LED DALI MC+ Switch Input Module - User Manual

Item no.: LC-004-300

1. Product Description

The DALI MC+ is a Compact Multi Control module with 4 freely programable swithcing inputs (potential-free closing contacts). The supply of the module directly via the DALI Line. The moduel can be used in a flush box directly behind a light switch

2. Specification

supply	via DALI signal line
typ. current consumption	4.1mA
input	4 x GPI
output	DALI
connecting wire cross section	0.5-1.5 mm2
wiring length to momentary switches	50 cm
Product Dimensions (L x W x H) in mm	40 x 28 x 15 mm
Weight	10g

3. Description

1. Compact DALI control unit with 4 general purpose inputs
2. Each input can be configured for digital or analog input signals
3. Momentary switches or 100kΩ potentiometers are connected directly to the DALI MC+
4. The following standard DALI commands can be assigned to switching actions: dim up, dim down, off, recall min, recall max, goto scene 1-16, direct arcpower in % as well as predefined and self-configured macros (DALI command sequences).
5. Colour temperature adjustment is supported. Implemented DT8-commands are STEP COOLER and STEP WARMER
6. For analog inputs the input signal is converted directly into a DALI arc power level. The conversion can be triggered periodically or by a predefined event.

7. AA switching action or a change in the input voltage signal (>2%) can be selected as trigger event for the conversion.

8. The DALI MC+ also has an adjustable „power-up"-function. In other words a user-defined command can be sent on power up (e.g. after a power failure)

9. Individual addresses (1-64), group addresses (1-16) or broadcast can be set as destination.

10. Configuration can be set up with DALICockpit and DALI-USB interface

11. Multiple DALI MC+ modules can be used on the same DALI-line

Addressing and Configuration Via a DALI-USB interface the DALI-Cockpit software tool can communicate with the DALI MC+. So the desired functionality can be configured easily on PC.

The DALI-Cockpit software is a free configuration tool for DALI systems. Hence standard DALI ballasts can be addressed and configured as well as the DALI MC+1. DALICockpit and DALI-USB Interface are required for configuration only and can be removed for standard operation (see typical installation drawing). For more details check the instruction manual of the DALI Switch, the DALI Tutorial and the description of the DALICockpit.

For simple applications the factory settings can be sufficient (dim&switch function). In this case there is no need for a DALI USB interface and a configuration tool. The factory setting is described below.

Destination Address: Broadcast

Input T1: digital, switch to last recent level
Input T2: digital, dim up
Input T3: digital, switch off
Input T4: digital, dim down

Adjustable Functionality

With the help of the DALI-Cockpit the DALI MC+ can be configured. Any input can be configured for analogue or digital input signals. When used as analogue input the input signal is either converted directly to a DALI dim level or be processed by a threshold algorithm and handled like a digital input signal.

When configured as analogue input an offset value for the input value range can be defined. Below this value the DALI output is 0, furthermore the trigger for the conversion can be defined.

Options for the trigger are periodic conversion or event based trigger.
For each digital input a high level on flexibility and individualism is offered due to the parameters available. Switching mode, destination addresses and DALI commands belong to the settings for a momentary switch. By means of the switching mode different actions for brief and long depress time can be defined for the momentary switches for miscellaneous applications.
The functions vary from simple push buttons or toggle push buttons via lighting based push button dimming keys to standard stairwell function with configurable delay time.

A complete overview is given in the table below.

	Function	Action	Description
1	Push Button	short/long: 1 * command X	Briefly pressing or holding down the push button will send command X one time
2	Push Button	short: 1 * command X long: 1 * command X then 1 * command Y	Briefly pressing or holding down the push-button will send command X one time Holding down the push button will send command X once and then command Y once
3	Push Button	short: 1 * command X long: 1 * command X then repeatedly command Y	Briefly pressing or holding down the push-button will send command X one time Holding down the push button will send command X once andthen command Y repeatedly
4	Push Button Toggle	short: toggle between command X and Y	Briefly pressing the push button will alternate between sending commands X and Y
5	Push Button Toggle	short: toggle between command X and Y lighting status based	Briefly pressing the push button will alternate between sending commands X and Y lighting based: If the light was previously switched off -> command X If the light was previously switched on -> command Y
6	Push Button Dimming Key	short: toggle between command X and Y, lighting status based long: dimming, lighting status based	Briefly pressing the push button will alternate between sending commands X and Y lighting based: If the light was previously switched off -> command X If the light was previously switched on -> command Y Holding down the dimmer switch dims or brightens the lighting.
7	Stairwell Function	short/long: command X, after run-on time command Y	If the pushbutton is pressed, command X is sent and the runon time starts. Once the run-on time elapsed, command Y is sent.
8	Push Button	short: 1*command X on release long: command Y repeated	Briefly pressing the push button and release will send command X Holding down the push button will send command Y repeated
9	Push Button	1 * command X, then command Y repeated without long button delay	Nach einem Kurzen Tastendruck (nach dem Auslassen) wird Befehl X gesendet und danach wiederholt Befehl Y (ohne Longpress Delay)

In addition to the switching mode the reaction on a depress action has to be defined. It consists of a DALI command and up to 4 destination addresses.
Individual addresses (1-64), group addresses (1-16) or broadcast can be set as destination address.
In the table below a summary of the DALI commands available is given.

In the table below a summary of the DALI commands available is given.

command number	command name	Function
-	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
16-31	GO TO SCENE	ruft Lichtszene 0-15 auf

As an alternative to the transmission of any single DALI command initiated by a depress action, it is possible to transmit a set of commands within a DALI-macro. This option can be used for either predefined processes (such as a scene sequencer) or any userdefined sequence of DALI-commands.

macro (required memory)	Function
Go Home (2 Byte)	Light dims down to DAP 0 with predefined fade time, then fade time is set back to a programmable value
Sequential Scenes (3 Byte)	Selectable scenes (or OFF) will be sent sequentially with each button press.
Dynamic Scenes (9 Byte)	Dynamic sequence of up to 4 selectable scenes, fadetimes and delays, stops with next button press

macro (required memory)	Function
DALI-Reset (1 Byte)	Sends DALI-Reset (address can be deleted optionally)
User defined Commands (5 Byte je Befehl, 19 Befehle max.)	A user defined macro file can be loaded to the switch
DT8 Cooler 3x (0 Byte)	Activates DT8 and sends STEP COOLER command 3x
DT8 Warmer 3x (0 Byte)	Activates DT8 and sends STEP WARMER command 3x
Switch On (4 Byte)	Switches to last recent level, works only in combination with Switch Off
Switch Off (3 Byte)	Stores last recent level and switches off
Dim Up (after Switch Off) (3 Byte)	Allows to Dim Up from OffState to MAXLEVEL, when having used Switch Off before

For each push button a macro memory of 96 bytes max is available. The sum of CmdX and CmdY macro memory may not exceed this value. For more details on the selection of predefined macros and the ability to create custom macro files check the manual of the DALI-Cockpit configuration software.

Another configurable feature is the "powerup"-function.
This is a user-defined reaction on a power up. The following options are available for the DALI Switch Cross:
• no action
• OFF
• go to scene 0-15

To take the startup-time of DALI-ballasts into account a delay time can be configured between power up and the start of transmission of the selected command.
This functionality of the DALI MC+ can thus be interpreted as an extension for DALI control gears. Although those ballasts have a POWER ON LEVEL for mains power up, they don't have a predefined dim level for bus voltage return. With the help of this feature the SYSTEM FAILURE LEVEL (which is set at a bus voltage loss) can be overruled.

Slave Mode

The DALI MC+ offers the possibility to read out the state of the switches and the analogue values of the inputs. Hence the module can be used for evaluating analogue and digital input signals only.

DALI Instruction Set

The DALI MC+ operates as control device on the DALI-line and transmits the predefined DALI-commands when a momentary switch is pressed. It is based on the standard for DALI Control Gears (IEC 62386-102). In addition to the DALI commands mentioned above the special command for writing the data transfer register and command 47 (STORE DTR AS FADE RATE) are implemented. Furthermore the ACTIVATE command and the DT8-commands STEP COOLER and STEP WARMER are used for colour temperature control.

4. Dimensions
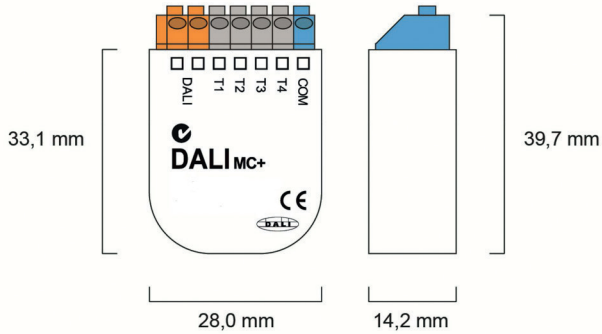
5. Wiring Diagram

The DALI MC+ is connected to the DALI-line. It is powered like all DALI modules directly by a DALI PS via the DALI signal line. A typical value of the DALI Switch current consumption is <4 mA. The connection to the DALI-line is polarity free and protected against overvoltage of up to 270Vac. The compact DALI MC+ can easily be installed in recessed conduit boxes.
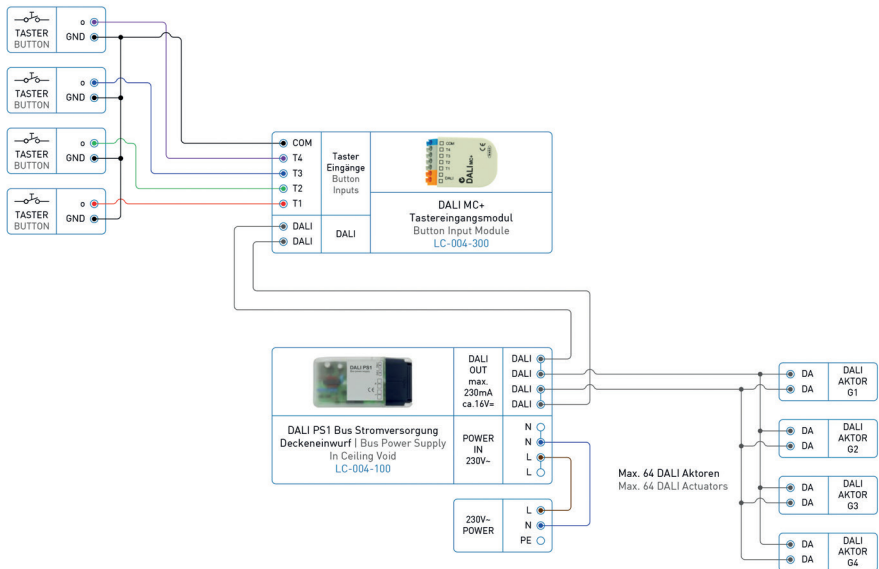
6. Safety warnings

6.1. To avoid installed the product in minefield, strong magnetic field and high voltage area.

6.2. To ensure the wiring is correct and firm avoiding short circuit damages to components and cause fire.

6.3. Please install the product in a well ventilated area to ensure appropriate temperature environment.

6.4. The product must be worked with DC constant voltage power supply.
Please check the consistence of input power with the product, if the output voltage of the power comply with that of the product.

6.5. Connect the wire with the power on is forbidden. Ensure proper wiring first then check to ensure no short-circuit, then power on.

6.6. Don't repair it by yourself whenever an error occur. Contact the supplier for any inquiry.