Lunatone

DALI 4Net

Datasheet

Central Control Device & Interface

Central control module
for 4 DALI lines

Art.Nr. 22176666
Art.Nr. 22176666-B

DALI 4Net Central DALI Control Device

Overview

- Independent light control of up to 256 DALI ballasts on 4 DALI-lines
- Configuration via Ethernet and PC-software tool DALI Cockpit
- Modbus TCP access (control & visualisation)
- With the DALI4Net control devices (input devices and sensors) and control devices on each DALI-line can be configured (Ethernet/DALI Interface)
- Addressing, configuration, status queries, monitoring
- Collision detection
- Din Rail Mounting
- 24V power supply (e.g. 24V/300mA Art.Nr. 241662012-24HS)

- Basic version and standard version with additional central functions available
- Central functions:
  - crossline functions for input devices and sensors
  - programmable schedule, real time clock
  - circadian daylight schedules
 - emergency function: starting of function and duration test

DALI 4Net Basic
22176666-B

Specification, Characteristics

type	DALI 4Net	DALI 4Net Basic
article number	22176666	22176666-B

electrical data:

power supply	24VDC
typ. current consumption	90 mA
Ethernet	1xEthernet 10/100Base-T, electrically isolated, isolation voltage 1500VAC, RJ45-connector
DALI	4 x DALI, electrically isolated

technical data:

storage and transportation temperature	-20°C … +75°C
operational ambient temperature	-20°C … +60°C
protection class	II (when used/installed as intended)
Protection degree housing	IP40
Protection degree terminals	IP20
max. connecting wire cross section	2,5 mm^2
mounting	DIN rail
dimensions	98 x 18 x 56 mm

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supported functions:

Gateway Modbus <-> DALI	✔	✔
ModBus TCP control	✔	✔
ModBus TCP queries	✔	✔
Zone definition (areas over multiple lines)	✔	✔
Real Time Clock	✔	✖
Central Scheduling	✔	✖
Crossline functions	✔	✖
Circadian daylight schedule	✔	✖
Emergency function	✔	✖
Sensor value polling	✔	✖
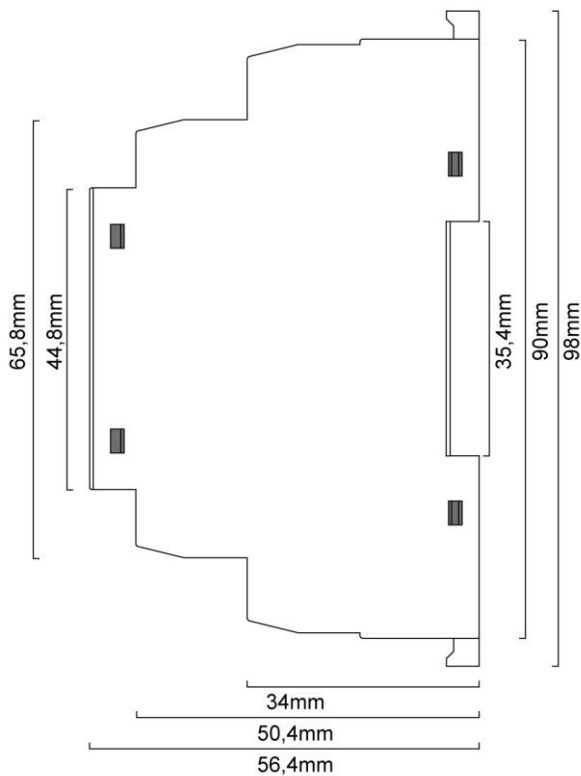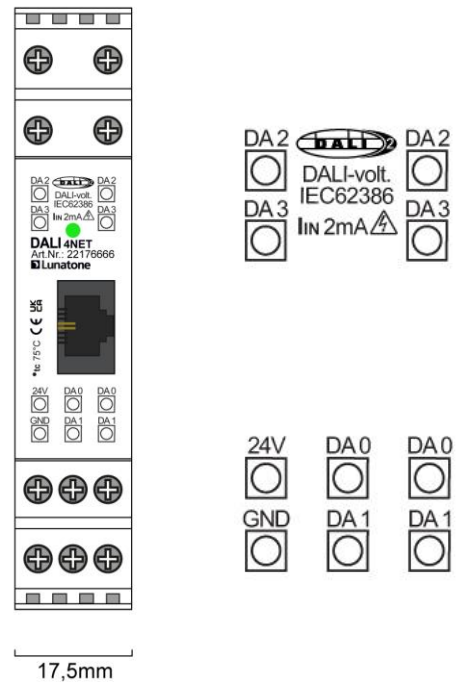
dimensions   connection plan
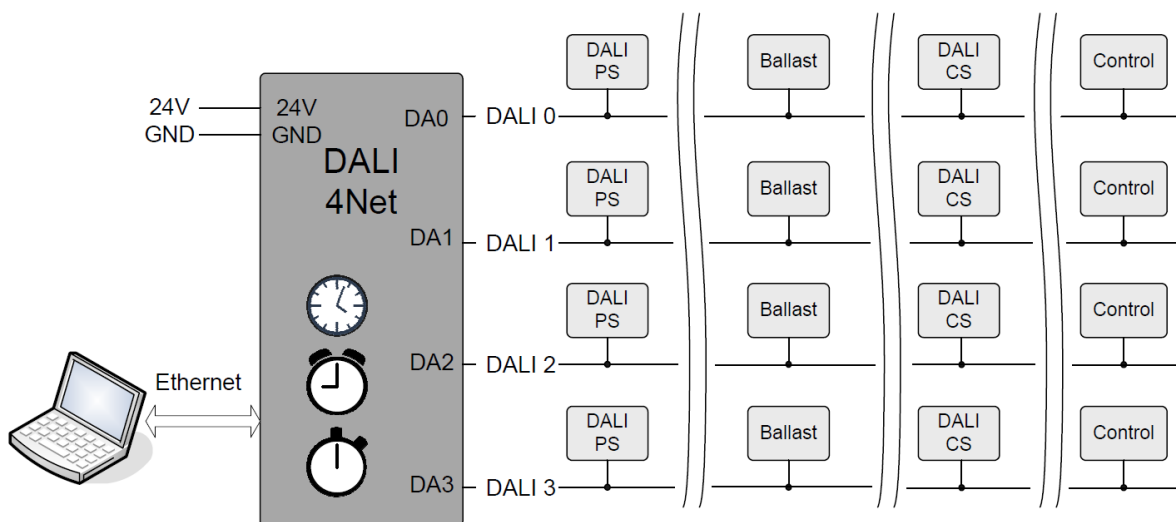
typical application

Installation

- supply voltage 24VDC (typ. current consumption 90mA)
- 4 DALI-outputs (DA0 … DA3) for connecting 4 DALI circuits
- for the supply of the DALI-lines proper DALI power supplies (e.g. DALI PS) are required

IP-Address: 192.168.0.99
Subnet mask: 255.255.255.0
Gateway: 192.168.0.1

Configuration

The DALI4Net and the DALI-lines can be configured with the help of the DALI-Cockpit software tool via Ethernet.
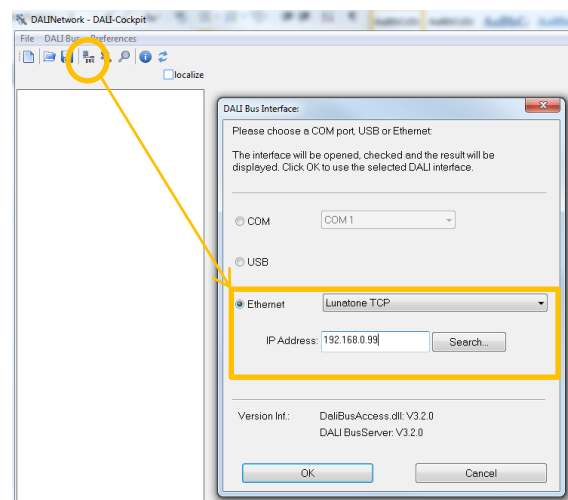
Network Settings, Date & Time

After Starting the Cockpit, the interface can be selected via the bus server menu (Menu: "DALI-Bus" -> "Bus Interface…").

Select **Ethernet -> Lunatone TCP** and enter IP of the device. Alternatively, the network can be scanned for devices (search-function). The DALI4Net is delivered with the following default network settings:

After entering the IP-address, press „OK" to connect.

The network settings can be changed (Static IP/DHCP) in the DALI-Cockpit, after changing the settings the device reboots and has to be reconnected.

For the DALI-4Net the Real Time Clock can be set by pressing the "Change-Time" button. In case of a power loss an internal energy buffer keeps time and date up to date for 24 hours. (not supported by the DALI4Net Basic).
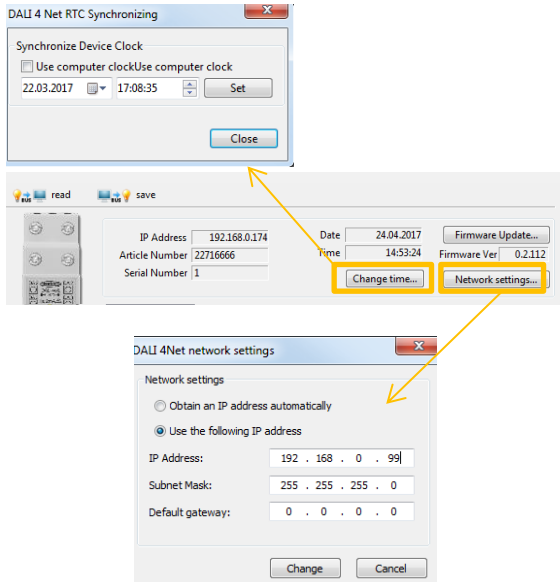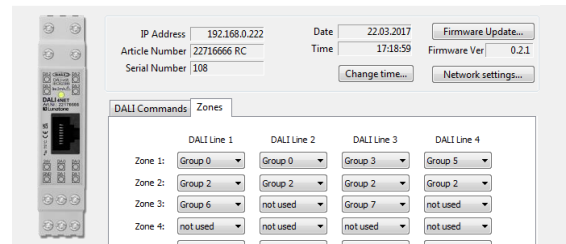

Addressing

In the component tree on the left the 4 DALI-lines can be selected. Each DALI-line can be addressed and configured separately. The corresponding connectors of each DALI-line are marked on the housing of the DALI 4Net. After addressing procedure all devices are listed as subset of the DALI-line in the component tree and can be accessed and configured by selection.
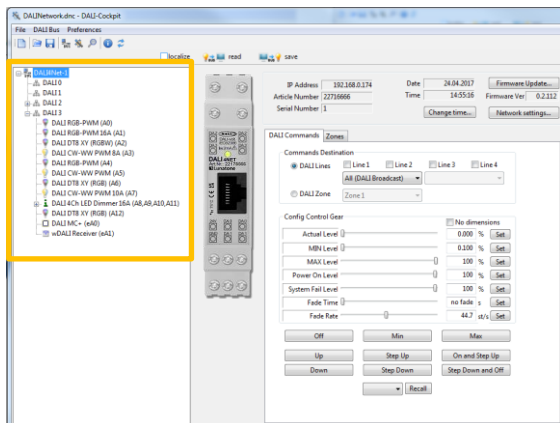
Crossline: Zones and Multiline-Access

With the DALI4Net it is possible to extend the effective range beyond a single DALI-line – by the definition of crossline zones:

A zone is a user-defined area across several DALI-lines. The number of zones is limited to 15. A group of each line can be assigned to a zone, i.e. groups with different numbers on each line can be combined in a zone (tab zones in DALI-Cockpit).

Zones can then be used as effective areas for control input devices or for control via Modbus TCP.

Apart from zones it is possible to access the same DALI-address (short address, group address broadcast) on several lines simultaneously.

Zones and multiline access can be tested in the tab „DALI-commands", at which these areas can be selected as destination of a DALI-command.


DALI 4Net, Datasheet   © 2022/09/10, Lunatone Industrielle Elektronik GmbH
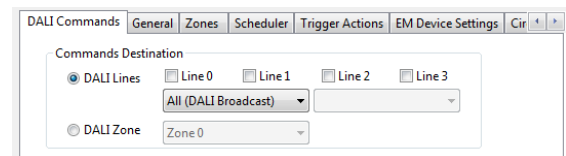
**Crossline functionality for Pushbuttons (Input Devices)**

For the DALI MC+, DALI Switch, DALI MC4L, wDALI MC, wDALI Switch and wDALI Remote crossline settings are available on the respective device cockpit pages. Crossline functionality for other input devices can be realized via "Trigger Actions", see next section.

If one of the above mentioned input device is connected to one of the 4 DALI-lines the DALI-Cockpit offers options to select between local bus operation and DALI-line crossline functions (in the DALI4Net basic version only local bus operations are supported).

When using local bus operations a DALI-line internal destination address can be selected:
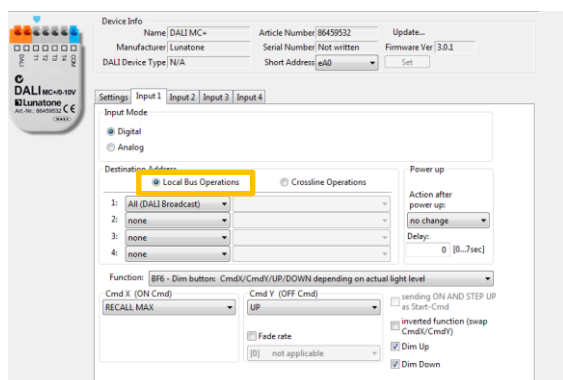
When using crossline operations for the destination address either a zone or a multiple line address (broadcast, group or DALI address) can be selected:
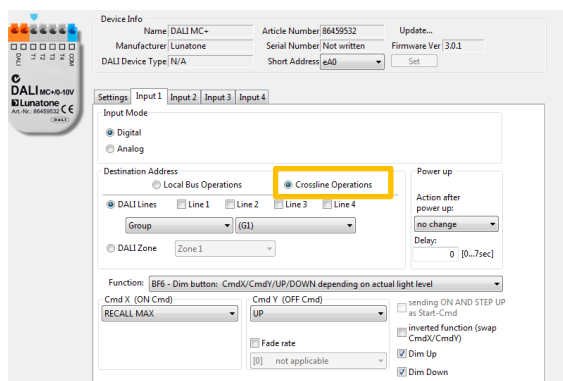

Crossline functionality - "Trigger Actions"

In the tab "Trigger Actions", links between the 4 lines can be created to forward DALI commands to other DALI lines.

With the template "Connect Areas" the DALI commands are forwarded bidirectionally between the defined areas of each line.
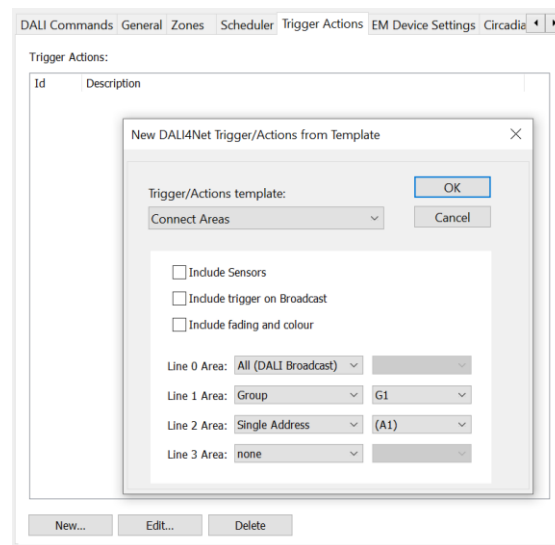
This means that the effective range of a push button can be extended to other lines via forwarding. The effective range of other lines can be: Broadcast, groups or addresses.

In order to create unidirectional or more complex links, a "Custom Trigger Action" can be created, where each trigger and following action can be selected individually.
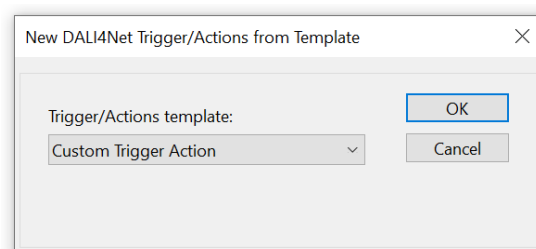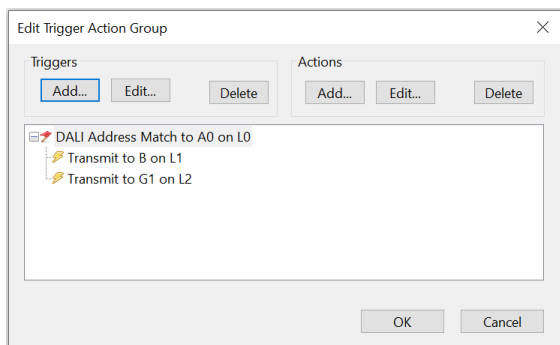
Example: unidirectional forwarding of DALI commands from address A0 on Line0 to broadcast line1 and group1 line2

Hint: With double clicking on a created "Connect Area", this template can also be displayed and adapted in the form of individual triggers and actions.
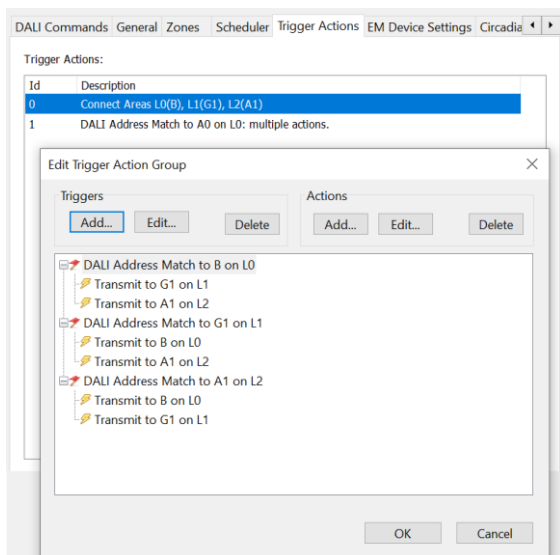
„Connect Areas" Triggers and Actions editable via double click

The Trigger / Actions function can also be used to implement more special requirements, such as cross-line control and synchronization of sensors.

Overview of the supported triggers / actions:

1. Connect areas

    ➔ This allows areas to be logically connected on different DALI lines

    ➔ Optional if connection is also applied to sensors: "Include sensors", higher-level broadcast commands "Include trigger on broadcast" and fading and colour: "include fading and colour"

2. Custom Trigger/Action

    ➔ Here, DALI commands (or certain properties, such as an address match) can be used to trigger actions (DALI commands)

    ➔ Triggers can be:
    - Address match
    - Frame Match (exact command match)
    - Sensor Area Match
    - Special Command Match (colour, fading)

    ➔ Actions can be:
    - Address change
    - Frame repeat
   - Sensor area forwarding
    - Special command forwarding

*Example: Definition of a sensor area across DALI lines*
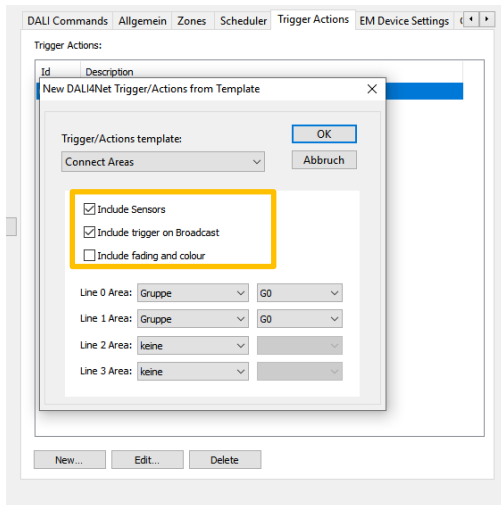
Connecting the groups G0 on Line0 and Line1: All commands to G0 on one line are passed on to the other, this also includes sensor signals: "Include Sensors" and broadcast commands "Include Trigger on Broadcast", i.e. if G0 is, for example switched on by a broadcast command, G0 on line 1 is also switched on. By selecting "include sensors", DALI CS sensors can work across lines and synchronize.

Example: Broadcast commands should always affect all 4 DALI lines

Definition of trigger: address match broadcast
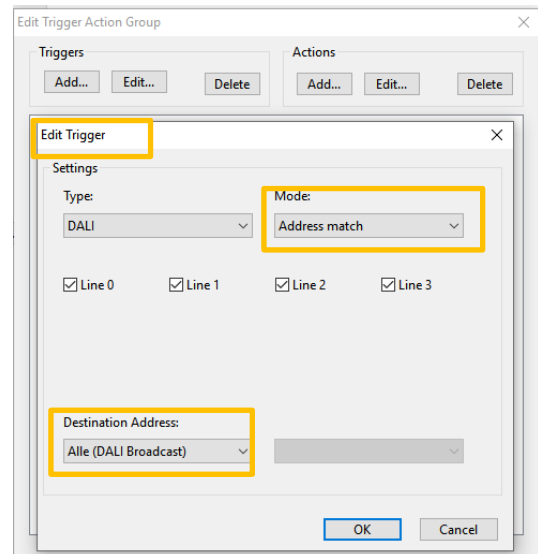
Definition Action: Adress Change to Broadcast
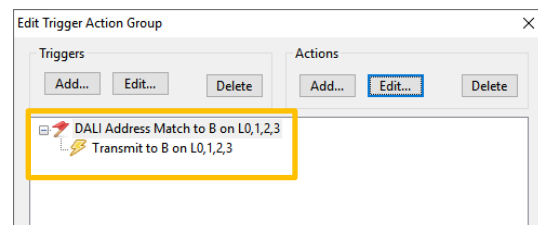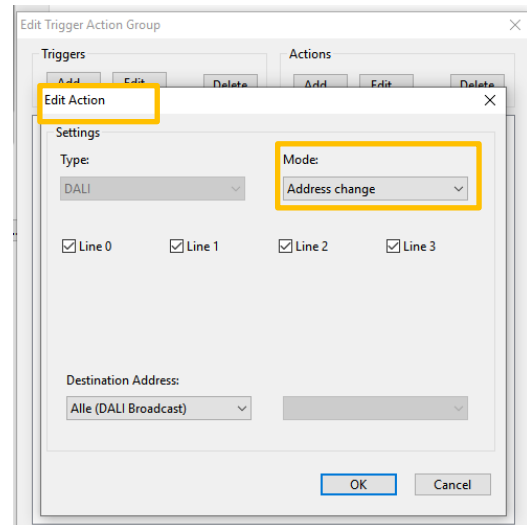
➔ If a command is sent Broadcast on any of the DALI lines, it will be forwareded broadcast on all other lines as well.
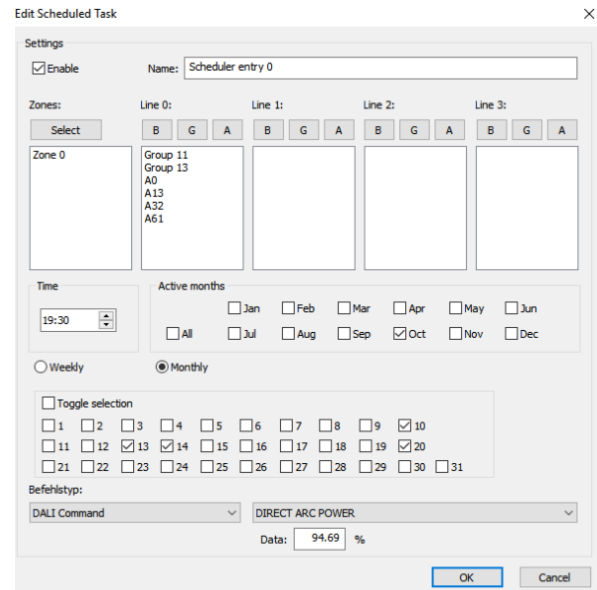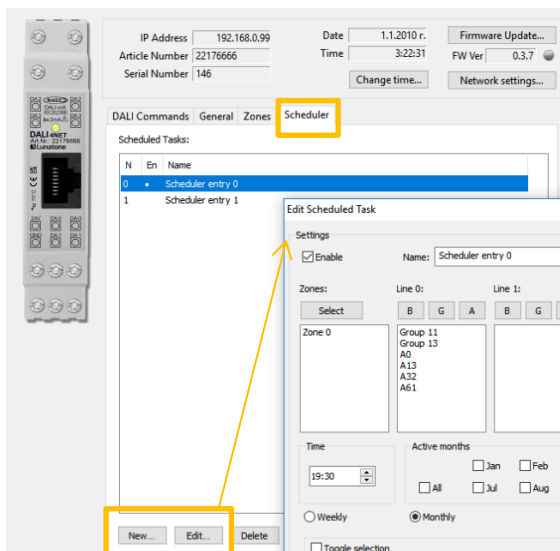
Scheduler Configuration

The DALI4Net offers a programmable scheduler function (not supported in the DALI4Net Basic).

In the „Scheduler"-tab the entries of the scheduler can be added, edited and deleted.

A maximum of 128 storage locations for scheduler entries are provided.

For each scheduler entry the following parameters can be set:

- name of entry (not stored in device, only in config file)
- effective range (zones and single addresses, groups or broadcast for each DALI-line)
- timestamp of action
- days (weekdays, days of month) and months on which action has to be executed
- action (DALI-command)

Example: in the entry „Scheduler Entry 0" from the screenshot above Zone0, group 11, 13 and the single addresses A0, A13, A32, A61 on DALI-Line 0 are switched to 95% at 19:30 on 10th /13th /14th and 20th of october.

Please note that for a valid entry months as well as days have to be defined.

The „Scheduler Entry 0" in the example above requires 7 storage locations out of the 128 available, because for each of the 7 effective ranges a individual storagelocation is required.

Emergency Functions

In the "EM Device Settings" tab, emergency lighting devices (device type 1 (DT1)) can be divided into up to 8 emergency groups.
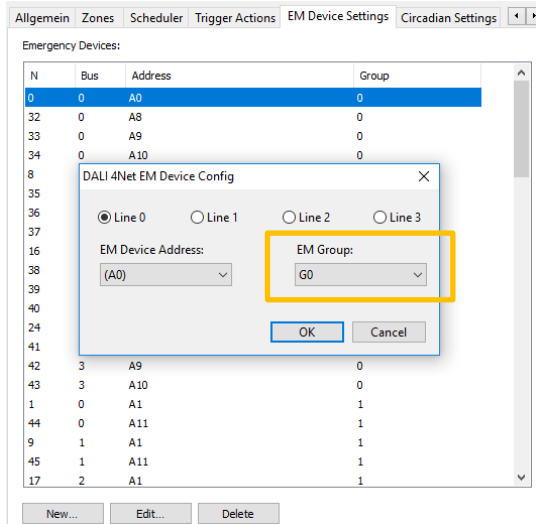
For the defined emergency groups, schedules with entries for function test, duration test and communication tests can then be specified.
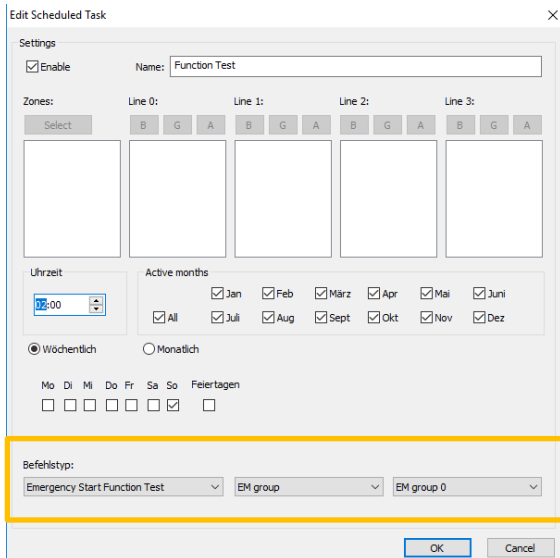
Please note: Only the results of the last test carried out are saved in the DALI4Net, i.e. for the logging of the tests these results must be read out cyclically via Modbus commands. For details on the ModBus commands, please refer to the manual.

Circadian Daylight Schedule

With the circadian daylight function, the DALI4Net offers the option of automatically adjusting the colour temperature of DT8-capable tunable white luminaires. In the "Circadian Settings" tab, two daily curves (for the longest and shortest day of the year) with each 24 support points (one for each hour) can be defined.

The colour temperature value is interpolated between each time point throughout the day, as well as between the two defined curves over the course of the year.

The colour temperature of the circadian function is updated and sent to the luminaires every minute.

As effective range for the circadian daylight function, the groups 0 to 15 can be selected for every line.
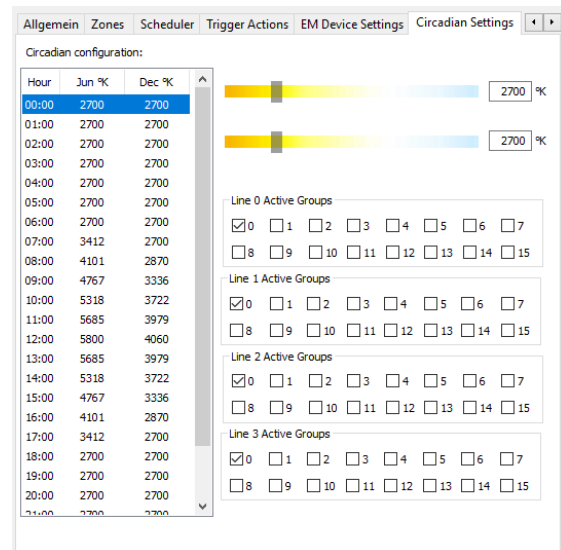
ModBus-TCP/IP Access

Modbus TCP/IP is part of the serial modus communication protocol for TCP/IP networks using port 502. The following Modbus functions are supported for accessing the DALI4Net:

Function Name	Function Code	Description
Read Multiple Holding Registers	03	Read Data Blocks From Device
Write Multiple Holding Registers	16	Write Data Blocks To Device
Read/Write Holding Registers	23	First Write, then Read from Specific Address, function used to send DALI commands

The Read/Write operations to Modbus registers are used to configure DALI4Net-functions as well as to access DALI-lines directly. Furthermore status and level of all control gear on a DALI-line can be polled simultaneously.

For further details to Modbus-TCP access please check the manual:
https://www.lunatone.com/wp-content/uploads/2018/03/22176666_DALI4Net_Manual_EN_M0002.pdf

and the Modbus TCP example collection:
https://www.lunatone.com/wp-content/uploads/2021/01/DALI-4Net-Access-via-Modbus-Sample-Collection.pdf

Sensor value polling– Registers 6100-7123

With the DALI 4Net it is also possible to automatically poll and log sensor values. The most recent value is saved in the DALI4Net and can be queried via registers 6100-7123. Supported sensors are DALI CS (Art.Nr. 86458621), DALI LS (Art.Nr. 86458674) and DALI Temp (Art.Nr. 86459544).

To do this, the DALI4Net must first be configured accordingly. This is possible in the DALI Cockpit, under the tab "General" section "Sensor Polling", by adding the sensor via "New..." and specifying its line and address (if all sensors in the system are to be added, this can be done using the button "add all").

The index number in the table then indicates the register number for the query: index 0 corresponds to register 6101.
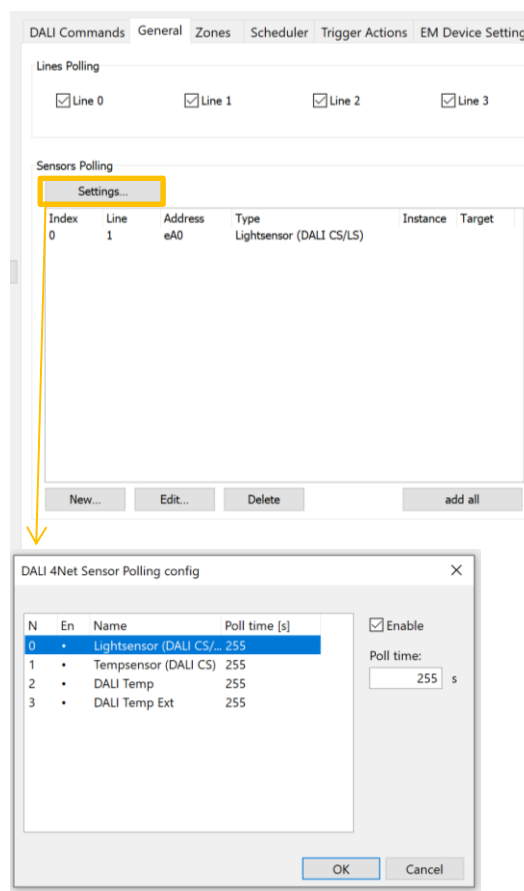
Under "Settings..." the polling time for the various sensor types (light and temperature) can be set.

Purchase Order Information

Art.Nr. 22176666: DALI 4 Net, 4 Line ModBus to DALI gateway with central controller functions

Art.Nr. 22176666-B: DALI 4 Net Basic, 4 Line ModBus to DALI gateway

Accessories:
Art. Nr.: 24166012-24HS, 24VDC/300mA power supply, dinrail, 1TE

Additional Information and Equipment

DALI-Cockpit – free configuration tool from Lunatone for DALI systems
https://www.lunatone.com/en/product/dali-cockpit/

Lunatone DALI products
http://www.lunatone.at/en/

Lunatone datasheets and manuals
http://lunatone.at/en/downloads/

DALI 4NET Modbus TCP Manual
https://www.lunatone.com/wp-content/uploads/2018/03/22176666_DALI4Net_Manual_EN_M0002.pdf

Contact

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www.lunatone.com

DALI 4Net Basic
22176666-B

Disclaimer

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

The compatibility with other devices must be tested in advance to the installation.