

KNX

KNX/DALI Gateway/Twin

N 141/14, N141/32



The KNX/DALI Gateways are used for lighting control in buildings.

- Up to 128 fully-fledged DALI channels for individual control of max. 128 DALI lights with automatic group creation
- Color temperature (Tunable White) and color control RGB(W) of DALI Device Type 8 lights according to Part 209 for the realization of e.g. human-centric lighting (HCL) applications
- Supports DALI-2 presence (Part 303) and brightness sensors (Part 304), as well as DALI-2 push-buttons (Part 301)
- IP interface for faster downloads
- Energy-saving function through the provision of up to 32 standby areas
- Integrated 2-point brightness and constant light controllers for easy implementation of complex light controls
- Customary simple commissioning process to increase efficiency
- KNX Secure
- Configurable dimming curves
- Human-centric lighting (HCL)
- Effect and time control

Characteristics

General information

The KNX/DALI Gateways are used to control electronic control gear (ECG) and other DALI operating devices in lighting systems. They are used in building automation. Device control is performed via DALI on the lighting side and via KNX on the building automation side.

Intelligent channel concept

The KNX/DALI Gateways have one (N 141/14) or two (N 141/32) DALI outputs. A maximum of 64 fully fledged DALI channels and an additional 12 DALI-2 brightness sensors, 12 DALI-2 presence sensors and 12 DALI-2 push-buttons can be integrated for each DALI output. A maximum of 64 ECG can be controlled individually or in groups via the 64 DALI channels. For individual control, only one ECG is assigned to a channel. Group control is facilitated by the intelligent channel concept, because a new DALI group is automatically created as soon as more than one ECG is assigned to a channel. This means that you do not have to specify in advance which ECGs are to be controlled individually or in groups. This allows for easier configuration. For complex lighting projects, it is thus possible to implement up to 32 groups per DALI output without going to the effort of linking group addresses.

Control

The devices certified according to DALI-2 are multi-master application controllers and support DALI-2 brightness and presence sensors as well as DALI-2 push-buttons as input devices in instance mode. For lighting control, it is possible to control not only the color temperature (Tunable White), but also the color (RGB, RGBW, HSV, HSVW) itself of type 8 DALI lights in line with IEC 62386-209. The ability to define up to 16 scenes per DALI output offers full flexibility for sophisticated automated lighting solutions. The package is rounded off with integrated two-point lighting controllers as well as constant lighting controllers, time and effect control, configurable dimming curves and a maximum of 16 calculators for brightness values.

Standby areas

In the interest of sustainability, the KNX/DALI Gateways offer up to 16 standby areas per DALI output. This means that the power consumption of switched-off DALI-ECG can be significantly reduced via an intermediate switching actuator.

Channel functions

Each individual channel offers many other interesting functions and setting options, including four different operating modes, such as normal mode or timer mode, operating and switching cycle counters to maximize the availability of integrated lamps, 2 logic blocks, 7 override levels sorted by priority, separate on and off delays, day/night mode and a variety of status messages for monitoring.

Device Control App (DCA)

The clear and simple menu navigation in the integrated device control app (DCA) makes both online and offline commissioning simple and efficient. In the DCA, the status of all connected lights can be viewed at a glance. The app also offers a wide range of test options.

Operation on the device

The KNX/DALI Gateways have a direct operating level at the front of the device. A membrane keypad with two control buttons keys and one status LED per DALI line can be used to centrally switch and dim all the lights connected to the DALI line (broadcast). This allows an uncomplicated light test without prior configuration and commissioning of the KNX/DALI Gateway. Potential errors (e.g. overload or short circuit) in the system are displayed down to the individual ECG level directly via the display and the LEDs of the membrane keyboard, and also via corresponding communication objects on the KNX bus. An efficient error analysis and search is thus guaranteed.

ECG replacement on the device

Defective electronic control gear (ECG) can be replaced without using the ETS software. The KNX/DALI Gateway uses the automatic device replacement function to check after start-up whether all previously commissioned ECGs are present in the DALI system. If a defective ECG is removed by the installer and replaced with a new one, the KNX/DALI Gateway can automatically detect this new ECG and program it with the configuration data of the failed device. This makes it possible to replace an ECG on the device quickly and without additional configuration work.

Requirements

- The new ECG does not have a short address (factory state or reset).
- It is the same type of device.
- The physical minimum dimming value of the ECG is less than or equal to the set minimum dimming value.
- The commissioning of the KNX/DALI Gateway has been fully completed.
- The bus and mains voltages on all ECGs are switched on.
- The gateway is in normal mode, direct operation or emergency operation.

Notes on replacement

- If there are several defective ECGs, they can be replaced one after the other. In each case, the correct ECG number (not the short address) must be selected on the basis of the system documentation.
- During automatic device replacement, all other KNX/DALI Gateway functions are stopped. Once the process is complete, the KNX/DALI Gateway executes all commands received in the meantime.
- Only one ECG can be replaced at any one time with this function.
- If several ECGs fail at the same time or are without mains voltage, the KNX/DALI Gateway can no longer uniquely assign the devices. In this case, new commissioning via the DCA is required.

Installation

The KNX/DALI Gateways are rail-mounted devices in N dimension for installation in arrangements and installation on TH-35 DIN rails as per standard IEC 60715. The devices are connected to the bus via a bus terminal block. The electronics of the device are powered via the 230V supply voltage. Since the necessary voltage is thus provided for the DALI lines, no further external DALI voltage supply is required. In addition, it is not permitted to connect another DALI power supply. The maintenance-free terminals are for connecting solid and fine-stranded conductors with conductor cross-sections from 0.5 to 2.5 mm² or for connecting multi-stranded conductors with 2.5 mm² conductor cross-sections to the DALI outputs. Stranded and fine-stranded conductors can be plugged into the terminals without ferrules. The KNX/DALI Gateways N 141/14 and N 141/32 consist of the device (hardware), the application program (software) and the device control app (app).

Functions

Functions of the KNX/DALI Gateway

What is DALI?

DALI (Digital Addressable Lighting Interface) is a bi-directional communication interface as per IEC 62386, the specification of which was defined by manufacturers for electronic control gear (ECG). It enables reception of e.g. switching and dimming commands as well as transmission of status information, such as the failure of a lamp or reporting an error in the ECG.

A DALI bus line can be used to connect up to 64 DALI actuators as well as 12 brightness and presence sensors or multisensors and 12 push-buttons, each of which can be assigned an individual participant address. This makes it possible to control each device individually, and status and error messages can be assigned to a specific electronic control device and therefore to a specific lamp. KNX/DALI Gateway N 141/14 or N 141/32, for example, can be used for the individual control of DALI devices.

For more information on DALI, visit: <http://www.dali-alliance.org>. The DALI dimming curve has been adapted to the sensitivity of the human eye. This results in a logarithmic characteristic curve for the luminous flux. However, humans perceive this logarithmic characteristic curve as a linear brightness curve. IEC 62386-102 describes the DALI values as "ARC Power across the light source," with an almost linear correlation to the luminous flux in most cases. The luminous flux describes the entire power emitted by a light source in all directions. The unit is lumen (lm).

Basic information about KNX/DALI Gateway N141/14 and N 141/32

The device is used to control DALI electronic control gear (ECG) via commands. Depending on the selected operating mode, in addition to the communication objects for the functions switching, dimming brighter/darker, dimming value, color temperature and status requests,

there is a series of additional functions available for each output, line or channel. As an alternative to the switching input, a control value input with configurable threshold value for switching on and off can be selected. In direct operation, a line can be operated via the corresponding push-buttons on the user interface. The device display shows the error codes of the DALI channel error messages. A corresponding communication object is created for each error message.

These KNX/DALI Gateways are KNX devices with one or two independent DALI interface(s), to which up to 64 DALI ECGs, an additional 12 DALI brightness sensors, 12 DALI motion sensors (12 combined brightness and motion sensors per DALI line are also possible) and 12 push-buttons can be connected per line. These can be controlled individually or in groups using the device. In addition, the device can detect and transmit status and error messages from DALI devices. To ensure efficient and fast commissioning, the device offers its own IP interface. The device can control both the brightness of the lights and also the color temperature ("Tunable White") and light color ("RGB(W)"). This makes the device suitable for human-centric lighting applications.

Individual names, parameters and scenes are assigned to the individual ECGs by means of ETS (Engineering Tool Software). The DALI sensors and their functionality are also assigned in the ETS. All DALI participants and functions are independent and can be linked via group addresses. The device is designed to act as the only multi-master application controller in a DALI segment. Other application controllers are switched off during configuration. The KNX/DALI Gateway is a rail-mounted device for installation in distributions. For DALI, the electronics of the DALI devices are fed via the DALI bus line. Hence, the device has an integrated power supply for AC 230 V for supplying the device electronics and generating the DALI bus voltage for each line.

All functions of the KNX/DALI Gateway are briefly described below.

Line operating modes

Each output (line) of the KNX/DALI Gateway can be set to one of the following operating modes:

- Normal mode (bus operation)
- Broadcast
- Deactivated

Normal mode

In normal mode, ECG in channels can be switched and dimmed individually without restriction. Control is carried out for each channel by three communication objects (switching, dimming, value setting). A channel assignment for an ECG can only be performed to a maximum of one DALI channel. Multi-channel assignments are not directly supported. If necessary, the assignments must be implemented via the KNX communication objects or via ECG control. Separate status objects inform about the switching and value status of the channel.

Broadcast

The "Broadcast" DALI line operating mode allows the simultaneous control of all connected ECGs in the channels via the Broadcast commands provided by DALI. Sensors are not taken into account. Commissioning is significantly reduced because neither the search nor the individual assignment is necessary. Thus, all settings for ECG, channels and sensors, the commissioning and test functionality for this line are omitted. For configuration, the parameters are available as in a group (ignition time 0.7s).

Deactivated

If a DALI line is deactivated, no channels attached to it and no assigned ECGs can be addressed.

Channel operating modes

Each channel of the KNX/DALI Gateway can be set to one of the following operating modes:

- Normal mode
- Timer mode
- Timer mode 2-fold
- Flashing
- Deactivated

Normal mode

In normal mode, ECG in channels can be switched and dimmed individually without restriction. Control is carried out for each channel by three communication objects (switching, dimming, value setting). A channel assignment for an ECG can only be performed to a maximum of one DALI channel. Multi-channel assignments are not directly supported. If necessary, the assignments must be implemented via the KNX communication objects or via ECG control. Separate status objects inform about the switching and value status of the channel.

Timer mode

In the "normal mode" operating mode, the timer modes for "delayed switching on and off" and "timer night mode" are available. For night mode, an additional warning can be set before switching off. In the "timer mode" operating mode, the functions "ON time 1 in day mode" and "ON time in night mode" are available. Moreover, a warning before switching off can be set separately for both functions. In the "timer mode 2-fold" operating mode, the functions "ON time 1 in day mode" and "ON time 2 in day mode" and "ON time in night mode" are available.

Flashing

In the "Flashing" operating mode, the channel is switched on and off cyclically with an adjustable on and off duration. It is also possible to set up delayed switching on and off.

Deactivated

If a channel is deactivated, no assigned ECG can be addressed.

Overrides

Up to seven different override function blocks can be activated to override the automation functions. For each override function block, one of the following functions can be selected:

- Manual override (ON)
- Permanent OFF
- Lock
- Central override
- User-defined override function
- Forced control

This enables flexible configuration of a separate priority-specific override for each channel. For the override functions a control value input can be selected instead of a switching input.

Counting of switching cycles and operating hours

The application program features optional counting of switching cycles and counting of operating hours without threshold monitoring for each channel. This facilitates monitoring of the service life of the connected lamps as well as efficient maintenance planning. The counting of operating hours can be performed in hours or seconds.

Scenes

The application program makes it possible to parameterize up to 16 scenes per DALI line. Up to 64 channels can be added to each scene. The dimming and color temperature values for the scene can be specified for each channel. As an alternative to the color temperature values, color values can be specified. The scenes are stored and retrieved via an 8-bit communication object. When new scene values are saved, the value of the channels is not queried via DALI; instead the internally calculated value is used. This value is then written to the channels and the associated ECG.

Logic operations

The KNX/DALI Gateway has 2 independent logic blocks per channel, each of which allows different mathematical operations: AND, OR, XOR, FILTER, TRIGGER. The switching information for the second input of logic operation 1 or 2 is received at the output via a corresponding communication object. The logical result is sent via a KNX communication object.

Color temperature control

The color temperature control is defined in standard DALI IEC 62386, in chapter 209 "Color Control." The ECG is defined as device type 8. Device type 8 refers to color controllable lights. The unit for color temperature is Kelvin (K). The KNX/DALI Gateways N 141/14 and N 141/32 can control the color temperature and brightness of type 8 ECG devices. The devices can be used in human-centric lighting applications, as it can control the color temperature of a DALI LED from warm white to cold white ("Tunable White"). Human-centric lighting (HCL) expands the concept of biologically effective lighting with holistic planning and covers the visual,

emotional and biological effects of light. HCL supports human health, well-being and performance in the long-term.

Color control

In the KNX/DALI gateway, DALI control devices of the type "DT8 - Colour Control" can be used to control the light color. RGB(W) color control allows precise control of LED lights that combine red, green, blue and white (RGBW). This control offers a wide range of color options and makes it possible to generate both colored light and pure white light. HSV color control describes colors in a cylindrical color model and offers an intuitive way of color control.

Ethernet

The KNX/DALI Gateways have an RJ45 socket via which the device can be connected to Ethernet. This significantly reduces the download times of the firmware and configuration.

2-point brightness controller

Up to 16 independent switching brightness controllers (2-point-lighting controls) are provided. These are independent of all other functions and can be used via objects.

2-point control is the most basic form of lighting control. If the brightness controller is activated (automatic operation), the lighting is switched on as soon as the brightness falls below the configured lower brightness limit. The lighting is switched off once the configured upper brightness limit is exceeded. The brightness limits can be set using parameters or communication objects.

Constant lighting control

Up to 16 independent steadily regulating constant light controllers are provided. These are independent of all other functions and can be connected and used via objects both internally and externally.

Constant lighting control is an advanced form of lighting control. The control uses natural light to balance out the artificial light that is necessary to light the room adequately, which reduces power consumption and therefore costs. The illuminance of natural light entering a room through the window decreases the deeper it enters into the room. The controller is able to control one main lamp group and up to four subsidiary lamp groups. This is especially suitable for application in rooms in which the daylight entering through the window decreases further into the room.

Human-centric lighting (HCL)

The gateway supports the control of DALI operating devices of the Tunable White device type and thus enables the control of the color temperature of suitable lamps. The color temperature can be controlled via relative and absolute dimming commands as well as via DALI scenes. The gateway provides up to four freely configurable HCL matrices for the implementation of biologically effective lighting (human-centric lighting, HCL). Each matrix defines a time-dependent profile of brightness and color temperature and can be activated or switched over at specific times of day or on specific weekdays, or via user control. The color temperature control is channel-specific via separate KNX communication objects and operates independently of the brightness control. It can also be used as an alternative for color control.

Dimming curves

Ten dimming characteristics are available for optimizing dimming behavior. The selected characteristic acts as an adjustment factor and makes it possible to darken or brighten lamps, especially in the medium dimming range. This method can be used, for example, to adapt the dimming behavior of LED lamps to the familiar behavior of conventional incandescent lamps.

Time control

With the help of time control, functions can be executed not only by hand, but also at specific times or upon specific events. Time control makes it possible to execute functions such as switching times and weekly programs at specific times or according to time intervals. Time control can be set via the DCA.

Effect control

Effect control describes the interaction of several actions that are triggered simultaneously or in a defined sequence, such as light scenes, combined actions of dimming light and shutters, or delayed effects in which the light is only switched on or off after a few seconds. Effect control can be set via the DCA.

Smart channels - new channel concept

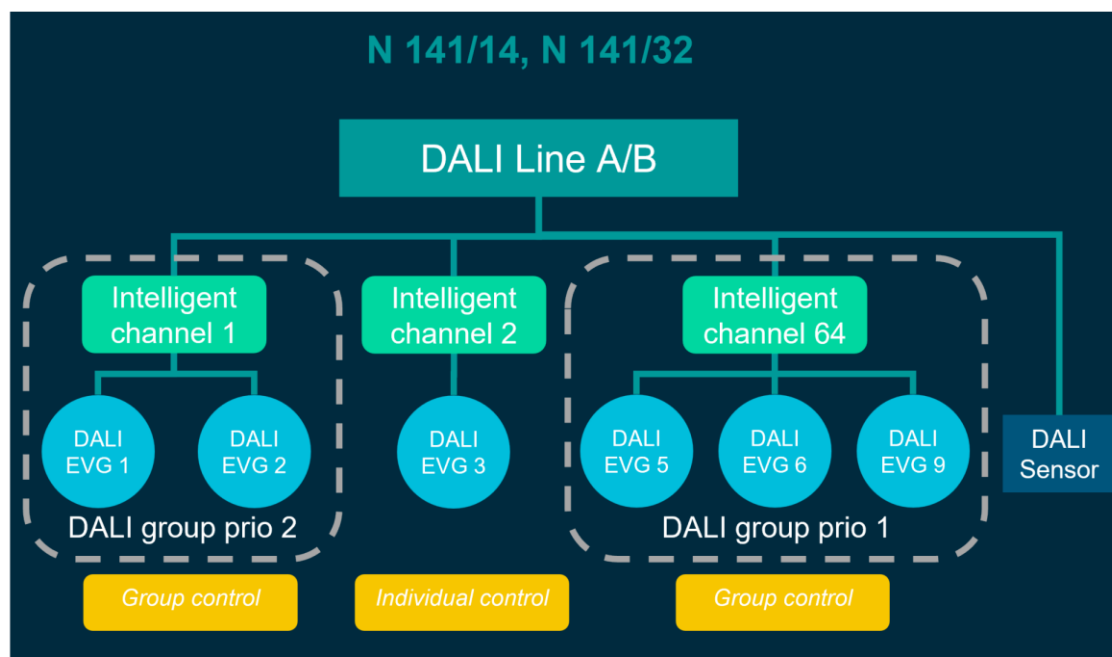


Fig. 1: New channel concept

The new generation of DALI-2 certified KNX/DALI Gateways N 141/14 and N 141/32 is equipped with up to two separate DALI outputs (A and B), depending on the version. The line (A or B) forms the top-level DALI instance, which can be connected to up to 64 ECGs and additional sensors. Within a DALI line, up to 64 ECGs are assigned to the respective provided smart channels, of which there are also up to 64. Among other things, the intelligence of the channels ensures that, if more than one ECG is assigned per channel, a DALI group is automatically created from the ECGs assigned to the channel. In addition, the channels containing the most ECGs are given preference when groups are created (i.e. group 1 = channel xy with the highest number of ECGs, group 2 = channel yx with the second-highest number of ECGs). The advantage of this functionality especially comes into effect if there are more than 16 channels with more than one ECG and there is thus the need for more than the 16 groups provided by DALI. From group 17 onwards, the ECGs are actuated in the KNX/DALI Gateway directly via the channels as if they were a group, even though sequential control runs in the background. Individual ECG control is still easily possible in the new KNX/DALI Gateways if only one ECG is assigned to a channel. DALI-2 sensors are incorporated at the line level.

Programming mode

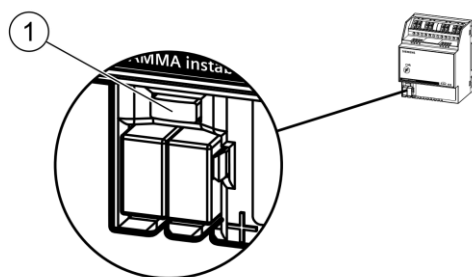


Fig. 2: Programming button and programming LED (exemplary illustration)



After bus voltage recovery, wait several seconds before pushing the programming (1) button (not before booting is complete).

Activate programming mode

- ◆ Briefly press the programming button (1) (< 2 seconds).
- ⇒ Programming mode is activated.
- ⇒ The programming LED (1) illuminates continuously.

Deactivating programming mode

- ✓ Programming mode is activated. The programming LED (1) illuminates continuously.
- ◆ Briefly press the programming button (1) (< 2 seconds).
- ⇒ Programming mode is deactivated.
- ⇒ The programming LED (1) is not illuminated.

Resetting the device to factory settings

NOTICE	
!	Loss of data due to resetting device! When you reset the device, all parameters and settings entered are deleted. • Ensure that the device is really supposed to be reset.

Resetting the device to factory settings

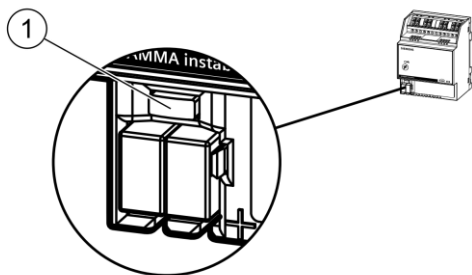


Fig. 3: Programming button and programming LED (exemplary illustration)

- ◆ Press the programming push-button (1) (at least 20 seconds) until the programming LED (1) starts flashing quickly.
- ⇒ The programming (1) LED flashes for 8 seconds.
- ⇒ The device has been reset to factory settings. All parameter settings have been deleted.
- ⇒ The building site function is active again.

Behavior on unloading the application program

After unloading the application program with the ETS, the unloaded device has no functions.

Behavior on voltage failure/recovery

The electronics of the device are powered by mains power. Mains voltage failure causes the functional failure of the KNX/DALI gateway and thus also the failure of the DALI voltage.

In case of a mains voltage failure, the current status and other values for each output are permanently saved so that they can be restored on mains voltage recovery.

On mains voltage recovery, the configured actions are executed and, if applicable, new statuses are reported.

Operation and error display on the device

The display on the front of the KNX/DALI Gateway shows whether there is an error and what type of error it is. The LEDs allow an exact localization of the error. The navigation on the display is done with the help of the arrow keys.

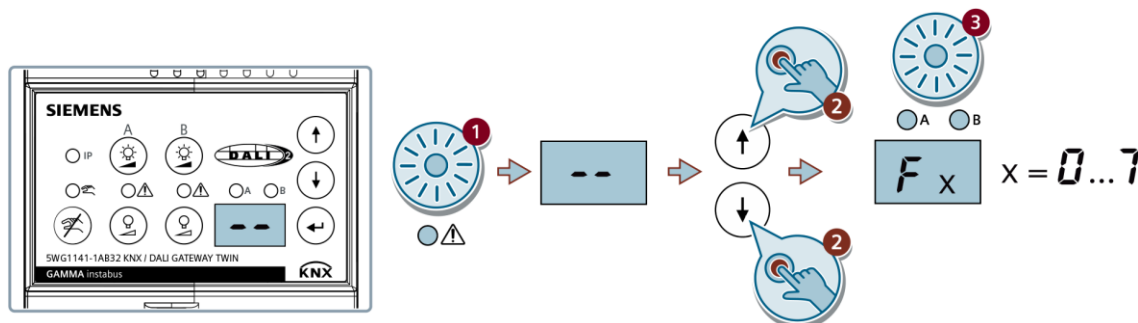


Fig. 4: KNX/DALI Gateway - operation and error display on the device

NOTICE	
!	The parameter “Information on device display” can be used in the ETS to specify what is displayed on the display. • Deactivated • Operation • Operating mode • Firmware version

Process

- If an error occurs, an error LED lights up [1]
- The error navigation on the display is done by pressing the arrow keys [2].
- The two LEDs [3] above the display indicate in which line the error occurs.

The following errors can occur:

Errors	Description
F0	Lamp defective
F1	ECG defective
F3	External voltage on DALI line
F5	DALI short circuit
F6	No ECG found
F7	Application controller switched off

Technical design

Position and function of the operating and display elements

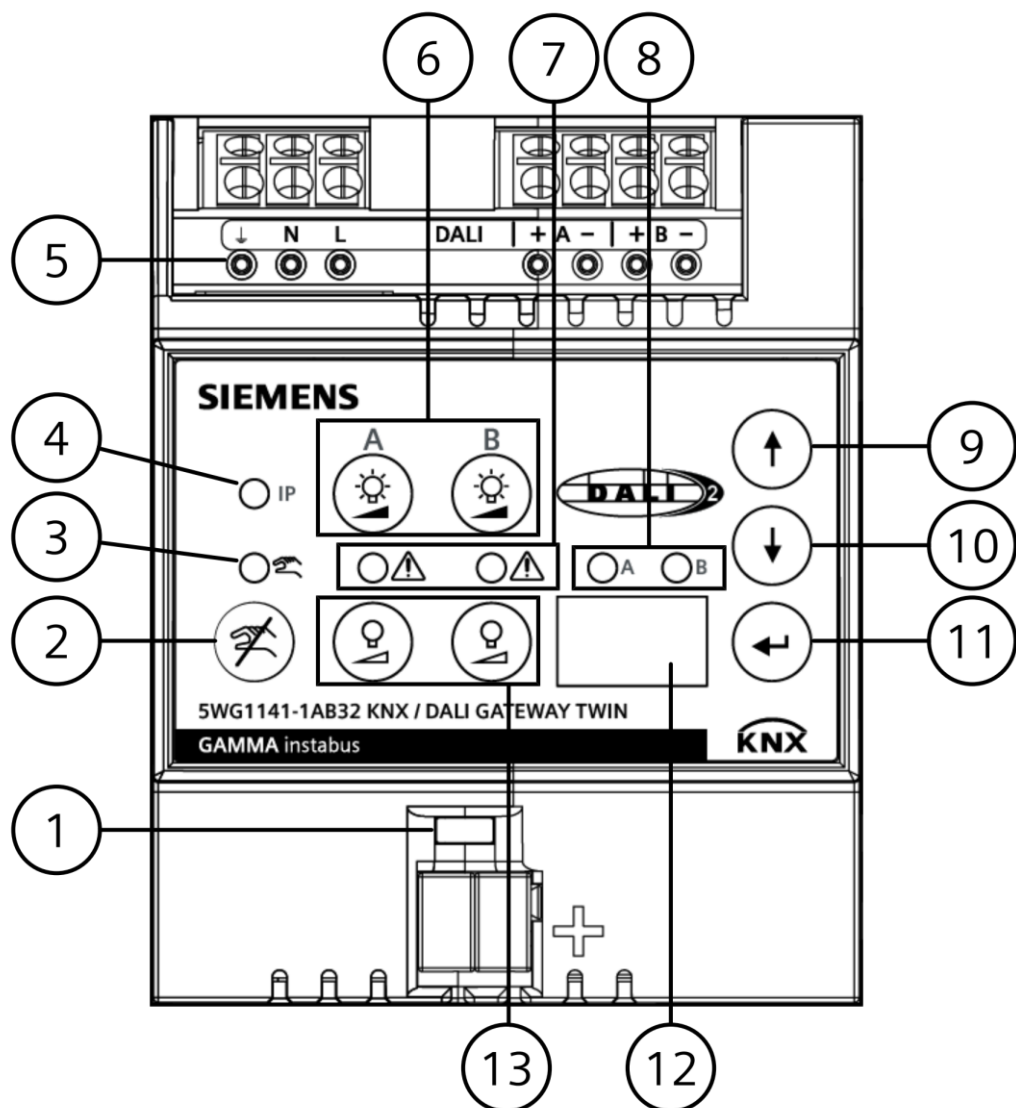


Fig. 5: Operating and display elements

Item	Operating or display element	Function
1	Programming LED (red), Programming button	Short push of button (< 1 s): • Activate programming mode, display status (LED on = active). Very long push of button (> 20 s): • Reset to factory settings (after 20 s, the LED starts flashing for about 8 s). Note: • Pushing button for longer (>1 s to 20 s) does not perform any function. • The device can be locked for approx. 10 s in programming mode. This is indicated by the flashing of the programming LED.
2	Push-button: Deactivate direct operation	Short press of button (< 1 s): • Deactivate/exit direct operation.
3	Status LED of direct operation	The LED shows whether direct operation is activated. The LED flashes regularly if direct operation is active for at least one channel.
4	Status LED of the IP connection	The LED shows if there is a link in the IP connection. The LED lights up when an Ethernet cable is connected and if communication is performed via IP.
5	Test contacts	Metering point for voltage testing
6	Push-buttons: Switching on line A or line B	Short press of button (< 1 s): • ECGs on line A/B are switched on (broadcast) Long press of button (> 1 s): • ECGs on line A/B are dimmed brighter (broadcast).
7	Error LEDs	The LEDs indicate whether there is an error on the respective line A or line B.
8	LEDs of the error display	The LEDs indicate the current line when the error display is operated with the push-buttons.
9	Push-button: Up	Menu control up in the display Note: • If the push-button is not pressed for more than 5 seconds, the standard display returns automatically.
10	Push-button: Down	Menu control down in the display Note: • If the push-button is not pressed for more than 5 seconds, the standard display returns automatically.

Item	Operating or display element	Function
11	Push-button: Enter	Confirmation of the error Note: • If the push-button is not pressed for more than 5 seconds, the standard display returns automatically.
12	Display	The display is used to display the device information (status, error codes and currently loaded firmware version): Note: The following device information can only be displayed if the "Information on device display" parameter is enabled. Status display: • c: Configuration mode • d: Direct operation (manual operation) • b: Normal mode (bus operation) • ...: Short address of the affected ECG Error display: • F0: Lamp defective • F1: ECG defective • F3: External voltage on DALI line • F5: DALI short circuit / overload • F6: No ECG found • F7: Application controller switched off Display of the loaded firmware version
13	Push-buttons: Switching off line A or line B	Short press of button (< 1 s): • ECGs on line A/B are switched off (broadcast) Long press of button (> 1 s): • ECGs on line A/B are dimmed darker (broadcast)

Position and function of the connections and labeling

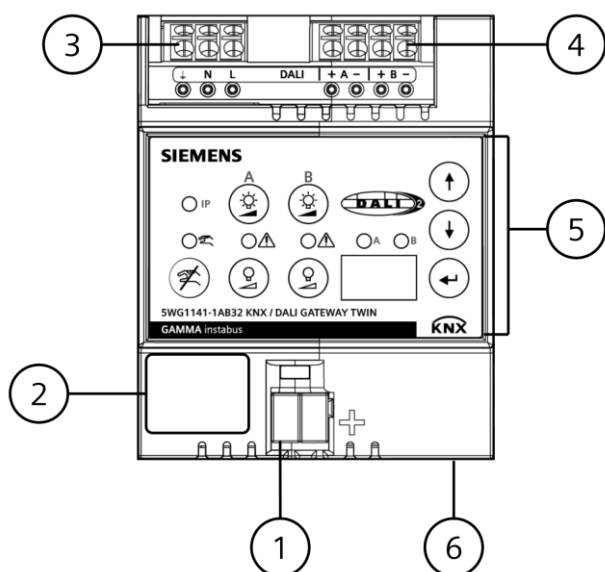


Fig. 6: Connections

Item	Element	Function
1	Connection pins for KNX bus terminal block, screwless	Connect KNX bus
2	Label field	Enter physical address
3	Connection terminals	Connect input and loads
4	Connection terminals for DALI lines	Connecting DALI lines
5	Membrane keypad with LEDs	Execute direct operation Switching and dimming lights Displaying status and error messages
6	RJ45 connector socket (located on the underside of the device)	Connecting IP communication

Type overview

Type	Designation	Item number
N 141/14 	KNX/DALI Gateway	5WG1141-1AB14
N 141/32 	KNX/DALI Gateway/Twin	5WG1141-1AB32

Version of the Engineering Tool Software



See the application program description for more information.

It can be downloaded from the following website:

<https://www.siemens.com/knx-td>

Selection Guide for Siemens KNX/DALI Gateways

Selection Guide Siemens KNX/DALI Gateways						
	N 141/14	N 141/32	N 141/03	N 141/21	N 141/31	N 525D11
Article number	5WG1141-1AB14	5WG1141-1AB32	5WG1141-1AB03	5WG1141-1AB21	5WG1141-1AB31	5WG1525-1DB11
Outputs						
DALI outputs	1	2	1	2	2	2
ECG per DALI output	64	64	64	64	64	20
Support of DALI sensors	DALI-2*		Siemens & Osram**			
IP interface	x	x				
Functions						
KNXSecure	x	x				
Direct operation	x	x	x	x	x	x
Broadcast operation	x	x	x	x	x	x
Configurable stand-alone operation			x	x	x	
ECG individual control	x	x	x	x	x	
ECG change on device	x	x	x	x	x	
Calculator	x	x				
Scheduled channels	10	10	10	10		
Commissioning tool	DCA	DCA	Plugin	Plugin	Plugin	Plugin
Standby areas for energysaving	x	x	x	x	x	
DALI groups per device	16	32	16	32	32	
Additional virtual groups per device	16	32				
Virtual channels per device	64	128				
Logical functions per channel	2	2				2
Automatic group creation and prioritization	x	x				
Scenes per DALI output	16	16	16	16	16	8
Integrated 8-bit scene control	x	x	x	x	x	x
Burn-in function (complete system)			x	x		
Burn-in function via object			x	x	x	
Pre-loaded applications			x	x		
Export/import function			x	x	x	
Switching cycle & operating hour counter	x	x	x	x	x	x
Night mode	x	x	x	x	x	x
Configurable dimming curves	x	x				x
Controller						
Color temperature control (TW)	x	x	x	x	x	x
Color control with DT8 (6 byte, RGB(W))	x	x				
Constant light control	x	x	x	x		
2 point control	x	x	x	x	x	
Effect control	x	x	x	x		
Human Centric Lighting profiles	x	x				
Emergency lighting						
Emergency mode			x	x	x	
Record of the emergency lights tests			x	x		
Control of individual battery lights			x	x		
Status						
DALI shortcut	x	x	x	x	x	x
DALI power supply	x	x	x	x	x	x
Error information	per ECG	per ECG	per ECG	per ECG	per ECG	per channel
Power supply						
Integrated power supply for electronics system	x	x	x	x	x	x
Integrated power supply for DALI outputs	x	x	x	x	x	x
Other						
Status display	LED + 7 segment	LED + 7 segment	LED + 7 segment	LED + 7 segment	LED + 7 segment	LED + 7 segment
Width (1 WU = 18 mm)	4	4	4	4	4	4
DALI-2 certified	x	x	x	x	x	x

Fig. 7: Selection Guide

* max. 12x brightness sensors + 12x presence sensors + 12 push-buttons OR 12x combined brightness/presence sensors

** max. 8 combined brightness/presence sensors + 12 push-buttons OR 16 push-buttons

Product documentation and support

Product documentation

Documents related to the product, for example the operating/assembly manual, technical product information, application program description, product database, additional software and CE declarations, can be downloaded from the following website:

<https://www.siemens.com/knx-td>



Frequently asked questions

For frequently asked questions regarding the product and their solutions, see:

<https://sieportal.siemens.com/en-de/search?scope=knowledgebase>



Support

Contact details for additional questions relating to the product:

Tel.: +49 89 9221-8000

<http://www.siemens.com/supportrequest>



Notes

Security

 CAUTION	
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage. • Observe national regulations and comply with the appropriate safety regulations.

⚠ WARNING



Risk of death due to electric voltage and electric current!

Electrical expertise is required for the installation. Incorrect installation can deactivate electrical safety features without this being apparent to a lay person.

- Do not open the housing of the device.
- The device should only be installed and put into operation by a certified electrician.
- Ensure that the device can be enabled.
- Secure the line feed with a B6 or C6 line protection switch

ETS downloads are encrypted via secure commissioning. Secure communication encrypts communication via objects.

The device complies with the KNX Data-Secure Standard. KNX Data Secure offers protection against manipulation in building automation and can be configured in the ETS project. The latest version of the ETS must be used for this purpose. Detailed expertise is required. Secure commissioning, requires a device certificate, which is affixed to the device in two versions.

Please observe the safety instructions!



For more information on secure commissioning, including security testing, refer to the “KNX Secure” section on the KNX website <https://www.knx.org/>.

Instructions for the secure operation of KNX devices and KNX systems

- Do not use the device to control security-related applications (such as door openers).
- Do not use the device to control security-related applications (such as emergency lighting, security or hazard alarm systems).
- Install N devices in a protected area (locked control cabinet).
- Only operate the device and the KNX system in a protected network environment and do not allow direct access from the Internet.
- For IP-based KNX communication, set up a separate IP network with its own hardware.
- The BCU key should no longer be used as this method is not secure.
- Configure the device with secure commissioning and secure communication in the ETS.
- Secure remote access to the device via an additional VPN connection. A virtual private network (VPN) establishes an encrypted and authorized connection (VPN tunnel) from a remote connection to a network via the internet. This VPN connection enables secure communication protected from eavesdropping between a remote device and the KNX installation.
- If Wi-Fi is used, change the preset SSID of the wireless access point. Encrypt the Wi-Fi using a secure procedure (such as WPA2 at present).
- Document network settings and give them to the building owner/operator or LAN administrator.
- Coordinate the administration of access rights to a KNXnet/IP device and the KNX installation in an IP network with the respective IP network administrator.

NOTICE



Measures after replacing a device in the KNX/IP network.

When a KNX device is stolen from a network or replaced due to a defect, all keys must be reassigned (changed) in the KNX installation. This change is necessary because it cannot be ruled out that the security-relevant data located in a protected area can be read.



For more information on KNX security, including, for example, a security check, refer to the "KNX Secure" section on the KNX website (<http://www.knx.org>).

Device certificate

For secure commissioning, the ETS requires a suitable device certificate. The device certificate is a string containing the device-specific FDSK (Factory Default Setup Key) and the serial number of a KNX Data Secure-enabled device. The certificate must be communicated to the ETS.

The FDSK is a factory-provided unique string for each secure device. The ETS uses it once to create further (digital) keys (tool key/runtime key) for secure communication within the project. The FDSK is stored in the ETS project for this specific device. If the FDSK is lost, the device cannot be started in secure mode.

After a reset to factory settings, the FDSK must be entered again for secure commissioning within the project.

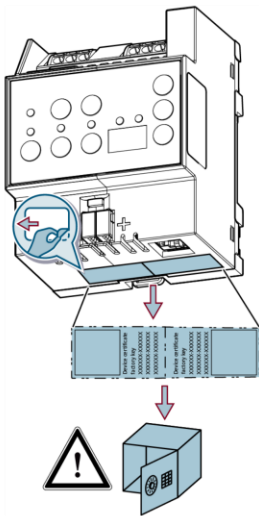


Fig. 8: Device certificate

Item	Designation
1	Factory key
2	QR code

The device certificate is affixed to the side of the device as a sticker.



The device certificates must be removed immediately after the device has been removed from the packaging and must then be stored safely! The FDSK must not fall into the hands of unauthorized persons.

How to store the device certificate:

1. Remove the device from the sealed packaging.
2. Scan the FDSK.
3. Remove all FDSK stickers from the device.
4. Store the device certificate in such a way that it is protected from unauthorized persons.
5. Install the device.

This procedure ensures that the FDSK cannot be read off from built-in devices.

NOTICE



If the scanned FDSK is lost, it is no longer possible to use the device (in secure mode) after a reset to factory defaults.
In the case of devices with secure mode activated by default, the loss of the FDSK means that the device can no longer be used after a reset to factory defaults.

Observe the following procedure for secure commissioning:

- To establish secure communication between KNX secure devices, you first have to assign a project password in the ETS so that the keys stored in the project are protected. Store the project password securely. Without a project password it is not possible to access the KNX project.
- The secure commissioning of the KNX Data Secure device requires a device certificate (FDSK - Factory Default Setup Key). This device certificate is specified at the factory and cannot be modified using the ETS. The device is equipped with two of them. Remove both stickers from the device and store them securely.
- Scan the QR code or enter the character string manually.
- The device certificate is used only for the initial commissioning with the ETS. After first use, the ETS generates its own tool key, which replaces the FDSK.
- You will need the device certificate again when you reset the KNX secure device to the factory defaults.

Note on installation

The device can be used for fixed installations in dry interior spaces, for installation in high-voltage distribution boards with DIN rails EN 60715-TH35 or small casings.



The recommended installation position is horizontal with the DALI connection at the top. Before installation, please note that the RJ45 connection is on the underside of the device.

Commissioning

Connecting the supply voltage

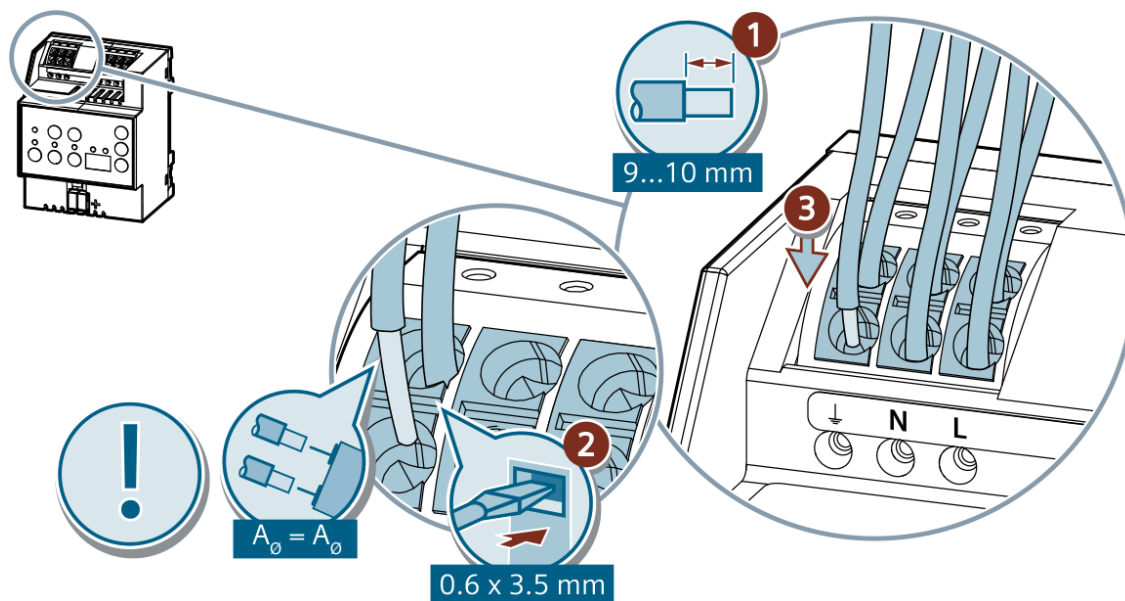
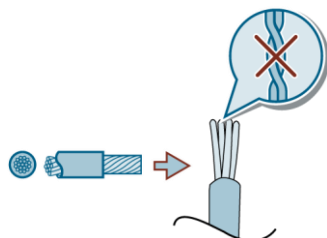


Fig. 9: KNX/DALI Gateway - connection of the supply voltage

Cu	
	0.5...2.5 mm ²
	2.5 mm ²



Connecting KNX

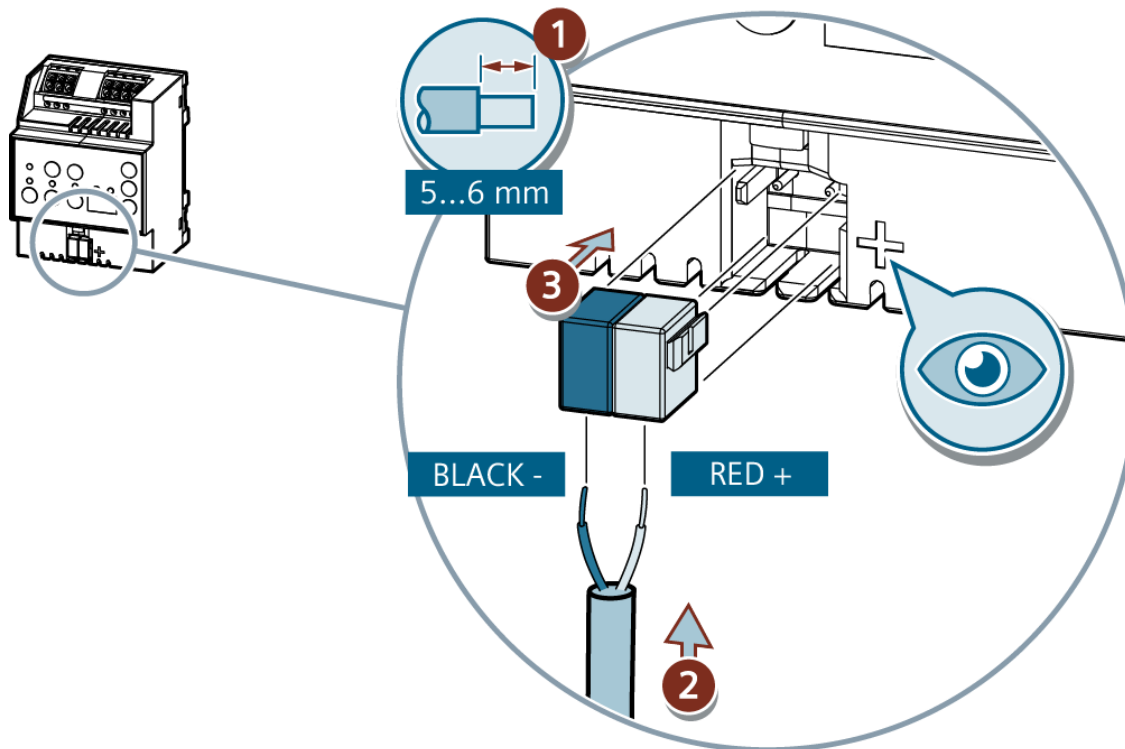


Fig. 10: KNX/DALI Gateway - connection of KNX

Optional Ethernet connection

It is possible to optionally connect an Ethernet cable (recommended) to achieve a faster download speed.

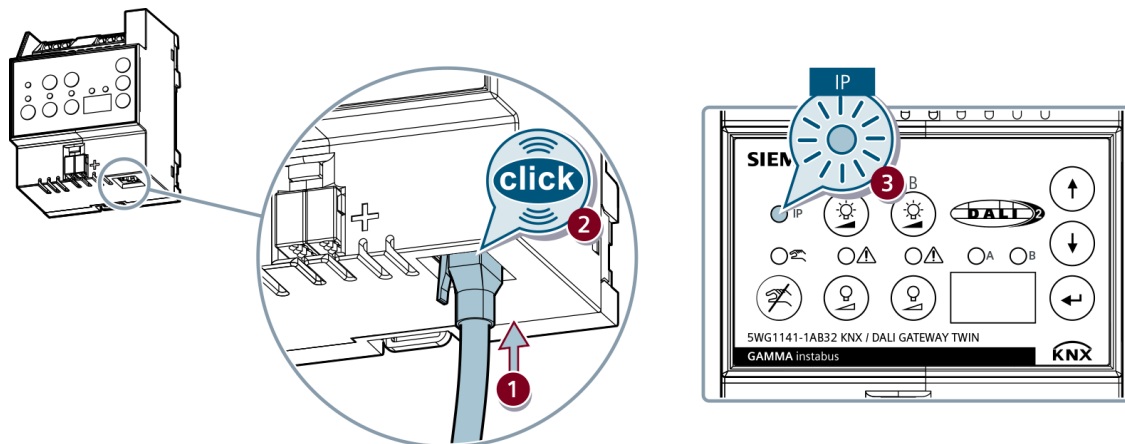


Fig. 11: KNX/DALI Gateway - Ethernet connection

Testing KNX 24 V DC type. SELV

This test can be used to check whether the bus connection cable is connected with the correct polarity and whether device is supplied with bus voltage.

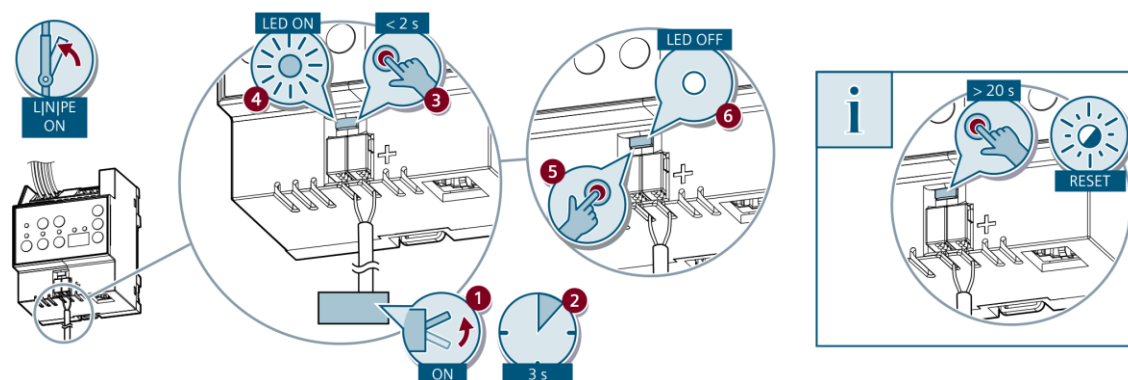


Fig. 12: KNX/DALI Gateway - testing KNX 24 V DC type. SELV

Holding the programming button down for more than 20 seconds resets the device to its factory settings.

Testing the DALI broadcast

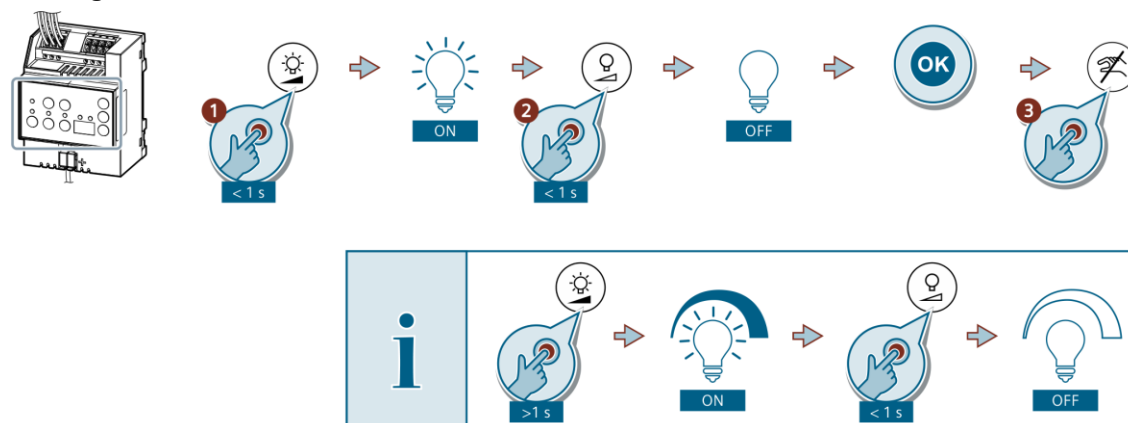


Fig. 13: KNX/DALI Gateway - testing the DALI broadcast

Disposal

	The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste. • Use only designated channels for disposing the devices. • Comply with all local and currently applicable laws and regulations.
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If a device is defective, contact the local sales office.

Technical data

Electrical data	N 141/14	N 141/32
KNX bus voltage	DC 24 V (DC 21...30 V)	
KNX power consumption	5 mA	
Operating voltage		
Nominal value	230 V	
Rated value AC	220 V ... 240 V, 50 - 60 Hz	
Rated value DC	220 V ... 240 V	
Power loss (internal consumption)	1.6 W AC / 1.8 W DC	
Power consumption (at 192 mA load per DALI channel)	6 W	11 W

Inputs/outputs	N 141/14	N 141/32
Power connection	3-pole (earth, N, L)	
DALI interface with DALI-2 certification according to IEC 62386-101 and 103	1	2
DALI power supply per line	approx. DC 18 V, potential-free, short circuit-proof max. current: $I_{max} = 250 \text{ mA}$ max. guaranteed current: $I_{max} = 192 \text{ mA}^*$ Connection of an additional DALI power supply not allowed	
Shutdown mechanism	Switch-off waiting time 700 ms Restart waiting time 10 s	
DALI function	DALI Multi-Master Application Controller with integrated bus power supply (no other supply allowed)	
DALI line length for copper at 25 °C	2.5 mm ² (AWG 14) max. 300 m (328 yd) 1.5 mm ² (AWG 16) max. 300 m (328 yd) 1.0 mm ² (AWG 18) max. 224 m (225 yd) The power loop resistance for each connected ECG must not exceed 10 Ohm.	

* for horizontal installation position with DALI connection at the top, otherwise 150 mA

Network communication	N 141/14	N 141/32
Standard for interfaces	Ethernet	
Internet protocols supported	ARP, ICMP, IGMP, TCP/IP, UDP/IP, DHCP, AutoIP	
KNXnet/IP as per KNX system specification	Core v2, Tunneling v2, Device Management, IP Secure, Secure Ready	

Mechanical data	N 141/14	N 141/32
Housing material	Plastic	
Dimensions	Rail-mounted device in N dimension Width 4 HP (1 HP = 18 mm) Dimensional drawing [▶ 26]	
Weight (device)	205 g	210 g
Fire load	5 MJ	

Environmental conditions	N 141/14	N 141/32
Environmental category (as per EN 60721-3-3)	Class 3k5	
Ambient temperature in operation	-5 °C...+45 °C (+23 °F...+113 °F)	
Storage temperature	-20 °C...+70 °C (-4 °F...+158 °F)	
Transport temperature	-25 °C...+70 °C (-13 °F...+158 °F)	
Relative humidity (non-condensing)	5%...95%	

Protection settings	N 141/14	N 141/32
Degree of pollution (according to IEC 60664-1)	2	
Over-voltage category (according to IEC 60664-1)	III	
Housing protection class (according to EN 60529)	IP20	
Electrical safety, KNX (SELV)	yes	
Electrical safety, device fulfills	EN 50428	

Protection settings	N 141/14	N 141/32
EMC requirements, device complies with	EN 50428	
Certification logos	KNX, EAC, RCM, WEEE, China-RoHS, DALI-2, UKCA	
CE mark	yes	

Reliability	N 141/14	N 141/32
Failure rate (at 40°C)	834 fit	976 fit

GTIN	N 141/14	N 141/32
GTIN number	4047625028725	4047625028732

Connections	N 141/14	N 141/32
Plug terminals for mains voltage and DALI interface, stripping length 9...10 mm	Permissible conductor cross-sections: 0.5...2.5 mm ² solid 2.5 mm ² stranded 0.5...2.5 mm ² fine-stranded, untreated	
KNX bus	Bus terminal block	

Connection example

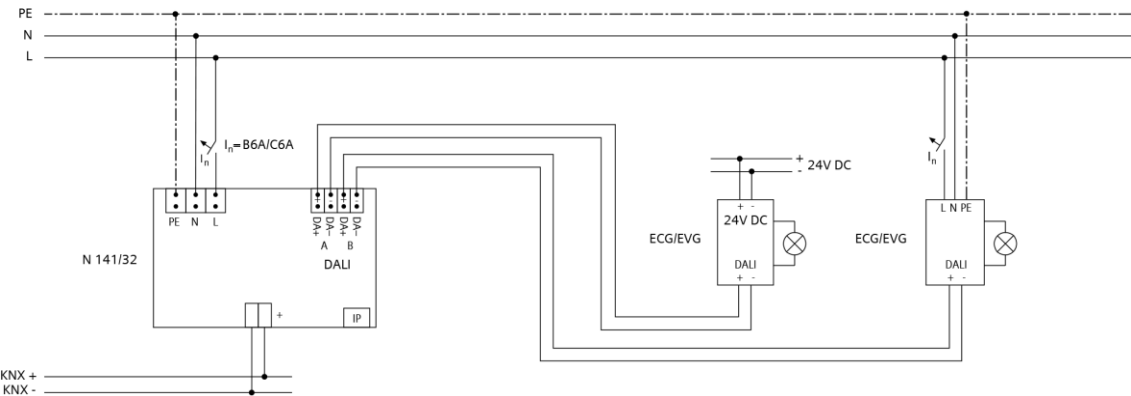


Fig. 14: KNX/DALI gateway - connection example

⚠ WARNING	
	Before connecting the DALI cables, make sure that there is no external voltage on and between the DALI cables! Applying an incorrect voltage to the DALI lines during operation may damage the device.

Dimensional drawing

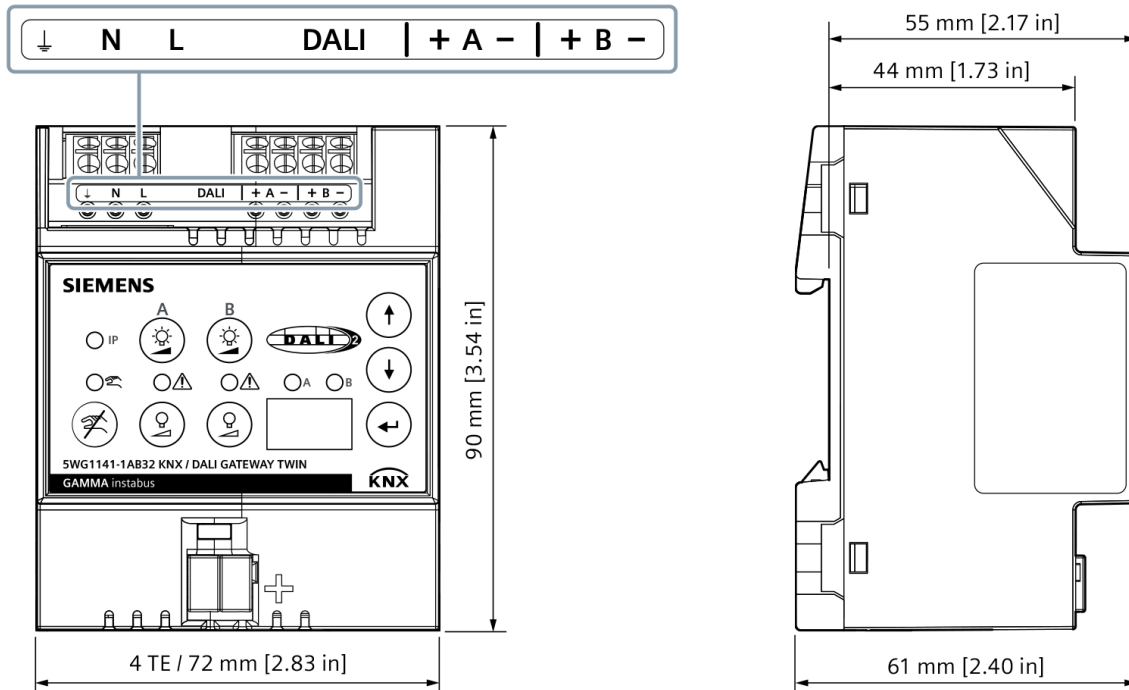


Fig. 15: KNX/DALI Gateway - dimensional drawing

Compliance information

European Union conformity

Contact for regulatory topics: (EU) Siemens AG, Berliner Ring 23, DE-76437 Rastatt

United Kingdom conformity assessed

Contact for regulatory topics: (GB) Siemens plc, Sir William Siemens House, Princess Road, Manchester, M20 2UR

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