

EnOcean DALI-2 MC

Datasheet

Multi Control Device



DALI control module
for integration of EnOcean
push-buttons and switches

Art. Nr. 86463327-app
factory default setting: **App-Controller activated**

Art. Nr. 86463327-int
factory default setting: **Instances activated**

Art. Nr. 86463327-NFC
factory default setting: **App-Controller activated**

EnOcean DALI-2 MC Control Device

Overview

- Compact DALI-2 control module for connection of up to 4 EnOcean pushbuttons to the DALI system
- different DALI commands, effective range and switching functions can be assigned to each of the 4 EnOcean inputs
- Multi-master capable: Several modules can be installed within a DALI circuit.
- Integrated DALI-2 application controller
- In addition to the standard DALI commands, the application controller also supports DALI DT8 TC and RGB (W) control
- Four DALI-2 pushbutton instances are available for an easy integration in central control systems
- short button press, long button press (with repetition for dimming) and «toggle» are supported
- Alternative button function: A second function can be assigned to each input. Activated / deactivated via a scene command or switch at input 4. Thus, Offering an easy solution to the partition wall problem.
- With the application controller Sequences, macros and other functions can be realized.
- Easy configuration via Lunatone DALI USB interface and DALI-Cockpit Software Tool.
- NFC version for simple, contactless configuration with the Lunatone NFC smartphone app (art.nr.: 86463327-NFC)
- Easy installation: the device can be installed in a flush-mounted installation box and is supplied via the DALI bus
- DALI-2 control unit according to IEC62386-103



Specification, Characteristics

type	EnOcean DALI-2 MC	EnOcean DALI-2 MC Integration	EnOcean DALI-2 MC NFC
article number	86463327-app	86463327-int	86463327-NFC
GTIN	9010342013836	9010342013836	9010342013836
factory default setting	app-controller active	instances active	app-controller active

DALI interface, power supply: DA, DA

output type	DALI, DALI-2, Multimaster
terminal markings	DA, DA
voltage range	9,5V ... 22,5Vdc according to IEC62386
typical current consumption DALI (16,5V)	6 mA
max. current consumption DALI (10V)	10 mA
DALI addresses	none
DALI-2 addresses	1

inputs EnOcean

inputs type	EnOcean – wireless (868 MHz)
number of inputs	4
minimum length of control pulse	40ms
control pulse length for long press	>500ms

insulation data

impulse voltage category	II
pollution degree	2
rated insulation voltage	250V
insulation DALI / housing	reinforced isolation
insulation test voltage DALI / housing	3000Vac

environmental conditions

storing and transportation temperature	-20°C ... +75°C
operational ambient temperature	-20°C ... +75°C
rel. humidity, not condensing	15% ... 90%

general data

dimensions (l x w x h)	59mm x 33mm x 15mm
mounting	back box installation, installation in protection class II devices
rated maximum temperature tc	75°C
expected life time	50.000h
protection class	SKII (when used/installed as intended)
protection degree housing	IP40
protection degree terminals	IP20

terminals

connection type	spring terminal connectors
wire size: solid core	0,5 ... 1,5 mm ² (AWG20 ... AWG16)

wire size: fine wired	0,5 ... 1,5 mm ² (AWG20 ...AWG16)
wire size: using wire end ferrule	0,25 ... 1 mm ²
stripping length	8,5 ... 9,5 mm / 0,33 ... 0,37 inch
tightening/ release of wire	push mechanism

standards

DALI	IEC62386-101:2014 IEC62386-103:2014
EMV	EN 61547 EN 50015 / IEC CISPR15
safety	EN 61347-2-11 EN 61347-1
Markings	DALI-2, CE

Factory Default Settings

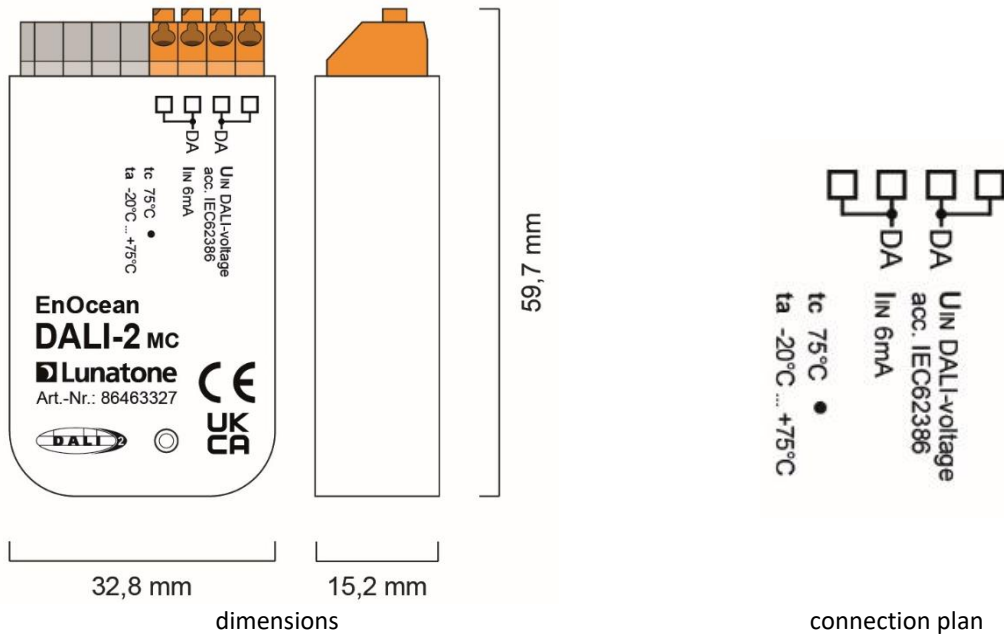
A basic configuration is already implemented on delivery (factory default setting). If necessary, this can be changed and adapted.

Version Application controller: art.nr. 86463327-app and art.nr. 86463327-NFC

	input 1	input 2	input 3	input 4
application controller	active			
instances – event messages	inactive	inactive	inactive	inactive
effective range	Broadcast	Broadcast	Broadcast	Broadcast
button function	BF6 Toggle + Dimming	BF10 short and long press	BF10 short and long press	BF13 – Tunablewhite dimming button
command X (CmdX)	RECALL MAX - UP	RECALL MAX	OFF	COOLER
command Y (CmdY)	OFF - DOWN	Dim up	Dim down	WARMER

Version Integration: art.nr. 86463327-int

	input 1	input 2	input 3	input 4
application controller	inactive			
instances – event messages	active	active	active	active
effective range	--	--	--	--
button function	--	--	--	--
command X (CmdX)	--	--	--	--
command Y (CmdY)	--	--	--	--



Typical application

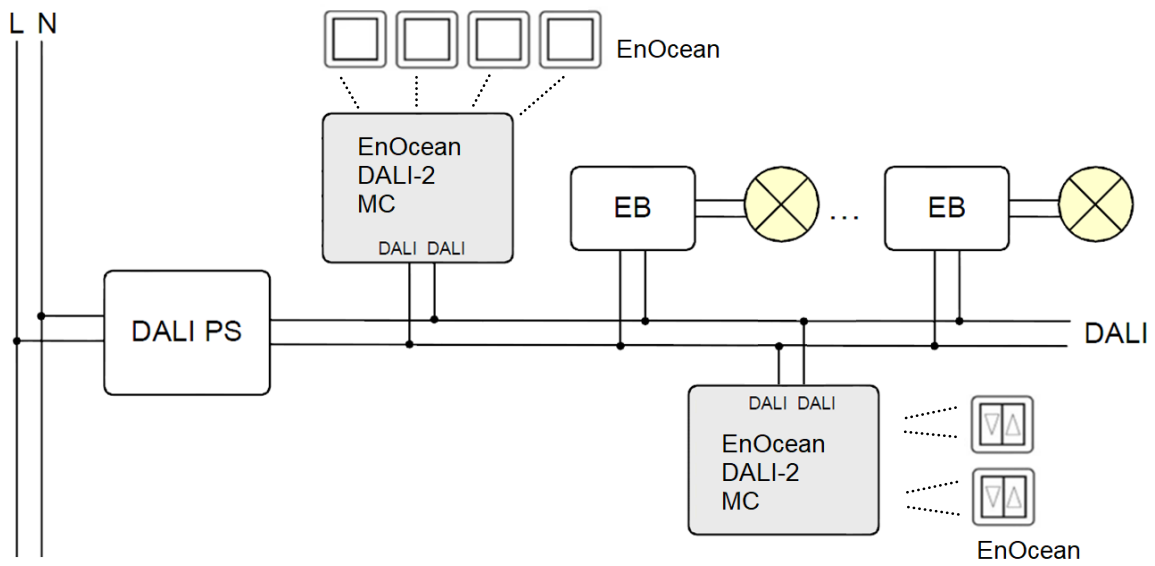




Fig. 1 Typical Application

Installation

- The EnOcean DALI-2 MC can be installed in a flush-mounted installation box
- The device is directly connected and supplied by the DALI bus. A DALI bus power supply (e.g. DALI PS) is required.
- The connection to the DALI terminals can be made regardless of polarity. The bus input is protected against overvoltage (mains voltage).

- The EnOcean DALI-2 MC must be in the transmission range of the EnOcean pushbutton
- 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).

Addressing and Configuration

- After installation, the device can already be used with the default factory settings. (factory default settings, page 4)
- Addressing and changes to the factory settings, such as setting the effective range and functions, are possible with the Software tool DALI Cockpit (Windows PC).
- EnOcean DALI-2 MC NFC: Addressing and changes to the factory settings, such as setting the effective range and functions, are possible with the [DALI Cockpit Software](#) (Windows PC) and the Lunatone DALI NFC smartphone app (see page 16).
- The coupling of the EnOcean button to the EnOcean DALI-2 MC is also possible via the [DALI Cockpit Software](#) (PC - Windows).
- When using the [DALI Cockpit Software](#), the PC must be connected to the DALI bus via a suitable interface module ([DALI-2 USB](#); [DALI USB](#), [DALI-2 WLAN](#), [DALI-2 Display](#), [DALI-2 IoT](#), [DALI 4Net](#), [DALI SCI RS232](#)). The EnOcean DALI-2 MC is automatically recognised by the DALI Cockpit during the addressing process and listed in the device overview. Effective range and desired functions can then be assigned to each input.
- The addressing is done according to the DALI-2 specification and the device receives a corresponding address.
- For localisation a buzzer is integrated in each EnOcean DALI-2 MC device. Alternatively, the allocation can also be done via the serial number of the device.

Operation and function

The EnOcean DALI-2 MC is a universal module for connecting EnOcean push buttons to control DALI-compatible lights. The function of each button input can be set individually.

As with other Lunatone control devices, the settings can be made with the DALI Cockpit Software tool.

Figure 2 shows the basic settings of the device - Cockpit tab "General".

It is necessary to distinguish between application controller and DALI-2 instances.




The application controller gives direct DALI control commands that are immediately executed by the DALI drivers.

The DALI-2 instances generate event messages that are interpreted and processed

by higher-level control units (WAGO, Beckhoff, LUNATONE DALI-2 KNX gateway). (General information on the DALI-2 instance mode: https://www.lunatone.com/wp-content/uploads/2021/10/DALI-2_Instance-Guide_EN_M0024.pdf)

Configuration of the EnOcean DALI-2 MC instances is described in section: **"Error! Reference source not found."** on page 14.

The Application controller and instances can be active at the same time.

 **Additional Information:** A deactivated Application Controller is indicated in the DALI Cockpit device tree with: . A device with active instances is indicated with: .

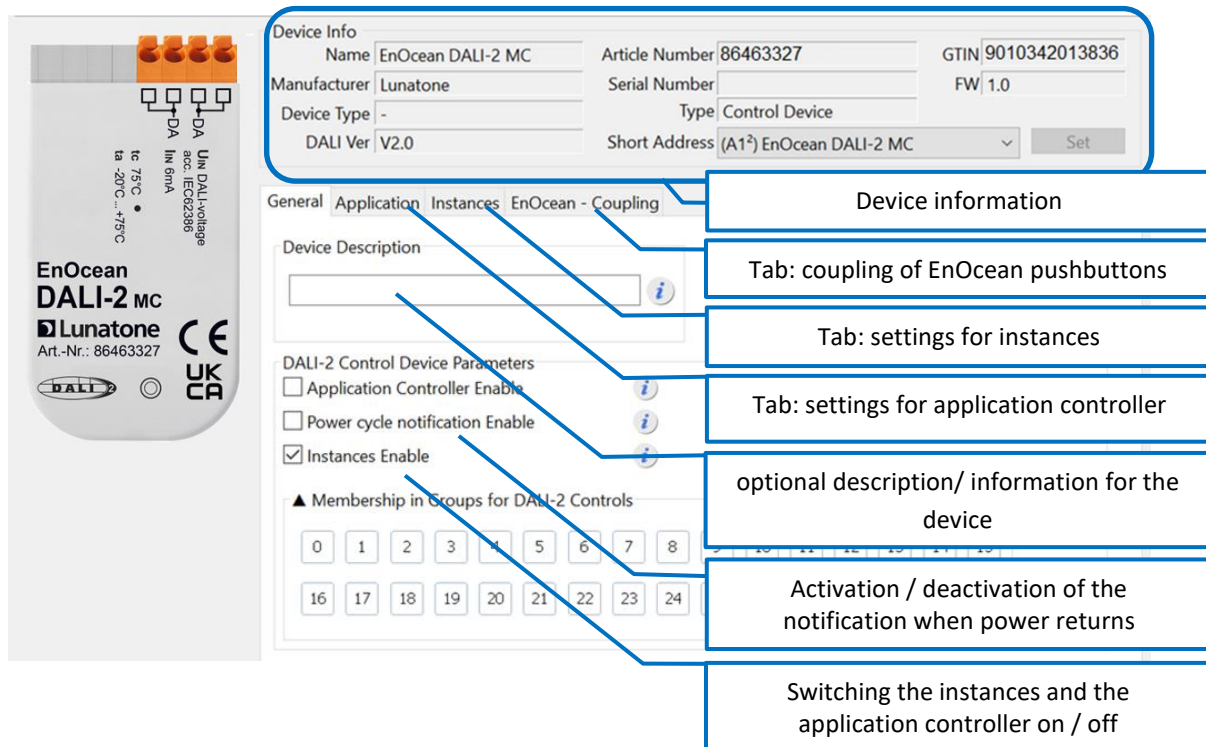


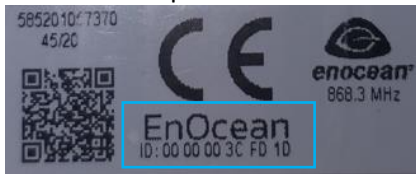
Fig.2: General Settings

Coupling of EnOcean buttons

Under the tab: "EnOcean - Coupling" (see Figure 3 below), EnOcean buttons can be coupled to the inputs of the EnOcean DALI-2 MC via manual ID input or by button press.

Coupling via manual ID input

In order to assign a button to each input of the EnOcean DALI-2 MC module, the button ID must be entered in the "ID" field. Each EnOcean button block has a unique ID which can be found on the button block. For button blocks with multiple buttons, the button assignment (A0, A1, B0, B1) can also be found on the button block and entered in the DALI Cockpit section "Button".



Coupling via button press

In order to assign an input of the EnOcean DALI-2 MC module to a button, the respective input (input 1 - input 4) can be activated in the section: "Teach in via button press". Then the EnOcean button to be assigned must be pressed 3 times in order to be linked to the specific input.

The device beeps when the key has been coupled successfully.

The option "manual teach in" is automatically set to "none" in the cockpit when the teaching process has been completed.

Caution, only one key at a time can be coupled.

Attention: After coupling via button press, the data of coupled devices are only visible in the input fields "ID" and "Key" fields after they have been read out from the device.

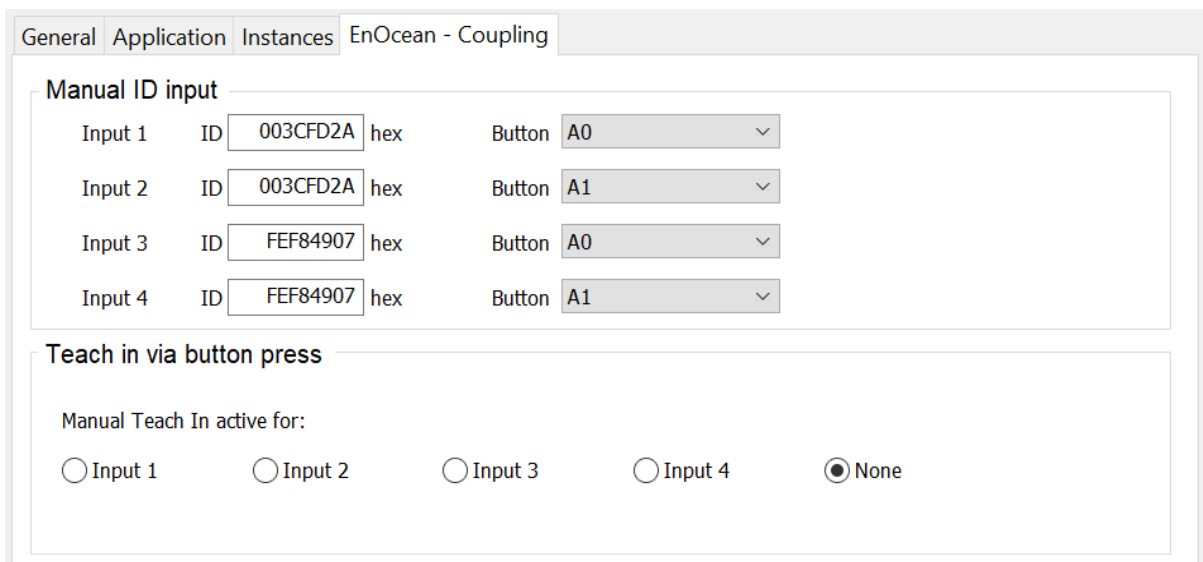


Fig. 3: EnOcean button coupling

Application Controller - Configure inputs 1-4

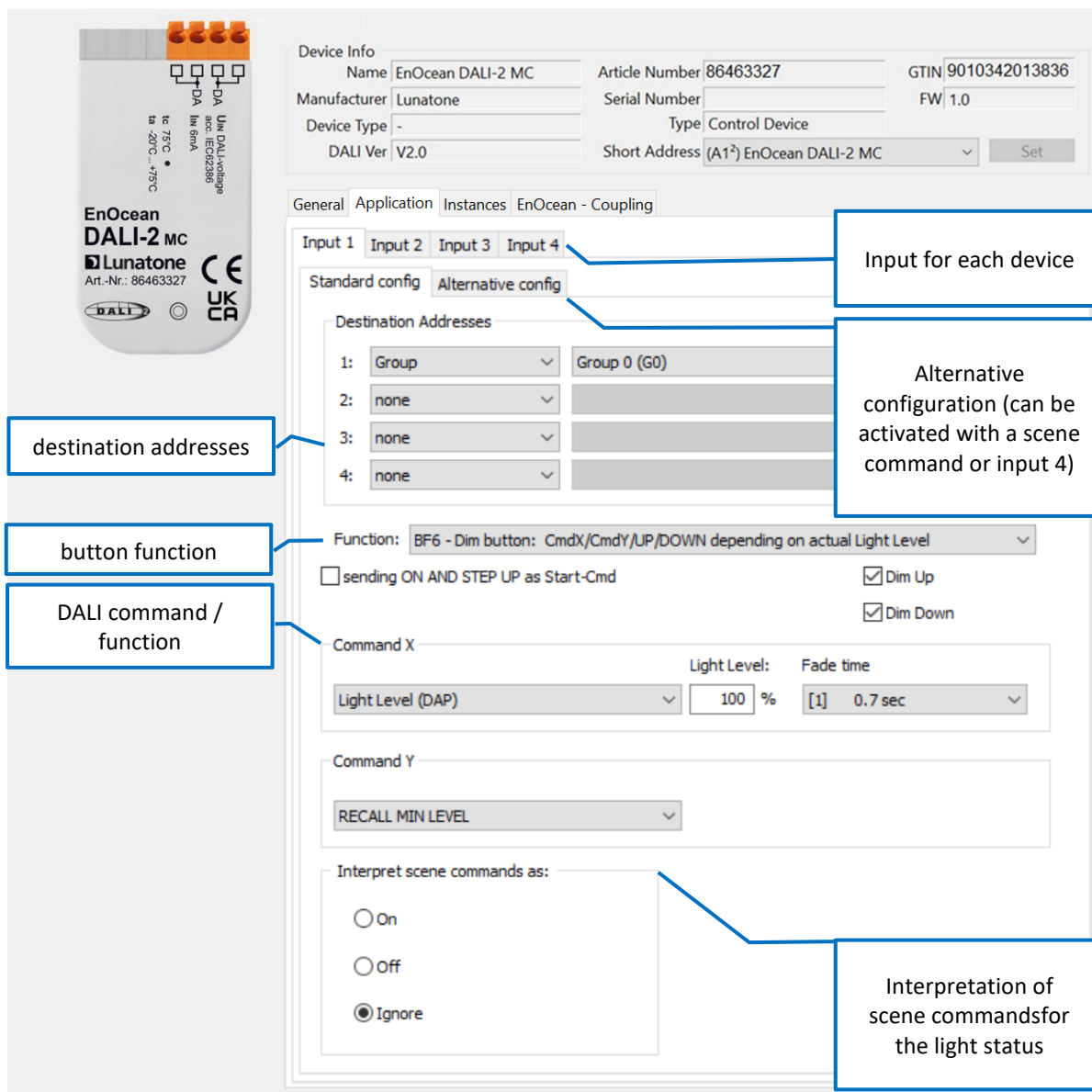


Fig. 4: Application: Application Controller

Destination address / effective range

Here you can set which devices are affected by the button function. Possible destination addresses:

- Broadcast (an alle)
- DALI group (0 - 15)
- DALI single address (0 - 63)

Up to 4 different target addresses can be defined for each button input. When the button is pressed the target addresses 1 to 4 will be processed sequentially (see Fig. 5)

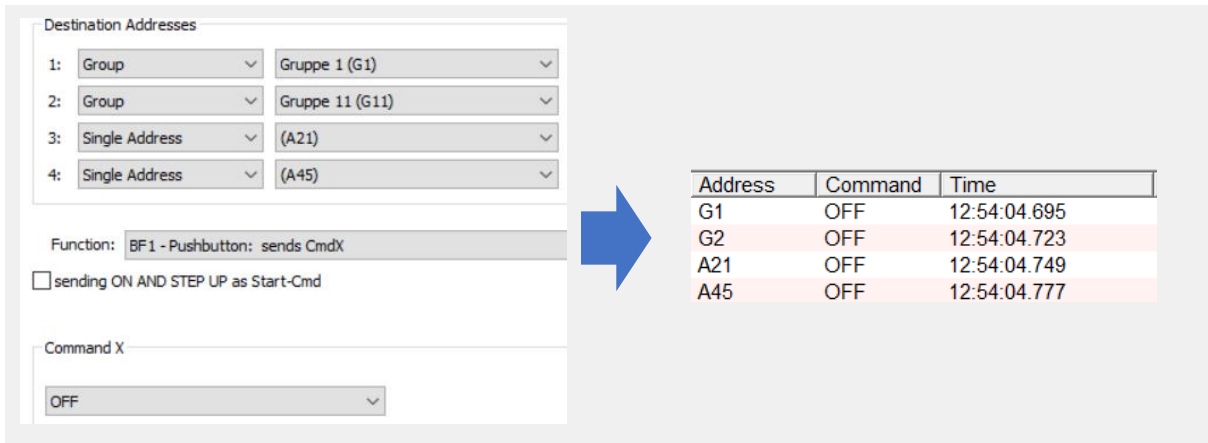


Fig.5 Example: Addressing Inputs 1-4 – sequentially processed

Button Function (BF)

Various "Button Functions" (BF) can be assigned to the individual buttons. The "Button Function" defines the behaviour of a button. A short or long press of the button can trigger different DALI commands. A toggle

function (switching between on and off) is also possible.

Key presses (short / long) are queried according to the following timing diagram and translated into internal signals (**key events**):

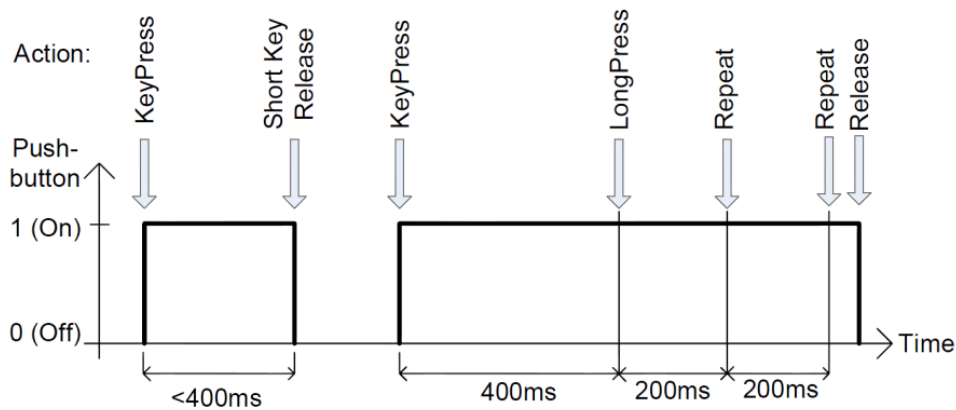



Fig.6 Key Events

The following table shows how the selected "Button Function" (lines 0 to 13) sends the commands **CmdX** and **CmdY** in connection with the "Key Events" (see Fig. 6). CmdX and CmdY refer to DALI commands.

 **Note:** The DALI commands are transmitted to all assigned target addresses.

button function number	event: press	event: short press (release)	event: long press	event: extra-long press	event: repeat	function	typical application
0	-	-	-	-	-	-	-
1	CmdX	-	-	-	-	sends CmdX on key press	master off
2	CmdX	-	CmdY	-	-	sends CmdX on key press sends CmdY on long key press	switch to 2 different levels
3	-	CmdX	-	CmdY	-	sends CmdX on key press sends CmdY on extra-long key press	store level as scene
4	CmdX / CmdY toggle	-	-	-	-	sends alternating CmdX and CmdY on key press	toggle push button
5	CmdX / CmdY toggle	-	-	-	-	sends CmdX or CmdY on key press depending on bus status	changeover button
6	-	CmdX / CmdY toggle	UP / DOWN	-	UP / DOWN	sends CmdX or CmdY on short key press depending on bus status sends alternating UP or DOWN on long press and repeat	push and dim
7	CmdX CmdY on any release	-	-	-	-	sends CmdX on key press sends CmdY on key release (after any duration)	switch
8	CmdX / CmdY toggle CmdY / CmdX toggle on any release	-	-	-	-	sends CmdX or CmdY on key press depending on bus status sends CmdY or CmdX on key release (after any duration) depending on bus status	changeover switch
9	CmdX CmdY on delay	-	-	-	-	sends CmdX on key press sends CmdY after a programmable delay	staircase control
10	-	CmdX	CmdY	-	CmdY	sends CmdX on short key press sends CmdY on long key press sends CmdY on repeat	push and dim
11	CmdX	-	-	-	CmdY	sends CmdX on key press sends CmdY on repeat	push and dim
13	-	CmdX / CmdY toggle	-	-	WARMER / COOLER	sends CmdX or CmdY on short key press depending on bus status sends alternating WARMER or COOLER on repeat	tunable white dim

Tab. 1

Commands

The actual action (which function is triggered when pressing a button) is determined by the button function and command assigned to the button.

In most cases, an X command (CmdX) and also a Y command (CmdY) can be selected.

The following options are available, see table 2.

Depending on the selected command, additional input fields might appear for further settings:



Fig. 7 Example for CmdX: DAP additional inputs: Light Level and Fade time

Predefined macros

Macros are predefined/ user defined command sequences that can be triggered by a single button press.

The following macros are available, see table 3.

Command number	Command name	action / function
no Nr.	DIRECT ARC POWER	direct arc power Level in %
0	OFF	off
1	UP	dim up (using fade rate)
2	DOWN	dim down (using fade rate)
3	STEP UP	increases light level by one increment
4	STEP DOWN	decreases light level by one increment
5	RECALL MAX	recalls MAX value
6	RECALL MIN	recalls MIN value
7	STEP DOWN AND OFF	decreases light level by one increment, if value at MIN switch off
8	ON AND STEP UP	increases light level by one increment, if OFF switch on
10	GOTO LAST ACTIVE LEVEL (DALI 2)	DALI-2-Cmd for switching on to the last active level (Memory-Function)
16-31	GO TO SCENE	go to scene 0-15

Table. 2

Nr	Makro	Function
M1	Go Home	Light dims down to DAP 0 with predefined fade time, then fade time is set back to a programmable value
M2	Sequential Scenes	A list of the scenes can be defined; the scene is switched with each button press.
M3	Dynamic Scenes	A dynamic sequence of up to 16 scenes can be defined, including custom fade times and delays.
M4	Save actual light level as scene	When triggered the current level is saved in a scene (options: light level, RGB colour value, WAF colour value or colour temperature).
M5	User Defined Cmd-List	A user-defined macro script with up to 19 commands is executed.
M6	TC cooler	Activates the DT8 mode and sends the command "COOLER" 3 times.
M7	TC warmer	Activates the DT8 mode and sends the command "WARMER" 3 times.
M8	Send RGB +	Activates the DT8 mode and sends an ascending RGB color table value.
M9	Send RGB -	Activates the DT8 mode and sends a descending RGB color table value.
M10	Delayed Off	Sends a DAP level and after a delay the OFF command. DAP level and delay are user defined.

Table.

Interpretation of scene commands when using toggle function

In order to correctly trigger the on and off commands with the toggle function, scene calls must be interpreted correctly. It is possible to set whether a scene should be interpreted as Off or On (Fig 8).

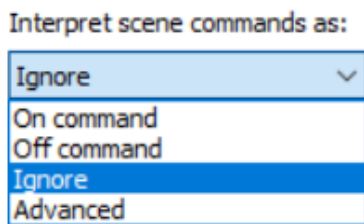


Fig. 8

Behavior on power-up

The behaviour when the device starts can be defined for each input. The following settings are possible:

- No action: (the device starts and only sends commands when triggered by the input)
- Sending a scene or OFF command with or without a delay after start (maximum delay: 7 seconds)

Alternative Configuration

An alternative/second configuration can be made for each button. All previously explained configuration options and settings are available. The alternative configuration can be recalled with button input 4 or a scene command.

Activate / deactivate the "Alternative Configuration":

- **"Disabled"**: the function is switched off, there is only the standard configuration
- **"Activation by Input 4"**: the standard and alternative configuration are switched with a button connected to input 4.
- **"Activation by Scene Commands"**: scenes can be selected which will activate / deactivate the alternative configuration

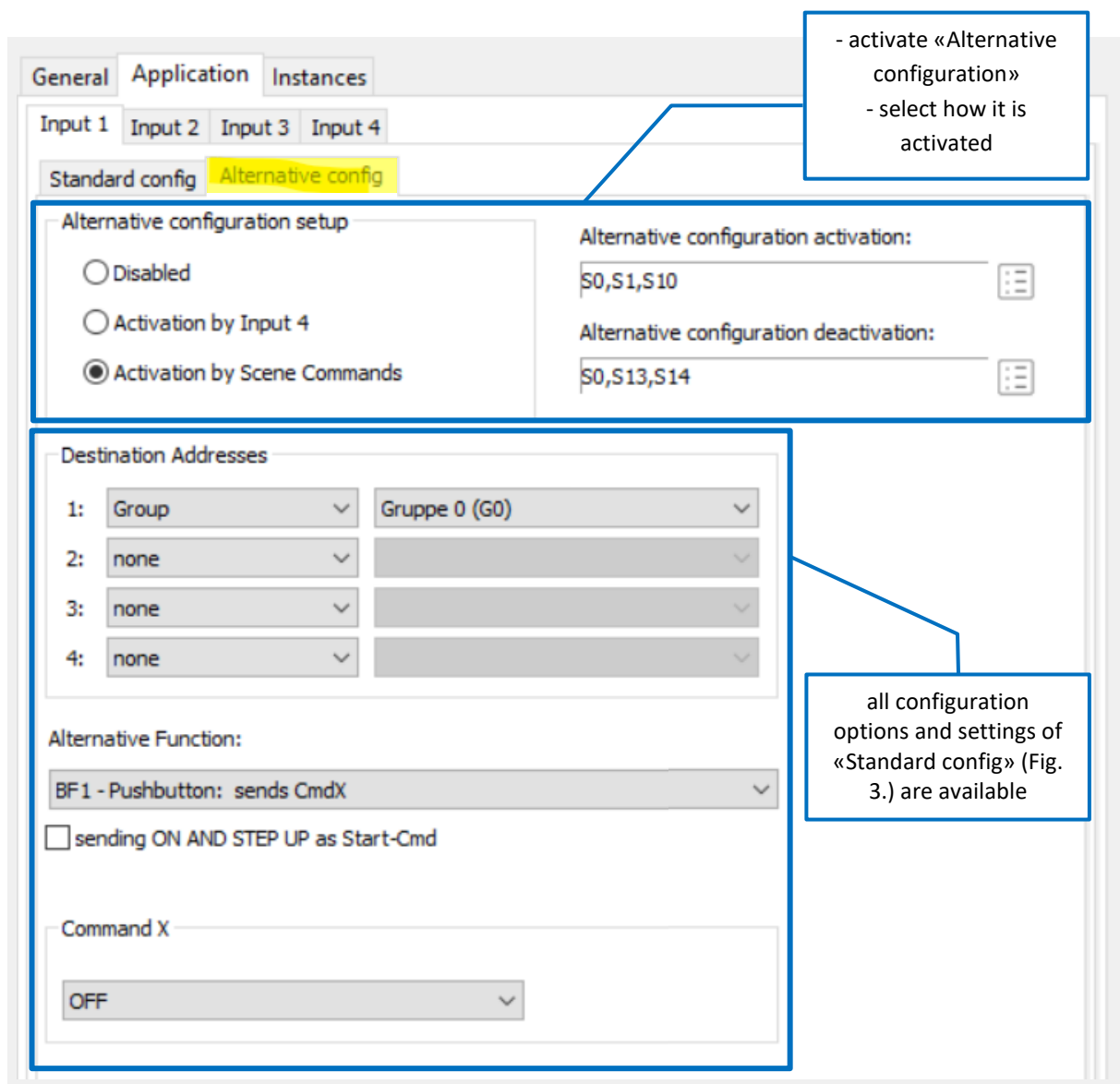


Fig. 9 Settings for the alternative configuration

DALI-2 instances

In this operating mode, no DALI control commands are sent on the bus, but DALI-2 event messages for DALI-2 compatible central control systems.

The EnOcean DALI-2-MC supports 4 instances of type 1 (IEC62386-301, Input Devices - Push Button), which are assigned to the 4 button inputs:

instance 0	input 1
instance 1	input 2
instance 2	input 3
instance 3	input 4

As defined in the standard, the following events are supported and sent on the DALI bus as INPUT NOTIFICATIONS, see table 4.

Further parameters of each instance are: event filter and event timer settings (short timer, double timer, repeat timer, stuck timer), which can be configured via the [DALI Cockpit Software](#), see figure 9.

General information on the DALI-2 instance mode and the instance types, event settings, event schemas etc. can be found in the instance guide:

https://www.lunatone.com/wp-content/uploads/2021/10/DALI-2_Instance-Guide_EN_M0024.pdf

Event name	Event Information	Description
Button released	00 0000 0000b	The button is released
Button pressed	00 0000 0001b	The button is pressed
Short press	00 0000 0010b	The button is pressed and released, without being pressed quickly again (in case of double press enabled), or the button is pressed and quickly released (in case of double press disabled)
Double press	00 0000 0101b	The button is pressed and released, quickly followed by another button press
Long press start	00 0000 1001b	The button is pressed without releasing it
Long press repeat	00 0000 1011b	Following a long press start condition the button is still pressed, the event occurs at regular intervals as long as the condition holds
Long press stop	00 0000 1100b	Following a long press start condition, the button is released
Button free	00 0000 1110b	The button has been stuck and is now released
Button stuck	00 0000 1111b	The button has been pressed for a very long time and is assumed stuck.

Tab.4

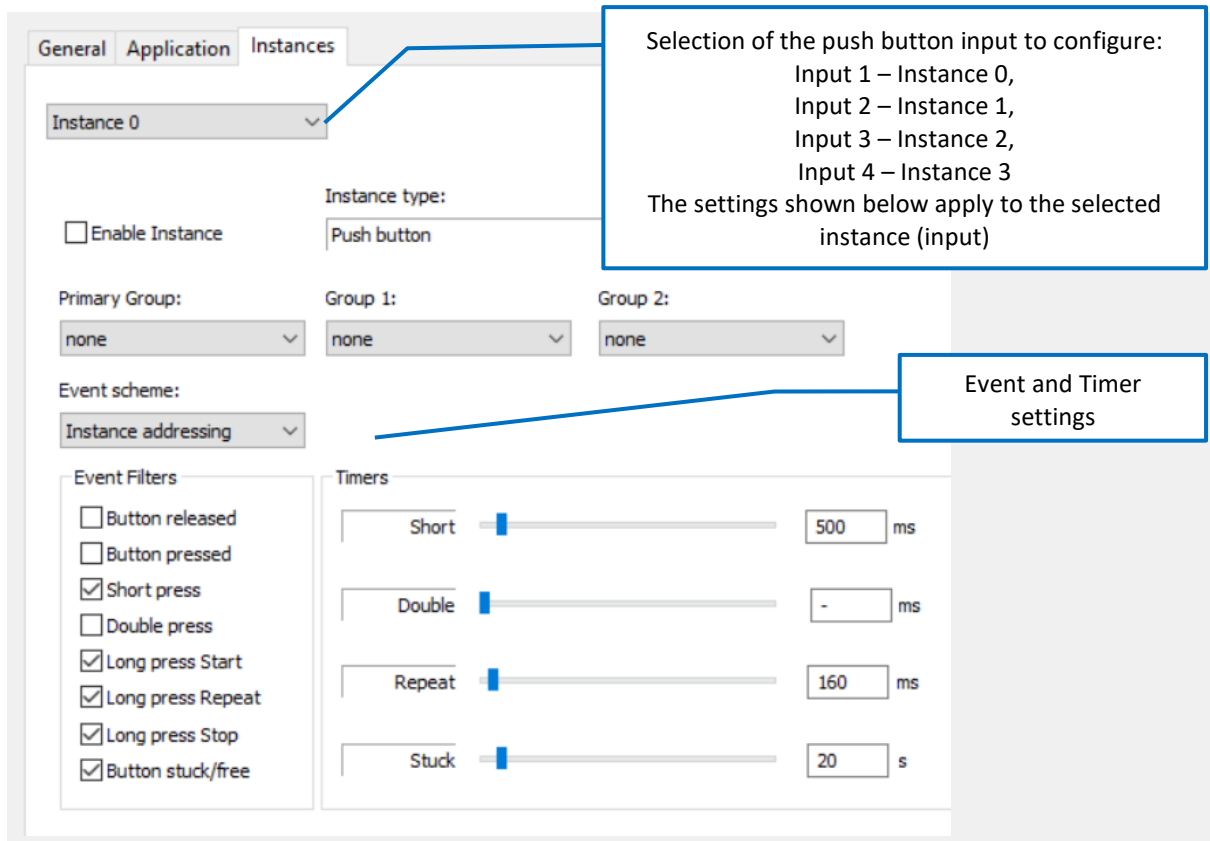


Fig. 10 Instance Settings

NFC-Version

article number.: 86463327-NFC



In addition to the DALI Cockpit Software, the EnOcean DALI-2 MC NFC includes a nearfield communication interface. This allows configuration over the NFC interface and a smartphone app.

- The EnOcean DALI-2 MC does not have to be connected to a DALI power supply for configuration with NFC, it is supplied directly via NFC.
- The functions required to operate the application controller can be configured with the Lunatone DALI NFC App.
- Easy to use smartphone app for quick configuration in the field as well as preparation before installation.
- Fast transfer and copying of device settings

App Download:

The Lunatone "DALI NFC" app is available for Android devices on the Play Store.



Connect:

- Switch on the NFC function and start the "DALI NFC" app.
- This is followed by the request to pair an "NFC-enabled device".
- As soon as the DALI-2 MC NFC is within range (indicated by signal tone / vibration) the device is automatically read out and shown on the display.



Fig. 11 NFC App Start Screen

It is important that the NFC antennas of the two devices are as close as possible to each other. The position of the antenna is marked on the EnOcean DALI-2-MC-NFC:



For Information on the NFC interface of your smartphone please check the instructions of the device manufacturer.

Lunatone DALI NFC App

The configuration options are the same as in the DALI Cockpit, see section "Operation and function" page 6 for further information.

The screenshot shows the configuration interface for an EnOcean DALI-2 MC device. The top section displays the device name and a back arrow. Below this is a product image and technical details: EnOcean DALI-2 MC, set description, Firmware V1.0, http://www.lunatone.com, Article Nr. 86463327-NFC, and Serial Nr. 81604388773. The 'Addressing' section shows 'Address' set to 3 with an increment of 4, and 'Control Device Groups' set to none. The 'Device Settings' section is currently on 'Input 1' and shows 'Destination Address' for 1-4 (1: group, 2: none, 3: none, 4: none) and 'Function' set to 'BF1: PUSH BUTTON - sends CmdX'. There is an unchecked checkbox for 'ON AND STEP UP as start cmd' and 'CmdX (On Command)' set to 'RECALL MAX LEVEL'. A 'SAVE TO DEVICE' button is at the bottom.

Callout boxes on the left side of the screenshot provide the following explanations:

- device information
- device address
- Device settings of the 4 push button inputs
- selection which push button input (T1 - T4) should be configured
- Destination addresses
- selection of button function behaviour
- DALI command / function
- "Save to device": parameters are saved on the device

EnOcean coupling, macros and instances cannot be set via NFC.

Fig. 12 NFC App – device configuration

Purchase Information

Art. Nr. 86463327-app**EnOcean DALI-2 MC**

factory default setting: **App-Controller activated**

GTIN 9010342013836

Art. Nr. 86463327-int**EnOcean DALI-2 MC Integration**

factory default setting: **instances activated**

GTIN 9010342013836

Art. Nr. 86463327-NFC**EnOcean DALI-2 MC NFC**

factory default setting: **App-Controller activated**

NFC Functionality

GTIN 9010342013836

Device Family:

DALI-2 MC button coupler with 4 potential-free inputs
DALI-2 MC4L

DALI-2 MC4L module with 4 switching inputs for mains voltage

wDALI MC for wireless connection of a standard button module

Additional Information and Equipment

DALI Cockpit - free configuration software for DALI systems

<https://www.lunatone.com/en/product/dali-cockpit/>

Lunatone DALI products

<https://www.lunatone.com/en>

Lunatone Datasheets and Manuals

<https://www.lunatone.com/en/download-s-a-z/>

Lunatone DALI NFC App

<https://play.google.com/store/apps/details?id=com.lunatone.dalinfrc&hl=de>



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Disclaimer

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