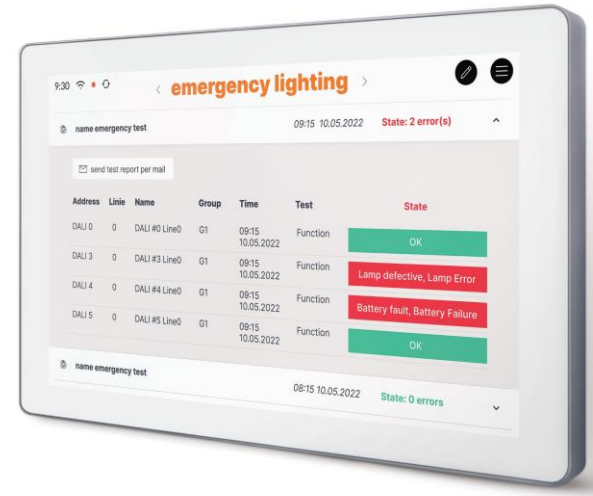
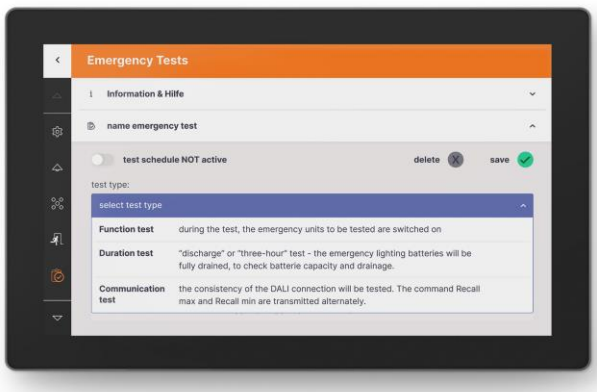
Lunatone

DALI-2 Display 7" Emergency





Datasheet

DALI-2 Control System

Multifunctional DALI-2 control
and operating unit for
DALI emergency light systems

DALI-2 Display 7" Emergency
Art.Nr.: 86456840-EM-W (white)
Art.Nr.: 86456840-EM-B (black)

Art.Nr.: 86456840-P-EM-W (white)
Art.Nr.: 86456840-P-EM-B (black)

DALI-2 Display 7" Emergency Control Device

Overview

- Multifunctional control device for DALI Emergency Light systems
- 7" capacitive touchscreen with 24-bit colour depth
- Dimensions: 178 x 111 x 8 mm
- Addressing and set-up of the DALI emergency light system
- Configuration of emergency groups
- Easy monitoring and management of emergency light systems
- Scheduling and automatization of communication, function and duration tests
- Automatic Logging and e-mail support of test reports
- Multi-master capable: multiple operating devices can be used together with an emergency light display in the same DALI circuit
- Easy installation: the device can be installed on a flush-mounted installation box
- Supply via 24-56V power supply or Power Over Ethernet – POE
- Version with additional functions of the DALI-2 Display Plus for controlling the DALI system available Art.Nr. 86456840-P-EM-W and Art.Nr.: 86456840-P-EM-B (for the additional functions see DALI-2 display data sheet)

Specification, Characteristics

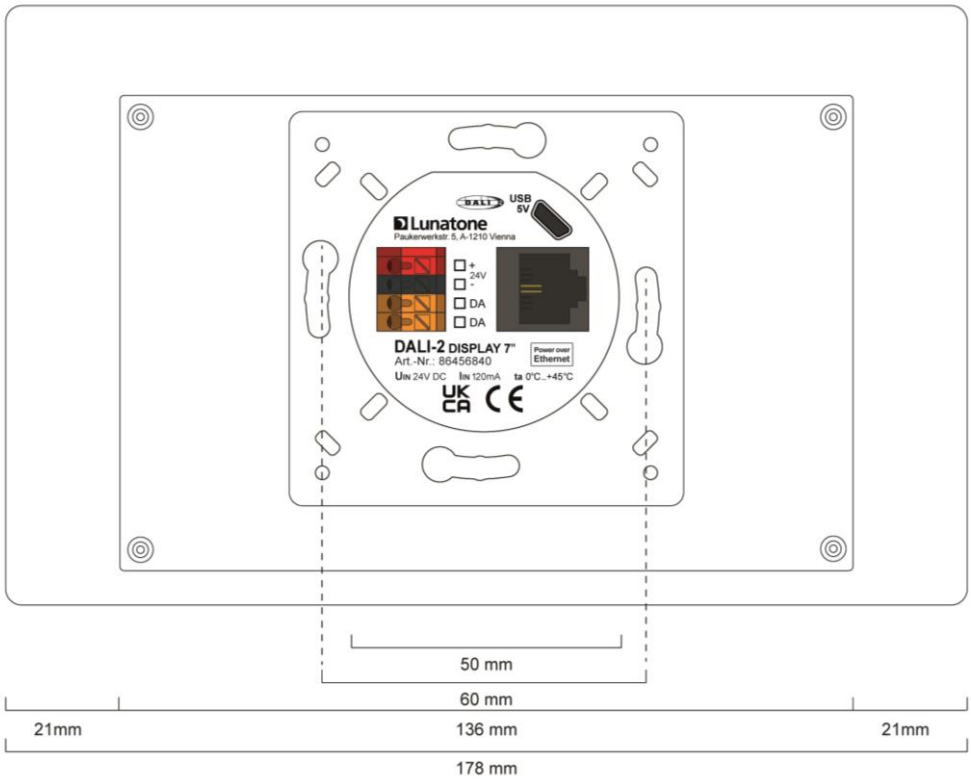
Type	**DALI Display 7" Emergency**	
article number	86456840-EM-W 86456840-P-EM-W	86456840-EM-B 86456840-P-EM-B

Electrical data:	
rated supply voltage display	24-56V DC
power consumption	3,5W
number of DALI lines	1
Current consumption DALI-line	<2mA
Interface	DALI

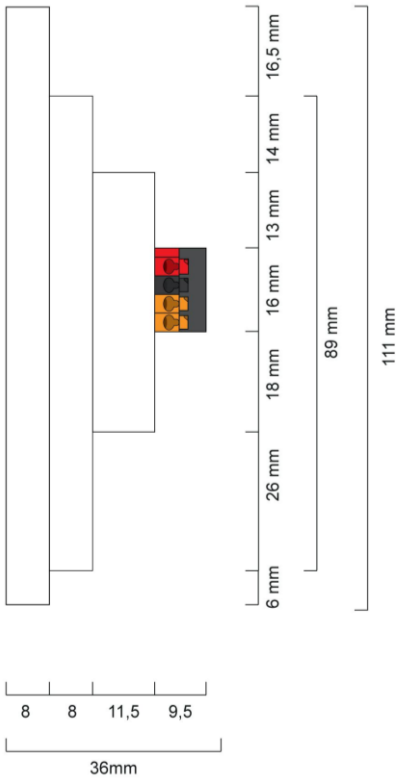
Mechanical data:		
ambient temperature	0…+45°C	
type of protection	IP20	
dimensions L x W x H	178 x 111 x 8 mm	
touchscreen size	7”	
touchscreen pixel	1024 x 600 px	
colours	24Bit	
colour display frame	white	black
colour housing	metallic grey	

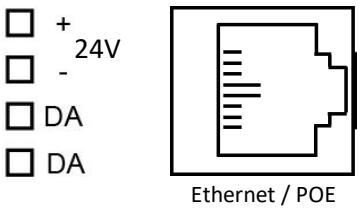
Terminals	
connection type	spring terminal connectors

wire size solid core	0,5 … 1,5 mm² (AWG20 … AWG16)
wire size stranded wired	0,5 … 1,5 mm² (AWG20 … AWG16)
wire size using wire end ferrule	0,25 … 1 mm²
stripping length	8,5 … 9,5mm / 0,33 … 0,37inch
release of wire	push button



dimensions Art.Nr.: 86456840-EM





connection plan

Typical Application

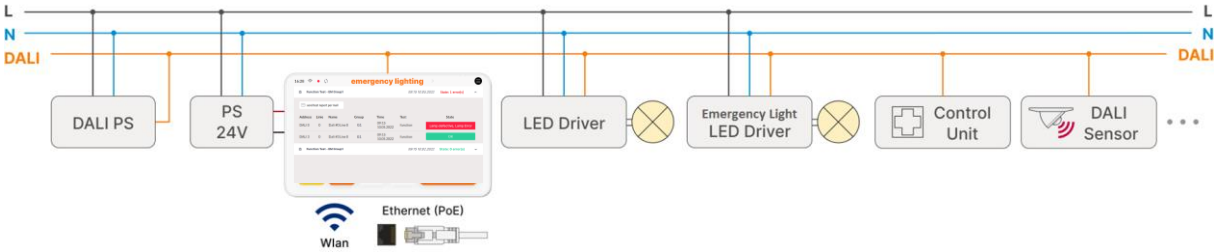


Figure 1 Typical Application – mixed DALI system

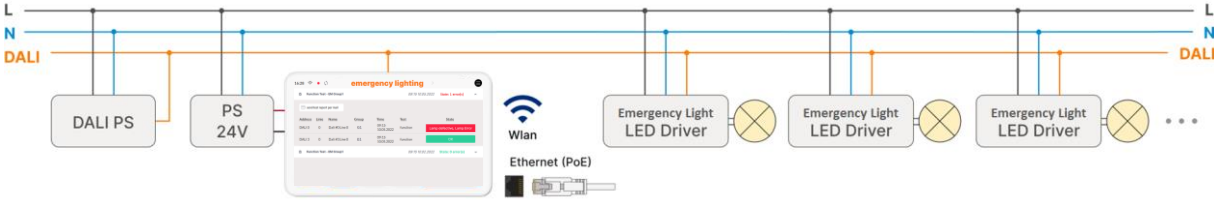


Figure 2 Typical Application 2 – Emergency light exclusive DALI system

Usage

The DALI-2 display 7” emergency is used for set-up, configuration and control of a DALI emergency light system. The DALI protocol standard IEC62386, is used to control the lighting equipment.

Via the display interface all luminaries can be controlled as groups and individual addresses.

The DALI-2 display offers scheduling of communication-, function-, and duration tests, an overview of available test reports of recently carried out emergency light tests and quick steps for error resolving of failed tests.

The DALI-2 Display Emergency Plus (Art.Nr. 86456840-P-EM incorporates all functionality of the DALI-2 Display Emergency described in this datasheet as well as the functionality of the DALI-2 Display Plus described in the DALI-2 Display datasheet.

Installation

- The DALI-2 Display can be directly connected to the DALI bus. A DALI bus power supply (e.g. DALI PS) is required.
- The device can be powered over ethernet (POE) or requires an additional 24V supply, which is connected to the corresponding terminals. (suitable power supply unit: PS 24V, 300mA Art.Nr.: 24166012-24HS)
- The connection to the DALI terminals can be made regardless of polarity. The bus input is protected against overvoltage (mains voltage).
- The wiring should be carried out as a permanent installation in a dry and clean environment.
- Installation may only be carried out in a voltage-free state of the system and by qualified specialists.

- National regulations for setting up electrical systems must be followed.
- The DALI wiring can be realised with standard low-voltage installation material. No special cables are required.
- Only 1 wire may be connected to each terminal. When using double wire end ferrules, the connection capacity of the terminal must be considered.

☞ **Attention:** The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply.

☞ The voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

Mounting

The DALI Display 7" Emergency can be directly attached to a standard flush-mounted installation box/ electrical socket.

For assembly, the backplate has to be attached to the electrical socket, considering the orientation (connector facing upwards, see Figure 3). Then the display can be put in from above and fixed with the two screws from below

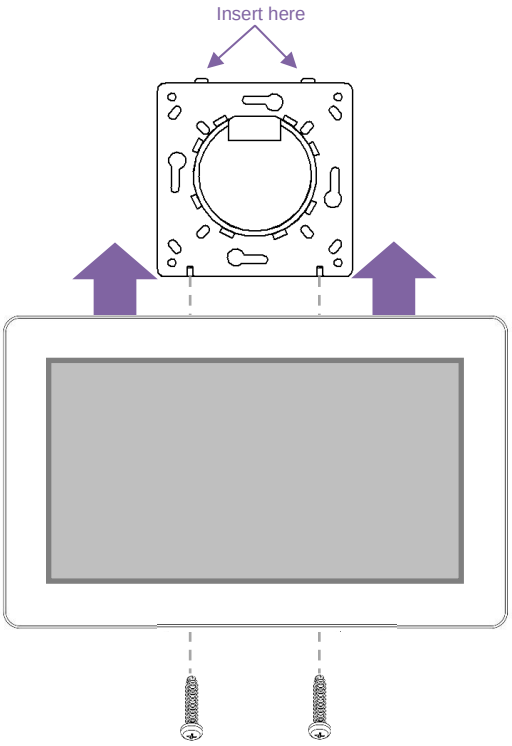


Figure 3 Mounting

Safety instructions

- The device is only suitable for indoor installation.
- Keep the product away from liquids and moisture.
- Cleaning is possible with a dry duster. Please do not use abrasives or solvents. Avoid contact with liquids.
- The housing is made of glass and metal, contact with sharp-edged objects can damage the display.
- If the device is defective, send it to Lunatone Industrielle Elektronik GmbH. Under no circumstances should the display be opened. Dismantling / disassembling the display can lead to damage and / or injuries.

Recycling

This product has been designed and manufactured using high quality materials and components that can be recycled and reused.

The device must be disposed of separately from household waste. Please follow the local regulations for the separate disposal of electronic products. The correct disposal of old devices protects our environment.

Functionality and Features

The DALI-2 Display 7” emergency serves as a universal module for **control,** as well as **set-up and configuration** of a DALI emergency light system.

By default, the display shows the **user interface** for monitoring the emergency light system. The user interface of the DALI-2 emergency display is made up of 2 pages (boards): The board **“test status”** (previously: emergency lighting status) and the board “**troubleshooting**” (previously: error resolving”), details on pages 12 and 15 respectively.

The view between the 2 boards can be changed by swiping to the right / left or selecting the arrow in the top next to the heading. The length of the board is flexible: with an up / down swipe of your finger, you can navigate up and down.

The **set-up and configuration menu** can be opened with the menu button at the top right. general settings and emergency test settings can be found there, as well as the board overview

Menu button

Overview and settings see page 7.
DALI system set-up and configuration see page 9
Test schedules see page 10.
User Interface see page 12 and following.

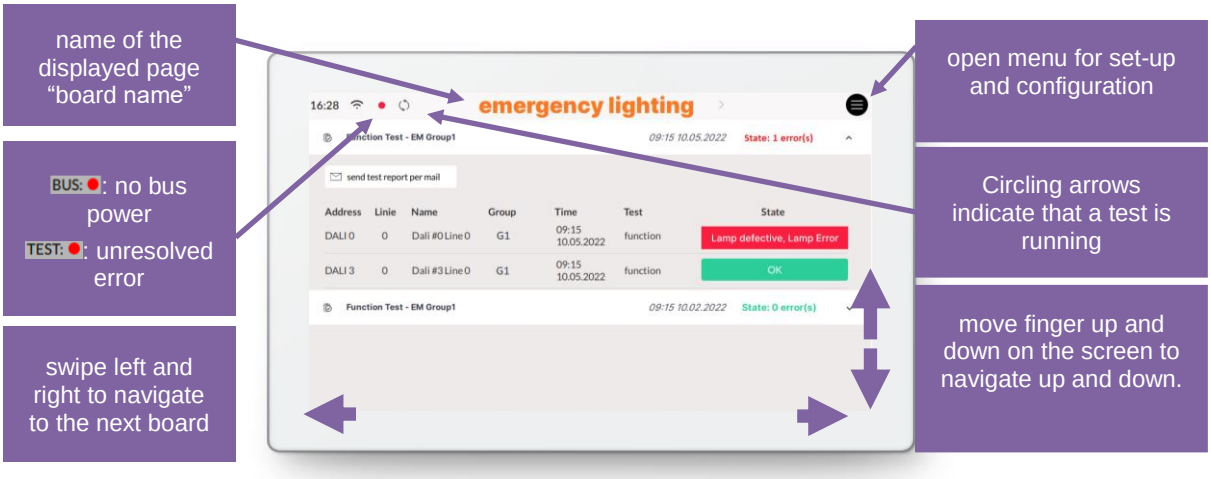
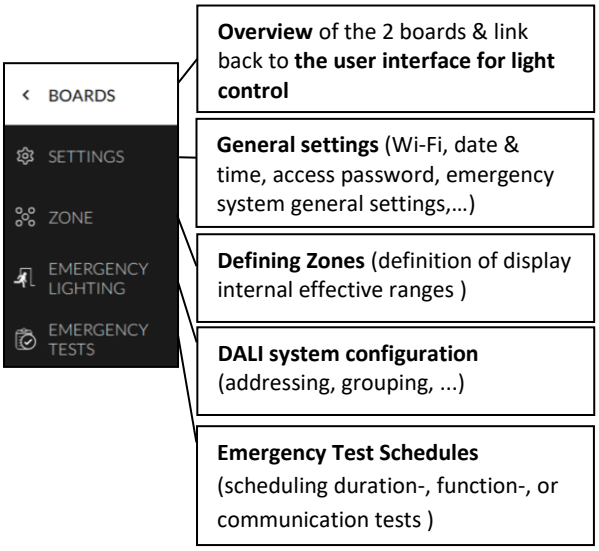


Figure 4 User Interface for Light Control DALI Display 7" Emergency

Set-up and configuration Menu

The configuration menu can be reached via the menu button at the top right.
The configuration menu contains settings for boards, general settings, settings for the DALI emergency system and test schedules.

Navigation and menu items



Menu item: Boards

This tab provides an overview of the existing boards. By clicking on either of the boards, the selected board will be opened.

Clicking on the board tab again will open the board the configuration menu was entered from (also indicated with a yellow board title).

The pen button next to the title “Boards” enables the configuration options: renaming and reordering.

- **Rename**: click the pencil symbol in the board window
- **Change the order**: select board (blue highlight) move with drag and drop.

Menu item: General Settings

General settings for the display and the emergency lighting system can be made here:

- *General*:
  - Setting the *name* of the display in the network
  - Information on *firmware version*
  - Setting the system language (options: English or German)
  - Setting the *screensaver* percentage and timeout
  - Settings *night time brightness* percentage and time range
  - Settings *night time screensaver* percentage and timeout
- *Date, Time & Location*: setting the time zone, date, time and location coordinates
- *Wi-Fi/Ethernet*: establishing an internet connection and displaying the IP address. To avoid unwanted access by third parties, the device should only be connected to a secure network. If the connect to the Wi-Fi entered fails repeatedly, select “delete all wi-fi information” and retry.
- *Access, Display Passwords*: with enabling “protect Menu & Board editing” and entering a password, the access to the configuration menu and editing mode is restricted. The restriction takes effect on after the selected time. Specific boards can be password protected by selection.
- *Emergency Lighting -General Settings:* setting a prolong time to extend the operation of the emergency lighting even after the main power has been restored (max. 1h), (e.g. to bridge the restart time of high-pressure lamps in the event of brief mains voltage interruptions). The basic setting in most emergency lighting devices is 0 minutes. The prolong time can

only be maintained if the battery capacity is sufficient.

- *Emergency Lighting – Deactivation:* manually deactivating the emergency lighting, if the main power supply is switched off and the emergency lighting should not to be switched on (e.g. during maintenance, a holiday etc.), the emergency lighting devices can be deactivated in two ways:
  - manually switching off the emergency lighting if the main power is already off → *REST*
  - preventing the emergency lighting to turn on once the main power is turned off, within the next 15min → *INHIBIT*

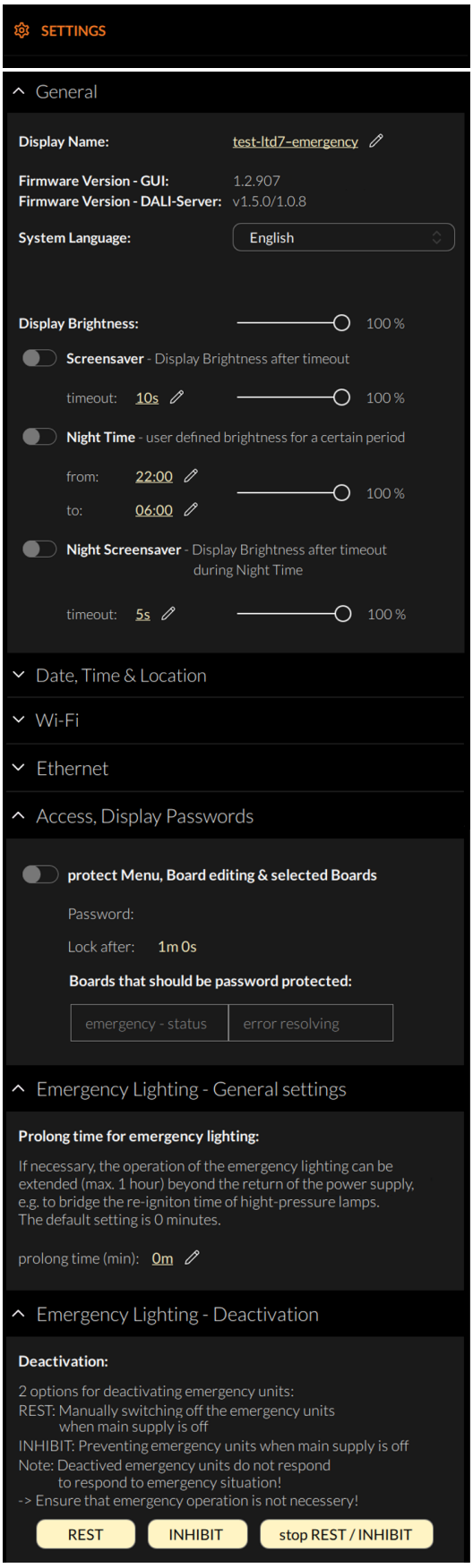
  Important: Deactivated emergency lighting devices will not switch on in an emergency. **Ensure that no emergency lighting operation is required!**

  When main power returns the emergency lighting will be activated again.

  To activate the emergency lighting devices before switching on the main power supply, select " STOP REST / INHIBIT "

- *Emergency Lighting – Error Signalling:* Two DALI addresses can be specified for error signalling. This makes it possible to send the error status to a higher-level system via e.g. DALI RM relay modules or indicating the status ("OK"/ "Error") with signal lamps.

- *Emergency Lighting – Notification:* set up notification via email (input email server and address) – notifications can be sent for all tests or only when errors are detected. Email settings can be tested via the button: send test report mail



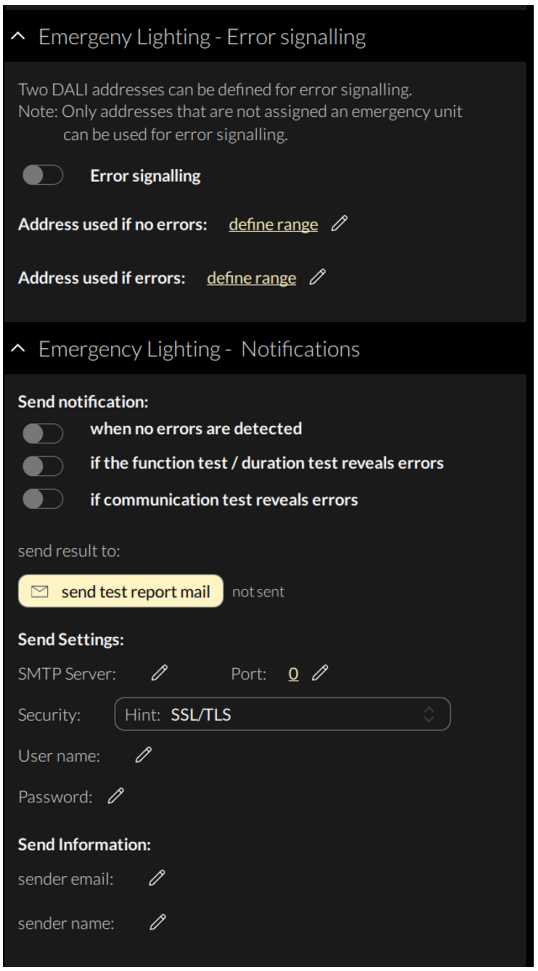


Figure 5 Overview Menu item: Display Settings

Menu item: Emergency Lighting Devices

The tab includes set-up and configuration options for the DALI system. Addressed and configured DALI device type 1 (DT1 - emergency lighting) devices of the connected DALI bus are listed here after a read out. The DALI Display 7” emergency supports addressing/readdressing as well as DALI system extensions. The devices found can then be grouped.

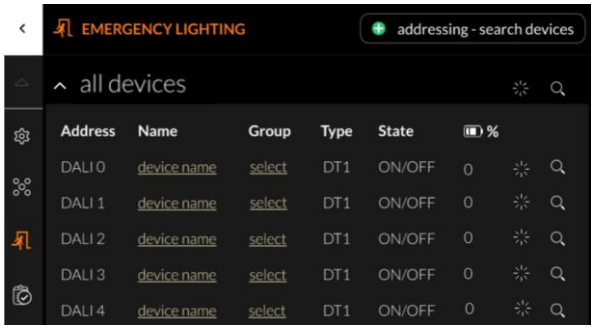


Figure 6 Menu item "Devices"

In order to control device groups from the display, the appropriate zones must also be defined - see section: Zones page 10

Only after the configuration has been completed, the test schedules can be created.

Addressing devices: Select "addressing - search" at the top right

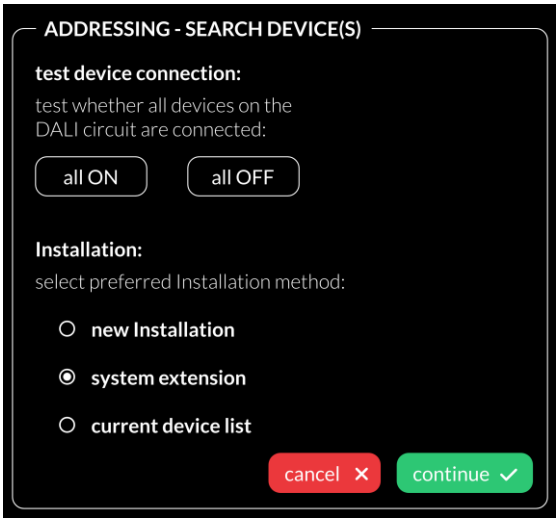


Figure 7 Pop-up addressing, search for devices

The “all ON” and “all OFF” buttons can be used to test whether all DALI devices are connected (see Figure 7).

Attention: some Emergency Lights are of the type ‘not maintained’ and therefore do not respond to DALI commands such as MAX/OFF. If normal DALI devices or maintained Emergency DALI devices do not respond, please check the DALI bus power supply (not included in the display) and the device wiring.

Available options:

- current device list: loads an already addressed DALI bus
- system extension: if devices were added to an existing system; the existing system keeps its addresses and new addresses will be added.

- new installation: for new installations or re-addressing, devices that already had an address will also get a new address.

After read out/addressing, all emergency light devices are displayed in the emergency lighting device list.

Assign device name: Click on the respective device name in the device list

Assign groups: Click on the respective group entry (“select”) in the device list to add the device to the corresponding groups.

Battery: from version 1.12 on the current battery charge of the emergency light devices is listed in this column.

State: click on the state symbol to switch the respective devices on and off (for easy localization). – Attention: emergency lights of the type ‘not maintained’ will not respond the sent DALI control commands.

Magnifying glass: click on the magnifying glass to start the IDENTIFY process for emergency lighting. How emergency lights behave with the DALI command IDENTIFY depends on the respective manufacturer and should be taken from the documentation for the emergency lighting ballasts.

Further configuration of DALI devices is possible with the DALI Cockpit – see page 16.

Menu item: Zones

Zones are a grouping of display internal DALI devices similar to DALI groups but without a limitation to 16 and without a limitation of one DALI line in case of a display with multi-line module. The devices in a Zone can consist of any number of devices (single addresses) and already formed DALI groups.

Within the display from here on only zones or devices can be selected as destination address (DALI groups are not available).

Attention: Zones in one display do not necessarily match zones of another display!

With this button it is possible to turn the selected devices on/off for review the assigned devices.

Additional zones can be added using the Add-Button:

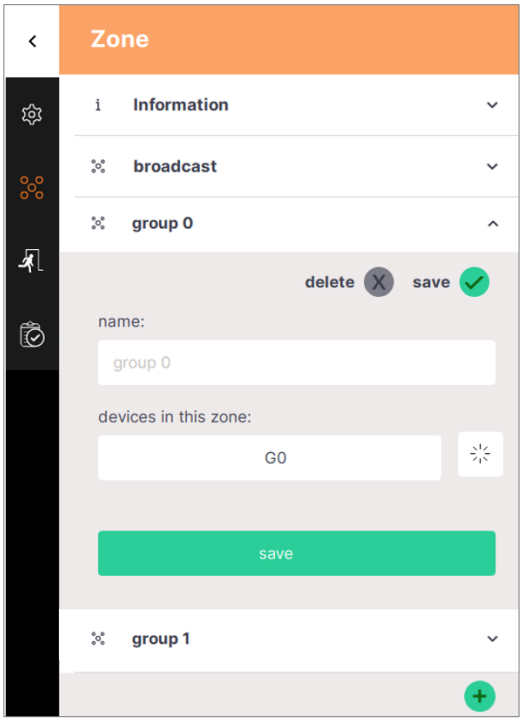


Figure 8 Menu item "Zones"

Menu item: Emergency Tests

In this section the communication-, function and duration tests can be schedules – for more details see section “Emergency Test Schedules” page 11.

Emergency Test Schedules

In the configuration menu section: Emergency Tests, the three different emergency tests: communication test, function test and duration test can be created for different emergency light devices or emergency groups and scheduled for different time intervals . For details on the test settings see Figure 10 below.

Additional schedules can be added using the Add-Button:

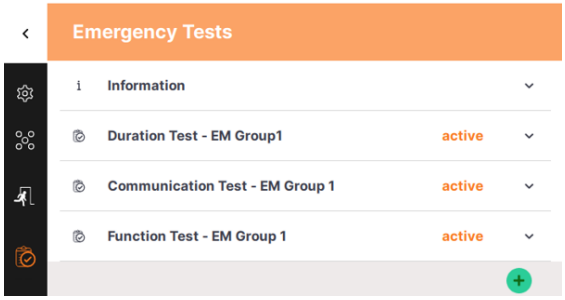


Figure 9 Menu item "Emergency Tests"

3 different test types can be selected:

- Communication Test: checking if the DALI communication with the device is possible
- Function Test: switching on the emergency lights to test the functionality
- Duration Test: the batteries of the emergency unit will be fully drained to check the battery capacity and discharge behaviour.
  Attention: Depending on the emergency lighting device, the duration test can take up to three hours. The batteries should be charged for at least 24 hours before starting the duration test.

For each test the devices that should be tested, a repetition interval and a start date and time can be selected. For each type of test different repetition intervals are available:

Communication test	
No repetition	only tested once on the specified day and time
every 10 minutes	tests periodically: checks all selected devices sequentially within 10 minutes. A new cycle is started after 10 minutes.
daily	the test is carried out daily at the specified time

Function test	
No repetition	only tested once on the specified day and time
weekly	the test is carried out once every week – on the weekday specified (input. “weekday”)
Jan - Dec	the test is carried out on the selected months on the first occurrence of the selected weekday (“repeated on week day”) and the specified time – (enables: monthy, every 2nd , 3rd etc. month up to yearly repetitions)

Duration test	
No repetition	only tested once on the specified day and time
Jan - Dec	the test is carried out on the selected months on the first occurrence of the selected weekday (“repeated on week day”) and the specified time (enables: monthy, every 2nd , 3rd etc. month up to yearly repetitions)

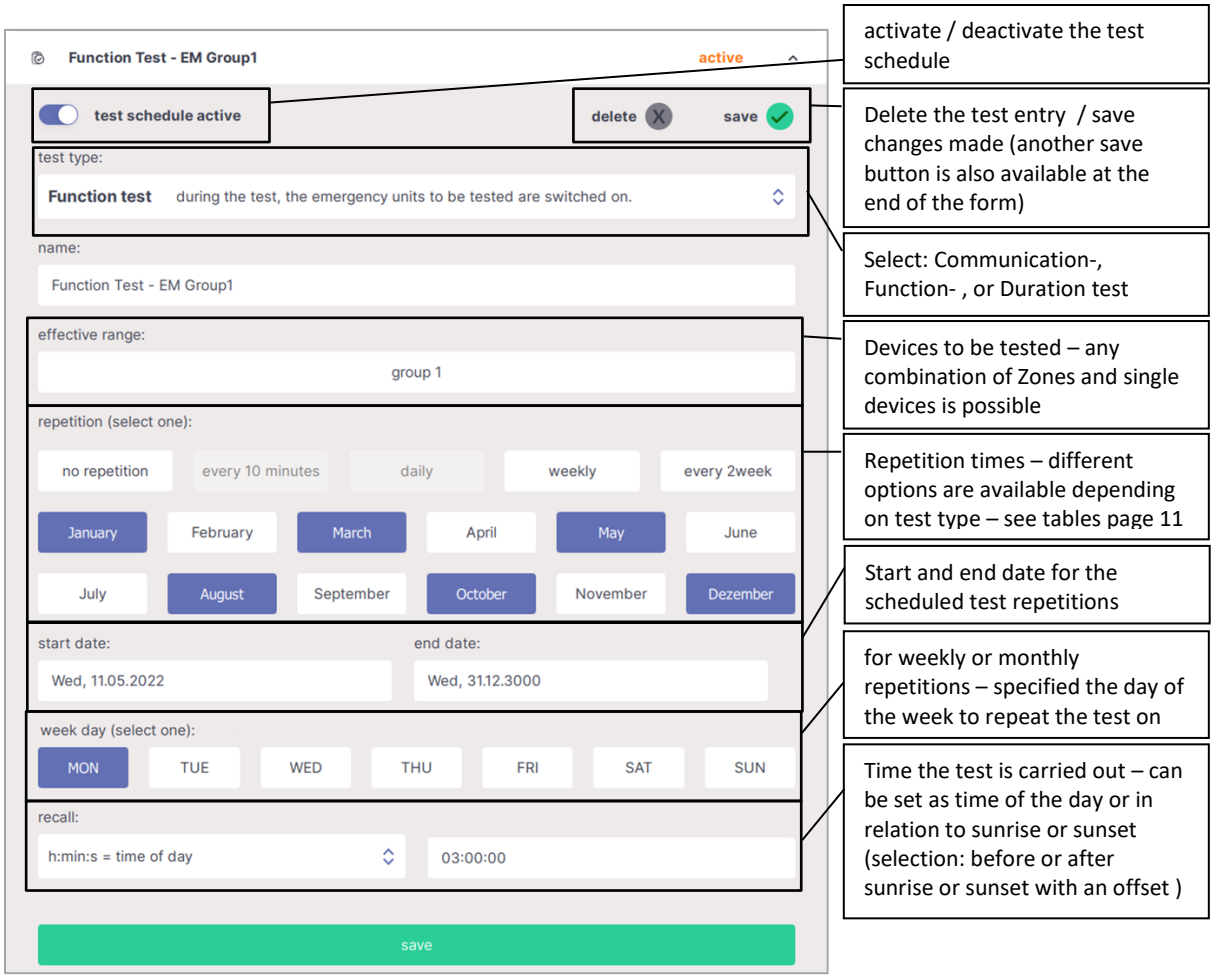


Figure 10 Configuration of emergency test schedules

User interface – Emergency Lighting

The user interface of the DALI Display is made up of two pages (boards): the report page and the error resolving page (see next section).

On the report page, the most recent result of each configured test is listed, when expanding the test list with the arrow on the right the test results for each device tested within the scheduled test can be reviewed.

The complete list of all carried out tests can be downloaded via the web interface of the display, see section “Emergency Test Reports” page 15.

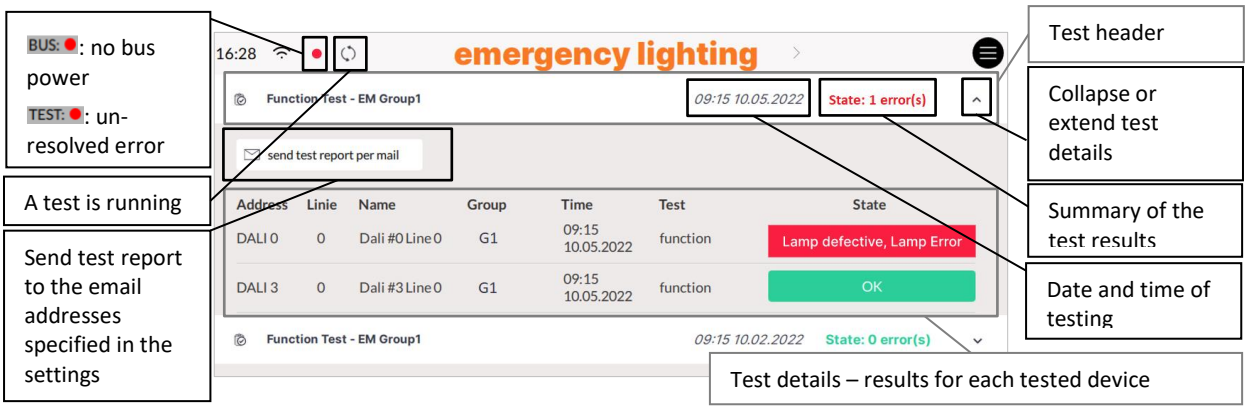


Figure 11 overview of test report page

Following test results / status messages are possible:

Communication Test

status	description / details
OK	Test successful – no error
Error	device is not reachable **possible reasons:** the device is not connected or defective, emergency unit has been replaced but not addressed
Bus error	Communication test failed as bus communication not possible **Possible reasons:** no bus power or bus short, DALI wiring error, or initialize/quiescent mode is active

Function Test

status	description / details
OK	test successful – no error
untested	The command to start the test is scheduled but not yet sent to the emergency light device
Starting	the command to start the test has been sent to the emergency light device, but the device has not started the test
Running	the emergency light device has started and is running the test
Bus error (previous: Communication error)	test could not be started or result could not read, as device is not responding, device is not reachable or commands cannot be sent, **possible reasons**: bus short, no bus power, device not connected, DALI wiring error, DALI device defective (no communication), emergency unit has been replaced but not addressed
Lamp failure (previous: lamp defective, lamp error)	Test result “lamp failure” received from emergency light device. **possible reasons**: broken or wrong luminaire, or wrong wiring between emergency light device and luminaire
Electronic circuit failure (previous: Error in emergency unit, charger failure)	Test result “electronic circuit failure” received from emergency light device **Possible reasons:** emergency unit defective
Battery failure (previous: battery fault, battery failure)	Test result “battery failure” received from emergency light device **possible reasons**: battery capacity too low, battery defective, or battery wiring wrong
Failed	The emergency light device reported failed function test, but has not specified the failure specifics (failure cases above)
Unexpected state, emergency status: XX, failure status: YY	The emergency light device reported unusual combination of error messages, the emergency status XX and the failure status YY. (also in the csv. available on the web interface “Downloads”) is the information returned by the device. Please contact your emergency light device supplier to clarify the returned error.
	The set maximum delay (configured in the emergency light device) to carry out the function test has been exceeded, the test might have still been carried out afterwards with the respective results. **possible reasons**: other operation of the device postponed test longer than maximum delay. **Corrective action**: Try to start the test again **Note**: the emergency light device will indicate the exceeded maximum delay until a test was carried out within the set time, the next started test will therefore still show this icon.

Failed to Start (previous: test failure case 1)	The emergency light device did not carry out the test. The maximum delay to start the test was exceeded and not carried out after another hour, the test is therefore . **possible reasons**: other operation of Emergency light device postponed test longer than maximum delay. **Corrective action**: try to start the test again
Duration test failed (previous: Test failure, case 2)	The emergency light device returned: function test success, but also duration test: failed. The previous duration test ended with an error (failed to reach full operating time) which has not been corrected **Corrective action**: replace battery and perform duration test manually

Duration Test

status	**description / details**
OK	Test successful – no error
untested	The command to start the test is scheduled but not yet sent to the device
Pending due to Battery < 100%	The test was sent to the device, the emergency light device will automatically start the test once the battery charge is at 100%
Starting	the command to start the test has been sent to the emergency light device, but the device has not started the test
Running	the emergency light device has started and is running the test
Bus error	Device not responding, device is not reachable, possible reason: bus error or device not connected
Failed	Test result “duration test failure” received from emergency light device **possible reasons**: battery problem
	The set maximum delay (configured in the emergency light device) to carry out the duration test has been exceeded, the test might have still been carried out afterwards with the respective results **possible reason**: duration test was interrupted **Note**: the emergency light device will indicate the exceeded maximum delay until a test was carried out within the set time, the next started test will therefore still show this icon
Failed to Start (previous: test failure case 1)	Test could not be performed, maximum time to start was exceeded until battery was fully charged **possible reasons**: other operation of Emergency light device postponed test longer than maximum delay, battery was not fully charged **Corrective action**: charge battery for at least 20 hours and start duration test manually

User interface – Error Resolving

The Error resolving page offers an easy way to restart failed tests – repeating a test of single devices can be done with the repeat-test button next to each entry.

At the bottom of the error resolving page all created test schedules can also be started manually (without repetition). The result of this test will be added to the test report page. Herewith the error report can be updated after error resolving.

If the error was resolved for single devices and the status is OK the entry on the error resolve page will disappear with the next manual or scheduled test carried out.

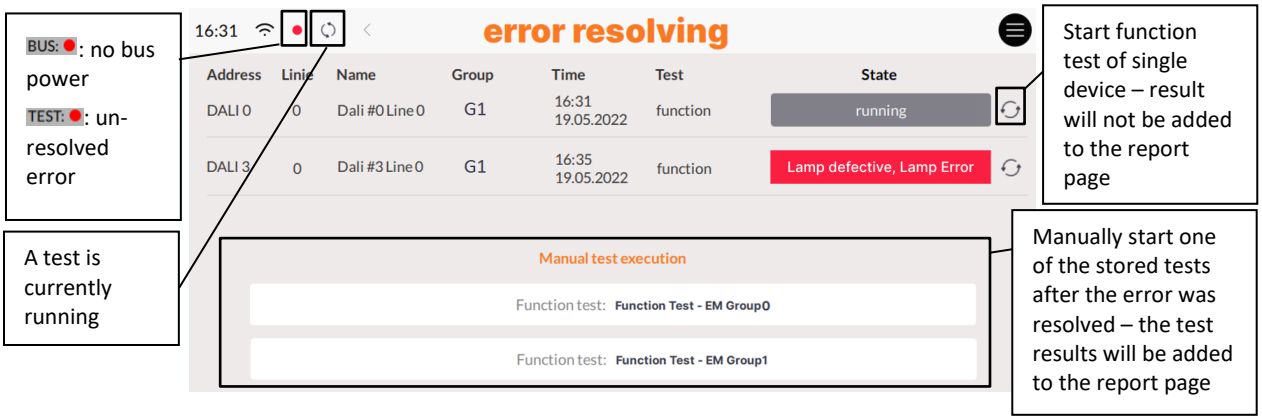
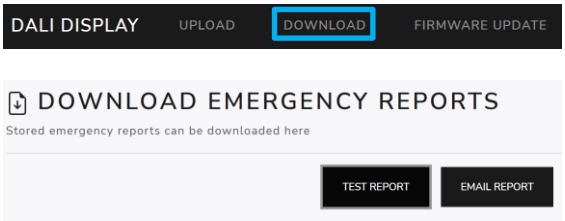


Figure 12 overview of error resolving page

Emergency Test Reports

The complete Test report logs can be downloaded on the display webinterface, see next section.

The report can be downloaded in the tab "Download"



Web Interface

The display web interface allows loading firmware updates, and downloading the emergency test reports.

The web interface can be accessed via a web browser. The PC, phone or tablet and the display must be in the same network and address range.

The network settings and the IP address of the display can be found under “Settings” -> “Ethernet” or “Settings” -> “Wi-Fi”.

The web interface can be accessed by entering the IP address of the display in the browser. The web interface has two tabs - for downloads and firmware updates see also Figure 13 below.

Firmware Update

Firmware updates are possible via the web interface of the display, see previous section.

On the web interface on the tab “Firmware update” the firmware update file (.lfu) can be uploaded and the update can be started using the "Upload" button, see also Figure 13.

The update can take up to 15 minutes. After an automatic restart of the display, the update is complete.

Attention: The Emergency Test Report (see previous section) should be downloaded before an Update is started.

Attention: The device should only be updated not downgraded, a downgrade will lead to data-loss

Attention: With the browser "Microsoft Edge" problems can occur during updates. It is recommended to use a different browser for firmware updates.

The latest software update file can be found here

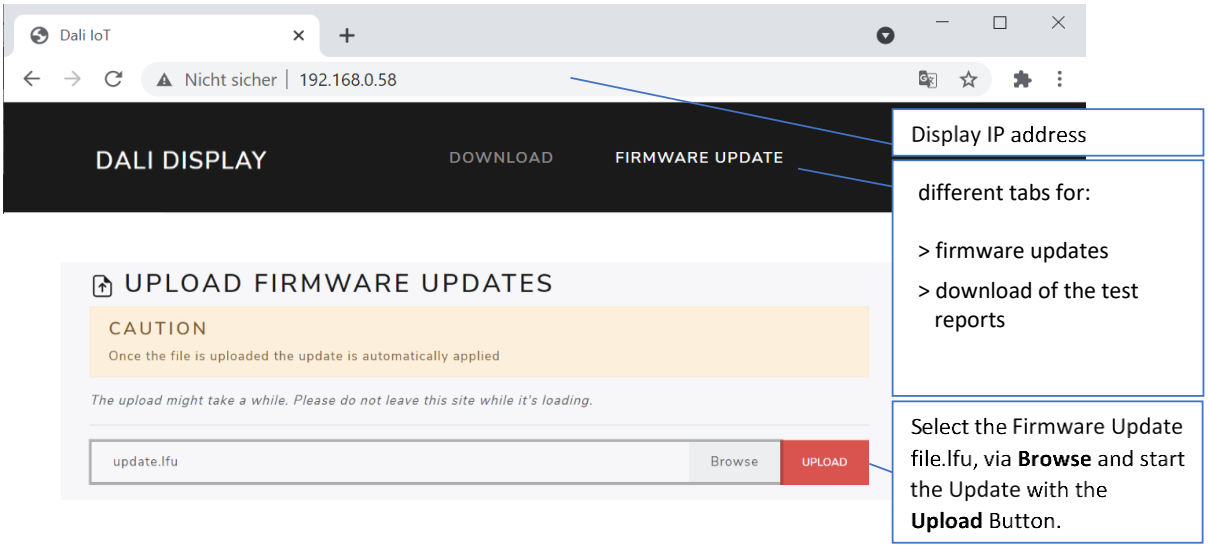


Figure 13 Web browser: Display Firmware Updates

DALI Cockpit

The DALI-2 Display can be used as a DALI Cockpit Interface (DALI Cockpit Version 1.38 or higher), for configuration of the DALI devices on the connected DALI bus.

The Windows PC from which the DALI Cockpit is used and the DALI-2 Display need to be in the same local network.

When selecting the DALI bus interface in the DALI Cockpit: choose the option "Network" and "DALI-2 Display, DALI-2 IoT, DALI-2 WLAN" and specify the device’s IP address, see Figure 14. If the IP address is not known, the network can be searched for devices using the button next to the IP address input field: ...

The DALI-2 Display interface can then be selected in the DALI Cockpit device tree and allows addressing and configuration of all connected DALI devices, like other interface modules e.g. DALI USB. See also Figure 15.

Warning: Addressing in the DALI Cockpit should only be either “System Extension” or “Read current device List”. If “new installation” is selected the device addresses are reassigned and the set effective ranges of zones, test schedules etc. in the DALI-2 Display are no longer correct.

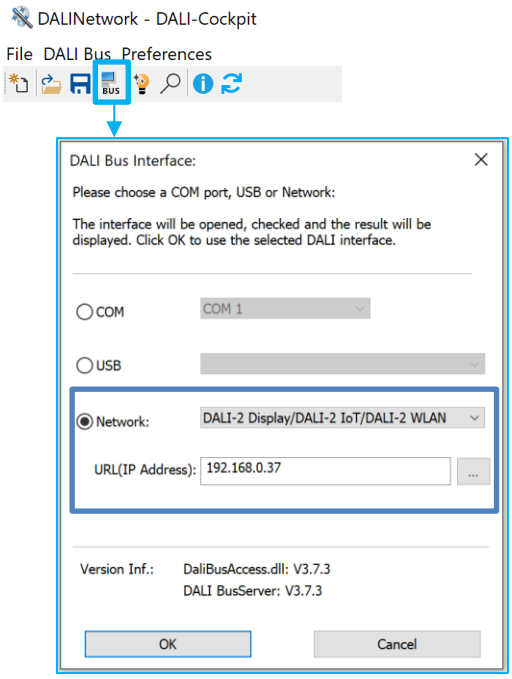


Figure 14 DALI Cockpit – selection of DALI bus interface

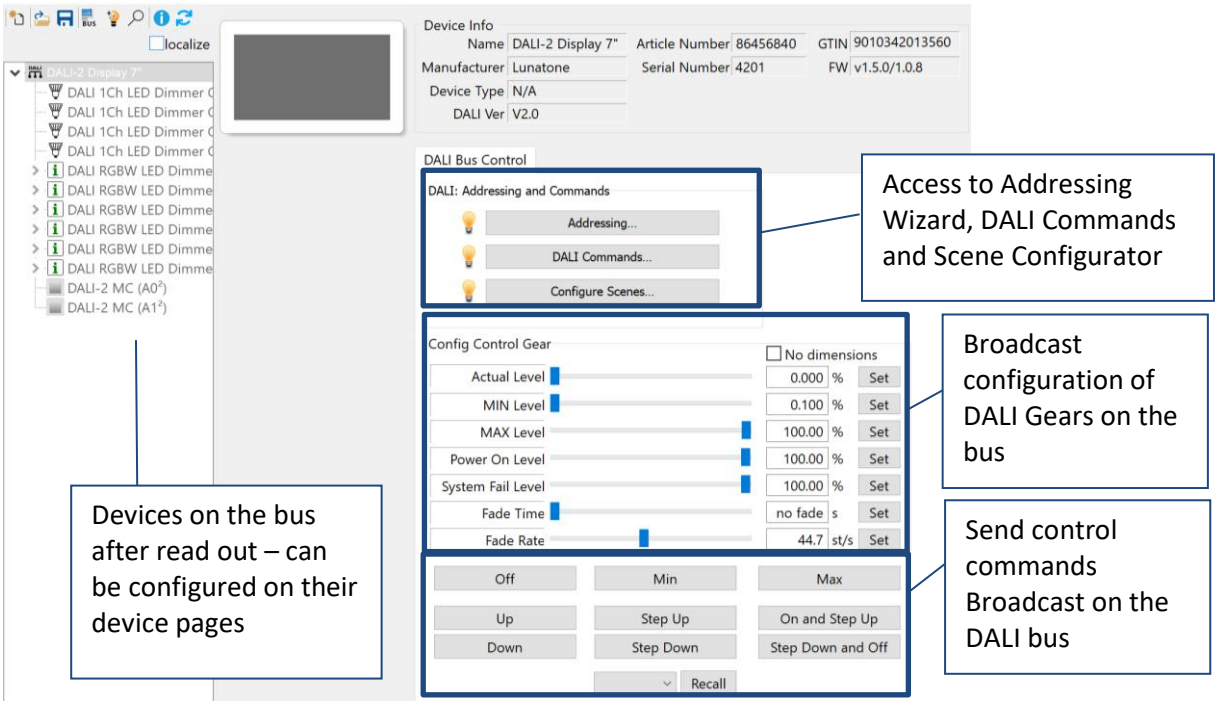


Figure 15 DALI Cockpit – display interface

Troubleshooting

Email Notification with a Gmail account: To allow the display to sign in and send emails via a Gmail account an app password is needed, for more information visit “google account help” -> “Sign in with app passwords”

Notification: “Could not read firmware version“ This message can be caused by defect hardware, broken pins (due to wrong mounting) or insufficient power supply of the DALI-2 Display.

Notification: “Firmware Update failed! Invalid or corrupt file”: Failing firmware updates are usually caused by incorrect lfu files and need to be resolved by uploading another software file. Please download the latest software here and retry the update.

Notification: “Cannot run addressing on DALI Bus (lines: 1, 2, ...)”: This message is normal in multiline setups (DALI-2 Display Bus Extension) where one or more lines are disconnected. It can indicate a problem when a line should be connected but is listed in the error message. The affected line probably has an insufficient DALI power supply, a shorted bus, or no power at all. To resolve this error check the wiring, bus status and power supplies of the respective line.

Notification: “Scan cancelled (addressing failed)”: An error occurred during addressing of the DALI bus, check for any interference on the DALI bus (e.g. central controls ignoring quiescent mode) and retry the addressing.

Notification: “Scan cancelled (could not communicate with DALI bus)”: This message occurs when a DALI scan cannot be started due to a communication error on the DALI line. The most likely cause is that no DALI bus is connected. Other possible causes are listed in section below: “Send error on line X”

Notification: “Send error on line X”:

- **Bus voltage error:** The DALI bus is not powered. Check if the DALI bus power supply is connected and working
- **DALI initialize mode** Another participant on the DALI bus activated the initialize mode. The Initialize mode will be exited once the other participant ends it, or after a 15minute timeout
- **DALI quiescent mode** Another participant on the DALI bus activated the quiescent mode. Quiescent mode will be ended once other participants send the command or automatically after 15minutes.
- **Send buffer full** The display interface received too many commands at once. Possibly to many automations, queries and macros are running at the same time. Please wait for some time and try again, if the error persists contact support.
- **Syntax error in parameters**: Please contact support with details on how this error occurred.

Purchase Information

Art.Nr.: 86456840-EM-W
DALI-2 Display 7" Emergency, white capacitive touchscreen with 24-bit colour depth, emergency light unit for 64 DALI addresses, white, 178 x 111 x 8mm

Art.Nr.: 86456840-EM-B
DALI-2 Display 7" Emergency, black capacitive touchscreen with 24-bit colour depth, emergency light unit for 64 DALI addresses, black, 178 x 111 x 8mm

Art.Nr.: 86456840-P-EM-W
DALI-2 Display 7" Emergency, white capacitive touchscreen with 24-bit colour depth, emergency light unit for 64 DALI addresses additionally including all functionality of the DALI-2 Display Plus see datasheet: https://www.lunatone.com/wp-content/uploads/2020/11/86456840_DALI-2_Display_7Inch_EN_D0095.pdf ,
white, 178 x 111 x 8mm

Art.Nr.: 86456840-P-EM-B
DALI-2 Display 7" Emergency, black capacitive touchscreen with 24-bit colour depth, emergency light unit for 64 DALI addresses additionally including all functionality of the DALI-2 Display Plus see datasheet: https://www.lunatone.com/wp-content/uploads/2020/11/86456840_DALI-2_Display_7Inch_EN_D0095.pdf ,
black, 178 x 111 x 8mm

Accessories

Art.Nr.: 24166012-24HS
PS 24V, 30mA – fitting power supply

Art.Nr.: 86451848
Display Bus Extension
Module, DALI system extension, DIN rail,
https://www.lunatone.com/en/product/dali-2-display-bus-extension-2/

Additional Information

Lunatone DALI products
https://www.lunatone.com/en

Lunatone Datasheets and Manuals
https://www.lunatone.com/en/downloads-a-z/

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device
https://www.lunatone.com/en/product/dali-cockpit/

Contact

Technical Support:
support@lunatone.com

Requests:
sales@lunatone.com

www.lunatone.com

Disclaimer

Subject to change. Information provided without guarantee. The datasheet refers to the current delivery.

The function in installations with other devices must be tested for compatibility in advance.

