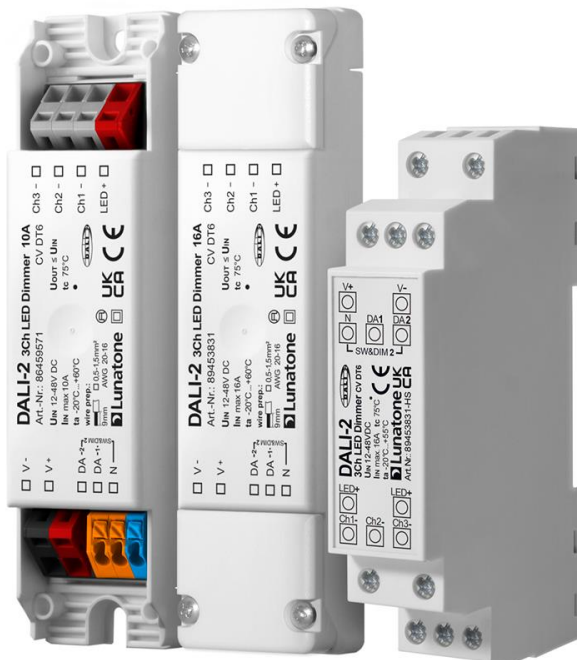


DALI-2 3Ch LED Dimmer CV

Datasheet Control Gear



3-channel LED Dimmer (CV, DT6)

Art. Nr. 89453828 (4A)

Art. Nr. 89453834 (8A)

Art. Nr. 86459571 (10A)

Art. Nr. 89453831 (16A)

Art. Nr. 89453831-HS (16A DIN Rail)

DALI-2 3Ch LED Dimmer CV Control Gear

Overview

- 3 channel DALI LED-Dimmer
- suitable for constant voltage LED-modules with operating voltages from 12V to 48V
- **Operating Mode DT6:** individual channel control via 3 DALI addresses
- **Operating Mode Colour&Dim:** control by 2 DALI-addresses, one for adjusting the light level and one for adjusting the colour
- **SwitchDim2:** 2 switch-inputs offer control of light level and colour without DALI
- dimming range 0.1%-100%
- adjustable PWM-frequency (122Hz/ 244Hz/ 488Hz/ 976Hz from FW version 4.6 on changed PWM frequencies: 122Hz /250Hz / 500Hz / 1kHz)
- compact types for integration in luminaires and remote ceiling
- supply voltage 12V to 48V DC (according to the operating voltage of the led modules)
- type dependent max. input currents of 4A, 8A, 10A or 16A
- the maximum input current can be freely distributed between the channels (max 10A per channel)
- low standby power consumption
- high efficiency
- configuration via PC-software DALI-Cockpit and DALI USB-interface
- user-friendly factory default settings

From FW Version 4.6 onward:

- DALI-2 compatible
- LED calibration for light adjustment
- Configurable RESET behaviour



Specification, Characteristics

type	DALI-2 3Ch LED Dimmer CV				
article number	89453828	89453834	89459571	89453831	89453831-HS
input: V+, V-					
input type	supply, DC				
marking terminals	V+, V-				
supply voltage	12VDC ... 48VDC				
maximum input current I_in_max	4A	8A	10A	16A	
standby power consumption (12V)	~ 120mW				
power on behaviour	configurable: 0%-100% or last value				
input: DA, DA					
input type	DALI, control signal				
marking terminals	DA, DA				
input voltage range	9,5V ... 22,5V DC (according to IEC62386-101)				

article number	89453828	89453834	89459571	89453831	89453831-HS
current consumption DALI	2mA				
number of DALI-addresses	operating mode DT6: 3 operating mode Colour&Dim: 2				

input: SW&DIM2

input type	SwitchDim2 (mains voltage)
marking terminals	N; SW&DIM2-1 (DA); SW&DIM2-2 (DA)
number of inputs	2
input voltage	230V AC $\pm 10\%$
input supply frequency	50Hz

output: V+/LED+, Ch1-,Ch2-, Ch3-

output type	LED Dimmer, constant voltage PWM	
marking terminals	V+, Ch1, Ch2, Ch3	LED+, Ch1-, Ch2-, Ch3-
number of outputs	3	
PWM frequency	FW: < 4.6. 122Hz/244Hz/488Hz/976Hz FW: ≥ 4.6 : 122Hz/250Hz/ 500Hz / 1kHz	

general data

dimensions (LxWxH) [mm]	60x33x15	120x30x22	98x18x56
mounting	back box	remote ceiling	DIN rail
rated max. temperature t_c	75°C		
expected life time ($T < T_c$)	>100.000h		
protection class	II in intended use		
protection degree	IP20		

environmental conditions

operational ambient temperature	-20°C ... +60°C	-20°C ... +55°C
storing and transportation temperature	-20°C ... +75°C	
rel. humidity, none condensing	15% ... 90%	

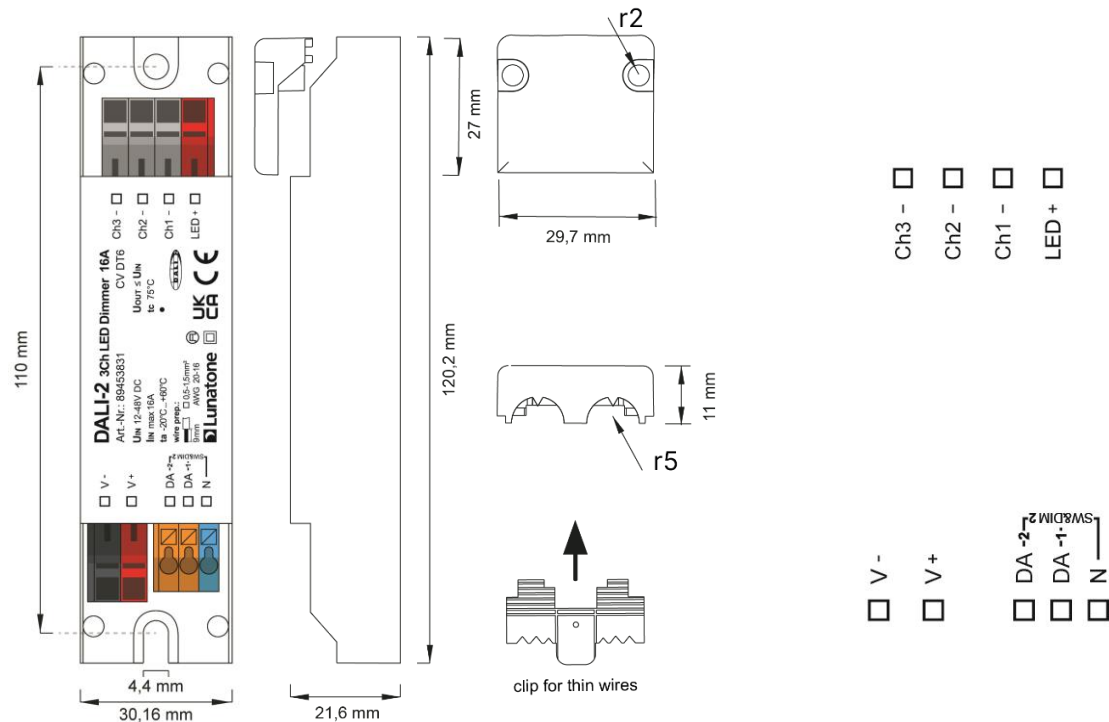
terminals: V+, V-,LED+, Ch1-,Ch2-, Ch3-

terminals	same as section terminals DA, DA, N see below	V+,V-, LED+, Ch1-,Ch2-, Ch3-	same as section terminals DA, DA, N see below
connection type		spring connector (cage clamp)	
wire size solid core		0,08 ... 2,5 mm ² (AWG28 ... AWG14)	
wire size fine wired		0,08 ... 2,5mm ² (AWG 28 ... AWG 14)	
wire size using wire end ferrule		0,25 ... 1 mm ²	
stripping length		5...6mm/0,2...0,24 inch	
release of wire		push back spring with tool	

terminals: DA, DA, N

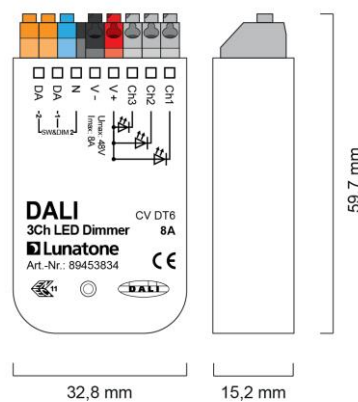
terminals	DA, DA, V+, V-, Ch1,Ch2, Ch3	DA, DA, N	DA, DA, V+, V-, N, LED+, Ch1-,Ch2-, Ch3-
connection type	spring terminal connector (push in cage clamp)		screw terminal
wire size solid core	0,2 ... 1,5 mm ²		0,5 ... 2,5 mm ²

	(AWG20 ... AWG16)	(AWG20 ... AWG14)
wire size fine wired	0,2 ... 1,5 mm ² (AWG20 ... AWG16)	0,5 ... 2,5 mm ² (AWG20 ... AWG14)
wire size using wire end ferrule	0,25 ... 1 mm ²	0,25 ... 1,5 mm ²
stripping length	8,5 ... 9,5mm / 0,33 ... 0,37inch	7 mm / 0,27 inch
release of wire	push button	screw
tightening torque	-	0,5Nm

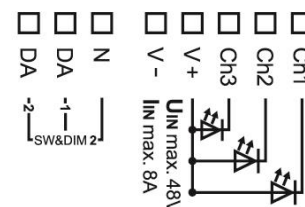


dimensions remote ceiling
Version 16A Art.Nr.: 89453831
Version 10A Art.Nr.: 86459571

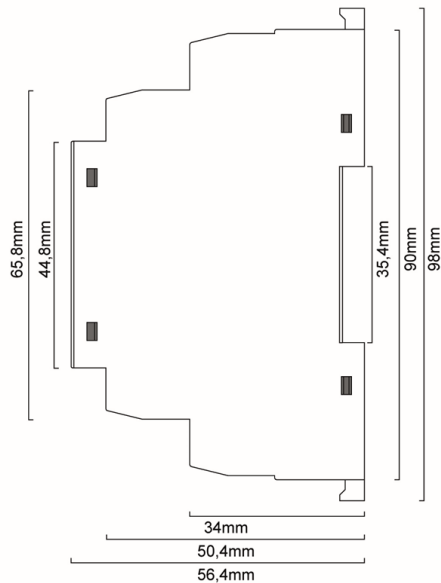
connection plan remote ceiling
Version 16A Art.Nr.: 89453831
Version 10A Art.Nr.: 86459571



dimensions back box
Version 8A Art.Nr.: 89453834
Version 4A Art. Nr.: 89453828



connection plan back box
Version 8A Art.Nr.: 89453834
Version 4A Art. Nr.: 89453828



dimensions DIN rail housing
Version 16A Art.Nr.: 89453831-HS



connection DIN rail housing
Version 16A Art.Nr.: 89453831-HS

Installation

RECOMMENDATION: Care should be taken on keeping cable lengths between DC power supply and dimmer, as well as between dimmer and luminaires (Led-Strings), as short as possible. This kind of installation will minimize the influence of voltage drops.

- The DALI-2 LED Dimmer back box versions can be installed in a flush-mounted installation box. Ensure proper working cable relief for installation in protection class II equipment
- The DALI-2 LED Dimmer remote ceiling versions are suitable for remote ceiling and integration in luminaires. Ensure proper working cable relief for installation in protection class II equipment
- The DALI-2 LED Dimmer DIN rail is suitable for DIN rail mounting, protection against electric shock has to be ensured by an appropriate enclosure.
- 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.
- Connect the terminals V+ and V- only to a DC supply voltage of category SELV (Safety Extra Low Voltage)
- the connection to the DALI-line (DA,DA) is polarity free
- If used in Sw&Dim2 mode for both inputs the same phase has to be used
- The DALI-interface can handle mains voltage, protecting the device in case wrong wiring
- Wiring topology of the DALI-line: line, tree, star
- Connect only one wire on each terminal, if twin ferrules are used, take note of the maximum wire size

- The DALI wiring can be realised with standard low-voltage installation material. No special cables are required.
- The DALI line may be routed together with the mains voltage (in one cable or as single wires in a tube)
- The devices are designed for 4A, 8A, 10A, or 16A input current. External protection must be provided to ensure that this current is not exceeded permanently, even in the event of a fault or short circuit. If two dimmers are powered by one power supply, depending on the quality of the power supply regulation, mutual

interference may occur, resulting in visible light fluctuations during dimming.



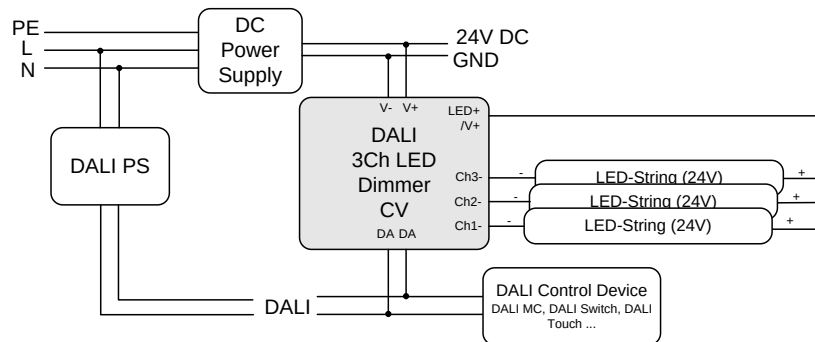
Attention: The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply



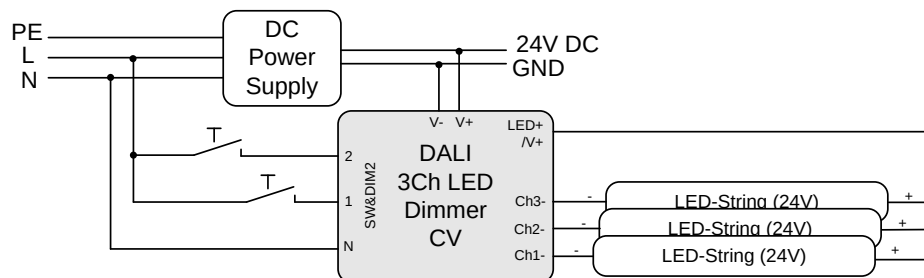
The voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

Typical Application

Control via DALI (all device versions)



Control via SwitchDim2 (all device versions)



Commissioning

- After connection the 3Ch Dimmer is ready to use. Delivery default settings see page 11.
- The DALI-2 3Ch Dimmer can be addressed with the DALI Cockpit PC Software.

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 Dimmer is automatically

recognised by the DALI Cockpit during the addressing process and listed in the device overview.

- Scene values, groups, DALI parameters and device specific settings can be configured in the DALI Cockpit, see section Cockpit: General Settings page 8 and following.

Operating Modes

The device offers two operating modes DT6 and Colour&Dim.

DT6 (factory default)

In this operating mode each channel can be controlled by its own DALI address (Device Type 6). From FW version 4.6 on Lunatone LED Dimmer are DALI 2 compatible and support DALI 2 commands.

SwitchDim2: Alternatively, the device can be controlled using 2 switch-inputs for mains voltage:

SW&DIM2-1: light level

short press: On/Off

long press: dimming

SW&DIM2-2: scene selector (short press)

scene pre-set see *Table 1*, page 11.

Colour&Dim

This operating mode is suitable for operating RGB—luminaires. Two DALI-addresses are used, the first address to control the light level and the second address to change the distribution on the output channels (e.g. for colour adjustments).

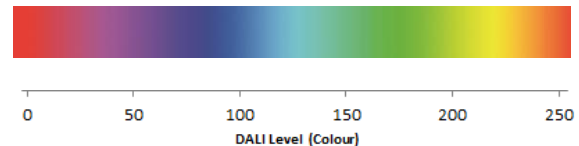
The Colour&Dim mode allows colour adjustments without affecting the light level and vice versa. For each channel DALI-standard commands like dim up/down and DAP are used. Thus, the device can be used with all common controls and gateways (e.g.

KNX). The Colour&Dim mode provides an alternative to the DT8-RGBWAF device.

Can be operated via DALI or SwitchDim2:

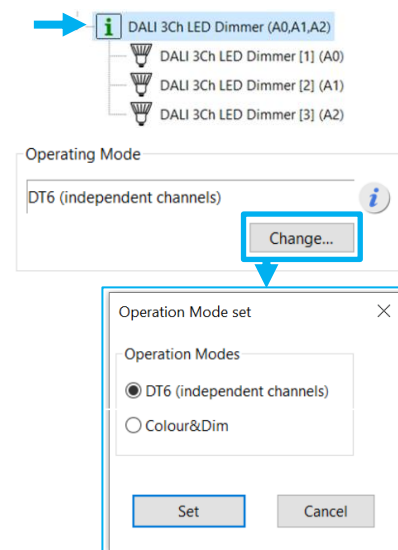
DALI-address 1, SW&DIM2-1: light level

DALI-address 2, SW&DIM2-2: colour



Selection of the operating mode

With the help of the PC-software tool DALI-Cockpit the operating mode can be easily set on the overview page.



The operating mode can also be set with the DALI-command: SET OPERATING MODE (IEC 62386-102 Ed.2). When changing the operating mode, the number of used DALI-addresses might change as well, which requires a new addressing process. In the DALI-Cockpit this address assignment is performed automatically.

Operating Mode:

Number	Operating Mode
0	DT6 (factory default)
0x90	DT6
0x93	Colour&Dim

Cockpit: General Settings

On the overview page basic control elements are available for each operating mode:

- *DT6*: 3 sliders, for the light level of each respective channel
- *Colour&Dim*: 2 sliders, one for level and one for colour

Additionally the following configurations can be made:

PWM Frequency

The PWM frequency can be selected:

122Hz / 244Hz / 488Hz / 976Hz.

From FW version 4.6 changed PWM frequencies: 122Hz/ 250Hz / 500Hz / 1kHz.

Ignore Broadcast Commands

The broadcast control of each channel can be deactivated individually. Through selection of "Ignore Broadcast", the respective channel does no longer respond to broadcast commands on the DALI bus (group assignments are not ignored).

Adjustable RESET behaviour

From FW 4.6. on the response to a DALI reset command is configurable. The following options are available:

- *Ignore command*: the DALI reset command does not trigger any changes to the device settings
- *DALI standard*: the selected device settings are reset to the values defined in the DALI standard (see table 1 below - second column: DALI standard values)
- *Custom settings*: the current device settings can be saved. With a DALI Reset command, the selected parameters (6 check boxes) are then reset to these saved values.

Calibration - light adjustment

The dimming range reaches from 0.1% to 100%. From FW version 4.6 on, it is possible to calibrate different light sources, with the option: "LED Calibration". For each channel, the MIN level (default: 0.1%) an intermediate value (default: 33%) and the MAX level (default: 100%) can be adjusted and matched between light sources.

To do this, the desired level with the upper slider needs to be set. Apply the value and start the fine adjustment by pressing the button next to it. The appropriate fine adjustments can now be made with the calibration slider below. See also Figure 1 below.

Overview page operating mode DT6

Overview page operating mode Colour&Dim

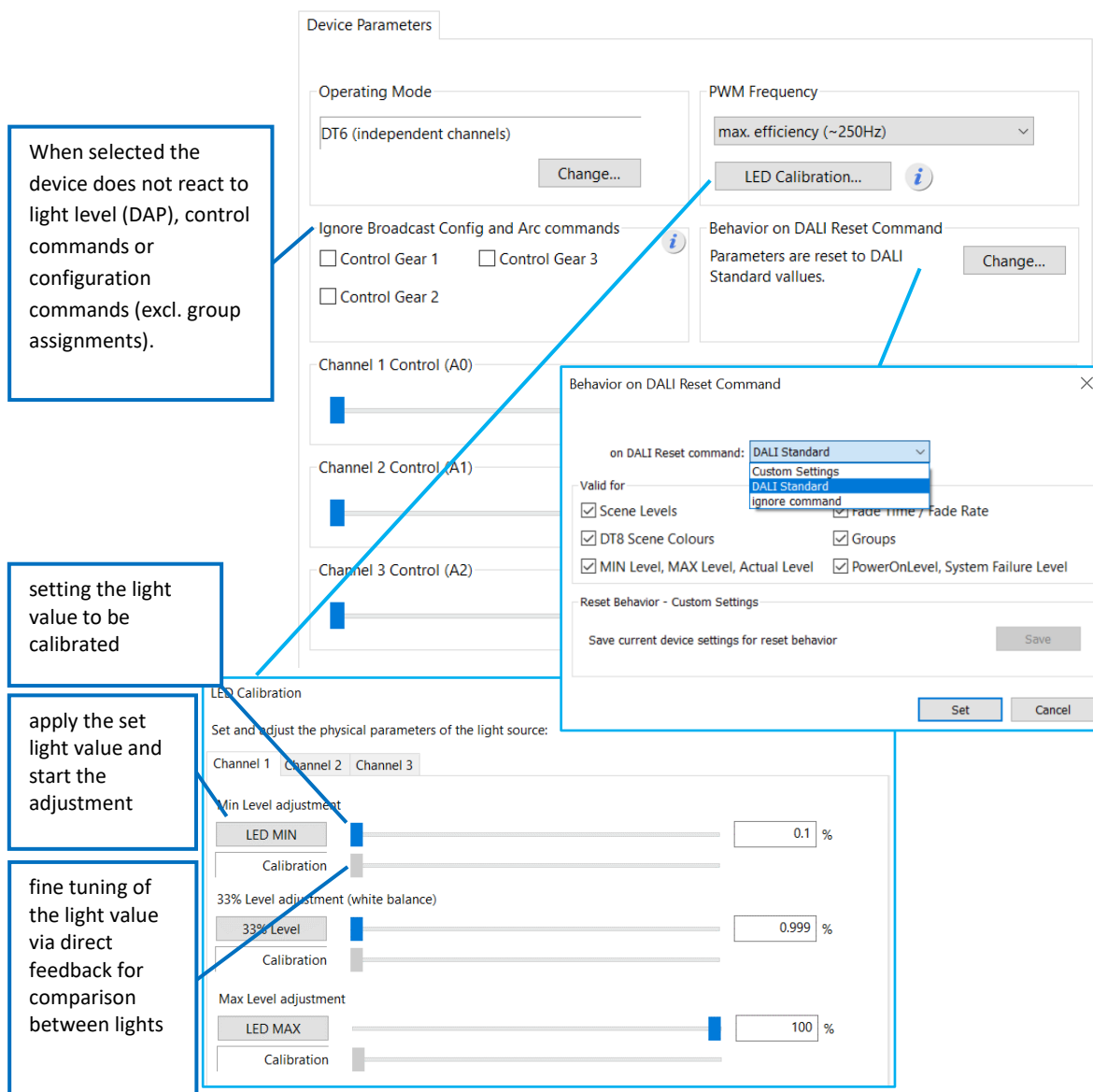


Figure 1 Cockpit overview page – LED calibration and settable RESET behaviour

DALI Cockpit: Additional Settings

Besides the settings on the general page each channel can be selected separately in the component tree for individual configuration.

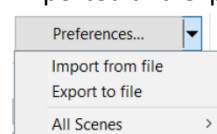


For each address the group membership can be set as well as scene values and DALI-parameters. In Colour&Dim operating mode, all values assigned to channel 2 are representing colours.

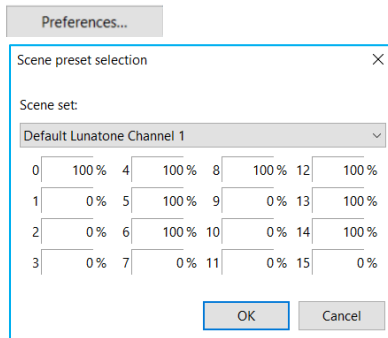
Figure 2 on page 10 shows the settings for each channel for both operating modes DT6 and Colour&Dim.

Scene settings

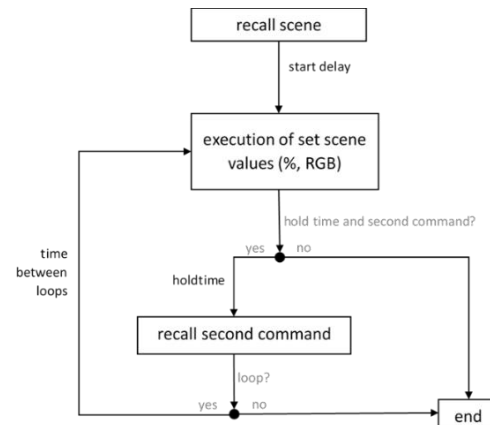
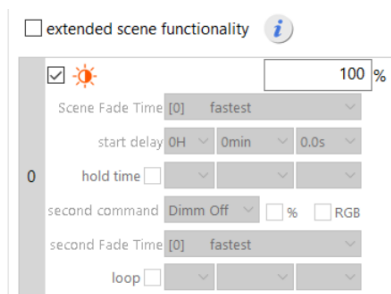
Via the arrow button the scene settings can be imported and exported.



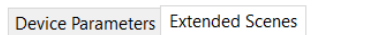
Via the button „Preferences“ the default scene settings can be loaded.



From FW 6.0 on, extended scene settings can be configured. With extended scenes it is possible to automatically change between 2 scene values (once or looped). Thereby enabling configuration of blinking lights, time delayed switch off or light repetitions, as well as traveling lights with multiple dimmers.



Extended Scenes are available for each of the 16 scenes on the second tab:



By enabling the extended scenes these are used instead of the standard scenes on the "Device Parameters" tab

Import/Export settings

With a right click on the channel in the device-tree overview the device settings can be exported or imported.

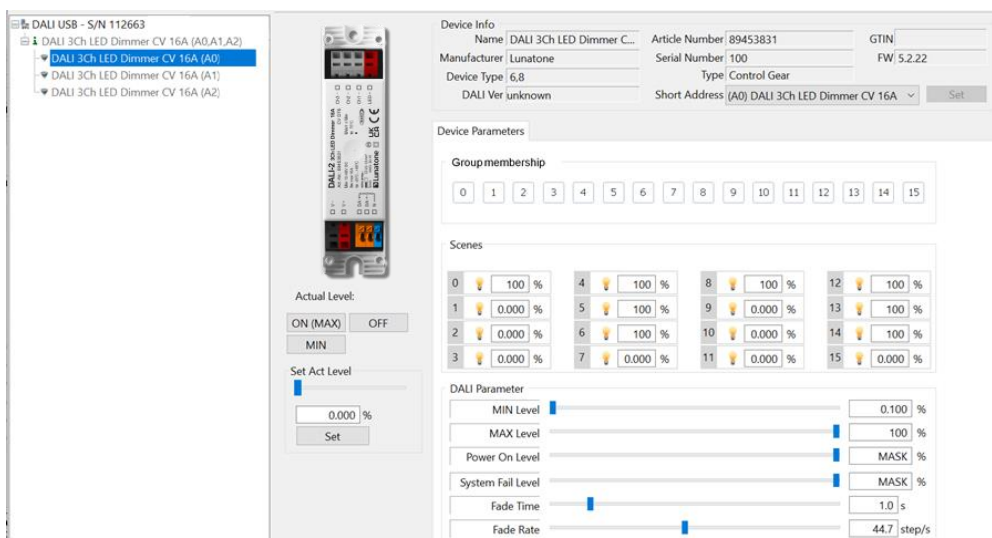
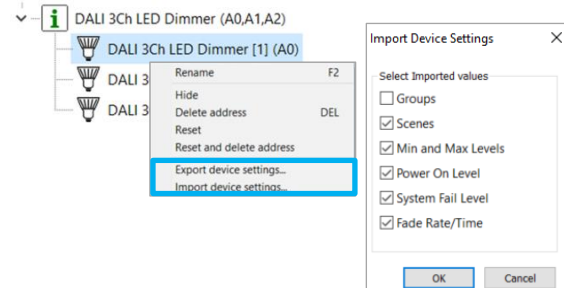


Figure 2 Cockpit Settings for each channel / address

Factory Default Settings

Before the initial addressing is performed, the device can already be controlled by group addresses. This predefined grouping will be deleted during the first addressing procedure. Afterwards groups can be assigned as usual

(e.g. with the DALI Cockpit). By sending a DALI-Reset command the device is set to DALI default values as defined in the standard.

The factory default values as well as the DALI-norm values are summarised in *Table 1* below.

Table 1 factory default settings column 1, DALI Standard settings column 2

	Delivery default				DALI norm
Operating mode	DT6				N/A (remains unchanged)
SwitchDim2	SW&DIM2-1: light level SW&DIM2-2: scene selector				N/A (remains unchanged)
Min Level	0.1%				0.1%
Max Level	100%				100%
Power On Level	Last light level (= MASK)				100%
System Failure Level	100%				100%
Fade Time	1s [2]				none
Fade Rate	89.4 steps/s [5]				44.7 steps/s
PWM-Frequency	FW ≥ 4.6: 1kHz FW < 4.6: 122Hz				N/A (remains unchanged)
Control before initial addressing	G0 – channel1 G1 – channel2 G2 – channel3				none
Scene values	Scene	Ch1	Ch2	Ch3	All scenes MASK
	0	100%	0%	0%	
	1	0%	100%	0%	
	2	0%	0%	100%	
	3	0%	100%	100%	
	4	100%	0%	100%	
	5	100%	100%	0%	
	6	100%	100%	100%	
	7	0%	0%	0%	
	8	100%	0%	0%	
	9	0%	100%	0%	
	10	0%	0%	100%	
	11	0%	100%	100%	
	12	100%	0%	100%	
	13	100%	100%	0%	
	14	100%	100%	100%	
15	0%	0%	0%		
Behaviour on DALI RESET command	set DALI Standard values, see column 2				N/A (remains unchanged)

Purchase Order Information

Art.Nr. 89453828: 3-channel LED Dimmer, CV, max. input current 4A, 12V-48V DC, back box

Art.Nr. 89453834: 3-channel LED Dimmer, CV, max. input current 8A, 12V-48V DC, back box

Art.Nr. 86459571: 3-channel LED Dimmer, CV, max. input current 10A, 12V-48V DC, SwitchDim2, remote ceiling & integration in luminaires

Art.Nr. 89453831: 3-channel LED Dimmer, CV, max. input current 16A, 12V-48V DC, SwitchDim2, remote ceiling & integration in luminaires

Art.Nr. 89453831-HS (16A DIN Rail):
3-channel LED Dimmer, CV, max. input current 16A, 12V-48V DC, SwitchDim2, DIN rail housing

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 datasheets and manuals

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

Lunatone DALI products

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

Contact

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Requests: sales@lunatone.com

www.lunatone.com



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.