Gateway KNX-DALI

DALIX

V1.0

PROGRAMMING MANUAL

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1 GENERAL DESCRIPTION

The DALIX gateway is a device used for control interface between DALI protocol lights and KNX devices.

It allows to control up to 64 DALI lights including an integrated power supply for them.

It is possible to control the lights through other KNX devices like touch panels, pushbuttons, etc. in previously configured and addressed installations.
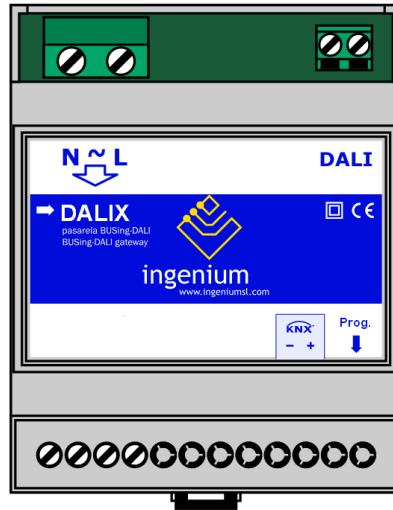
2 TECHNICAL INFORMATION

- Power supply: 230 Vac / 29 Vcc (EIB Bus).

- Maximum power consumption: 2,6 VA.

- Current consumption: 5 mA (EIB Bus).

- Mounting: DIN rail.

- Size: 4 DIN modules.

- Environment temperature range: Operation: -10ºC/55ºC; Storage: -30ºC/60ºC; Transportation: -30ºC/60ºC.

- Up to 64 DALI lights individual control.

- 16 DALI groups control.

- DALI power supply included.

3 PROGRAMMING

This manual shows how to configure the DALIX gateway memory however the DALI installation must have been addressed and the scenes and groups previously configured, otherwise the operation of the gateway could be wrong, to see how to configure the DALI installation see 3.1.8 DALI installation configuration (pag.11).

The DALIX gateway can be programmed with the following applications that can operate independently or interact with the others as if there were various autonomous devices connected to the KNX BUS:

- Dimmers: For conventional DALI dimming ballasts configuring and control.

- EmgNmx-k: For emergency Dali lights.

- UAL: Arithmetic and logic unit application.

3.1 DIMMERS

3.1.1 ADDING DALI LIGHTS

To include DALI lights in the ETS project it is necessary to add to the gateway memory a number of *Dimmer* applications. Each application will control one DALI light or group depending on the parameters configured.

We have to configure the DALI address of each light in the corresponding application. To do so, from the topology window, do right click on the device and select Edit parameters / General.
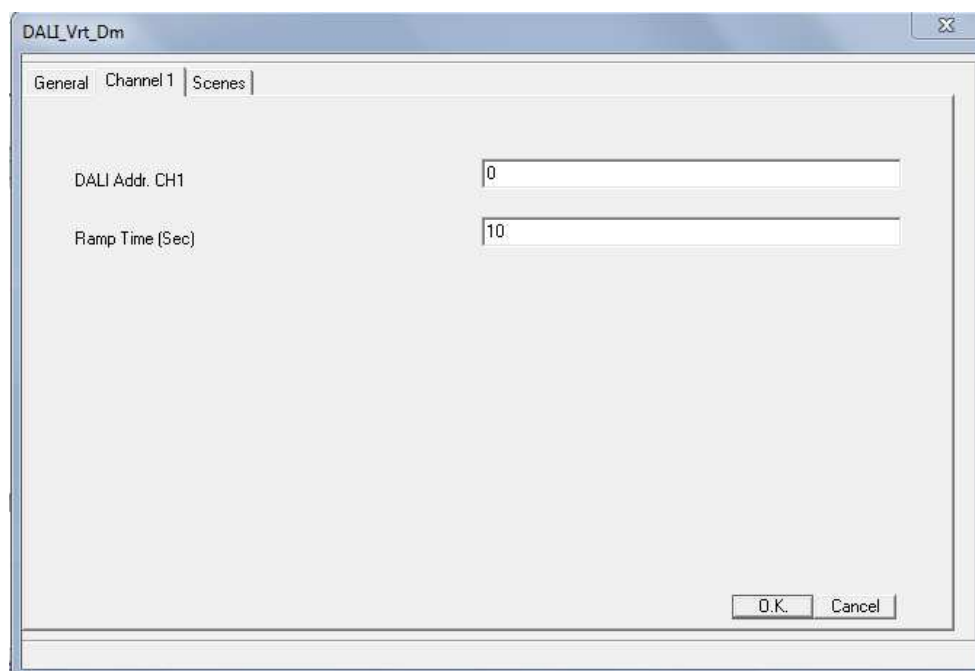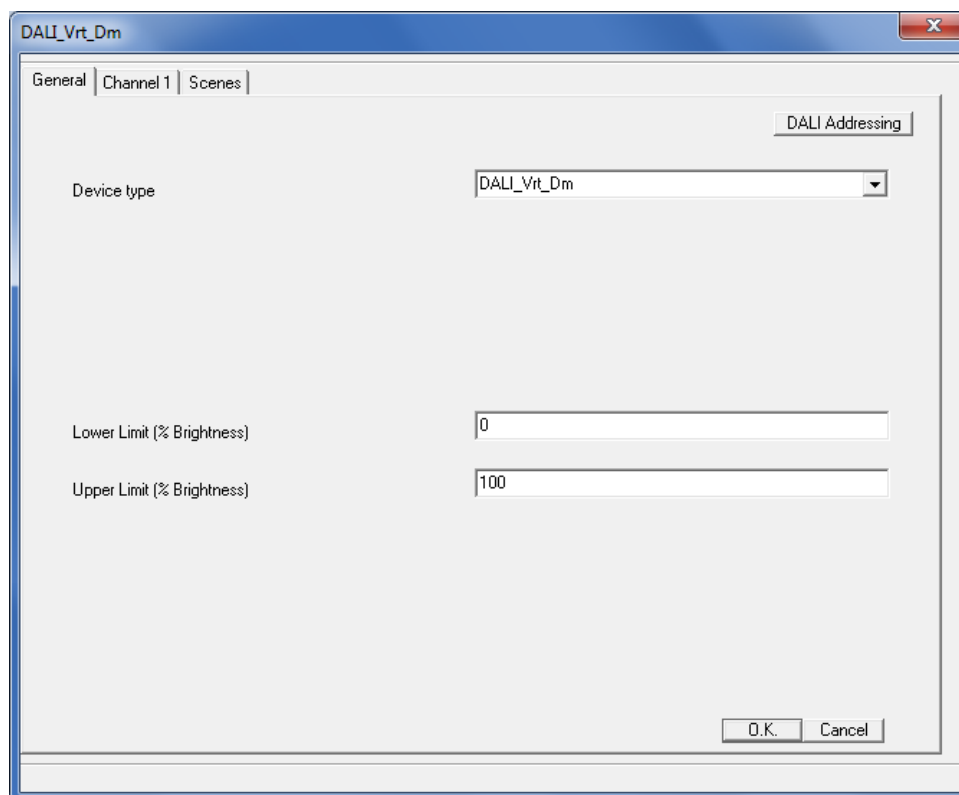
Some parameters can be hidden depending on the device selected or the previous configuration. The description of every parameter is shown next:

3.1.2 PARAMETERS: GENERAL

Device type	
Values	RK1000/2000, RK2x500, RK3x500, RGBL-K, DALI_virtual_dimmer, DMX_virtual_dimmer
Description	Allows to select the corresponding device that will be programmed by the application. The ETS will show or hide communications objects and parameters according to this parameter. In this case the device that must be selected is DALI_virtual_dimmer.
Lower limit	
Values	From 0 to 100
Description	Is the minimum regulation value (in percentage %) that the dimmer can reach. The brightness level of the dimmer will stop at the lower limit when receiving decrements by precise control telegrams (by object 2) or dimming telegrams (by object 1) and it can only be switched off with a "0" through the on/off or value objects (objects 0 and 2).
Upper limit	
Values	From 0 to 100
Description	Is the maximum regulation value (in percentage %) that the dimmer can reach. The brightness level of the dimmer will stop at the upper limit when receiving increments by precise control telegrams (by object 2) or dimming telegrams (by object 1).

In the next tab of the plugin we can set the DALI address number of the light and the ramp speed.

3.1.3   PARAMETERS: CHANNEL 1

DALI Address	
Values	From 0 to 79
Description	It is the DALI address number of the light (from 0 to 63). The communication objects of this application will control the DALI light configured here.
Ramp speed (sec)	
Values	From 0 to 255
Description	It is the brightness change rate measured in seconds. The brightness changes gradually when using Channel X value or dimmering communication objects. Typical value = 10 (seconds).

Now we can associate the device communication objects to the group address. The data traffic in both directions will be translated by the gateway so that the DALI light device will seem to be a KNX dimmer.

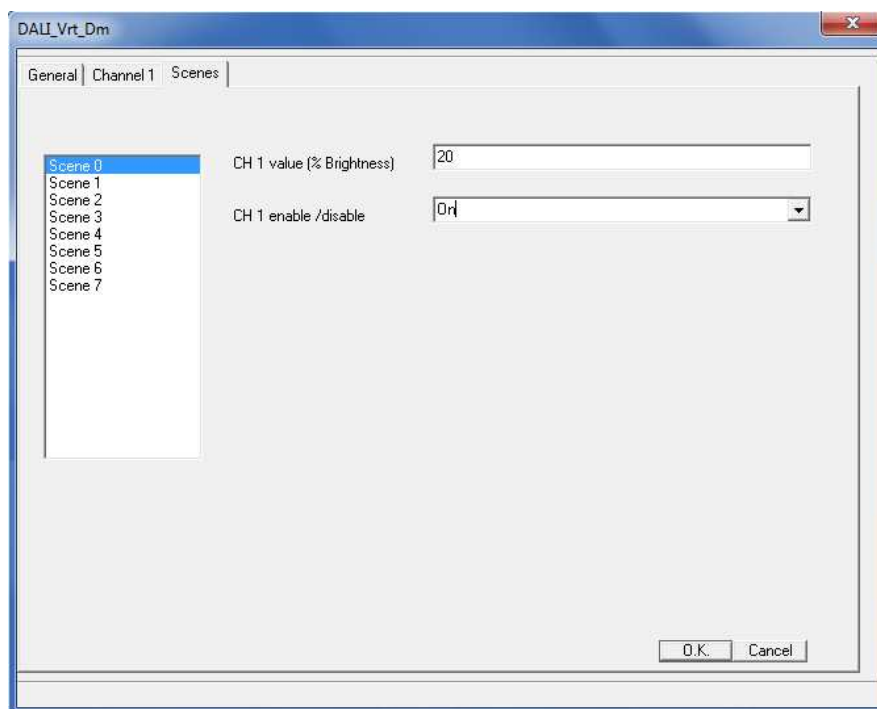| Number	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
0	CH1 - On/Off	CH1- On/Off			1 bit	C	-	W	T	-
1	CH1 - Dimmer	CH1 - Dimmer			4 bit	C	-	W	T	-
2	CH1 - Value	CH1 - Value			1 Byte	C	-	W	T	-
3	CH1 - On/Off state	CH1 - On/Off state			1 bit	C	R	W	T	U
4	CH1 - Value state	CH1 - Value state			1 Byte	C	R	-	T	U
21	DALI_Vrt_Dm-Enable	Enable			1 bit	C	R	W	T	-
22	Scene	Scene			1 Byte	C	-	W	T	-

Now we just have to program the device in the gateway, from this point the procedure is completely identical to the one with any other KNX device. Do right click over the device and select download, then press the gateway programming button when the software requests for it.

Repeat again to control the next DALI light with address 2 adding a new Dimmer application to the gateway memory and setting its DALI address parameter the value 2 and so on with the other DALI lights.

Address parameter	DALI address
0 - 63	0 - 63

3.1.4   PARAMETERS: SCENES 0 TO 7

The application allows to configure up to 8 DALI scenes that can be executed from bus commands with the corresponding communication object (number 22). The presets of the dimmer when calling a scene are configured in the following parameters tab:

Channel 1Value	
Values	From 0 to 100
Description	Is the value memorized in the scene for the brightness level of the dimmer. The brightness level will go up or down slowly according to the ramp speed configured if the scene is executed.
Channel 1 Enable	
Values	Yes/No
Description	Select if the channel is enabled (included in the scene) or not. In case of being enabled the channel will set the brightness configured in the value parameter when the scene is called.

3.1.5 COMMUNICATION OBJECTS

Number of communication objects: 6.

Number of assignments: 23.

Object	Name / Function	Length	DPT	Flags				
				C	R	W	T	U
0	CH1 on/off / Channel switch on and off	1 bit	1.001	●		●	●	
1	CH1 dimmer / Channel dimming	4 bits	3.007	●		●	●	
2	CH1 value / Set regulation value	1 byte	5.001	●		●	●	
3	CH1 on/off state / On/off status feedback	1 bit	1.001	●	●		●	●
4	CH1 value state / Regulation value feedback	1 byte	5.001	●	●		●	●
21	DALI Enable / Enables or disables the device	1 bit	1.001	●	●	●	●	
22	Scene / Scene execution	1 byte	5.010	●		●	●	

3.1.6 OBJECTS DESCRIPTION

Object 0: CH1 - On/Off

1 bit communication object to switch on and off the regulation channel 1. When a "1" is received through this object the dimmer is switched on and the brightness level goes up to the last regulation value. When a "0" is received the dimmer is switched off.

Object 1: CH1 - Dimmer

4 bits communication object for dimming control with pushbuttons. Depending on the dimming steps set in the pushbutton, telegrams will make the brightness level go up or down according to the ramp speed configured. Breaks telegrams to this object will stop the brightness at the current level.

Object 2: CH1 - Value

1 byte communication object for precise control by setting a new brightness level directly. The brightness level will go up or down slowly according to the ramp speed configured.

Object 3: CH1 - On/Off state

1bit communication object for feedback signalling of the on / off state of the dimmer. When the dimmer is off and receives a switch on telegram or a brightness value, a "1" is sent through this object. When the dimmer is on and it receives a switch off telegram or a brightness value of 0% a "0" is sent through this object.

Object 4: CH1 - Value state

1byte communication object for feedback signalling of the current brightness level of the dimmer. When it receives a new brightness value or an increase/decrease telegram the final brightness value is sent through this object.

| Object 21: DALI dimmer Enable |
|---|
| 1 bit communication object to enable or disable the device control through the KNX BUS. When a "0" is received through this object the device cannot be controlled by BUS telegrams. When a "1" is received the device is enabled. |
| **Object 22: Scene** |
| 1byte communication object for internal scenes execution. Scenes can be programmed in the parameters window of the device. There are up to 8 scenes available. |

3.1.7 ADDING DALI GROUPS

To include a DALI group in the ETS project it is necessary to add to the gateway memory a number of *Dimmers* applications, in the same way as done with DALI individual lights.

We have to configure the DALI group in the Address parameter. To do so, from the topology window, do right click on the device and select Edit parameters / General.
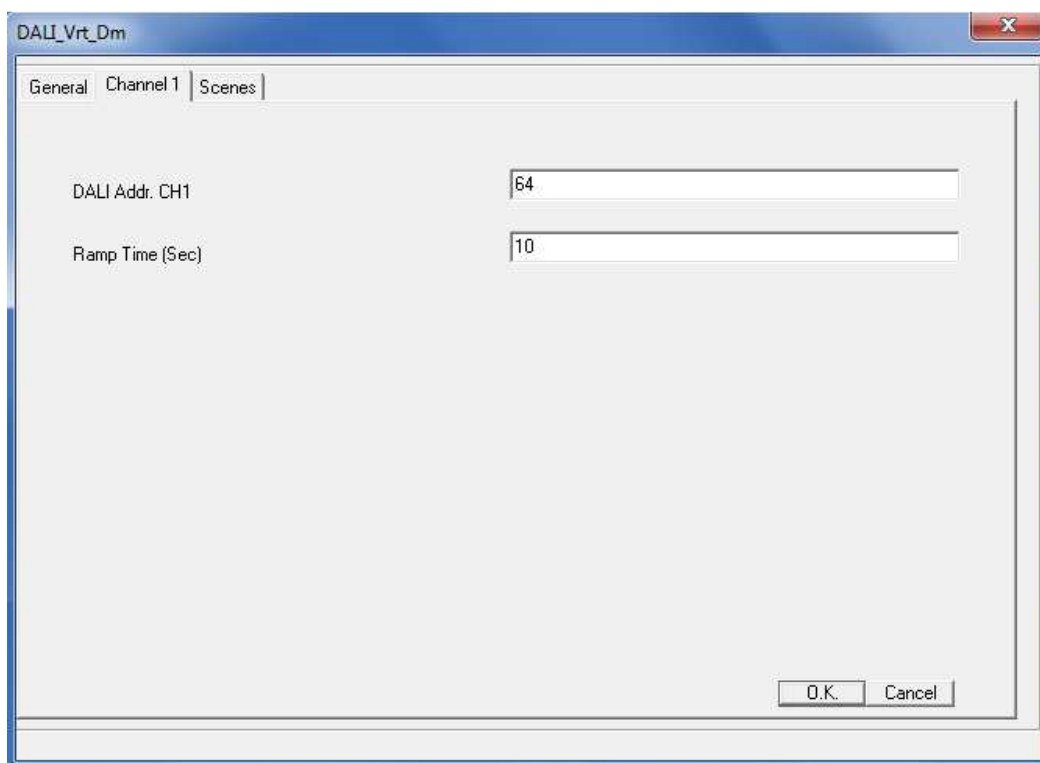
In the DALI address case set a number from 64 to 79 to control DALI groups from 1 to 16.

Now we can associate the device communication objects to the group address. The data traffic in both directions will be translated by the gateway so that the DALI group will seem to be a KNX device.

| Number ▲	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
0	CH1 - On/Off	CH1- On/Off			1 bit	C	-	W	T	-
1	CH1 - Dimmer	CH1 - Dimmer			4 bit	C	-	W	T	-
2	CH1 - Value	CH1 - Value			1 Byte	C	-	W	T	-
3	CH1 - On/Off state	CH1 - On/Off state			1 bit	C	R	W	T	U
4	CH1 - Value state	CH1 - Value state			1 Byte	C	R	-	T	U
21	DALI_Vrt_Dm-Enable	Enable			1 bit	C	R	W	T	-
22	Scene	Scene			1 Byte	C	-	W	T	-

Now we just have to program the device in the gateway, from this point the procedure is completely identical to the one with a native KNX device. Do right click over the device and select download, then press the gateway programming button when the software requests for it.

Repeat again to control the next DALI group number 2 adding a new Dimmers application to the gateway memory and setting its Address parameter with the value 66 and so on with the other DALI groups.

| BUSing direction	DALI group
64 - 79	1 - 16

3.1.8   DALI INSTALLATION CONFIGURATION

The DALI installation must have been addressed and the scenes, groups and parameters also configured, otherwise the operation of the gateway could be wrong. In the next section, we will see how to use the DALI addressing tool available in the ETS application.
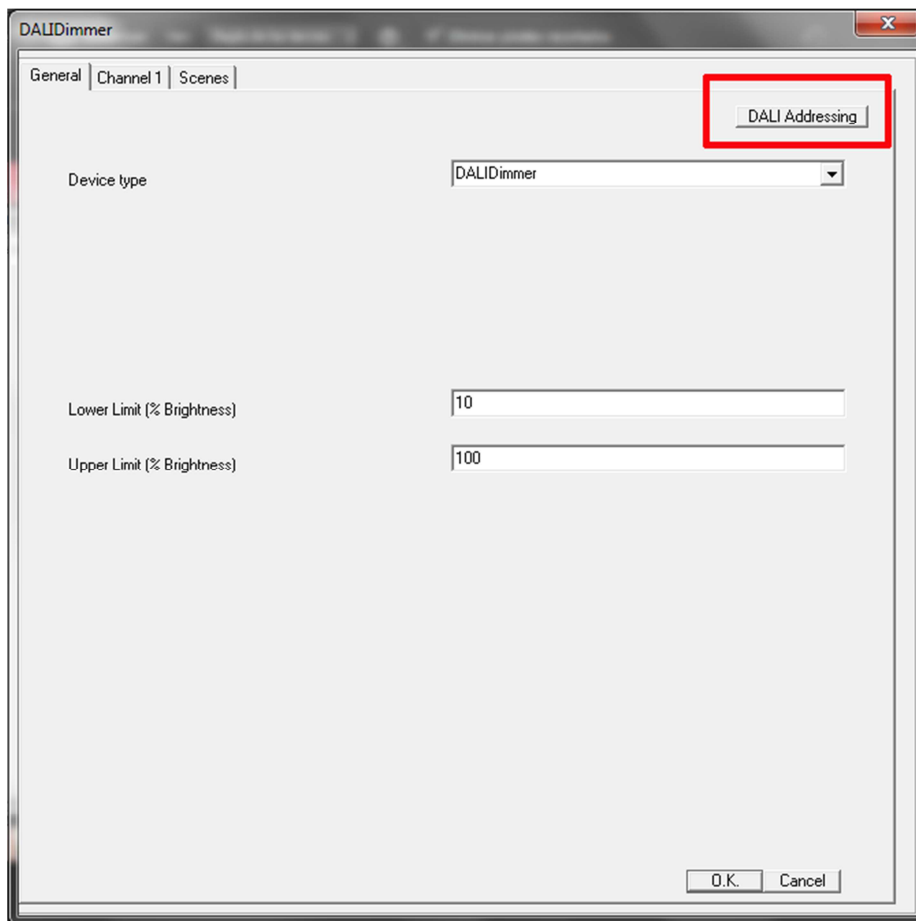
Once we have acceded to the DALI addressing tool, we will be able to edit and configure all internal parameters of DALI ballasts, even their DALI address.

We have different possibilities if we want to create a new installation from the beginning or if we want to increase an existing DALI installation.

The main interface of this tool has three different areas: one with three buttons on the upper right corner to do different process (detecting all connected ballasts, starting a new installation or editing an existing installation), one field below them to receive information and recognize the status of the process (for example, is shows us a validation message if the connection between the KNX DALI gateway and the PC have been done correctly), and one vertical field to list all DALI ballast which have been connected and recognized.
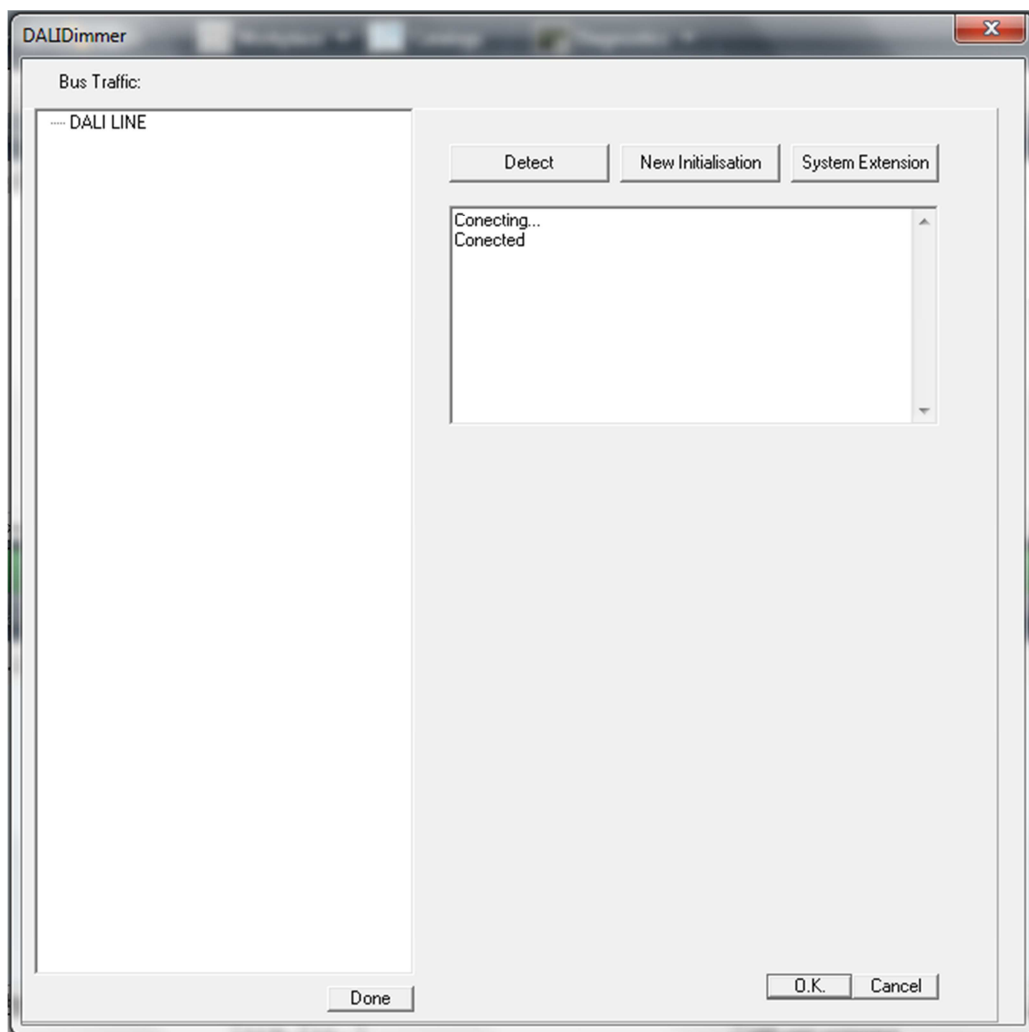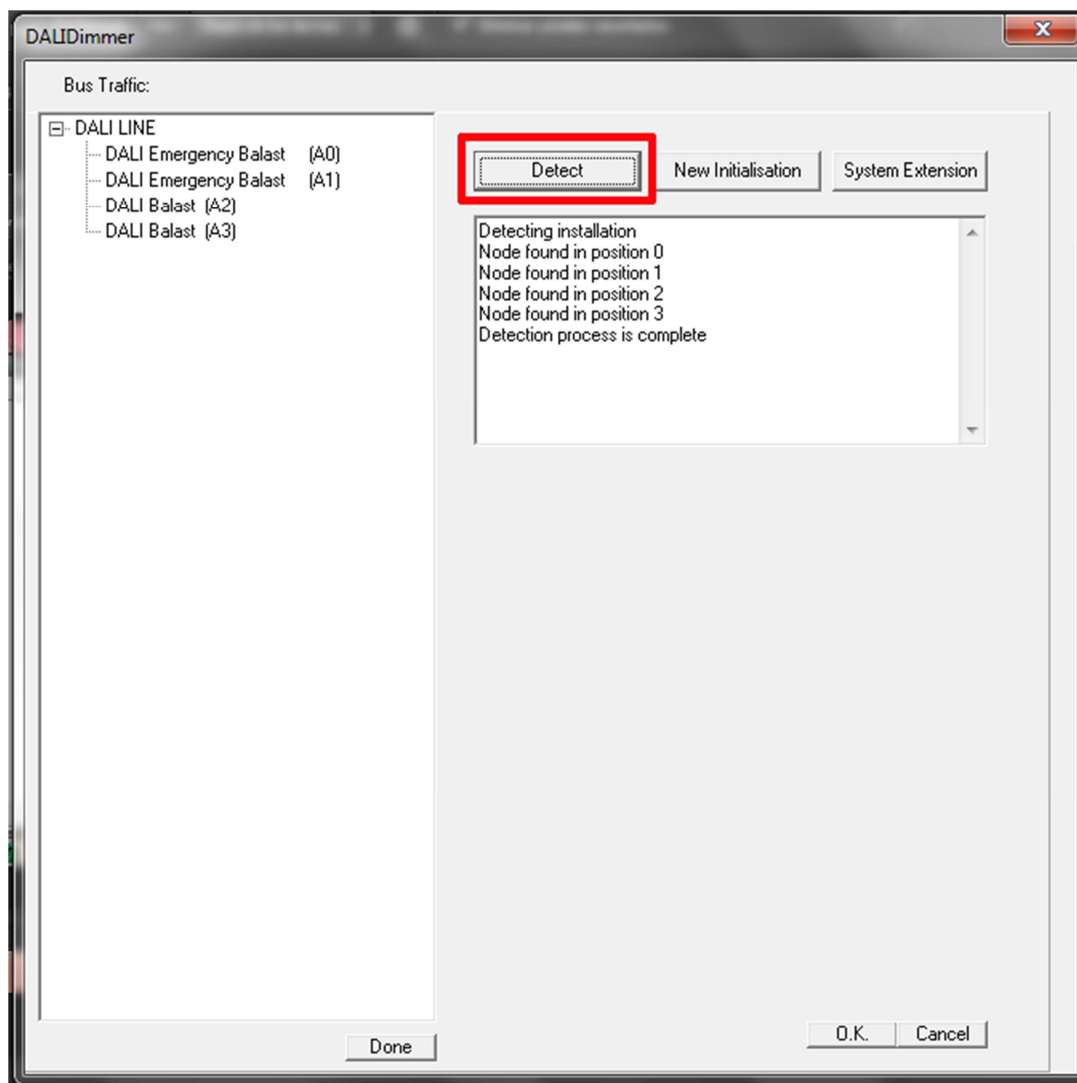
3.1.8.1 DETECTION PROCESS

With this option, this tool recognizes all DALI ballasts which are connected to the KNX DALI gateway with their assigned DALI address, allowing users to edit different DALI ballast parameters, even the DALI address.

To run this option, it is just necessary to click over "Detect" button. Process will start, and we will be able to follow the evolution through the field located below the buttons.

In the next picture, we can see a detection example with four DALI ballast as result. In the left vertical field, we can see the list of all detected ballasts. All of them show their own DALI address in brackets. E.g. (A0) -> DALI ballast with DALI Address = 0.

When the detection process is complete, the application will notify the end and users will have the possibility to edit different DALI parameters.

To edit some parameters individually, it is just necessary to select the DALI ballast in the left list, and the right application side, will show some options:

- DALI Address: User can edit this value (value from 0 to 63) and click on "Apply" to send the new DALI Address to the DALI ballast

- Maximum level: To dim the DALI ballast to 100%

- Off: To dim the DALI ballast to 100%

- Groups and Scenes: User can link this individual DALI ballast to a specific DALI group (0-15) or to specific the regulation value (0-255, where 0=0% and 255=100%) for each dimmer scene (0-15).
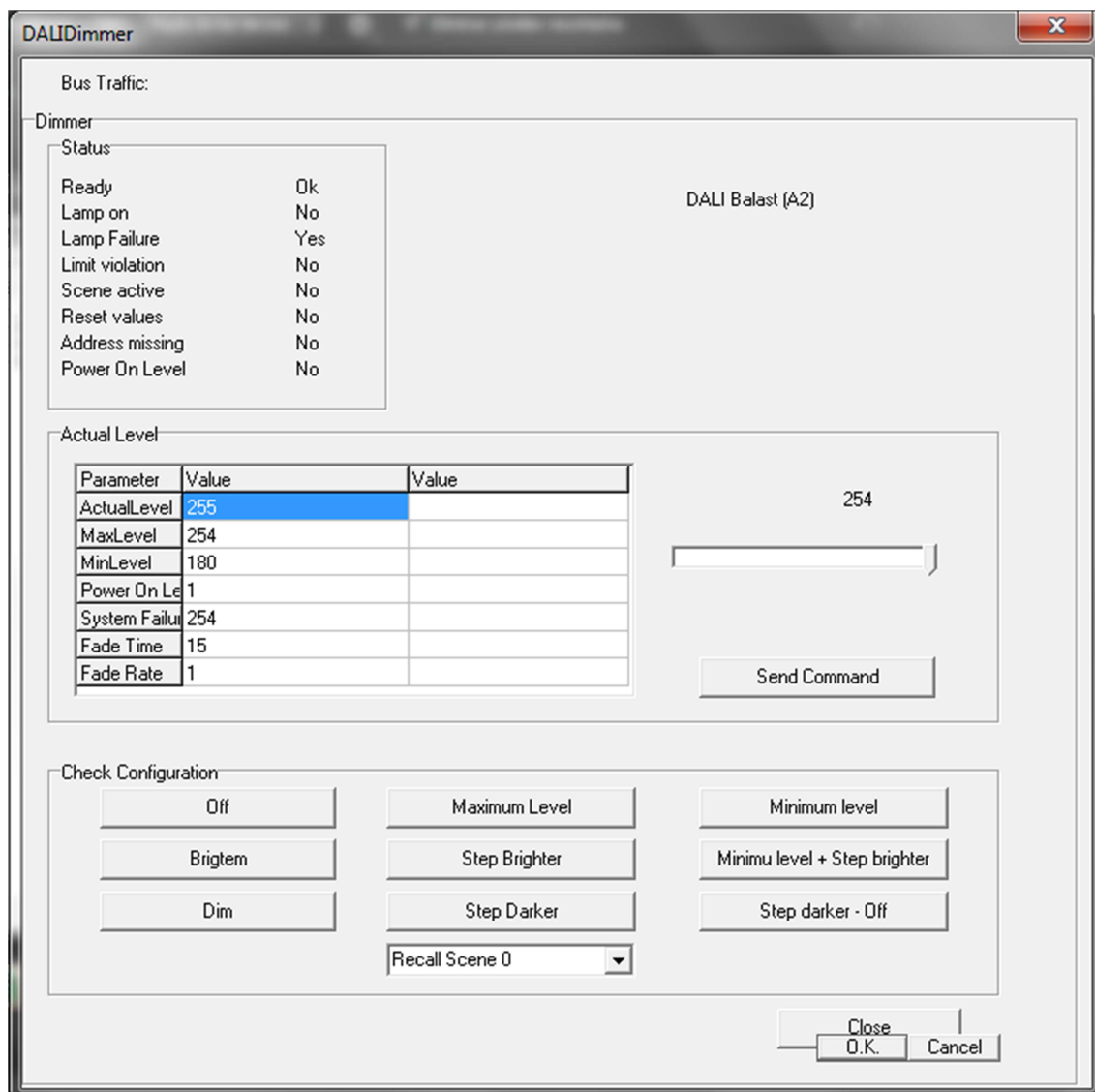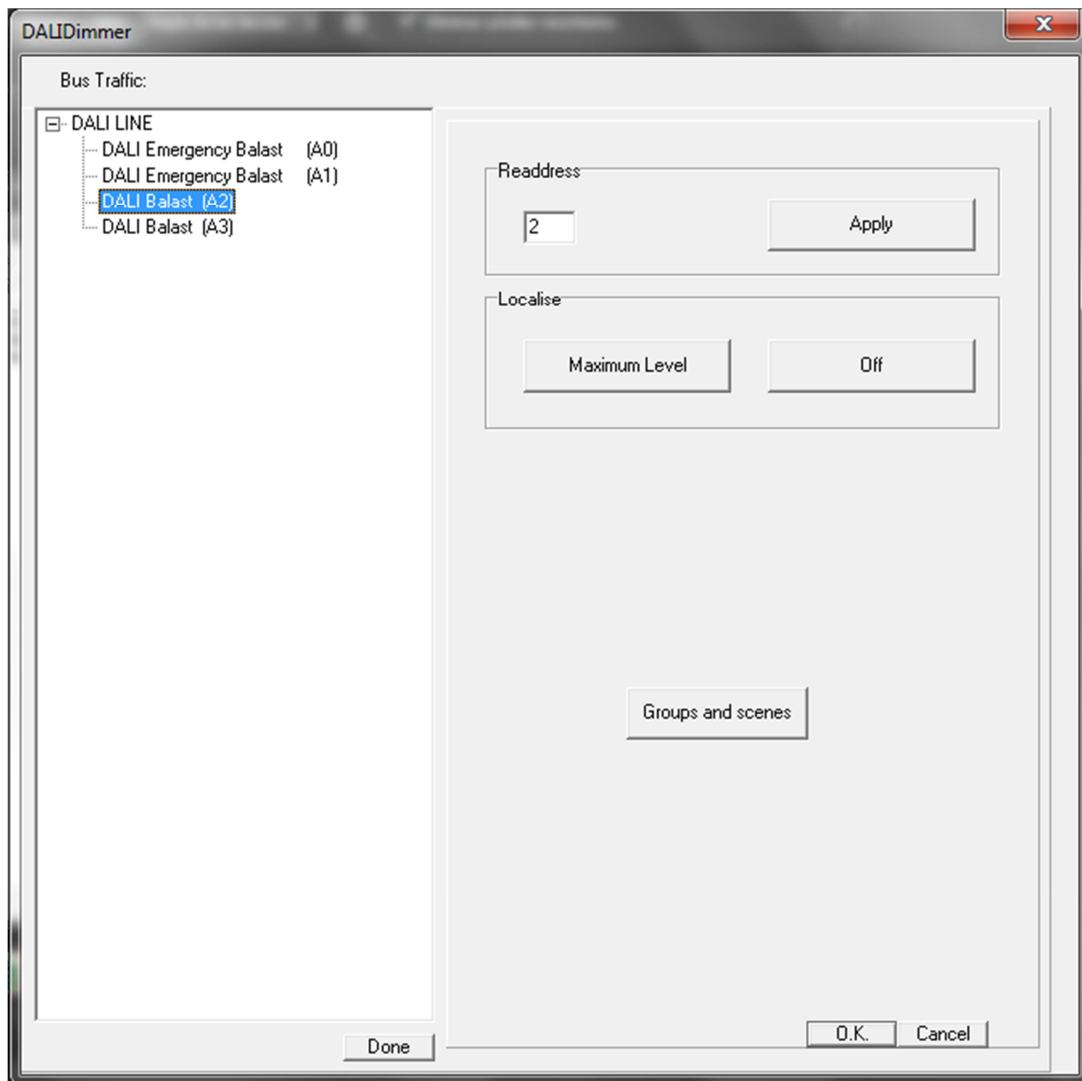
When user selects Groups and scenes options, the application completes the interface with the groups and the scenes available for this kind of dimmer. Next picture shows the interface for the Groups and scenes option.
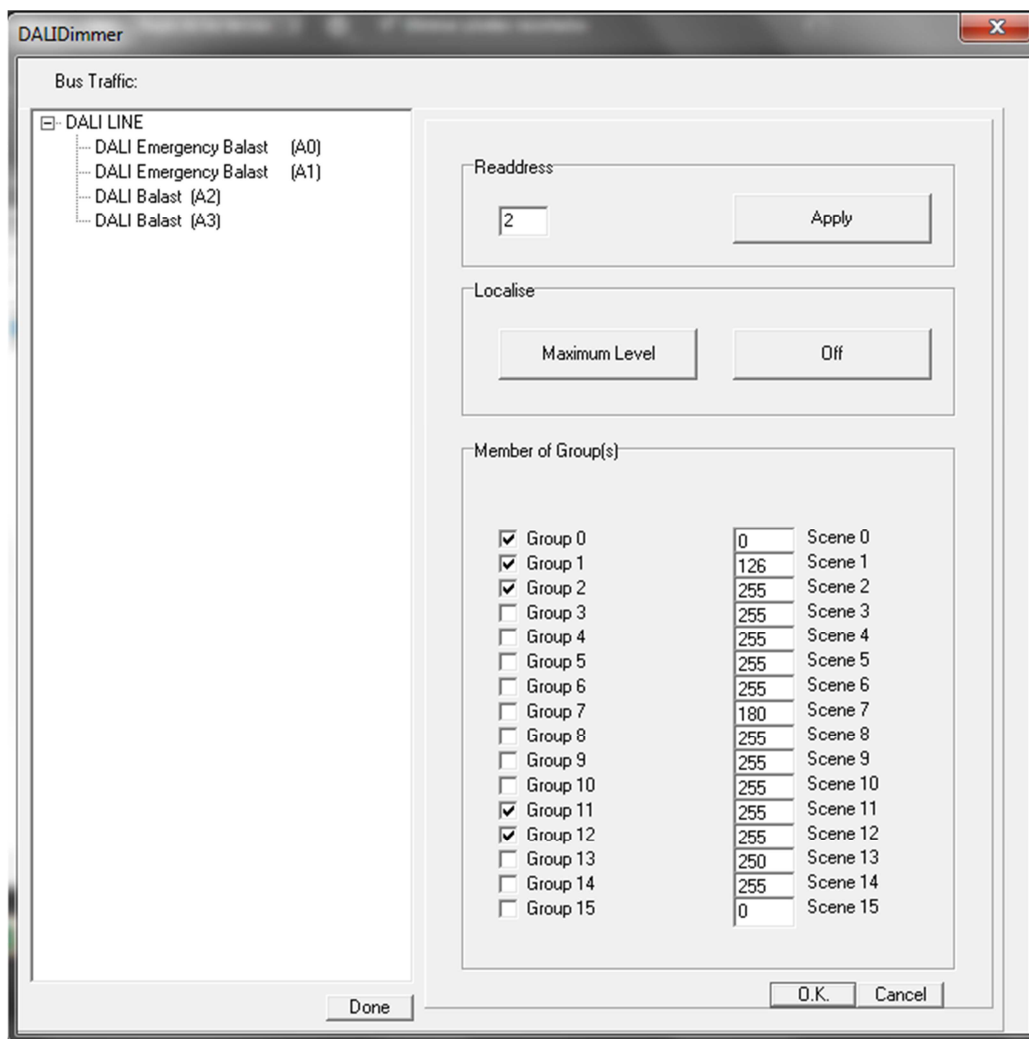
There is other option to edit more DALI ballast parameters. To access to them, it is necessary to do double left click over the DALI ballast listed in the left vertical field. Once the user selects the ballast and access to it (doing double click), the interface will be personalize for the selected DALI ballast as it is showed in the next picture.

The new interface shows for the indicated DALI ballast (upper right side), the current status (upper left side) and current values. It is also possible to regulate the % value using the slider located in the middle of the interface. In the lower area, there are some different buttons to check different status of the ballast like maximum or minimum level.

3.1.8.2 NEW INITIALIZATION

This second option, allows user to start a new installation, assigning new DALI address to DALI ballast recognized by the application. When the process is completed, the application notifies it to us showing a message in the right status field, as you can see in the next picture.

Once the process is complete, user can do all possibilities we have explained before with all detected ballasts.

Next picture shows an example of a new initialization process.
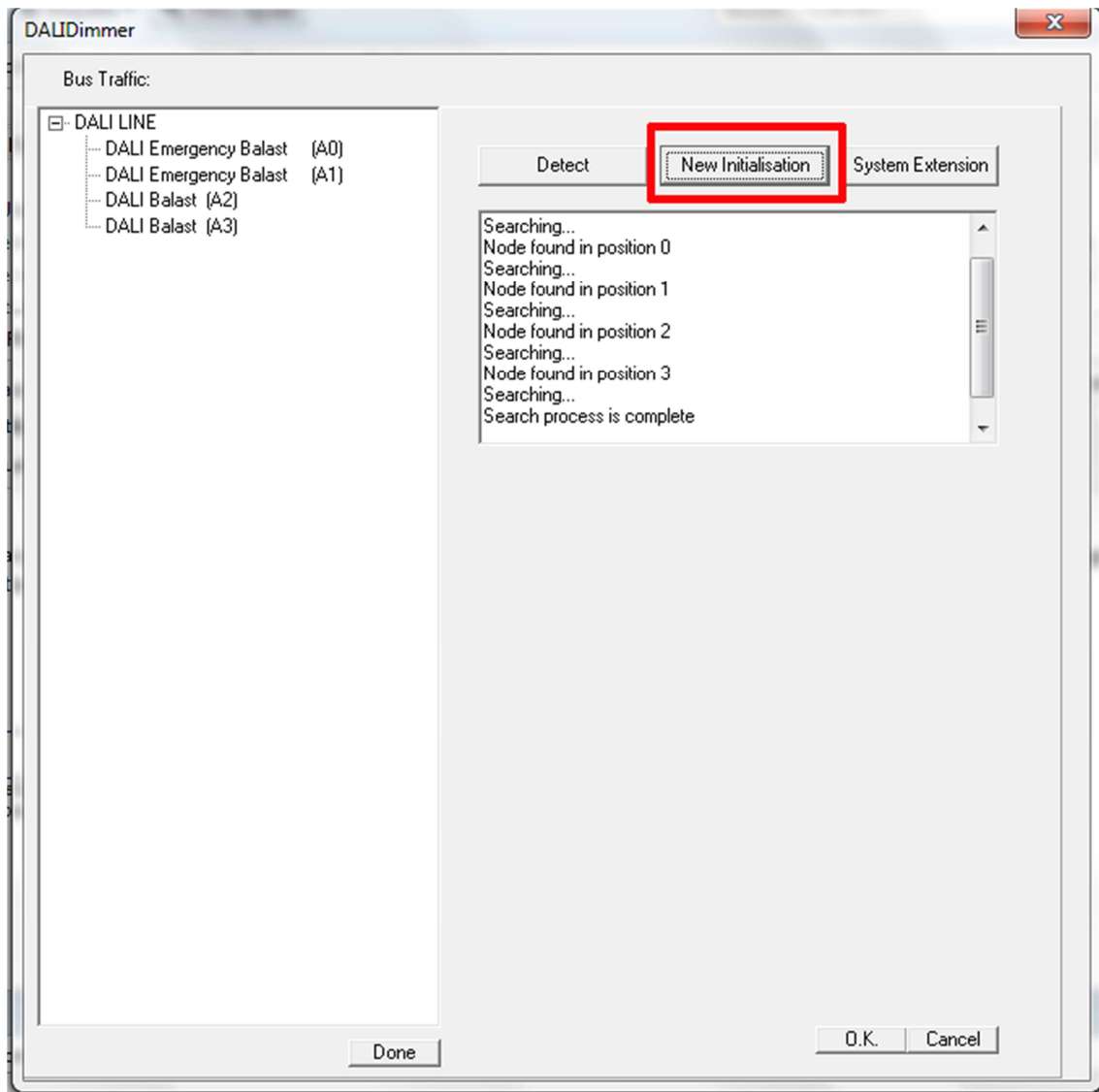
3.1.8.3 SYSTEM EXTENSION

As last option, the application allows user to increase an existing application, including new DALI ballast in free DALI addresses.

3.2 EMERGENCY LIGHTS

The programming process is similar to Dimmers application. Now we can see the description of the communication objects and general parameters.

3.2.1 COMMUNICATION OBJECTS

▲ ⬛ 1.1.4 EmgNmx-K
  ⬛ 0: Non maintained / maintained function - Modo funzionamento
  ⬛ 1: Fluorescent tube Alarm - Lamp Alarm
  ⬛ 2: Battery Alarm - Lamp Alarm
  ⬛ 3: Status: test in progress - Lamp status
  ⬛ 4: Status: Emergency - Lamp status
  ⬛ 5: Status: Rest mode - Lamp status
  ⬛ 6: Status: Low consumption - Lamp status
  ⬛ 9: Battery charge: percentage - Measure
  ⬛ 13: Functional test: in progress - Control
  ⬛ 14: Battery test: in progress - Control
  ⬛ 16: Rest mode: ON/OFF - Control

Communication object	Description
0 Mantained/Non manitained	The answer indicates if it is a permanent emergency or not. Not available for DALI emergency lights.
1 Fluorescent tube alarm	It is sent when there is a tube failure.
2 Battery alarm	It is sent when there is a battery failure.
3 Status : Test in progress	It is sent when the light changes to test mode.
4 Status : Emergency	It is sent when the light changes to emergency mode (Emergency on).
5 Status : Stand by mode	It is sent when the light changes to stand by mode.
6 Status : Low consumption	It is sent when the light changes to low consumption mode.
9 Battery charge percentage	Battery charge level.
13 Functional test	Starts functional test.
14 Battery test	Starts battery test.
16 Stand by mode	Allows to activate/deactivate stand by mode.

3.2.2 GENERAL PARAMETERS

Parmeters	Description
Operating mode transmition	Enable/Disable sending the operation mode when it changes.
Emergency status transmition	Enable/Disable sending the tube switching on and off event. On – Emergency mode Off – Stand by mode
Lamp alarm transmition	Enable/Disable sending the tube and battery alarm.
Status transmition	Not used
BUSing direction	For individual control of DALI emergency lights set DALI address. For DALI group control set a value between 64 – 79 for groups 1 – 16.

3.3 UAL APPLICATION

The UAL (Arithmetic and logic unit) application is also supported by the DALIX gateway. See the specific UAL programming manual ("MP_KNX_UAL.pdf") for further information.
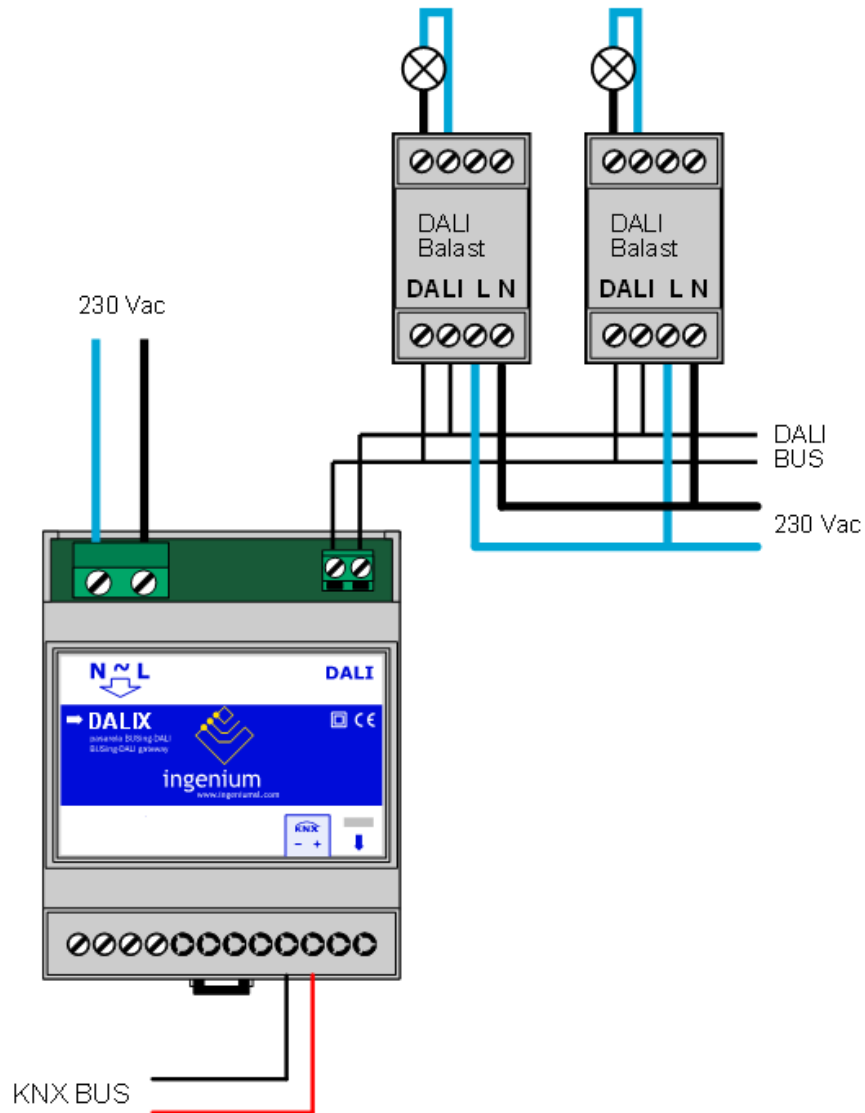
3.4 PROGRAMMING OPTIONS

3.4.1 RESTORE FACTORY SETTINGS

The DALIX allows to restore factory settings just using the programming button. To get this functionality, it is necessary to remove the KNX BUS connector from the device, push the programming button and connect the BUS while hold the programming button for 5 seconds. When LED status turns on, it indicates that the DALIX has been successfully restored.

3.4.2 SIMULTANEOUS PROGRAMMING

It is possible to program more than one application at the same time, just pushing once the programming button. To get this, it is necessary to push the programming button for 5 seconds, and the status LED blinks 10 times. Then, the gateway allows to program all applications you need. When the process ends, it is necessary to push the programming button for 5 seconds and the led should blink 5 times. This indicates that the process is over and we have left the programming mode.

4 INSTALLATION

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