

DALI-2 MC Mini

Datasheet Multi Control Device



DALI control module with four
potential-free inputs
for push-buttons and switches

Art. Nr. 86451537

Datenblatt Deutsch:

https://www.lunatone.com/wp-content/uploads/2026/01/86451537-DALI-2_MC-Mini_GER_D0143.pdf

DALI-2 MC Mini Control Device

Overview

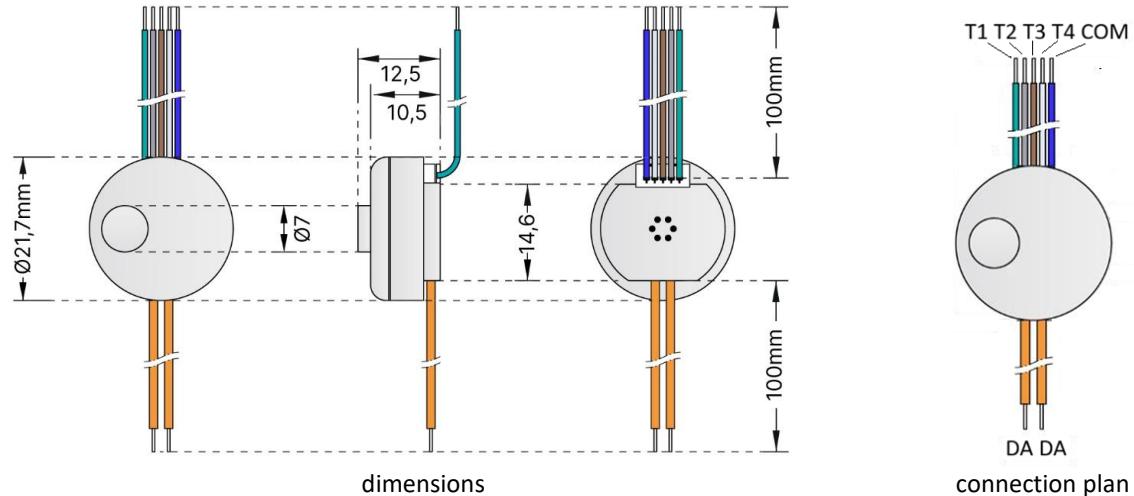
- Compact DALI-2 control module with 4 potential-free inputs
- Each input can be configured for digital or analog input signals. As digital input it is possible to add a status LED ($V_F < 2,5V$) in parallel.
- Momentary switches or $100k\Omega$ potentiometers can be connected directly to the DALI MC Mini
- Multi-master capable: Several modules can be installed within a DALI circuit.
- Four DALI-2 pushbutton instances and four DALI-2 Absolute input device instances are available for an easy integration in building management systems
- As DALI-2 Application controller, different effective ranges, button functions and DALI commands can be assigned to each input
- In addition to the standard DALI commands, the application controller also supports DALI DT8 TC and RGB (W) control, as well as Sequences, macros and other functions.
- Available button functions are among others: short button press, long button press (with repetition for dimming) and «toggle»
- Suitable for push-buttons, as well as switches
- Additional 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.
- For potentiometer use the input signal is converted directly into a DALI light-level.
- Adjustable “power-up”-function
- Easy configuration via Lunatone DALI USB interface and DALI-Cockpit Software Tool.
- 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

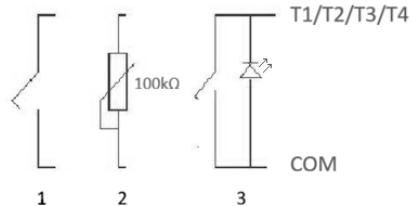
Type	DALI-2 MC
article number	86451537
factory default setting	App-Controller activated Instance Event Messages deactivated
DALI interface, power supply: DA, DA	
output type	DALI, DALI-2, Multimaster
input cable colour	orange
cable length	100 mm
voltage range	9,5V ... 22,5Vdc according to IEC62386
typical current consumption DALI (16,5V)	3.8 mA
max. current consumption DALI (22,5V)	3.9 mA
DALI addresses	none
DALI-2 addresses	1
input	
Input type	Potential free button/switch
number of inputs	4
input cable colours	T1: green T2: grey T3: brown T4: white COM: blue
cable length	100 mm
minimum length of control pulse	40ms
control pulse length for long press	configurable: 200-5100ms
max wire length pushbutton input	5m
insulation data	
impulse voltage category	II
pollution degree	2
rated insulation voltage	250V
insulation DALI / mains	reinforced isolation
insulation test voltage DALI / mains	3000Vac
environmental conditions	
storing and transportation temperature	-20°C ... +75°C
operational ambient temperature	-20°C ... +60°C
rel. humidity, not condensing	15% ... 90%
general data	
dimensions (l x w x h)	22mm x 22mm x 13mm (details below)
mounting	back box installation, installation in protection class II devices
rated maximum temperature tc	65°C
expected life time	200.000h

protection class	SKII (when used/installed as intended)
protection degree	IP20
standards	
DALI	IEC62386-101:2014, IEC62386-103:2014
EMV	EN 61547, EN 50015 / IEC CISPR15
safety	EN 61347-2-11, EN 61347-1



Options input connection:

- 1- Button / switch
- 2- 100kΩ Potentiometer
- 3- Button / switch and status LED $V_F < 2,5V$.



Factory Default Settings

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

	input 1	input 2	input 3	input 4
application controller	active			
Analog / digital	digital	digital	digital	digital
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
command on power up	none	none	none	none
alternative configuration	inactive	inactive	inactive	inactive
scene interpretation	ignore	ignore	ignore	Ignore
instances – event messages	inactive	inactive	inactive	inactive
Event scheme	instance addressing			
Event filter	Pushbutton: short press, long press, repeat, stop, stuck Absolute input device: position			
Instance groups	none			

Pushbutton - Timer		400 ms
Short press		-
Double		160 ms
Repeat		20 s
Stuck		
Absolute input device – Timer		
Report		0 s
Deadtime		0,1 s

Typical application

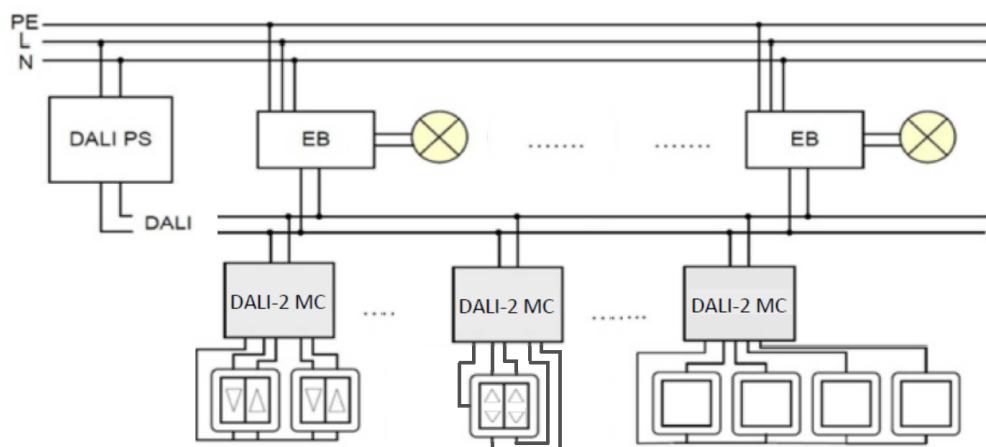


Figure 1 Typical Application

Installation

- The 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 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.
- The maximum cable length of the button connections is 5m. If a longer connection line is required, please use DALI MC-4L.

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

Attention: 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.
- 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).
- 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 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 DALI-2 MC device. Alternatively, the allocation can also be done via the serial number of the device.
- Physical selection: At the end of the addressing process, by double-clicking the physical button, the DALI Cockpit identifies and adds the input connections (T1 to T4 on the device) to the device list.
- Instances: instance parameters can be configured according to IEC 62386-301 and -302, see section DALI-2 Instances page 13.

Operation and function

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

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

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. Configuration of the application is described in the section Application Controller - Configure inputs T1-T4, page 7.

The DALI-2 instances generate event messages that are interpreted and processed by higher-level control units (WAGO, Beckhoff, ...).

(General information on the DALI-2 instance mode: <https://www.lunatone.com/en/dali-2-factsheet/> section: DALI-2 Instancemode) Configuration of the instances is described in section: DALI-2 Instances on page 13.

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**. A device with active instances is indicated with: **i**

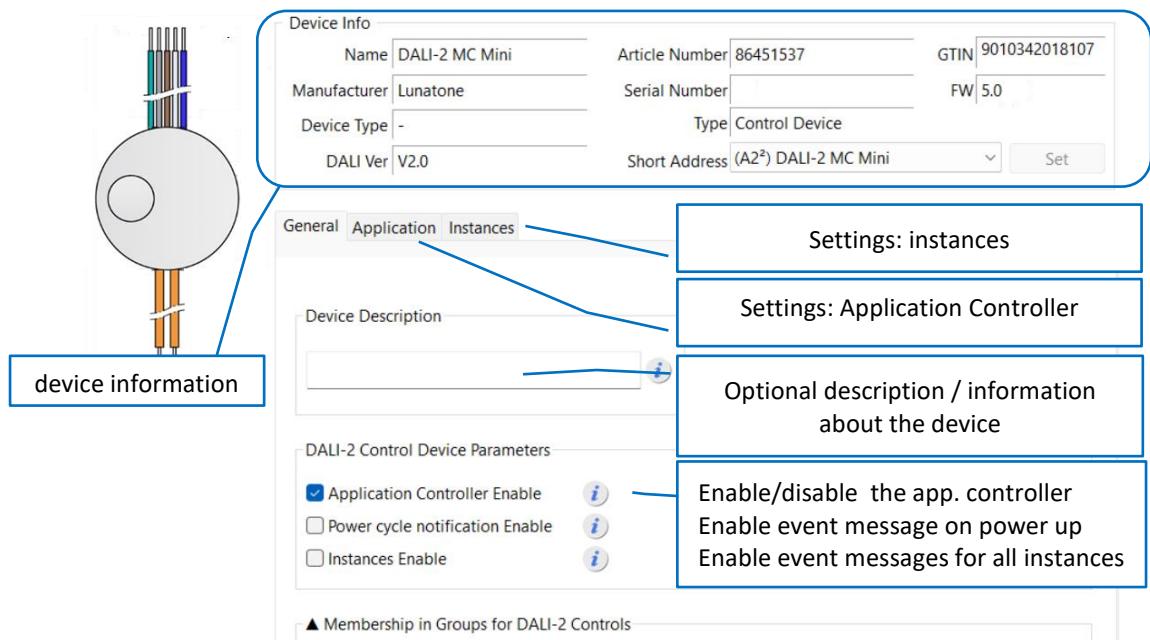


Figure 2 DALI Cockpit General Settings

Application Controller - Configure inputs T1-T4

In the DALI Cockpit, the settings of the Application Controller for inputs 1-4 can be configured under the "Application" tab, see Figure 4 page 8.

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 Figure 3)

Address	Command	Time
G1	OFF	12:54:04.695
G2	OFF	12:54:04.723
A21	OFF	12:54:04.749
A45	OFF	12:54:04.777

Figure 3 Example: Addressing Inputs 1-4 – sequentially processed

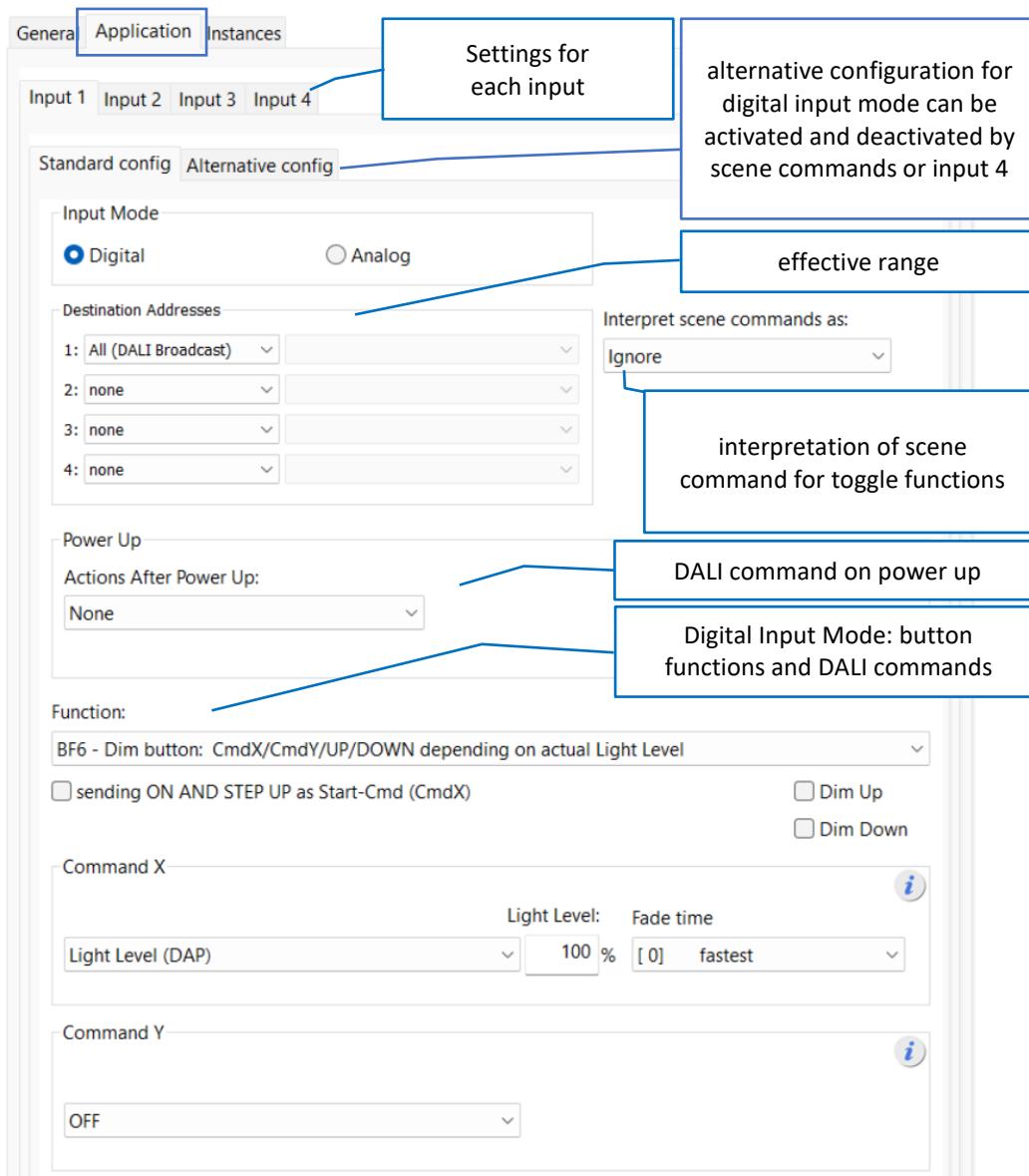


Figure 4: Application: Application Controller

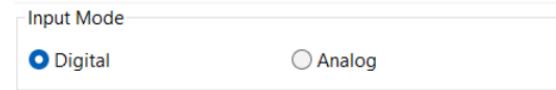
Behaviour on power-up

The behaviour when the device starts up 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 configurable DALI command (light level, OFF, Max, Min, Scene, Go To Last Active Level)

Analog / Digital Input

With the DALI Cockpit each of the 4 inputs can be configured as an analog or digital input.



For the "Digital" option, the button/switch functions described under section "Digital Input Mode: Button Function (BF)" are available.

For the "Analog" option, the corresponding input is evaluated as an analog input for potentiometer use. The input signal is converted into a DALI light level. The DALI level is triggered by a voltage change of the input signal.

The minimum and maximum possible light output levels can be configured.

Function:

BFO - no action

Analog input from potentiometer

Direct feedback when turning Poti

Minimum value



0.991 %

Maximum value



100 %

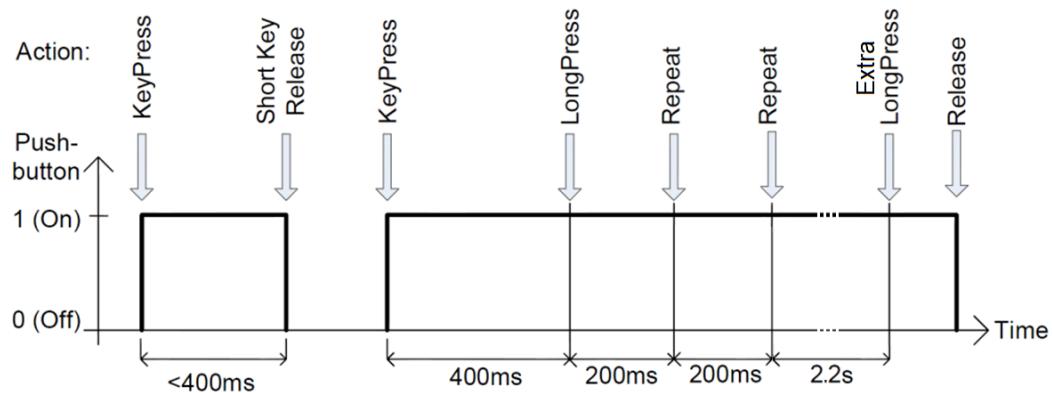


Figure 5 Key Events

Digital Input Mode: 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 timing diagram shown in *Figure 5* below, and translated into internal signals (**key events**).

The following *Table 1* shows how the selected "Button Function" (lines 0 to 13) sends the commands **CmdX** and **CmdY** in connection with the "Key Events" (see *Figure 5*). CmdX and CmdY refer to DALI commands.



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

Table 1 Buttonsfunctions

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:

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 Commands

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



Figure 6 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:

Nr	Makro	Funktion
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. (delay up to 3h from firmware 5.0 on)
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 3 Macros

M2: The selection "common scene list" allows the buttons (T1-T4) with M2 and this selection to continue switching the same scene list

M3, M5 and M10: From FW 5.0 on these macros can be configured to be stopped by a scene command or an Off command. When selected the Macros are always stopped on seeing a scene or Off-command sent broadcast, or to the first destination address.

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).

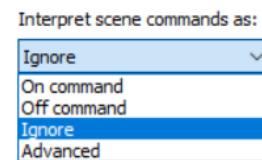


Figure 7.: Scene Interpretation

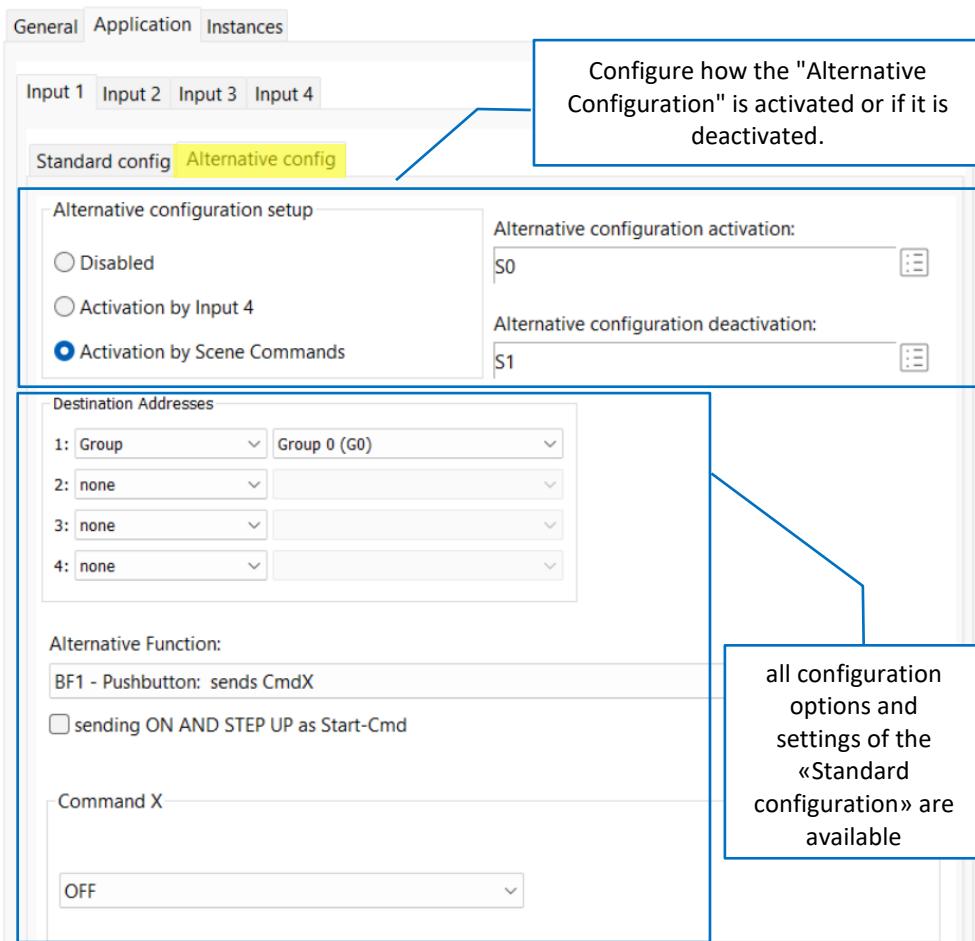


Figure 8 Settings for the alternative configuration

Alternative configuration

An alternative/second configuration can be made for each button, see *Figure 8*. All previously explained configuration options and settings are available, except for macros, which are not available for the alternative commands. The alternative configuration can be activated 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
activate: the selected scene commands to the effective range of the standard configuration activate the alternative configuration
deactivate: the selected scene commands to the effective range of the standard configuration and the effective range of the alternative configuration deactivate the alternative configuration.

With which origin/address information the events are sent is determined with the instance-scheme.

All instance settings 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

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 DALI-2-MC Mini supports 8 instances, 4 instances of type 1 (IEC62386-301, Input Devices - Push Button) and 4 instances of type 2 (IEC62386-302, Input Devices – Absolute Input Device) which are assigned to the 4 button inputs as follows:

Instance Nr.	Input	Type
0	digital T1	Pushbutton
1	digital T2	Pushbutton
2	digital T3	Pushbutton
3	digital T4	Pushbutton
4	analogue T1	Absolute input
5	analogue T2	Absolute input
6	analogue T3	Absolute input
7	analogue T4	Absolute input

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

Which events are sent can be determined using the event filter.

Instance Type 1 - Pushbutton

parameters of the instances 0-3 are:

- Event filter: button released, button pressed, short press, double press, start long press, long press repeat, stop long press, button stuck/free
- Event timer settings: short timer, double timer, repeat timer, stuck timer

Pushbutton event information see *Table 4* page 14.

Instances can also be queried using Query Input Value. Pushbutton instances return the following values in response to a query:

button free	0x00	button not pressed / switch open
button pressed	0xFF	Button pressed / switch closed

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.

Table 4 Events

Instance Type 2 – Absolute Input Device

parameters of the instances 4-7 are:

- Event filter: Position
- Event timer settings: report timer, deadtime

The Report Timer allows events to be sent repeatedly even without value changes. Due to the dead time, no further event will be sent even if the value changes.

The event information contains the position with a value range (10-bit resolution): 0 – 1024.

DALI24 Event 84 8b ff iT2, iN2 Event 1023

The resolution of the query input value is 8 bits, the position is determined by multiplying the Answer by a factor of 4:

DALI24 Inst Query 01 02 8c A0, iN2 QUERY INPUT VALUE
DALI8 Answer ff = 255 (0xff)

→ Position: $255 \times 4 = 1020$

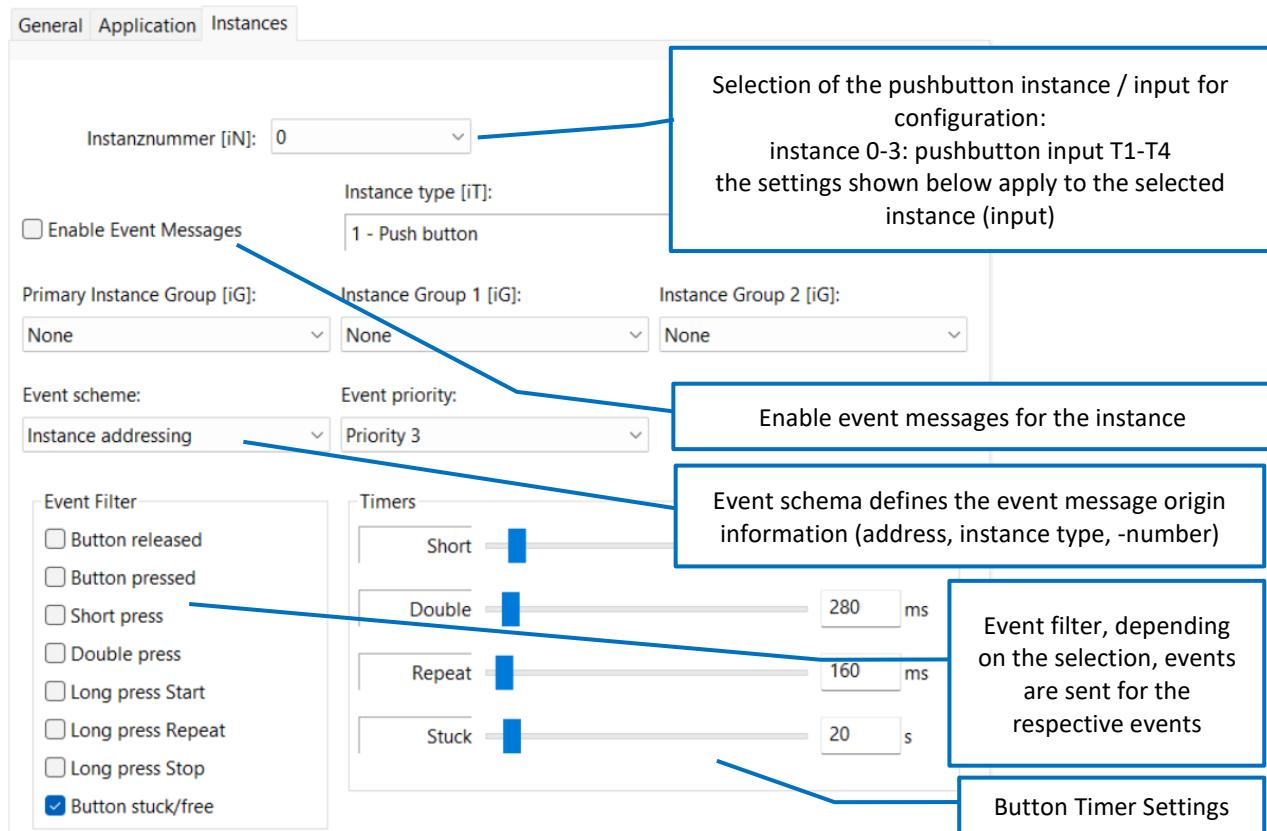


Figure 9: DALI Cockpit Instance Settings

Purchase Information

Art. Nr. 86451537 DALI-2 MC Mini

Additional Information and Equipment

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device

<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/>

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