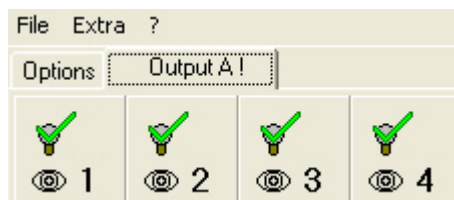


The DALI device is monitored, triggered by *Detect ballasts*. The eye symbol can be combined with every other symbol.

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:



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.



If the DALI device or a lighting group is selected it will be displayed by a lighting lamp symbol.



The DALI device is monitored and triggered by *Detect ballasts*. 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-orientated DG/S 1.16.1 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.

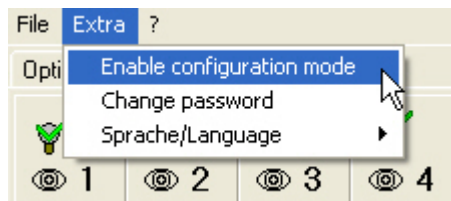
Note

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.

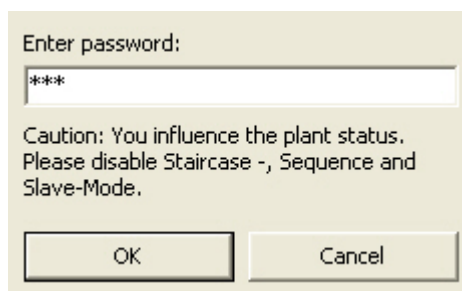
A.7.6 Configuration mode

The DGS Software Tool features a configuration mode, in which the DALI devices connected to the DG/S 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.

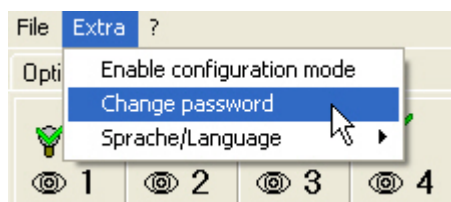
Activation of the configuration mode can be undertaken in menu *Extra > Activate configuration mode*. The program returns to display mode when the configuration mode is deactivated.



The configuration mode is protected by a password (ABB) to avoid unwanted readdressing or regrouping of the connected DALI devices on the DG/S.



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 (ABB).
The file *settings.cfg* can be found in the DGS Software Tools directory.
The *settings.cfg* file is generated automatically the next time the DGS Software Tool is invoked.

After the correct password has been entered, you are in the configuration mode.

The screenshot shows the 'Options' tab of the configuration software. The 'Output A' sub-tab is active. The 'Physical address for configuration' section contains three input fields with values 2, 1, and 1, and a 'Disconnect from device' button. The 'Ballast monitoring (Buttons enabled in configuration mode)' section shows 'Channel A' with '19 ballasts detected' and '19 ballasts monitored', and a 'Detect ballast' button. The 'Brightness level (in %)' section has two input fields: '100' (selected) and '0' (unselected). The 'Conflicts (Buttons enabled in configuration mode)' section displays 'No conflicts detected.' and two buttons: 'Apply values from gateway' and 'Apply values from ballasts'. At the bottom, there is a checked checkbox for '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 DG/S. All KNX assignments are automatically matched:

- DG/S 1.1: The member number (DALI address) indicated in the DGS Software Tool corresponds with the number of the device in the KNX.
- DG/S 1.16.1: The group number (DALI address) indicated in the DGS 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-orientated DG/S 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 %)

In the *Device monitoring (fields enabled in configuration mode)* on the DG/S 1.1, the number of detected and monitored DALI devices for output A and output B are displayed separately. On the DG/S with just one output only this is displayed.

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 DG/S. 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 DG/S. 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 DGS Software Tool using the *Detect ballasts* button. If this button is actuated, the DG/S starts to analyse the system, and the current system status is stored as a new reference value. This analysis process is indicated on the DG/S 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-orientated DG/S 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 DG/S 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.

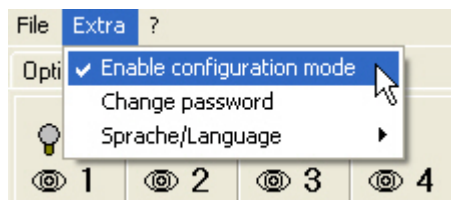
If the function *Detect ballasts* has been actuated beforehand, a red X will appear at the original address location as the ballast has disappeared. With a renewed *Detect ballasts* call the new assignment/addressing is stored as a reference state.

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 DG/S are monitored continuously. If the fault status changes, it is displayed directly in the DGS Software Tool. A status change can take up to 90 seconds depending on the number of connected DALI devices.

With the DG/S 1.16.1, 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.

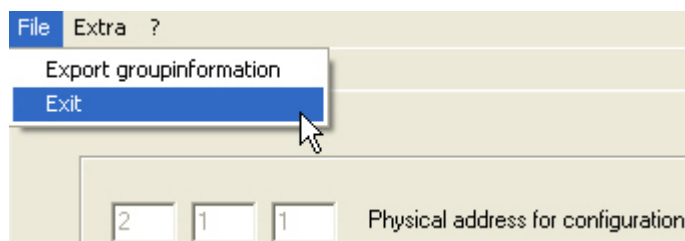
The configuration mode should be deactivated under *Extras* in order to revert to the display mode.



If the configuration mode is exited or the DGS Software Tool is ended, the DALI devices assume the brightness value which is parameterised as the deselected brightness.

A.7.7 Exiting the DGS Software Tool

The DGS Software Tool can be exited via the *File > Exit* menu.



If the configuration mode is exited or the DGS 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 DG/S Software Tool, the addressing of the DG/S 1.1 and DG/S 1.16.1 are described in this section.

For the simple DG/S 1.1 it is not necessary to perform DALI commissioning (configuration). The DG/S 1.1 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.

The same is also the case with the DG/S 1.16.1, unless otherwise parameterised in the parameter window [General](#) on page 34, the automatic DALI addressing is suppressed. Furthermore, with the DG/S 1.16.1 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 DG/S 1.16.1. 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 56, there are parameterisation options, where the DG/S 1.16.1 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 DG/S Software Tool even without a manual lighting group assignment.

As soon as the gateway operating voltage is applied, the DG/S checks all outputs for existing DALI devices.

This process is also started after a download or KNX voltage recovery or DG/S 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 DG/S. If no DALI services are detected, the first DALI device is assigned with DALI address 0 and is made available in the DG/S 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 DG/S, 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 DG/S 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 DG/S, 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 DG/S, may receive a new address.

A.7.9 Exchange of DALI equipment

The DGS Software Tool may also be used if more than two ballasts have failed in a DALI output of the DG/S. If only one ballast has failed and the DALI addresses are assigned without any gaps for the DALI devices (normally the case with DG/S), 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 DG/S. With the DG/S 1.16.1 however, the automatic DALI address assignment in parameter window [General](#), page 34, 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 DG/S. If only the DALI address is assigned and the group and scene assignment is not undertaken in the process, the DG/S will detect a conflict between the data in the DG/S and the DALI devices. This conflict is indicated in the DGS Software Tool and can also be remedied there. It is possible to assume the data of the DG/S 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 DG/S 1.16.1. The DG/S 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 DG/S, 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 DG/S, may receive a new address. A correction or exchange of the address can be implemented with the DGS Software Tool.

A.8 Further information about DALI

Further information about DALI and its possibilities in lighting technology can be found in our manuals:

- *The DALI manual*, from ABB Stotz-Kontakt:



- *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.

A.9 Scope of delivery

The ABB i-bus® KNX DALI Gateway DG/S 1.16.1 is supplied together with the following components.

Please check the items received using the following list:

- 1 pc. DG/S 1.16.1 MDRC
- 1 pc. installation and operating instructions
- 1 pc. KNX bus connection terminal (red/black)

A.10 Ordering information

Short description	Designation	Order No.	bbn 40 16779 EAN	Price group	Weight 1 pc. [kg]	Packaging [pc.]
DG/S 1.16.1	DG/S, 16 groups, MDRC, MB ¹⁾ 4	2CDG 110 103 R0011	66950 4	26	0.19	1

Other DALI Gateways in the ABB i-bus® range ²⁾

DG/S 1.1	DG/S, 1-fold, MDRC, MB ¹⁾ 4	2CDG 110 026 R0011	58583 5	26	0.19	1
DG/S 8.1	DG/S, 8-fold, MDRC, MB ¹⁾ 6	2CDG 110 025 R0011	58582 8	26	0.2	1

¹⁾ MB = module width²⁾ For compact function description see: [ABB i-bus® DG/S comparison](#), on page 9

A.11 DALI equipment

ABB provides a comprehensive range of DALI components.

Ballasts (electrical upstream devices) for fluorescent lamps, electronic transformers for low-voltage halogen lamps, dimmers, switch actuators, DALI LED converters etc. with DALI interfaces are available.

All DALI components and their technical properties are listed in the low-voltage main catalogue Chapter 15: *Lighting equipment*.

More information can be obtained from the following address:

ABB STOTZ-KONTAKT/Striebel & John

Vertriebsgesellschaft mbH (ASJ)
Postfach 10 12 69
69002 Heidelberg
Eppelheimer Strasse 82
69123 Heidelberg
Germany
E-Mail: asj.customer@de.abb.com

Telephone: 01805 69 2002

Fax: 01805 69 3003

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Notes

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www.abb.de/knx

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