theben

Manual
DALI-Gateway P64 KNX
Version 2.0

2025-01-02

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Content

1 Using the application program

This application program description outlines the function of the DALI-Gateways P64 KNX software for devices equipped with firmware version 2.1 or higher.

Product family:	Gateways
Product type:	DALI
Manufacturer:	Theben AG
Name:	DALI-Gateway P64 KNX
Order number.:	4940303

Number of communication objects: 2429

When using KNX Secure:
Number of secure group addresses for use: 1000
Number of communication partners: 100

1.1 Impact and compatibility

The new firmware V2.1 requires the ETS application V2.1 and the DCA V2.1
The already existing ETS version 1.x is not valid and cannot be downloaded into this firmware V2.
Likewise the new ETS V2 cannot be downloaded into an old firmware V1.x. During such a download, a message appears describing an incompatible firmware version (see Additional Features from Version 2.1).

1.1.1 Impact for web access

A total of 2 sessions (login) can be managed.
One session is reserved for admin user, the other can be used as a normal user.

2 Product information

2.1 DALI Bus system properties

The cross-functional DALI Bus (DALI = Digital Addressable Lighting Interface) is a system used to control electronic ballasts (ECGs) in lighting technology. The specifications of the DALI communications interface are set in the international norm EN 62386.

The DALI Bus enables the receipt of switch and dim commands. In addition, the DALI can be used for the notification of a failure status such as light or ECG failures or for other light status information. In line with the latest DALI standard, devices with emergency light function (EN 62386-202) are also supported. Status and operating mode of emergency lights can be monitored and different prescribed testing procedures can be performed.

Via the connected control device / gateway (Master), up to 64 individual DALI ECGs (Slaves) can be connected in a DALI segment. When the DALI is commissioned, the ECGs receive an automatically generated 3 byte long address. Based on the long address a short address between 0 and 63 is assigned during the further commissioning process. As the address assignment is automatic, the device order is random. The individual ECGs/lights therefore need to be identified during the further commissioning process (see below).

The addressing of individual ECGs in the system is either based upon the short address (individual addressing) or upon a DALI group address (group addressing). For this purpose, any number of ECGs within a segment can be assigned to up to 16 groups. The group addressing in the DALI system guarantees that switch and dim processes of different lights within a system are performed simultaneously without imposition of time delays. In addition to short and group addresses, the light values of individual DALI ECGs can also be merged into scenes and addressed via scene addresses.

For a detailed description of the DALI system, please see the DALI manual at:

➔ *https://www.digitalilluminationinterface.org*

2.2 Product features

The DALI-Gateway P64 KNX is a multi-master application controller for controlling electronic ballasts with DALI interface via the KNX installation bus. It supports ballasts according to EN 62386-102 ed1 (DALI 1), devices according to EN 62386-102 ed2 (DALI-2), as well as DALI-2 motion sensors and light sensors according to EN 62386-303 and EN 62386-304.

The device transforms switching and dimming commands from the connected KNX system into corresponding DALI telegrams, or status and event information from the DALI bus into KNX telegrams.

The DALI-Gateway P64 KNX has a DALI output which can control up to 64 ECGs. In addition, up to 8 DALI-2 motion detectors or light sensors can be connected. Multi-master operation according to EN 62386-103 ed2 is permitted.

The required power supply for the connected ECGs and motion sensors is provided directly from the device. Additional DALI power supplies are not required. When using sensors supplied via the DALI bus, it must be ensured that the current consumption of all connected DALI devices does not exceed the guaranteed value.

The device is available in a 4TE wide DIN rail housing for direct installation in an electrical distribution board. The bus connection is made via a standard bus connector. Mains and DALI lines are connected via screw terminals on the device. Ethernet is connected via an RJ45 socket.

Per gateway the ECGs can be controlled in 16 groups. In addition to the group control the DALI-Gateway P64 KNX also allows individual control of up to 64 ECGs.

In addition to the control of all standard operating devices, the DALI-Gateway P64 KNX also allows the operation of single battery emergency lights (EN 62386-202). Emergency lighting systems with central battery are also supported.

A maximum of 8 motion detectors with light sensors can also be controlled.

In addition to the pure gateway functions, the DALI-Gateway P64 KNX offers numerous additional features:

- Addressing of 16 DALI groups and/or individual addressing of up to 64 individual ECGs
- Flexible DALI commissioning concept: directly on the device, via integrated web server or in the ETS5 (DCA)
- Coloured light control with the support of Device Type 8 (DT-8) ballasts and control via communication objects
- Coloured light control depending on ballast Sub-Type:
  - Colour Temperatur (DT-8 Sub-Type Tc)
  - XY Colour (DT-8 Sub-Type XY)
  - RGB (DT-8 Sub-Type RGBWAF)
  - HSV (DT-8 Sub-Type RGBWAF)
  - RGBW (DT-8 Sub-Type RGBWAF)
- Automatic, time-controlled setting of light value, light colour and colour temperature (also for Human Centric Lighting applications) for groups and/or individual ECGs
- Automatic change of colour temperature depending on the light value (Dim-To-Cold)
- Control of colour temperature via communication object for DT6, warm white and cool white
- Broadcast objects for controlling all connected ECGs simultaneously (also possible for color values)
- Various operating modes for groups such as continuous mode, night mode, staircase mode
- Integrated operating hours counter for each group and/or individual ECG with alarm when end of life is reached
- Individual fault detection with objects for each individual luminaire/EVG

- Complex error evaluation on group/device level with error number and error rate calculation
- Error threshold monitoring with individually adjustable threshold values
- Scene module for up to 16 scenes, which can be assigned to KNX scenes 1..64 as required
- Extensive scene programming, including the possibility of dimming scenes
- Setting of colour in DT-8 luminaires via scenes for groups and/or individual ECGs
- Effect module for sequence controls and lighting effects including colour adjustment in DT-8 luminaires
- Test mode for systems with emergency luminaires supplied by central battery
- Support of single-battery emergency lights DT-1
- Support of test procedures for emergency lights with time and date stamp
- "Quick Exchange Function" for easy replacement of individual defective ECGs
- "Energy saving function" allows the ECG power supply to be switched off when light is switched off via additional switching actuators
- Integrated web server with extensive options for commissioning and maintenance
- Integrated "Visualization" via Web browser for direct operation and display
- Cross-device summary of errors in the entire system
- Manual operation of group and broadcast telegrams via operating keys and display on the device
- Signaling of error states and status diagnosis via LEDs and display on the device

ⓘ The special interface for configuring the DALI segments is designed as a DCA (Device Control App) for the ETS 5 and ETS 6. Please make sure that the corresponding ETS app is installed in addition to the product database knxprod. This is available for download at https://my.knx.org/.

Additional Features from Version 2.1:

- Call scenes and effect from time control module
- New- and Post Installation directly into groups or if short address is externally configured
- Reading the GTIN number of ECGs and input devices for easy identification
- New IoT Interface: API/MQTT
- Web access limitation to 1 user and 1 admin account

- Adjustable Soft-Start-Behavior
- Enhanced concept for "virtual input devices" allows assignment of several instances
- Extended functionality of the motion detector with 2-point light control
- DALI-2 push buttons are supported as input devices with numerous KNX functions.
- Generic Type DALI2-Input Devices are supported for various physical sensors
- Internal linking of input devices directly with DALI groups
- Support of Energy Reporting according to DALI Part 252.
- Constant light control
- Calibration of light sensors in DCA added
- DALI push button function extension: one-button dimming
- Description texts for input devices can be added

2.3 Operating concept

The device is equipped with 3 operating interfaces:

- Keys and display on the device
- ETS + DCA
- Web interface

It is recommended to select "one" operating concept for commissioning and later configuration.

ⓘ The operating concepts cannot be used in parallel or simultaneously.

Any change in the ETS or DCA will only become visible when the website is called up again (renewed login). The web page already called up cannot update these changes online.

It is also important to make sure that changes made with the website are only visible in ETS after a synchronization in DCA, see chapter 10.5 Synchronization between webpages and DCA.

Since an ETS download with the corresponding configuration of parameters and group assignment is necessary, the following procedure is recommended:

- Parameter setting and group assignment with ETS
- Commissioning of the ballasts and allocation to groups with the DCA
- Configuration of scenes, effects and timer commands with DCA or web interface
- Status and error diagnosis with the DCA or web interface

2.4 Scope of delivery and commissioning

The scope of delivery consists of:

- DALI-Gateways P64 KNX with pre-installed software
- Operating and installation instructions
- 1x heat shrinkable tubing 1.2 x 2cm for additional insulation of the bus cable

The following connectors can be found at the bottom of the REG casing (from left to right):

- KNX bus coupler
- RJ45 plug for Ethernet
- 230 V AC connector

The following connector can be found on top:

- DALI connector

The factory setting of the DALI-Gateways P64 KNX

- IP address assignment: DHCP
- Physical address: 15.15.255

A KNX project created with the ETS programming software should be available for the initial commissioning.

Error-LED

The Error LED indicates the following errors:

- KNX connection is interrupted
- DALI failure
- Internal error

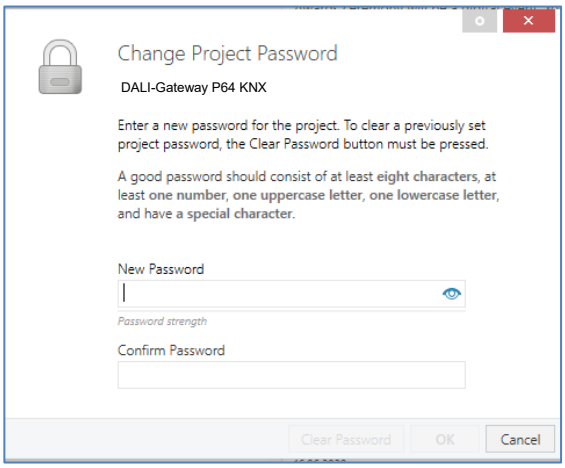
3 KNX Secure

The KNX standard has been extended by KNX Secure. This enables the transmission of encrypted information within KNX. This allows secure encryption of ETS downloads as well as communication via objects.

There are special conditions to be kept in mind when using secure devices in ETS. Please refer to the corresponding web pages on the KNX website (https://www.knx.org)

The DALI-Gateway P64 KNX is equipped with a KNX Secure Stack.

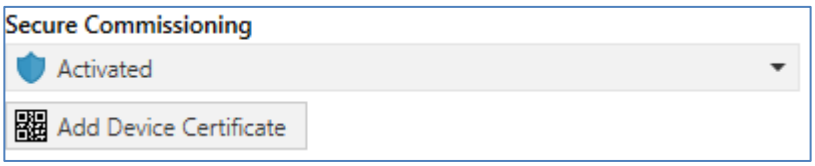
In order to use a device "safely", the ETS project must first be protected with a password.



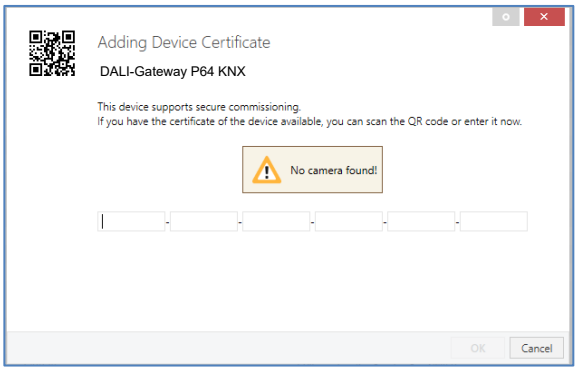
"Safe" devices can only be downloaded with an interface that supports longer telegrams (extended frames).

3.1 Secure usage

In the ETS the secured usage is shown in the properties as follows:



Subsequently, the device certificate must be read in for each "safe" device. For this purpose, the camera is available as a QR code reader or the code must be entered manually:



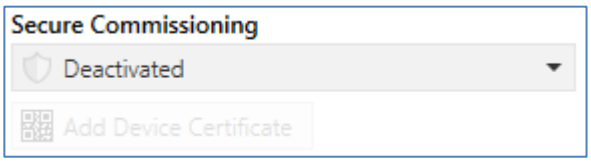
The certificate consists of the serial number and an initial key FDSK (Factory Default Setup Key). This code is only used for initial commissioning with the ETS. During the first download this key is replaced by the ETS. This prevents unauthorized persons from gaining access to the installation despite knowing the initial key.
This initial key is printed on the device label both as a QR code and in text form.

A "removable" sticker is also supplied, which the user can place in his documentation.

The unit is designed to use up to 1000 group addresses in secure communication. Up to 100 communication partners are possible to communicate with the DALI-Gateway P64 KNX via secured group communication.

3.2 Unsecure usage

However, the DALI-Gateway P64 KNX can also be configured with deactivated security in the ETS, as was previously the case. In this case, group communication with other devices can also be carried out as usual. In this case no encrypted ETS download takes place.



3.3 Master reset

A master reset must be carried out so that the device can be returned to the manufacturing state and thus the initial key can be reactivated.
The following procedure must be followed for this:

1. Remove KNX connector.
2. Keep commissioning KNX push button pressed.
3. Add KNX connector.
4. Keep KNX push button pressed for long time (~7sec) after KNX power supply connection.

After this procedure, the device is back in the delivery state.

4 Colour control

The DALI-Gateway P64 KNX also supports ECGs for colour control (device Type 8 according to EN 62386-209). Such devices allow for multi-channel colour control (RGB) and thereby enable the mixing of a light colour or the setting of a colour temperature via DALI.

4.1 Features of DALI device type 8

ECGs for colour control (DT-8) are offered by a range of manufacturers. Usually, these devices allow for the direct control of LED modules with multi-colour LEDs. The most common ones are modules with LEDs in the three colours red, green, blue (RGB), as well as modules with two different white tones (Tunable White).

ⓘ DT-8 ECGs for the sub-Type PrimaryN are **not** supported by the DALI gateway.

Occasionally LED modules with a further integrated white channel (RGBW) are offered on the market. Whilst it is, of course, possible to control the different colour channels individually, each via a separate DALI control device for LEDs (Device Type-6), this solution has the disadvantage, that each of these devices is assigned a separate DALI short address. This means that two (tunable white), three (RGB) or even four short addresses are required to control a module. With a maximum number of 64 available short addresses per DALI segment, the number of lights that can be used would be greatly reduced. With a DT-8 device, however, only one short address is required for all colour channels and the maximum possible range of 64 lights can be controlled.

The DALI standard EN 62386-209 defines different colour control methods for DT-8 devices. Normally, a certain device supports only one of these possible methods.

ⓘ Therefore, please pay attention to the specifications of the respective device or lamp manufacturer.

4.2 Colour display via XY coordinates

The display of a colour via two nominated coordinates in a so-called colour space is a common method. By means of the x-y coordinates any point in this space is accessible and as a result any colour can be defined. The diagram used in the DALI standard is the colour space chromaticity diagram according to the 1931 CIE standard. (Cambridge University Press) which is shown in the following graphic:

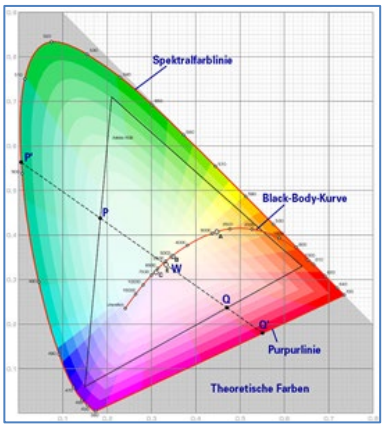


Figure: University Cambridge press, source Wikipedia

In devices that support the x-y coordinates method, the colour is set via two values between 0.0 and 1.0. However, because of the physical properties of an LED, even in an RGB LED module not every colour is practically possible. In practice, it is common to set the value which is closest.

Please pay attention to the instructions of the ECG or lamp manufacturer. Usually the xy values, which are supported by the lamp, are specified here. XY values outside of the specified range can lead to incorrect values and non-reproducible colours.

4.3 Colour display via colour temperature

One subset of all the possible colours in the colour space displayed above, are the different white tones. The white tones are found on one line across the whole colour space. The points on this so-called black bodyline (BBL) are usually defined via a colour temperature in Kelvin. This makes it possible to exactly determine the white tone of a light between warm and cool with just one value. The colour temperature principle is therefore perfect for the control of white light fixtures (tunable white).

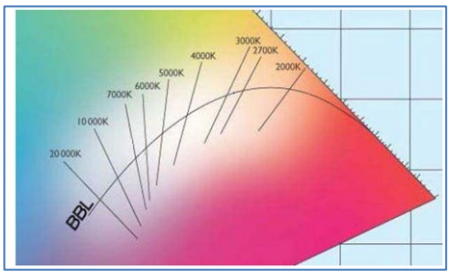


Figure: University Cambridge press, source Wikipedia

DT-8 operating devices set the required colour temperature on an LED module by mixing cool and warm white LEDs. Of course, as before this is only possible within certain physical limits. With today's LED modules colour temperatures between 2000 and 8000 Kelvin are common.

4.4 Colour display via 3 or 4 colour channels (RGBWAF)

Principally, a colour is always created by mixing different individual colours (different white tones, RGB or RGBW). A colour can therefore also be displayed based on the mixing ratio of different single colours, e.g., 50 % red, 0 % green, 60 % blue.

Unlike the methods described above, the colour definition in this case is not exact but depends greatly on the specific, physical attributes of the LEDs used to create the colour (wavelength, intensity). Nonetheless, the indication of the primary colour percentages within a system is useful for the relative description of a colour. In some DT-8 ballasts, the colour is set by defining 3 (RGB) or 4 values (RGBW) between 0 and 100 %.

According to DALI standard EN 62386-209, up to six colours (RGBWAF) can theoretically be drawn upon.
The DALI-Gateway P64 KNX, however, only supports a maximum of 4 colours, in line with the ECGs that are currently available on the market.

4.5 Colour display via 2 DT-6 LED types

This allows a colour temperature to be set via 2 DT-6 groups. For example, LED strips with a warm colour (3000 K) are assigned to a master group and LED strips with a cold colour (6000 K) to a slave group.

With this assignment, only the master group with one colour temperature is controlled. The device automatically calculates the control of the warm and cold LED to achieve the desired colour.

5 Operating modes

Each group and individual ECG offer different operating modes that can be set individually on the parameter page.

5.1 Normal mode

In normal mode, ECGs can be dimmed and switched without restrictions both via individual and group control. The control of each ECG and each group is based on three communication objects (switching, dimming, value setting). For DT-8 ECGs numerous additional objects for light colour control are available.

An ECG can only be assigned to a single DALI group. The DALI-Gateway P64 KNX does not support multi-group assignments on DALI level. If such assignment is required, please use KNX communication objects for this purpose. Separate status objects inform about the switch and value status both at group and individual ECG level.

5.2 Permanent mode

If you would like to run an individual ECG or a whole group permanently with a certain light value, (e.g. a permanently lit corridor or workshop) you can choose the permanent mode option. The ECG or group are automatically set to the required value after you program or switch on the gateway. Switch and dim objects remain hidden. Light status, failure and service functions, however, are also available in permanent mode.

ⓘ Should a device in this mode not be running at the preset light level because of a special operation (e.g. identification process on the device display) or failure (e.g. ECG was without power when the gateway was started) the light level is automatically corrected after 60 seconds.

5.3 Staircase mode

This operating mode is supported by groups, only. In staircase mode, the value set via a switch, dim or value telegram is automatically changed to the switch off value after a programmable time. The lights can be switched off immediately or in 2 steps (within a minute) or through dim-down (within a minute).

In staircase mode, each additionally received telegram re-starts the internal timer. The lights switch off when the timer runs out after the most recently received telegram. The staircase mode can be disabled or enabled via an additional object. If the staircase mode is disabled, the group behaves like in normal mode and does not automatically switch off. If the mode is disabled whilst the switch-off timer is already running, the timer stops and the group remains at the currently set value if the mode is enabled again, the timer starts again from the beginning.

5.4 Night mode

The night mode corresponds largely to the staircase mode. The only difference is that the automatic switch-off is dependent on the central night object of the gateway. If the night object is not set (day), the group behaves like in normal mode. If the object is set (night), the group either switches off after a programmable time or it goes into permanent mode.

5.5 Panic mode (special case)

The panic mode can be activated via a central object for the whole gateway. All groups and ECGs that have been enabled for panic mode, permanently switch to a programmable panic light value on receipt of the object. They can no longer be controlled individually. When the panic mode is switched off, the devices return to the previous light value, or the switch on / switch off value and can again be controlled individually.

ⓘ When the panic mode is active, both the scene and time scheduling module are de-activated.

5.6 Test mode for central battery emergency lights

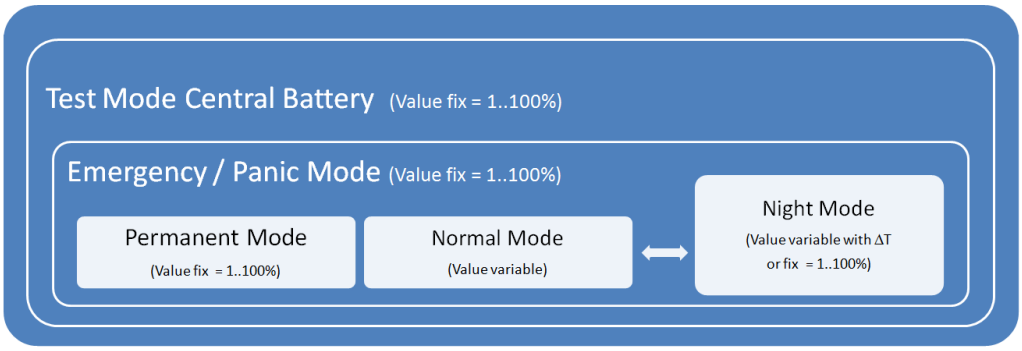
Through its internal function the DALI-Gateway P64 KNX supports installations with central battery emergency luminaires. Any ECG (except for those of the self-contained battery Type) can be configured as an emergency light (even when assigned to a group). You can choose a test time between 15 minutes and 4 hours. If the gateway receives the central battery test object, the respective lights change to a programmable value for this time period. They can no longer be switched or dimmed via the corresponding objects. The discharge time and capacity of the central battery can thereby be tested under pre-defined conditions.

So that individual ECGs within a group can no longer be switched via group telegrams or scenes, the group assignment is dissolved for the duration of the test mode. When the test has finished, groups and scenes are automatically re-programmed onto the ECGs. Should the gateway lose power during the test mode, the unprogrammed devices are marked and automatically programmed on return of the power supply. The test mode, however, does not continue. It has to be re-started.

When the test mode terminates normally, the devices return to the previous light value, or the switch on / switch off value and can again be controlled individually.

5.7 Operating mode hierarchy

Some of the individual operating modes described above have higher functions and roles for the operation of the system as a whole. A prioritization or hierarchy of operating modes is therefore required.
The central battery test mode has the highest priority followed by the panic mode. The permanent, normal and night modes have the same priority level in the hierarchy.



By default manual mode is enabled and can always be used for service and maintenance functions. However, it can be disabled by means of ETS parameters, see chapter 21.1.4 Page parameter – special functions.

6 Light Control Module

The DALI-Gateway P64 KNX offers the possibility from version 2.1.0 with the connected DALI-2 light sensors (motion detectors with light sensors) to realize directly a light control via threshold (2-point light control) or to realize a constant light control. The light control ensures that light is switched on or controlled when the light value measured by the sensor falls below a minimum set value. For the output, a corresponding communication object is available as 1 bit (only 2-point light control) or alternatively as a 1-byte value (constant light control) is available.

The control can also act directly internally on the 16 DALI groups of the device. Linking of the communication object is not necessary in this case, which leads to a considerable reduction in the bus load compared to constant light control via a KNX sensor. The selection and setting of the main and, if necessary, up to 2 sub-groups, and the weighting of the sub-groups is carried out via ETS parameters.

If the direct control of internal DALI groups is used by the light control, it can be set via a parameter whether a change of the light value of the group (main or subgroup) is to be carried out by a command, outside of the light control, i.e.:

- Group On/Off, Dimming, value setting via communication object.
- Group part of a scene and scene activation
- Group in panic or test mode
- Broadcast switching, value setting

deactivates the control or switches off the automatic mode.

In such a case, the control must first be reset to automatic mode via the communication object Disable/Automatic. In addition to activating the control via the object, the control can also be activated automatically after an adjustable period of time (fallback mode). The status of the control (active/not active) is provided via the existing status object.

Attention: Higher-priority operating modes (see chapter 5.7 Operating mode hierarchy) of the respective group, i.e.

- Emergency/panic operation
- Test mode central battery
- Permanent mode

as well as a blocking via the blocking object of the group, always prevent the control from changing the group, even if the above-mentioned parameter is not set.

Light control can also be activated depending on the presence detection of a linked DALI-2 motion detector. In this case, the light is only switched on if the value falls below the setpoint and the detector has reported "Presence". If the sensor reports "Vacant → No more movement detected", the light switches off and control of light is stopped.
In semi-automatic mode (can be set via parameters), control is only started if an external trigger is issued via the semi-automatic object in addition to presence detection.

6.1 Light control via treshold

The light switch-off behaviour of a light controller with presence detection can also be set via a parameter. Either the controller always switches off the light if there is sufficient extraneous light (> setpoint) or the controller only switches off when the "Vacant" state is reached (i.e. switching off is independent of the light value).

In the first case of a 2-point light control, it should be noted that light switched on by the control requires a threshold value shift. If, for example, artificial light is added when the daylight threshold value falls below 200 lux, the threshold value is exceeded again by the artificial light component. So that the controller does not immediately switch off again, the added artificial light must be taken into account by the controller and the threshold value raised accordingly. For this purpose, the light value is measured before and after switching on and the difference is added to the threshold value. The light is only switched off again if the correspondingly corrected value is exceeded.

Since it takes a few seconds for the new light value to reach the final value, depending on the type of lamp and ballast used, the delay time until the second measurement after the light is switched on can be set via parameters.

It should be noted that a maximum delay of 15 seconds (default 6 seconds) can be selected here. If the group is set in such a way that the final value is not reached within this time (e.g. with dimming time at switch-on > 15 seconds), the control cannot function because no correct artificial light component is taken into account.

If a deactivated controller is reset to automatic mode with artificial light already switched on (e.g. after deactivation by manually switching on the group) via the communication object Disable/Automatic, no threshold value adjustment takes place. In this case, only the previously adjusted threshold value (parameter modified by object value if applicable) is relevant for the 2-point control. In corresponding lighting conditions, it is therefore possible that the manually set light is first switched off after activation, as the artificial light component is already above the light threshold. If, however, the daylight component is below the threshold after switching off, the controller will switch the light on again. After switching on, the artificial light component is taken into account and the light remains on due to the threshold shift.

If the light switch-off behaviour of a light controller with presence detection is set to "Switching off is independent from the light value", this effect of brief switching off cannot occur because switching off is not caused by the light value but exclusively by the "Vacant" state.

6.2 Constant light control

With the DALI-Gateway P64 KNX, it is also possible to implement constant light control directly via the connected DALI-2 sensors. With constant light control, the light value measured by the sensor is compared with the desired setpoint value and the lighting level is automatically adjusted to the setpoint value. The illuminance of the artificial light component set by the DALI gateway is adjusted to the optimum value depending on the incidence of daylight (through windows or skylights).

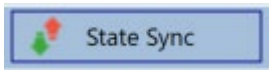
As with 2-point control, the controller can be activated directly depending on presence detection by a connected DALI-2 motion detector. The controller is only activated if the sensor has detected movement and reports "presence". If no more movement is detected ("vacant"), the light and control are switched off. As with the 2-point controller, semi-automatic operation is also possible.

With the control concept implemented in the DALI-Gateway P64 KNX, the dimming value is successively increased or reduced until the measured actual value reaches the setpoint value. To prevent too frequent a change, a hysteresis symmetrical to the setpoint value can be set. If a light level is reached within the hysteresis range, no further light adjustment takes place.
Both the maximum increment used for the approach and the time between sending a new output value can be set via parameters. The start value, which is set first when the control is activated, can also be parameterized. As an alternative to a fixed start value, the device can also calculate the switch-on value automatically. In this case, the device takes the measured daylight

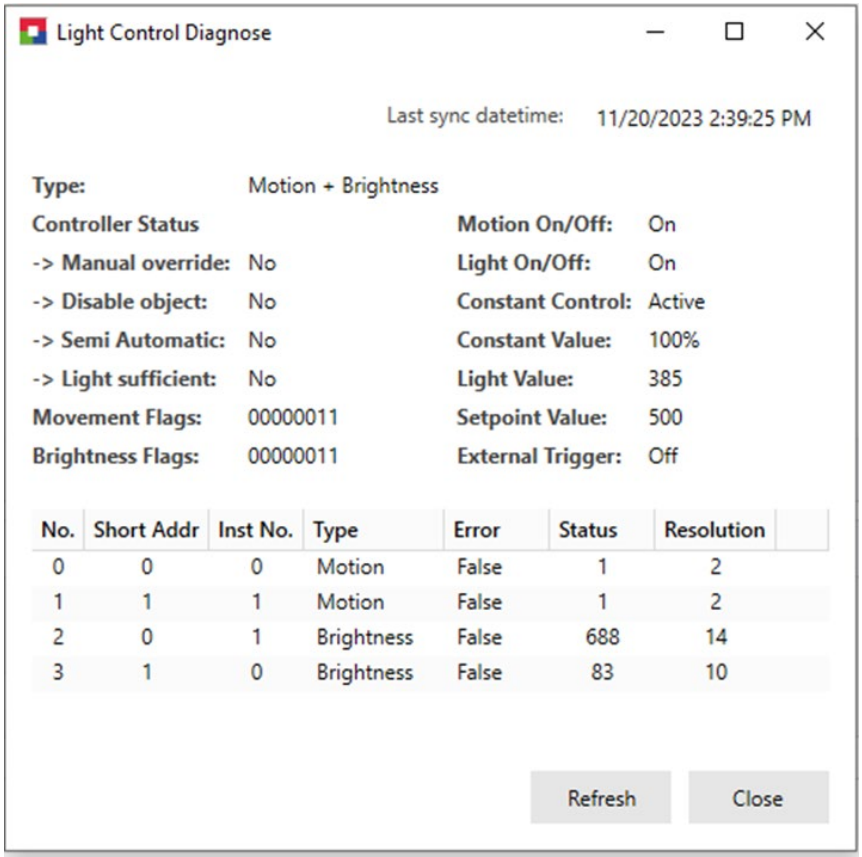
into account when switching on and only activates as much light as is necessary as the start light.
It should be considered that the start value can only be calculated automatically if the device has been calibrated beforehand (see chapter 6.4 Calibration of constant light control). As long as no calibration has been carried out and no plausible calibration data is available, the start value set in the ETS is always used when starting the control.

6.3 Light control diagnostic

To monitor the current status of the light control, a diagnostic window with detailed information can be opened in DCA View.
This operation requires a connection to the DALI-Gateway P64 KNX and a previous executed "State Sync" operation. By pressing "State Sync" all diagnostic data will be read from the device.



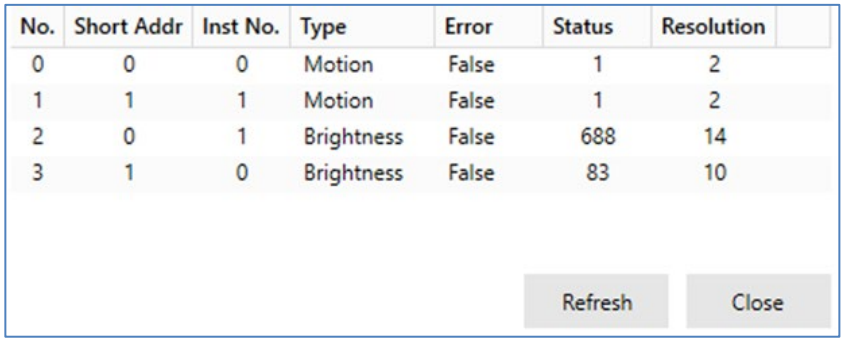
By a right click in one of the 8 motion detectors in the left tree the diagnostic window can be opened. The prerequisite for this is that this motion detector has been activated for light control in the ETS parameters.



This diagnose windows displays all interesting values of the light control system:

Type:	Type of control unit, usually Motion + Brightness
Controller Status: • Manual override • Disable object • Semi Automatic • Light sufficient	Information of current status
Movement Flags	Which connected instance does indicate a movement. In case of 5 connected instances for each one bit can be set and indicate that movement has been detected.
Brightness Flags	Which connected instance does indicate a brightness value. In case of 5 connected instances for each one bit can be set and indicate that brightness has been detected.
Motion On/Off	Shows the motion status
Light On/Off	Shows the Light Output status
Contant Control	Shows the constant controller status
Contant Value	Shows the constant controller output
Light Value	Shows the current corrected light value
Setpoint Value	Shows the current setpoint value
External Trigger	Shows the status of the external trigger

In addition, information of all instances linked to the motion/brightness detector in the ETS is provided in the diagnosis window.



The values are not updated automatically. There is a manual "Refresh" necessary to update current values/status.

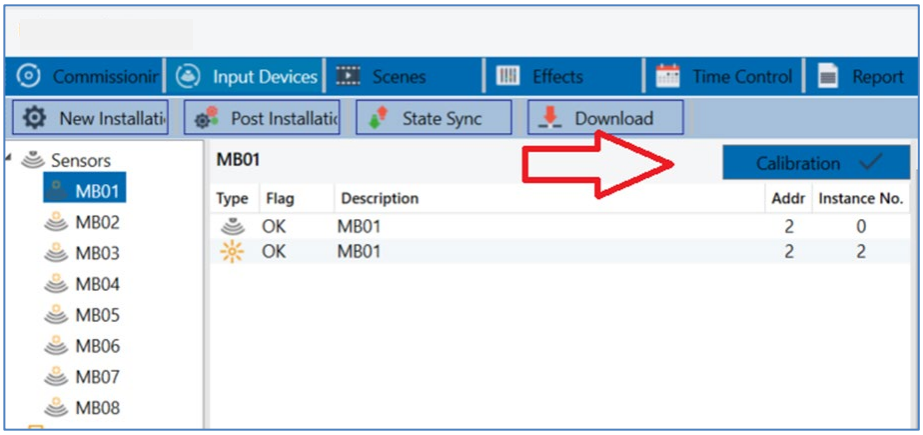
6.4 Calibration of constant light control

The light values measured by the connected DALI-2 sensors do not usually correspond to the illuminance actually present at the workplace. The measuring point of the sensors is on the ceiling and therefore the illuminance is measured on the ceiling and not at the workplace. In addition, the specific properties of the room (reflection factors of furniture, floors, walls, etc.) have a considerable influence on the light measurement.
Manual calibration of the sensor values is therefore normally essential for the control system to function correctly. The actual lighting conditions at the workplace are measured with a luxmeter and the values measured by the DALI-2 sensor are adjusted using the measured values.

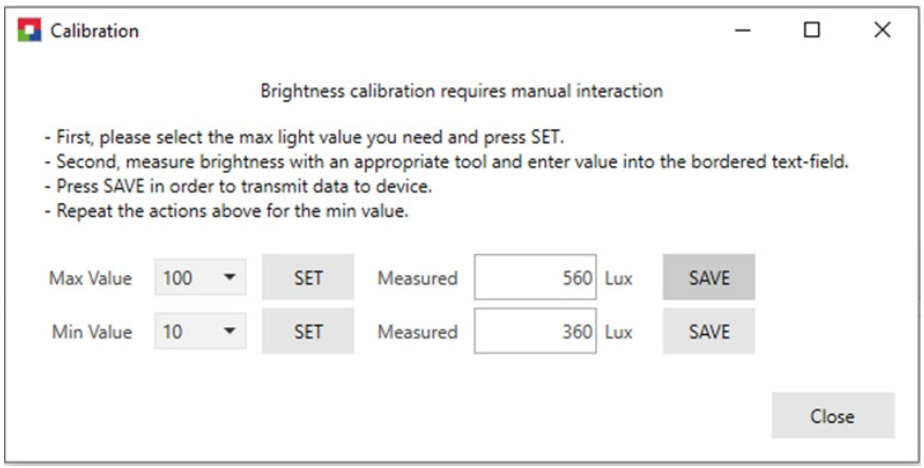
The DALI-Gateway P64 KNX offers a user-friendly method for calibrating the light values directly in the DCA.
If the following requirements are met:

- Constant light control has been activated for this ETS detector in the ETS parameters
- In the ETS parameters "Calibration via DCA" has been activated in the brightness tab

the calibration process can be activated via the corresponding button in the DCA.



A window opens when the calibration button is selected:



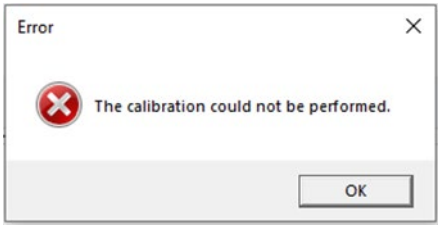
The condition for successful calibration is that it is performed in a darkened scenario, if possible completely without daylight.

Calibration is carried out in 4 steps:

1. First, the artificial light is switched on to a max. value between 70 % and 100 %. By pressing the "SET" button, the light of all groups involved is switched on according to the ETS configuration and the assigned groups.
2. The measured value is then entered and the "SAVE" button is pressed. This saves the first interpolation point.
3. The second interpolation point is recorded at a minimum value between 10 % and 30 %.
4. Here too, the measuring device is read, the value is entered and saved by pressing the "SAVE" button.

This completes the calibration, and a linear approximation is calculated with these two reference points.
The value measured in the brightness sensor is now corrected using this calibration function.

ⓘ If the calibration could not be carried out, the following error message appears and the process should be repeated.



ⓘ If the calibration could not be carried out, the brightness correction is reset and a 1:1 assignment is activated in the gateway. This means that the same value measured by the sensor on the ceiling is used to calculate the control.

7 Analysis and service functions

7.1 Energy reporting according DALI Part 252

The DALI-Gateway P64 KNX supports device type 51 ECGs to read energy or power values directly from the ECGs and make the information available on the KNX.
The standard defines a minimum cycle time of 30 seconds for reading out the energy data. In the event of a status change, the correct consumption should therefore be available after this time at the latest. Depending on the ECG manufacturer, this time can vary and be adjusted via an ETS parameter.
The DALI-Gateway P64 KNX also automatically calculates the consumption per group and per device.

7.2 Recording operating hours

The DALI-Gateway P64 KNX allows for the operating hours (burning time) of each lamp to be individually recorded for each group and individual ECG. The internal recording is precise to the second. The value is available externally via communication objects (DPT 13.100).

The operating hours recording is independent from the dim value. This means any light value > 0% contributes to an increase in the operating hours of a group. The counter can be reset (when a lamp is changed). To reset the counter, the value 1 is written on the communication "reset operating hours".

A maximum value can be configured for each running time counter (life span), which activates an alarm object on the KNX bus. This information can be used for maintenance purposes.

In accordance with KNX standards, the operating hours are sent in seconds. However, these can be changed into other units.

7.3 Failure recognition at ECG level

A major advantage of DALI technology is the individual recognition of light failures or faulty ECGs. The DALI-Gateway P64 KNX supports this function.

For error analysis, the DALI gateway cyclically interrogates all connected ECGs for ECG and lamp faults. The polling cycle can be configured. If the time is 1 second (standard setting) and there are 64 connected ECGs, the complete process of scanning all ECGs for light and ECG failures takes 128 seconds (1 second per ECG and failure Type). It can therefore take up to about 2 minutes before a fault that has occurred is recognized. For each ECG, a communication object is available to send the information to the KNX bus (1Bit or 1 Byte object). In addition, the failure status can also be checked on the DCA in the ETS.

Furthermore, the error status of all TOEs is clearly displayed on the web page of the gateway.

If the parameter setting is "Polling cycle for failures" = "No query", all failure queries are disabled. No ECG or converter failures or lamp failures are recognized in this case. This setting is only useful for service purposes when an extreme reduction of the DALI busload is required.

7.4 Failure analysis at group level

If ECGs and /or converters are merged into groups, numerous group-specific failure data is available in addition to the individual ECG data. For this purpose, different communication objects are available for each group. In addition to general information such as whether there is a failure within a group and of what Type, the complete number of faulty devices within the group and the failure rate can be listed via a communication object. An alarm object is sent when a certain failure rate is exceeded. A complex object with a summary of the data further adds to the analysis options.

For details of group-specific communication objects, please see the communication objects description below in chapter 20.3 Group objects.

The failure information for a group is also clearly displayed on the web site of the integrated web server.

7.5 Failure analysis at device level

Failure analysis objects similar to those at group level are also available at device level (i.e. for all ECGs connected to the gateway). The failure rate or number of faulty ECG in the whole DALI segment can be made available via communication objects. In contrast to the group level, at gateway level the percentage and number of failures can be broken down further according to failure Type. The alarm threshold for the failure rate can be individually set for ECG, light and converter failures.

For further details regarding the communication objects, please see the communication objects description in chapter 20.1.2 General objects – analysis and service.

As before, the failure information for the entire gateway is also displayed on the website.

8 Webserver

8.1 Basics

In addition to the DCA, you can also easily commission the DALI via the integrated web server. For this purpose, connect the DALI-Gateway P64 KNX directly to the IP network. An RJ-45 socket is located above the KNX bus connector at the bottom left-hand side of the device.

Use a standard patch cable to connect the device to a switch, hub or router of the IP network. You can also use a WLAN access point as network coupler. This means you can commission the DALI via a portable notebook, tablet PC or mobile phone.

Once the network is physically connected, you need to assign an IP address to the DALI-Gateway P64 KNX to enable access via the web browser. By default, all Theben devices with an IP interface are set to DHCP address assignment. If there is a DHCP server in the network the device automatically receives an IP address after initialization. This address is shown on the device display. If no DHCP service is available or if you would rather use a fixed IP address, you must set the address either via ETS. You may also need to configure the sub-net mask and standard gateway (for direct access via the Internet). Those two parameters can only be configured in the ETS.

Once the IP address has been assigned correctly, load the device website via any common web browser.

ⓘ Please, take care that you open a https connection via https://<ip>

HTML5 functionality is required for all browsers used. Google Chrome, Mozilla Firefox and Microsoft Edge have been tested in the current status (version of this document).

8.2 Safety aspects

The communication with the web server in the DALI-Gateway P64 KNX is encrypted via HTTPS. Each device has a self-signed SSL certificate. This certificate contains among other things the name of the owner, his public key, the period of validity and the name of the certification authority.

The SSL certificate existing in the device was signed by the certification authority and can be verified with the corresponding public key of the certification authority.
In order for the SSL certificate of the device to be considered trustworthy, the browser or PC must know the certificate of the certification authority in order to confirm the trustworthiness. The operating system manages a list of all "trusted certification authorities", so-called CA root certificates.
If a secure connection is then established in the browser, the browser first checks whether this certificate can be confirmed by a CA root certificate. If the check is positive, a closed lock is usually displayed in the browser line to confirm security.
If the device certificate cannot be confirmed, a security warning will be issued and must be accepted manually.

The DALI-Gateway P64 KNX devices have their own CA root certificate, and all device certificates are derived and confirmed from this CA root certificate.

If this CA root certificate is imported on the operating system, the browser recognizes all DALI-Gateway P64 KNX devices as "trustworthy", as the individual device certificates are confirmed by this CA root certificate.

The device makes the CA root certificate available via an administrator page. The procedure for loading this certificate and then installing it on the PC is explained in the chapter 8.3 Import of the CA Root Certificate.

8.3 Import of the CA Root Certificate

As already explained in the security aspects, the device enables the CA root certificate to be loaded.
To do this, please log in on the website as "Administrator" and select the menu item "ADMINISTRATOR". Below the actions is the entry "Load the root certificate". This allows the root certificate to be stored on the PC. See also chapter 8.7.2 Download issuer certificate.

To import this certificate, please proceed as follows:

Install security certificate:

- Right-click the exported file in the location where it was saved and select "Install Certificate".
- In the next step, the storage location is queried. Here you can select "Current User" or "Local Computer". Click on "Next".
- Here the option "**Save all certificates to the following store**" should be selected and "Browse" should be clicked.
- Select the **Trusted Root Certification Authorities** folder as the certificate store and OK.

After completion, the message "The import process was successfully completed" is displayed.

In order for the browser to check this new issuer certificate when calling up a website, it must be restarted.

8.4 User accounts

Two user accounts are managed in the DALI-Gateway P64 KNX. A user with all rights as administrator and a normal user with restricted rights. A total of 4 sessions (login) can be managed. One session is reserved for the admin user, the other can be used as a normal user.

8.4.1 Administrator

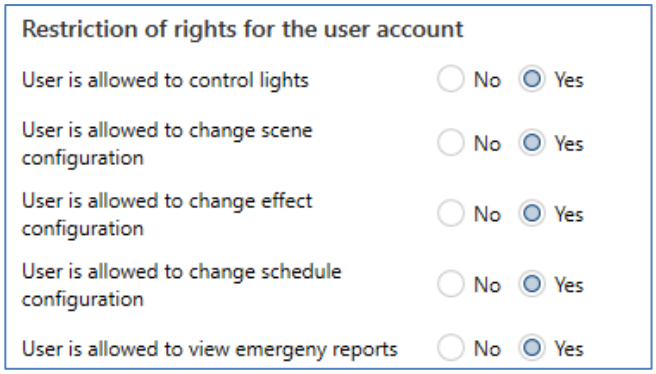
This user role has all rights. In particular, commissioning, i.e. new installation or subsequent installation of the ballasts or motion detectors, is only permitted to the administrator.

ⓘ Only one administrator can be logged on at a time.

8.4.2 Normal user

The rights of the normal user can be set in even more detail with the ETS.
Basically, commissioning is blocked for the user.

By default, however, it has all operating rights to switch lights, configure scenes, effects, schedules and view status information.



8.5 Password management and login

For security reasons, access to the web server in the device is blocked by default. Therefore, an ETS configuration and a download is necessary before using the IP interface.

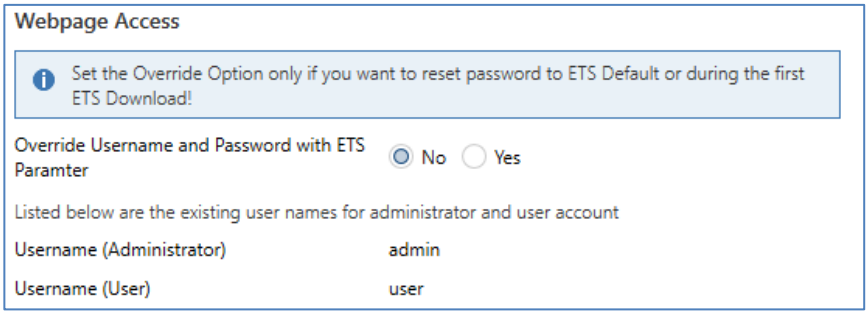
After setting the network configuration, the web server can be activated. By default, the following accesses are provided with the corresponding access data.

Account	Login Name	Password
Admin Account	admin	dali
User Account	user	user

ⓘ Please note that after the download the passwords for the accesses must be changed again into secure passwords.

After that the passwords should not be reset with the ETS.

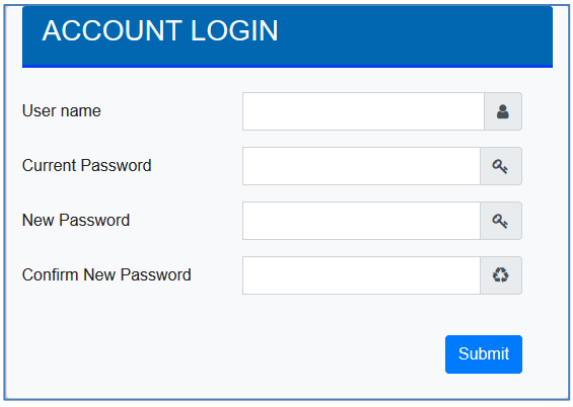
It is therefore strongly recommended to set the corresponding parameter to "No" before the next ETS download:



After the first ETS download and the parameter "Overwrite login name and password" set to "Yes", the authentication is carried out with these values. Afterwards a prompt appears asking you to change the password.

The following rule must be observed here:

- At least 8 characters
- Upper and lower case
- At least one digit
- At least one special character



Afterwards you can log in with the changed password.

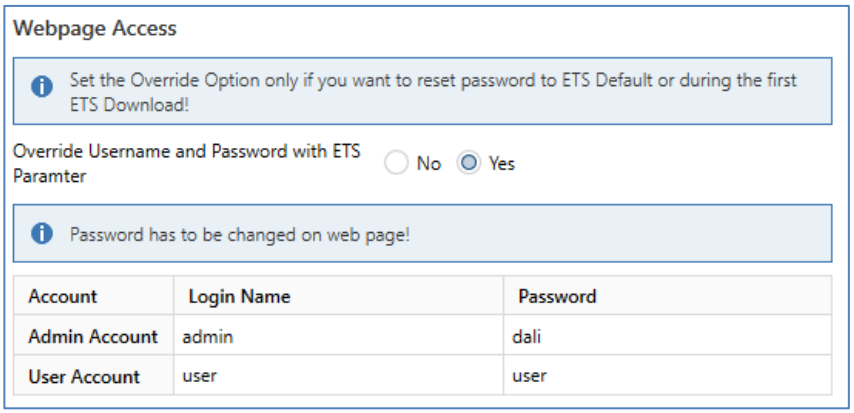
The username is only defined with the ETS configuration.

Accordingly, it would be possible to assign a customer-specific login name for the administrator or the standard user.

However, it is recommended to use the default names "admin" and "user".

8.5.1 Password forgotten

If the password is forgotten, the password can be reset via an ETS download with the ETS and the corresponding parameter, see figure.



This is followed by changing the password as described in the previous chapter.

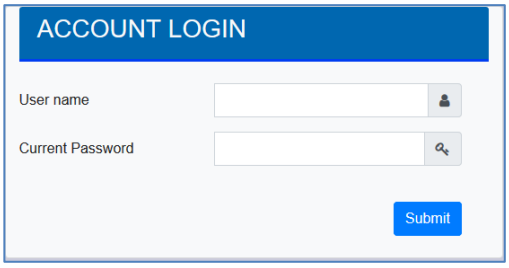
8.6 Log-in the website

Once the IP connection to the gateway is established, the website can be accessed by entering the IP address in the address field of the browser. The website can be accessed with user or administrator rights.

Please, take care that you open a https connection via https://<ip>

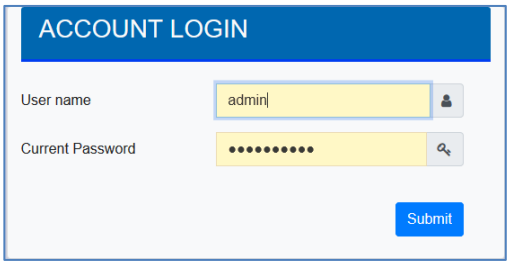
When logging in as "user", the function of the website is restricted, and configuration commands are blocked. This login should be used if the website is used for visualization and operation. If the website is also used for DALI commissioning, the login as administrator is required. All following illustrations and descriptions of the web pages refer to the administrator representation.

In the login window, the username is used to decide whether the administrator role or the normal user role should be activated.



The username is defined in the ETS. By default, "admin" and "user" are used.

Under certain circumstances it is advisable to save the login data in the browser. You will be prompted to do so. With the next call the data are then already pre-filled.



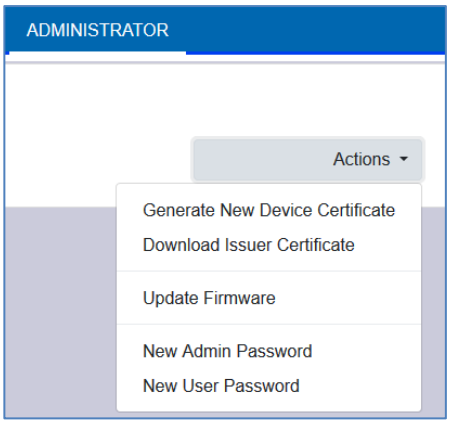
If there is no login after 1 minute, a subsequent login is reported as a "forbidden request" for security reasons. The correct URL must then be loaded again, and the user must log on again.

For security reasons, access to the website will be blocked for 1 minute if 4 incorrect login attempts are detected.

Up to four sessions can be managed. If all four sessions are logged in with "User", the role of "Admin" is also acknowledged with the response "No Session available". In this case the logged in "Users" must first be logged out.

8.7 Administration of the website

For administration, please log in on the website as "Administrator" and select the menu item "ADMINISTRATOR".



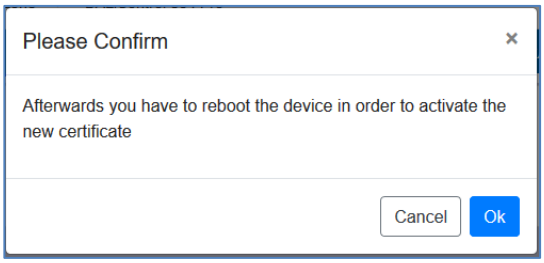
8.7.1 Generate new device certificate

The device is delivered with a certificate. This certificate has a lifetime of 5 years.
There are different reasons to renew the certificate:

- The IP address of the device has changed (after initial commissioning)
- The certificate is no longer valid and must be renewed

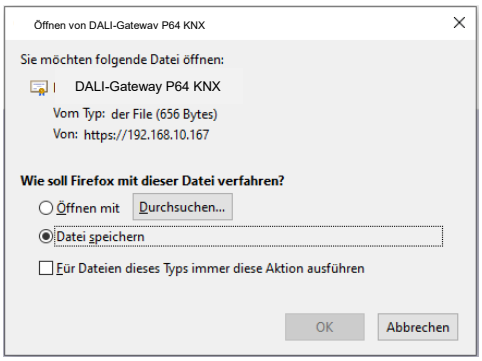
To regenerate a certificate, you must be logged in to the administrator role.

Under the tab "Administration" you have the possibility to generate a new certificate.
After the certificate is created, the device must be manually restarted for the new certificate to become active.



8.7.2 Download issuer certificate

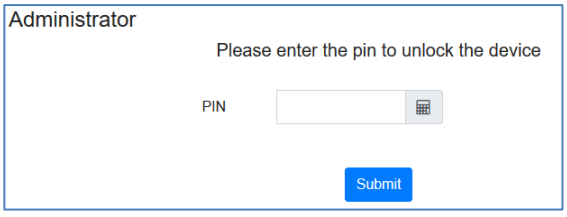
With this action the issuer certificate can be downloaded to the PC.



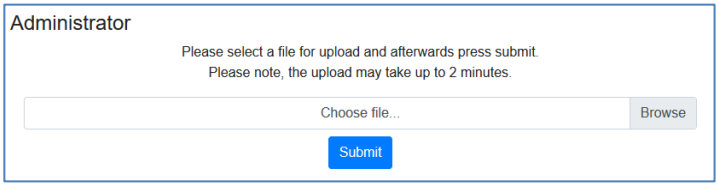
Please select a storage location in order to install the issuer certificate on the PC afterwards, see 7.3 Import of the CA Root Certificate. The certificate will be saved in a ".der" format.

8.7.3 Update firmware

Here the firmware of the device can be updated. For security reasons, the PIN is requested which has already been configured in the ETS.



Only if the PIN is entered correctly, the next window is displayed to select the firmware package.



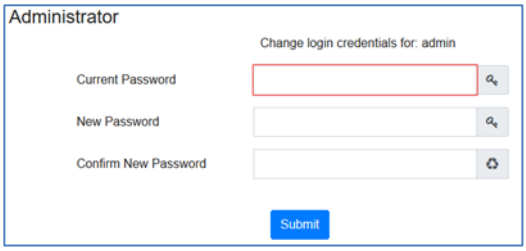
The firmware update can take up to 2 minutes.

Under unpredictable conditions, the transmission can be interrupted with an error. The following errors could be reported. Please contact the manufacturer.

- 701: Device is not unlocked via PIN
- 702: Signature could not be verified
- 703: Device type does not match
- 704: Manufacturer does not match
- 705: Request ID is invalid
- 799: General error

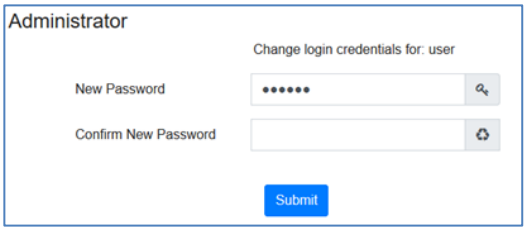
8.7.4 New admin password

In this menu item the password for the administrator can be changed.



8.7.5 New user password

In this menu item the password for the user can be changed.



8.7.6 API/MQTT access configuration

Settings and instructions for using MQTT are explained in chapter 21 API/MQTT. When using the API/MQTT, please observe the safety instructions in chapter 24 Disclaimer for cyber security.

8.8 Language setting on website

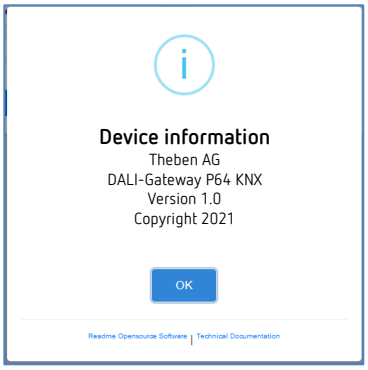
The language English is selected on delivery. The language can be changed directly on the device using the buttons, see submenu chapter 19.2.1 Sub menu: language.

Only the languages English, German and French are provided on the website.

8.9 Calling the start page

The website consists of a header and a menu bar, which are always visible. The header displays the logo, the installation location, if defined in the ETS configuration, and the login name.

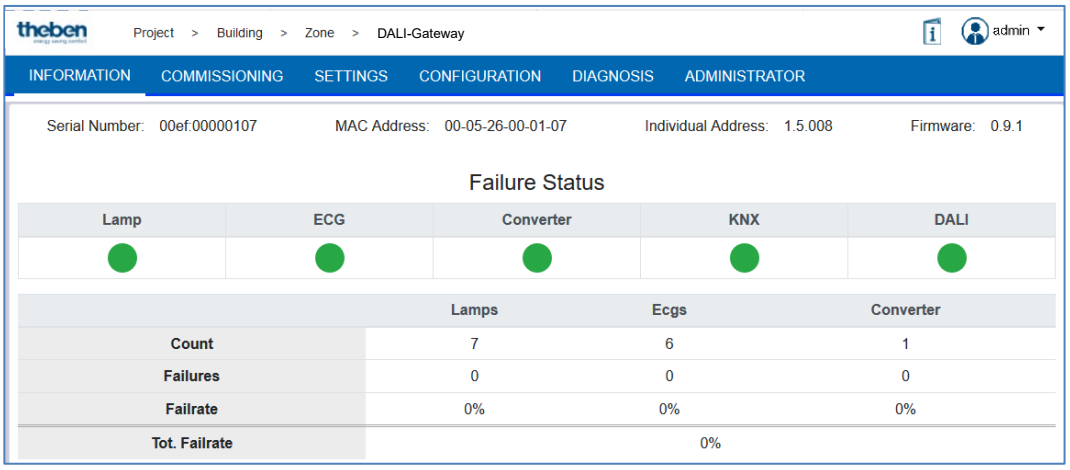
The Info button displays a popup window with the version, a link to the technical documentation and a link to use the OpenSource sources.



The menu line consists of the entries:

- Information
- Commissioning (only in the admin login)
- Settings
- Configuration
- Diagnosis
- Administrator (only in the admin login)

Initially, the overview page with the basic information of the device is displayed:



The following properties of the DALI gateway are displayed in the upper line:

- Serial number
- Mac address
- KNX address
- Firmware version
- DNS name

The current error situation is also displayed. A distinction is made between the following types of error:

- Lamp fault
- ECG Error
- Converter error
- KNX Error
- DALI error

The table below shows the number of connected devices and their error rate.

8.10 Actions on the webseite

Different actions can be performed on the website. A distinction is made between configuration commands such as new installation and switching commands.
Acknowledgement after processing is absolutely necessary for configuration commands. If this cannot be received because of errors, the process is aborted after a timeout of 5 minutes.

8.11 Automatic log-off

An inactive session, i.e. a login as user or administrator without active operation, is automatically logged off after 5 minutes. After this time, the login window appears again. This is particularly useful for the administrator session, so that it is not blocked indefinitely.

ⓘ Mouse movements, keyboard entries and clicks are considered active operation.

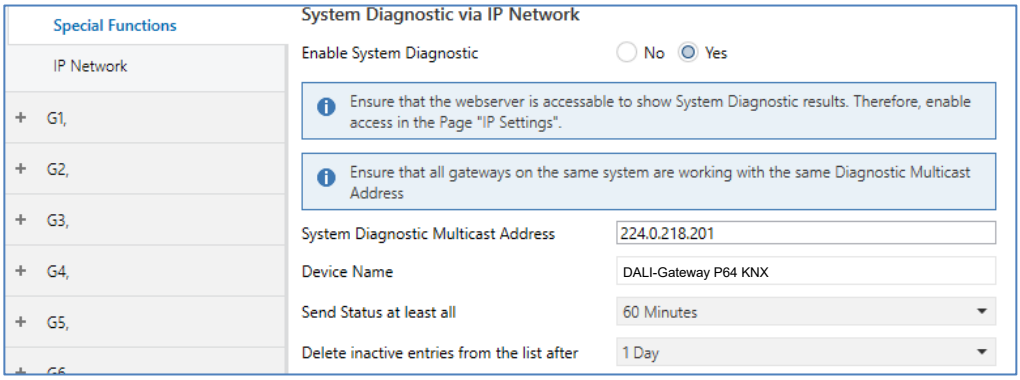
9 System diagnostics

A system with several DALI gateways allows a simple automated overview of the fault status of all connected gateways. The complete overview is available in each gateway and can be displayed on the website.

When a gateway is restarted, it reports with status information and is automatically transferred to the list of other devices. The current status is automatically sent with every error status change. Further parameter settings are described in the next chapter.

9.1 Requirements and functions

To activate the system diagnostics, the corresponding parameter must be set in the ETS.



All gateways that are to communicate with each other must be configured with the same multicast address.
Each event (value change and error message) is automatically sent to the group of participating gateways. This allows each gateway to store and monitor the status of the other gateways. This data is only stored temporarily and is collected again after a restart.
Another parameter can be used to define the time after which the status should be sent if no change has occurred during this time and no automated event is reported.

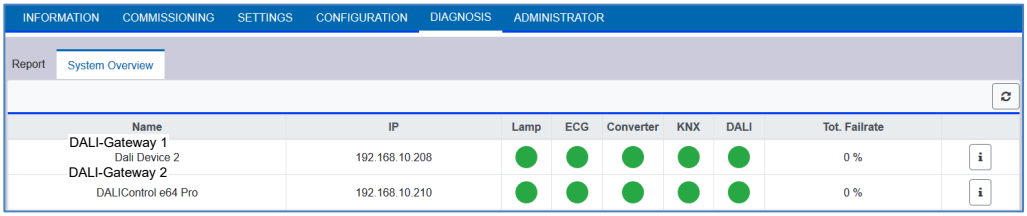
The inactive entries (inactive gateways) are deleted after a predefined time, which can be set via ETS.

After restarting a gateway, the device status is initially sent to this multicast address. Subsequently, at each change, or after the time set in the ETS. The system diagnostics broadcast service cannot be fully protected against spoofing. If in doubt about the correct device segment status, please login to the corresponding device web interface directly.

The parameters are also described in chapter 21.1.4 Page parameter – special functions.

9.2 Viewing the diagnostic information

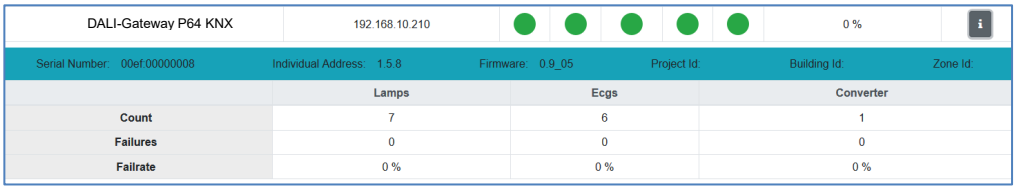
The diagnostic view is displayed on the website. To do this, select "Diagnosis" in the main menu and "System Overview" in the following submenu.



In a list all DALI gateways that are working in the same system and are enabled according to the requirements are displayed.
The following information is displayed:

- Name of the DALI gateway
- IP address of the DALI gateway
- Lamp Error
- ECG Error
- Converter error
- KNX Error
- DALI error
- Failure rate

Clicking the Info button displays further information about the status of the device in a detail window.



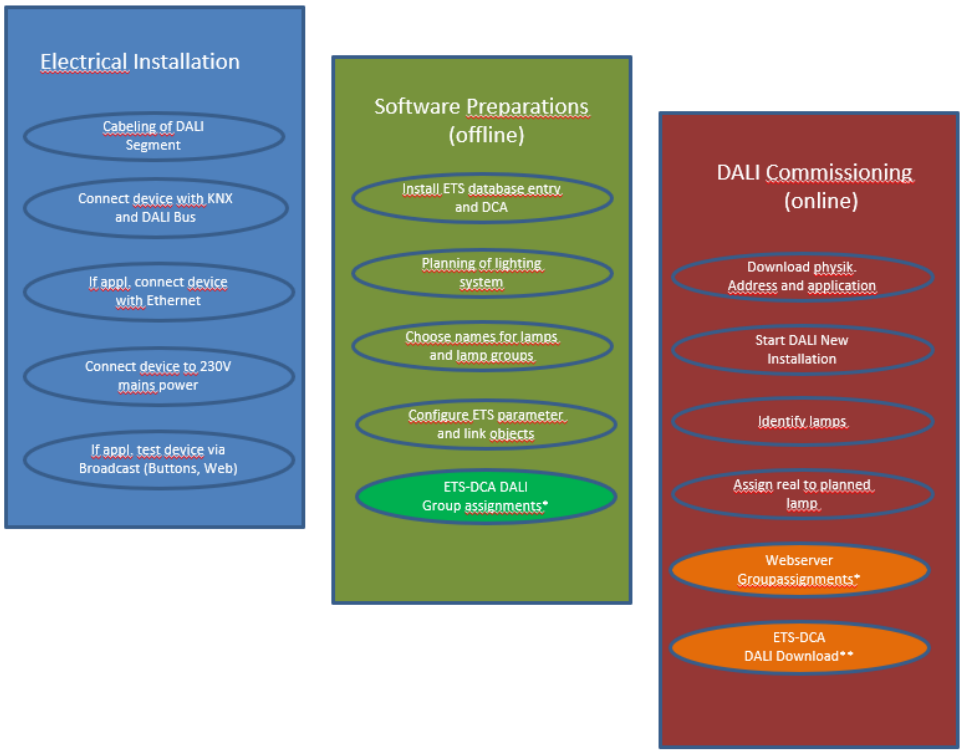
9.3 Website access to other gateways

Each DALI gateway in the list can be opened in a second browser tab by clicking on the IP address.

The corresponding login data of the DALI gateway must be available.

10 Installation and commissioning concept

The following graphic shows the steps required for the new installation and commissioning of a DALI gateway:



* When commissioning via DCA the group assignment can already be done in the planning phase (offline). When commissioning via web server the system has to be on-line.

10.1 DALI new installation

After wiring the DALI segment (see mounting and operating instructions) and software preparations such as installation, planning and configuration (see below) which can be performed without connection to the DALI gateway (offline), you are ready to start a new DALI installation. A new installation is only possible with a connection to the DALI gateway and when the ECGs that are to be installed are connected and supplied with power.

As with every configuration process, the new installation is possible in a number of different ways:

- Configuration and execution via DCA (Device Control App) in the ETS 5
- Configuration and execution via integrated web server (Ethernet network connection required)
- Configuration and execution via push buttons and display on the device

Depending on the type of use, configuration data should be synchronized in the DCA, see 10.5 Synchronization between webpages and DCA.

If you start a new installation, the ECGs connected to the DALI gateway are reset and automatically recognized and programmed by the DALI gateway. During the programming process each ECG is assigned a short address between 0 and 63 based on a random long address. As the long address is generated randomly, the short addresses and lights need to be assigned afterwards (exception: special case of new installation with externally configured devices, see below). The new installation makes the connected ECGs known to the gateway and enables the gateway to contact them via the short address.

ⓘ Please remember that every time a new installation is started, the ECGs are reset and thereby randomly allocated again. Any previous configuration is overwritten and deleted.

10.2 Identification and assignment of DALI ECGs

As the ECGs are assigned randomly following the new installation, individual ECGs need to be identified and assigned as required. During the commissioning process, the ECGs are usually identified by setting an ECG / lamp to flashing mode. This means that in the installation, the lamp can be identified visually so that it can be assigned according to the user's preference. Instead of flashing, lights can also be turned on/off.

For self-contained emergency lights according to DT-1, the identification is slightly different. As not all lights support switching on/off or may only switch on in case of power loss, the EN 62386-202 enables the activation of an identification status. When the gateway sets these ECGs to flashing mode, the identification status starts instead. The exact execution of this status is up to the manufacturer. Normally the control LED connected to the converter flashes red or red-green for a few seconds. Please refer to the instructions for the emergency lights or converters used.

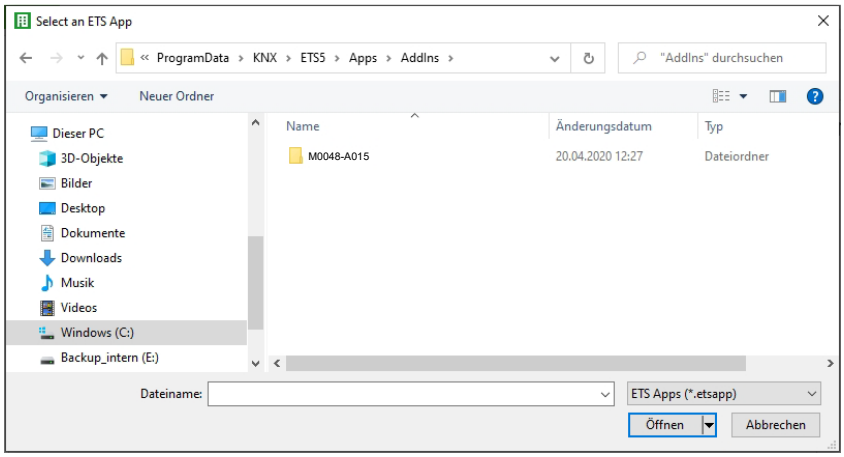
After an ECG has been identified, it can be assigned to the previously planned ECG. Again, there are different options for the assignment (DCA, web server, push buttons and display on the device). The different options are described in the following chapters.

10.3 ETS app (DCA)

The application for the DALI-Gateway P64 KNX is based on the standard surface for the configuration of communication objects and parameters as well as a special surface for commissioning the DALI bus system. This special surface is designed as a DCA (Device Configuration App) for the ETS 5. All required program data are automatically created when the app is imported.
The ETS app is made available via the KNX catalogue entry and associated documents via the KNX Shop (https://my.knx.org/).

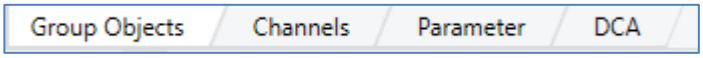
Click on the "App" button in the ETS 5-footer and then select the "plus" button in order to add a new application to your ETS 5 system:

A file box will appear to select the ETS App for the DALI-Gateway P64 KNX:



The application will now be installed and displayed in the list of all ETS 5 apps:

After the installation, the ETS has to be re-started. When the product is selected, an additional "DCA" tab is shown in the ETS 5.



10.4 Configuration

The parameters and the corresponding group addresses can now be configured as with any other KNX product. Through the parameters, various operating modes can also be configured. These are described in more detail in the chapter 5 Operating modes.

If a later use of the website is to be enabled, this must first be enabled in the ETS parameterization.
As the DALI-Gateway P64 KNX also supports colour control, future ECGs or groups with the desired colour control should be configured in ETS. Only in this way can the corresponding communication objects be made available.

In order to better identify the types of ECGs or groups both in the DCA and on the website, meaningful descriptive texts should also be defined for the ECGs and groups. These texts are also displayed in the list of communication objects.

The DALI specific configuration is performed in the DCA tab or by using the webpage. You should start by planning and naming the ECGs you want to use and by assigning them to the required groups.
This work can be carried out offline without connection to the KNX and without connection to the DALI-Gateway P64 KNX. The actual DALI commissioning is only possible online which means that a connection to the device is required. During this process the connected ECGs are recognized so that they can be assigned to the previously set up configuration.

After the assignment, the special DALI configuration has to be loaded onto the device by using the "Program" button in the DCA tab, see chapter 13.1 DCA commissioning or 12.2 Website commissioning.

Finally, the parameters and links to group addresses should be loaded onto the device. The device is now ready to use.

10.5 Synchronization between webpages and DCA

The web pages read the real data from the device each time they are called up and thus always display current configuration data. The DCA on the other hand works with the configuration data stored in the ETS.

If a configuration has been carried out with the web page or with the buttons directly on the device and you should continue working with the DCA later, a synchronization is necessary. The menu items "Extras" and "Read device data" in the DCA are used for this purpose. More detailed information can be found in chapter 18 DCA extras.

11 Maintenance and expansion

11.1 Quick exchange of individual ECGs

When a DALI segment is commissioned, the short address, group assignment (if applicable) and other configuration data are programmed into the ECG's internal memory. If you need to replace an ECG because of a fault, you need to program this data onto the new device.

The DALI-Gateway P64 KNX offers a function that makes it possible to quickly and easily replace individual ECGs. The "ECG quick exchange" can be started from the DCA, the web server (when logged in as administrator) or on the device (push buttons, display) itself. The gateway first checks if any of the configured ECGs that are known to it have been reported as faulty. Then the segment is searched for new, unknown devices. If a new device is found, all configuration details of the old ECG are automatically programmed onto the new one and the installation is immediately ready for use again.

However, the ECG quick exchange only works if just one ECG within a segment is faulty and replaced by a new one. If several devices are faulty, the ECGs have to be identified and you must use the post installation function.

ⓘ Please also remember that the quick exchange is only possible for devices of the same Type. You cannot, for example, replace an ECG for self-contained battery emergency lights with a device for LEDs.

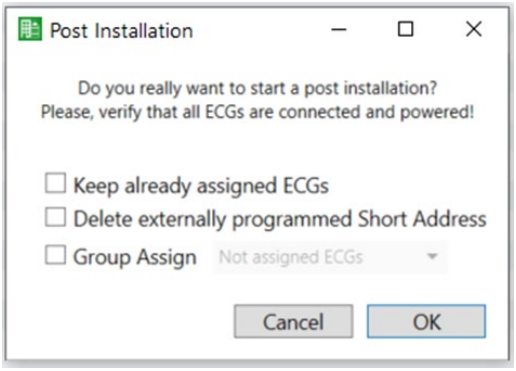
If a quick exchange is not possible because of any of the conditions above, the gateway terminates the process with a failure code. The different failure codes have the following meaning:

Failure Type 7: No ECG fault
Failure Type 8: More than one ECG faulty
Failure Type 9: No new ECG can be found
Failure Type 10: ECG has wrong device Type
Failure Type 11: More than one new ECG

11.2 DALI post installation

If you would like to expand an already commissioned DALI segment with new ECGs or would like to replace several faulty ones in the segment, please use the "post installation" function.
It is possible to activate "post installation" on DCA or on the device itself (push buttons, display) and in the web browser when logging in as administrator.

When you start the post installation, the gateway first check on basis of DALI long address if all previously configured ECGs are still available in the segment. Usually, ECGs that no longer exist or cannot be found are deleted from the gateway's internal memory. Should unavailable ECGs be kept (i.e. if parts of the system are not powered temporarily), the deleting can be avoided by using an additional option.



Usually, ECGs have no short address and long address 0xFFFFFF on delivery by default. It might be possible, that ECGs got a short address even if long address is still 0xFFFFFF (i.e. if an external tool was used for programming). In order to delete short address in this case please activate the control element “Delete externally programmed short address“.

After verification the segment is searched for new ECGs. Newly found devices are inserted into any existing gaps or added on at the end.

Please remember that the maximum number of ECGs within a segment is 64.

As the position (short address) of a newly found device is allocated randomly, you need to identify the lights after the installation and if required assign them to groups.

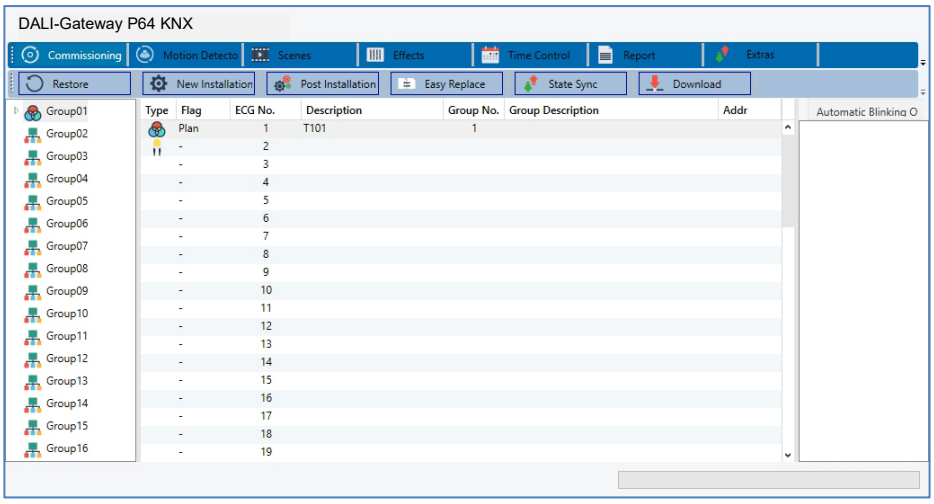
Alternatively, an automatic group assignment can be made by selecting the corresponding check box.

12 DALI commissioning ECG

This chapter describes the commissioning with the DCA and the website.

12.1 DCA commissioning

Following the physical installation and wiring of the DALI ECGs and lights and the electronic commissioning, the ECG configuration needs to be prepared and planned in the DCA. For this purpose, open the commissioning page in the DCA:



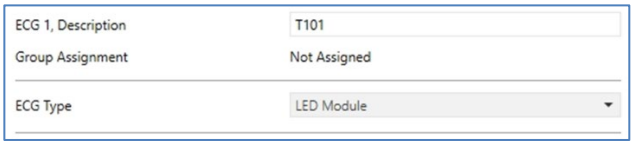
The group configuration is displayed in a tree structure on the left-hand side. The middle part shows a table for the ECG configuration and names. A list on the right-hand side shows the actual devices found in the system that have not yet been identified. During the planning phase the list is empty as the ETS is not yet connected to the system.

12.1.1 Preparation

First you should plan and name the ECGs. Use the description field to enter a name (light number, room number, etc).

Type	Flag	ECG No.	Description
	-	1	T101

Double-click to display an editing window which will allow you to enter a maximum of 20 characters. You should also set the correct ECG Type in the parameters (in this example LED Module is selected):



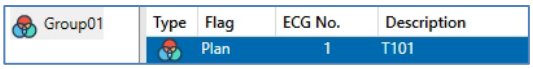
This also leads to the corresponding display in the type field in the DCA:

	Type	Flag	ECG No.	Description
-->		-	1	T101

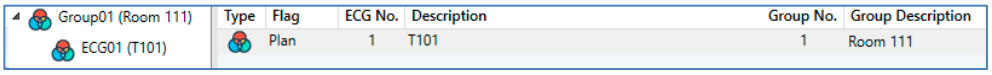
The icon in the first column always reflects the ETS setting.

As a next step, you should define the group control Type in the parameters (in this example colour control via RGB):

This leads to the corresponding display in the group tree in the DCA:



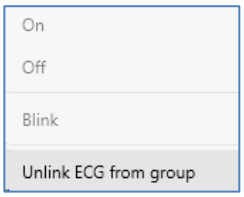
You can now assign the individual ECGs to the corresponding groups. Pull the ECGs via drag & drop onto the corresponding group in the tree on the left-hand side.



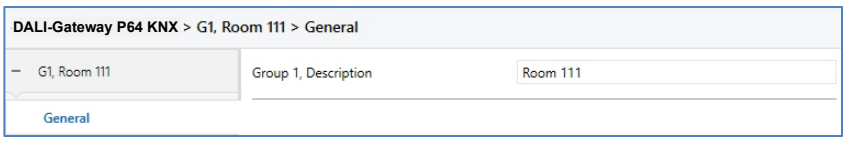
If an ECG is assigned to a group by drag & drop, the corresponding group number is automatically displayed in the "Group No." field in the ECG configuration table. The icon of the group type is also automatically displayed.

The icon in the first column of ECGs assigned to a group always reflects the type of the group, i.e. the icon of the ECG is replaced by the icon of the group.

If a group assignment has to be removed, the command can be found in the context menu of the ECG configuration table:



You can enter a user-friendly name in the neighboring field "group description". ECG and group names are automatically displayed both in the group configuration tree (displayed in brackets) and in the descriptions of the ETS communication objects. Alternatively you can rename groups via the parameter page:



Easily recognizable names make it much easier for the system integrator when linking group addresses with communication objects.

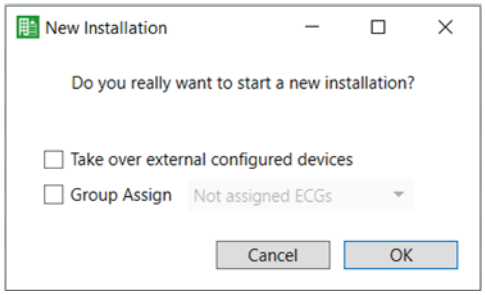
47	G1, Switching, Room 111	On/Off
48	G1, Dimming, Room 111	Brighter/Darker
49	G1, Set Value, Room 111	Value
52	G1, Status, Room 111	On/Off
53	G1, Status, Room 111	Value
54	G1, Failure Status, Room 111	Yes/No
57	G1, Colour RGB, Room 111	Value
69	G1, Colour RGB, Room 111	Status

12.1.2 New installation

Once the planning, parameter setting and linking of group addresses have all been completed, the DALI segment can be commissioned. To do so, please connect the commissioning PC with the ETS to the KNX system via an interface (USB or IP). Once the connection is active, you need to program the physical address of the gateway. The communication between the plug-in and the gateway is based on the physical address.

Use the 'commissioning' page and the 'new installation' button to start the teach-in process of the connected DALI segment.

During the teach-in process all ECGs are automatically recognized and each ECG is assigned a short address from 0 - 63. Depending on the size of the connected DALI segment the process can take up to 3 minutes.



Group assignment

It is possible to make a group assignment directly during the new installation, so that a time-consuming second step for the assignment to groups is not necessary.

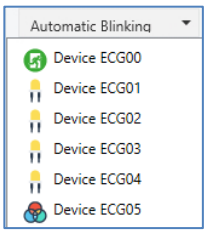
Take over of already externally configured devices

Alternatively, it is possible to take over and read in an already externally configured system, i.e. ECGs and group assignment already programmed with a short address.

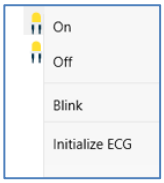
It must be ensured that with this option the corresponding ETS number is assigned to each short address, i.e. short address 0 is assigned to ETS index 1. Example: 2 ECGs found with short address 5 and 6 are assigned to ETS index 6 and 7.

A bar in the bottom right-hand corner indicates how far this process has progressed. At the same time a display also informs about the current process and the number of ECGs that have so far been found.

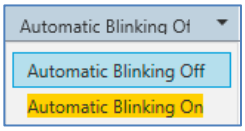
Once the process is complete, all ECGs that have been found are displayed in the list of to-be identified devices on the right-hand side.



To identify the devices, switch the corresponding lamp on and off. If you select an ECG and press the right mouse button, a context menu appears from which you can select the required function.

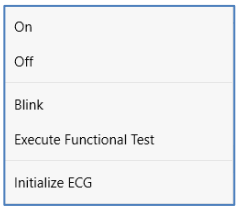


Alternatively, you can also select ‘on’ in the box ‘Flash automatically’.



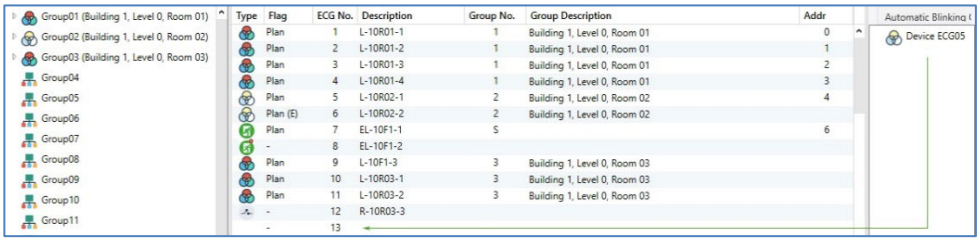
In this case, the flashing mode of an ECG starts by itself when a device is selected.

For self-contained battery emergency lights, selecting "flashing" activates the identification process of the light. Usually, the status LED of the emergency light flashes during this process. **Please pay attention** to the description of the lights you are using. As the status LED does not work or is not visible for some lights, you can also start a function test. During the function test, the ECG usually switches the lights on for a few seconds.



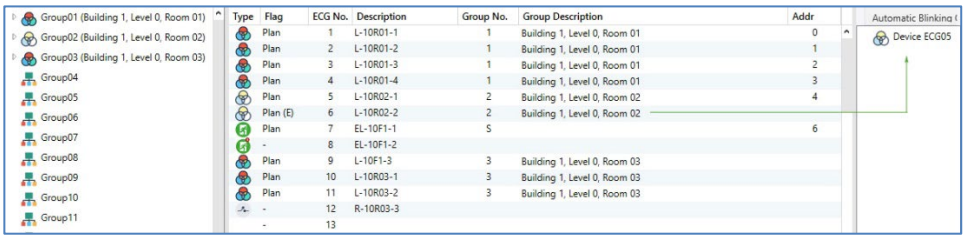
The context menu is also available at group level. During the identification process it might be useful to switch certain groups or all connected lamps on or off. You can also send broadcast commands via the context menu, in order to, for example, switch all lights on or off, see chapter 12.1.5 Operating DALI devices.

Once an ECG has been identified, you can drag and drop it onto the previously planned element in the ECG configuration table.



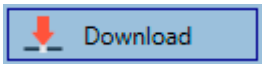
Once an ECG has been dragged into the ECG configuration table, it disappears from the list of non-identified ECGs. At the same time the 'PLAN' flag in the configuration table shows that the ECG has been assigned to the planned element. The last column in the table shows the real ECG short address.

Please make sure that the short address is between 0 and 63. If an ECG has been wrongly assigned, it can be moved back to the list of non-identified devices using the same drag& drop mechanism.

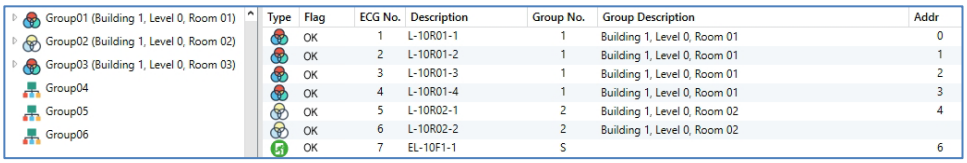


The element in the configuration table is now available again (Flag: 'PLAN (E)' à Empty) and the ECG re-appears in the list of non-identified devices from where it can now be moved to a different element if required.

Please remember that at this point all operations that have been performed are only displayed in the workspace. They are not immediately loaded onto the DALI gateway. To start the process of downloading the settings onto the gateway and the ECGs, you must press the 'Download' button.



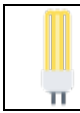
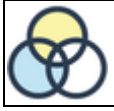
The download can take up to 1 minute. The progress bar informs about the current status. Once the download is complete, all previously planned ECGs are programmed in the system with the DALI configuration. The respective devices are marked with an "OK" flag in the ECG configuration table.



Please remember that the download on the 'commissioning page' only programs the DALI configuration data onto the gateway and ECGs. The actual ETS application with parameter settings and group addresses still has to be downloaded onto the device either before or after the DALI identification and commissioning. This is done, as usual, via the normal download process in the ETS.

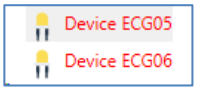
12.1.3 ECG and group detail info

The following icons are displayed for the different ECG Types in the DCA: A green background shows that this ECG has been configured as emergency light with central battery. See below:

	ECG Type 0: Fluorescent lamp
	ECG Type 1: Emergency light switchable or Emergency Light + Colour temperature
	ECG Type 1: Emergency light non switchable
	ECG Type 2: Discharge lamp
	ECG Type 3: Low voltage lamp
	ECG Type 4: Incandescent lamp
	ECG Type 5: 0..10 V Converter
	ECG Type 6: LED
	ECG Type 7: Relais module
	ECG Type 8: Colour module RGB
	ECG Type 8: Colour module tunable white
	ECG Type 8: Colour module tunable white + RGB

12.1.4 Failure and status display

During the commissioning, lamps/ECGs are identified visually (ON, OFF, flashing). It is therefore crucial that all lamps and ECGS operate correctly. If the gateway identifies a lamp or ECG fault during the installation process, the ECG concerned is highlighted in red. Failures are displayed for non-identified devices (right tree):

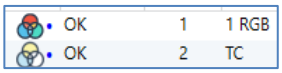


and for ECGs that have already been assigned (middle table).

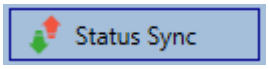
Type	Flag	ECG No.	Description	Group No.	Group Description
	OK	1	L-10R01-1	1	Building 1, Level 0
	OK	2	L-10R01-2	2	Building 1, Level 1
	OK	3	L-10R01-3	S	
	OK	4	L-10R01-4	S	

Failures are marked with a red dot. Detailed information is available via double-click (see next chapter).

If the lifetime of a lamp, provided that a limit has been set in the ETS parameters, exceeds the value, the ECG will be marked with a blue dot.



As the view is not automatically updated and as it may take a few minutes for the DALI gateway to recognise a fault, we recommend that you press the 'Status Sync' button a short while after the installation.



This ensures that the displayed status is updated with the actual status and any failures that may have been detected in the meantime are displayed correctly.

If an ECG failure already exists during the search process of the initial installation, the device is usually not detected. This means that the number of ECGs found does not correspond to the number that was expected. ECG failures are only displayed in the manner described above if the ECG concerned has been previously programmed and is known to the gateway.

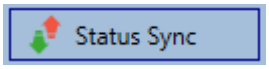
In addition to ECG failures, further ECG info is exported or displayed.
This information includes:

- Long address
- Short address
- Device Type
- Device subType (important for colour ECGs DT-8)

  - TC: Temperature Colour
  - XY: XY Colour
  - RGBW: RGB or HSV colour
- Device subType (important for emergency ECGs DT-1)
  - SW: switchable emergency lights
  - NSW: non switchable emergency lights
- Failure status

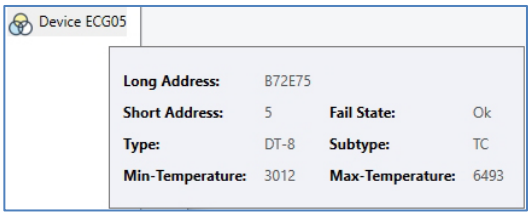
For DT-8 ECGs with colour temperature control the following are also displayed:
- Min. temperature
- Max. temperature

Press the "Status Sync" button to export and update the information.



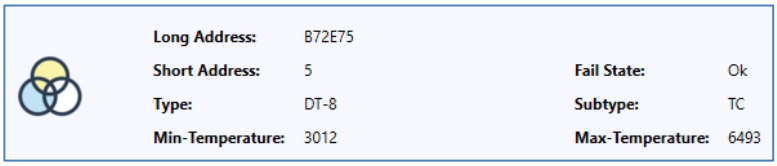
The process can take a few seconds:

ECG info in the right-hand side tree
Additional information for the ECGs is displayed via tooltip:



To activate the tooltip, hover over the position with the mouse.

ECG info in the ECG table
Double-click to open another window with further details:

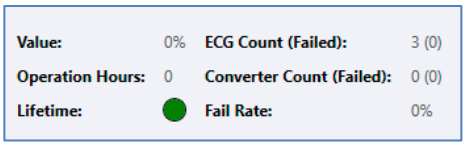


The icon in the detail window shows the real ECG type. Please make sure that the ETS definition is the same as the actual type.

Further information:
- Long address
- Real short address
- Type
- Sub-Type

- Failure status
- Min. temperature (only for sub-Type TC)
- Max. temperature (only for sub-Type TC)

Group info in the group tree
Additional information for the group is displayed via tooltip in the group tree.



12.1.5 Operating DALI devices

DALI devices can be directly controlled in five different ways.

Broadcast
In this case telegrams that all participating devices react to are sent to the DALI bus.
The commands are executed by all ECGs even if they have not yet been commissioned.
Therefore, these commands work independently of the status of the DALI system.

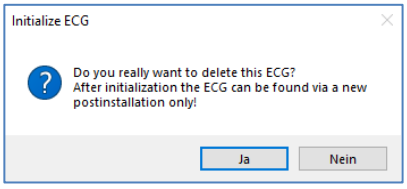
Group control
In this case, group telegrams are sent to control a particular group. For this process to work correctly, the ECGs need to have been assigned to groups and the configuration has to be downloaded onto the gateway.

ECG control
In this case, ECGs can be individually controlled.

Emergency (converter) inhibit
Use the context menu in the group tree on the left-hand side to disable converters. If the power supply for the connected emergency lights is turned off within 15 minutes after activating the converter inhibit mode, the lights are turned off instead of changing into emergency mode. This operating mode may be necessary during the commissioning and installation process to prevent constant emergency lighting and battery discharge.

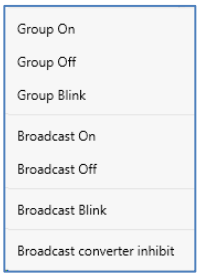
Emergency (converter) start functional test
Use the context menu in the right-hand side tree or the list to start a function test with converters.

Initialize ECG
This function is only available in the tree on the right. This can be used to completely delete an ECG. After this action, it is no longer present and can only be found by renewed post installation. Therefore, this action must be confirmed by the operator:

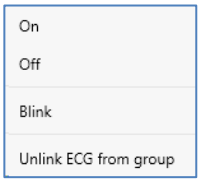


The DCA offers different options to activate these commands. The DALI must be commissioned and a connection to the gateway must be available for all of the options.

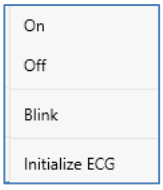
Group menu in the left-hand side tree:



Context menu in the ECG table:



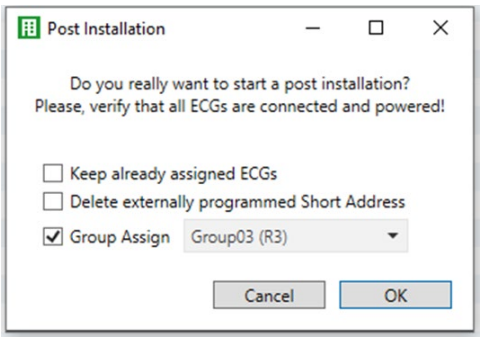
ECG menu in the right-hand side tree:



12.1.6 Post installation

If you would like to expand an already commissioned DALI segment with new ECGs or would like to replace several faulty ones in the segment, please use the "post Installation" function.

When you start the post installation in the ETS, the gateway first check if all previously configured ECGs are still available in the segment. ECGs that no longer exist or cannot be found are usually deleted from the gateway's internal memory. Should unavailable ECGs be kept (i.e. if parts of the system are not powered temporarily), the deleting can be avoided by using an additional option: "Keep already assigned ECGs".



Usually, ECGs have no short address and long address 0xFFFFFF on delivery by default. It might be possible, that ECGs got a short address even if long address is still 0xFFFFFF (i.e. if an

external tool was used for programming). In order to delete short address in this case please activate the control element “Delete externally programmed short address“.

After verification the segment is searched for new ECGs. Newly found devices are inserted into any existing gaps or added on at the end.

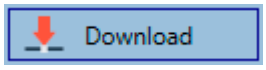
Please remember that the maximum number of ECGs within a segment is 64.

As the position (short address) of a newly found device is allocated randomly, you need to identify the lights and if required assign them to groups.

If you choose the setting "Switch ECG power supply via object", the corresponding objects are sent before the post installation. Afterwards the ECG can be assigned again to a group.

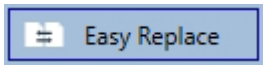
It is also possible to make a group selection directly during the subsequent installation, so that a time-consuming second step for the assignment to groups is no longer necessary.

Please remember that at this point all operations that have been performed are only displayed in the workspace. They are not immediately loaded onto the DALI gateway. To start the process of downloading the settings onto the gateway and the ECGs, you must press the ‘Download’ button.

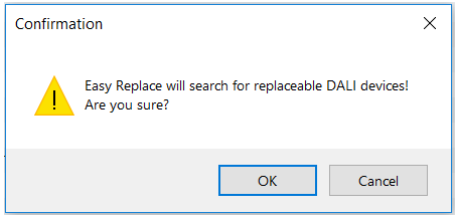


12.1.7 ECG quick exchange

If you need to exchange an individual ECG because of a fault, you can also use the quick exchange function. Press the quick exchange button in the DCA.



The execution of this function must be confirmed in a query window.

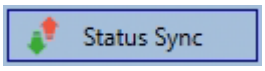


If a quick exchange is not possible because of external circumstances, the gateway terminates the process with a failure code. The different failure codes have the following meaning:

Failure Type 7: No ECG fault
Failure Type 8: More than one ECG faulty
Failure Type 9: No new ECG can be found
Failure Type 10: ECG has wrong device Type
Failure Type 11: More than one new ECG

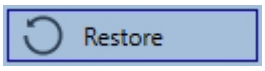
12.1.8 Status sync

Use this function to read and display the status of all ECGs, see chapter 12.1.3 ECG and group detail info. The DALI gateway polls the ECG status cyclically.

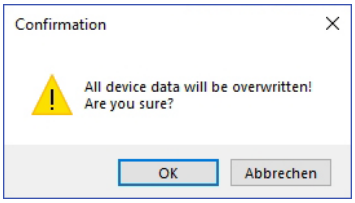


12.1.9 Restoring the DALI configuration

This command is used to completely restore a DALI-Gateway P64 KNX, for example, by replacing it with a completely unprogrammed device.



After actuation, a window appears in which the overwriting of the device configuration must be confirmed.



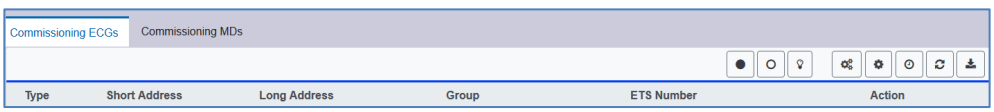
In this case all DALI relevant data from the ETS is written onto the device.

Once this process is complete, the device must be restarted manually. This function only applies to the DALI configuration. It is therefore essential to carry out a normal ETS download for the ETS parameters and communication objects.

We recommend you do an ETS back-up after you have completed the configuration.

12.2 Website commissioning

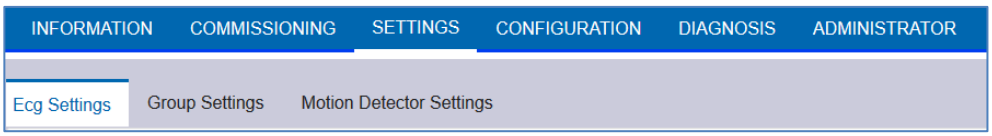
After the physical installation and wiring of the DALI ECGs and luminaires and the electrical commissioning, the ECG configuration must first be prepared and planned on the website. For this purpose, the commissioning page is opened:



Important for commissioning via web is the correct ETS configuration of the groups and ECG settings. Here the group type (normal or colour control) and also the individual ECG types should already be correctly defined.

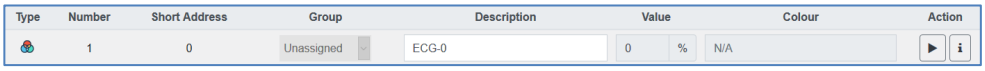
12.2.1 Preparation

The first step should be to plan and designate the ECGs and groups. For this purpose, a name (luminaire number, room number and group designation or similar) can be entered in the description field on the "Settings" page.



It is useful to assign plausible descriptive texts for the groups and for the ECGs which are to be used later as individual ECGs.

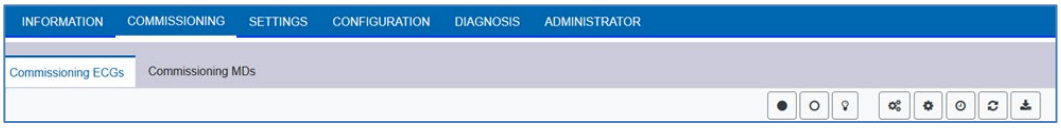
The view under ECG settings is sorted by the ETS ECG number. These ECG numbers must then also receive the corresponding planned settings and object assignments in ETS.

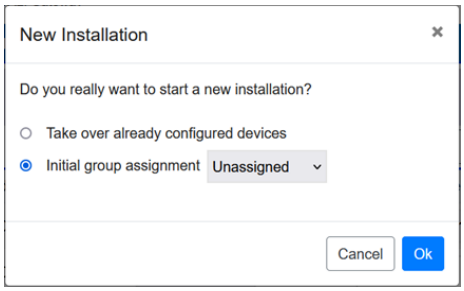


Please note that all performed operations are initially only displayed within the user interface but are not directly loaded into the DALI gateway. To start the save operation the save button in the upper right corner must be pressed:

12.2.2 New installation

After planning, setting the parameters and linking the group addresses, the actual commissioning of the DALI segment takes place. The teach-in process of the connected DALI segment can then be started via the "Commissioning" page and the "New installation" button.





Initial group assigment

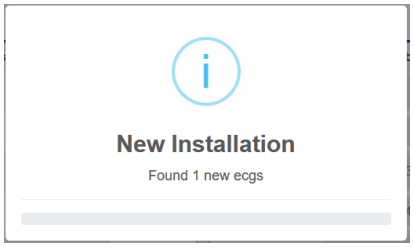
It is possible to make a group selection directly during the new installation, so that a time-consuming 2nd step for the assignment in groups is not necessary.

Take over already configured devices

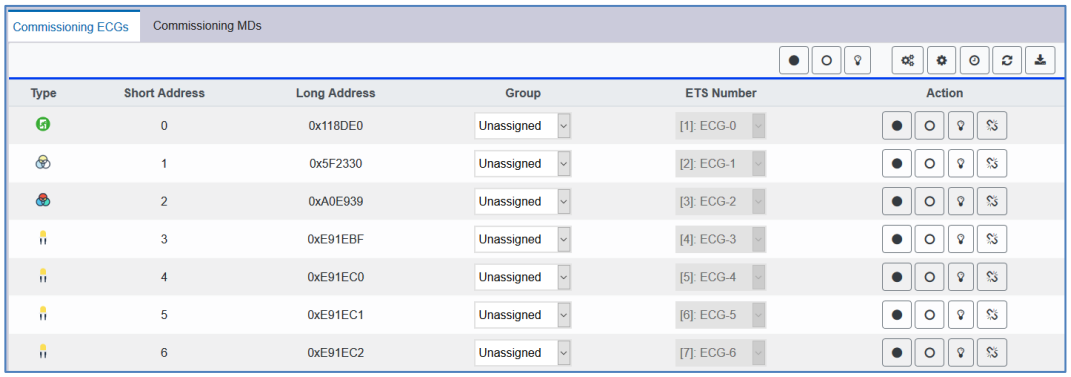
Alternatively, it is possible to take over and read in an already externally configured system, i.e. ECGs and group assignment already programmed with a short address.

It must be taken into account that with this option the corresponding ETS number is assigned to each short address, i.e. short address 0 is assigned to ETS index 1. Example: 2 found ECGs with short address 5 and 6 are assigned to ETS index 6 and 7.

During teach-in, all ECGs are automatically detected and each ECG is assigned a short address from 0..63. The teach-in process can take up to 3 minutes, depending on the size of the connected DALI segment. The progress is shown in the popup window.

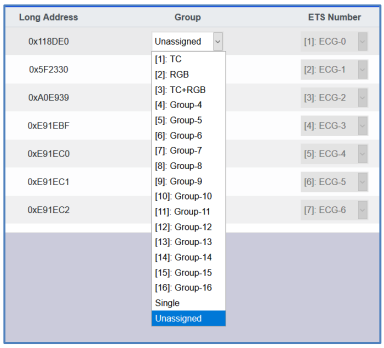


After completion of the teach-in process, all found ECGs are included in the table.



The identification is now carried out by switching the respective light on and off.

Once an ECG has been identified, it can be assigned as an individual ECG or to a group in the drop-down menu:



The desired assignment to the ETS ECG number can then be selected.
Example: ECG with control of colour temperature with short address 1 is assigned to group 1 (TC) and ETS ECG number 2:

With this procedure all found ECGs can be assigned.

Please note that the real short address is between 0 and 63.

Please remember that at this point all operations that have been performed are only displayed in the workspace. They are not immediately loaded onto the DALI gateway. To start the process of downloading the settings onto the gateway and the ECGs, you must press the 'Download' button.

The programming process can take up to 1 minute.

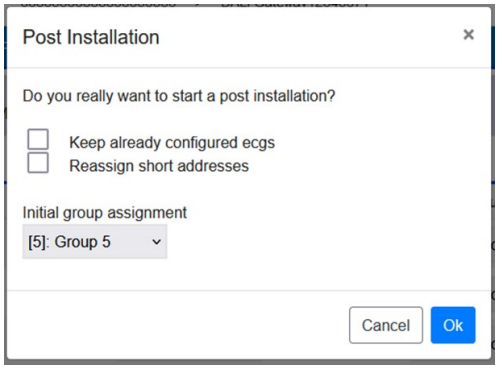
It is important to note that the programming process on the "commissioning side" only programs the DALI configuration data in gateway and ECGs. In addition, the actual ETS application with the parameter settings and group addresses must be loaded into the device before or after the DALI identification and commissioning. This is done as usual via the normal loading process in the ETS.

12.2.3 Post installation

If an already commissioned DALI segment is to be extended by additional ECGs, or if several defective ECGs in the segment are to be replaced, the "post installation" function must be used.

When you start the post installation in the ETS, the gateway first check if all previously configured ECGs are still available in the segment. ECGs that no longer exist or cannot be found are usually deleted from the gateway's internal memory. Should unavailable ECGs be kept (i.e. if

parts of the system are not powered temporarily), the deleting can be avoided by using an additional option: "Keep already configured ECGs".



Usually, ECGs have no short address and long address 0xFFFFFF on delivery by default. It might be possible, that ECGs got a short address even if long address is still 0xFFFFFF (i.e. if an external tool was used for programming). In order to delete short address in this case please activate the control element "Reassign short address".

After verification the segment is searched for new ECGs. Newly found devices are inserted into any existing gaps or added on at the end.

Please remember that the maximum number of ECGs within a segment is 64.

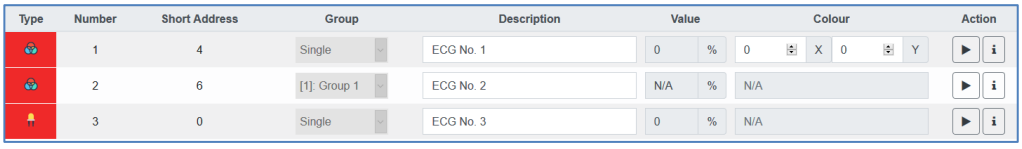
Since the position (short address) of the newly found devices was assigned randomly, an identification of the luminaires and, if necessary, a group assignment must be carried out after the subsequent installation, as with the new installation.

If you choose the setting "Switch ECG power supply via object", the corresponding objects are sent before the post installation. Afterwards the ECG can be assigned again to a group.

It is possible to make a group selection directly during the post installation, so that a time-consuming 2nd step for the assignment in groups is not necessary.

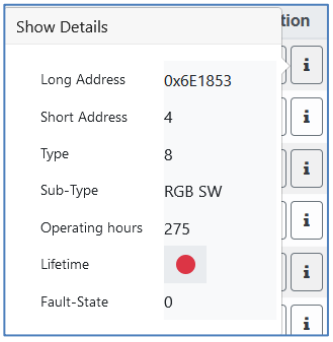
12.2.4 Failure and status display

The identification of the luminaires/ECGs' during commissioning is carried out visually (switch on, switch off, flashing) and is therefore only possible if the lamps and ECGs are working without errors. If a lamp or ECG fault is identified by the gateway during the installation process, the corresponding ECG is highlighted in red.



If the lifetime of a lamp, provided that a limit has been set in the ETS parameters, exceeds the value, the ECG will be highlighted in blue.

By pressing the Info button detailed information will be shown:



The displayed value for the fault state has the following meaning:

12.2.5 Operating DALI devices

The DALI devices can be controlled directly in various ways.
In the menu bar is available:

Broadcast

In this case telegrams that all participating devices react to are sent to the DALI bus.
The commands are executed by all ECGs even if they have not yet been commissioned.
Therefore, these commands work independently of the status of the DALI system.

Emergency (converter) inhibit

Use the context menu in the group tree on the left-hand side to disable converters.
If the power supply for the connected emergency lights is turned off within 15 minutes after activating the converter inhibit mode, the lights are turned off instead of changing into emergency mode. This operating mode may be necessary during the commissioning and installation process to prevent constant emergency lighting and battery discharge.

Easy replace

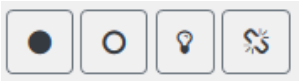
If you need to exchange an individual ECG because of a fault, you can also use the quick exchange function. This action must be confirmed by the operator:
If a quick exchange is not possible because of external circumstances, the gateway terminates the process with a failure code. The different failure codes have the following meaning:

Failure Type 7: No ECG fault
Failure Type 8: More than one ECG faulty

Failure Type 9: No new ECG can be found
Failure Type 10: ECG has wrong device Type
Failure Type 11: More than one new ECG

In the table for each individual ECG:

ECG control

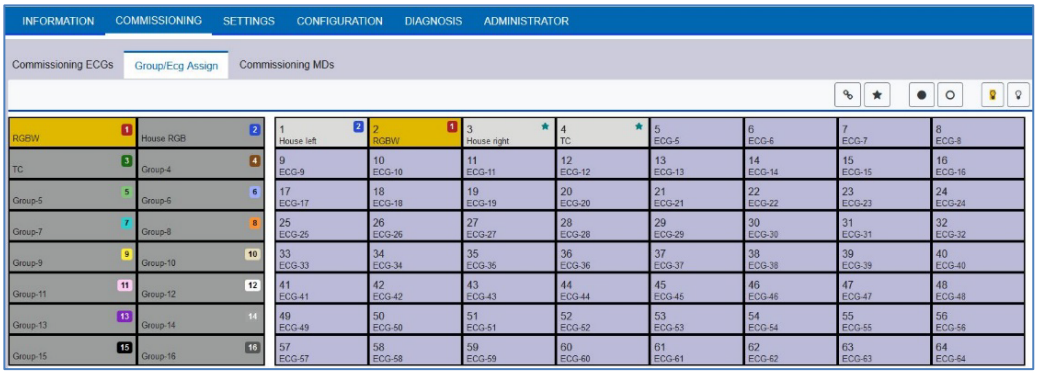


Single ECGs can be controlled directly.

This can be used to completely delete an ECG. After this action, it is no longer present and can only be found by renewed post installation. Therefore, this action must be confirmed by the operator.

12.2.6 Group/ECG assignment

With the help of this table, ECGs can be easily assigned to groups or reassigned. Alternatively, ECGs can also be defined as individual ECGs.
This page shows the groups on the left side and the ECGs on the right side.



Each group is numerically and color coded and contains the respective group name. Each ECG shows the ECG number and also the respective name. In addition, the ECGs show the group memberships by a numerical and color tag. ECGs marked with an asterisk are Single ECGs. Groups and ECGs that are switched on are displayed with a yellow background.

The following functions are available in the menu line:

Group assign commands

This is used to assign one or more ECGs to a group. First the group must be selected, then the ECGs that are to be assigned to it. The assignment happens immediately and is confirmed by a popup. Assigned ECGs get a numeric and colored tag.

Single ECG

With this command the assignment of an ECG to a group is solved. It is again a single ECG which is marked by an asterisk.

All On/Off

These broadcast commands switch all groups and ECGs on or off.

Switch On/Off

With the help of these two commands, individual groups or ECGs can be switched On or Off.

13 DALI commissioning: motion detectors and push buttons

The DALI-Gateways P64 KNX allows the configuration of input devices.

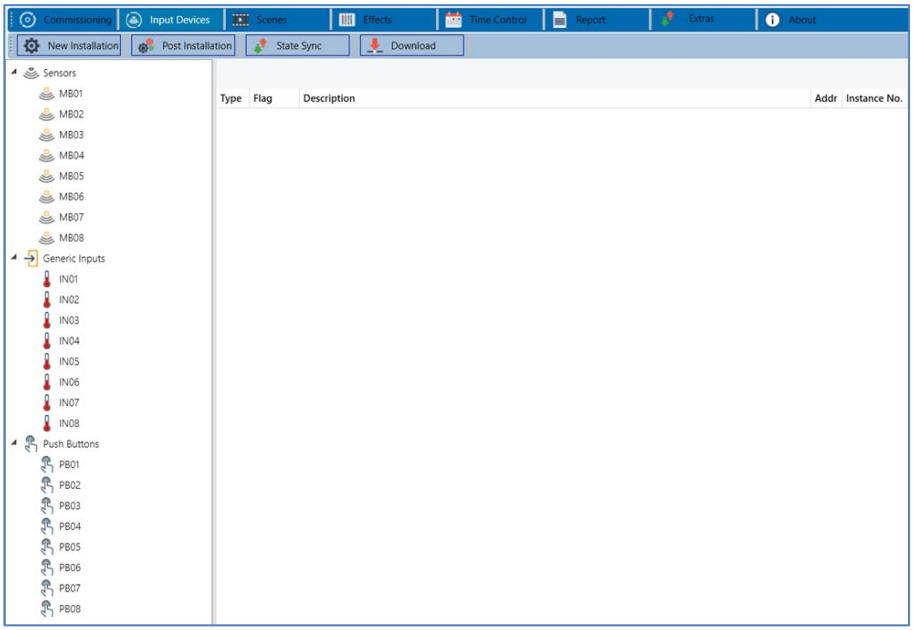
> Only motion detectors that comply with the IEC 62386 part 303/304 standard are supported; for example the presence detectors theRonda S360 DALI-2 S UP WH (2080590), theRonda P360 DALI-2 S UP WH (2080090), PlanoSpot 360 DALI-2 S DE WH (2030190).

Each input device is identified by a short address, as with ECGs. This address is assigned during the new installation. The DALI-Gateways P64 KNX supports up to 8 motion sensors.
Each input device can contain one or more instances. With motion sensors it is common that one instance represents the "motion" and another instance represents the “brightness”.

This type of motion detector is preset in the DALI-Gateways P64 KNX. The exact function of the respective instances is not specified and can be found in the specification of the respective input device.

13.1 DCA commissioning

The assignment settings and programming of motion sensors can be done in the DCA. For this purpose, switch from the commissioning page to the Motion Detector page.



13.1.1 Preparation

The first step should be the complete ETS configuration and naming. Refer to chapter 21.5 Motion/brightness detector and the following.
Depending on the ETS parameter the different types of input devices are being displayed with different icons.


Icon for motion detector with brightness


Icon for motion detector without brightness, according to Part 303


Icon for Brightness, according to Part 304


Icon for temperature measurement


Icon for humidity measurement


Icon for CO2 measurement


Icon for VOC measurement


Icon for sound measurement


Icon for generic measurement, depending on input device type


Icon for push button interface, according to Part 301


Icon for absolute input, according to Part 302


Icon for push button left button


Icon for push button right button


Icon for power


Icon for energy

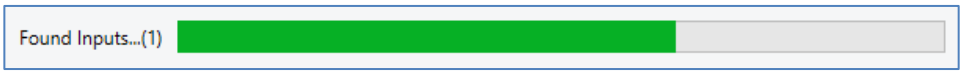

Icon for unknown instance type


Icon for generic input

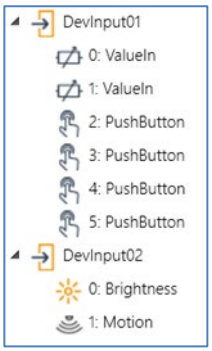
13.1.2 New installation

The teach-in process of the connected DALI segment can then be started via the "Commissioning" page and the "New installation" button.

During teach-in, all motion detectors are automatically detected and each motion detector is assigned a short address from 0..63. The teach-in process can take up to 3 minutes, depending on the size of the connected DALI segment. The progress is shown in the progress bar at the bottom right of the window. At the same time a display informs about the number of motion detectors found so far, or about the current process.



When the teach-in process is complete, all input devices found are entered in the list of devices still to be identified on the right-hand side of DCA.



The following instance types can be recognized:

 Icon for push button interface, according to Part 301 (instance type number 1)

 Icon for absolute input, according to Part 302 (instance type number 2)

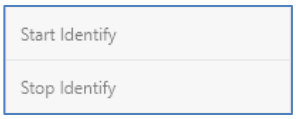
 Icon for motion detector, according to Part 303 (instance type number 3)

 Icon for brightness, according to Part 304 (instance type number 4)

 Icon for generic input (instance type number 0)

 Icon for unknown instance type

The identification is now carried out by an identity process of the motion detectors. When activated, an LED usually flashes in the identified motion detector.



The way in which the connected motion sensor displays its identification may be different for different manufacturers. Please read the manufacturer's instructions.

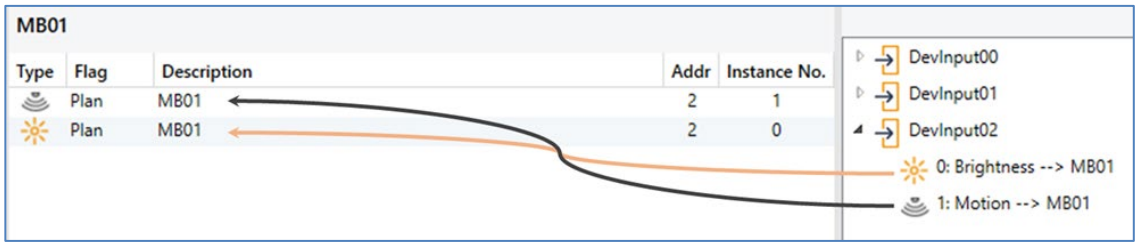
13.1.3 Assigning description texts

A description text of up to 20 characters can be entered by right-clicking in the right tree of the input devices found.

13.1.4 Assignment of input devices to ETS items

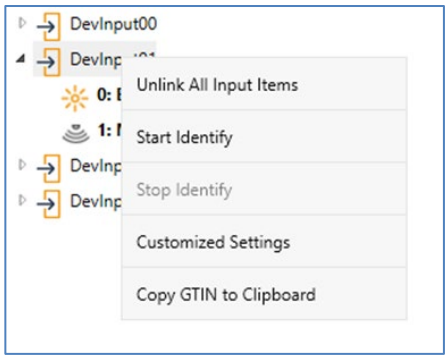
Once a device has been identified, it can be dragged and dropped to the corresponding ETS entry in the table. The assignment is based on instance level. Each instance can be assigned to the required ETS item entry.

Once the assignment via drag & drop has been done, the status is indicated by the Flag „Plan" and the link on the right hand side is shown in normal font size.

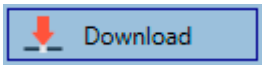


To delete an assignment, this entry can also be dragged back into the right-hand tree.

To delete all assignments of the instances of an input device, the item "Unlink All Input Items" can be found in the context menu of the device. The context menu of the input device is opened by pressing the right mouse button.

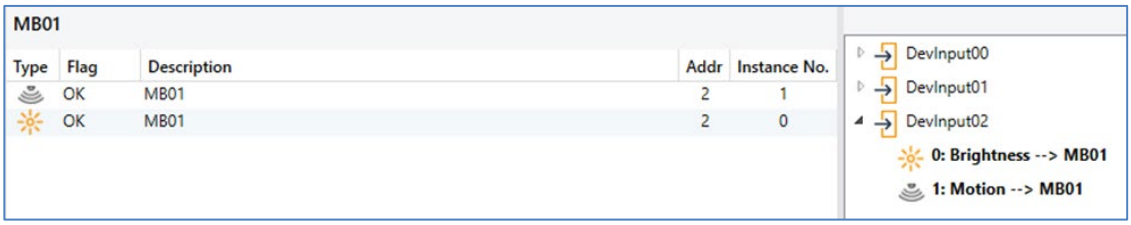


Please note that all performed operations are initially only displayed within the user interface but are not directly loaded into the DALI gateway. To start the loading process of the settings into the Gateway and into the motion detectors, it is **absolutely necessary** to press the "Download" button.



The programming process can take up to 1 minute. The progress bar provides information about the current status. When the loading process is complete, all previously planned motion sensors

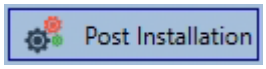
in the real system have been programmed with the DALI configuration. In the motion detector configuration table, the corresponding devices are marked with the "OK" flag and the link on the right hand side is shown in bold font size.



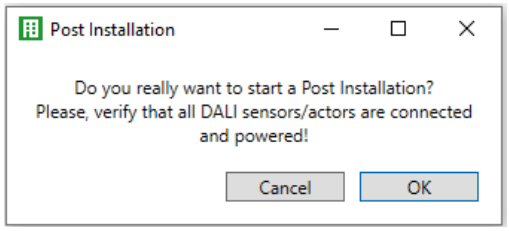
It is important to note that the programming process on the "commissioning side" only programs the DALI configuration data into the gateway and into the ECGs/movement sensors. In addition, the actual ETS application with the parameter settings and group addresses must be loaded into the device before or after the DALI identification and commissioning. This is done as usual via the normal loading process in the ETS.

13.1.5 Post installation

If an already commissioned DALI segment is to be extended by additional motion detectors, or if one or more defective motion detectors in the segment are to be replaced, the "Post installation" function must be used.



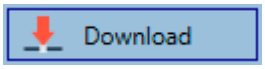
If a subsequent installation is started, the gateway first checks on the basis of the DALI long address whether all previously configured motion sensors are still present in the segment. Normally, motion sensors that are no longer present or cannot be found are deleted from the internal memory of the gateway during the subsequent installation.



Please note the maximum number of 8 motion detectors and 8 push buttons in one segment.

Since the position (short address) of the newly found devices was assigned randomly, the motion detectors must be identified after the subsequent installation in the same way as for the new installation.

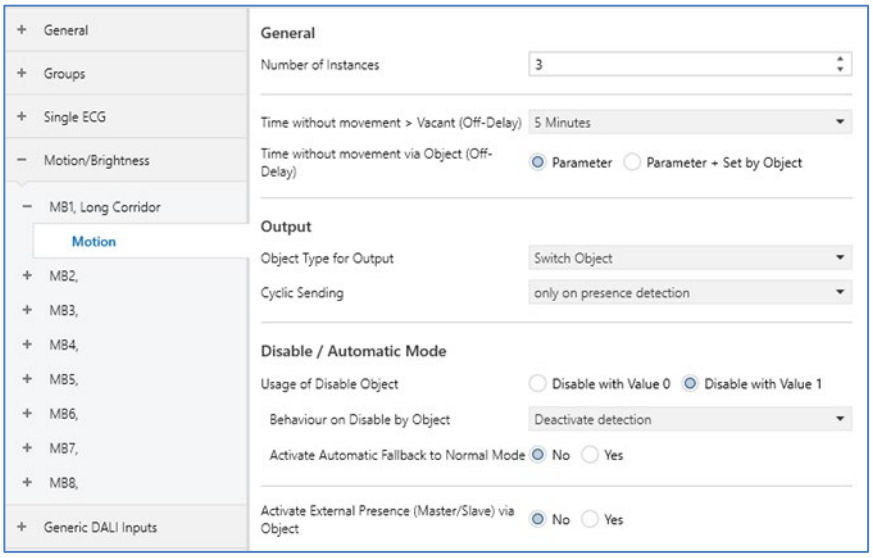
Please note that all performed operations are initially only displayed within the user interface but are not directly loaded into the DALI gateway. To start the loading process of the settings into the Gateway and into the motion detectors, it is absolutely necessary to press the "Download" button.



13.1.6 Using more than 1 instance

The new concept allows to configure one ETS item (motion/brightness or push button) with more than one instance.

A well-known use case is the master/slave concept in a long corridor. In such a situation more than one movement detector have to be installed and they should work together to light the corridor. In order to support more than one instance the according ETS parameter has to be set.



In DCA view each instance appears as a separate line in oder to connect to a real device.

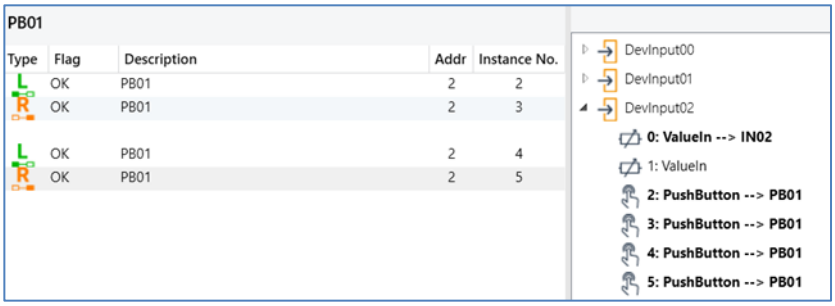
In this sample, 3 instances of 3 different real movement detectors are being connected to one ETS movement detector. This results in triggering the ETS movement detector whenever one of the 3 instances of the real devices detects a movement.

More than one instance connected to an ETS entry works as an “OR” gate. All events detected by the real devices will trigger the functionality.

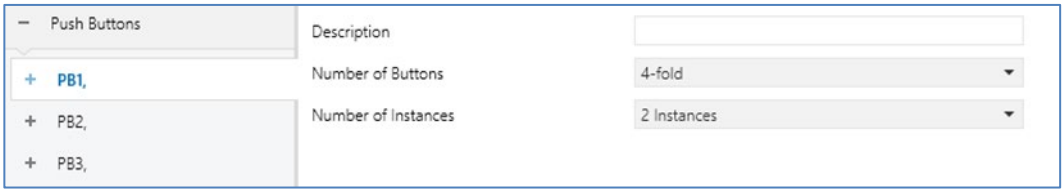
13.1.7 DALI push buttons/push button interfaces

The DALI-Gateways P64 KNX supports up to 8 push buttons/push button interfaces with max. 8 keys or 4 pairs of keys.

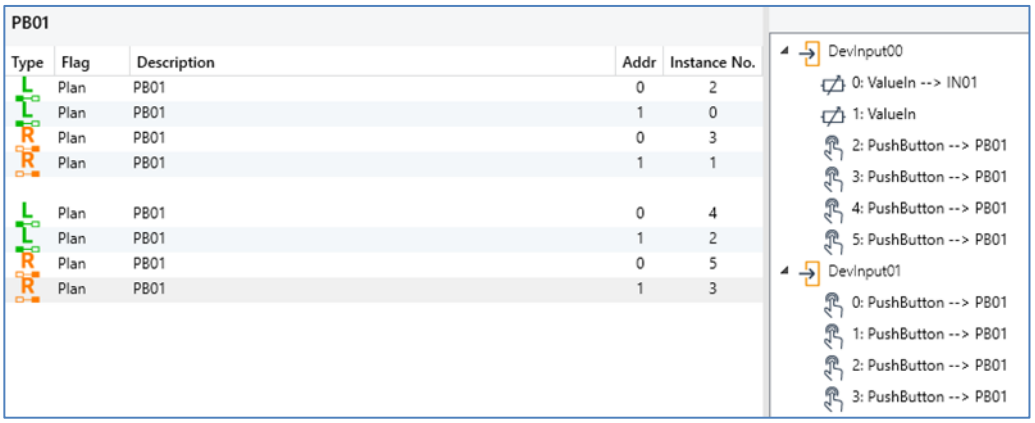
The ETS setting is working in “pairs”, thus also the view in the DCA displays the button “left” and “right” as a pair. If a 4-fold button is configured, only two pairs are visible.



A push button in the ETS can also be parameterized with several instances.



For example, to realise two real DALI push buttons in one room with the same configuration or mode of operation.



For further information refer to the handbook of the manufacturer of such in Input device. The instance number of the Dali button can only be adapted by the documentation of the manufacturer of this push button (interface).

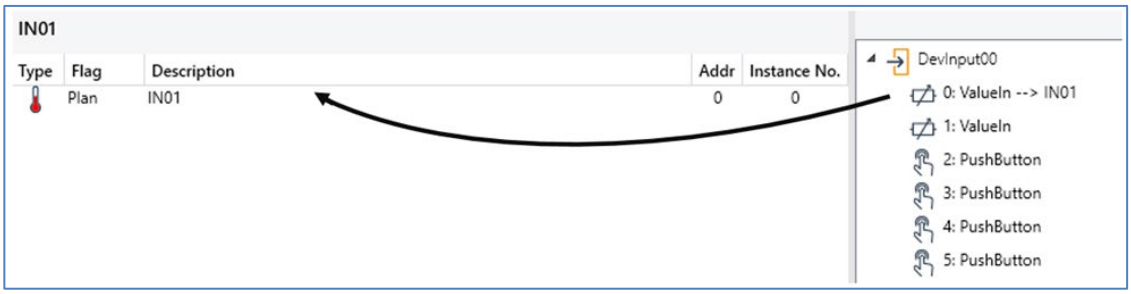
13.1.8 Special input devices (generic inputs)

More and more manufacturer of DALI-2 Movement Detectors provides also different kinds of measurement:

- Brightness
- Temperature
- Humidity
- AIR quality
- ……..

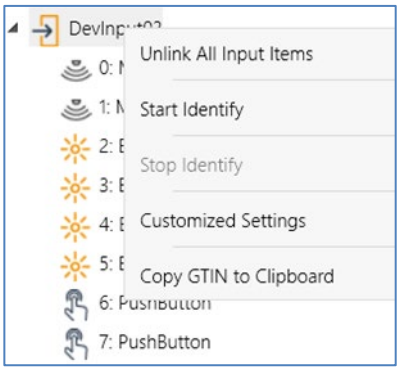
This information can also be assigned to ETS communication objects. Therefore the ETS parameters of those "generic inputs" has to be defined accordingly, refer to chapter 21.6 Generic DALI inputs.

Once such a device has been identified, it can be dragged and dropped to the corresponding ETS entry in the table.



13.1.9 Customized settings

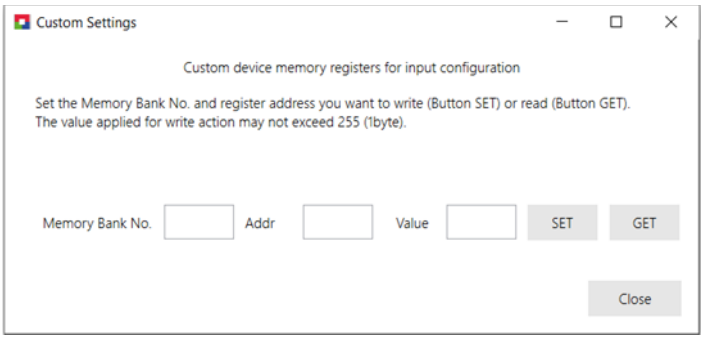
On the right side of the DCA input device window, the context menu of each input device offers the possibility to make device-specific settings.



In the previous example chapter, an absolute input instance was assigned to an ETS temperature element.
Unfortunately, there is no standard that defines the format and range of the transmitted value. This leads to the situation that manufacturer-specific settings have to be configured in the input device, usually by writing special values to special memory banks.

To enable such a special setting, the DCA offers the possibility to change values in memory banks.
On the right-hand side of the DCA input device window, the context menu of each input device offers the option of adjusting the memory setting.

By pressing "Customized Settings" the following window will be opened:



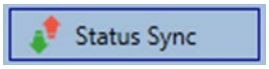
A special memory position is defined by Memory Bank Number, the memory address and the value to be written or to be read.

For further information refer to the manual of the manufacturer of such in Input device. Take care by any modification.

13.1.10 Failure and status display

During operation an input device or even a single instance can report a failure.
If the gateway identifies a fault, the instance concerned is highlighted in red.

As the view is not automatically updated and as it may take a few minutes for the DALI gateway to recognise a fault, we recommend that you press the 'Status Sync' button to manually trigger an update of the view.

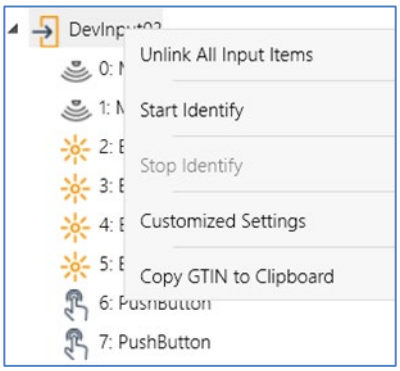


This ensures that the displayed status is updated with the actual status and any failures that may have been detected in the meantime are displayed correctly.

13.1.11 Retrieving the GTIN

Sometimes it might be very interesting to lookup some data in the official "Product Database" of the DALI Alliance, refer to https://www.dali-alliance.org/products.

A simple reference to find a product is the GTIN number, which is unique for each DALI-2 device. On the right-hand side of the DCA commissioning window, the context menu of each input device provides the possibility to copy the GTIN to the clipboard.



This information can in a next step easily be used in the product database webpage.

13.1.12 Calibration for constant light control

See chapter 6.4 Calibration of constant light control.

13.2 Website commissioning

Due to the strong interaction with the ETS context and parameters, commissioning of the input devices using the website is not supported.

14 The scene module

The DALI-Gateway P64 KNX enables the programming and invoking of up to 16 internal light scenes. A scene is invoked via a 1 Byte scene object. It can be adjusted by which KNX scene 1..64 (value 0..63) which of the 1..16 DALI scenes is invoked. This object can also be used to save scenes (Bit 7 set). The currently set value is saved as scene value. In case of DALI DT-8 devices, the currently set light colour or colour temperature also becomes part of the scene and is automatically adjusted when a scene is invoked.
General, a scene can consist of groups and individual ECGs (if these have not been assigned to a group).

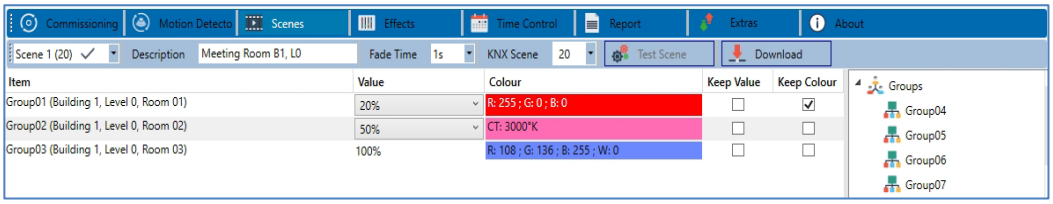
To assign a group to a scene or to delete a group from a scene and to assign the KNX scene number to the DALI scene, use the DCA or the website. Both configuration methods can be used to set values and colours for invoking a scene.

By default, when a scene is called up, the programmed scene is jumped to immediately without dimming time. If a scene is to be dimmed, a dimming time can also be set for each scene. If a scene is in the process of dimming, switching an individual group (or an ECG) from the scene does not cause the entire scene to be stopped, but only the group addressed is affected. All other groups continue the dimming process started by the scene call.

For each scene a 4 Bit dim object is available. This makes it possible to dim all the lights in a scene together.

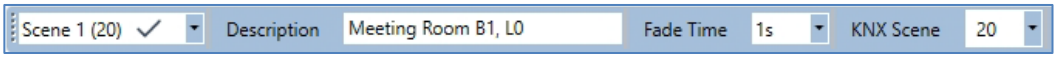
14.1 Scene configuration via DCA

Scenes can be programmed and assigned in the DCA. For this purpose, change from the commissioning to the scene page.



14.1.1 Configuration

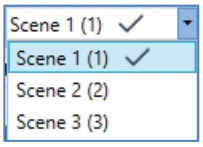
You can enter a user-friendly name for each scene in the description field. The name can be up to 20 characters long.



If you do not want a scene to start immediately but would prefer dimming it up to its final value, you can set the dimming time individually for each scene.

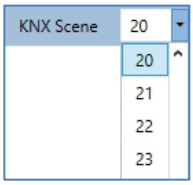
Please remember that the dim time always refers to the full value range. Accordingly, a dim time of 30 s means a value change of 100 % within 30 s. If the value within a scene is only changed by 50 %, the change is performed within 15 s.

Select the required scene from the dropdown on the left-hand side.



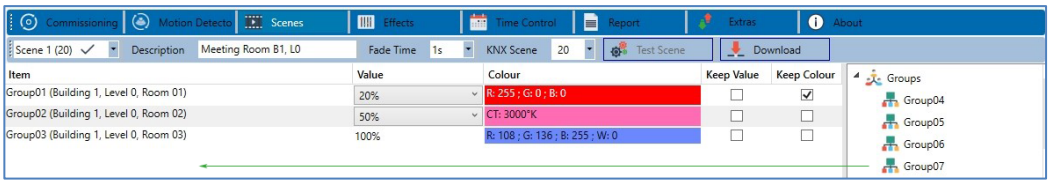
A "tick" means that the scene has already been defined.

A scene is activated by a 1 Byte scene object according DPT 18.001. In the KNX standard you are able to address up to 64 scenes by this datapoint. In the DALI gateway there are only 16 scenes available. By default, DALI scenes are assigned one to one to the KNX scenes, what means scene 1 of the DALI gateway is usually invoked by object value 0 (KNX scene 1) respectively by object value 128 it is programmed. In the DCA it is now possible to change this assignment. This adjustment can be done in the headline of the scene editor:



In the example above, the selected DALI scene can be invoked object value 19 (KNX scene 20), respectively programmed by value 147. Please note that the assignment has to be unique. If different DALI scenes are assigned to the same KNX scene only the first DALI scene is activated/ programmed.

The groups which you would like to use for this scene can be moved from the tree on the right-hand side into the field in the middle using drag-and-drop.



Use the entry fields to enter the required values for this scene.

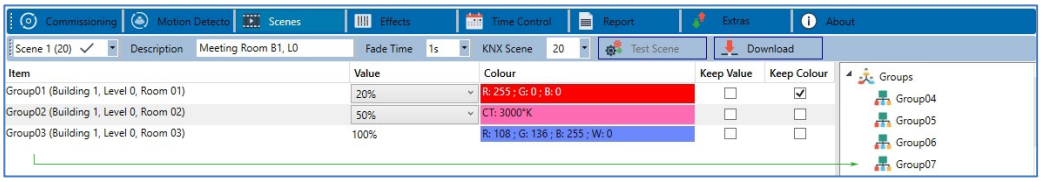
Value
A brightness level between 0 and 100 % can be selected via a drop-down field.

Colour
Defines the colour according to Type of colour control for this group. Use the context menu or simply double-click to open a window to select the colour from a colour picker.

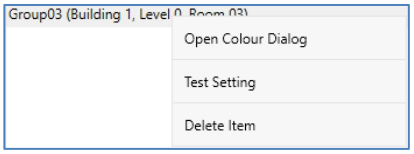
Keep value
In this case the current value remains unchanged when the scene is invoked. The entry field for the value is disabled. Any entry in the value field is ignored.

Keep colour
In this case the current colour remains unchanged when the scene is invoked. The entry field for the colour is disabled. Any entry in the colour field is ignored.

To delete an entry, select a group and use drag and drop to move it back to the tree on the right-hand side.

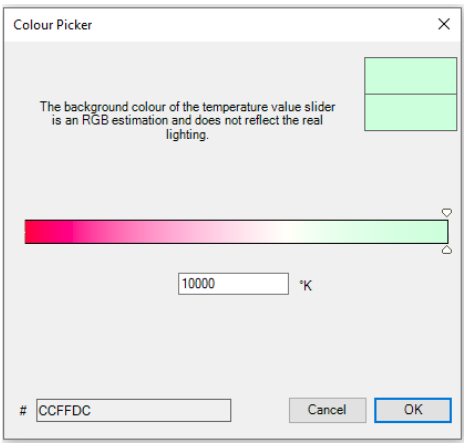


You can also delete an entry via the context menu (right click on a line):

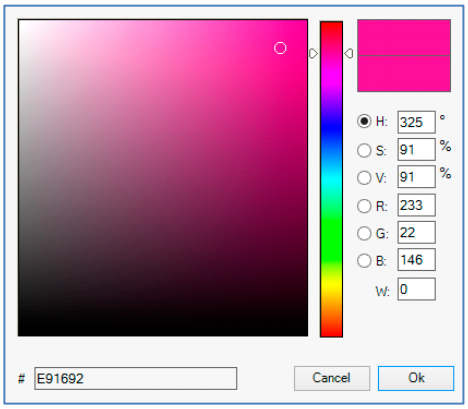


14.1.2 Colour setting

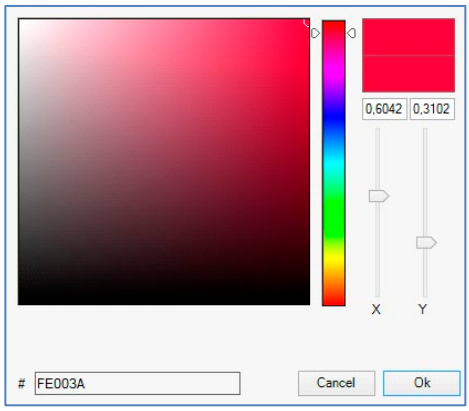
Each group or ECG can only support one Type of colour control.



The following color input window is displayed for the "Color Temperature" type.

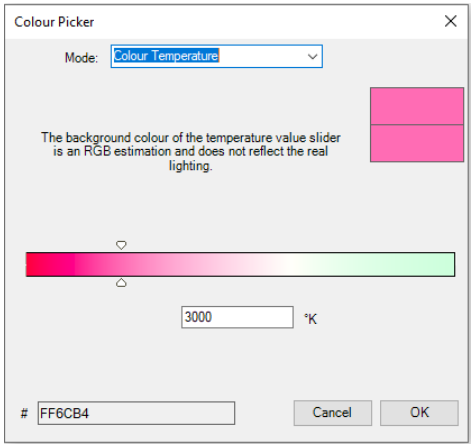


For the "RGB (RGBW)" or "HSV" type, this color input window is displayed:



For the type "XY" this color input window is displayed.

Groups with flexible colour control types
If a group in ETS is selected as color type "RGB + color temperature", this group can be used in the scene with both color controls. This type is indicated by the following dialog element:



In the upper setting the type of control can be selected.

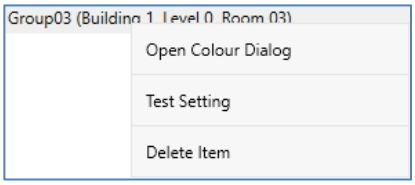
14.1.3 Programming scenes

Once all scene values have been set and assigned, you need to download the scene onto the DALI ECGs. For this purpose, please press the download button in the top right-hand corner.

A connection to the DALI-Gateway P64 KNX is required. In principle, you can also plan individual scenes in the ETS 'offline', independently of the DALI system. The DCA only has to be connected to the gateway for the duration of the programming.

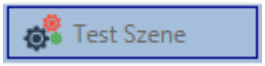
14.1.4 Testing a scene event

One way to test the settings for an event is via the context menu (right click with the mouse):



A connection to the DALI-Gateway P64 KNX is required. The command setting the value and colour of the group is executed. This means you can check the correct properties before programming the whole scene. If "Keep Value" or "Keep colour" have been selected, the current values are kept and the new values are not activated.

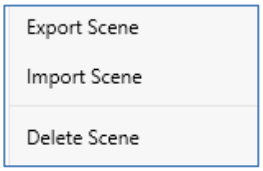
14.1.5 Testing the scene as a whole



After a scene has been programmed, the button becomes active. Press the button to activate and execute the selected scene. A connection to the DALI-Gateway P64 KNX is required for this purpose.

14.1.6 Export/import/delete

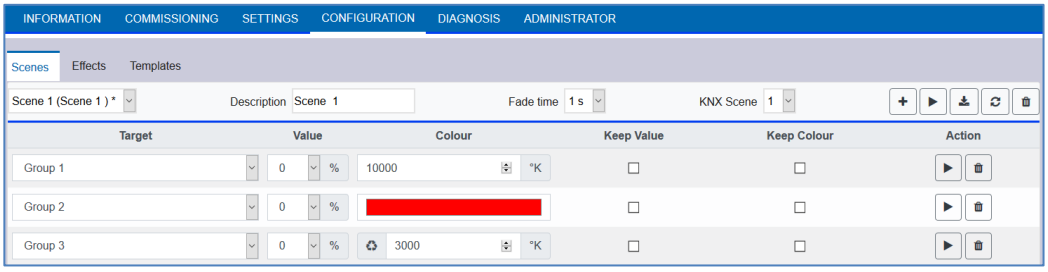
In order to be able to reuse a scene that has already been created, it is possible to export it. The created XML file can be saved separately to be used again in another project or in another template. The commands for export or import can be found in the context menu.



The template is saved as an XLM file in the desired target directory.

14.2 Scene configuration via web server

The assignment settings and programming of scenes can be done from the web page via the web server. After starting the web page, switch to the configuration page for this purpose and select "Scenes".



Up to 16 scenes can be configured here. Each scene can be provided with a description text.

14.2.1 Configuration

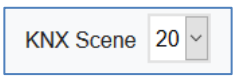
On the left side, the desired scene can be selected in the drop-down menu. An "asterisk" indicates that this scene has already been defined.

In the description field of the scenes a user-friendly name can be assigned. This name can be up to 10 characters long.

If the scene is not to be jumped to immediately when called up, but is to be dimmed to the end value, a dimming time can also be set individually for each scene.

Please note that the dimming time always refers to the complete value range. Accordingly, a dimming time of 30 s means a change in value of 100 % within 30 s. If the value is only changed by 50 % within the scene, this change will be made within 15 s.

The scene is activated via a 1-byte scene object in accordance with DPT 18.001. In the KNX standard, up to 64 scenes can be addressed. However, only 16 scenes are available in the DALI gateway. By default, the assignment of the DALI scene to the KNX value which calls up the scenes is set to 1 to 1 assignment. This means that scene 1 of the DALI gateway is activated via the KNX object value 0 (KNX scene 1) or programmed via the object value 128. It is possible to change this assignment. The setting can be made in the header of the scene editor:



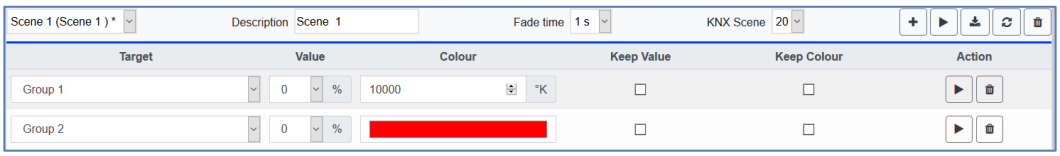
In the example above, the selected DALI scene is then called up via the object value 19 (KNX scene 20) or programmed via the value 147. It must be ensured that the assignment is unique. If the same KNX scene is assigned to different DALI scenes, only the first DALI scene is retrieved/programmed by the KNX scene call.

The following actions are available for a selected scene:

- Adding a new entry
- Test this scene (the scene must first be loaded into the gateway)
- Saving the scene
- Reload configuration data
- Deleting a scene

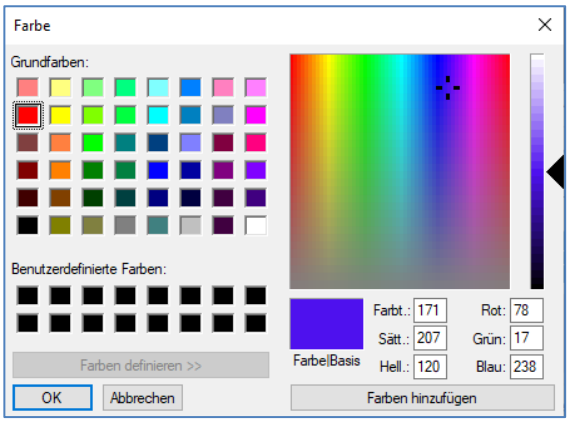
14.2.2 Colour settings

If individual ECGs or groups are parameterized for colour control (DT-8), a colour can be set in addition to the light value. To do this, click in the Color field of the desired ECG or group:

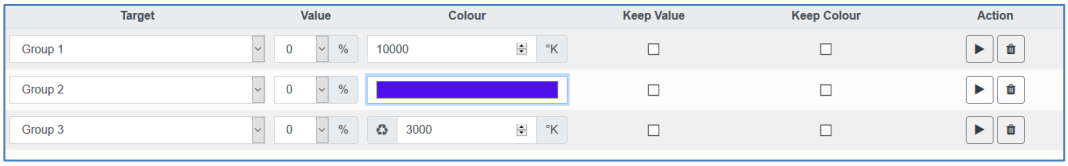


Setting a colour is only possible if the respective group or ECG has been enabled for colour control. Otherwise, the note N/A (not applicable) appears in the "Color" field.

A further window opens in which the color data can be set.



With the confirmation "OK" the set colour for the group / individual ECG is adopted in the scene.



Two additional flags can be used to set whether only the value setting or only the colour setting should be made:

- KV (Keep Value) → Value remains as set, only colour is taken into account
- KC (Keep Colour) → Colour remains as set, only value is taken into account

Groups with variable colour control
If a group in ETS is selcted as color type "RGB + color temperature", this group can be used in the scene with both color controls.
This type is indicated by the following dialog element:

By clicking on the front icon, the input of color temperature in Kelvin changes to the normal color dialog.

14.2.3 Programming the scenes and scene test

Once all entries have been made for all desired scenes, the settings must be loaded from the browser into the device. This is done by pressing the "Save" button.

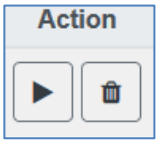
The scene data are then also transferred simultaneously to the connected ECGs.
During programming, a descriptive text (max. 10 characters) can also be assigned to the respective scene. To do this, the name must be entered in the text field above the scene block before saving.

If the selected scene is to be activated for testing, this can be done using the "Test scene" button.

The scene data can be loaded from the gateway into the web browser using the "Reload scene" button.

14.2.4 Testing an event in the scene

A way to test the setting of an event is in the "Action" column. When the "Play" button is activated, this event is sent to the DALI bus.



The command with the setting of the value and color is executed for this group or ECG. In this way the desired property can be checked before programming the whole scene. If the properties "Keep value" or "Keep color" are set, the corresponding values are not activated but are kept at the current value.

15 The effect module

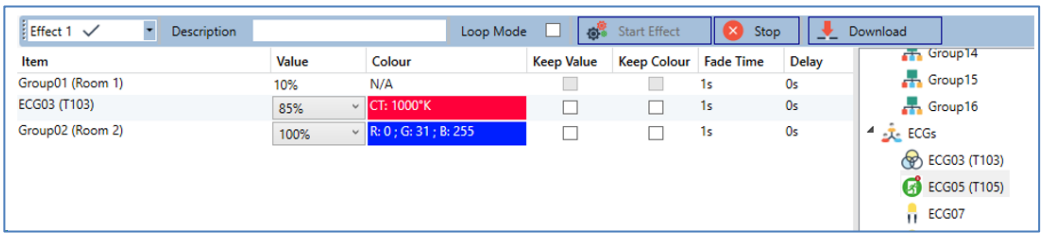
In addition to light scenes the DALI-Gateway P64 KNX also enables the use of effects. An effect is essentially the process control of light values of different groups and individual ECGs. The individual light values can either be directly controlled or dimmed via a dim value. Please remember that the value relates to a dim time between 0 and 100 % (see scene module).

The DALI-Gateway P64 KNX enables 16 independent effects. An effect is started or stopped via a 1 Byte object. Set Bit 7 in the object to start the effect. Receiving the object with a deleted Bit 7, will stop the effect.

Altogether, 500 effect steps can be programmed, which can be spread across 16 effects.

15.1 Effect configuration with the DCA

Effect programming and assigning can be done via the DCA. For this purpose, please change from the commissioning to the effect page.

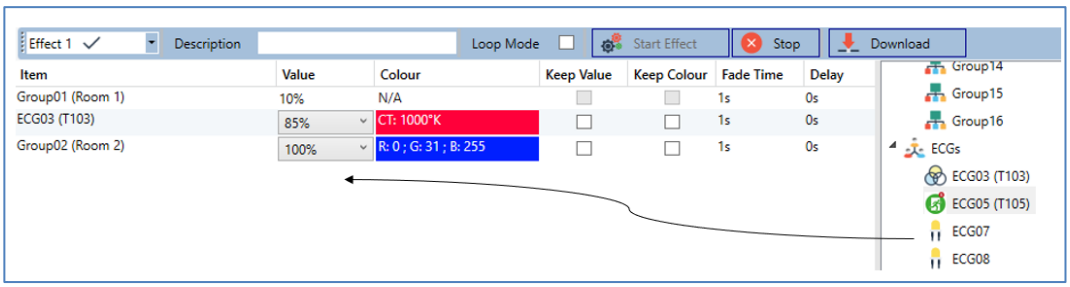


15.1.1 Configuration

On the effect page, select the required effect from the drop-down field.

In the description field of the effect a user-friendly name can be assigned. This name can be up to 20 characters long.
If the "Loop Mode" setting is checked, this effect is played endlessly and can only be stopped by a stop command.

Drag the groups and individual ECGs that are required for this effect from the tree on the right-hand side into the middle field listing the effect steps. The order of the list entries corresponds to the individual effect steps. To change the order within the list, use the mouse to move the entries around.



Enter the values required for the scene in the different fields.

Value
Defines the light value between 0.. and 100 %. The value can be selected via a drop-down field.

Colour
Defines the colour according to the Type of colour control for this group. Double-click on the mouse or use the context menu to open a window and simply select the colour from a colour picker.

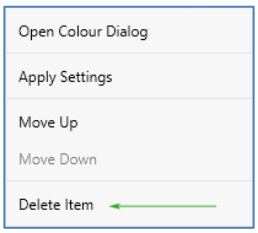
Keep value
With this setting, the current value remains unchanged when the scene is recalled. The entry field for the value is disabled with this setting as it is not needed. Any entry in the value field will be ignored.

Keep colour
With this setting, the current colour remains unchanged when the scene is recalled. The entry field for the value is disabled with this setting as it is not needed. Any entry in the colour field will be ignored.

Fade time
Defines the time needed to achieve the required setting. This entry can be used to define fading effects.

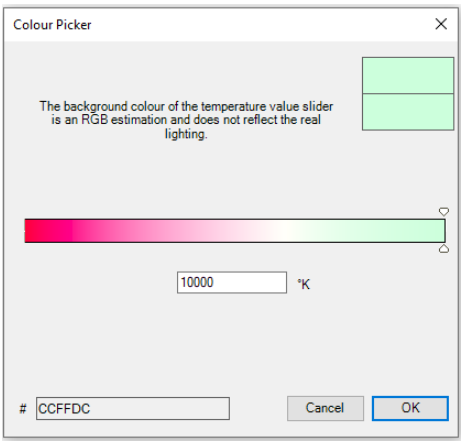
Delay
Defines the time until the next event.

To delete an entry, select a group and drag it back into the tree on the right-hand side.
Another option to delete an entry is via the context menu (delete element):

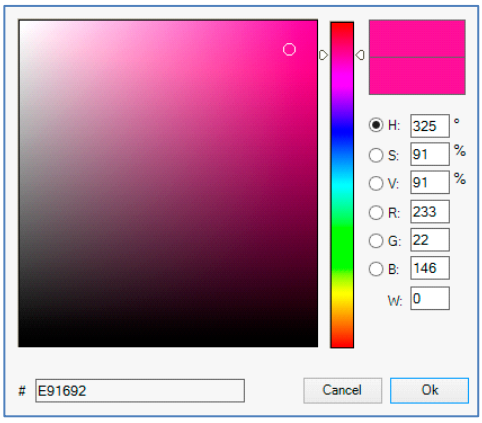


15.1.2 Colour settings

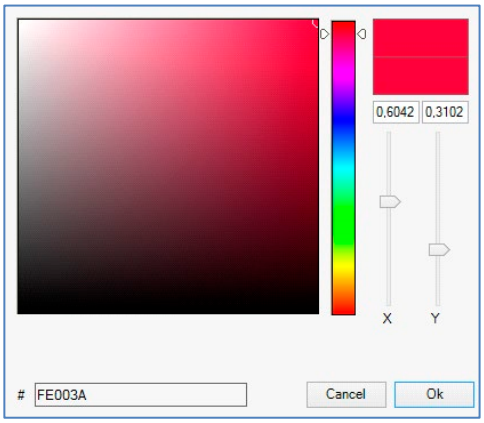
Each group or ECG can only support one type of colour control.



The following color input window is displayed for the "Color Temperature" type.



For the "RGB (RGBW)" or "HSV" type, this color input window is displayed.



For the type "XY" this color input window is displayed.

For the type RGB + color temperature a selection option is offered in the upper line.

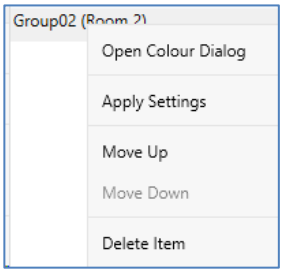
15.1.3 Programming effects

Once all effect values have been set and assigned, save the effect on the device. Press the "download" button in the top right-hand corner.

A connection to the DALI-Gateway is required for the download. Individual effects can also be planned "offline" in the ETS, independently of the DALI system. The DCA only needs to be connected to the gateway for the download.

15.1.4 Testing an effect event

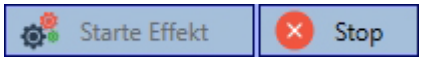
To test the settings of an event, use the context menu (right click on a field):



Connection to the DALI-Gateway is required. The command is performed with the value and colour settings that have been defined for this group or ECG. This makes it possible to check properties before the whole effect is programmed. If "Keep value" or "Keep colour" have been set, the respective values will not be activated, and the current value will be retained.

15.1.5 Testing the whole effect

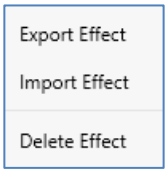
After an effect has been programmed, the button is activated. Press the button to start the selected effect. Connection to the DALI-Gateway is required.



To stop an endless (loop mode) effect, press the stop button.

15.1.6 Export/Import/Delete

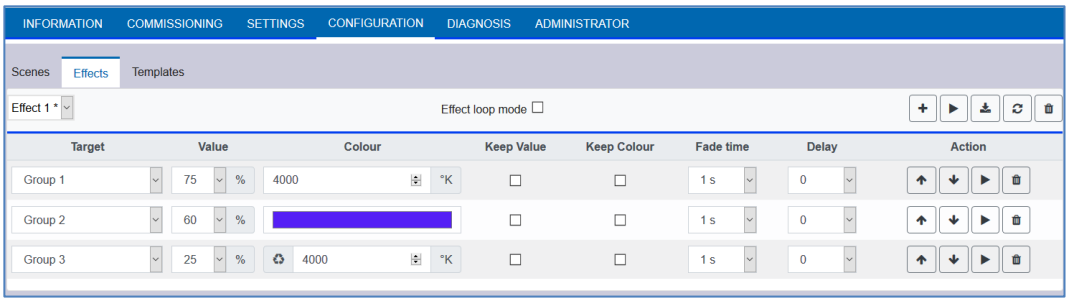
In order to be able to reuse an effect that has already been created, it is possible to export it. The created XML file can be saved separately to be used again in another project or in another template. The commands for export or import can be found in the context menu.



The template is saved as an XLM file in the desired target directory.

15.2 Effect configuration via web server

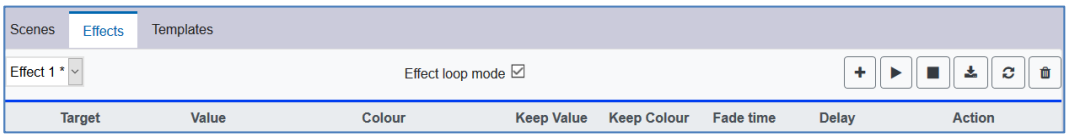
The assignment settings and the programming of effects can be done from the website via the web server. After starting the web page, switch to the configuration page and select "Effects".



15.2.1 Configuration

On the left side, the desired effect can be selected in the drop-down menu. An "asterisk" indicates that this effect has already been defined.

If the "Endless" setting is checked, this effect is played endlessly and can only be stopped by a stop command.



The following actions are available for a selected effect:

- Adding a new entry
- Testing the effect (the effect must first be loaded into the gateway)
- Saving the effects
- Reload configuration data
- Delete effect

Use the "Plus" button to add new entries to the selected effect.
In the Dropdown element you can now select the desired group or the desired single ECG.

The order of the entries in the list corresponds to the order of the individual effect steps. If the order within a list is to be changed, this can be changed using the buttons in the action column.

The desired values for this effect can be entered in the individual entries.

Value
Specifies the brightness value in 0..100 % and can be selected via a drop-down field.

Colour
Specifies the color according to the type of color control for this group. To do this, a window is opened by clicking on it to simply select the colour in a colour picker.

Keep value
With this setting, the current value remains unchanged when the effect is called. The input field for the value is deactivated, as it is not taken into account in this function. An entry in the value field is ignored.

Keep colour
With this setting, the current color remains unchanged when the effect is called. The input field for the color is deactivated, as it is not considered in this function. An entry in the color field is ignored.

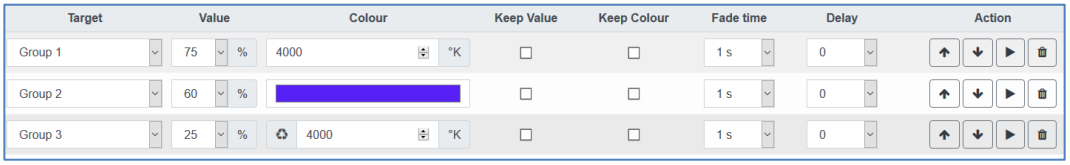
Fade time
With this setting, the time can be defined to reach the desired setting. This allows you to define crossfade effects.

Delay
The delay defines the time until the next event is set.

Delete
To delete an entry, use the corresponding button in the action column.

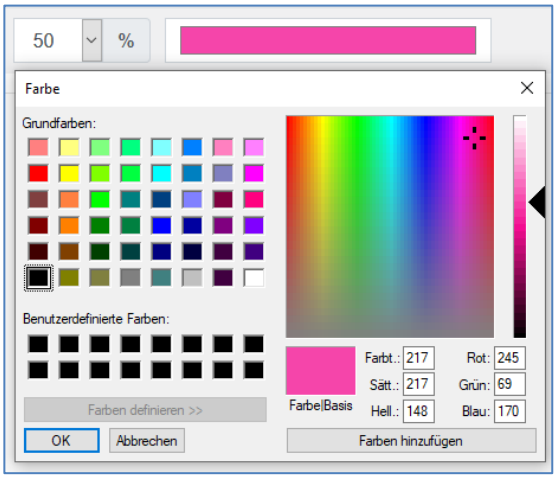
15.2.2 Colour settings

If individual ECGs or groups are parameterised for colour control (DT-8), a colour can be set in addition to the light value. To do this, click in the Color field of the desired ECG or group:



Setting a colour is only possible if the respective group or ECG has been enabled for colour control. Otherwise, the note N/A (not applicable) appears in the "Color" field.

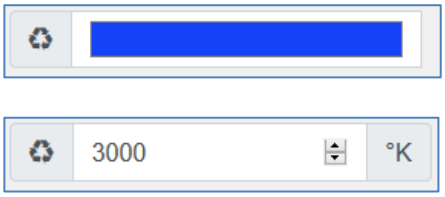
A further window opens in which the color data can be set.



With the confirmation "OK" the set colour for the group / individual ECG is adopted in the effect.

Groups with variable colour control
If a group in ETS is selected as color type "RGB + color temperature", this group can be used in the effect with both color controls.

This type is indicated by the following dialog element:



By clicking on the front icon, the input of color temperature in Kelvin changes to the normal color dialog.

15.2.3 Programming the effects and effect test

Once all entries for all desired effects have been made, the settings must be loaded from the browser into the device. This is done by pressing the "Save" button.

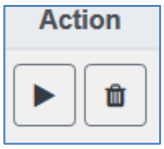
If the selected effect should be activated for testing, this can be done by pressing the "Test effect" button.

In case of loop mode, the effect can be stopped.

Loading the effect data from the gateway into the web browser is possible by pressing the "Reload Effects" button.

15.2.4 Testing an event in an effect

A way to test the setting of an event is in the "Action" column. When the "Play" button is activated, this event is sent to the DALI bus.



The command with the setting of the value and color is executed for this group or ECG. This way the desired property can be checked before programming the whole effect. If the properties "Keep value" or "Keep color" are set, the corresponding values are not activated but are kept at the current value.

16 The time control module

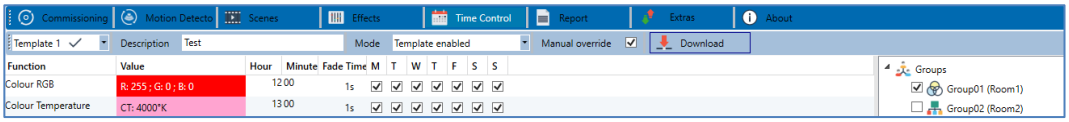
In order to use the colour setting options of DT-8 devices, DALI-Gateway P64 KNX offers an integrated time control module. With this module, users can automatically set a defined light colour and potentially a light value depending on the current time and date. Up to 16 templates are available. A template combines different actions which will trigger an event at a configurable time.

Time control of DT-8 colour ECGS is particularly interesting for white light control. Changes in colour temperature over the course of a day have a positive effect on well-being and efficiency in the workplace. Educational institutions, hospitals and many other settings use daytime dependent white light control.

The time control module can also be used to implement general temporal colour changes in DT-8 devices. For example, a building facade can be illuminated in red light in the first half of the night and in blue light in the second half of the night. Automatic adjustment of the dimming value depending on the time is also possible.

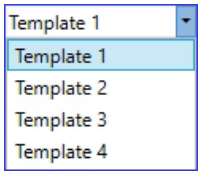
16.1 Time schedules configuration with DCA

Time control can be programmed and assigned in the DCA. For this purpose, change from the commissioning to the time control page.



16.1.1 Configuration

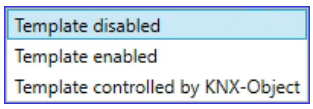
Use the drop down on the left-hand side to select a template.



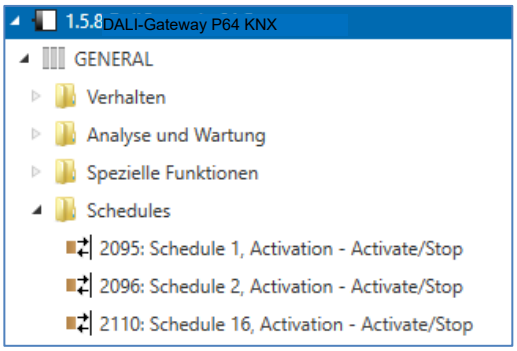
A "tick" means that the template has already been defined.

Use the description field to enter a user-friendly name for the template. The name can be up to 20 characters long and is displayed in brackets in the dropdown list for information purposes.

You can also define the behaviour of the template:



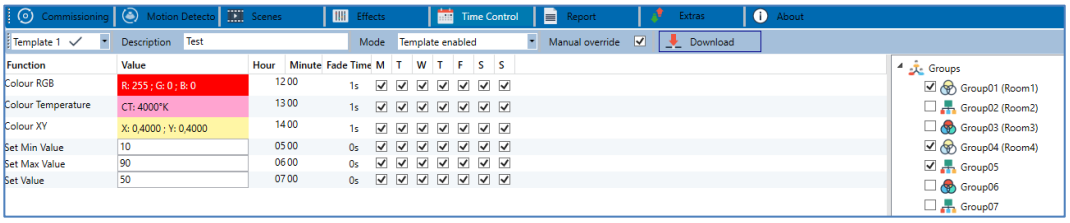
The template can be disabled. By default, all templates are enabled. It is also possible to enable or disable the template via a communication object. If you choose the option "control template via object" the corresponding objects are displayed. See chapter 20.1.6 Time control objects.



By using the „Manual Override" Option you can allow to temporally deactivate a certain group in this template. Please refer to chapter 16.1.4 Manual override.

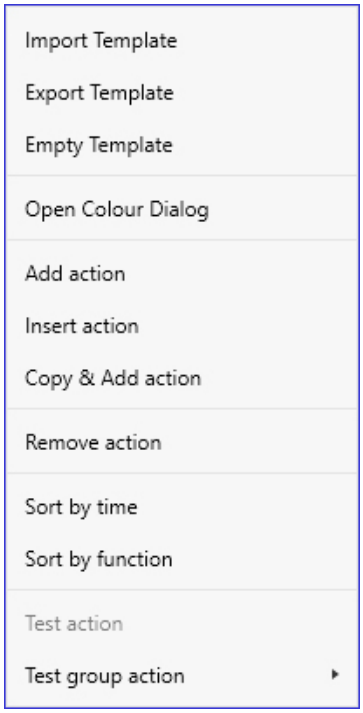
Use the tree on the right-hand side to select the DALI groups that you want to include in the template.

The middle part of the page is used to create an action list. All groups that have been selected, automatically perform an action at the configured time. Altogether a maximum of 300 actions can be stored on a DALI gateway if all templates are used. A context menu is available to control and create action lists.



A total of 9 function types are available for time control. See chapter 16.1.2 Types of action.

The creation of action lists and the operation is done as far as possible via the context menu. The context menu opens when the mouse pointer is positioned on an action in a line and the right mouse button is pressed. The following functions are then available for editing and creating action lists:



Import template
See 16.1.5 Export/import

Export template
see 16.1.5 Export/import

Empty template
Completely removes the configuration of this template.

Add action
Creates a new action and adds it to the end of the list.

Insert action
Creates a new action and inserts it between two existing list entries.

Copy and add action
Copies a selected action and adds it to the end of the list.

Delete action
Deletes a selected action.

Sort by time
Sorts the action list into ascending chronological order.

Sort by function
Sorts the action list according to function entries.

Test action
Immediately executes the chosen action (without regard for any potentially configured transition time) for all selected groups within a template. A connection to the DALI-Gateway P64 KNX is required.

Test group action
Immediately executes the chosen action (without regard for any potentially configured transition time) for a selected group within a template. You can also select the group via the context menu. A connection to the DALI-Gateway P64 KNX is required.

16.1.2 Types of action

Once you have created an action, set the corresponding function via the selection box. For each function, you can select a value, the time of the action and (if you would like the value to slowly cross-fade) a transition time. If you do not want the action to be performed every day, please enter the days of the week when you want to schedule the action.

Please remember that only certain value ranges make sense for each function. In principle any value can be entered in the value field. However, if this value exceeds the possible value range, it is automatically limited to the maximum value. (For example, if you enter 200 for the function "Set value", the maximum value 100 % is automatically entered.)

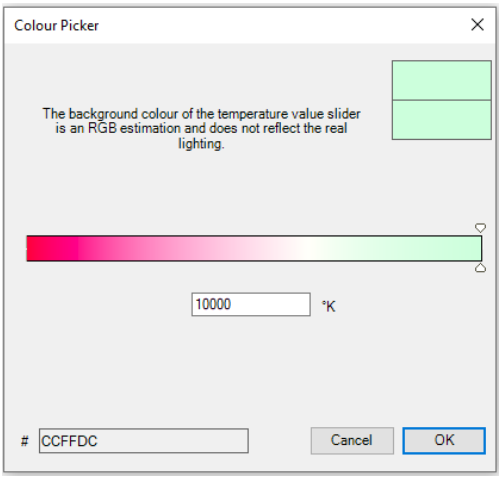
The following functions are possible for an action:

Set value
Sets the brightness level of a group. The permitted value range is between 0 and 100 %.

Min Value
Sets the minimum dim value of the selected group for relative (4 Bit) and absolute (8 Bit) dimming. When using this action, any minimum dim value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %.
This value is reset to the ETS setting after an ETS download.

Max Value
Sets the maximum dim value of the selected group for relative (4 Bit) and absolute (8 Bit) dimming. When using this action, any maximum dim value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %.
This value is reset to the ETS setting after an ETS download.

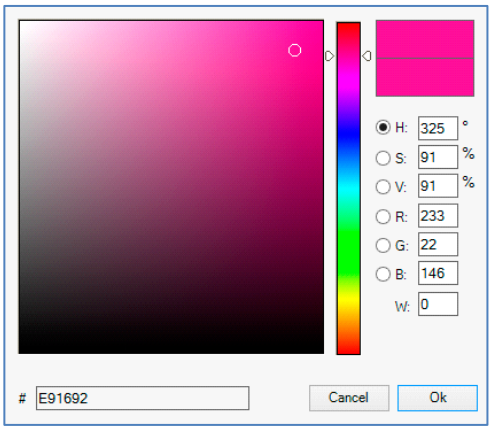
Colour temperature



This function sets the colour temperature of DT-8 devices that support the colour temperature setting (TC). On the ECG the colour is also changed if the lamp is turned off at the time of the action. You can enter the colour temperature range. The value range permitted is between 1000 and 10000 K but please remember the physical limits of the connected ECGs and lights.

Colour RGB
Sets the colour values of DT-8 devices that support the colours RGB. On the ECG the colour is also changed if the lamp is turned off at the time of the action. The values for each colour can be entered separately. The permitted value range for R, G and B is between 0 and 255. The final colour is a mixture of the different primary colours according to their percentage.

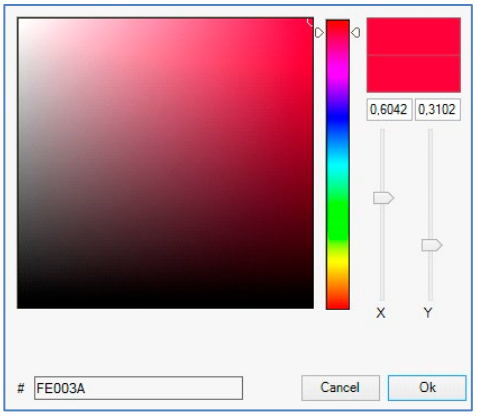
Colour RGBW
Sets the colour values of DT-8 devices that support the colours RGB or RGBW.
On the ECG the colour is also changed if the lamp is turned off at the time of the action.
The values for each colour can be entered separately. The permitted value range for R, G, B and W is between 0 and 255. The final colour is a mixture of the different primary colours according to their percentage.



Colour HSV
Sets the colour values of DT-8 devices that support the colours RGB. However, the value is entered by means of saturation, hue and brightness levels in this case.
On the ECG the colour is also changed if the lamp is turned off at the time of the action.
The permitted value range for the hue is between 0 and 360°, the value range for saturation and brightness is between 0 and 100 %.

Colour HSVW
In this function, a separate white value (separate channel) is specified in addition to HSV.

Colour XY
Sets the XY colour of DT-8 devices that support the XY colour space. On the ECG the colour is also changed if the lamp is turned off at the time of the action. The X and Y coordinates of the colour can be entered separately. The permitted value range for X and Y is from 0.0 to 1.0. Please remember the physical limits of the connected ECGs/lights. Not every colour from the colour spectrum can be set.



Max On Value
Sets the maximum ON value of the selected group or ecg. When using this action, any maximum On value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %. This value is reset to the ETS setting after an ETS download.

In principle, every group and ecg can be added to a template independently of the ECG device Types used in the group. Whilst the functions "Set Value", "MinValue" and "MaxValue" work for all device Types, (including, for example, fluorescent lights DT-0 and LED modules DT-6), the colour control functions "Colour Temperature", "Colour XY", "Colour RGBW", "Colour RGB", "Colour HSV"and "Colour HSVW" can only be executed by the connected DT-8 devices.

Other device types will ignore these actions. This also applies to the selected method. A DT-8 device with XY control, for example, will ignore an RGBW action and vice versa.
If the DT-8 devices within a group or template use different methods but are to perform a colour change at the same time, you need to set up two actions with different functions for the same point in time:

Function	Value	Hour	Minute	Fade Time	M	T	W	T	F	S	S
Colour HSV	H: 246° ; S: 92% ; V: 92%	11	00	1s	☑	☑	☑	☑	☑	☑	☑
Colour Temperature	CT: 2200°K	11	00	1s	☑	☑	☑	☑	☑	☑	☑
Set Value	66	11	00	0s	☑	☑	☑	☑	☑	☑	☑

Once an action table within a template is complete, you need to save the template into the DALI gateway. Please press the download button to do so.

Please remember that time-dependent actions can only be performed if they have previously been saved on the gateway. You can, however, test individual actions via the test button without saving them on the gateway. This does not change the data on the device.

16.1.3 Disable/enable

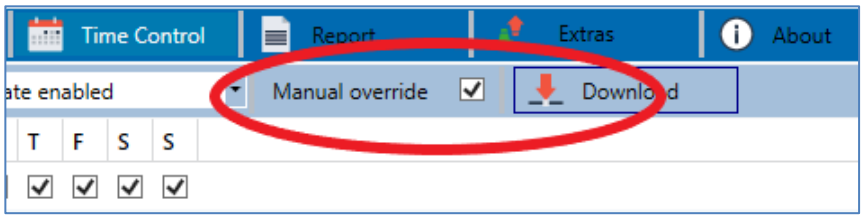
A template can be enabled or disabled in the header of the editor.

This makes it possible to fully prepare a template whilst disabling its execution. This way you can, for example, create two templates: one for a building in normal mode and one for the holiday period. You can now simply enable the required template without having to modify any of the actions. It is even easier to control time-dependencies via external objects. If you select this setting for a template, you can control it via the external objects 2095ff.

The value on receipt of the object determines whether a template is disabled or enabled.

16.1.4 Manual override

By default, actions are triggered immediately when the action time is reached regardless of any previously executed commands (automatic mode).
However, if the "Manual override" flag is set in a time program, the automatic mode can be stopped by a manual intervention for individual groups / ECGs of the template. Automatic mode is thus manually overridden.



This function is particularly interesting for HCL control applications. If the brightness or color of an element (group/individual ECG) is changed, automatic operation for this element stops. No automatic color adjustment will then be performed at the next action time. The change made by the user will remain until the automatic mode is activated again.

The activation of the automatic mode according to the template takes place at the reception of the next 1 bit Off or On telegram belonging to the element, or at the switching off of the element by another command (e.g. scene value = 0 or broadcast = 0). When an on telegram is received, the last color value regularly desired by an action is set. When an off telegram is received, the group/individual ECG is switched off and the automatic system continues to run in the background. Furthermore, a manual override is always resolved at midnight and automatic mode is automatically reactivated.

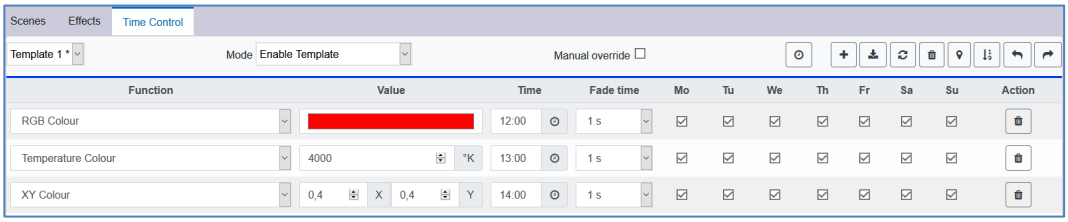
16.1.5 Export/import

To reuse a previously created template it is possible to export the template. The resulting xml file can be saved separately so that it can be reused in another project or template.
The export and import commands can be found in the context menu.

The template is saved as an XLM file in the chosen destination directory.

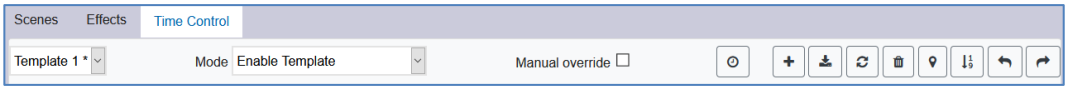
16.2 Time schedules configuration via web server

The assignment settings and the programming of schedules can be done from the website via the web server. After starting the web page, switch to the configuration page for this purpose and select "Templates".



16.2.1 Configuration

On the left side you can first select the desired template in the drop-down menu.
An "asterisk" indicates that this template has already been defined.



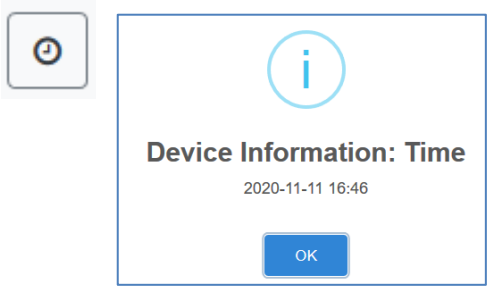
Option "Mode":
The behaviour of the template can be defined, see chapter 16.1.3 Disable/enable.

Option "Manual override":
Please refer to chapter 16.2.4 Manual override.

The following actions are available for a selected template:

- Read current date/time
- Adding a new entry
- Saving the template
- Reload configuration data
- Delete template
- Assignment of groups and/or ECGs
- Sorting the entries
- Import of the configuration from an xml file
- Export of the configuration to an xml file

Specially for the time schedule it is necessary to ensure that the gateway is working with correct date and time information. By clicking on this icon, the current date/time information is being displayed:



With the "Plus" button new entries can be added to the selected template. In the drop-down element you can now select the desired action type, see next chapter.

Depending on the action type, values and colors as well as the time of execution including the desired weekdays can be selected.

16.2.2 Types of action

Once you have created an action, set the corresponding function via the selection box. For each function, you can select a value, the time of the action and (if you would like the value to slowly cross-fade) a transition time. If you do not want the action to be performed every day, please enter the days of the week when you want to schedule the action.
Please remember that only certain value ranges make sense for each function. In principle any value can be entered in the value field. However, if this value exceeds the possible value range, it is automatically displayed a red border to indicate the not matching input value.

The following functions are possible for an action:

Set value
Sets the brightness level of a group. The permitted value range is between 0 and 100 %.

Min Value
Sets the minimum dim value of the selected group for relative (4 Bit) and absolute (8 Bit) dimming. When using this action, any minimum dim value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %.
This value is reset to the ETS setting after an ETS download.

Max Value
Sets the maximum dim value of the selected group for relative (4 Bit) and absolute (8 Bit) dimming. When using this action, any maximum dim value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %.
This value is reset to the ETS setting after an ETS download.

Colour temperature
This function sets the colour temperature (TC). On the ECG the colour is also changed if the lamp is turned off at the time of the action. You can enter the colour temperature range. The value range permitted is between 1000 and 10000 K but please remember the physical limits of the connected ECGs and lights.

Colour RGB
Sets the colour values of DT-8 devices that support the colours RGB or RGBW. On the ECG the colour is also changed if the lamp is turned off at the time of the action.
The values for each colour can be entered separately. The permitted value range for R, G, B and W is between 0 and 255. The final colour is a mixture of the different primary colours according to their percentage.

Colour RGBW
Sets the colour values of DT-8 devices that support the colours RGB. On the ECG the colour is also changed if the lamp is turned off at the time of the action. The values for each colour can be entered separately. The permitted value range for R, G and B is between 0 and 255. The final colour is a mixture of the different primary colours according to their percentage.

Colour HSV
Sets the colour values of DT-8 devices that support the colours RGB. However, the value is entered by means of saturation, hue and brightness levels in this case.
On the ECG the colour is also changed if the lamp is turned off at the time of the action.
The permitted value range for the hue is between 0 and 360°, the value range for saturation and brightness is between 0 and 100 %.

Colour HSVW
In this function, a separate white value (separate channel) is specified in addition to HSV.

Colour XY
Sets the colour temperature of DT-8 devices that support the XY colour space display (XY). On the ECG the colour is also changed if the lamp is turned off at the time of the action. The X and Y coordinates of the colour can be entered separately. The permitted value range for X and Y is from 0.0 to 1.0. Please remember the physical limits of the connected ECGs/lights. Not every colour from the colour spectrum can be set.

Max On Value
Sets the maximum ON value of the selected group or ecg. When using this action, any maximum On value set in the ETS parameters is automatically overwritten. The permitted value range is between 0 and 100 %.
This value is reset to the ETS setting after an ETS download.

Call scene
This function starts a desired scene. The internal scenes 1..16 can be selected.

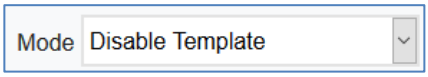
Start/Stop Effect
This function starts or stops a desired effect. The internal effects 1..16 can be selected.

In principle, every group can be added to a template independently of the ECG device Types used in the group. Whilst the functions "Set Value", "MinValue" and "MaxValue" work for all device Types, (including, for example, fluorescent lights DT-0 and LED modules DT-6), the colour control functions "Colour Temperature", "Colour XY", "Colour RGBW", "Colour RGB" and "Colour HSV" can only be executed by the connected DT-8 devices. Devices of other device types will ignore the actions. This also applies with regard to the selected procedure.

Other device Types will ignore these actions. This also applies to the selected method. A DT-8 device with XY control, for example, will ignore an RGBW action and vice versa. If the DT-8 devices within a group or template use different methods but are to perform a colour change at the same time, you need to set up two actions with different functions for the same point in time.

16.2.3 Disable/enable

In the page header, the respective template can be released or locked.



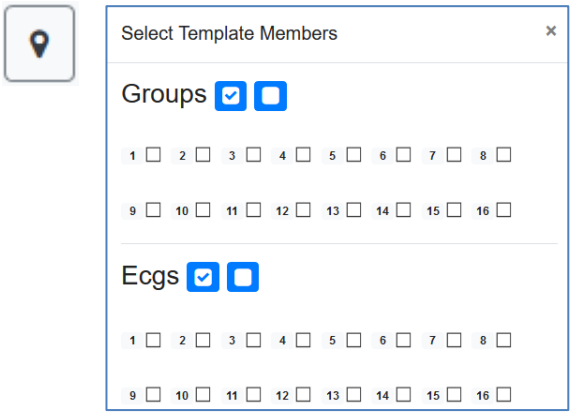
This option allows you to prepare templates completely but block their execution. For example, two templates could be created: One for the normal operation of a building and another one for the holiday period. By simply selecting the desired template, the desired template can be released without having to manipulate any actions. Time dependencies can be implemented even more conveniently using external objects. If this setting is selected for a template, the control can be carried out via the external objects 2095ff.

16.2.4 Manual override

Please refer to chapter 16.2.4 Manual override.

16.2.5 Assignment of groups and ECGs

By selecting the "Assignment" button, the desired groups and ECGs that are to work with this schedule can be selected.



16.2.6 Programming the time programs

Once all entries for all desired templates have been made, the settings must be loaded from the browser into the device. This is done by pressing the "Save" button.

16.2.7 Export/import

In order to be able to reuse an already created template, it is possible to export it. The created XML file can be saved separately to be used again in another project or in another template. The export or import can be done with the following buttons:

Import of a time program

Export of a time program

The template is saved as an XML file in the desired target directory.

16.3 Timer

To ensure the safe operation of the time control module the exact time and date are required on the device. This has to be provided by the KNX in form of 3 byte communication objects. The precision of the DALI gateway's internal time calculation is limited. It is therefore essential to update the time at least once a day. When the application is started the device automatically sends a read request for time and date to the KNX bus.

The time control module remains completely disabled until an updated time has been received. Actions are only performed after receipt of a valid time. Please remember that the 3 byte time object also transmits information about the current weekday (Monday – Sunday). (For some KNX timers this is configurable). If a 3 byte object is received without this information, the

weekday is not checked. This means that an action which has, in fact, only been enabled for Saturday and Sunday would also be performed on a Monday.

As the date is not calculated internally, the DALI gateway automatically sends a read request to the date object at 00:01 and at 00:04. At the same time, the time object is also automatically queried. A further read request is sent at 3:01. This avoids any potential failures when clocCW change to daylight saving time and vice versa.

17 Self-contained battery emergency lights

The DALI-Gateway P64 KNX also supports ECGs for the control of self-contained battery emergency lights. (Device Type 1 according to EN 62386-202). Such devices contain a battery within the lamp that will operate the light for a certain time period in case of loss of power supply.

17.1 Features

Principally a distinction is made between switchable and non-switchable devices for self-contained battery lamps. A switchable device can be directly connected to a lamp just like a 'normal' ECG. In normal mode the light (usually an LED) can be switched and dimmed via DALI. The standard switch parameters and objects are available for these devices.

In contrast to the 'switchable' device, a 'non-switchable' device (converter) can only control the connected lamp in an emergency. The light is normally either always on or always off. As these devices do not allow direct switching, there are no objects available for this purpose.

During both new and post-installation, the DALI-Gateway P64 KNX recognizes automatically, whether the connected device is a 'switchable' or 'non-switchable' ECG.

Sometimes special, non-switchable converters are used together with "normal" DALI ECGs in a light. These lights are therefore called emergency lights with 2 DALI devices. The two ECGs make a device pair that shares a common light. The 'non-switchable' device uses the DALI communication to query the device status and to initiate mandatory test phases. The switchable device controls the light in normal mode.

However, because of the DALI structure with its random assignment of short addresses, the pairing of a 'normal' device with a 'non-switchable' device does not occur automatically. It has to be performed manually on the parameter page in ETS. The assignment is crucial for failure analysis purposes as 'non-switchable' devices usually share the connected lamp with a 'normal' device. Without the assignment, a lamp failure may be double counted. In addition, the 'normal' ECG in a pair is usually automatically disconnected from the power supply when the emergency light is tested. This loss of function generates an ECG failure. However, by making a pair, the gateway recognizes automatically, whether a real ECG failure has occurred or whether the corresponding converter has simply been tested. Only real ECG failures are taken into account for the analysis.

17.2 Identification

For identification after new/reinstalled single-battery emergency lights, the identification process is started when "flashing mode" is selected. Usually the status LED of the emergency light flashes. However, please observe the respective description of the light. Since the status LED is not executed or visible with some lights, a function test can be started alternatively. During the function test, the ECG usually switches the luminaire on for a few seconds.

17.3 Converter inhibit mode

Self-contained battery emergency lights always change into emergency mode if there is a power supply failure. The lamp is now operated by the internal battery. However, it may become necessary at times to cut off the power supply, for example during maintenance work or the

commissioning phase of a building. To prevent the lights from switching into emergency mode, the converters connected to the DALI-Gateway P64 KNX can be disabled via the push buttons and display on the device (see above). This converter inhibit mode is only available for all connected devices at the same time. If the power supply is turned off within 15 minutes after activating the mode, the connected lights do not change into emergency mode and the lights remain switched off. When the power resumes, the lights return to normal. If the 15 minutes run out without a power loss, all converters are automatically reset to normal mode.

17.4 Test mode

The DALI-Gateway P64 KNX supports the execution and recording of mandatory tests for self-contained battery emergency lamps.

> The legal regulations and norms vary in different countries. Please make sure that you comply with all country-specific requirements.

The DALI-Gateway P64 KNX supports functional tests, long duration tests and battery status tests. Functional and duration tests can be started externally via KNX telegrams (1 byte telegrams, see below) or via the device website. Alternatively, you may choose to set automatic test intervals. This means tests are performed automatically via the connected converters (please check the converter description for the exact function). After a test has been completed, the test results are available on the KNX bus via communication objects, and they may be recorded in the visualisation. The corresponding objects are updated with the test result and automatically sent after every new test. Please see chapter 19.1.5 Objects for emergency for the exact function.

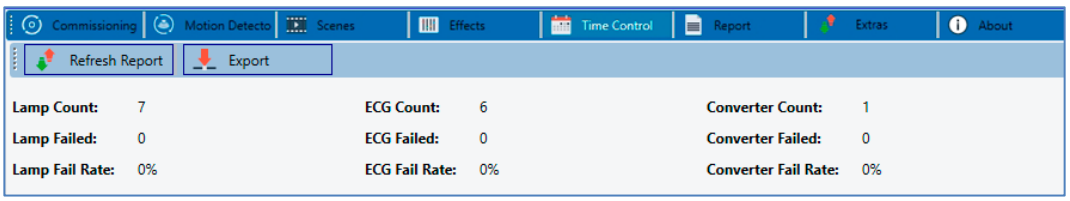
Alternatively, test results can be displayed on the website if you select the respective converter.

17.5 Emergency test results

The test results of the self-contained battery emergency lights can be displayed on the website as well as in the DCA.

17.5.1 DCA report

The "Report" tab displays statistical data on the fault status of the connected ECGs, as well as the test reports of the connected emergency luminaires. In the upper part the following information is displayed:



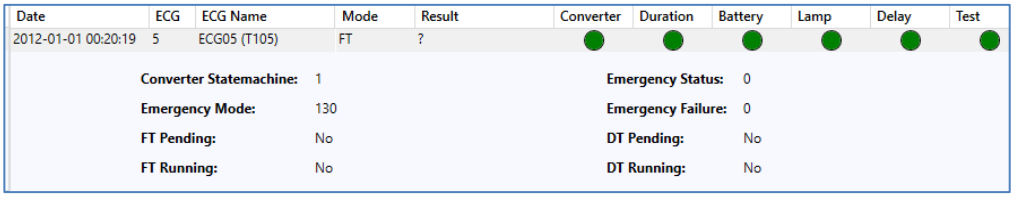
- Lamp count
- ECG count
- Converter count

- Lamp failed
- ECG failed
- Converter failed
- Lamp failure rate
- ECG failure rate
- Converter failure rate

Press the "Refresh" button to display the test reports (Result of the last emergency lighting test of all emergency lights). This information is directly obtained from the emergency lights via a DALI command.

Date
ECG: number of ECGs (ETS Definition)
ECG name: name of the ECG assigned by the ETS
Mode: FT= function test; DT: duration test; BT: battery test
Result: during a battery test the battery status is displayed; during a duration test the time of the test is displayed.
Converter: green: no failure; red: converter was faulty during the test (DALI QUERY 252: bit 0)
Duration: green: no failure; red: duration of the battery is insufficient (DALI QUERY 252: bit 1)
Battery: green: no failure; red: battery faulty (DALI QUERY 252: bit 2)
Lamp: green: no failure; red: emergency light is faulty (DALI QUERY 252: bit 3)
Delay: green: no failure; red: maximum delay time has been exceeded during function or duration test (DALI QUERY 252: bit 4 or bit 5)
Test: green: ok

Detailed information about emergency lights
Double-click on an emergency light (converter) to display detailed information.

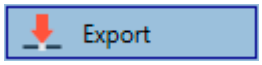


Converter status: status according to DTP 244.600:

0: Unknown
1: Normal mode active, all OK
2: Inhibit mode active
3: Hardwired inhibit mode active
4: Rest mode active
5: Emergency mode active
6: Extended emergency mode active
7: FT in progress
8: DT in progress

Emergency light status: status according to DALI Query_Emergency_Status 253
Emergency light mode: status according to DALI Query_Emergency_Mode 250
Emergency light failure: status according to DALI Query_Failure_Status 252

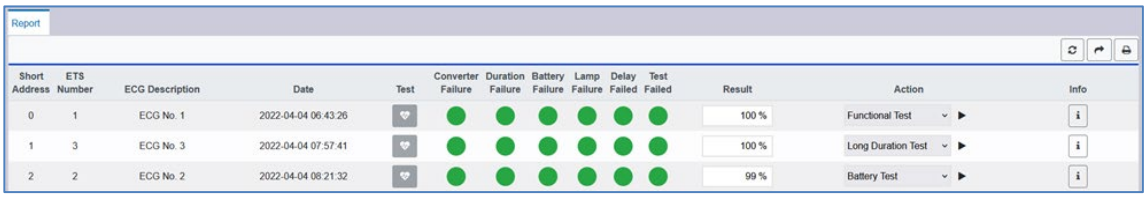
Exporting test results



Press the Export button to save the test results in an xml file. The file can be saved in any location.

17.5.2 Website report

The test results of the emergency lights can be displayed on the website via the web server. After starting the web page, switch to the diagnostics page for this purpose and select "Report".



This table lists all configured emergency luminaires:

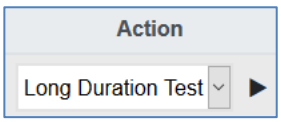
Short address: real address of the ECG
ECG: Number of the ECG (ETS definition)
ECG Description: the name given to this ECG by the ETS
Date: date of the last test result
Converter: green: no error; red: converter was faulty during test (DALI QUERY 252: bit 0)
Duration: green: no error; red: battery rated time insufficient (DALI QUERY 252: bit 1)
Battery: green: no error; red: battery defective (DALI QUERY 252: bit 2)
Lamp: green: no error; red: emergency lighting lamp defective (DALI QUERY 252: bit 3)
Delay: green: no error; red: maximum delay time in function test or duration test exceeded (DALI QUERY 252: bit 4 or bit 5)

Result: during a battery test, the charge state of the battery is displayed; during an endurance test, the time of the test is displayed

Testing

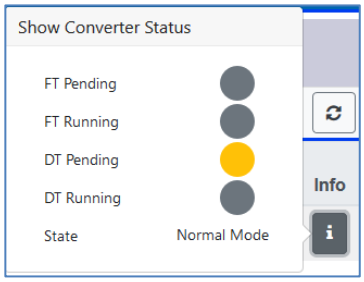
	FT = function test
	DT: duration test
	BT: battery test

Action
Here you can choose between function test, endurance test and battery test. The test is started with the following key:



Detailed information of an emergency lamp

Info: The Info button displays detailed information:

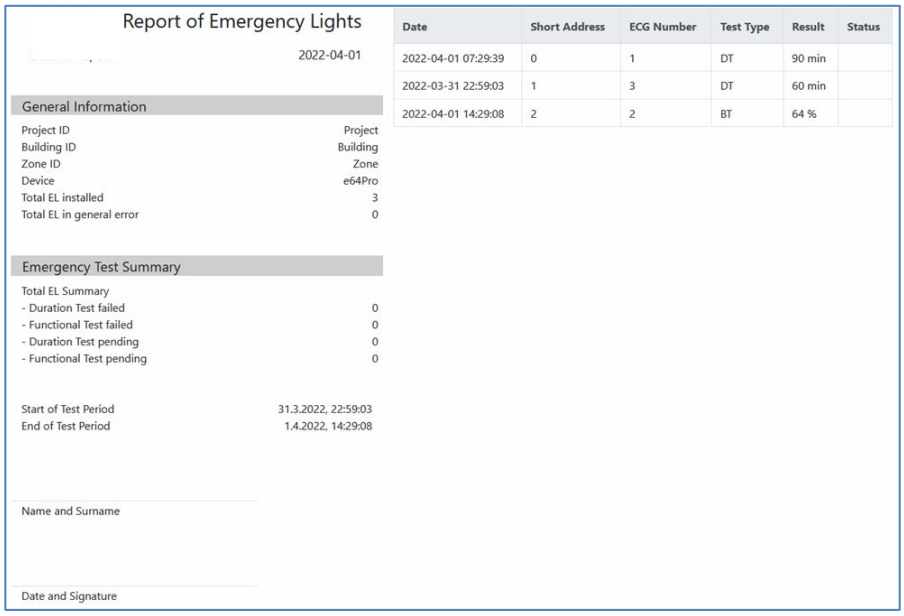


Exporting the test results in xml

Press the Export button to save the test results in an xml file.
The storage location is freely selectable.

Exporting the test results as html print

By pressing the Export button, the test results are summarized in an HTML page and prepared for printing. The printout can be started via the browser.



Report of Emergency Lights

2022-04-01

General Information

Project ID	Project
Building ID	Building
Zone ID	Zone
Device	e64Pro
Total EL installed	3
Total EL in general error	0

Emergency Test Summary

Total EL Summary	
- Duration Test failed	0
- Functional Test failed	0
- Duration Test pending	0
- Functional Test pending	0
Start of Test Period	31.3.2022, 22:59:03
End of Test Period	1.4.2022, 14:29:08

Name and Surname

Date and Signature

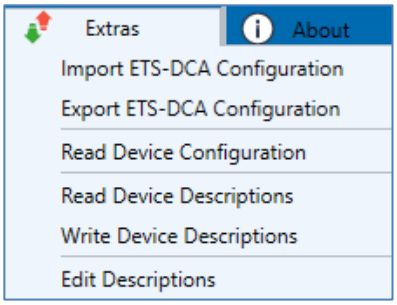
Date	Short Address	ECG Number	Test Type	Result	Status
2022-04-01 07:29:39	0	1	DT	90 min	
2022-03-31 22:59:03	1	3	DT	60 min	
2022-04-01 14:29:08	2	2	BT	64 %	

The current status is displayed in the "Status" column. If a test is pending or has been started, this is indicated by the abbreviations FTW (function test waiting) or DTW (duration test waiting). The last completed test is displayed with date/time and result.

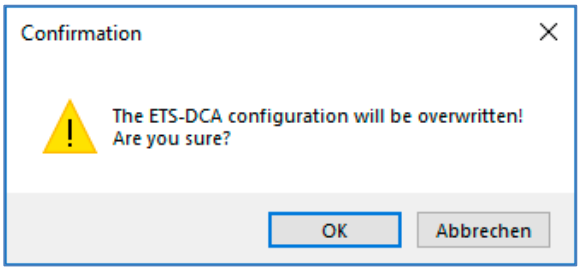
Date	Short Address	ECG Number	Test Type	Result	Status
2022-04-01 07:29:39	0	1	DT	90 min	FTW
2022-03-31 22:59:03	1	3	DT	60 min	
2022-04-01 14:29:08	2	2	BT	64 %	

18 DCA extras

The menu item **Extras** offers further special functions.



Import device configuration
A previously saved device configuration can be loaded into the ETS with this function.



Please remember that all DCA data in the ETS will be overwritten with this data. Press the "Restore" button under commissioning in order to load the configuration onto the DALI gateway. See chapter 12.1.9 Restoring the DALI configuration.

Apart from the Dali configuration, important ETS parameters are also written back. These include:

- Group assignment of the ECGs
- Device types and selection of colour control
- Type of input devices
- Type of light control

Export device configuration
The ETS DCA configuration can be saved as an xml file.

Read device configuration
All data from the DALI gateway is exported and transferred to the ETS-DCA configuration.

> This is especially important if you have previously worked with the website. Description texts are not read automatically. To do this, the separate menu item "Read description texts" must be selected.

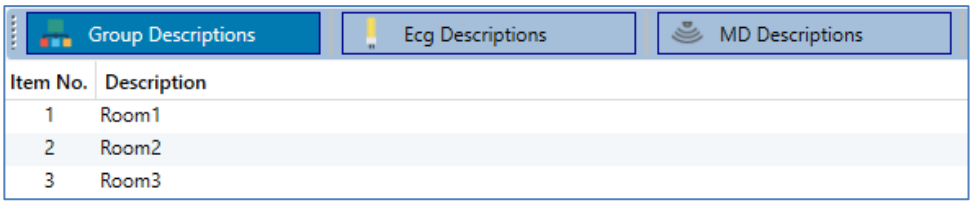
Read description texts
The description texts of the ECGs, groups and scenes can also be saved on the DALI gateway. The descriptions on the device are available on the device website. Please remember that the device allows only 20 characters per name. In case the website was previously used for commissioning, the texts are transferred to the ETS.

Write description texts
The description texts of the ECGs, groups and scenes can be saved on the DALI gateway. The descriptions on the device are available on the device website.

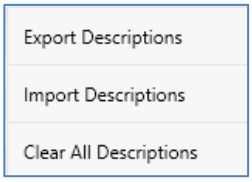
Edit description texts
The description texts of the ECGs, the groups and input devices can be defined separately under this menu item.

18.1 Menu: edit descriptions

For each category the description texts can be entered separately.



In addition, it is possible to import, export or delete texts by right-clicking on a line in the context menu:



There are 2 formats provided for export, resp. import: xml, txt

By default, the "xml" format is selected. The following is an example of the group export:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<GRP_TEXT>
 <text index="1" description="Room 1" />
 <text index="2" description="Room 2" />
 <text index="3" description="Room 3" />
 <text index="4" description="Room 4" />
 <text index="5" description="" />
 <text index="6" description="" />
 <text index="7" description="" />
 <text index="8" description="" />
 <text index="9" description="" />
 <text index="10" description="" />
 <text index="11" description="" />
 <text index="12" description="" />
 <text index="13" description="" />
 <text index="14" description="" />
 <text index="15" description="" />
 <text index="16" description="" />
</GRP_TEXT>
```

(xml): If you do not want to overwrite all texts, you can simply omit the corresponding indices.

(txt): When using the txt format, it should be noted that this file is read in line by line. An entry that is not to be changed must therefore be defined as an "empty" line. An entry that is to be deleted is marked with single quotation marks.

19 Commissioning (via display and push buttons)

You can commission the connected DALI segment and set and change some functions and tests via the three push buttons (MOVE, Set/Prg, ESC) and the 2 x12 character display on the front of the device. The user concept is menu-based. Depending on the menu position, you can select two sub-levels. The current menu position is shown on the display. To navigate within the menu, press the push buttons briefly.

The Move key is used to select the next menu item within a level. With a short push on the Prg/Set button you reach the respective subordinate level. Pressing the ESC key causes leaving the selected level and returning to the superordinate level.

19.1 Main menu level 1

The main menu (level 1) has the following structure:

DALI-GATEWAY P64 KNX	The product name and firmware version are displayed. The sub-menu can be used to set the display language.
NETWORK IP ADDRESS	This sub-menu displays the IP address set in the ETS or assigned by the DHCP server.
NEW INSTALLATION	When a DALI segment is newly installed, use the sub-menu to reset the connected DALI devices and automatically search for ECGs. **Unlike with a new installation that was started through DCA or web server, the ECGs in this case are directly assigned 1:1 to the real ECGs.**
POST INSTALLATION	Use this sub-menu to start the automatic search process and possibly adjust the configuration following a post-installation of DALI ECGs.
ECG EASY REPLACEMENT	Use this sub-menu to active the ECG quick exchange function and possibly program and integrate individually replaced ECGs into the system.
GROUP ASSIGNMENT	Identifies ECGs and assigns them to DALI groups.
GROUP TEST	Switches programmed groups for test purposes.
SCENE TEST	Tests individually programmed scenes.
SYSTEM TEST	Use this sub-menu to individually load any existing system failures.
MAINTENANCE ECG/LAMP	Resets operating hours:
CONVERTER INHIBIT MODE	Activates the converter inhibit mode in the installation phase.

To perform a function or change a configuration within a sub-menu, go to the respective position and change into programming mode. To change into programming mode, hold the Prg/Set button for more than 2 seconds. Once the function is in programming mode, a →-symbol appears in the display. If the programming mode is active, use the Move button to change a parameter or setting. Briefly press the Prg/Set button again to complete the process and save the set parameter or activate the function.

19.2 Sub menu level 2

19.2.1 Sub menu: language

The sub menu language has the following structure:

DALI-GATEWAY P64 KNX	The product description and firmware version are displayed. The display language can be set in the sub-menu.
LANGUAGE GERMAN	The currently set display language is shown. Hold the Prg/Set button to change into programming mode. Use the MOVE button to choose from one of the following languages:

GERMAN, ENGLISH, FRENCH, SPANISH, ITALIAN, DUTCH, SWEDISH. Briefly press the Prg/Set button again to save the configuration. The display now works in the selected language.

ⓘ the language will be activated after a restart of the device.

19.2.2 Sub menu: IP network/address

The sub menu IP/address has the following structure:

NETWORK IP ADDRESS	Briefly press the Prg/Set button to change from the main menu IP ADDRESS to the sub-menu.
DHCP: 192. 168.004.xxx	This sub-menu displays the IP address currently set in the ETS or assigned by the DHCP-Server.

19.2.3 Sub menu: new installation

The sub menu new installation has the following structure:

NEW INSTALLATION	Briefly press the Prg/Set button to change from the main menu NEW INSTALLATION to the sub-menu SEARCH ECGs via PROG-MODE.
SEARCH ECGs via PROG-MODE	This sub-menu displays the IP address currently set in the ETS or assigned by the DHCP-Server.
FOUND ECGs: xx	Use this sub-menu to reset the connected DALI devices and automatically search for ECGs during a new installation.

19.2.4 Sub menu: post installation

The sub menu post installation has the following structure:

POST INSTALLATION	Briefly press the Prg/Set button to change from the main menu POST INSTALLATION to the sub-menu SEARCH ECGs via PROG-MODE.
SEARCH ECGs via PROG- MODE	Hold the Prg/Set button to change into programming mode. Briefly press the Prg/Set-button again to start the verification and search process. The device searches for the connected ECGs via their long address and automatically compares them to the previous configuration.
DELETED ECGs: x	If ECGs have been removed from the DALI segment, the entries are deleted from the de-vice. The number of deleted devices is displayed during the verification process.
NEW ECGs: x	After that, the DALI segment is searched for newly installed devices. Newly added ECGs are automatically reset and any previously pro-grammed parameters and group assignments are deleted. Depending on the number of connected ECGs the search process may take a few minutes. During the search process, the number of newly found devices is shown in the display.
DELETED/NEW ECGs: x/x	Once the whole process (verification and search) is complete, the display shows both the deleted and the newly found ECGs (deleted devices / new devices from left to right, see picture on the left). Press the ESC button (or wait for about 30 seconds) to return to the level above.).

19.2.5 Sub menu: ECG quick exchange

The sub menu ECG quick exchange has the following structure:

ECG QUICK EXCHANGE	Briefly press the Prg/Set button to change from the main menu ECG QUICK EXCHANGE to the sub-menu SEARCH ECGs via PROG-MODE.
SEARCH ECGs via PROG- MODE	Hold the Prg/Set button to change into programming mode. Briefly press the Prg/Set-button again to start the quick exchange. The device first checks if one or several ECGs in the system were faulty. It then automatically looCW for newly connected ECGs in the segment. The quick exchange is only possible if just one ECG in the segment was faulty and one new ECG is found. If the process is successful, the number of the replaced ECG is shown in the display.
ECG xx REPLACED	If the search process cannot be completed because the required conditions are not met, a failure code appears in the display.
ERROR TYPE xx	If the search process cannot be completed because one of the conditions necessary for the quick exchange is not fulfilled, an error code is shown in the display. The displayed error codes have the following meaning: - Failure Type 7: No faulty ECG - Failure Type 8: More than one ECG faulty - Failure Type 9: No new ECG found - Failure Type 10: ECG has wrong device Type - Failure Type 11: More than one new ECG

Press the ESC button (or wait for about 30 seconds) to return to the level above.

19.2.6 Sub level: group assignment

The sub menu group assignment has the following structure:

GROUP ASSIGNMENT	Briefly press the Prg/Set button to change from the main menu GROUP ASSIGNMENT to the sub-menu. Within this menu the individual ECGS that were found during the search process can be assigned to 16 DALI groups and previous assignments can be modified.
ECG NR.:xx GROUP: --	Briefly press the MOVE button to run through the different ECGs. The number of the selected ECG is shown in the first display line. As long as the ECG is selected, the connect-ed lamp is flashing. The programmer can thereby determine which lamp is assigned to the number.
KONV. NR.: xx GROUP: --	If the selected device is a converter for emergency lights, the selection sets the device into identification mode and the display shows the word CONV. For identification purposes, the function LED on the converter flashes during the test (see user manual for the converter).
KONV. NR.: xx GROUP: xx	Hold the Prg/Set button to change into programming mode. Briefly press the MOVE button again to select the group that you want to assign the ECG to. If the group is selected, briefly press the Prg/Set button to confirm and save the setting. Press the ESC button (or wait for about 30 seconds) to return to the level above.

19.2.7 Sub menu: group test

The sub menu group test has the following structure:

GROUP TEST	Briefly press the Prg/Set button to change from the main menu GROUP TEST to the sub-menu. Within the menu, groups can be switched either individually or all together (ALL GROUPS TEST = BROADCAST) to test the installation.
GROUP: X TEST	Briefly press the MOVE button to run through the individual groups. The number of the selected group is shown in the first display line.
GROUP: X ----> OFF	Hold the Prg/Set button to change into programming mode. Briefly press the Move button to select whether you would like to switch the group on or off. Briefly press the Prg/Set button to execute the selected command. Press the ESC button (or wait for about 30 seconds) to return to the level above.

19.2.8 Sub menu: scene test

The sub menu scene test has the following structure:

SCENE TEST	Briefly press the Prg/Set button to change from the main menu SCENE TEST to the sub-menu. Within the menu you can invoke all scenes for test purposes or program newly set light scenarios into the scene.
SCENE: X TEST	Briefly press the MOVE button to run through the individual scenes. The number of the selected scene is shown in the first display line.
SCENE: X ---> INVOKE	Hold the Prg/Set button to change into programming mode. Briefly press the Move button to choose whether you would like to invoke or save a scene. Briefly press the Prg/Set-Taste button to execute the selected

command and either invoke or save the scene. Press the ESC button (or wait for about 30 seconds) to return to the level above.

19.2.9 Sub menu: system test

The sub menu system test has the following structure:

SYSTEM TEST	Briefly press the Prg/Set button to change from the main menu SYSTEM TEST to the sub-menu. Within the menu you can check for any potential failures.
DALI NO ERRORR	If there is no failure, this is shown in the display.
DALI ERROR	The following failures can be recognized by the system. They are shown in the display and also simultaneously set off the red failure LED: - DALI short-circuits - Lamp fault with the lamp or ECG number being displayed - ECG failure with display of the ECG number - No KNX Bus In case of a DALI short-circuit, no further failures can be recognized. For all other failure Types, several failures can be recognized at the same time. Within the menu you can toggle between different failures by briefly pressing the Move button.
LAMP xx ERROR	The number of the ECG is displayed for lamp failures. This means that a failure can be easily localized.
ECG xx ERROR	The number of the ECG is displayed for ECG failures. This means that a failure can be easily localized.
KNX NO ERROR	If there are no failures, this is shown on the display.

19.2.10 Sub menu: maintenance ECG/lamp

The sub menu maintenance ECG/lamp has the following structure:

MAINTENANCE ECG/LAMP	Briefly press the Prg/Set button to change from the main menu MAINTENANCE ECG/LAMP to the sub-menu. Within the menu you can start the burn-in of a lamp and reset the reader for its operating hours.
ECG NR.: xx xxx h	Briefly press the MOVE button to run through the individual ECGs. The number of the selected ECG is shown in the first display line. Line 2 shows the number of operating hours since the last reset.
ECG. NR.: xx RESET	Hold the Prg/Set button to change into programming mode. Briefly press the Prg/Set button to execute the selected command. Press the ESC button (or wait for about 30 seconds) to return to the level above.

19.2.11 Sub level: converter inhibit mode

The sub menu converter inhibit mode has the following structure:

CONVERTER INHIBIT MODE	Briefly press the Prg/Set button to change from the main menu CONVERTER INHIBIT MODE to the sub-menu. Within the menu you can turn on the Inhibit Mode for all connected self-contained battery emergency lights. If the mains power supply is turned off within 15 minutes from activating the Inhibit Mode, the lights do not change into emergency mode but remain switched off. Particularly during the initialization phase of a building this operating mode may be required to prevent the emergency lights from being turned on constantly.
INHIBIT MODE via PROG- MODE	Hold the Prg/Set button to change into programming mode.
INHIBIT CONVERTER?	Briefly press the Prg/Set button again to activate the Inhibit Mode. Press the ESC button (or wait for about 30 seconds) to return to the level above.

20 ETS communication objects

The DALI-Gateway P64 KNX communicates via the KNX bus based on a powerful communication stack of the System B type. Altogether 2110 communication objects are available, which are described below separated by function bloc.

Up to 1000 group addresses can be used in encrypted form, see chapter 3.1 Secure usage.

20.1 General objects

20.1.1 General objects – behaviour

Object	Object name	Function	Type	Flags
1	Time	Time	3 Byte 10.001	CWT
This object is used to set the time. The time must be provided by a central timer and updated at least twice a day.				
2	Date	Date	3 Byte 11.001	CWT
This object is used to set the date. The date must be provided by a central timer and updated at least twice a day. Leap years and change-over to and from daylight saving time are not taken into consideration during internal calculations of time and date. Therefore, please pay attention that the timer sends the correct date on these occasions.				
10	Activate Panic mode	Activate/Stop	1 Bit 1.010	CW
Use this object to activate or stop the panic mode via the bus.				
11	Activate Test mode	Activate/Stop	1 Bit 1.010	CW
This object is used to activate or stop the test mode via the bus.				
12	Activate Night mode	Activate/Stop	1 Bit 1.010	CW
This object is used to activate or stop the night mode via the bus.				

20.1.2 General objects – analysis and service

Object	Object name	Function	Type	Flags
13	General failures	Yes/No	1 Bit 1.005	CRT
This object is used to report the presence of a general failure in the connected DALI segment independent of its type.				
14	DALI failure	Yes/No	1 Bit 1.005	CRT
This object is used to report the presence of a DALI short-circuit in the connected DALI segment.				
15	General Failure Exceed Theshold	Yes/No	1 Bit 1.005	CRT
This object is used to report that the total of all lamps, ECG and converter failures recognised by the gateway, exceeds the set threshold.				

16	General Failure in Total	Value	1 Byte 5.010	CRT
This object is used to report the total number of all lamps, ECG and converter failures recognised by the gateway. Please remember that for each connected device a failure is counted just once. A simultaneous lamp failure in case of an ECG or converter failure cannot be recognised or counted.				
16a	General Failure in %	Value	1 Byte 5.001	CRT
This object is used to report the failure rate as a percentage of all lamps, ECG and converter failures recognised by the gateway. Please remember that for each connected device a failure is counted just once. A simultaneous lamp failure in case of an ECG or converter failure cannot be recognised or counted.				
17	Lamp Failure Exceed Theshold	Yes/No	1 Bit 1.005	CRT
This object is used to report that the total of all lamp failures recognised by the gateway exceeds the set threshold.				
18	Lamp Failure in Total	Value	1 Byte 5.010	CRT
Reports the total amount of lamp failures recognised by the gateway.				
18a	Lamp Failure in %	Value	1 Byte 5.001	CRT
Alternatively, this object is used to report the failure rate as a percentage of the total number of lamps in the DALI segment.				
19	ECG Failure Exceeds Theshold	Yes/No	1 Bit 1.005	CRT
This object is used to report that the total of all lamp failures recognised by the gateway exceeds the set threshold.				
20	ECG Failure in Total	Value	1 Byte 5.010	CRT
Reports the total amount of ECG failures recognised by the gateway.				
20a	ECG Failure in %	Value	1 Byte 5.001	CRT
Alternatively, this object is used to report the failure rate as a percentage of the total number of lamps in the DALI segment.				
21	Converter Failure Exceeds Theshold	Yes/No	1 Bit 1.005	CRT
This object is used to report that the total of all converter failures recognised by the gateway exceeds the set threshold.				
22	ECG Failure in Total	Value	1 Byte 5.010	CRT
Reports the total amount of converter failures recognised by the gateway.				
22a	ECG Failure in %	Value	1 Byte 5.001	CRT
Alternatively, this object is used to report the failure rate as a percentage of the total number of converters in the DALI segment.				
23	Status On/Off Group 1 – Group 16	Status	4 Bytes 27.001	CRT
Activates the status display for groups 1 - 16.				
24	Status On/Off ECG 1 - ECG 16	Status	4 Bytes 27.001	CRT
Sends the switch status for ECGs 1 - 16. Each value >0% is interpreted as ON.				

25	Status On/Off ECG 17 - ECG 32	Status	4 Bytes 27.001	CRT
Sends the switch status for ECGs 17 - 32. Each value >0% is interpreted as ON.				
26	Status On/Off ECG 33 - ECG 48	Status	4 Bytes 27.001	CRT
Sends the switch status for ECGs 33 - 48. Each value >0% is interpreted as ON.				
27	Status On/Off ECG 49 - ECG 64	Status	4 Bytes 27.001	CRT
Sends the switch status for ECGs 49 - 64. Each value >0% is interpreted as ON.				
28	Status Failure Lamp/ECG	Status	1 Byte 238.600	CRT
Sends the switch status of individual lamps in the DALI segment when the system is started or when a change has taken place. Bit 0 - 5 refer to the number of the ECG. Bit 7 represents an ECG failure, Bit 6 a lamp failure. For example: Bit 7 6 5 4 3 2 1 0 ECG 5 / ECG failure 1 0 0 0 0 1 0 0 ECG 6 / Lamp failure 0 1 0 0 0 1 0 1 If a value is received where Bit 7 and Bit 6 are set, it is interpreted as a status query. For example: Bit 7 6 5 4 3 2 1 0 ECG 5 / Query 1 1 0 0 0 1 0 0 The gateway responds with the current status of the queried ECG. Bit 7 6 5 4 3 2 1 0 ECG 5 / ECG failure 1 0 0 0 0 1 0 0				
29	Total Active Power	Value	4 Bytes 14.056	CRT
This object provides the total active power of all ECGs of device type 51 according to DALI part 252 which are installed.				
29a	Total Active Energy	Value	4 Byte 13.010	CRT
This object provides the total active energy of all ECGs of device type 51 according to DALI part 252 which are installed.				
2406-2413	Sensor x, Input Device Error	Yes/No	1 Bit	CRT
These objects transmit the error status of an ETS sensor (motion detector or generic input). An ETS sensor can be linked to different instances of different real input devices. As soon as a linked instance reports an error, this is communicated via these objects.				
2414-2421	Generic x Input Device Error	Yes/No	1 Bit	CRT
These objects transmit the error status of an ETS Generic elements. As soon as a linked instance reports an error, this is communicated via these objects.				
2422-2429	Push Button x Input Device Error	Yes/No	1 Bit	CRT
These objects transmit the error status of an ETS Push Button. An ETS Push Button can be linked to different instances of different real input devices. As soon as a linked instance reports an error, this is communicated via these objects.				

20.1.3 General objects – special functions

Object	Object name	Function	Type	Flags
34	Scene invoke / program	Start/Program	1 Byte 18.001	CW

Scenes can be called up or programmed via this object. Up to 16 scenes are available in the Dali Gateway. To program a set scene, the top bit must be set:

	Start	Program
Scene 1	0	128
Scene 2	1	129
.....		
Scene 16	15	143

35.. 50	Scene x, Dimming	Brighter/Darker	4 Bit 3.007	CW
Scene 1 .. 16 can be dimmed relatively via this object. Dimming is set with bit 4, dimming with bit 4 deleted. Bits 1..3 indicate the respective step sizes. Bit 1..3 deleted is interpreted as a stop telegram. **Note:** The min / max values of the respective groups that were defined with the ETS are also taken into account when dimming the scenes.				
51	Effects start / stop	Start/Stop	1 Byte	CW
Effects can be started or stopped via this object. Up to 16 effects are available in the Dali Gateway. The top bit must be set to start an effect. Stopping takes place when bit 7 is deleted. Effect Off Effect On Effect 1 0 128 Effect 2 1 129 ..... Effect 16 15 143				

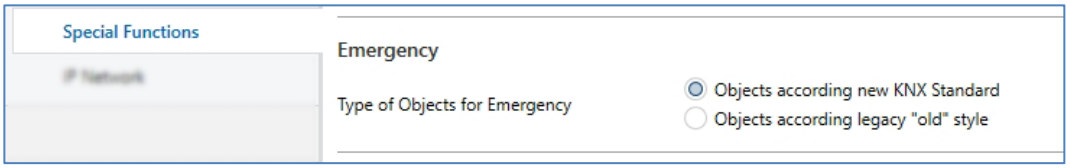
Objects for energy saving

Each group as well as each ECG can be de-energized via a separate actuator. Up to 16 energy-saving objects are provided in the parameters for this purpose.

52.. 67	Energy Saving Object 1.. 16	On / Off	1 Bit 1.001	CRT
With the appropriate assignment in the parameters, this object is switched off when associated groups or ECGs are switched off. This allows a separate power supply to be switched off. If the associated groups or ECGs are controlled again with a value > 0%, this object is switched on again before. In this case, a minimum time delay is programmed so that the ECGs are ready for operation again, see 21.1.4 Page parameter – special functions.				

Objects for emergency

Two types of communication objects are offered on the device. The selection is defined via parameters:



The objects are explained with the respective ECGs.

20.1.4 Time control objects

A communication object for enabling and disabling templates is available for each of the up to 16 templates in the colour control module. See chapter 16.1.3 Disable/enable. These need to be enabled under time control in the DCA.

Object	Object name	Function	Type	Flags
68	Template 1, Activation	Activate/ Stop	1 Bit 1.010	CW
Template 1 is activated via this object. The template is active when the value is 1 and will be executed according to schedule.				

83	Template x, Activation	Activate / Stop	1 Bit 1.010	CW
Template X is activated via this object. The template is active when the value is 1 and will be executed according to schedule.				

20.2 Broadcast objects

Object	Object name	Function	Type	Flags
3	Broadcast, Switching	On / Off	1 Bit 1.001	CW
All connected lights can be switched on or off together using this object. If connected ECGs are in a special state (test mode, panic mode), they are not switched. In this case, switching takes place through sequential addressing on the DALI bus and a delay between the first and last luminaire may be visible. If there is no special state, switching takes place simultaneously using DALI broadcast telegrams. The broadcast switching function always switches to 0 or 100%. The parameters "switch-on and switch-off value" for groups and electronic ballasts are not taken into account. **Note:** This object is only visible if you have selected 21.1.4 Page parameter – special functions "Enable broadcast" in the parameters.				
4	Broadcast, Set Value	Value	1 Byte 5.001	CW
All connected lights can be set to one value using this object. If connected ECGs are in a special condition (test mode, panic mode), they are not changed. In this case, switching takes place by sequential addressing on the DALI bus and a delay between the first and last light may be visible. If there is no special state, the values are set at the same time by DALI broadcast telegrams. **Note:** This object is only visible if "Enable broadcast" was selected in the parameters 21.1.4 Page parameter – special functions Broadcast can also be released for colour control. In this case, up to 4 further objects no. 3-7 are shown, see Parameter page: -> Special functions. The description of the different colour control objects is explained in detail in chapter 4 Colour control.				

20.2.1 Broadcast objects – colour control

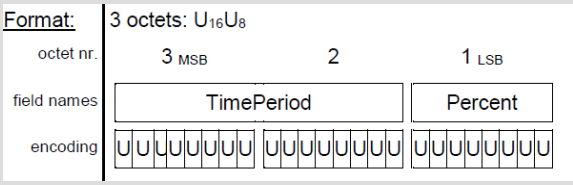
Object	Object name	Function	Type	Flags
5	Broadcast, (RGB) Red	Value	1 Byte 5.001	CW
The broadcast colour control can be set via this object. The values for (RGB) red are transferred here.				
5a	Broadcast, (RGB)	Value	3 Byte 232.600	CW
Send the colour (RGB) via this object.				
5b	Broadcast, (HSV) Hue	Value	1 Byte 5.001	CW
Send the (HSV) Hue value via this object.				
5c	Broadcast, (RGBW)	Value	6 Byte 251.600	CW
The set colour (RGBW) is sent as a value via this object.				

5d	Broadcast, Set Colour X	Value	2 Bytes 7.600	CW
Send the (X/Y Colour) X value via this object.				
6	Broadcast, (RGB) Green	Value	1 Byte 5.001	CW
The broadcast colour control can be set via this object. The values for (RGB) green are transferred here.				
6a	Broadcast, (HSV) Saturation	Value	1 Byte 5.001	CW
Send the saturation via an HSV value via this object.				
6b	Broadcast, Set Colour Y	Value	2 Bytes 7.600	CW
Send the (X/Y Colour) Y value via this object.				
7	Broadcast, (RGB) Blue	Value	1 Byte 5.001	CW
The broadcast colour control can be set via this object. The values for (RGB) blue are transferred here.				
8	Broadcast, White	Value	1 Byte 5.001	CW
The broadcast control can be set via this object. The values for red, white are transferred here.				
9	Broadcast, Colour Temperatur	Value	2 Bytes 7.600	CW
Send the colour temperature value via this object.				

20.3 Group objects

A set of communication objects is available for each one of the up to 16 possible groups.
The following objects are available (Example group 1):

20.3.1 Group objects – behaviour

Object	Object name	Function	Type	Flags
85	G1, Switching	On/ Off	1 Bit 1.001	CW
Use this object to switch group 1 on or off.				
86	G1, Dimming	Brighter/Darker	4 Bit 3.007	CW
Used for the relative dimming of group 1. Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
87	G1, Value setting	Value	1 Byte 5.001	CW
Über dieses Object kann Gruppe 1 auf den entsprechenden Value gesetzt werden.				
88	G1, Value setting	Value/Time	3 Bytes 225.001	CW
Attention: Object 50 is shown for the following parameter: G1 --> Behaviour --> Additional value setting object with dim time. Use this object to set group 1 to the required value and dim time.  The time is defined in multiples of 100 ms. Because of DALI properties, a value range of 1s to 200 s is accepted. Vaues outside this value range are restricted accordingly. A dim time of 10s is coded as follows: 10 s = 10 x 10 x 100 ms				
89	G1, Enable	Yes/No	1 Bit 1.003	CW
Attention: Object 51 is shown for the following parameter: G1 --> General --> Function of the additional object This object enables the operation of group 1: Object = 0 → Disabled Object = 1 → Enabled				
89a	G1, Disabled	Yes / no	1 Bit 1.003	CW
This object disables the operation of group 1: Object = 0 → Enabled Object = 1 → Disabled				
90	G1, Status	On/Off	1 Bit 1.001	CRT
Sends the switch status of the group. Any value > 0 % is interpreted as ON.				
91	G1, Status	Value	1 Byte 5.001	CRT
Sends the value status of the group.				

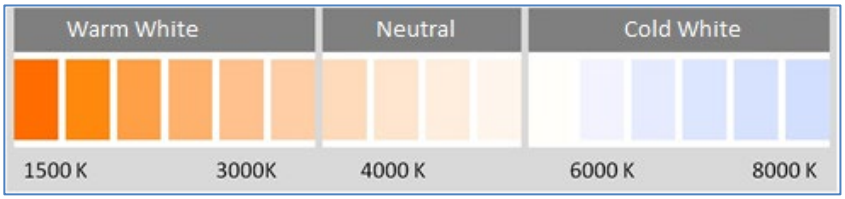
20.3.2 Group objects – colour control

Different colour control options are supported:

- Colour temperature RGB
- HSV
- RGBW
- XY
- Colour temperature + RGB
- Colour temperature + RGBW

Only one type of colour control can be selected per group. All ECGs in the group that support this type, can be controlled. Other ECG types will not react to the command. Please make sure to only include ECGs with the same colour control in a group. Depending on type of colour control chosen, different objects are displayed:

Colour temperature
The colour temperature can be set in Kelvin. Colour temperatures below 3000 K are called "warm white", above 5000 K "cool white" and between 3000 and 5000 "neutral white".



Object	Object name	Function	Type	Flags
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
102	G1, Colour Control Fading	Warmer/Cooler	4 Bit 3.007	CW
The colour in the group can be changed using this object. Increase the angle with bit 3 set, decrease the angle with bit 3 deleted. Bit 0..3 deleted is interpreted as a stop telegram. This means that the entire circumference of the circle can be circulated and every colour can be set.				

108	G1, Colour Temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status.				
113	G1, Colour Temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

RGB

The RGB colour space is called additive colour space as the colour perception is created by mixing the three primary colours.

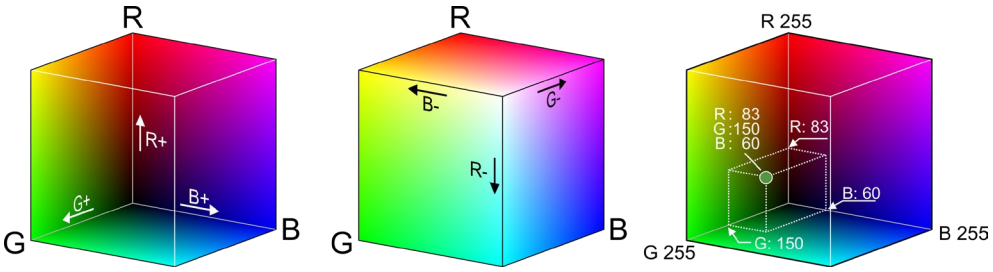


Figure: RGB cubes (source: Wikipedia)

RGB (DPT 232.600)

Object	Object name	Function	Type	Flags
95	G1, Colour RGB	Value	3 Byte 232.600	CW

Sets the colour in the group as RGB.

Format:	3 octets: $U_8U_8U_8$
octet nr.	3 MSB 2 1 LSB
field names	R G B
encoding	UUUUUUUU UUUUUUUU UUUUUUUU
Encoding:	All values binary encoded.
Range::	R, G, B: 0 to 255
Unit:	None
Resol.:	1
PDT:	PDT_GENERIC_03

Datapoint Types

ID:	Name:	Range:	Resol.:	Use:
232.600	DPT_Colour_RGB	R: 0 to 255 G: 0 to 255 B: 0 to 255	R: 1 G: 1 B: 1	G

107	G1, Colour RGB	Status	3 Byte 232.600	CRT
Use this object to send the set colour of the group as status.				

RGB (separate objects)

Object	Object name	Function	Type	Flags
99	G1, Colour (RGB) Red	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for red (R) are transmitted.				
100	G1, Colour (RGB) Green	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for green (G) are transmitted.				
62	G1, Colour (RGB) Blue	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for blue (B) are transmitted.				
103	G1, (RGB) Fading Red	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the colour (R) in the group. Bit 4 is set to increase the red component and deleted to decrease the red component. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
104	G1, (RGB) Fading Green	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the colour (G) in the group. Description as for colour change RGB (R).				
105	G1, (RGB) Fading Blue	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the colour (B) in the group. Description as for colour change RGB (R).				
109	G1, Colour (RGB) Red	Status	1 Byte 5.001	CRT
Sends the selected colour (R) as group status.				
110	G1, Colour (RGB) Green	Status	1 Byte 5.001	CRT
Sends the selected colour (G) as group status.				
111	G1, Colour (RGB) Blue	Status	1 Byte 5.001	CRT
Sends the selected colour (B) as group status.				

HSV

The colour is set as an HSV value. This consists of hue, saturation, and value. The value (V) is set via the value object number 60/61. Further objects are displayed for hue (H) and saturation (S). The hue is entered as a value between 0° and 360° and rotates around the colour circle making it easy to reach all colours of the circle.

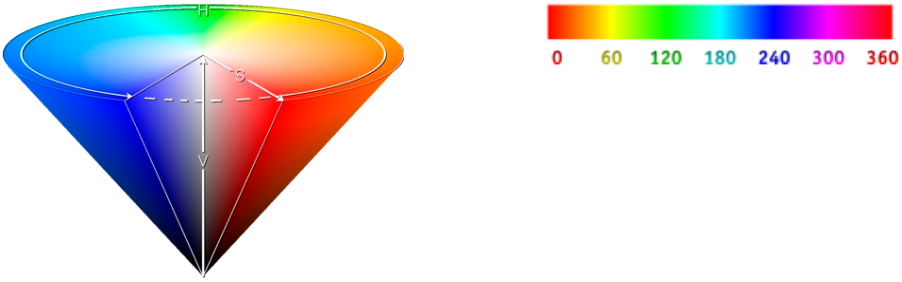
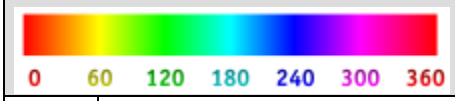


Figure: HSV colour value (Source: Wikipedia)

Values for saturation and intensity (darkness value) are set between 0 and 100%.100% mean complete saturation and full intensity.

HSV (separate objects)

Object	Object name	Function	Type	Flags
98	G1, Colour (HSV) Hue	Value	1 Byte 5.003	CW
Sets the colour via an HSV value. A value between 0° and 360° can be transmitted. Please remember that the used data type 5.003 only allows for a resolution of about 1.4°. 				
99	G1, Colour (HSV) Saturation	Value	1 Byte 5.001	CW
Use this object to set the saturation. A value between 0° and 100% can be transmitted.				
103	G1, Colour (HSV) Fading Hue	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the hue of a group. Bit 3 is set to increase the angle and deleted to decrease the angle. Bit 1 to 3 deleted is interpreted as a stop telegram. As the whole colour circle is accessible, any colour can be set.				
104	G1, Colour (HSV) Fading Saturation	Brighter/Darker	4 Bit 3.007	CW
See change of hue above. The value between 0 and 100% is increased incrementally.				
109	G1, Colour (HSV) Hue	Status	1 Byte 5.003	CRT
Sends the configured hue as group status.				
110	G1, Colour (HSV) Saturation	Status	1 Byte 5.001	CRT
Sends the configured saturation as group status.				

RGBW

RGBW (6 byte object DPT 251.600)

Object	Object name	Function	Type	Flags
95	G1, Colour RGBW	Value	6 Byte 251.600	CW

Use this object to set the colour in the group as RGBW. Enter the colour values for white, blue, green and red between 0 and 100% in the upper Bytes. 4 Bits in the 1st Byte determine whether the corresponding colour values are valid.

Datapoint Type

DPT_Name:	DPT_Colour_RGBW		
DPT Format:	$U_8U_8U_8U_8r_8r_4B_4$	DPT_ID:	251.600

Field	Description	Supp.	Range	Unit	Default
R	Colour Level Red	M	0 % to 100 %	-	-
G	Colour Level Green	M	0 % to 100 %	-	-
B	Colour Level Blue	M	0 % to 100 %	-	-
W	Colour Level White	M	0 % to 100 %	-	-
m_R	Shall specify whether the colour information red in the field R is valid or not.	M	{0,1}	None.	None.
m_G	Shall specify whether the colour information green in the field G is valid or not.	M	{0,1}	None.	None.
m_B	Shall specify whether the colour information blue in the field B is valid or not.	M	{0,1}	None.	None.
m_W	Shall specify whether the colour information white in the field W is valid or not.	M	{0,1}	None.	None.

Object	Object name	Function	Type	Flags
107	G1, Colour RGBW	Status	6 Byte 251.600	CRT

Sends the set colour of the group as status.

RGBW (separate objects)

Object	Object name	Function	Type	Flags
98	G1, Colour (RGB) Red	Value	1 Byte 5.001	CW

Sets the colour in the group. The values for red (R) are transmitted.

Object	Object name	Function	Type	Flags
99	G1, Colour (RGB) Green	Value	1 Byte 5.001	CW

Sets the colour in the group. The values for green (G) are transmitted.

Object	Object name	Function	Type	Flags
100	G1, Colour (RGB) Blue	Value	1 Byte 5.001	CW

Sets the colour in the group. The values for blue (B) are transmitted.

Object	Object name	Function	Type	Flags
101	G1, Colour White	Value	1 Byte 5.001	CW

Sets the colour in the group. The values for white (W) are transmitted.

Object	Object name	Function	Type	Flags
103	G1, (RGB) Fading Red	Brighter/Darker	4 Bit 3.007	CW

Use this object to change the colour (R) in the group. Bit 4 is set to increase the red component and deleted to decrease the red component. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.

Object	Object name	Function	Type	Flags
104	G1, (RGB) Fading Green	Brighter/Darker	4 Bit 3.007	CW

Use this object to change the colour (G) in the group. Description as for colour change (red).				
105	G1, (RGB) Fading Blue	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the colour (B) in the group. Description as for colour change (red).				
106	G1, Fading White	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the colour green in the group. Description as for colour change (red).				
109	G1, Colour (RGB) Red	Status	1 Byte 5.001	CRT
Sends the set colour red as group status.				
110	G1, Colour (RGB) Green	Status	1 Byte 5.001	CRT
Sends the set colour green as group status.				
111	G1, Colour (RGB) Blue	Status	1 Byte 5.001	CRT
Sends the set colour blue as group status.				
112	G1, Colour White	Status	1 Byte 5.001	CRT
Sends the set colour white as group status.				

HSVW (separate objects)
See chapter 19.3.2 Group objects – Colour control, HSV (separate objects).

XY colour
The colour is determined through an XY value between 0 and 1:

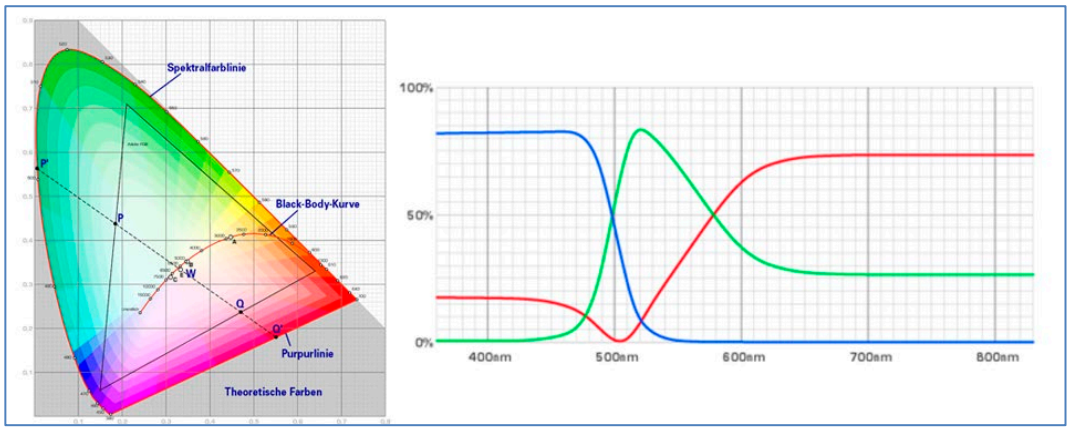


Figure: XY colour value (Source: Wikipedia)

In the KNX bus, this value range is converted to a range 0..65535 (2-byte integer). The value 65535 therefore corresponds to value 1 in the graphic.

XY (combined objects)

Object	Object name	Function	Type	Flags
95	G1, Colour XY	Value	6 Byte 242.600	CW

Use this object to set the colour via XY coordinates in the group. The brightness level is entered in the 2nd Byte via a value between 0 and 100% followed by the Y and X coordinates between 0 and 65535. 2 Bit in the lower byte determine whether brightness and XY values are valid.

Datapoint Types

ID:	Name:	Use:
242.600	DPT_Colour_xyY	FB

Data fields	Description	Range	Unit	Resol.
x-axis	x-coordinate of the colour information	0 to 65 535	None.	None.
y-axis	y-coordinate of the colour information	0 to 65 535	None.	None.
Additional encoding information				
The x – and y – ordinate of the xyY colour scheme have a value between 0 and 1. This value shall be linearly mapped onto the range from 0 to 65 535, by multiplying the unencoded coordinate value by 65 535 and and rounding to the earest integer value. For decoding, the inverse operation shall be done.				
Brightness	Brightness of the colour	0 % to 100 %	%	None.
Additional encoding information				
The brightness shall be encoded as in DPT_Scaling (5.001).				
C	This field shall indicate whether the colour information in the fields x-axis and y-axis is valid or not.	0: invalid 1: valid	None.	None.
B	This field shall indicate whether the Brightness information in the field Brightness is valid or not.	0: invalid 1: valid	None.	None.

107	G1, Colour XY	Status	6 Byte 242.600	CRT

This object is used to send the set XY coordinates as status of the group.

XY (separate objects)

Obj	Object name	Function	Type	Flags
95	G1, Colour X	Value	2 Byte 7.001	CW

Use this object to set the X value between 0 and 65535.

98	G1, Colour Y	Value	2 Byte 7.001	CW

Use this object to set the Y value between 0 and 65535.

107	G1, Colour X	Status	2 Byte 7.001	CRT

Use this object to set the X value between 0 and 65535.

109	G1, Colour Y	Status	2 Byte 7.001	CRT

Use this object to set the Y value between 0 and 65535.

Colour temperature + RGB

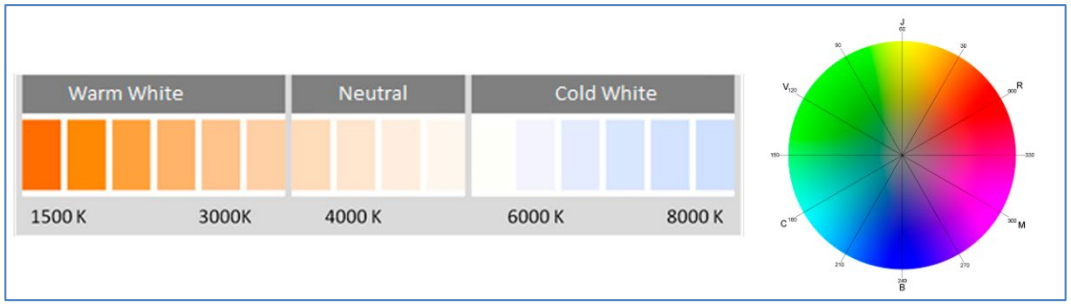


Figure: Colour temperature + RGB (Source: Wikipedia)

Colour temperature + RGB (3 byte combined objects DPT 232.600)

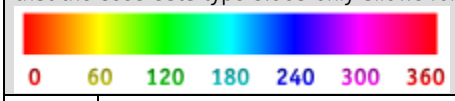
Object	Object name	Function	Type	Flags
95	G1, Colour RGB	Value	3 Byte 232.600	CW
The colour can be set as RGB in the group via this object. The colour values for white, blue, green and red are given in the lower bytes in the value range of 0 ... 100%. In the 5th byte, 4 bits indicate whether the corresponding colour values are valid.				
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
102	G1, Colour Control Fading	Warmer / Colder	4 Bit 3.007	CW
Changes the colour temperature in the group. Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
107	G1, Colour RGB	Status	3 Byte 232.600	CRT
Sends the set RGB colour as group status.				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status.				
113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

Colour temperature + RGB (RGB separate objects)

Object	Object name	Function	Type	Flags
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
98	G1, Colour (RGB Red)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for red (R) are transmitted.				
99	G1, Colour (RGB Green)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for green (G) are transmitted.				
100	G1, Colour (RGB Blue)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for blue (B) are transmitted.				
102	G1, Colour Control Fading	Value	1 Byte 5.001	CW
Changes the colour temperature in the group. Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
103	G1, Colour (RGB) Fading Red	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour red in the group. Bit 4 is set to increase the red component and deleted to decrease the red component. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
104	G1, Colour (RGB) Fading Green	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour green in the group. Description as for colour change (red).				
105	G1, Colour (RGB) Fading Blue	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour blue in the group. Description as for colour change (red).				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status.				
109	G1, Colour (RGB Red)	Status	1 Byte 5.001	CRT
Sends the set colour red as group status.				
110	G1, Colour (RGB Green)	Status	1 Byte 5.001	CRT
Sends the set colour green as group status.				
111	G1, Colour (RGB Blue)	Status	1 Byte 5.001	CRT

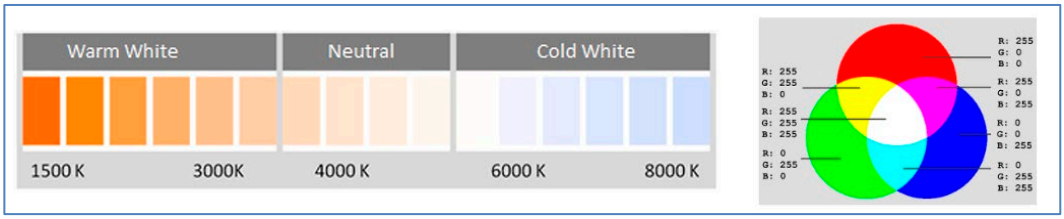
Sends the set colour blue as group status.				
113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

Colour temperature + RGB (HSV separate objects)

Object	Object name	Function	Type	Flags
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
98	G1, Colour (HSV) Hue	Value	1 Byte 5.003	CW
Sets the colour via an HSV value. A value between 0° and 360° can be transmitted. Please remember that the used data type 5.003 only allows for a resolution of about 1.4°. 				
99	G1, Colour (HSV) Saturation	Value	1 Byte 5.001	CW
Use this object to set the saturation. A value between 0° and 100% can be transmitted.				
102	G1, Colour Control Fading	Warmer/ Cooler	4 Bit 3.007	CW
The colour in the group can be changed using this object. Increase the angle with bit 3 set, decrease the angle with bit 3 deleted. Bit 0..3 deleted is interpreted as a stop telegram. This means that the entire circumference of the circle can be circulated, and every colour can be set.				
103	G1, Colour Control Fading Hue	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the hue of a group. Bit 3 is set to increase the angle and deleted to decrease the angle. Bit 1 to 3 deleted is interpreted as a stop telegram. As the whole colour circle is accessible, any colour can be set.				
104	G1, Colour Control Fading Saturation	Brighter/ Darker	4 Bit 3.007	CW
See change of hue above. The value between 0 and 100% is increased incrementally				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status				
109	G1, Colour (HSV) Hue	Status	1 Byte 5.003	CRT
Sends the configured hue as group status.				
110	G1, Colour (HSV) Saturation	Status	1 Byte 5.003	CRT
Sends the configured saturation as group status.				

113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

Colour temperature + RGB



Colour temperature + RGBW (6 byte combined objects DPT 251.600)

Object	Object name	Function	Type	Flags
95	G1, Colour RGBW	Value	6 Byte 251.600	CW
The colour can be set as RGB in the group via this object. The colour values for white, blue, green and red are given in the lower bytes in the value range of 0 ... 100%. In the 5th byte, 4 bits indicate whether the corresponding colour values are valid.				
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
102	G1, Colour Control Fading	Warmer/ Colder	4 Bit 3.007	CW
Changes the colour temperature in the group. Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
107	G1, Colour RGBW	Status	6 Byte 251.600	CRT
Sends the set RGB colour as group status.				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status.				
113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

Colour temperature + RGBW (RGBW separated objects)

Object	Object name	Function	Type	Flags
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
98	G1, Colour (RGB Red)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for red (R) are transmitted.				
99	G1, Colour (RGB Green)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for green (G) are transmitted.				
100	G1, Colour (RGB Blue)	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for blue (B) are transmitted.				
101	G1, Colour White	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for white (W) are transmitted.				
102	G1, Colour Control Fading	Warmer/ Colder	4 Bit 3.007	CW
Changes the colour temperature in the group. Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
103	G1, Colour (RGB) Fading Red	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour red in the group. Bit 4 is set to increase the red component and deleted to decrease the red component. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
104	G1, Colour (RGB) Fading Green	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour green in the group. Description as for colour change (red).				
105	G1, Colour (RGB) Fading Blue	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the colour blue in the group. Description as for colour change (red).				
106	G1, Colour Fading White	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change white in the group. Description as for colour change (red).				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status.				
109	G1, Colour (RGB Red)	Status	1 Byte 5.001	CRT

Sends the set colour red as group status.				
110	G1, Colour (RGB Green)	Status	1 Byte 5.001	CRT
Sends the set colour green as group status.				
111	G1, Colour (RGB Blue)	Status	1 Byte 5.001	CRT
Sends the set colour blue as group status.				
112	G1, Colour White	Status	1 Byte 5.001	CRT
Sends the set white as group status.				
113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

Colour temperature + RGBW (HSVW separated objects)

Object	Object name	Function	Type	Flags
96	G1, Colour temperature	Value	2 Byte 7.600	CW
Sets the colour temperature in the group.				
97	G1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the colour temperature in the group relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
98	G1, Colour (HSV) Hue	Value	1 Byte 5.003	CW
Sets the colour via an HSV value. A value between 0° and 360° can be transmitted. Please remember that the used data type 5.003 only allows for a resolution of about 1.4°. 				
99	G1, Colour (HSV) Saturation	Value	1 Byte 5.001	CW
Use this object to set the saturation. A value between 0° and 100% can be transmitted.				
101	G1, Colour White	Value	1 Byte 5.001	CW
Sets the colour in the group. The values for white (W) are transmitted.				
102	G1, Colour Control Fading	Warmer/ Cooler	4 Bit 3.007	CW
The colour in the group can be changed using this object. Increase the angle with bit 3 set, decrease the angle with bit 3 deleted. Bit 0..3 deleted is interpreted as a stop telegram. This means that the entire circumference of the circle can be circulated and every colour can be set.				
103	G1, Colour Control Fading Hue	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change the hue of a group. Bit 3 is set to increase the angle and deleted to decrease the angle. Bit 1 to 3 deleted is interpreted as a stop telegram. As the whole colour circle is accessible, any colour can be set.				

104	G1, Colour Control Fading Saturation	Brighter/ Darker	4 Bit 3.007	CW
See change of hue above. The value between 0 and 100% is increased incrementally				
106	G1, Colour Fading White	Brighter/ Darker	4 Bit 3.007	CW
Use this object to change white in the group. Description as for colour change (red).				
108	G1, Colour temperature	Status	2 Byte 7.600	CRT
Sends the set colour temperature as group status				
109	G1, Colour (HSV) Hue	Status	1 Byte 5.003	CRT
Sends the configured hue as group status.				
110	G1, Colour (HSV) Saturation	Status	1 Byte 5.003	CRT
Sends the configured saturation as group status.				
112	G1, Colour White	Status	1 Byte 5.003	CRT
Sends the set white as group status.				
113	G1, Colour temperature relative	Status	1 Byte 5.001	CRT
Sends the set relative colour temperature as group status.				

20.3.3 Group objects – analysis and service

Object	Object name	Function	Type	Flags
92	G1, Failure Status	Yes/No	1 Bit 1.001	CRT
Attention: Object 92 is shown for the following parameter: G1 → Analysis and service → "Type of failure status object". This object is used to send the failure status for lamp, ECG and converter failures within the group.				
94	G1, Failure Exceeds Theshold	Yes/No	1 Bit	CRT
This object is used to report that the total of all lamp failures recognised in the DALI segment exceeds the set threshold.				
94a	G1, Failure Theshold in Total	Value	1 Byte 5.010	CRT
This object is used to report the failure rate in total of the total number of lamps in the DALI segment.				
94b	G1, Failure Theshold in %	Value	1 Byte 5.001	CRT
Alternatively, this object is used to report the failure rate as a percentage of the total number of lamps in the DALI segment.				
114	G1, Operating Hours Reset	Yes/No	1 Bit 1.015	CW
Resets the operating hours in a group via value "1". **Note:** Object 76-78 is shown for the following parameter: G1 → Analysis and service → "Operation Hour Calculation" = Yes.				

115	G1, Operating Hours (Seconds)	Value	4 Byte 13.100	CW
Counts the operating hours in the group. The value is transmitted in seconds according to DPT 13.100.				
115a	G1, Operating Hours (Hours)	Value	4 Byte 12.102	CW
Counts the operating hours in the group. The value is transmitted in hours according to DPT 12.102.				
116	G1, Life Time Exceeded	Yes/No	1 Bit 1.005	CW
Shows whether the maximum life span set in the parameters has been exceeded. **Note:** If the threshold value is exceeded, an alarm is sent via this object (by sending the value "*1*"). An alarm is re-sent for every operating hour that is above the threshold value.				
117	G1, Active Power	Value	4 Byte 14.056	CRT
This object provides the total active power of all ECGs of device type 51 according to DALI part 252 which are assigned in this group.				
117a	G1, Active Energy	Value	4 Byte 13.010	CRT
This object provides the total active energy of all ECGs of device type 51 according to DALI part 252 which are assigned in this group.				

20.4 Single ECG objects

20.4.1 Single ECG objects – behaviour

A communication object is available for each of the up to 64 connected ECGs and corresponding lamps to display the failure status. (Example ECG 1):

Object	Object name	Function	Type	Flags
629	ECG1, Switching	On/Off	1 Bit 1.001	CW
Use this object to switch an ECG on or off if it is not in special mode (test mode, emergency lights, panic/ emergency mode).				
630	ECG1, Dimming	Brighter/ Darker	4 Bit 3.007	CW
This object is used for the relative dimming of an ECG that is not in special mode (test mode, emergency lights, panic/ emergency mode). Bit 4 is set to dim up and deleted to dim down. Bits 1 to 3 refer to the increment size. Bit 1 to 3 deleted is interpreted as a stop telegram.				
631	ECG 1, Set Value	Value	1 Byte 5.001	CW
Sets the value of ECG1 unless it is in special mode (test mode, emergency lights, panic/ emergency mode).				
632	ECG1, Enable	Yes/No	1 Bit 1.003	CW
Note: Object 562 is shown for the following parameter: ECG 1 → General → Function of the additional object. Use this object to enable the operation of ECG 1: Object = 0 → Operation disabled Object = 1 → Enable operation				
632a	ECG1, Disable	Yes/No	1 Bit 1.003	CW
Use this object to disable the operation of ECG 1: Object = 0 → Enable operation Object = 1 → Operation disabled				

633	ECG1, Status	On/Off	1 Bit 1.001	CRT
Sends the ECG switch status. Each value >0% is interpreted as ON.				
634	ECG 1, Status	Value	1 Byte 5.001	CRT
Sends the ECG value status.				

20.4.2 Single ECG objects – colour control

Objekt	Objektname	Funktion	Typ	Flags
636	ECG 1, Colour temperature	Value	2 Bytes 7.600	CW
Sets the ECG 1 colour temperature.				
636a	EVG 1, Colour RGB	Value	3 Bytes 232.600	CW

Sets the ECG1 colour in as RGB.

Format:	3 octets: $U_8U_8U_8$
octet nr.	3 MSB 2 1 LSB
field names	R G B
encoding	UUUUUUUU UUUUUUUU UUUUUUUU
Encoding:	All values binary encoded.
Range::	R, G, B: 0 to 255
Unit:	None
Resol.:	1
PDT:	PDT_GENERIC_03

Datapoint Types

ID:	Name:	Range:	Resol.:	Use:
232.600	DPT_Colour_RGB	R: 0 to 255 G: 0 to 255 B: 0 to 255	R: 1 G: 1 B: 1	G

636b	ECG 1, Colour RGBW	Value	6 Bytes 251.600	CW

Use this object to set the ECG1 colour as RGBW. Enter the colour values for white, blue, green and red between 0 and 100% in the upper Bytes. 4 Bits in the 1st Byte determine whether the corresponding colour values are valid.

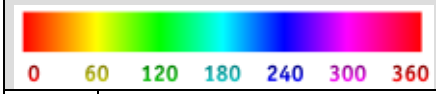
Datapoint Type					
DPT_Name:	DPT_Colour_RGBW				
DPT Format:	$U_8U_8U_8U_8r_4B_4$		DPT_ID:	251.600	
Field	Description	Supp.	Range	Unit	Default
R	Colour Level Red	M	0 % to 100 %	-	-
G	Colour Level Green	M	0 % to 100 %	-	-
B	Colour Level Blue	M	0 % to 100 %	-	-
W	Colour Level White	M	0 % to 100 %	-	-
m_R	Shall specify whether the colour information red in the field R is valid or not.	M	{0,1}	None.	None.
m_G	Shall specify whether the colour information green in the field G is valid or not.	M	{0,1}	None.	None.
m_B	Shall specify whether the colour information blue in the field B is valid or not.	M	{0,1}	None.	None.
m_W	Shall specify whether the colour information white in the field W is valid or not.	M	{0,1}	None.	None.

636c	ECG 1, Colour XY	Value	6 Bytes 242.600	CW

Use this object to set the colour via XY coordinates in the group. The brightness level is entered in the 2nd Byte via a value between 0 and 100% followed by the Y and X coordinates between 0 and 65535. 2 Bit in the lower byte determine whether brightness and XY values are valid.

Datapoint Types		
ID:	Name:	Use:
242.600	DPT_Colour_xyY	FB

Data fields	Description	Range	Unit	Resol.
x-axis	x-coordinate of the colour information	0 to 65 535	None.	None.
y-axis	y-coordinate of the colour information	0 to 65 535	None.	None.
Additional encoding information The x – and y – ordinate of the xyY colour scheme have a value between 0 and 1. This value shall be linearly mapped onto the range from 0 to 65 535, by multiplying the unencoded coordinate value by 65 535 and and rounding to the earest integer value. For decoding, the inverse operation shall be done.				
Brightness	Brightness of the colour	0 % to 100 %	%	None.
Additional encoding information The brightness shall be encoded as in DPT_Scaling (5.001).				
C	This field shall indicate whether the colour information in the fields x-axis and y-axis is valid or not.	0: invalid 1: valid	None.	None.
B	This field shall indicate whether the Brightness information in the field Brightness is valid or not.	0: invalid 1: valid	None.	None.

636d	ECG 1, Colour (HSV) Hue	Value	1 Byte 5.001	CW
Sets the ECG1 colour via an HSV value. A value between 0° and 360° can be transmitted. Please remember that the used data type 5.003 only allows for a resolution of about 1.4°.  				
637	ECG 1, Colour temperature relative	Value	1 Byte 5.001	CW
Sets the ECG 1 colour temperature relatively between 0 and 100%. The value range 0 to 100% is automatically converted to the possible colour temperature range.				
637a	EVG 1, Colour (HSV) Saturation	Value	1 Byte 5.001	CW
Use this object to set the saturation. A value between 0° and 100% can be transmitted.				
638	ECG 1, Colour White	Value	1 Byte 5.001	CW
Sets the ECG1 colour. The values for white (W) are transmitted.				
639	ECG 1, Colour Control Fading	Warmer/Cooler	4 Bit 3.007	CW
The ECG1 colour can be changed using this object. Increase the angle with bit 4 set, decrease the angle with bit 4 deleted. Bit 1..3 deleted is interpreted as a stop telegram. This means that the entire circumference of the circle can be circulated, and every colour can be set.				
639a	ECG 1, Colour (HSV) Fading Hue	Brighter/Darker	4 Bit 3.007	CW
Use this object to change the hue of the ECG1. Bit 4 is set to increase the angle and deleted to decrease the angle. Bit 1 to 3 deleted is interpreted as a stop telegram. As the whole colour circle is accessible, any colour can be set.				
640	ECG 1, Colour (HSV) Fading Saturation	Brighter/Darker	4 Bit 3.007	CW
See change of hue above. The value between 0 and 100% is increased incrementally.				
641	EVG 1, Colour Fading White	Brighter/Darker	4 Bit 3.007	CW
Use this object to change ECG1 colour white.				
642	ECG 1, Colour temperature	Status	2 Bytes 7.600	CRT
This object sends the set colour temperature as ECG1 status.				
642a	EVG 1, Colour RGB	Status	3 Bytes 232.600	CRT
This object sends the set RGB colour as ECG1 status.				
642b	EVG 1, Colour RGBW	Status	6 Bytes 251.600	CRT
This object sends the set RGBW colour as ECG1 status.				
642c	EVG 1, Colour XY	Status	6 Bytes 242.600	CRT
This object sends the set XY colour as ECG1 status.				

642d	EVG 1, Colour (HSV) Hue	Status	1 Byte 5.001	CRT
This object sends the set (HSV) hue colour as ECG1 status.				
643	ECG 1, Colour temperature relative	Status	1 Byte 5.001	CRT
Über dieses Objekt wird die relative Farbtemperatur als Status der EVGs gesendet.				
643a	EVG 1, Colour (HSV) Saturation	Status	1 Byte 5.001	CRT
This object sends the set (HSV) saturation colour as ECG1 status.				
644	ECG 1, Colour White	Status	1 Byte 5.001	CRT
This object sends the set white (W) colour as ECG1 status.				

20.4.3 Single ECG – Emergency setting

Objects according to the new KNX standard

Object	Object name	Function	Type	Flags
645	Converter 1, Test start	Start	1 Byte 20.611	CW

Use this object to start a long duration test, function test and battery status query of the converter. The individual Bits have the following meaning:

20.611 DPT_Converter_Test_-Control

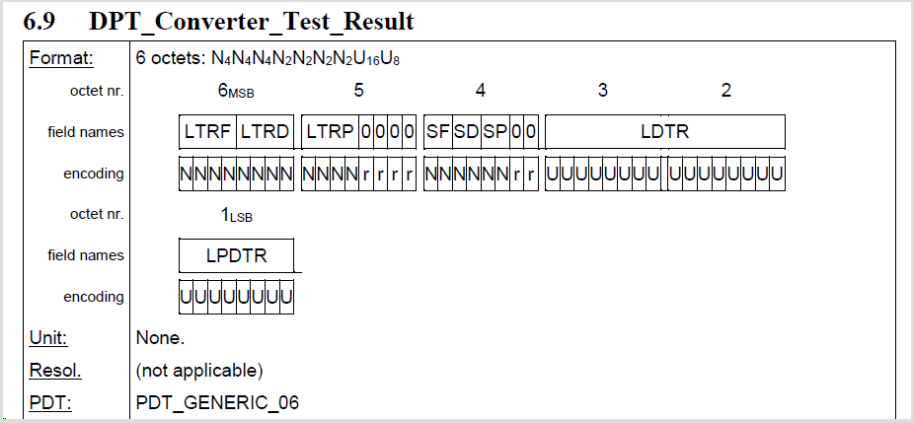
Encoding
0 : Reserved, no effect
1 : Start Function Test (FT) Acc. DALI Cmd. 227
2 : Start Duration Test (DT) Acc. DALI Cmd. 228
3 : Start Partial Duration Test (PDT) not supported
4 : Stop Test Acc. DALI Cmd 229
5 to 255 : Reserved, no effect

Note: Concurrent tests to the same DALI converter will be supported. This DPT controls a test of a DALI converter. It allows also to stop a running test.

Attention: The gateway does not support "Partial Duration Test" and therefore this command is not active!

646	Converter 1, Test result	Test	6 Byte 245.600	CRT

This object reports the converter status according to Konnex data point type 245.600.



Data field	Description	Encoding	Range
LTRF	Last Test Result FT: Test result of last function test	0: Unknown 1: Passed in time 2: Passed max delay exceeded 3: Failed, test executed in time 4: Failed, max delay exceeded 5: Test manually stopped 6 to 15: Reserved, do not use	{0...15}
LTRD	Last Test Result DT: Test result of last duration test	0: Unknown 1: Passed in time 2: Passed max delay exceeded 3: Failed, test executed in time 4: Failed, max delay exceeded 5: Test manually stopped 6 to 15: Reserved, do not use	{0...15}
LTRP	Last Test Result PDT: Test result of last partial duration test	Attention: The gateway does not support "Partial Duration Test" and therefore this area is not used and stays 0!	
SF	Start Method of Last FT	0: Unknown 1: Started automatically 2: Started by Gateway 3: Reserved Updated after a test has been finished.	{0...3}
SD	Start Method of Last DT	Start Method of Last DT 0: Unknown 1: Started automatically 2: Started by Gateway 3: Reserved Updated after a test has been finished.	{0...3}
SP	Start Method of Last PDT	Attention: The gateway does not support "Partial Duration Test" and therefore this area is not used and stays 0!	

LDTR LPDTR	Contains the battery discharge time as the result of the last successful duration test (DT). According to DALI Cmd. 243 Last PDT Result Provides the remaining Battery Charge Level after the last PDT	DPT 7.006 DPT_TimePeriodMin The max. value of 510 min shall be interpreted as 510 min or longer. Attention: The gateway does not support "Partial Duration Test" and therefore this area is not used and stays 0!	{0...510}

647	Converter 1, Status	Status	2 Byte 244.600	CRT

This object reports the converter status according to Konnex data point type 244.600.

6.8 DPT_Converter_Status

Format:	2 octets: $N_4B_4N_2N_2N_2N_2$
octet nr.	2_{MSB} 1_{LSB}
field names	CM HS FP DP PP CF
encoding	NNNNBBBB NNNNNNNN
Unit:	None.
Resol.	(not applicable)
PDT:	PDT_GENERIC_02

Datapoint Types

ID:	Name:	Usage:
244.600	DPT_Converter_Status	FB

Data field	Description	Encoding	Range
CM	Converter Mode according to the DALI converter state machine	0: Unknown 1: Normal mode active, all OK 2: Inhibit mode active 3: Hardwired inhibit mode active 4: Rest mode active 5: Emergency mode active 6: Extended emergency mode active 7: FT in progress 8: DT in progress 9 to 15: Reserved. Shall be 0.	{0...15}
HS	Hardware Status	Bit 0: Hardwired Inhibit is active Bit 1: Hardwired switch is on Bit 2 and 3: Reserved. Shall be 0.	{0,1}
FP	Function Test Pending	0: Unknown 1: No test pending 2: Test pending 3: Reserved NOTE 26 The information about a running test is given in the Converter Mode field. NOTE 27 The status "Unknown" may for instance occur at power-up.	{0...3}

DP	Duration Test Pending	Duration Test Pending 0: Unknown 1: No test pending 2: Test pending 3: Reserved NOTE 28 The information about a running test is given in the Converter Mode field. NOTE 29 The status "Unknown" may for instance occur at power-up.	{0...3}
PP	Partial Duration Test Pending	Attention: The gateway does not support "Partial Duration Test" and therefore this area is not used and stays 0!	
CF	Converter Failure	Indicates that one or more failures were detected. Further information about the Type of failure can be found in CTR. 0: Unknown 1: No failure detected 2: Failure detected 3: Reserved	{0...3}

648	Converter 1, Battery info	Status	2 Byte 7.001	CRT

This object reports the battery status according to Konnex data point type 246.600.

6.10 DPT_Battery_Info

Format:	2 octets: $r_4B_4U_8$
octet nr.	2_{MSB} 1_{LSB}
field names	0 0 0 0 BS | BCL
encoding	r r r r B B B B | N N N N N N N N
Unit:	None.
Resol.	(not applicable)
PDT:	PDT_GENERIC_02

Datapoint Types		
ID:	Name:	Usage:
246.600	DPT_Battery_Info	FB

Field names	Description	Encoding	Range
BS	Battery Status	Bit 0: Battery Failure Acc. DALI Cmd. 252 Bit 1: Battery Duration Failure Acc. DALI Cmd. 252 Bit 2: Battery Fully Charged Bit 3 to 7: Reserved, must be 0	{0, 1}
BCL	Battery Charge Level Indicates the recent charge level	0: deep discharge point ... 254: fully charged 255: unknown or not supported According to DALI Cmd. 241	{0...255}

Objects according to earlier versions

Object	Object name	Function	Type	Flags
645	Converter 1, Test start	Start	1 Byte	CW

This object is used to start a long duration test, function test and battery status query of the converter. The individual Bits have the following meaning:

Bit 0 → Start function test
Bit 1 → Function test pending
Bit 2 → Start duration test
Bit 3 → Duration test pending
Bit 4 → Query battery status
Bit 5 → Battery status query pending
Bit 6 → Function test running
Bit 7 → Duration test running

Object	Object name	Function	Type	Flags
646	Converter 1, Test result	Test	3 Byte	CRT

This object is used to analyse the results of function and duration tests and the battery status. The individual bits have the following meaning:

Bit 23..16 → If test is function or battery test: Battery status 0..100 %
→ If test is duration test: Test time of duration test in steps of 2 minutes
Bit 15 → Failure during duration test
Bit 14 → Failure during function test
Bit 13 → Maximum time for duration test exceeded
Bit 12 → Maximum time for function test exceeded
Bit 11 → Emergency lamp faulty
Bit 10 → Battery faulty
Bit 9 → Battery operating hours too short
Bit 8 → Converter faulty
Bit 7 → Duration test pending
Bit 6 → Function test pending
Bit 5 → Duration test running
Bit 4 → Function test running
Bit 3 → Test failure during the last test
Bit 2 → Last test was battery query
Bit 1 → Last test was duration test
Bit 0 → Last test was function test

20.4.4 Single ECG objects – analysis and service

635a	ECG 1, Failure Status	Status	1 Bit 1.005	CRT
Sends the failure status of lamp, ECG and converter failures.				
635b	ECG 1, Failure Status	Status	1 Byte 5.010	CRT
Sends the failure status of lamp, ECG and converter failures. Bit 0 → Lamp error Bit 1 → ECG error Bit 2 → Converter error				
649	ECG 1, Operating Hours Reset	Yes/No	1 Bit 1.015	CW
Resets the operating hours counter. **Note:** Object 579-581 is shown for the following parameter: ECG1 --> Analysis and service --> "Operation Hour Calculation" = Yes.				
650	ECG 1, Operating Hours (Seconds)	Value	4 Bytes 13.100	CRT
The operating hours of a lamp in Seconds are sent via this object. The internal counter can be set to 0 (Reset) or another value via this object. Please remember: The "Write" flag is switched off in the presetting.				
650a	ECG 1, Operating Hours (Hours)	Value	4 Bytes 12.102	CRT
The operating hours of a lamp in Hours are sent via this object. The internal counter can be set to 0 (Reset) or another value via this object. Please remember: The "Write" flag is switched off in the presetting.				
651	ECG 1, Life Time Exceeded	Yes/No	1 Bit 1.002	CRT
This object is used to send a status message when the configured lifetime of a lamp is exceeded.				
652	ECG 1, Active Power	Value	4 Byte 14.056	CRT
This object provides the active power of device type 51 according to DALI part 252.				
652a	ECG 1, Active Energy	Value	4 Byte 13.010	CRT
This object provides the active energy of device type 51 according to DALI part 252.				

20.5 Motion detector/brightness sensor objects

A set of communication objects is available for each of the up to 8 possible motion detectors. The following objects are available (example BM 1):

2165	MB1, Movement Switching	On/Off	1 Bit 1.001	CRT
The output is switched when motion is detected.				
2165a	MB1, Movement Set Value	Value	1 Byte 5.001	CRT
A certain value can be sent when motion is detected				
2165b	MB1, Movement Set Scene	Activate	1 Byte 17.001	CRT
When motion is detected, an assigned scene is started.				
2167	MB1, Movement Off	On/Off	1 Bit 1.001	CW
Input: The presence can be switched off directly via this object and the detector is reset.				
2168	MB1, Time without movement > Vacant	Time(s)	2 Byte 7.005	CRW
Input: Time without movement to be set using this object. Attention: Input values less than 10 seconds will be limited to 10 seconds. Minimal value is 10 seconds.				
2169	MB1, External Motion (Presence)	Yes/No	1 Bit 1.001	CW
Input: This object can be used to hold the "presence state" by some other external information. As long as this input in on, the motion stays on "presence mode".				
2171	MB1, Brightness	Brightness	2 Byte 9.004	CRT
Sends the value of the detected brightness as an object to the bus.				
2172	MB1, Brightness is below the Threshold	Yes/No	1 Bit 1.005	CRT
Sends an object to the bus when the value falls below the threshold.				
2173	MB1, Failure Status	Status	1 Bit 1.005	CRT
Sends the failure status as an object on the bus.				
2174	MB1, Semi-Auto Mode	Start	1 Bit 1.010	CW
Start the regulation in Semi-Auto Mode				
2175a	MB1, Control Output	ON/Off	1 Bit 1.001	CRT
Output: The Value sent when Brightness is below Setpoint (Threshold)				
2175b	MB1, Control Output	Value	1 Byte 5.001	CRT
Output: The Value sent when Brightness is not equal Setpoint				

2176	MB1, Disable Automatic	ON/Off	1 Bit 1.001	CW
Input: Using this object the Light Control or Movement Detection can be activated/enabled or deactivated/disbaled. By default and restart of the device the Light Control is activated.				
2177	MB1, Automatic Status	Inactive/Activ e	1 Bit 1.011	CRT
Output: This object indicates the Status of the Light Control.				
2178	MB1, Brightness Setpoint	Value	2 Bytet 9.004	CRW
Input: The setpoint of brightness can be adjusted here.				
2179	MB1, Brightness Setpoint dimming	Up/Down	4 bit 3.007	CW
Input: The setpoint of brightness can be changed via dimming.				

20.6 Generic DALI input objects

A set of communication objects is available for each of the up to 8 possible generic inputs. The following objects are available (example GI 1):

2301	GI1, Temperature	Value	2 Byte 9.001	CRT
The output transmits the current temperature.				
2301a	GI1, Humidity	Value	2 Byte 9.007	CRT
The output transmits the current humidity.				
2301b	GI1, Air Quality	CO2	2 Byte 9.008	CRT
The output transmits the current CO2 Value.				
2301c	GI1, Air Quality	VOC	2 Byte 9.008	CRT
The output transmits the current VOC Value.				
2301d	GI1, Scalingc	Value	1 Byte 5.001	CRT
The output transmits the current scaling value.				
2301e	GI1, Sound [db]c	Value	1 Byte 5.010	CRT
The output transmits the current db value.				
2301f	GI1, Generic 1 Byte unsigned	Value	1 Byte 5.00x	CRT
The output transmits the current generic value.				
2301g	GI1, Generic 2 Byte float	Value	2 Byte 9.00x	CRT
The output transmits the current generic value.				

2302	GI1, xxxx is above Threshold	Yes/No	1 Bt 1.005	CRT
The output is sent in alarm status.				
2303	GI1, xxxx is below Threshold	Yes/No	1 Bt 1.005	CRT
The output is sent in alarm status.				
2302a	GI1, xxxx Alarm 1	Yes/No	1 Bt 1.005	CRT
The output is sent in alarm status.				
2302b	GI1, xxxx Alarm 2	Yes/No	1 Bt 1.005	CRT
The output is sent in alarm status.				

20.7 Push button objects

A set of communication objects is available for each of the up to 8 possible push buttons. Each push button can have up to 4 button pairs. The following objects are available (example PB 1, Pair 1):

The push button pair works as a connected pair.

2325	PB1, Pair1, Switching	On/Off	1 Bit 1.001	CT
The output transmits the switching command.				
2326	PB1, Pair1, Dimming	Up/Down	4 Bit 3.007	CT
The output transmits the dimming command.				
2325a	PB1, Pair1, Shutter	Step	1 Bit 1.009	CT
The output transmits the step (open/close) command for slats				
2326a	PB1, Pair1, Shutter	Up/Down	1 Bit 1.008	CT
The output transmits the shutter command for moving Up/Down.				
2325b	PB1, Pair1, Value	Value	1 Byte 5.001	CWTU
The output transmits the fix value defined by parameter				
2325c	PB1, Pair1, Value	Value	1 Byte 5.001	CWTU
The output transmits the variable value defined by parameter				
2325d	PB1, Pair1, Presence	On/Off	1 Bit 1.018	CT
The output transmits the presence				

The push button pair works with single buttons.

2325	PB1, Pair1, Switching Left Button	Toggle On Off	1 Bit 1.001	CWTU CT
The output transmits the switching command.				
2326	PB1, Pair1, Switching Right Button	Toggle On Off	1 Bit 1.001	CWTU CT
The output transmits the switching command.				
2325a	PB1, Pair1, Switching Left Button	Value	1 Byte 5.001	CT
The output transmits the value.				
2326b	PB1, Pair1, Switching Right Button	Value	1 Byte 5.001	CT
The output transmits the value.				
2325a	PB1, Pair1, Scene Left Button	Invoke Invoke / Program	1 Byte 17.001 18.001	CT
The output transmits the scene command.				
2326b	PB1, Pair1, Scene Right Button	Invoke Invoke / Program	1 Byte 17.001 18.001	CT
The output transmits the scene command.				

20.8 Generic KNX input objects

Communication objects are available for up to 16 generic KNX information. The following objects are available (example KNXI 1):

2389	KNXI1	Boolean	1 Bit 1.001	CWU
The Input is read according selected datapoint type. boolean [1] 1.xxx scaling [5.1] DPT_Scaling unsigned [5.10] DPT_Value_1_Ucount unsigned [5.4] DPT_Percent_U8 signed [6.10] DPT_Value_1_Count signed [6.1] DPT_Percent_V8 float [9] 9.xxx float [9.1] DPT_Value_Temp float [9.6] DPT_Value_Pres float [9.24] DPT_Power float [9.22] DPT_PowerDensity float [9.5] DPT_Value_Wsp float [9.4] DPT_Value_Lux float [9.7] DPT_Value_Humidity float [9.10] DPT_Value_Time1 float [9.21] DPT_Value_Curr float [9.20] DPT_Value_Volt float [9.8] DPT_Value_AirQuality float [9.9] DPT_Value_AirFlow				

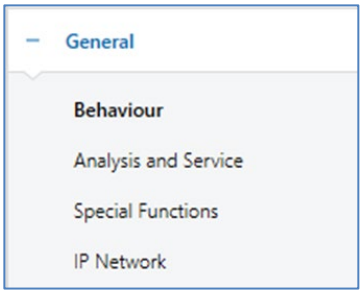
float	[9.27] DPT_Value_Temp_F
unsigned	[7.1] DPT_Value_2_Ucount
unsigned	[7.13] DPT_Brightness
signed	[8.1] DPT_Value_2_Count
float	[14] 14.xxx
float	[14.68] DPT_Value_Common_Temperature
float	[14.58] DPT_Value_Pressure
float	[14.56] DPT_Value_Power
float	[14.31] DPT_Value_Energy
float	[14.33] DPT_Value_Frequency
float	[14.10] DPT_Value_Area
unsigned	[12.1] DPT_Value_4_Ucount
signed	[13.1] DPT_Value_4_Count
signed	[13.10] DPT_ActiveEnergy
signed	[13.13] DPT_ActiveEnergy_kWh
signed	[13.2] DPT_FlowRate_m3/h

21 ETS parameters

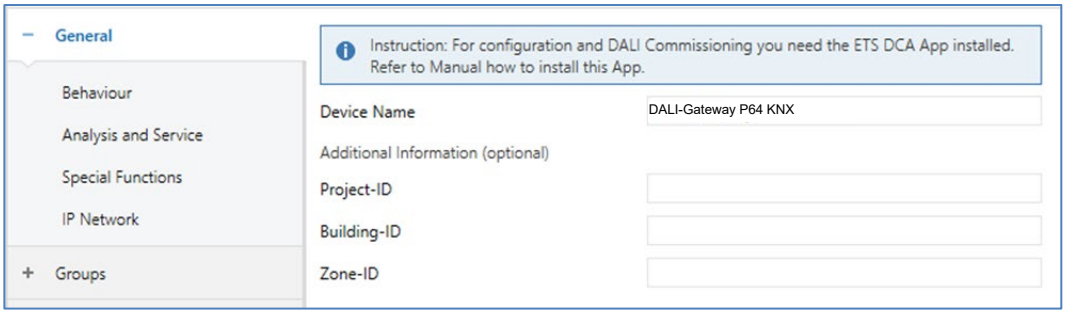
The ETS parameters of the device are distributed across different parameter pages. To simplify the overview, only the parameter pages of the device selected in the function tree are displayed.

21.1 General

Five parameter pages are available under the heading "General". The parameters are described below.

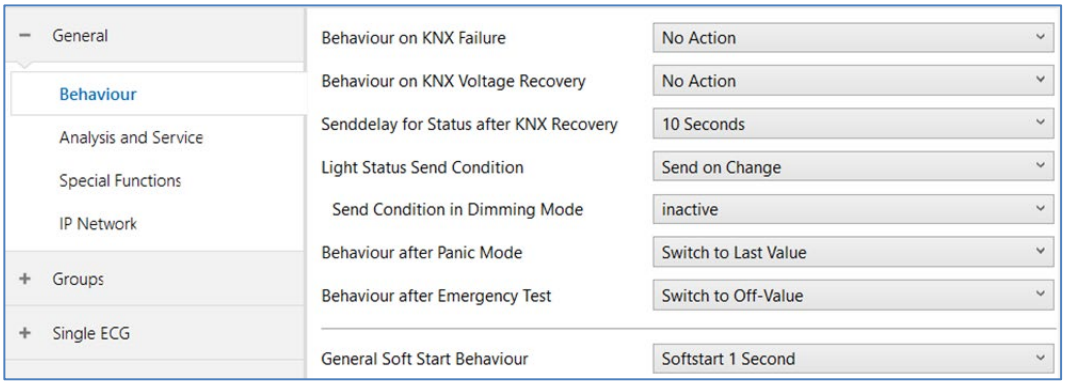


21.1.1 Page parameter – general



Parameter	Settings
Device Name	DALI-Gateway P64 KNX
You can assign your own device name here. DALI-Gateway P64 KNX is preset.	
Additional information about: Project-ID, circuid-ID, distributation board-ID	Project-ID Circuit-ID Distributionboard-ID
Space for additional installation instructions (optional)	

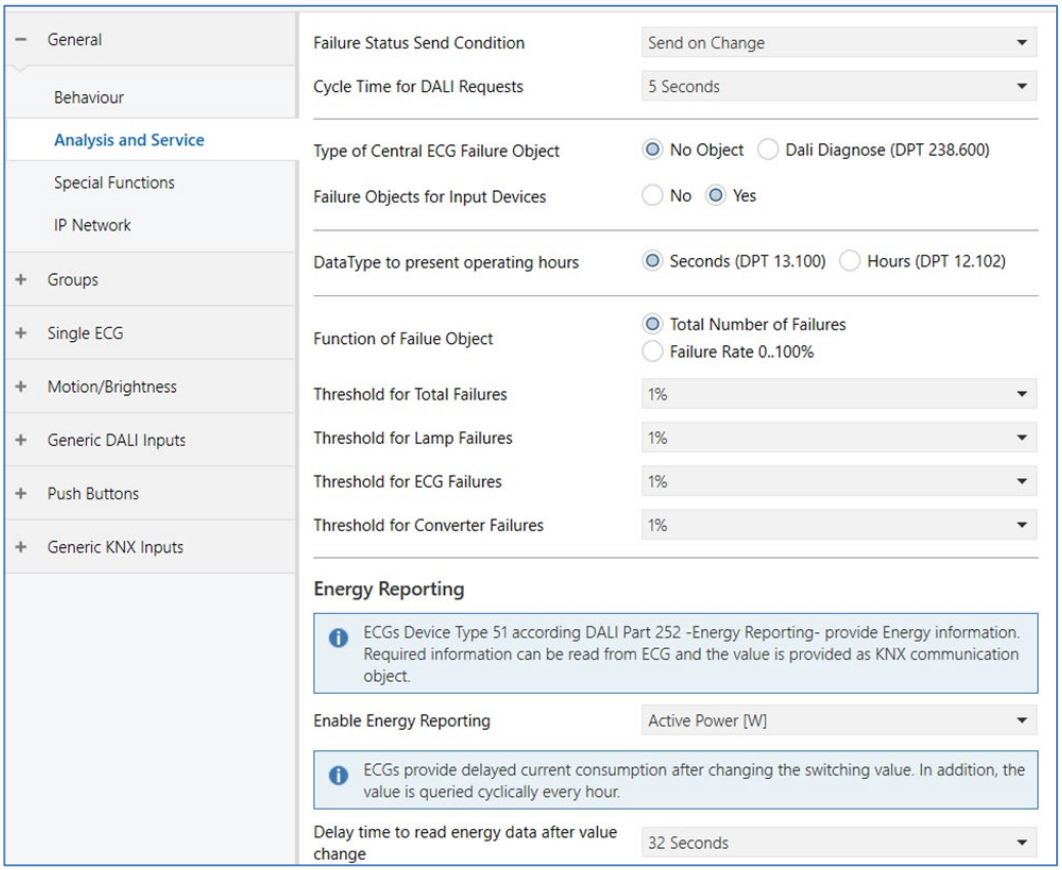
21.1.2 Page parameter – behaviour



Parameter	Settings
Behaviour on KNX Failure	**No Action** Switch to ON-Value Switch to OFF-Value Switch to Panic Value
Use this parameter to set the behaviour of the connected ECGs/lamps when a KNX failure occurs.	
Behaviour on KNX Voltage Recovery	**No Action** Switch to Last Value Switch to ON-Value Switch to OFF-Value
Use this parameter to set the behaviour of the connected ECGs/lamps on KNX voltage recovery or bus reset.	
Send delay for Status after KNX Recovery	immediately 5 Seconds **10 Seconds** 15 Seconds 20 Seconds 30 Seconds 40 Seconds 50 Seconds 60 Seconds
Sets a delay for sending status objects after KNX voltage recovery or a bus reset. In installations with more than one gateway, different settings for this parameter can prevent all devices from sending at the same time.	
Light Status Send Condition	Send on Request **Send on Change** Send on Change and after Bus reset
Determines the light status send conditions (switch status and value status) of the connected ECGs and groups.	
Send Condition in Dimming Mode	If Change > 2% If Change > 5% If Change > 10% If Change > 20% **inactive**
Use this parameter to set whether and when you would like a value status to be sent via a 4 bit dimming telegram during dimming (relative dimming). If you use the setting inactive, the value is only sent after the dimming process is complete.	
Behaviour after Panic Mode	Switch to OFF-Value Switch to ON-Value **Switch to Last Value**

Use this parameter to determine which light value ECGs / lamps are to adopt after the panic mode has finished. If you use "Switch to Last Value", the value prior to the panic mode is saved and the lamp returns to this value afterwards.	
Behaviour after Emergency Test	Switch to OFF-Value Switch to ON-Value **Switch to Last Value**
Use this parameter to determine which light value ECGs / lamps are to adopt after the emergency test has finished. If you use "Switch to OFF-Value", the value prior to the emergency test is saved and the lamp returns to this value afterwards.	
General Soft Start Behaviour	No Softstart **Softstart 1 Second** Softstart 1.5 Seconds Softstart 2 Seconds
This parameter defines the general fading time if an ECG is switched on/off.	

21.1.3 Page parameter – analysis and service

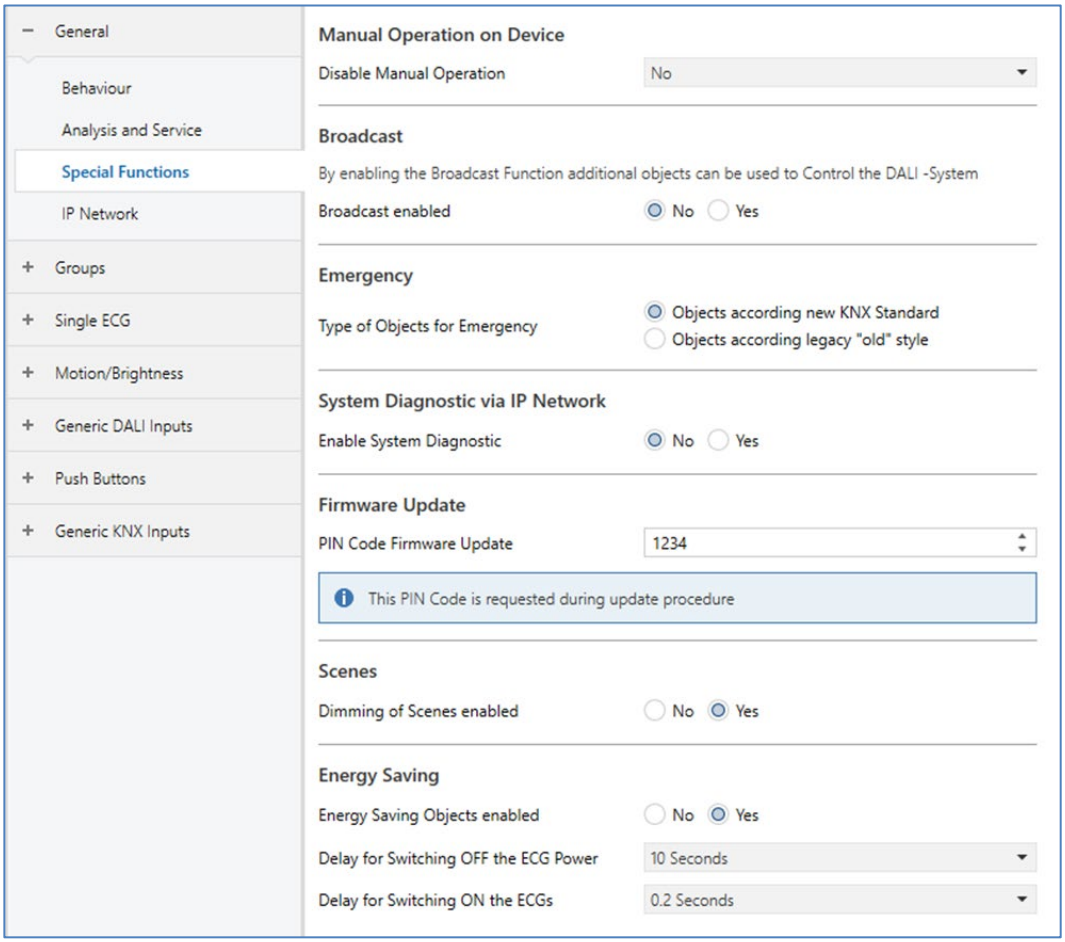


Parameter	Settings
Failure Status Send Condition	Send on Request **Send on Change** Send on Change and after Bus reset
Sets the conditions under which the failure status objects of the connected ECGs and groups are to be sent.	

Cycle Time for DALI Failure Request	no request 0.5 Seconds 1 Second 2 Seconds 3 Seconds 4 Seconds **5 Seconds** 6 Seconds 7 Seconds 8 Seconds 9 Seconds 10 Seconds
To analyse ECG and lamp failures, a periodic request has to be sent to the ECGs via DALI telegrams. Use this parameter to set the cycles for these periodic requests. **Attention:** If you set "no request" ECG and lamp failures can no longer be recognised. The evaluation of emergency luminaires is no longer possible! You should therefore use this setting only during service or in special cases.	
Type of Central ECG Failure Object	**No Object** Dali Diagnose (1 Byte)
Use this parameter to select whether you want to use the central failure object for ECG and lamp failures (object number 13).	
Function of Failure Object	**Total number of Failures** Failure rate 0..100%
Use this parameter to select whether you want to use the failure analysis objects (objects number 16, 18, 20 and 22) to report the total amount of failures or the failure rate in %.	
Threshold for Total Failures	**1%** 2% 3% 100%
Configures a threshold value for the general failure alarm object (object 16). The threshold value takes all failures (ECG, lamp and converter failures) into consideration independently of the failure type and relates them to the total number of connected ECGs and converters.	
Threshold for Lamp Failures	**1%** 2% 3% 100%
Configures a threshold value for the lamp failure alarm object (object 18). The threshold value considers all lamp failures in relation to the total number of connected lamps in the DALI segment.	
Threshold for ECG Failures	**1%** 2% 3% 100%
Configures a threshold value for the ECG failure alarm object (object 20). The threshold value considers all ECG failures in relation to the total number of connected ECGs in the DALI segment.	
Threshold for Converter Failures	**1%** 2% 3% 100%

Configures a threshold value for the converter failure alarm object (object 22). The threshold value considers all converter failures in relation to the total number of connected converters in the DALI segment.	
Enable Energy Reporting	**No** Active Power [W] Active Energy [Wh]
ECGs Device Type 51 according to DALI Part 252 -Energy Reporting- provide Energy information. Required information can be read from ECG and the value is provided as KNX communication object. This parameter defines the type of reporting.	
Delay time to read energy data	Only cyclically every hour 4 Second .. **32 Seconds** .. 60 Seconds
The energy information will be provided by ECG within a delay. This delay depends on how the ECG is calculating the energy and therefore this value can be defined according of the ECG type. **Attention:** Due to this background, the value of the power is always calculated with a time delay In addition, the value is queried cyclically every hour. For more details refer to 7.1 Energy reporting according DALI Part 252.	

21.1.4 Page parameter – special functions

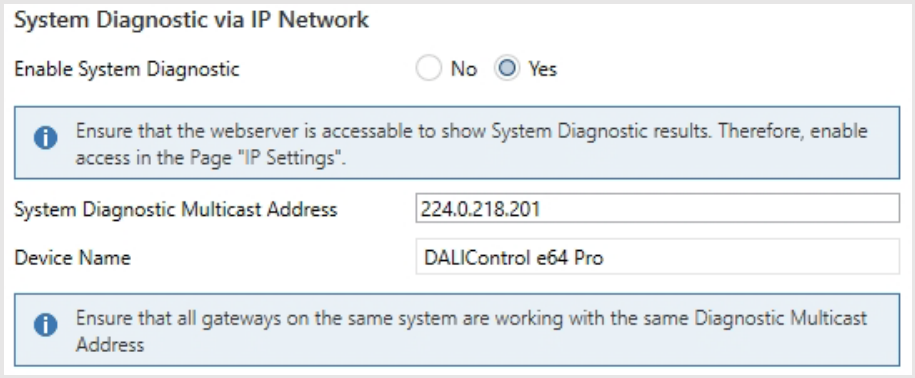


Parameter	Settings
Enable operation on the device	**No** Yes, all settings are disabled Yes, without installation
With this parameter, manual control can be enabled directly on the device.	
Broadcast enabled	**Yes** No
This parameter can be used to enable the broadcast function in addition to group control. The activation activates a new tab "Broadcast. See chapter 21.2 Broadcast.  **Note:** When activating the broadcast function, additional objects to control the DALI system can be used and further parameters appear.	

Type of Objects for Emergency	**Objects according new KNX Standard** Objects according legacy "old" style

Enable System Diagnostics	**No** Yes

Allows system diagnostics over the network. Has been in the security settings → IP Network / Security Settings the option "Communication on local network, only" is selected, the possibility of external diagnostic access is disabled.



System diagnostics Multicast address	**224.0.2.201**

All gateways belonging to the system must communicate via the same multicast address.

Device name	

The device name already defined under General Settings is displayed here. It can also be changed here. This name will be displayed later on the web page.

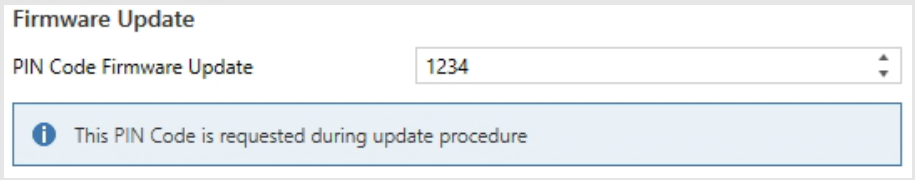
Send status at least all	No **30 minutes** 60 minutes 120 minutes

A further parameter can be used to define after which time the status is to be sent if no change has occurred during this time and thus no automated event is reported.

Delete inactive entries from the list after	6 hours 12 hours **1 day** 2 days 3 days 4 days

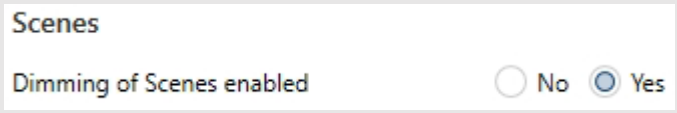
The inactive entries (non-active gateways) are deleted after this time.

PIN Code Firmware Update	1234

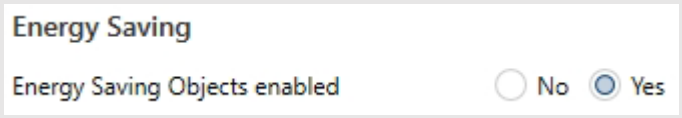


This number is requested during a firmware update, see 8.7.3 Update firmware.

Dimming of Scenes enabled	**No** Yes



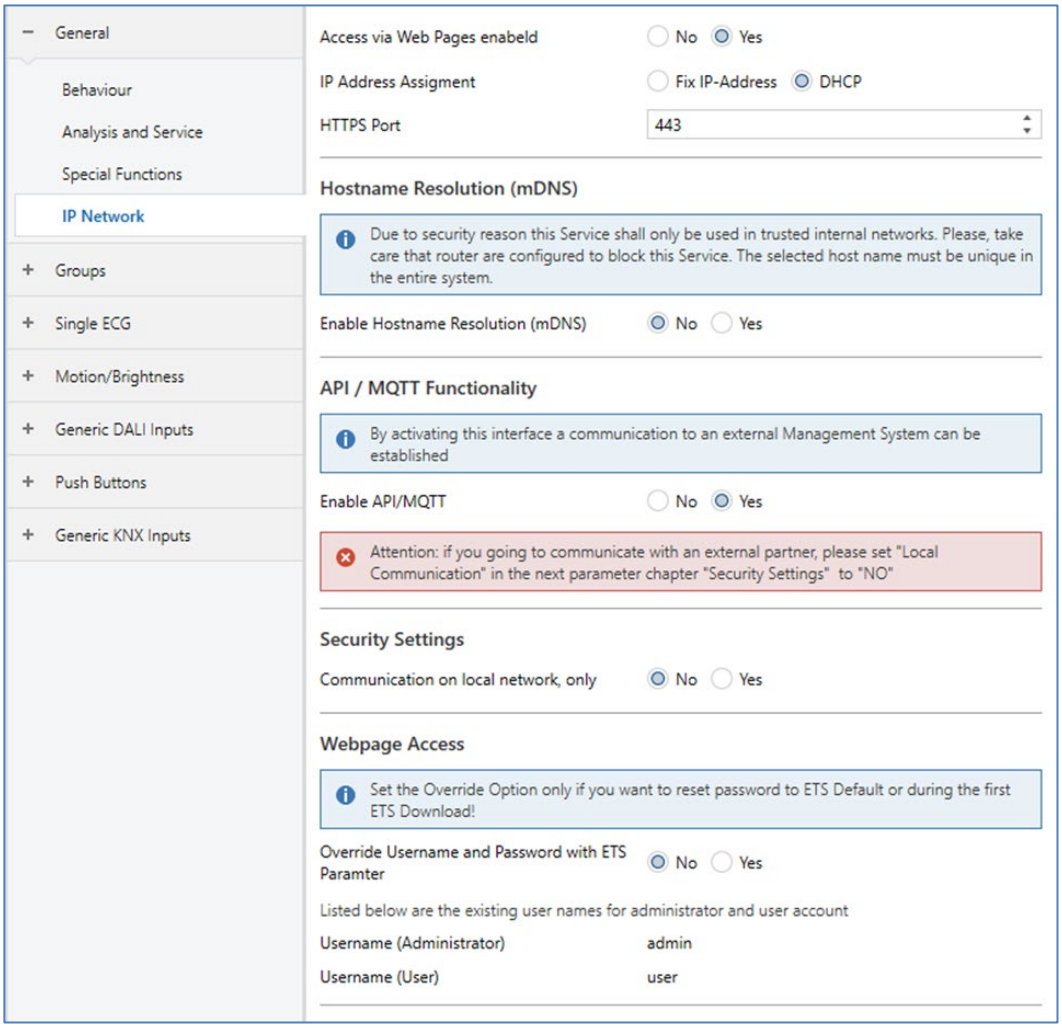
Energy Saving Objects enable	**No** Yes

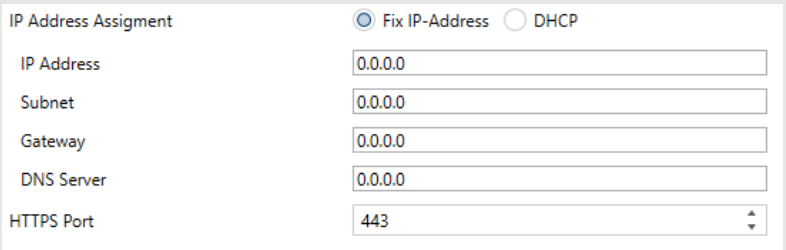


When this function is activated, an energy-saving object can be selected for both groups and ECGs to switch off the power supply when the lighting is switched off.

Delay for Switching OFF the ECG Power	**10 Seconds** 30 Seconds 1 Minute 2 Minutes 5 Minutes 10 Minutes
Delay before switching off the power.	
Delay for Switching ON the ECGs	0.1 Seconds **0.2 Seconds** 0.3 Seconds ... 1 Second 2 Seconds
Delay until the ECGs are switched on. During this time the actuator controlling the power supply must have switched safely.	

21.1.5 Page parameter – IP network



Parameter	Settings
Access via Web Pages enabled	**No** Yes
This can be used to deactivate the basic use of web operation for security reasons. **Attention:** An IP connection is required for the firmware update. If deactivated, no firmware update is possible!	
IP Address Assignment	Fix IP-Address **DHCP**
Determines whether the device is given a fixed IP address or a dynamic IP address via DHCP. When selecting the fixed IP address, the following additional parameters are shown. 	

HTTP Port	**443**
The device has a HTTPSI web server to visualize the status or to carry out commissioning. The port is set to the standard value 443.	
Name resolution (mDNS)	
Enable Host Name Resolution (mDNS)	**Nein** Ja
If enabled the device can be found by this hostname	
Host Name	
This parameter defines the Host Name.	

> Due to security reason this Service shall only be used in trusted internal networks. Please, take care that router are configured to block this Service. The selected host name must be unique in the entire system.

API / MQTT Functionality	
Enable API/MQTT	**No** Yes
Using this parameter, the API / MQTT Feature can be enabled. MQTT can be used to communicate with an external Broker to provide data to other management systems.	

> By activating this interface a communication to an external Management System can be established

Enable API/MQTT ○ No ◉ Yes

> Attention: if you going to communicate with an external partner, please set "Local Communication" in the next parameter chapter "Security Settings" to "NO"

In „red" colour you see an important hint in case you want to communicate with external partner.

Settings and instructions for using MQTT are explained in chapter 22 API/MGTT.

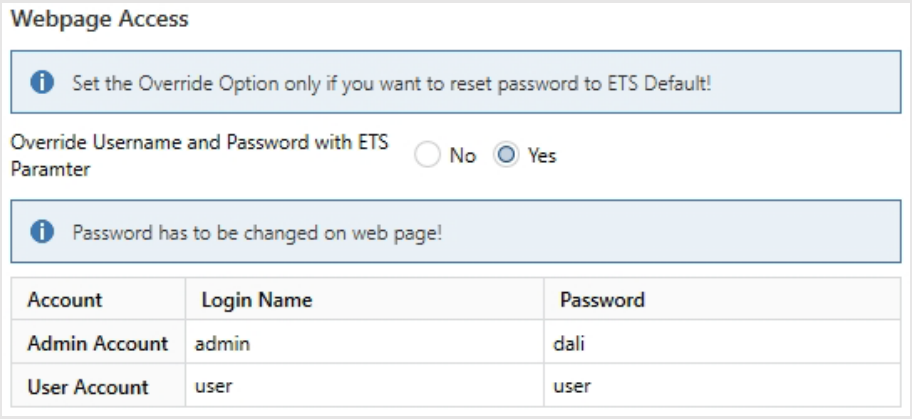
Security settings	
Communication on local network, only	**No** Yes
This parameter can be used to restrict the web server for operating and controlling the device via websites. By default, only requests from the local network are accepted.	

Communication on local network, only ○ No ◉ Yes

> The webserver accepts request from local networks, only

Website access	
Overwrite Username and Password with ETS Parameter.	No **Yes**

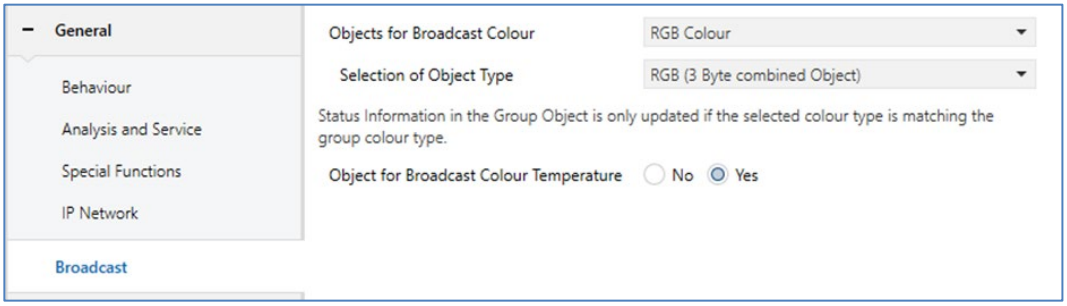
With this option the passwords can be reset. Refer to chapter 3 KNX Secure for detailed information.

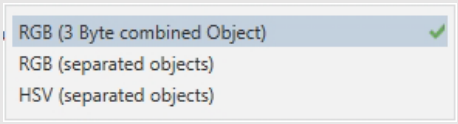
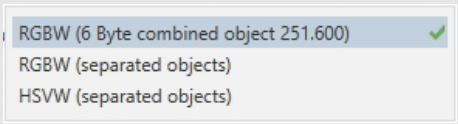


Admin Account	Entry (8 characters)
The standard operator is "admin". The default password "**dali**" must be changed on the website and has a maximum length of 8 characters. **Note:** An empty password is not allowed.	
User Account	Entry (8 characters)
The default operator is "**user**". The default password "**user**" must be changed on the website and has a maximum length of 8 characters. **Note:** An empty password is not allowed.	
Restriction of rights for the user account	User are allowed to control lights — No User are allowed to change scene configuration — No User are allowed to change effect configuration — No User are allowed to change schedule configuration — No User are allowed to view emergeny reports — No
Here the user rights can be released or restricted.	

21.2 Broadcast

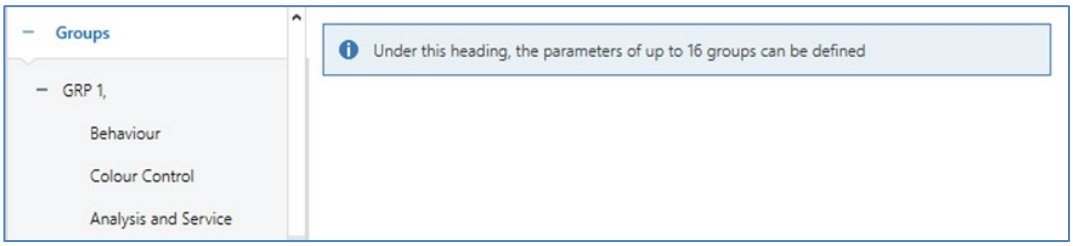
This tab is displayed if the "Broadcast enabled" option has been activated in → ETS parameters/general/special functions.



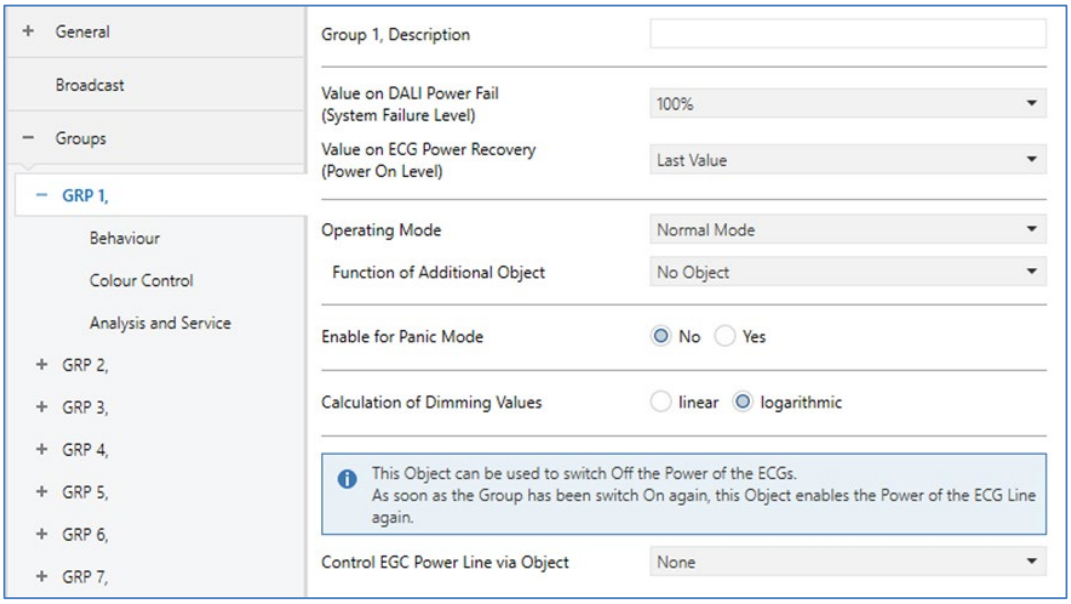
Objects for Broadcast Colour	**No** RGB Colour RGBW Colour XY Colour
This defines which communication objects are to be displayed for broadcast colour control.  When selecting RGB / RGBW or XY colour, an additional selection window is displayed.  Selection RGB Colour  Selection RGBW Colour  Selection XY Colour **Note:** The status information is only updated if the type of the colour control matches the type defined in the group.	
Object for Broadcast Colour Temperature	No **Yes**
Activate object for broadcast colour temperature.	

21.3 Group

There are 4 parameter pages for group settings. The parameters are described below:



21.3.1 General Group 1 (2..16)



Parameter	Settings
Group x, Description	e.g.: Room1 (window)

Use this parameter to define a group description. The description is shown for all communication objects. For example: Room1 (window).

G1, Switching, Room1 (window)	On/Off
G1, Dimming, Room1 (window)	Brighter/Darker
G1, Set Value, Room1 (window)	Value
G1, Status, Room1 (window)	On/Off
G1, Status, Room1 (window)	Value
G1, Failure Status, Room1 (window)	Yes/No

Value on DALI Power Fail (System Failure Level)	0..100% **[100]** Last value
Use this parameter to set the value of a lamp after a loss of DALI power. The value is saved on the ECG and the device automatically changes to the value when a power loss occurs.	
Value on ECG Power Recovery (Power On Level)	0..100% [100] **Last value**
Use this parameter to set the value of a lamp after a return of ECG power supply. The value is saved on the ECG and the device automatically changes to the value when power is restored.	
Operating Mode	**Normal Mode** Permanent Mode Normal/Night Mode Staircase Mode
Use this parameter to set the operating mode of a group.	
Value in permanent mode (if permanent mode is selected)	0..100% **[50]**
Use this parameter to set the value of all lamps in a group in 'permanent mode'. Lamps in this mode cannot be switched or changed. They remain at the set value.	
Behaviour in Normal / Night mode (if is selected)	**Delayed Switch-Off automatically** Delayed Switch-Off in 2 steps automatically Delayed Dim-Off automatically Activate Permanent Mode and Ignore Telegrams
This parameter can be used to set how the corresponding group behaves if night mode has been activated via the night object (No. 12). The parameter is only shown if the group is set to "Night Mode". Special settings: • **Delayed Switch-Off in 2 steps automatically:** - 1 minute before the configured time the value is set to 50% of the actual value. - After the configured time the switch-off value is set. • **Delayed Dim-Off automatically:** - 1 minute before the configured time, the current value is dimmed to the switch-off value. • **Activate Permanent Mode and Ignore Telegrams:**	
Automatic Switch OFF after	1 Minute 2 Minutes 3 Minutes 4 Minutes **5 Minutes** 10 Minutes 15 Minutes ... 90 Minutes
Use this parameter to set the time after which a group in normal/night mode automatically switches off. This parameter is only visible if you select "night mode".	
Behavior in Staircase Mode (if is selected)	**Delayed Switch-Off automatically** Delayed Switch-Off in 2 steps automatically Delayed Dim-Off automatically

This parameter can be used to set how the corresponding group behaves in staircase operation. The parameters are only shown if the group is set to "staircase function".

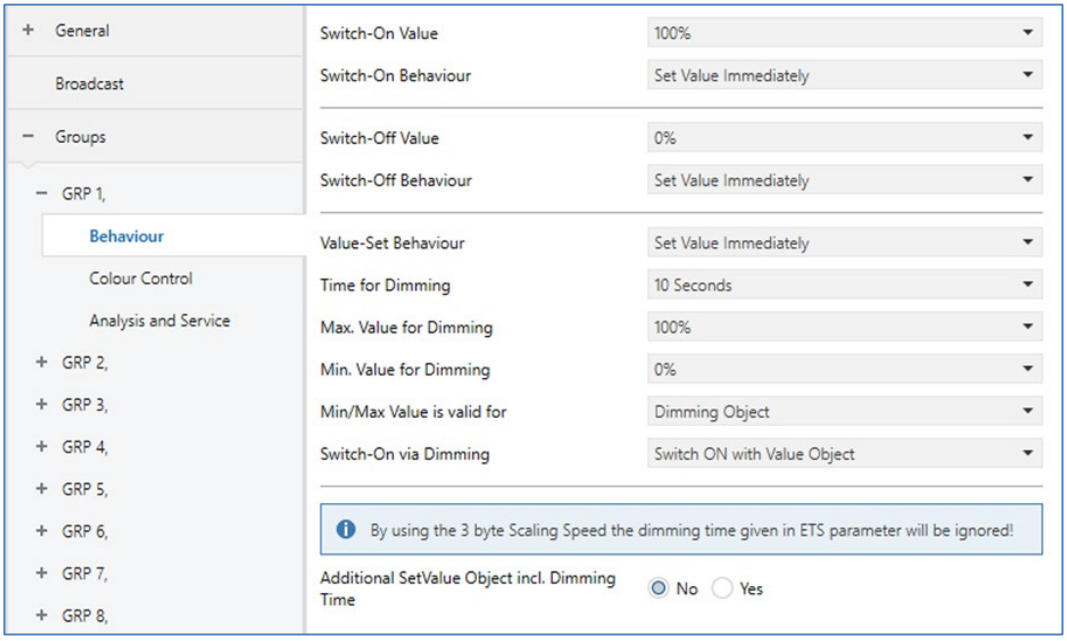
- **Delayed Switch-Off in 2 steps automatically:**
  - 1 minute before the configured time the value is set to 50% of the actual value.
  - After the configured time the switch-off value is set.
- **Delayed Dim-Off automatically:**
  - 1 minute before the configured time, the current value is dimmed to the switch-off value.

Automatic Switch OFF after	1 Minute 2 Minutes 3 Minutes 4 Minutes **5 Minutes** 10 Minutes 15 Minutes ... 90 Minutes
Use this parameter to set the time after which a group in staircase mode automatically switches off. This parameter is only visible if you select 'staircase mode'.	
Function of Additional Object	**No Object** Disable Object Release Object Staircase function Disable Object
Use this parameter to set the function of an additional object. If you select "Disable Object", value 1 disables the operation of the group. If you select "Release Object", value 1 enables the operation of the group. **Attention**: The disabled function does only refer to Switch ON/OFF and SetValue via Objects If you select " Staircase function Disable Object", value 1 disables only the staircase function. This can be used to temporarily disable the staircase function for example during cleaning.	
Behaviour on Disable	**No Change** Switch to On-Value Switch to OFF-Value
This parameter appears when an additional object has been selected to define the behaviour when disabled.	
Behaviour on Enable	**No Change** Switch to On-Value Switch to OFF-Value
This parameter appears when an additional object has been selected to define the behaviour when enabled.	
Enabled for Panic Mode	**No** Yes
Determines whether a group should be considered during panic mode. The panic mode is controlled via central object number 10.	
Value in Panic Mode	**1%** .. **50%** .. 100%
Use this parameter to select the value for this operating mode.	
Calculation of Dimming Values	**logarythmic** linear

Sets the dimming curve for the group.
This Object can be used to switch Off the Power of the ECGs. As soon as the Group has been switch On again, this Object enables the Power of the ECG Line again.

Control ECG Power Line via Object	**None** Energy Saving Object 1.. 16
Here you define the object with which the power supply is to be switched off. This parameter is only visible if this function was previously set on the General → Special functions parameter page, see 21.1.4 Page parameter – special functions.	

21.3.2 Behaviour

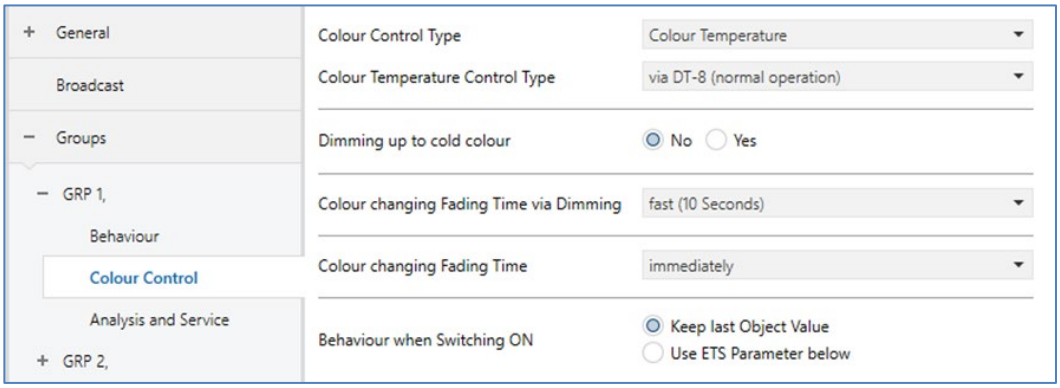


Parameter	Settings
Switch-ON Value	1% 5% 10% ... 95% **100%** Last value
Use this parameter to set the switch-on value. If you select "last value", the value is set to the dimming value prior to the lamp being switched off.	

Switch-ON Behaviour	**Set Value Immediately** Dimm to Value in 3s Dimm to Value in 6s Dimm to Value in 10s Dimm to Value in 20s Dimm to Value in 30s Dimm to Value in 1 Minute Dimm to Value in 2 Minutes Dimm to Value in 5 Minutes Dimm to Value in 10 Minutes
Use this parameter to set the switch-on behaviour.	
Switch-OFF Value	**0%** 5% 10% ... 45% 50% ... 95% **99%**
Use this parameter to set the switch-off value.	
Switch-OFF Behaviour	**Set Value Immediately** Dimm to Value in 3s Dimm to Value in 6s Dimm to Value in 10s Dimm to Value in 20s Dimm to Value in 30s Dimm to Value in 1 Minute Dimm to Value in 2 Minutes Dimm to Value in 5 Minutes Dimm to Value in 10 Minutes
Use this parameter to set the switch-off behaviour.	
Value-Set Behaviour	**Set Value Immediately** Dimm to Value in 3s Dimm to Value in 6s Dimm to Value in 10s Dimm to Value in 20s Dimm to Value in 30s Dimm to Value in 1 Minute Dimm to Value in 2 Minutes Dimm to Value in 5 Minutes Dimm to Value in 10 Minutes
Use this parameter to configure the behaviour on receipt of a new dimming value via value setting. Please remember that the dim time always refers to the full value range. Accordingly, a dimming time of 30 s means a value change of 100% within 30 s. If the value within a scene is only changed by 50%, the change is performed within 15 s.	

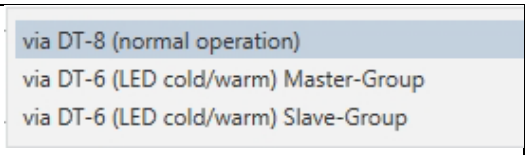
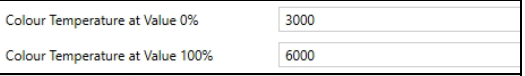
Time for Dimming	3 Seconds 4 Seconds 5 Seconds 6 Seconds 10 Seconds 20 Seconds 30 Seconds 60 Seconds
Use this parameter to set the dim time for relative dimming in relation to a value range from 0 to 100%.	
Max. Value for Dimming	50% 55% 100%
Use this parameter to configure the maximum dimming value that can be set through relative dimming.	
Min. Value for Dimming	0% 0.5% 1% ... 5% 50%
Use this parameter to configure the minimum dim value that can be set through relative dimming.	
Min/Max Value is valid for	Dimming Object Value Object Dimming & Value Object
Use this parameter to select the object that minimum and maximum values are valid for. It is possible to set, for example, 60% via dimming and 100% via value setting.	
Switch ON via Dimming	No Switch ON with Dimming Object Switch ON with Value Object Switch ON with Dimming & Value Object
Use this parameter to select whether a switched off group should be switched on when receiving a relative 4 Bit dimming object, a value setting object or both.	
Additional SetValue Object incl. Dimming Time.	No Yes
Determines whether the SetValue object is to be used with the combined dimming time (DPT 225.001). See object Nr. 50. **Note**: If you select the 3 Byte object (combination of value and dimming time), the dimming time in the ETS is ignored.	

21.3.3 Colour control



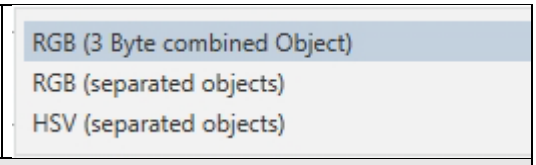
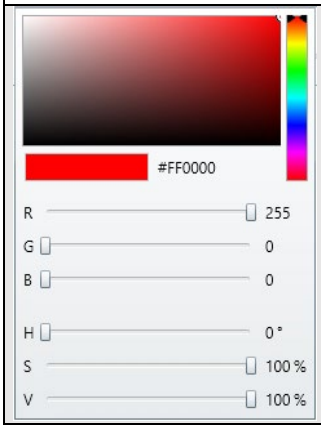
Parameter	Settings
Colour Control Type	**none** Colour temperature RGB colour RGBW colour XY Colour Colour temperature + RGB Colour temperature + RGBW
This parameter can be used to set which colour control should be used in this group. Please make sure that the ECGs in this group also support this type of control.	

Colour temperature

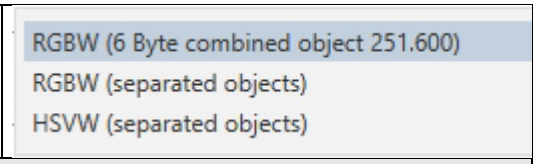
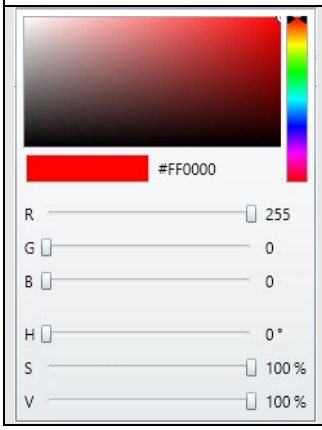
Colour Temperatur Control Type (when selecting "Colour temperature")	
When "Colour Temperature" is selected, these types of control are supported.	
Via DT-8 (normal operation)	
Dimming up to cold colour	**No** Yes
When this option is activated, the colour temperature is changed as the light is dimmed up. The corresponding values are set in the following parameter	
Colour temperature at Value 0% Colour temperature at Value 100%	
Parameters for setting the colour temperature (warm) in dimmed light and (cold) in high dimmed light.	
Colour changing Fading Time via Dimming	**Fast (10 seconds)** Standard (20 seconds) Slow (40 seconds)
This parameter is used to decide how quickly the colour temperature should be changed when dimming.	

Colour changing Fading Time	**immediately** 1 second 5 seconds 10 seconds 20 seconds 30 seconds 60 seconds 90 seconds
This parameter is used to decide how quickly the colour temperature should be changed.	
Behaviour when Switching ON	**Keep last Object Value** Use ETS Parameter below
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last Object Value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Colour Temperature when Switching ON	3000
Colour temperature at power-on with the option "Use ETS Parameter below" enabled.	
Via DT-6 (LED cold/warm) Master-Group	via DT-6 (LED cold/warm) Master-Group
This allows a colour temperature to be set via 2 DT-6 groups. For example, LED strips with a warm colour (3000K) are assigned to a master group and LED strips with a cold colour (6000K) to a slave group	
Colour Temperature by using 2 Groups (one for cold white, one for warm white) Colour Temperature for Master LED (warm) 1000 °K Colour Temperature for Slave LED (cold) 6000 °K	
Here the real values for the two LEDs are defined	
Via DT-6 (LED cold/warm) Slave-Group	via DT-6 (LED cold/warm) Slave-Group
This Group is controlled by another Master Group. Settings and Objects from the Master are vaild.	
Assign according Master Group	**Group 1** Group 2 Group 3 .... Group 16
Assignment of the relevant master group.	

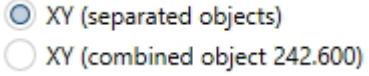
RGB

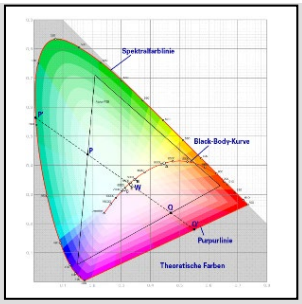
Selection of Object Type (when selecting "RGB Colour")	
When selecting "RGB colours", these types of control are supported.	
Time at colour change via dimming	**Fast (10 seconds)** Standard (20 seconds) Slow (40 seconds)
This parameter is used to decide how quickly the colour temperature should be changed when dimming.	
Colour changing Fading Time	**immediately** 1 second 5 seconds 10 seconds 20 seconds 30 seconds 60 seconds 90 seconds
This parameter is used to decide how quickly the colour temperature should be changed.	
Correction Value for special LED	
Under certain circumstances, the intensity of the colours red, green, blue may not be exactly matched to the illuminants and the ballast. In order to carry out a subsequent correction, the weighting of the individual colours can be changed here. An intensity of 100% means that this colour is controlled to 100%.	
Behaviour when Switching ON	**Keep last Object Value** Use ETS Parameter below
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last Object Value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Colour value at switch-on	
	This parameter defines the RGB colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.

RGBW

Selection of Object Type (when selecting "RGBW Colour")	
When selecting "RGBW colours", these types of control are supported. For ETS parameters see chapter 20.3.2 Group objects – colour control.	
Behaviour when Switching ON	**Keep last Object Value** Use ETS Parameter below
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last Object Value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Use ETS parameters as set below.	
	This parameter defines the RGBW colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.

XY Colour

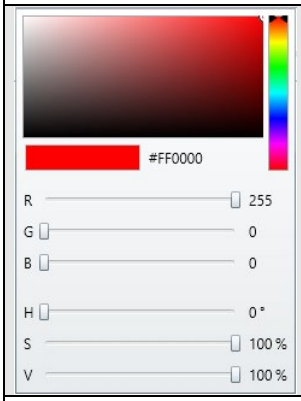
Selection of Object Type (when selecting "XY Colour")	
This parameter can be used to set which objects are to be used for control.	
Colour changing Fading Time	**immediately** 1 second 5 seconds 10 seconds 20 seconds 30 seconds 60 seconds 90 seconds
This parameter is used to decide how quickly the colour should be changed.	
Behaviour when Switching ON	**Keep last Object Value** Use ETS Parameter below
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last Object Value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Use ETS Parameter below.	X-Value when Switching ON (0..1) Y-Value when Switching ON (0..1)



This parameter is used to define the X colour at switching-on.
The value range is between 0 and 1.
X= 0.33 and Y=0.33 corresponds to the white point.

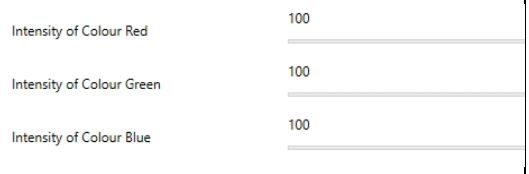
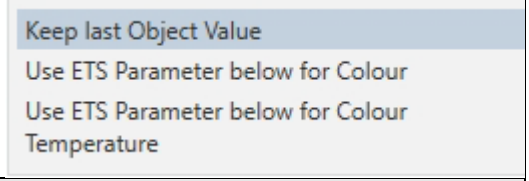
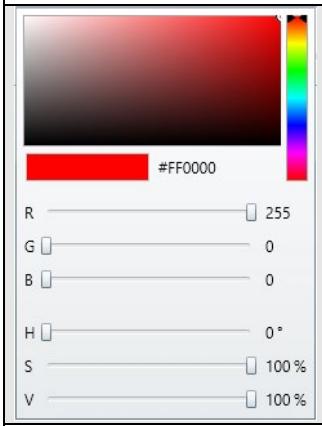
Colour temperature + RGB

Selection of Object Type (when selecting "Colour temperature + RGB")	RGB (3 Byte combined Object) RGB (separated objects) HSV (separated objects)
When "Colour temperature + RGB" is selected, these types of control are supported.	
Dimming up to cold colour	**No** Yes
When this option is activated, the colour temperature is changed as the light is dimmed up. The corresponding values are set in the following parameter	
Colour temperature at Value 0% Colour temperature at Value 100%	Colour Temperature at Value 0% 3000 Colour Temperature at Value 100% 6000
Parameters for setting the colour temperature (warm) in dimmed light and (cold) in high dimmed light.	
Time at colour change via dimming	**Fast (10 seconds)** Standard (20 seconds) Slowly (40 seconds)
This parameter is used to decide how quickly the colour should be changed when dimming.	
Time at colour change	**immediately** 1 second 5 seconds 10 seconds 20 seconds 30 seconds 60 seconds 90 seconds
This parameter is used to decide how quickly the colour should be changed.	
Correction value for special LED	Intensity of Colour Red 100 Intensity of Colour Green 100 Intensity of Colour Blue 100
Under certain circumstances, the intensity of the colours red, green, blue may not be exactly matched to the illuminants and the ballast. In order to carry out a subsequent correction, the weighting of the individual colours can be changed here. An intensity of 100% means that this colour is controlled to 100%.	

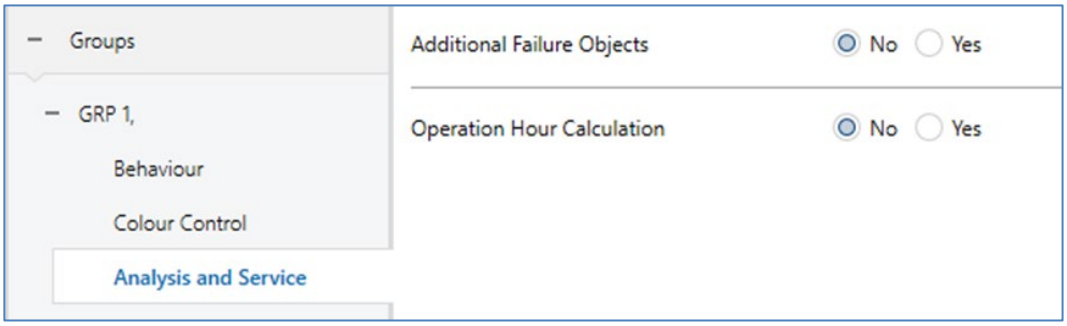
Behaviour when Switching ON	Keep last Object Value Use ETS Parameter below for Colour Use ETS Parameter below for Colour Temperature
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last Object Value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Use ETS parameters as set below.	Colour Value when Switching On #FF0000
	This parameter defines the RGB colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.
Behaviour when Switching ON	3000
Colour temperature on power on with the option "Use ETS parameters for colour temperature as set below" enabled.	

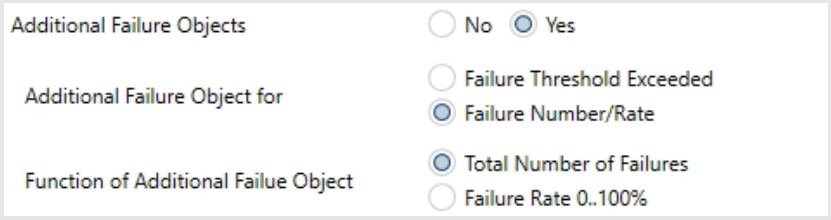
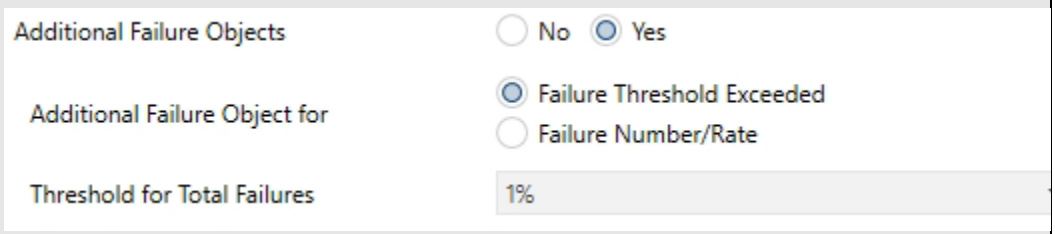
Colour temperature + RGBW

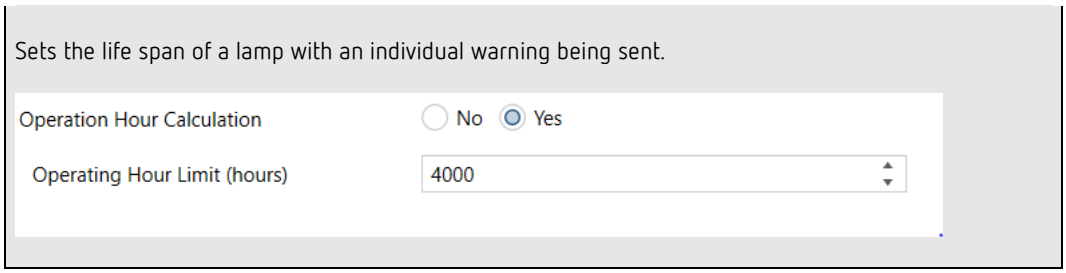
Selection of the Object Type (when selecting "Colour Temperatur + RGBW")	RGBW (6 Byte combined object 251.600) RGBW (separated objects) HSVW (separated objects)
When selecting "Colour Temperatur + RGBW", these types of control are supported.	
Dimming up to cold colour temperature	**No** Yes
When this option is activated, the color temperature is changed as the light is dimmed up. The corresponding values are set in the following parameter:	
Colour temperature at 0% Colour temperature at 100%	Colour Temperature at Value 0% 3000 Colour Temperature at Value 100% 6000
Parameters for setting the colour temperature (warm) in dimmed light and (cold) in high dimmed light.	
Colour changing Fading Time via Dimming	**Fast (10 seconds)** Standard (20 seconds) Slow (40 seconds)
This parameter is used to decide how quickly the colour should be changed when dimming.	

Colour changing Fading Time	**immediately** 1 second 5 seconds 10 seconds 20 seconds 30 seconds 60 seconds 90 seconds
This parameter is used to decide how quickly the colour should be changed.	
Correction Value for special LED	
Under certain circumstances, the intensity of the colours red, green, blue may not be exactly matched to the illuminants and the ballast. In order to carry out a subsequent correction, the weighting of the individual colours can be changed here. An intensity of 100% means that this colour is controlled to 100%.	
Behaviour when Switching ON (when selecting "ETS Parameter below for Colour")	
This parameter is used to decide whether the last valid colour value should always be used or basically the colour temperature that was set with the ETS. **Note:** in case of "Keep last object value" - **Attention:** in case of an invalid object value, the preset colour of the ETS is used.	
Use ETS Parameter below (when selecting "ETS Parameter below for Colour Temperature")	
 This parameter defines the RGB colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.	
Behaviour when Switching ON	
Colour temperature on power on with the option "Use ETS parameters for colour temperature as set below" enabled.	

21.3.4 Analysis and service



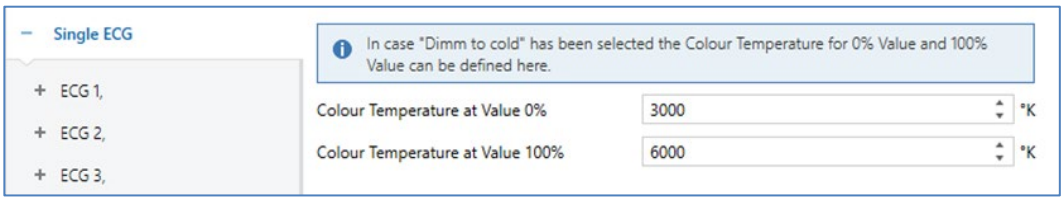
Parameter	Settings
Additional Failure Objects	**No** Yes
Use this parameter if you want to define additional failure objects.	
Additional Failure Object for	**Failure threshold Exceeded** Failure Number/Rate
Determines whether the additional failure object should be used as a 1 Byte object for number of failures/failure rate or as a 1 Bit object for exceeding the failure threshold.	
Function of Additional Failure Object	**Total Number of Failures** Failure Rate 0..100%
Use this parameter to select either number of all failures in a group or failure rate in %. This parameter is only visible if you select "Total Number of Failures" as additional failure object. 	
Threshold for Total Failures	1%...100% **[1%]**
Use this parameter to enter the threshold in %. When the threshold is exceeded, the failure alarm object is sent. This parameter is only visible when you select "Failure Threshold Exceeded" as additional failure object. 	
Operation Hours Calculation	Yes **No**
Use this parameter if you want to count the operating hours of a group.	
Operating Hour Limit (hours)	1 h..200.000 h **[4000 h]**



21.4 Single ECG

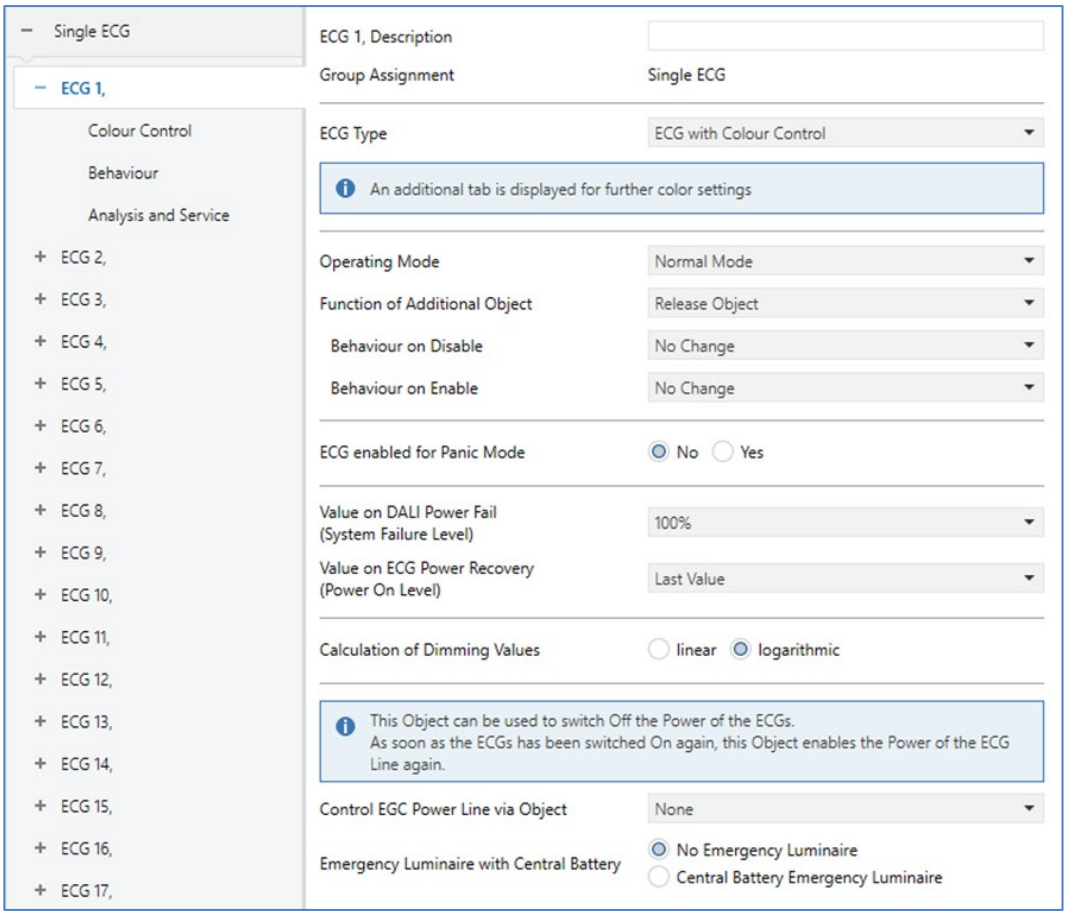
The settings for the ECGs are made on two parameter pages, provided that this ECG is defined as a single ECG and has not been assigned to a group. The parameters on these pages are described below.

21.4.1 Single ECG - General



Colour Temperature at Value 0% Colour Temperature at Value 100%	Colour Temperature at Value 0% 3000 Colour Temperature at Value 100% 6000
Parameters for setting the colour temperature (warm) with dimmed light and (cold) with dimmed light.	
Number of ECGs to be controlled?	Number of ECGs to be controlled? 2
Parameter for setting the number of ECGs (0.. 64) to be installed.	

21.4.2 ECG 1 (2..64)



Parameter	Settings
ECG x, Description	e.g.: Floor, 1 level
With this parameter an ECG description can be defined. This description is displayed as an overview for all communication objects. Example for the description: Floor, 1 level.	

ECG 1, Switching, Floor, 1 level	On/Off
ECG 1, Dimming, Floor, 1 level	Brighter/Darker
ECG 1, Set Value, Floor, 1 level	Value
ECG 1, Status, Floor, 1 level	On/Off
ECG 1, Status, Floor, 1 level	Value
ECG 1, Failure Status, Floor, 1 level	Status

Group Assignment	Not assigned Group 1 ... Group 16
The group assignment is configured via the DCA or via the website and is only displayed here.	

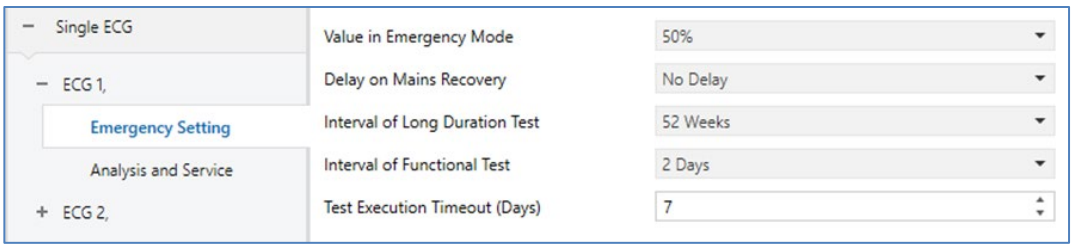
ECG Type	Fluorescent Lamp Self Contained Battery Lamp (non switchable) Self Contained Battery Lamp (switchable) Self Contained Battery Lamp (switchable) + Colour Control Discharge Lamp Low Voltage Lamp Incandescent Lamp 0..10V Converter **LED Module** Relay Module ECG with Colour Control
Use this parameter to set the type of ECG used.	
ECG Type	**LED Module**
Parameters for the ECG type LED module	
Operating Mode	**Normal Mode** Permanent Mode Normal / Night Mode
This parameter allows to set the operating mode in which the ECG shall be operated. Night operation is controlled via a central object no. 12.	
Function of Additional Object	**No Object** Disable Object Release Object
This parameter can be used to define the function of an additional object. If the "Disable object" is selected, an object is displayed which blocks operation of the ECG if the value is "1". If the "Enable object" is selected, an object is displayed which enables operation of the ECG if the value is "1". **Note:** Disable function only refers to ON/OFF and value setting commands via KNX objects	
Behaviour on Enable	**No Chance** Switch to ON-Value Switch to OFF-Value
This parameter is displayed when an additional object is selected. The behaviour during activation can be defined here.	
Value in Permanent Mode	1..100% **[50%]**
This parameter allows you to set the value to which the corresponding lamp is permanently set in "Permanent" Mode. In the operating mode 'continuous operation' the lamp cannot be switched or changed, but always lights up in the set value. The parameter is only displayed if the ECG is set to 'continuous operation'.	
Behaviour in Normal / Night Mode (if is selected)	**Delayed Switch-Off automatically** Delayed Switch-Off in 2 steps automatically Delayed Dim-Off automatically Activate Permanent Mode and Ignore Telegrams
This parameter can be used to set how the corresponding group behaves if night mode has been activated via the night object. The parameter is only shown if the group is set to "Normal Night Mode". Special settings: • **Delayed Switch-Off in 2 steps automatically:** - After the set time is set to 50% of the previous value. - After a further minute, the switch-off value is set. • **Delayed Dim-Off automatically:** - After the set time, the switch-off value is dimmed within one minute. • **Activate Permanent Mode and Ignore Telegrams:**	

Automatic Switch-Off after (minutes)	1 minute 2 minutes 3 minutes 4 minutes **5 minutes** 10 minutes 15 minutes ... 90 minutes
This parameter is used to decide after how many minutes the ECG shall be switched off.	
Function of Additional Object	**No Object** Disable Object Release Object Staircase function Disable Object
Use this parameter to set the function of an additional object. If you select "Disable Object", value 1 disables the operation of the group. If you select "Release Object", value 1 enables the operation of the group. If you select " Staircase function Disable Object", value 1 disables only the staircase function. This can be used to temporarily disable the staircase function for example during cleaning.	
Behaviour on Enable	**No Change** Switch to On-Value Switch to OFF-Value
This parameter appears when an additional object has been selected to define the behaviour when enabled.	
Enabled for Panic Mode	**No** Yes
Determines whether a group should be considered during panic mode. The panic mode is controlled via central object number 10.	
Value in Panic Mode	1..100% [**50**]
Use this parameter to select the value for this operating mode.	
Value on DALI Power Fail (System Failure Level)	0..100% **[100]** Last value
Use this parameter to set the value of a lamp after a loss of DALI power. The value is saved on the ECG and the device automatically changes to the value when a power loss occurs.	
Value on ECG Power Recovery (Power On Level)	0..100% [**100**] **Last value**
Use this parameter to set the value of a lamp after a return of ECG power supply. The value is saved on the ECG and the device automatically changes to the value when power is restored.	
Calculation of Dimming Values	**logarythmic** linear
Sets the dimming curve for the group.	
This Object can be used to switch Off the Power of the ECGs. As soon as the Group has been switch On again, this Object enables the Power of the ECG Line again.	
Control ECG Power Line via Object	**None** Energy Saving Object 1.. 16
Here you define the object with which the power supply is to be switched off. This parameter is only visible if this function was previously set on the General → see 20.1.3 General objects – special functions.	
Emergency Lights with Central Battery	**No Emergency Lighting** Central Battery Emergency Lighting

Use this parameter if you want the ECG to control an emergency light with central battery. Devices defined as emergency lights are specifically marked during status notifications and a special test mode can be activated via an object. This parameter is not visible if "self-contained emergency light" has been selected.	
Value in Test Mode	0..100% [**50**]
This parameter can be used to set the value to which the corresponding lamp is permanently set in "Test mode". In the operating mode "test mode" the lamp cannot be switched or changed, but always lights up in the set value. This parameter is only visible if "Emergency lighting with central battery" has been selected. Test mode is started with object 11.	
Duration of Test Mode (minutes)	5 Minutes .... **1 Hour** .... 4 Hours
Use this parameter to configure for how long the lamp will be on after starting the test mode. A lamp in this mode cannot be switched or changed. It remains at the set value. This parameter is only visible if you select "emergency lights with central battery".	
ECG Type	Fluorescent Lamp
Parameters for the ECG type " Fluorescent Lamp". See parameter settings for LED modules.	
ECG Type	Self Contained Battery Lamp (non switchable)
Parameters for the ECG type "Self Contained Battery Lamp (non switchable)"	
Converter controls	ECG 1... 64 **Not assigned**
Type of Failure Object	**1 bit** 1 byte
Here you can define whether the error is to be reported in the form of a bit (Alarm DPT 1.005) or via a byte object with the information about lamp or ballast errors, see chapter: 18.4 ECG objects.	
ECG Type	Self Contained Battery Lamp (switchable)
Parameters for the ECG type "Self Contained Battery Lamp (switchable)". See parameter settings for LED modules. The parameter setting "emergency lighting with central battery" is not available for this ECG type.	

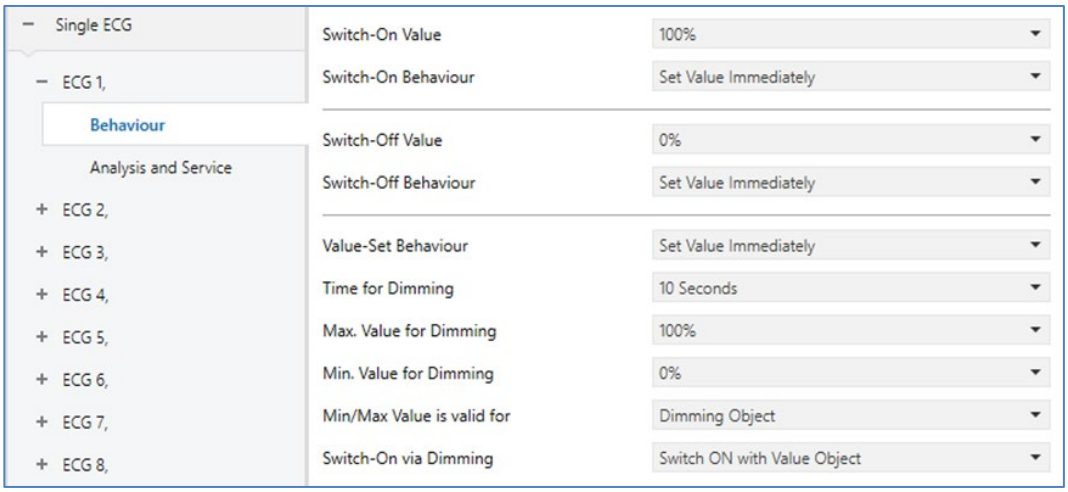
ECG Type	Self Contained Battery Lamp (switchable) + Colour Control
Parameters for the ECG type "Self Contained Battery Lamp (switchable) + Colour Control". See parameter settings for LED modules. The parameter setting "emergency lighting with central battery" is not available for this ECG type.	
ECG Type	Discharge Lamp
Parameters for the ECG type "Discharge Lamp". → See parameter settings for LED modules.	
ECG Type	Low Voltage Halogen Lamp
Parameters for the ECG type "Low Voltage Halogen Lamp". → See parameter settings for LED modules.	
ECG Type	Incandescent Lamps
Parameters for the ECG type "Incandescent Lamps". See parameter settings for LED modules.	
ECG Type	0..10V Converter
Parameters for the ECG type "0..10V Converter". → See parameter settings for LED modules.	
ECG Type	Relais Module
Parameters for the ECG type "Relais Module". See parameter settings for LED modules.	
ECG Type	ECG with Colour Control
Parameters for the ECG type "ECG with Colour Control". → See parameter settings for LED modules.	

Emergency setting
This parameter page is only displayed if one of the ECG types Emergency lamp has been selected.



Parameter	Settings
Value in Emergency Mode	1..100% **[50]**
Sets the light value of a self-contained battery emergency light in case of a power failure or during a long duration test.	
Delay on Main Recovery	**No delay** 30 seconds 1 minute 2 minutes 3 minutes 4 minutes 5 minutes 10 minutes 10 minutes 15 minutes 20 minutes
Sets the delay until a self-contained battery lamp changes back into normal mode after power has been restored.	
Interval of Long Duration Test	No automatic test 1 week 2 weeks .... **52 weeks**
Use this parameter to set the intervals at which the converter is to perform automatic long duration tests.	
Interval of Functional Test	No automatic test 1 day **2 days** .... 28 days
Use this parameter to set the intervals at which the converter is to perform automatic functional tests.	
Test Execution Timeout (Days)	0..255 **[7]**
If a function or long duration test cannot be started immediately, (for example because the battery is not fully charged), the converter tries to execute the test later. Use this parameter to configure how long to attempt another test start and when to send a failure notification that the time has been exceeded. If the setting is 0, timeout will occur after 15 minutes.	

Behaviour



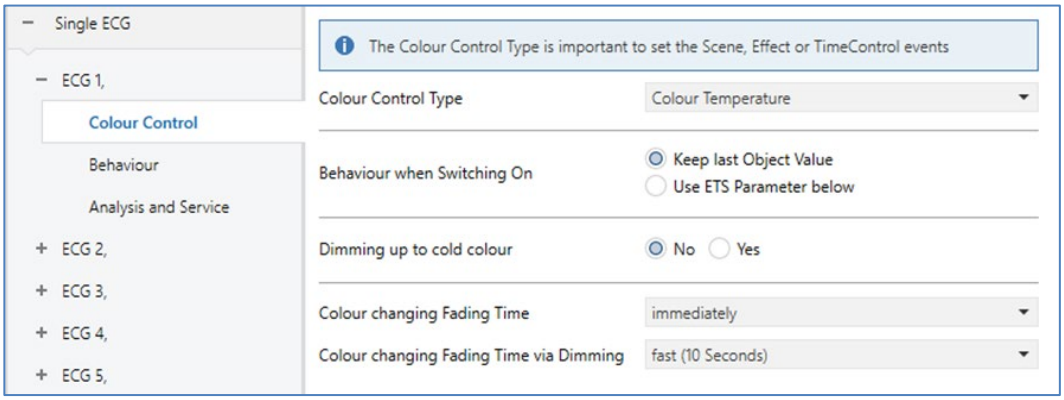
Parameter	Settings
Switch-ON Value	1.. 100% [**100**] Last value
Use this parameter to set the switch-on value. If you select "Last value", the value is set to the dimming value prior to the lamp being switched off.	
Switch-ON Behaviour	**Set Value Immediately** Dim to Value in 3s Dim to Value in 6s Dim to Value in 10s Dim to Value in 20s Dim to Value in 30s Dim to Value in 1 Minute Dim to Value in 2 Minutes Dim to Value in 5 Minutes Dim to Value in 10 Minutes
Use this parameter to set the switch-on behaviour.	
Switch-OFF Value	**0%** 5% 10% ... 45% 50% ... 95% **99%**
Use this parameter to set the switch-off value.	
Switch-OFF Behaviour	**Set Value Immediately** Dim to Value in 3s Dim to Value in 6s Dim to Value in 10s Dim to Value in 20s Dim to Value in 30s Dim to Value in 1 Minute Dim to Value in 2 Minutes Dim to Value in 5 Minutes Dim to Value in 10 Minutes

Use this parameter to set the switch-off behaviour.	
Value-Set Behaviour	**Set Value Immediately** Dim to Value in 3s Dim to Value in 6s Dim to Value in 10s Dim to Value in 20s Dim to Value in 30s Dim to Value in 1 Minute Dim to Value in 2 Minutes Dim to Value in 5 Minutes Dim to Value in 10 Minutes
Use this parameter to configure the behaviour on receipt of a new dimming value via value setting. Please remember that the dim time always refers to the full value range. Accordingly, a dimming time of 30 s means a value change of 100% within 30 s. If the value within a scene is only changed by 50%, the change is performed within 15 s.	
Time for Dimming	3 Seconds 4 Seconds 5 Seconds 6 Seconds **10 Seconds** 20 Seconds 30 Seconds 60 Seconds
Use this parameter to set the dim time for relative dimming in relation to a value range from 0 to 100%.	
Max. Value for Dimming	50% 55% **100%**
Use this parameter to configure the maximum dimming value that can be set through relative dimming.	
Min. Value for Dimming	**0%** 0.5% 1% ... 5% 50%
Use this parameter to configure the minimum dim value that can be set through relative dimming.	
Min/Max Value is valid for	**Dimming Object** Value Object Dimming & Value Object
Use this parameter to select the object that minimum and maximum values are valid for. It is possible to set, for example, 60% via dimming and 100% via value setting.	
Switch ON via Dimming	No Switch ON with Dimming Object **Switch ON with Value Object** Switch ON with Dimming & Value Object
Use this parameter to select whether a switched off group should be switched on when receiving a relative 4 Bit dimming object, a value setting object or both.	
Cyclic request of status	**No** Yes

Use this parameter to read the status of special ballast cyclically.
Attention: In the special case that DALI luminaires are switched manually independently of the gateway, the status can be queried cyclically. The cycle time is set in the "General -> Analysis and Service" tab.

Colour control

This parameter page is only displayed if the ECG type is "Single battery emergency light (switchable) + colour control" or "ECG with colour control".



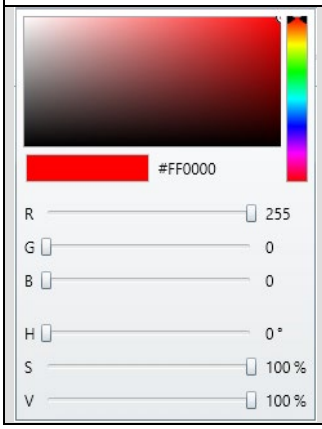
Colour temperature

Parameter	Settings
Colour Control Type **Note:** The colour control type is important to set the Scenes, Effects or Time Control events.	none Colour Temperature RGB Colour RGBW Colour XY Colour HSV Colour HSVW Colour
This parameter can be used to set which colour control is to be used for the ECG. The default value is set to "Colour temperature".	
Colour Temperature when Switching On	3000
The set colour temperature when switched on in Kelvin.	
Dimming up to cold colour	**No** Yes
General parameter for colour Temperature at 0% and at 100% are taken into account, see ECG>General See chapter 20.4.1 Single ECG objects – behaviour.	
Behavior when Switching ON	Keep last Object Value Use ETS Parameter below
This parameter is used to decide whether the last valid colour value should always be used, or the parameters set below should be used. **Note:** with "Keep last object value" – **Attention:** with an invalid object value, the preset colour of the ETS is used.	

Colour changing Fading Time	immediately 1 Second 5 Seconds 10 Seconds 20 Seconds 30 Seconds 60 Seconds 90 Seconds
The set time for the colour change between immediate and 90 seconds.	
Colour changing Fading Time via Dimming	fast (10 Seconds) standard (20 Seconds) slow (40 Seconds)
The time for the colour change when dimming is set here.	

RGB

Colour Control Type	RGB Colour
Colour control assigned to the ECG.	
Colour Value when Switching ON	#FF0000

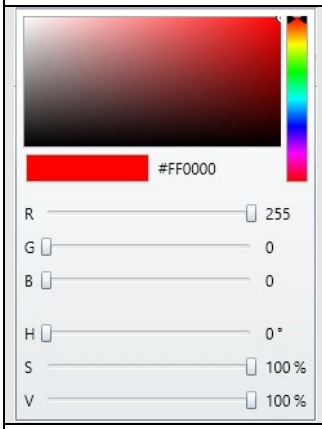


This parameter defines the RGB colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.

RGBW

Colour Control Type	RGBW Colour
Colour control assigned to the ECG.	

Colour Value when Switching ON	#FF0000



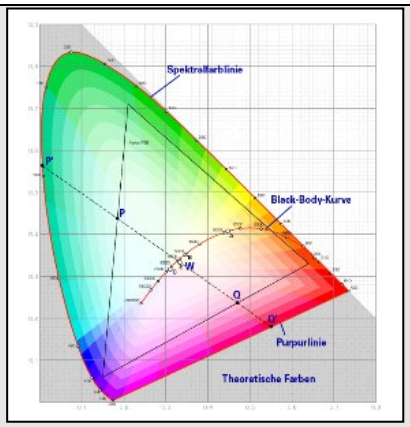
This parameter defines the RGB colour when switching on. To do this, a window for colour selection is displayed via the button in the ETS.

Additional White	255

The additional white value from 0 to 255 can be set using the slider. The increment is 1 increment.
The default value is 255 (max.).

XY colour

Colour Control Type	XY Colour
Colour control assigned to the ECG.	
X-Value when Switching ON (0..1) X-Value when Switching ON (0..1)	0.33 0.33



This parameter defines the X colour when switching on. The range of values is between 0 and 1.
X = 0.33 and Y = 0.33 correspond to the white point.

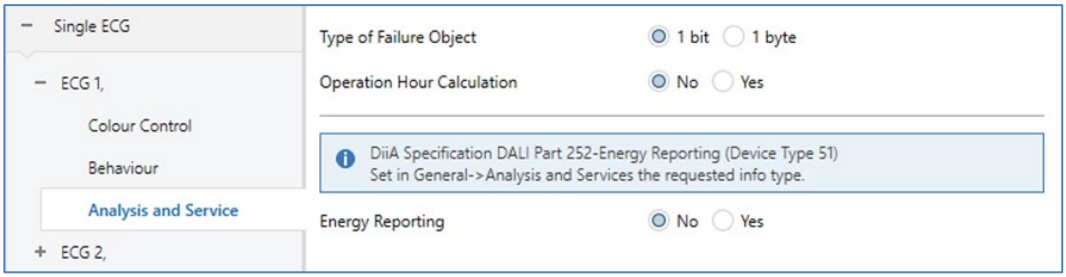
HSV

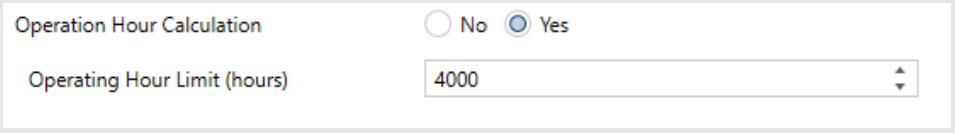
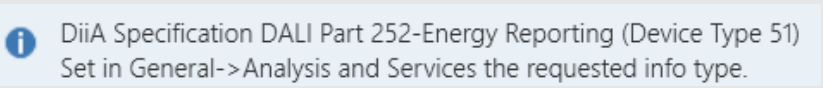
Colour Control Type	HSV Colour
Parameters for the colour control type "HSV colour". → see parameter settings for RGB colour.	

HSVW

Colour Control Type	HSVW Colour
Parameters for the colour control type "HSV colour". → see parameter settings for RGBW colour.	

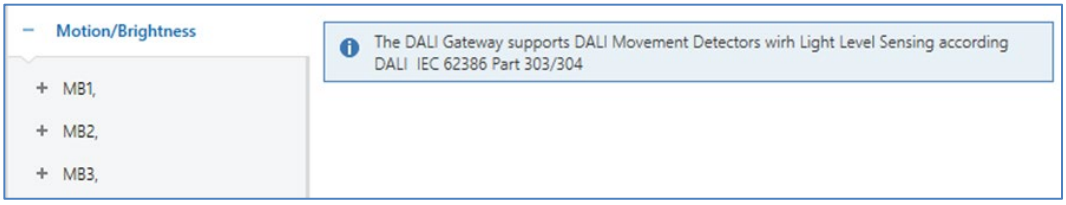
Analysis and maintenance



Type of the failure object	**1 bit** 1 byte
Here you can define whether the error is to be reported in the form of a bit (Alarm DPT 1.005) or via a byte object with the information about lamp or ballast errors, see chapter: 20.4 Single ECG objects. **Note: The 1 Byte object is a NON DPT type and will not be implemented in future versions**	
Operating hours Calculation	Yes **No**
This parameter can be used to set whether an individual operating hours count for the group is desired.	
Operating hours Limit value (hours) (Calculation for operating hours).	1 h..200.000 h **[4000 h]**
This parameter is used to set the lamp life at which an individual warning is sent.  	
Energy Reporting	Yes **No**
This parameter can be used to enable the energy reporting service.  	

21.5 Motion/brightness detector

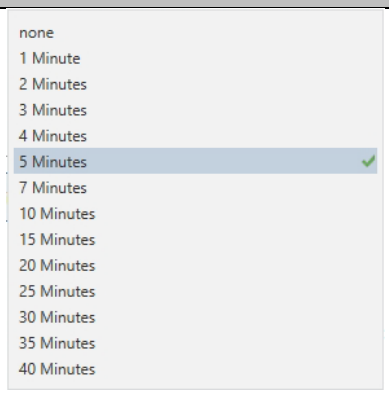
21.5.1 Motion/brightnesss – general

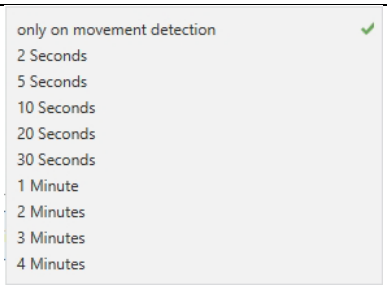


Parameter	Settings
MB x, Description	**e.g. x, Floor 1, Building 2**
This parameter can be used to define a motion detector description. This description is displayed for an overview for all communication objects. Example: MB1, Floor1, Building 2. MB1, Movement Switching, Floor1, Buildung 2 — On/Off MB1, Movement Off, Floor1, Buildung 2 — On/Off MB1, Brightness, Floor1, Buildung 2 — Brightness MB1, Failure Status, Floor1, Buildung 2 — Status MB1, Brightness is below the Threshold, Floor1, Buildung 2 — Yes/No	
Type of Sensor	**Motion+Brightness** Motion only Brightness only
This parameter defines the support of Motion and/or Brightness. Motion and Brightness Settings are available on a new parameter page.	
Type of Light Control	**none** Light Control via Threshold Constant Light Control
If a Light Control is required a new Parameterpage will be displayed.	

21.5.2 Motion

Parameter	Settings
Number of Instances	**1** 7
A well known use case is the master/slave concept in a long corridor. In such a situation more than one movement detector have to be installed and they should work together to light the corridor. In order to support more than one instance the according ETS parameter has to be set.	

DALI Configuration	
Time without movement > Vacant (Off-Delay)	
After this time, the presence is deactivated, i.e. if no movement is detected in this preset time, it can be assumed that no person is within the range of the motion detector. IEC62386-303 (Hold Timer)	
Time without movement via Object (Off-Delay)	**Parameter** Parameter + Set by Object
This parameter defines if the off delay, mentioned above, can be adjusted by a communication object.	
Off-Delay after Startup	**Use ETS Parameter** Keep last Object Value
This parameter is visible, if an external object for the Off-Delay has been used. In this case, the startup behaviour can be defined by this parameter.	
Object Type for Output	**Switch Object** Set Value Object Scene Object
Selection of the object type which is sent to the bus.	
Value in Presence State	**0 to 100%**
Value to be caled in Presence State.	
Value in Vacant State	**0 to 100%**
Value to be caled in Vacant State.	
Scene in Presence State	**Scene 1 to 64**
Scene to be called in Presence State.	
Scene in Vacant State	**Szene 1 bis 64**
Scene to be caled in Vacant State.	

Cyclic Sending	
Selection of behaviour in cycle sending mode.	
Activate External Trigger (Master/Slave) via Object	**No** Yes
If this parameter is set to "Yes", an additional object is displayed and a "1" telegram is equivalent to "Motion detected".	
Configuration of disable object is only displayed if no light control has been activated. If light control is activated, these parameters can be found on the corresponding light control page.	
Usage of Disable Object	**No** Disable with Value 0 Disable with Value 1
Here you define how the disable object is to be used.	
Behaviour on Disable	**Deactivate detection** Deactivate and turn OFF immediately Deactivate and turn ON immediately
Using this parameter the Behaviour in case of switching to “disable mode” can be defined. By returning back to normal mode, the detection is activated again.	
Activate Automatic Fallback to Normal Mode	**No** Yes
It is also offered the possibility switching back to normal mode (enable detection) automatically. In this case the next parameter defined the time.	
Fallback Time to Normal Mode after	1 Minute…**10 Minutes**…..4 Hours
Here the fallback time to normal mode is defined.	

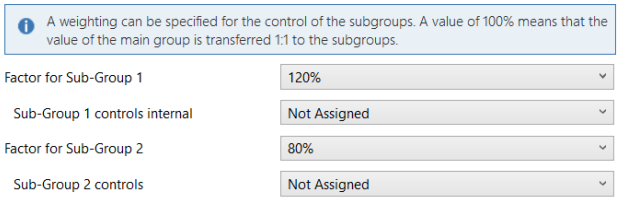
21.5.3 Brightness

Parameter	**Settings**
Number of Instances	**1** …. 7
A well-known use case is calculationg the brightness depending of more than one brightness sensor as an average value. This parameter here defines the number of instances which should taken into account for the final brightness value.	
DALI Configuration	
Deadtime between Brightness Events	

Specification of a fixed period of time after which the current brightness value is sent.	
Hysteresis in %	10
Value of the hysteresis in % [0 .. 25]. The standard value is set to 10%.	
Send Value by change of	10
Send value by changing in % [1 .. 250]. The standard value is set to 10%.	
Cyclical sending	No 2 Seconds 5 Seconds 10 Seconds 20 Seconds 30 Seconds 1 Minute 2 Minutes 3 Minutes 4 Minutes
Specification of a fixed period of time after which the current brightness value is sent.	
Brightness Correction	
Only visible when constant light control is activated	
Brightness Correction	**Use always below ETS Values** Use DCA Calibration
The measured brightness (lux) can be corrected via fixed ETS parameters or via manual calibration in the DCA, see 13.1.12 Calibration for constant light control.	
Brightness Correction Value	0
Increase / decrease of the measured brightness (Lux) by the set value. [-500 .. +500]. The default is 0 (no correction).	
Room Reflexion	0% .. 200%
An additional reflection factor can be defined here. The default is 100% (no correction).	
Threshold alarm	
Threshold alarm activated at	500
Setting the brightness threshold above which the limit alarm is activated.	
Hysteresis for Threshold Alarm	20
Value of the switch-on delay (hysteresis) in% [1 .. 250]. The standard value is set to 20%.	
Behavior when Value < Threshold	Send OFF when Value < Threshold **Send ON when Value < Threshold**
Selection of the send behavior when the limit is exceeded.	

21.5.4 Light control via threshold

Parameter	Settings
Setpoint Brightness	500
Entry of the brightness setpoint value of the switch-on threshold. The value can be between 0 - 2000 lux. Default setting is 500 lux.	
Setpoint Brightness Hysteresis	10 lux **20 lux** .. 100 lux
Hysteresis of the brightness setpoint value.	
Setpoint Value based on	**Parameter** Parameter + Set by Object
If this parameter is set to "Parameter + Set by Object", an additional object will be displayed in order to ajust the level (threshold).	
Setpoint Start Behaviour	**Use ETS Parameter** Keep last Object Value
This parameter is visible, if an external object for the Brightness Level has been used. In this case, the startup behaviour can be defined by this parameter.	
Switch Off Behaviour	**No presence is detected** No presence is detected or brightness is sufficient
In case the light is On because the brightness is below the setpoint (threshold) there are 2 options to switch off the light again. Option 1: The light is switched off only if no presence is detected anymore. Option 2: The light is switched off if the brightness is above setpoint again independently of the presence detection.	
Delay time for correct calculation	5 .**6.** 15 Seconds
In case of Option 2 the additional artificial light has to be taken into account to allow a correct switch off behaviour. Therefore, a delay time is necessary. ⓘ Delay time to calculate the artificial light component for the regulation. The brightness sensor should have detected the added light after this time.	
Light groups to be controlled	**Main Group** Main Group + 1 Sub Group Main Group + 2 Sub Groups
The light control can directly work with internal DALI groups instead of using KNX objects. By default, it is possible to control one main group. In case there is a large room there are further options to control up to 2 sub groups in addition. **Attention**: If using internal groups, the group configuration itself has higher priority. Example: If the Light Control is working with Group 1 and Group 1 is set to disable mode or panic mode, the Light Control Module is not working, because the setting of the group itself has higher priority.	
Main Group controls internal Group	**Not assigned** Group 1 .. Group 16

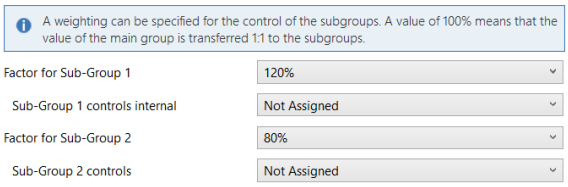
Here the group umber to be controlled can be defined.
In case more than one group shall be controlled there are new parameter visible to define the relationship between the groups: 

Factor for Sub-Group x	**120%** 50% .. 200%
Here you can define the weighting of the sub-group measured against the main group.	
Sub-Group x controls internal	**Not assigned** Group 1 .. Group 16
Here the group umber to be controlled can be defined.	
Activate Semi-Automatic Mode	**No** Yes
If this operating mode is selected, the control must be started manually via an additional semi-automatic object. **Note:** The control only switches on the lighting when motion is detected.	
Object Type for output	**Switch Object** Set Value Object
The type of object to be activated in case the brightness is below setpoint (threshold) can be defined as a 1 bit or 1 byte (value) object. If brightness is below the switch object is ON, the value of the 1 byte value object can be defined with next parameter. The behaviour and the condition to switch off again can be defined with another parameter "Switch Off Behaviour " described above.	
Output Value	**100%** 0% .. 100%
The 1 byte value to be sent if brightness is below setpoint (threshold)	
Cyclical sending	No 2 Seconds 5 Seconds 10 Seconds 20 Seconds 30 Seconds 1 Minute 2 Minutes 3 Minutes 4 Minutes
Specification of a fixed period of time after which the current output value is sent.	
A manual override of the groups involved deactivates the light control	**Yes** No

When overwriting the groups belonging to the control via object values, scenes or effects, the control can be deactivated, refer to 6 Light Control Module.	
Usage of Disable Automatic Object	Disable with Value 0 **Disable with Value 1**
Here you define how the disable object is to be used.	
Behaviour on Disable Automatic Mode	**Keep last value** Turn OFF immediately Turn ON immediately
Using this parameter, the Behaviour in case of switching to "disable mode (inactive)" by the object "Disable Automatic" can be defined.	
Activate Fallback to Automatic Mode	**No** Yes
It is also offered the possibility switching back to automatic mode (enable detection) automatically. In this case the next parameter defined the time.	
Fallback Time to Automatic Mode after	1 Minute...**10 Minutes**.....4 Hours
Here the fallback time to automatic mode is defined.	

21.5.5 Constant light control

Parameter	**Settings**
Setpoint Brightness	500
Entry of the brightness setpoint value of the switch-on threshold. The value can be between 0 - 2000 lux. Default setting is 500 lux.	
Setpoint Brightness Hysteresis	10 lux **20 lux** .. 100 lux
Hysteresis of the brightness setpoint value.	
Setpoint Value based on	**Parameter** Parameter + Set by Object
If this parameter is set to "Parameter + Set by Object", an additional object will be displayed in order to adjust the level (threshold).	
Setpoint Start Behaviour	**Use ETS Parameter** Keep last Object Value
This parameter is visible, if an external object for the Brightness Level has been used. In this case, the startup behaviour can be defined by this parameter.	
Light groups to be controlled	**Main Group** Main Group + 1 Sub Group Main Group + 2 Sub Groups
The light control can directly work with internal DALI groups instead of using KNX objects. By default it is possible to control one main group. In case there is a large room there are further options to control up to 2 sub groups in addition. **Attention**: If using internal groups the group configuration itself has higher priority. Example: If the Light Control is working with Group 1 and Group 1 is set to disable mode or panic mode, the Light Control Module is not working, because the setting of the group itself has higher priority.	

Main Group controls internal Group	**Not assigned** Group 1 .. Group 16
Here the group umber to be controlled can be defined.	
In case more than one group shall be controlled there are new parameter visible to define the relationship between the groups:  	
Factor for Sub-Group x	**120%** 50% .. 200%
Here you can define the weighting of the sub-group measured against the main group.	
Sub-Group x controls internal	**Not assigned** Group 1 .. Group 16
Here the group umber to be controlled can be defined.	
Activate Semi-Automatic Mode	**No** Yes
If this operating mode is selected, the control must be started manually via an additional semi-automatic object. **Note:** The control only switches on the lighting when motion is detected.	
Setpoint when Light Control is starting	**Use ETS Parameter** Automatic Start Value
After activation of the control, the output is set to a start value. **Note:** The automatic start value is based on a calculation according to a performed DCA calibration. Without a successful calibration, the manual ETS start value is used.	
Start Value	**80%** 0% .. 100%
Definition of Setpoint after start of control	
Min. Step Size for Controlling	0.5% 1% **1.5%** 2% 2.5% 3% 4% 5%
This parameter defines the minimum change in the output variable during control.	

Delay before new value is sent	1 Second 2 Seconds 2 Seconds **3 Seconds** 4 Seconds 5 Seconds 6 Seconds 7 Seconds 8 Seconds 9 Seconds 10 Seconds
This parameter defines the time between two output variables during control.	
A manual override of the groups involved deactivates the light control	**Yes** No
When overwriting the groups belonging to the control via object values, scenes or effects, the control can be deactivated, refer to: 6 Light Control Module.	
Usage of Disable Automatic Object	Disable with Value 0 **Disable with Value 1**
Here you define how the disabled object is to be used.	
Behaviour on Disable Automatic Mode	**Keep last value** Turn OFF immediately Turn ON immediately
Using this parameter the Behaviour in case of switching to "disable mode (inactive)" by the object "Disable Automatic" can be defined.	
Activate Fallback to Automatic Mode	**No** Yes
It is also offered the possibility switching back to automatic mode (enable detection) automatically. In this case the next parameter defined the time.	
Fallback Time to Automatic Mode after	1 Minute…**10 Minutes**…..4 Hours
Here the fallback time to automatic mode is defined.	

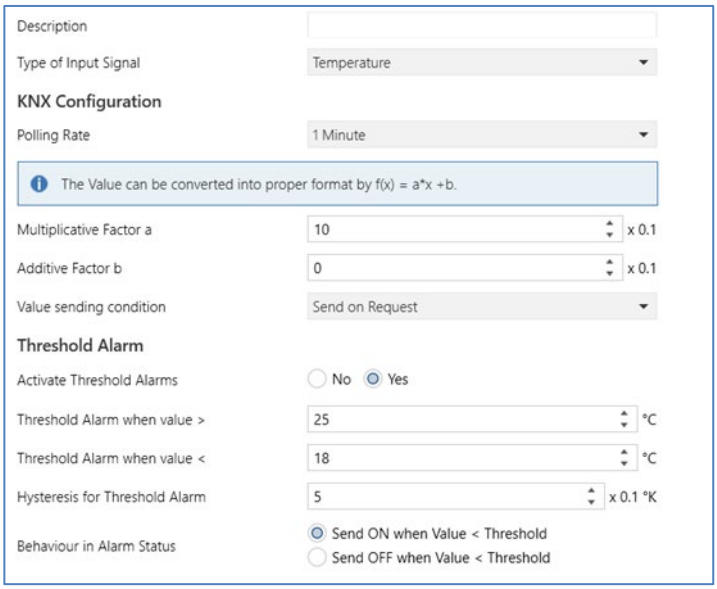
21.6 Generic DALI inputs

More and more manufacturer of DALI-2 Movement Detectors also provides different kinds of measurement:

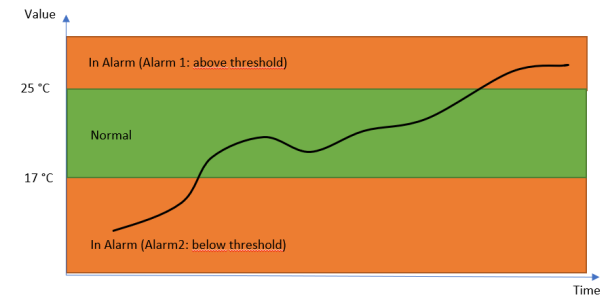
- Brightness
- Temperature
- Humidity
- AIR quality
- ……..

The sensors must correspond to instance type 0 so that they can be connected to the generic inputs.

This information can also be assigned to ETS communication objects. The following parameter descript the conversion factor and the setting of required threshold alarm:



Parameter	Settings
Description	
Use this parameter to define a description.	
Type of Input Signal	**Temperature** Humidity CO2 VOC Scaling [%] Sound [db] Generic 1 Byte unsigned Generic 2 Byte float
According to this definition the correct data type of communication object is selected.	
Polling Rate on DALI	1 Minute not used 10 Seconds 20 Seconds 30 Seconds 40 Seconds 50 Seconds 1 Minute 2 Minutes 3 Minutes 4 Minutes 5 Minutes
Generic Inputs of DALI Input Device are being polled. Often there is no DALI Standard for such inputs. In order to reduce DALI traffic the poll rate should be defined as small as possibe. Sample: for temperature signal a poll rage > 1 Minute is sufficiant.	
The Value can be converted into proper format by f(x) = a*x +b.	
Multiplicative Factor a	**10** x0.1 Range -128 .. +128

Due to the situation that there is no standard it might be necessary that the value received from the DALI nput device has to be converted. The conversion can be done via f(x) = ax + b A value a=10 is converted into 1. A value a=100 is converted into 10.	
Additive Factor b	**0** x0.1 Range -128 .. +128
According to the decription mentioned above. A value b=0 is converted into 0. A value b=100 is converted into 10.	
Value sending condition	**Send on Request** Send on Change Send on Change and after Busreset
Use this parameter to define the conditions of sending the Value.	
Send Value by change of	**5** x0.1 Range 0 .. 255
This parameter specifies at which change the value is sent on the KNX. Sending event if the value has been changed by 0.5 results in the parameter „5".	
Activate Threshold Alarms	**No** Yes
By setting this parameter to „Yes" an additional threshold alarm is activated. **Attention:** The type of alarming is different according to the type of input signal.	
Threshold Alarm when value > Threshold Alarm when value <	25 18
Type: Temperature and Humidity In this type of input signal a value range is defined for status „good" and outside this range the status „alarm"  	
Threshold Alarm when value > Threshold Alarm when value >	800 1200

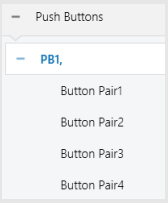
Type: CO2 and VOC

In this type of input signal two threshold limits can be defined in order to allow a pre-alarm.

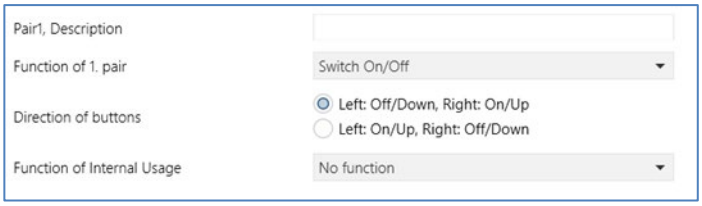
Hysteresis for Threshold Alarm	**0.5 °C** 2% or 16 ppm
According to the input signal the requested hysteresis can be defined.	
Behaviour in Alarm Status	**Send ON when Value in Alarm** Send OFF when Value in Alarm
This parameter defines the value send in alarm or normal status.	

21.7 Push buttons

The DALI Gateway supports DALI push button according DALI IEC 62386 Part 301/332.
Up to 8 push buttons with up to 8 buttons each can be configured.

Parameter	Settings
Description	
Use this parameter to define a description.	
Number of Buttons	2-fold 4-fold 6-fold **8-fold**
This parameter defines the number of buttons. Only a number of pairs is supported. According to this parameter additional tabs are being displayed:  	
Number of Instances	**1 Instance** 2 Instances 3 Instances 4 Instances
A push button can be supplied by up to 4 instances. The normal use case is the 1:1 assignment with 1 instance. But in special use cases it makes sense to allow more than 1 instance. Sample use case: A room with 2 door entrances: On each door there is one push button, but the functionality should be the same for both push buttons. In the ETS we define "ONE" push button, but we link 2 different instances of 2 different real push buttons to the ETS element in the DCA. Internally, the parameterised function is executed when either the one or the other real button is pressed. DCA View: **PB01 (Room with 2 entrance)** Type | Flag | Description L - PB01 (Room with 2 entrance) L - PB01 (Room with 2 entrance) R - PB01 (Room with 2 entrance) R - PB01 (Room with 2 entrance)	

21.7.1 Push buttons - pair

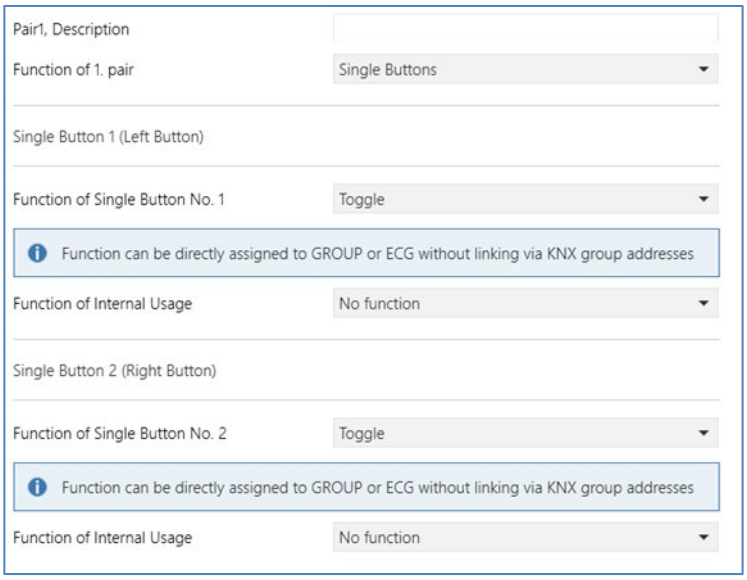


Parameter	Settings
Description	
Use this parameter to define a description.	
Function of pair	No function Switch On/Off Switching / Dimming with stop telegramm Shutter Set value fix Set value in steps Presence Single Buttons
Here the general function of the push button can be selected. A special mode is the selection "single button". In this case the button pair is splitted into single button with single functionality.	
Feedback available	**No** Yes
According to IEC 61386-332 Feedback elements of push buttons are being supported. If there is a DALI input device with LED feedback availabe, the next parameter defines the type of control.	
Feedback LED Left	**Always OFF** Always ON Status Status invers
This parameter defines the type of control.	
Feedback LED Right	**Always OFF** Always ON Status Status inverse
This parameter defines the type of control.	
Direction of buttons	**Left: Off/Down, Right: On/Up** Left: On/Up, Right: Off/Down
This parameter defines the direction and usage of the button pair.	
Function of Internal Usage	**No function** Set Group Set ECG
The function of the push button can also be directly used to interact with internal DALI Groups or ECGs. The advantage is that no group address has to be used and so an easy and quick configuration can be done. This possibility is available for: • Switch On/Off • Switching / Dimming • Set value fix • Set value in steps	
Group Number to be set	**1 ..16**
If internal usage is required here the Group number can be defined to be set by the button.	
ECG Number to be set	**1 ..64**
If internal usage is required here the ECG number can be defined to be set by the button.	

Function: Set Value fix	
Value left button	**0% .. 100%**
Value to be sent by pressing left button	
Value right button	**0% .. 100%**
Value to be sent by pressing right button	
Function: Set Value in steps	
Value Step size	2% **5%** 10% 20% 33% 50%
Value increased or decreased by given value and to be sent.	

21.7.2 Push buttons – single button

Each button can be used as a single button left and right. In this description, only one single button is described.



Parameter	Settings
Function of Single Button No.1	
The available functions to be used in single button mode are listed here.	
Function: Switch On/Off/Toggle	
Function of Internal Usage	**No function** Set Group Set ECG
The function of the push button can also be directly used to interact with internal DALI Groups or ECGs. The advantage is that no group address has to be used and so an easy and quick configuration can be done.	
Group Number to be set ECG Number to be set	**1 .. 16** **1 .. 64**
If internal usage is required here the Group or ECG number can be defined to be set by the button.	
Function: Set Value, Toggle Value	
Value 1 Value 2 (only in function „toggle value“)	**0% .. 100% (in steps of 5%)** **0% .. 100% (in steps of 5%)**
By pressing the button this value will be sent.	
Function of Internal Usage	**No function** Set Group Set ECG
The function of the push button can also be directly used to interact with internal DALI Groups or ECGs. The advantage is that no group address has to be used and so an easy and quick configuration can be done.	
Group Number to be set ECG Number to be set	**1 .. 16** **1 .. 64**
If internal usage is required here the Group or ECG number can be defined to be set by the button.	
Function: Switch On/Off/Toggle, Set Value, Toggle Value	
Feedback available	**No** Yes
According to IEC 61386-332 Feedback elements of push buttons are being supported. If there is a DALI input device with LED feedback availabe, the next parameter defines the type of control.	
Feedback LED Left or LED Right	**Always OFF** Always ON Status Status inverse
This parameter defines the type of control.	
Function: Scene invoke, Scene invoke/program	
KNX Scene Number to be set	**1 .. 64**
This parameter defines the KNX Scene number to be sent via communication object.	
Function of Internal Usage	**No function** Scene

The function of the push button can also be directly used to interact with internal DALI Scenes. The advantage is that no group address has to be used and so an easy and quick configuration can be done.	
Internal Scene Number to be set	**1 .. 16**
This parameter defines the internal DALI Scene number to be set.	
Function: Effect start/stop (intern only)	
Function of Internal Usage	**No function** Effect start Effect stop
The function of the push button can also be directly used to interact with internal DALI Scenes. The advantage is that no group address has to be used and so an easy and quick configuration can be done.	
Internal Effect Number to be set	**1 .. 16**
This parameter defines the internal Effect number to be started or stopped.	
Function: Toggle / Dimming (intern only)	
Function of Internal Usage	**No function** Set Group Set ECG
The internal use function allows direct one-button dimming of a group or ECGs. A short press of the button switches the selected group (or the selected ECG) between the switch-on and switch-off value. Dimming is performed with a long press of the button. The dimming direction changes each time the button is pressed. No communication objects for controlling external KNX devices are available for this function.	
Group Number to be set ECG Number to be set	**1 .. 16** **1 .. 64**
Here the Group or ECG number for one-button dimming can be defined to be set by the button.	

21.8 Generic KNX inputs

In this section up to 16 KNX Inputs can be defined with the purpose to transmit information from the KNX system to MQTT.

Parameter	Settings
Description	
Use this parameter to define a description.	
DataType	2 Byte float 1 bit 1 Byte (0..100%) 1 Byte unsigned 1 Byte signed 2 Byte unsigned 2 Byte signed 2 Byte float 4 Byte unsigned 4 Byte signed 4 Byte float no object
The data Type defines the general type of value to be transmitted	
Unit Type	°C (DPT9.001) No unit (Float value) °C (DPT9.001) Pa (DPT9.006) kW (DPT9.024) W/m2 (DPT9.022) m/s (DPT9.005) lux (DPT9.004) % Humidity (DPT9.007) s (DPT9.010) mA (DPT9.021) mV (DPT9.020) ppm (DPT9.008) air flow (m3/h - DPT9.009) °F (DPT9.027)
Depending on the data type different units are offered and the according DPT for the communication object is selected	

22 API/MGTT

22.1 General

There is an increasing demand for IoT functionality in order to alert or notify users anywhere over the internet.
The communication protocol selected is MQTT (Message Queuing Telemetry Transport (MQTT) protocol). It is a light weight protocol, which has a very low footprint to send and receive data. So, it uses very less amount of data to send and receive information. Therefore, MQTT is one of the best to open KNX data to the IoT world.

22.2 MQTT basics

22.2.1 MGTT client

The DALI Gateway works as a MQTT client. "A Client always establishes the Network Connection to the Server.
It can

- "Publish" Application Messages that other Clients might be interested in.
- "Subscribe" to request Application Messages that it is interested in receiving.
- "Unsubscribe" to remove a request for Application Messages.
- "Disconnect" from the Server.

Refer to: http://docs.oasis-open.org/mqtt/mqtt/v3.1.1/os/mqtt-v3.1.1-os.html

22.2.2 MQTT broker

Each MQTT Client has to connect to a so-called Broker. The broker is at the heart of any publish/subscribe protocol. Depending on the implementation, a broker can handle up to millions of concurrently connected MQTT clients.
Therefore, it is important that the broker is highly scalable. The part of MQTT Broker is not described in this document.

22.2.3 MQTT security

The MQTT specification does not define anything else on top of TCP, however the transport layer security (TLS) is recommended to be used.

22.3 MQTT communication

The MQTT connection is always between one client and the broker. Clients never connect to each other directly. Once the connection is established, the broker keeps it open until the client sends a disconnect command or the connection breaks.
Due to this method, there is no problem at all for clients that are located behind a NAT (Router). No additional management of Router NAT tables and port forwarding is necessary anymore.

22.3.1 Client ID

The client identifier (Client-Id) identifies each MQTT client that connects to an MQTT broker. The broker uses the Client-Id to identify the client and the current state of the client. Therefore, this Id should be unique per client and broker.

Client-ID should be unique for all Dali Gateways and in the broker management. The Client-ID, by default, contains the key word "dali" in conjunction with the unique serial number.
The client-ID can be changed by user via Web Frontend. The maximum number of characters is 23.

22.3.2 Topics

In MQTT, the word topic refers to a char string that the broker uses to filter messages for each connected client. The topic consists of one or more topic levels. Each topic level is separated by a forward slash (topic level separator).

This results in various method to identify an information. The topic structure can be defined on the root level to a certain DALI gateway or can be defined in an abstract way to make the structure independent of any Dali gateway hardware.

In current implementation the predefined topic structure contains the client-id as a fix assignment to the Dali Gateway.

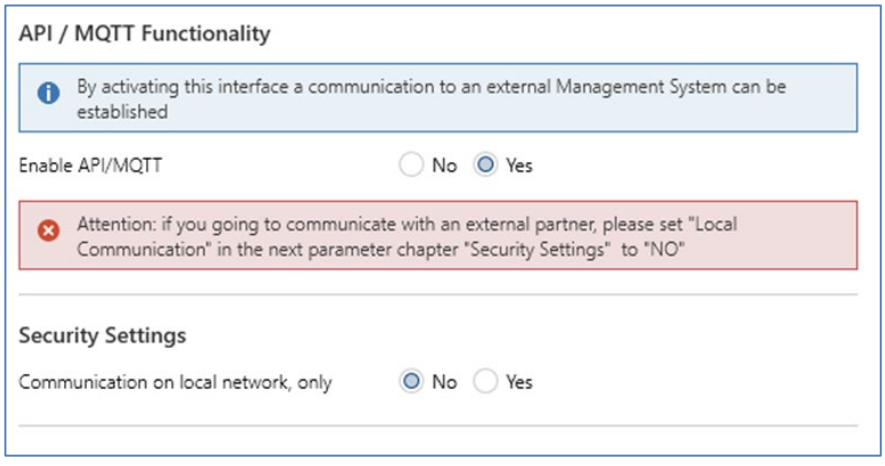
22.3.3 Topic structure and payload

The main topic up to the gateway can contain several location attributes, like:
[PROJECTID/][BUILDINGID/][ZONEID/]client-Id

The client-ID identifies the current DALI Gateway.
The location part [PROJECTID/][BUILDINGID/][ZONEID/] can be defined by ETS configuration. Each part can have a character length of 20 char.

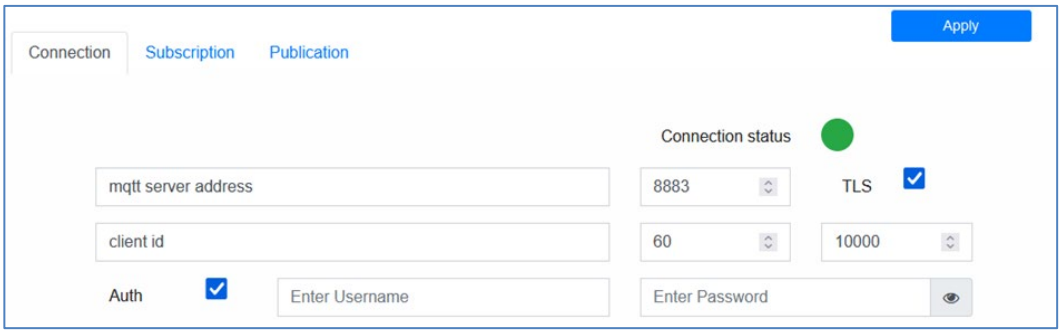
22.4 MQTT configuration page

Provided, that in ETS API/MQTT has been enabled, the configuration can be defined in Administrator tab of the Website.



The configuration distinguishes between:

- Connection
- Subscription
- Publication



22.4.1 Connection

The following entries have to be filled:

MQTT Server Adress:
Client ID: predefined with "dali" + serial number"
MQTT Server Port: predefined with "8883"
TLS: predefined "YES"
Keep Alive (s): predefined with "60"
Communication Timeout (ms): predefined with "1000"
Auth: authorisation defined by MQTT Server (Broker)

22.4.2 Substription

Subcription can be used to allow commands from external sources.
The predefined prefix is "cmd/", but could be changed on this page.

22.4.3 Publication

Right now 5 different information are provided:

- Groups
- Ecgs
- Emergency Lights
- Sensors
- KNX datapoints

The tag name for this part of topic can be changed on this page.

22.5 Publication and payload

22.5.1 Root Level ([location]/client-id)

On this root level the gateway provides three properties:

- status (always retained)

- info (always retained)
- statistics (always retained)
- config (always retained)

Sub-Topic status
The Sub-Topic status indicates the online/offline status. The offline status is propagated by the Last Will command. This information is published as "retained".

Sub-Topic info
Device specific information are provided. This information is published as "retained".

Sub-Topic statistics
Here the general statistics are being presented:

Number of Lamps
Number of ECGs
Number of Converter
Number of Lamp Failure
Number of ECG Failure
Number of Converter Failure
Failure Rate Lamps
Failure Rate ECG
Failure Rate Converter
Failure Rate Gateway
General Failure Mode


```
{
 "CntLamps": 7,
 "CntEcgs": 6,
 "CntConverter": 1,
 "LampFailures": 0,
 "EcgFailures": 0,
 "ConverterFailures": 0,
 "LampFailRate": 0,
 "EcgFailRate": 0,
 "ConverterFailRate": 0,
 "TotalFailRate": 0,
 "FailMode": 0
}
```


The general "FailMode" defines the status in a bit set, according:

Bit 0 Lamp Failure
Bit 1 ECG Failure
Bit 2 Converter Failure
Bit 3 Not Used
Bit 4 KNX Failure
Bit 5 DALI Failure

Sub-Topic config
The information of the static configuration is divided into group and ecg parts.

Sub-Topic config/groups


```
[
 {
  "Number": 1,
```

```
   "Name": "Group  1",
   "ColorType": 0,
   "CntEcgs": 1,
   "CntConverter": 0
  },
....
]
```


Up to 16 group information are stored in this topic. Each group contains information about the Description, the Colour Type defined in ETS, the number of ECGs and the number of assigned converter.

Definition of Colour Type:

- 0: no Colour
- 4: ColorTemp
- 5: xy Colour
- 6: RGBW
- 7: RGB
- 8: HSV
- 9: HSVW
- 10: CT+RGBW
- 11: CT+RGB
- 12: CT+HSV
- 13: CT+HSVW
- 14: CT Master
- 15: CT Slave

Sub-Topic config/ecgs


```
[
 {
   "Number": 1,
   "ShortAddress": 6,
   "LongAddress": 3430086,
   "GroupNumber": 3,
   "Name": "ECG No. 1",
   "DeviceType": 6,
   "ColorType": 0
 },
 ..
]
```


Up to 64 ECG information are stored in this topic. Each ECG part contains the number, the short and long address, the group number in case it is assigned to a group, the name, device type and the colour type.

In Case of Single ECG usage, not assigned to any group, the group number is set to 0.
Definition of Colour Type:

- 0: no Colour
- 4: ColorTemp
- 5: xy Colour
- 6: RGBW
- 7: RGB
- 8: HSV
- 9: HSVW

Sub-Topic energy

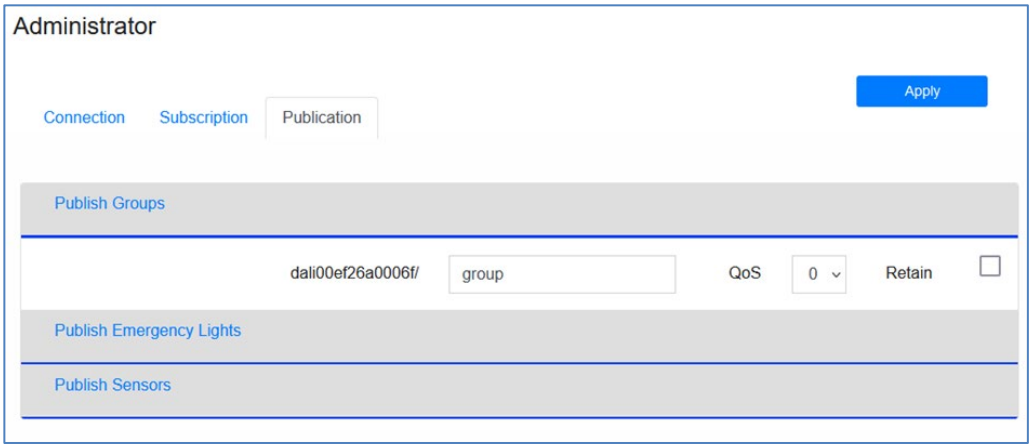

```
{
  "Value": 0,
  "Unit": "Wh"
}
```


Sub-Topic power


```
{
  "Value": 0,
  "Unit": "W"
}
```


22.5.2 Root level ([location]/client-id/group/index)

By default the Group Level topic is called "group". However, it can be modified on web MQTT configuration page. The maximal length is 15 char.



Sub-Topic status

Each group index indicates the value and current mode in json format:


```
{
  "Mode": 0,
  "Value": "0%"
}
```


Mode is defined according:

Bit 0	1 Byte	Permanent Mode
Bit 1	1 Byte	Panic Mode
Bit 2	1 Byte	Emergency Test Mode
Bit 3	1 Byte	Group Disable
Bit 4	1 Byte	PowerSwitchOff
Bit 5	1 Byte	AutoSwitchOff
Bit 6	1 Byte	Staircase Disable Mode
Bit 7	1 Byte	Lifetime Exceeded

Sub-Topic colour


```
"Colour": {
   "tc": 1345,
   "rgbw": {
    "r": 255,
    "g": 255,
    "b": 128,
```

```
    "w": 0
   }
  }
```

<tc> ::= "tc": <Colour-Temperatur>
<rgb> ::= "rgb": { "r": <0-255>,"g":<0-255>,"b":<0-255>}
<rgbw> ::= "rgbw": { "r": <0-255>,"g":<0-255>,"b":<0-255>,"w":<0-255>}
<hsv>::= "hsv": {"h":<0..255>,"s":<0-100>, "v":<0-100>}
<hsvw>::= "hsvw": {"h":<0..255>,"s":<0-100>, "v":<0-100>,"w":<0-255>}
<xy>::="xy": {"x": <0-65535>,"y":<0-65535>}

Sub-Topic statistics

```
{
  "CntLamps": 1,
  "CntEcgs": 1,
  "CntConverter": 0,
  "LampFailures": 0,
  "EcgFailures": 1,
  "ConverterFailures": 0,
  "FailRate": 100,
  "OperatingHours": 0
}
```

Sub-Topic energy

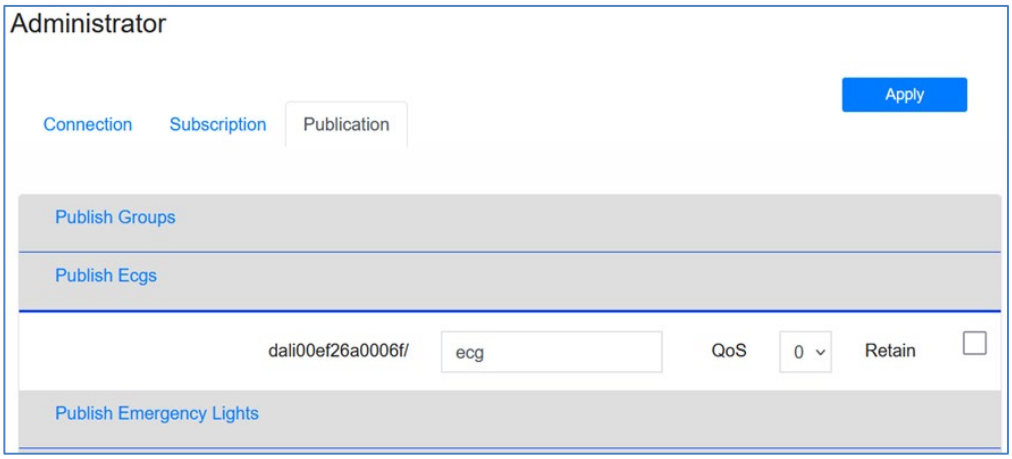
```
{
  "Value": 0,
  "Unit": "Wh"
}
```

Sub-Topic power

```
{
  "Value": 0,
  "Unit": "W"
}
```

22.5.3 ECG level ([location]/client-id/ecg/index)

By default the ECG Level topic is called “ecg”. However, it can be modified on web MQTT configuration page. The maximul length is 15 char.



Sub-Topic status
Each ecg index indicates the value and current mode in json format:

```
{
  "Mode": 0,
  "Value": "0%"
}
```

Mode is defined according:

Bit 0	1 Byte	Permanent Mode
Bit 1	1 Byte	Panic Mode
Bit 2	1 Byte	Emergency Test Mode
Bit 3	1 Byte	not used
Bit 4	1 Byte	PowerSwitchOff
Bit 5	1 Byte	AutoSwitchOff
Bit 6	1 Byte	Staircase Disable Mode
Bit 7	1 Byte	Lifetime Exceeded

Sub-Topic colour

```
{
   "tc": 1345
}
```

<tc> ::= “tc”: <Colour-Temperatur>
<rgb> ::= “rgb”: { “r”: <0-255>,”g”:<0-255>,”b”:<0-255>}
<rgbw> ::= “rgbw”: { “r”: <0-255>,”g”:<0-255>,”b”:<0-255>,”w”:<0-255>}
<hsv>::= “hsv”: {“h”:<0..255>,”s”:<0-100>, “v”:<0-100>}
<hsvw>::= “hsvw”: {“h”:<0..255>,”s”:<0-100>, “v”:<0-100>,”w”:<0-255>}
<xy>::=”xy”: {”x”: <0-65535>,”y”:<0-65535>}

Sub-Topic alarm
Each ecg indicates the alarm status in json format:
{
"Alarm": 0
}

Sub-Topic energy
{
"Value": 0,
"Unit": "Wh"
}

Sub-Topic power
{
"Value": 0,
"Unit": "W"
}

22.5.4 Sensor level ([location]/client-id/sensor/index)

Sub-Topic presence
Each sensor index indicates the brightness, if configured, and current Error in json format:
{
"Error": 0,
"Value": 1
}

Sub-Topic brightness
Each sensor index indicates the brightness (lux), if configured, and current Error in json format:
{
"Error": 0,
"Value": 228
}

Sub-Topic temperature
Each sensor index indicates the temperature (°C), if configured, and current Error in json format:
{
"Error": 0,
"Value": 20.2
}

Sub-Topic humidity
Each sensor index indicates the humidity (%), if configured, and current Error in json format:
{
"Error": 0,
"Value": 52
}

Sub-Topic co2
Each sensor index indicates the air quality (CO2 in ppm), if configured, and current Error in json format:
{
"Error": 0,
"Value": 528
}

Sub-Topic voc
Each sensor index indicates the air quality (VOC in ppm), if configured, and current Error in json format:
{
"Error": 0,
"Value": 528
}

Sub-Topic sound
Each sensor index indicates a sound (db) type, if configured, and current Error in json format:
{
"Error": 0,
"Value": 76
}

Sub-Topic genericUnsigned
Each sensor index indicates a generic value type, if configured, and current Error in json format:
{
"Error": 0,
"Value": 128
}

Sub-Topic genericFloat
Each sensor index indicates a generic value type, if configured, and current Error in json format:
{
"Error": 0,
"Status": 77.89
}

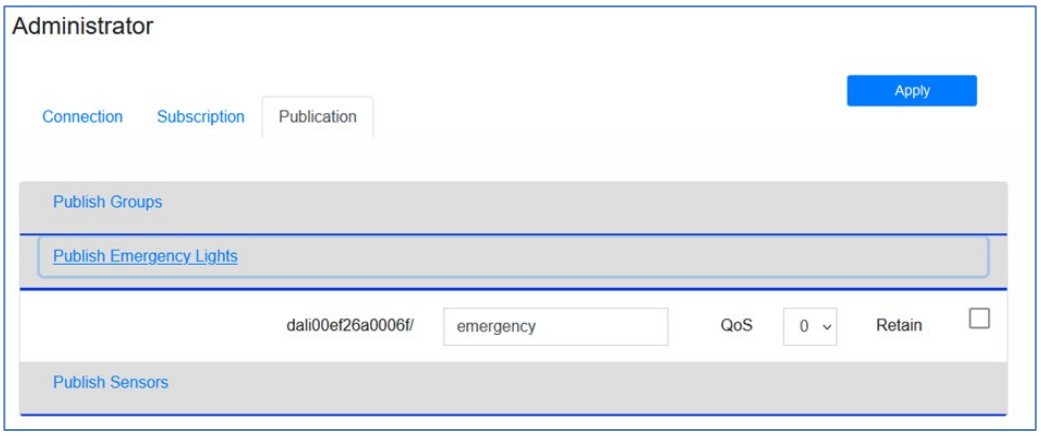
22.5.5 KNX datapoint level ([location]/client-id/knx/index)

In the ETS configuration up to 16 KNX Inputs can be defined in order to publish the information via MQTT.

Sub-Topic knx
{
"Value": 22,
"Unit": "°C"
}

22.5.6 Emergency level ([location]/client-id/emergency/index)

Attention: The index is linked to the device short address and NOT to ETS ECG number!



Sub-Topic emstatus
Each self-contained emergency ECG indicates the Status in json format:

```
{
 "ShortAdr": 6,
 "EtsNumber": 10,
 "State": 1,
 "EmStatus": 8,
 "EmMode": 130,
 "EmFailure": 0
}
```

ECG Short address as well as associated ETS number is part of this information block.

The "State" field indicates the State Machine according:

1st nibble (bit 0 – 3):
0: Unknown, 1: Normal Mode, 2: Inhibit Mode, 3: Fixed Inhibit Mode 4: Rest-Mode, 5: Emergency Mode, 6: Extend. Emergency Mode, 7: FT running, 8: DT running

2nd nibble (bit 4 – 7):
Bit 4 1 Bit FT Manually Started
Bit 5 1 Bit DT Manually Started
Bit 6 1 Bit FT Pending
Bit 7 1 Bit DT Pending
The "EMStatus" field indicates original result of DALI query 253.
The "EMMode" field indicates original result of DALI query 250.
The "EMFailure" field indicates original result of DALI query 252.

Sub-Topic emtest
Each self-contained emergency ECG indicates the Test-Report json format:

```
{
 "ShortAdr": 6,
 "EtsNumber": 10,
 "TestResult": 255,
 "TestMode": 1,
 "TestFlags": 0,
 "Hour": 15,
```

```
  "Minute": 15,
  "Second": 22,
  "Day": 9,
  "Month": 11,
  "Year": 21
}
```


ECG Short address as well as associated ETS number is part of this information block.

TestResult indicates the result:
[0..254] for 0..100% in Function Test (value 255 means "invalid")
[0..255] in minutes multiplied by 2 for Duration Test result

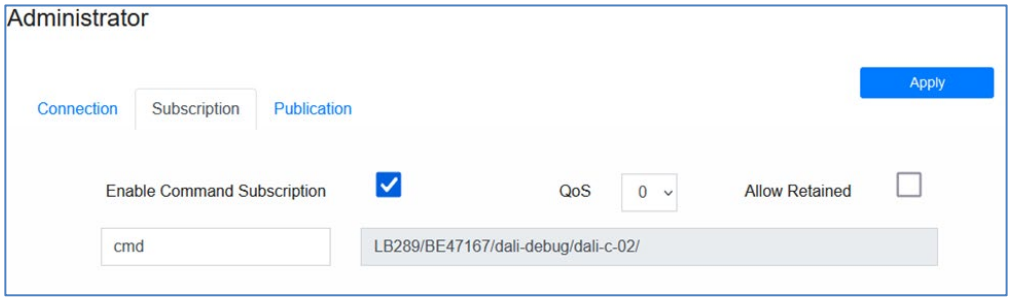
TestMode indicates the type of test:
1: Function Test
2: Duration Test
4: Battery Test

TestFlags:
Bit 0: Inverter Circuit Fault
Bit 1: Battery Duration Fault
Bit 2: Battery Fault
Bit 3: Lamp Fault
Bit 4: Delay Fault

Time Stamp: Time in Date/Time when this result has been generated.

22.6 Commands and payload

The MQTT Interface allows to send commands to special topics. This option has to be "enabled" in the configuration page of the Website.
A command is indicated with "cmd/" prefix in front of the topic.



22.6.1 Group level (cmd/[location]/client-id/group/index)

Sub-Topic status
Allowed payload content: on|off
Take care using lower case

Sub-Topic value
Allowed payload content: 0% .. 100% or 0 ..255

Sub-Topic tc
Allowed payload content: 0..10000

Sub-Topic colour
Allowed payload content: <colour-hex> | <colour-json>

<colour-hex>
#red,green,blue,white (coded 0..255)

<colour-json>
{
"rgb": { "r": 0..255, "g": 0..255, "b": 0..255}
Or
"rgbw": { "r": 0..255, "g": 0..255, "b": 0..255, "w": 0..255}

}

{
"hsv": { "h": 0..360, "s": 0..100, "v": 0..100}
Or
"hsvw": { "h": 0..360, "s": 0..100, "v": 0..100, "w": 0..255}

}

{
"xy": { "x": 0.0..1.0, "y": 0.0..1.0 }
}

22.6.2 ECG level (cmd/[location]/client-id/cdg/index)

Sub-Topic status
Allowed payload content: on|off
Take care using lower case

Sub-Topic value
Allowed payload content: 0% .. 100% or 0 ..255

Sub-Topic tc
Allowed payload content: 0..10000

Sub-Topic colour
Allowed payload content: <colour-hex> | <colour-json>

<colour-hex>
#reg,green,blue,white (coded 0..255)

<colour-json>
{
"rgb": { "r": 0..255, "g": 0..255, "b": 0..255}
Or
"rgbw": { "r": 0..255, "g": 0..255, "b": 0..255, "w": 0..255}

}

{
"hsv": { "h": 0..360, "s": 0..100, "v": 0..100}
Or
"hsvw": { "h": 0..360, "s": 0..100, "v": 0..100, "w": 0..255}

}

{
"xy": { "x": 0.0..1.0, "y": 0.0..1.0 }
}

22.6.3 Scene level (cmd/[location]/client-id/scene/index)

Allowed payload content: on
Take care using lower case.

23 FAQ

23.1 Web access

The IP address is called up in the browser, but the message "This page is not available" is displayed.

- The web page access must be activated in the ETS.
- The IP address must be entered in the form "https://<ip>.

23.2 Security

Despite an imported root certificate, no "secure" closed lock is displayed.
Probably the IP address was changed, and no new certificate was created. Please create a new device certificate as administrator.

After several failed logins, the device cannot be logged in and is no longer accessible.
After 3 failed login attempts, the connection to this IP address is blocked for one minute for security reasons.

The IP address of the DALI GW is correctly configured, but the device cannot be reached via a router or over the internet.
In the default setting, access is only allowed in local networks. This setting must be changed in the ETS.

The password has been forgotten.
An ETS download with the corresponding settings must be carried out. Afterwards the user is asked to enter a new and secure password.

23.3 DCA

The DCA does not display the configuration that is visible on the web page. The data was not synchronized. Please read out the device data, see chapter 18 DCA extras.

24 Disclaimer for cyber security

In order to protect plants, systems, machines and networks from online threats, it is necessary to implement a holistic, state-of-the-art security concept and keep it up to date.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks. These should only be connected to a network or the Internet if and to the extent that the connection is necessary and appropriate security measures (e.g. firewalls or network segmentation) are in place.

This is especially important when using external IoT services, e.g. MQTT brokers.
In addition, the security recommendations of Theben AG must be observed. For further information please contact your contact person at Theben AG or visit our website.

Theben AG strongly recommends using updates as soon as they are available and to always using the latest versions. Using versions that are no longer supported or not using the latest updates may increase your risk of online threats. Theben AG strongly recommends that you follow security recommendations regarding the latest security threats, patches, and related measures.

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25.1 Open Source Software used in Firmware

All Open Source Software components used within the product are shown on the website, refer to chapter 8.9 Calling the start page.

25.2 Open Source Software used in DCA

Package Name: ColorMine - Version: 1.1.3
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