

WAGO-I/O-SYSTEM 750 **DALI Multi-Master Module** **753-647**

**Configuration of a DALI Lighting System via WAGO-
I/O-PRO V2.3 Visualization**

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

We wish to point out that the software and hardware terms, as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

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1 Important Notes

To ensure fast installation and start-up of the units, we strongly recommend that the following information and explanations are carefully read and adhered to.

1.1 Legal Principles

1.1.1 Subject to Change

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1.1.3 Personnel Qualification

The use of the product described in this document is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the appropriate current standards. WAGO Kontakttechnik GmbH & Co. KG assumes no liability resulting from improper action and damage to WAGO products and third-party products due to non-observance of the information contained in this document.

1.1.4 Intended Use

For each individual application, the components are supplied from the factory with a dedicated hardware and software configuration. Modifications are only admitted within the framework of the possibilities documented in this document. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please send your requests for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

1.2 Scope of Applicability

This application note is based on the stated hardware and software from the specific manufacturer, as well as the associated documentation. This application note is therefore only valid for the described installation.

New hardware and software versions may need to be handled differently.

Please note the detailed description in the specific manuals.

1.3 Symbols

Attention



Attention!

Boundary conditions that must always be observed to ensure smooth operation.

Note



Important note!

Routines or advice for efficient use of a device and software optimization.

Information



Additional Information

Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

2 Description

This document describes the configuration of the DALI lighting system via the visualization of WAGO-I/O-PRO V2.3. The parameters of the DALI lighting system (e.g. group assignment, scene configurations) are preset using special ready-made input masks and transmitted to the electronic ballasts (control gear) via the DALI Multi-Master module 753-647.

Note



Access options

For the visualization of the WAGO-I/O-PRO V2.3, it is essential to establish a connection between the PC and the WAGO fieldbus controller. Depending on the fieldbus controller used, two options are available. The first option is available for all types of fieldbus controllers. Connection to the fieldbus controller's service interface is established via 750-923 USB communication cable. For the ETHERNET fieldbus controllers (e.g. KNX IP and BACnet/IP), there is the option of connecting via the ETHERNET interface.

3 Required Libraries

Table 1: Required libraries

Supplier	Short description
DALI_647_02.lib	DALI standard library
DALI_647_02.exp	Export file for the visualization
WAGOLIBMBX_01.lib	K-Bus ¹ communication
Standard.lib	Standard functions

4 Optional Libraries

To include functions related to type 1 and type 2 sensors, the following files are also required:

Table 2: Required libraries

Supplier	Label
DALI_647_SensorType1_02.lib	DALI sensor type 1 library
DALI_647_SensorType1.exp	Export file for the visualization
DALI_647_SensorType2_02.lib	DALI sensor type 2 library
DALI_647_SensorType2.exp	Export file for the visualization

¹ K-Bus = Internal data bus

5 Program call

To establish communication with the DALI Multi-Master module 753-647, an instance of the **FbMaster753_647** module is required (see Figure 1).

The **PrgDALIConfig** program module is called up in the main program (PLC_PRG) of the WAGO PLC. The program module controls the DALI standard visualization and is located in the *DALI_647_02.lib* library.

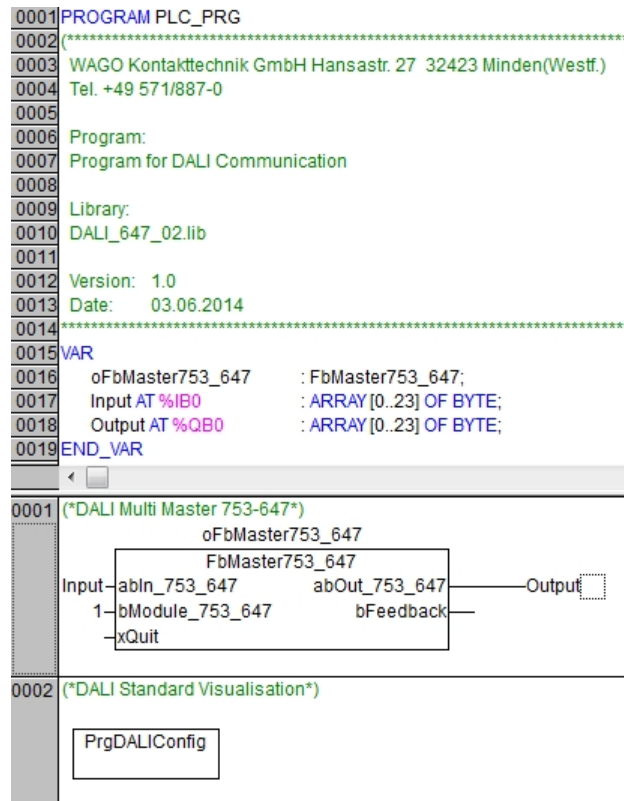


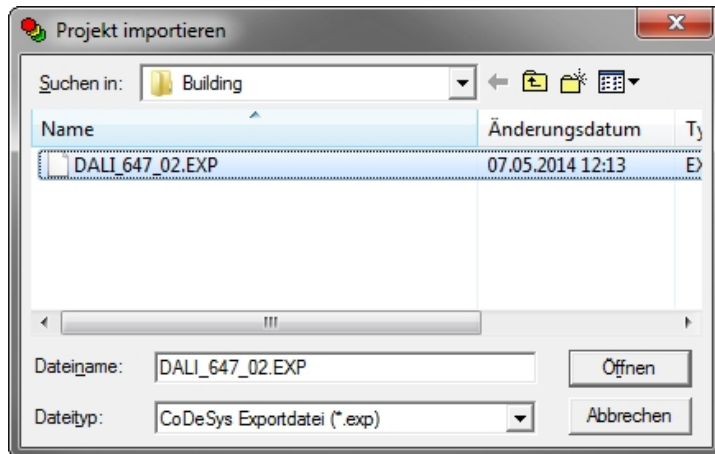
Figure 1: Program for calling up visualization.

To use the configuration interfaces for sensor types 1 and 2, the **PrgDALIConfigSensorType1** program modules from the *DALI_647_SensorType1_02.lib* library and the **PrgDALIConfigSensorType2** program module from the *DALI_647_SensorType2_02.lib* library must be added.

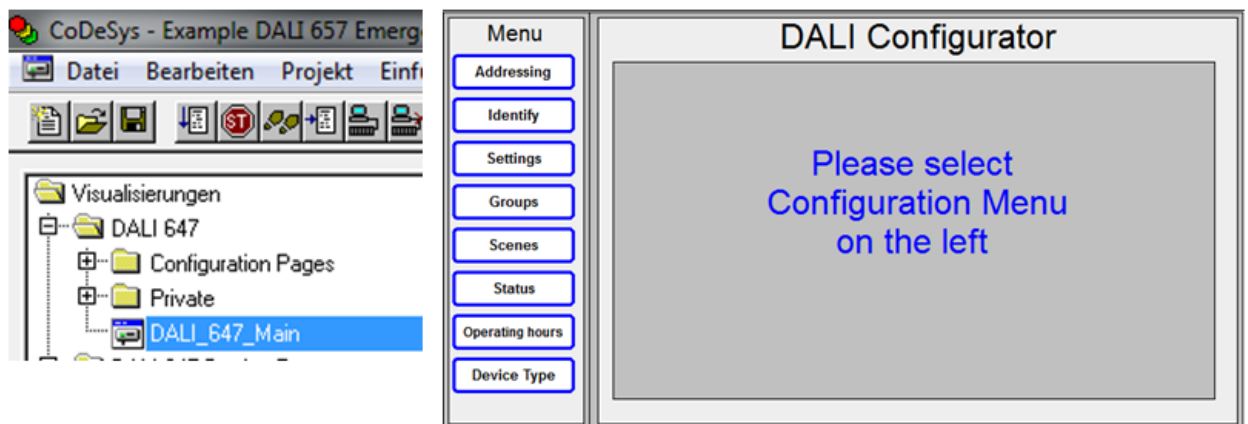
6 Visualization

6.1 Importing Visualization.

- 1) Import the *DALI_647_02.EXP* import file (**Project > Import**). The visualization is imported after pressing the **[Open]** button.



- 2) After importing the file, the *DALI 647* folder is added to the **Visualization** tab. The path to the start page of the *DALI_647_Main* visualization is *Visualizations\DALI 647*



To use the configuration interfaces for sensory types 1 and 2, the *DALI_647_SensorType1.exp* and *DALI_647_SensorType2.exp* export files must be added, which includes other visualization elements.

7 Description of the Configuration Interface

7.1 Home page

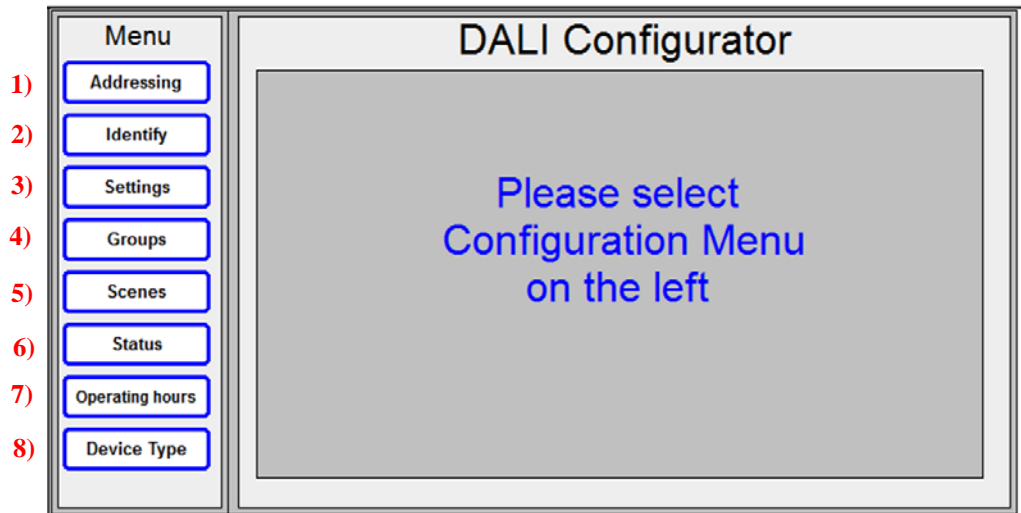


Figure 2: Start page

The selection menu on the left of the start page is used to navigate to the various DALI configuration interfaces.

- | | |
|-----------------------------|--|
| 1) [Addressing] | The short address can be allocated on this page. |
| 2) [Identify] | This page is used to identify the DALI control gear and to assign the short addresses. |
| 3) [Settings] | The DALI control gear can be configured on this page. |
| 4) [Groups] | The group can be assigned on this page. |
| 5) [Scenes] | The configuration interface is used to define the DALI light scenes. |
| 6) [Status] | The status of the attached DALI control gear can be queried here. |
| 7) [Operating hours] | The operating hours of the DALI control gear can be queried here. |
| 8) [Device Type] | The configuration interface is used to configure other DALI device types defined in IEC 62386. |

Note**Short addresses**

Once the DALI bus line is connected, the DALI Multi-Master module needs up to 1 minute until the short addresses available can be read from the memory.

Note**Error response**

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.2 Addressing

7.2.1 Addressing Control Gears

Figure 3: Addressing

Allocating short addresses can be controlled via **Addressing → Control Gears**.

- | | |
|--|---|
| <p>1) Module number</p> <p>2) Feedback</p> <p>3) [Random Addressing]</p> <p>4) [Stop Addressing]</p> | <p>Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.</p> <p>This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the <i>DALI_647_02.lib</i> in the appendix.</p> <p>By pressing this button, random addressing is carried out. Three choices are available:</p> <ul style="list-style-type: none"> • If you mark the checkbox for Set reset values, the newly addressed control gear is reset to its default values. • If you mark the checkbox for Only devices without short address, only the devices which do not yet have a short address will be addressed. • If you mark the checkbox for Change actual level, the control gear will change its dimming level after addressing. <p>By pressing this button, addressing is interrupted.</p> |
|--|---|

- | | | |
|-----|-------------------------------|---|
| 5) | [Physical Selection] | By pressing this button, physical addressing (e.g., unscrewing the lights) is started. Two choices are available: <ul style="list-style-type: none"> • If you mark the checkbox for Set reset values, the newly addressed control gear is reset to its default values. • If you mark the checkbox for Only devices without short address, only the devices which do not yet have a short address will be addressed. |
| 6) | [Delete short address] | By pressing this button, the short address entered is deleted. |
| 7) | [Reset values] | By pressing this button, the control gear values of the short address entered are reset. |
| 8) | [Sync Database] | By pressing this button, the module database is synchronized. |
| 9) | [Central On] | Central On. |
| 10) | [Central Off] | Central Off. |

Note**Error response**

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.2.2 Sensor Type 1 Addressing

Allocating short addresses can be controlled via **Addressing → Sensor Type 1**.

- 1) **Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) **Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 3) **[Start Addressing]** By pressing this button, random addressing is carried out. Three choices are available:
 - If you mark the checkbox for **Set reset values**, the newly addressed control gears are reset to their default values.
 - If you mark the checkbox for **Only devices without short address**, only the devices which do not yet have a short address will be addressed.
 - If you mark the checkbox for **Identify**, the sensor to be addresses flashes.
- 3) **[Stop Addressing]** By pressing this button, addressing is interrupted. It only appears when addressing is started.

- | | |
|----------------------------|---|
| 4) Multi Sensor Bus | After pressing button 3) or 8) , the multi-sensors available on the bus are marked in blue. The numbering does not concern the stored DALI addresses, rather fictional numbering of existing sensors. |
| 5) Multi Sensor PLC | In this line, the PLC configuration created by you is displayed. You have the option to assign any sensor number in the PLC line to an existing sensor from the overlying bus line. You can then use the PLC sensor number you selected in your project. |
| 6) Push Button Bus | After pressing button 3) or 8) , the switching sensors available on the bus are marked in blue. The numbering does not concern the stored DALI addresses, rather fictional numbering of existing sensors. |
| 7) Push Button PLC | In this line, the PLC configuration created by you is displayed. You have the option to assign any sensor number in the PLC line to an existing sensor from the overlying bus line. You can then use the PLC sensor number you selected in your project. |
| 8) [Read] | By pressing this button, the DALI bus is scanned for existing sensors. They are then displayed in bus lines 4) and 6) highlighted in blue. |
| 9) [Locate] | By pressing this button, "Locate" is enabled or disabled. If "Locate" is enabled, the sensor to be localized appears in the bus (4) and 6)) and in the PLC (5) and 7)) line in orange. Another sensor is located by clicking it. |
| 10) [Assign] | By pressing this button, assignment mode is enabled or disabled. When assignment mode is enabled, you can assign a sensor from the bus line (4) and 6)) a required sensor in your PLC configuration (5) and 7)). This happens by clicking "Bus sensors" and then clicking the required "PLC sensors". |
| 11) [Clear] | By pressing this button, clear mode is enabled or disabled. When clear mode is enabled, already assigned sensors in the PLC line (5) and 7)) are cleared, freeing up any memory locations. |

12) [Assign All]

This button only appears when assignment mode is enabled (**10**). By pressing this button, the bus configuration read in (**4**) and (**6**) is transferred to the PLC configuration (**5**) and (**7**).

Caution: Any existing PLC configuration is overwritten.

Note**Error response**

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the [**Quit**] button before you can continue using the configurator.

7.2.3 Sensor Type 2 Addressing

Allocating short addresses can be controlled via **Addressing → Sensor Type 2**.

- 1) **Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) **Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 3) **[Start Addressing]** By pressing this button, random addressing is carried out. Three choices are available:
 - If you mark the checkbox for **Set reset values**, the newly addressed control gear is reset to its default values.
 - If you mark the checkbox for **Only devices without short address**, only the devices which do not yet have a short address will be addressed.
 - If you mark the checkbox for **Identify**, the sensor to be addresses flashes.
- 3) **[Stop Addressing]** By pressing this button, addressing is interrupted. It only appears when addressing is started.

- | | |
|----------------------------|---|
| 4) Multi Sensor Bus | After pressing button 3) or 8) , the multi-sensors available on the bus are marked in blue. The numbering does not concern the stored DALI addresses, rather fictional numbering of existing sensors. |
| 5) Multi Sensor PLC | In this line, the PLC configuration created by you is displayed. You have the option to assign any sensor number in the PLC line to an existing sensor from the overlying bus line. You can then use the PLC sensor number you selected in your project. |
| 6) Push Button Bus | After pressing button 3) or 8) , the switching sensors available on the bus are marked in blue. The numbering does not concern the stored DALI addresses, rather fictional numbering of existing sensors. |
| 7) Push Button PLC | In this line, the PLC configuration created by you is displayed. You have the option to assign any sensor number in the PLC line to an existing sensor from the overlying bus line. You can then use the PLC sensor number you selected in your project. |
| 8) [Read] | By pressing this button, the DALI bus is scanned for existing sensors. They are then displayed in bus lines 4) and 6) highlighted in blue. |
| 9) [Locate] | By pressing this button, “Locate” is enabled or disabled. If “Locate” is enabled, the sensor to be localized appears in the bus (4) and 6)) and in the PLC (5) and 7)) line in orange. Another sensor is located by clicking it. |
| 10) [Assign] | By pressing this button, assignment mode is enabled or disabled. When assignment mode is enabled, you can assign a sensor from the bus line (4) and 6)) a required sensor in your PLC configuration (5) and 7)). This happens by clicking “Bus sensors” and then clicking the required “PLC sensors”. |
| 11) [Clear] | By pressing this button, clear mode is enabled or disabled. When clear mode is enabled, already assigned sensors in the PLC line (5) and 7)) are cleared, freeing up any memory locations. |

12) [Assign All]

This button only appears when assignment mode is enabled (**10**). By pressing this button, the bus configuration read in (**4**) and (**6**) is transferred to the PLC configuration (**5**) and (**7**).

Caution: Any existing PLC configuration is overwritten.

Note

Error response

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.3 Identification

Figure 4: Identification

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) [Read Short Address]** By pressing this button, the short addresses available are read and marked in blue.
- 3) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the module description for the *DALI_647_02.lib* in the appendix.
- 4a) Current Address** Here you can select the actual short address to replace the short address:
 - The short addresses available are marked in **blue**.
 - The selected short address to replace is marked in **green**.
- 4b) New Address** Here you can select the new short address to replace the short address:
 - The short addresses available are marked in **blue**.
 - The selected short address to replace is marked in **orange**.

- | | | |
|----|-------------------------|---|
| 5) | [Replace] | The DALI control gear is normally addressed in random order. Addresses can be replaced, however, to allow them to be assigned in a logical order. The (green) short address selected using the <i>Current Address</i> button and short address selected using the <i>New address</i> button (orange) can be replaced using the [Replace] button. |
| 6) | [Identification] | If this button is enabled, the lighting fixture is switched on currently selected in the Current Address field. |
| 7) | [Central On] | Central On |
| 8) | [Central Off] | Central Off |

Note**Short addresses**

Once the DALI bus line is connected, the DALI Multi-Master module needs up to 1 minute until the available short addresses can be read from the memory.

Note**Replacing short addresses**

To replace the short address, at least one short address must be available.

Note**Error response**

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.4 Control Gear Settings

Figure 5: Control Gear Settings

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the module description for the *DALI_647_02.lib* in the appendix.
- 3a) [Short address] / [Group]** This button is used to switch between short address and group commands. The button label also automatically adapts accordingly.
- 3b) Input field** Input field of the short address or group.
- 4) [Read]** By pressing this button, the parameters of the selected short address are read.
- 5) [Write]** By pressing this button, the available settings of the short address or group concerned are written.
- 6) Min Level** This value defines the minimum dimming value.
- 7) Fade Rate** The fade rate determines the dimming speed. The definition of the fade rate and dimming speed is available in the appendix of the module description for the *DALI_647_02.lib*.
- 8) Power On Level** Dimming value the supply voltage is restored.
- 9) Max Level** This value defines the maximum dimming value.
- 10) Fade Time** The fade time determines the fade rate for direct dimming values. The definition for fade time is available in the appendix of the module description for the *DALI_647_02.lib*.
- 11) System Failure** This parameter defines the dimming value when a

Level system failure occurs (e.g. bus short-circuit).

Note**Error response**

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

Note**Reading out group parameters.**

Group subscribers cannot be read out. If an attempt is made to read them out, an error message appears. You must acknowledge the error message by pressing the **[Quit]** button. However, group subscribers can be written.

7.5 Group Configuration

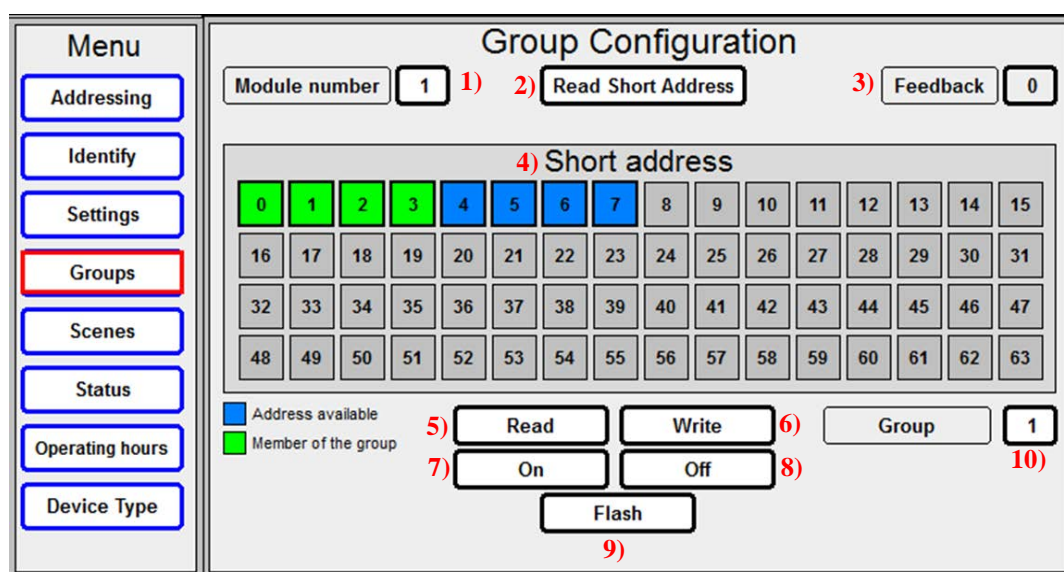


Figure 6: Group settings

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) [Read Short Address]** By pressing this button, the short addresses available are read and marked in blue.
- 3) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 4) Short Address** The status of the attached devices is displayed:
 - The short addresses available are marked in **blue**.
 - The group subscribers are marked in **green**.
- 5) [Read]** By pressing this button, the group subscribers are queried and marked in green.
- 6) [Write]** Group assignment of the DALI control gear is carried out by clicking on the short addresses marked in blue. The selected short addresses are displayed in green. For group formation, press the **[Write]** button.
- 7) [On]** Switch on the selected group
- 8) [Off]** Switch off the selected group
- 9) [Flash]** By pressing this button, the selected group begins to flash. This is used to check the group configuration. The flashing is stopped by pressing the button again.
- 10) Group** Group input field. Group subscribers are marked in

green.

Note

Group Configuration

The group configuration is automatically read when changing the group number!

Note

Short addresses

Once the DALI bus line is connected, the DALI Multi-Master module needs up to 1 minute until the available short addresses can be read from the memory.

Note

Error response

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.6 Scene Configuration

Figure 7: Scene configuration

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) [Read Short Address]** By pressing this button, the short addresses available are read and marked in blue.
- 3) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 4) Scene values** The short addresses available are marked in blue.
- 5) Input / output field of the light scene** The scene value read is output here. If the value changes, the new dimming value is called directly.
- 6) [Read]** The scene configuration is read for the selected scene in **8)** and output to the respective output area **5)**.
- 7) [Write]** The scene configuration is written to the control gear with the value entered in the input button **5)**.
- 8) Scene** Scene input field to be configured.
- 9) Send On Delta** The direct lamp value is transmitted to the control gear on a change in value when this checkbox is marked. A direct lamp value is not transmitted to the control gear when this box is not marked.

Note



Error response

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.7 Control Gear Status Query

Figure 8: Control gear status query

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 3) Short Address** The status of the attached control gear is displayed:
- **Blue:** The short address is available.
 - **Yellow:** Lamp is ON.
 - **Orange:** Lamp is defective.
 - **Red:** Control gear fault
- 4) [Read]** By clicking on this button, the status of the control gear is queried.

Note



Short addresses

Once the DALI bus line is connected, the DALI Multi-Master module needs up to 1 minute until the short addresses available can be read from the memory.

Note

Error response

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.8 Reading the Operating Hours

Figure 9: Read the operating hours

- 1) Module number** Specifies which DALI master module is to be addressed on the PLC. Counting is from left to right.
- 2) [Read]** By clicking on this button, an operating hours query is sent to all control gear.
- 3) Feedback** This output area displays a numeric code as a response. The numeric codes are listed in the function block description for the *DALI_647_02.lib* in the appendix.
- 4) Operating Hours** The operating hours read are output here. The operating hours can be reset by simply marking the short addresses. The short address selected (**purple**) is marked via mouse click.
- 5) [Reset Selected]** By pressing this button, the operating hours selected are reset.
- 6) [Reset All]** By pressing this button, all operating hours are reset.
- 7) [Set Selected]** This function is available starting with FW4. Operating hours can be edited starting with this version. The selected operating hours are written to the control gear when this button is clicked.

Note



Error response

In case of error, a pop-up window appears. You must first acknowledge the error by pressing the **[Quit]** button before you can continue using the configurator.

7.9 Configuring Different Device Types

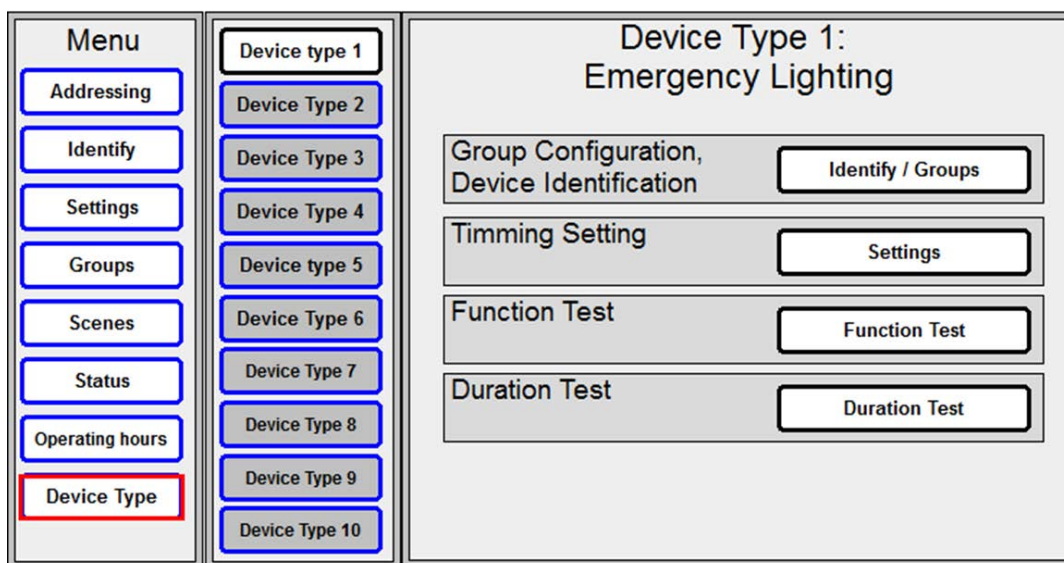


Figure 10: Selecting the device type

The navigation menu for all the various device types is displayed by clicking on the **[Device Type]** button. These device types are listed in IEC 62386.

[Device Type 1]	Configuration menu for device type 1 (device for emergency lighting)
[Device Type 2]	Configuration menu for device type 2 (device for HID lamps)
[Device Type 3]	Configuration menu for device type 3 (device for low voltage halogen lamps)
[Device Type 4]	Configuration menu for device type 4 (device for dimming incandescent bulbs)
[Device Type 5]	Configuration menu for device type 5 (conversion from digital signal to DC voltage)
[Device Type 6]	Configuration menu for device type 6 (LED)
[Device Type 7]	Configuration menu for device type 7 (switching function)
[Device Type 8]	Configuration menu for device type 8 (color control)
[Device Type 9]	Configuration menu for device type 9 (sequencer)
[Device Type 10]	Configuration menu for device type 10 (Optical control)

Note



Enabling the button **[Device Type X]**

The button of the device type concerned is only enabled when the respective library is integrated in the project.

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