

DALI-2 LED Power Supply CW-WW

Datasheet Control Gear



DALI-2 LED Power Supply (DT8) for independent control of light level and colour temperature of tuneable white luminaires

constant voltage:

Art.Nr. 89453849-CWW-24V (24V, 25W)

constant current:

Art.Nr. 89453849-CWW-350 (15W, 350mA)

Art.Nr. 89453849-CWW-500 (20W, 500mA)

Art.Nr. 89453849-CWW-700 (20W, 700mA)

Art.Nr. 89453849-CWW-800 (20W, 800mA)

Art.Nr. 89453849-CWW-1000 (20W, 1000mA)

Art.Nr. 89453849-CWW-1050 (20W, 1050mA)

DALI-2 LED Power Supply CW-WW Control Gear

Overview

- DALI-2 LED Power Supply for the control of tuneable white luminaires
- types for constant voltage and constant current LED-modules available
- **Operating Mode DT8:** one DALI-address for the independent control of light level and colour temperature (DALI DT8, Colour Type Tc)
- **Operating Mode Balance&Dim:** control by 2 DALI-addresses, one for adjusting the light level and one for adjusting the channel balance (e.g. colour temperature)
- **Operating Mode Dim2Warm:** one DALI-address for simultaneous adjustment of light level and colour temperature
- **SwitchDim2:** 2 switch-inputs offer control of level and colour without DALI
- dimming range 0.1%-100%
- adjustable PWM-frequency (122Hz/244Hz/488Hz/976Hz from FW version 5 on changed PWM frequencies: 122Hz / 250Hz / 500Hz / 1kHz)
- supply voltage 230V AC
- CV-Type: output 24V PWM (max. 1A)
- CC-Type: output currents of up to 1050mA
- configuration via PC-software DALI-Cockpit and DALI USB-interface
- overtemperature shutdown, integrated short circuit protection
- user-friendly factory default settings

Specification, Characteristics

constant voltage (CV)

type	DALI-2 LED Power Supply CW-WW CV 24V
article number	89453849-CWW-24V
electrical data	
supply voltage	220-240V AC / 50-60Hz, $I_{in}=0.12A$, power factor > 0.95, inrush current < 0.2A
output	24V $\pm$ 0.5V PWM
max. output current I_{led}	1A
galvanic isolation	SELV
control input	DALI or SwitchDim2
number of DALI-addresses	2mA
number of DALI addresses	operating mode DT8, Dim2Warm: 1 operating mode Balance&Dim: 2

general data

dimensions (L x W x H)	120mm x 42mm x 22mm
mounting/housing	remote ceiling / integration in luminaires
expected lifetime (at $t_c \leq 65^\circ\text{C}$)	>50000h
housing material	PC, class V0
protection degree housing	IP40
protection degree terminals	IP20
power on behaviour	configurable via DALI: 0%-100% or last value

environmental conditions

storing and transportation temperature	$-20^\circ\text{C} \dots +75^\circ\text{C}$
operational ambient temperature	$-20^\circ\text{C} \dots +45^\circ\text{C}$

terminals

connection type	spring terminal connector (push in cage clamp)
wire size solid core	0,2 ... 1,5mm ² (AWG 24 ... AWG 16)
wire size fine wired	0,2 ... 1,5mm ² (AWG 24 ... AWG 16)
wire size using wire end ferrule	0,25 ... 1mm ²
stripping length	8,5 ... 9,5mm / 0,33 ... 0,37 inch
housing material	PA66, class V0
actuation type	push button



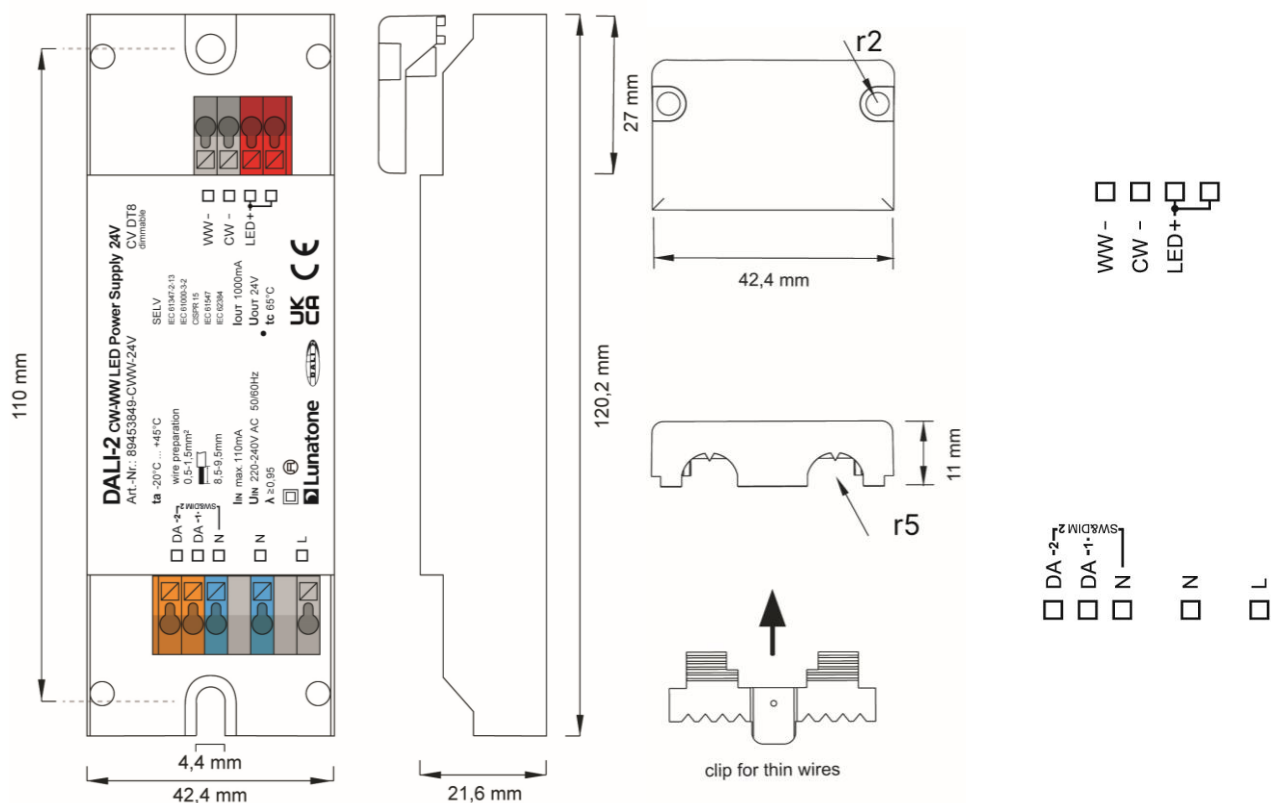
IEC 61347-2-13

IEC 61000-3-2

CISPR 15

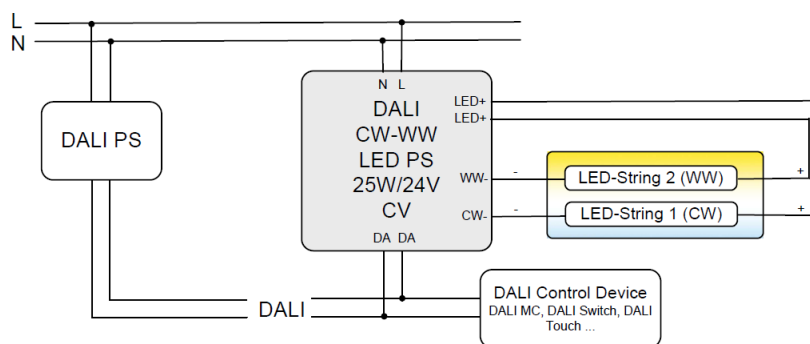
IEC 61547

IEC 62384

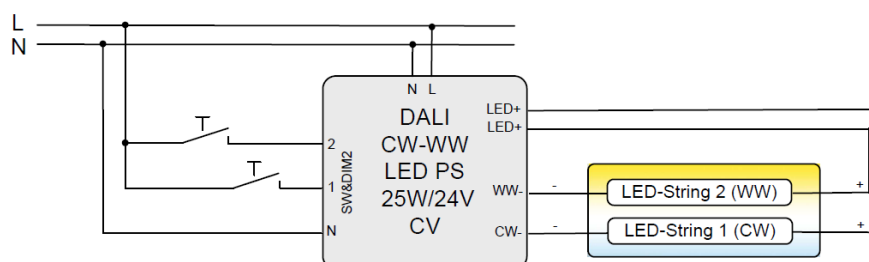


Typical Application – Constant Voltage

DALI:



SwitchDim2:



constant current (CC)

type	DALI-2 LED Power Supply CW-WW CC				
article number	89453849-CWW-350	89453849-CWW-500	89453849-CWW-700	89453849-CWW-800	89453849-CWW-1050

electrical data					
supply voltage	220-240V AC / 50-60Hz, $I_{in}=0.12A$, power factor > 0.95, inrush current < 0.2A				
max. output current I_{led}	350mA	500mA	700mA	800mA	1050mA
output voltage range V_{led}	12V-44V	12V-36V	12V-26V	12V-26V	12V-17V
galvanic isolation	SELV				
control input	DALI				
current consumption DALI	2mA				
number of DALI-addresses	operating mode DT8, Dim2Warm: 1 operating mode Balance&Dim: 2				

general data	
dimensions (L x W x H)	120mm x 42mm x 22mm
mounting/housing	remote ceiling / integration in luminaires
expected lifetime (at $t_c \leq 65^\circ C$)	>50000h
housing material	PC, class V0
protection degree housing	IP40
protection degree terminals	IP20
power on behaviour	configurable via DALI: 0%-100% or last value

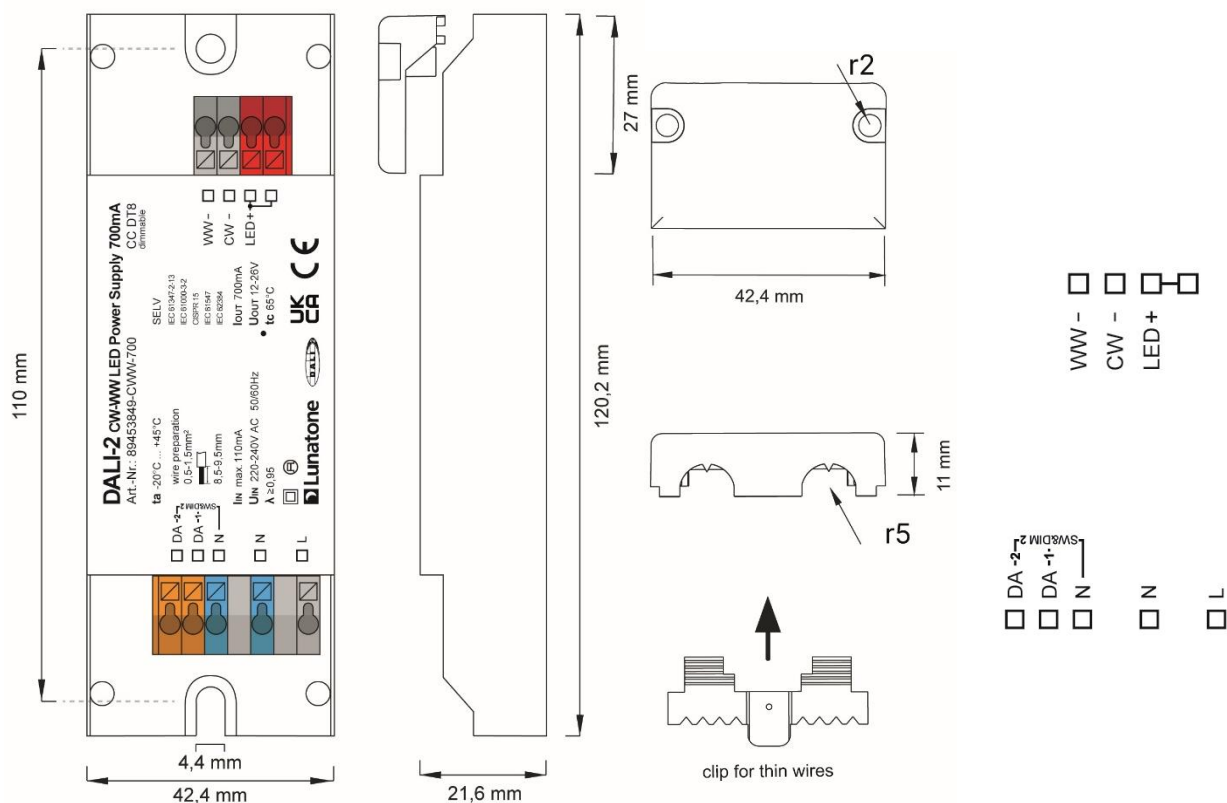
environmental conditions	
storage/transportation temp.	-20°C ... +75°C
ambient temperature	-20°C ... +45°C

terminals	
connection type	spring terminal connector (push in cage clamp)
wire size solid core	0,2 ... 1,5mm ² (AWG 24 ... AWG 16)
wire size fine wired	0,2 ... 1,5mm ² (AWG 24 ... AWG 16)
wire size using wire end ferrule	0,25 ... 1mm ²
stripping length	8,5 ... 9,5mm / 0,33 ... 0,37 inch
housing material	PA66, class V0
actuation type	push button

on request: output currents from 250mA to 1050mA available



IEC 61347-2-13
IEC 61000-3-2
CISPR 15
IEC 61547
IEC 62384

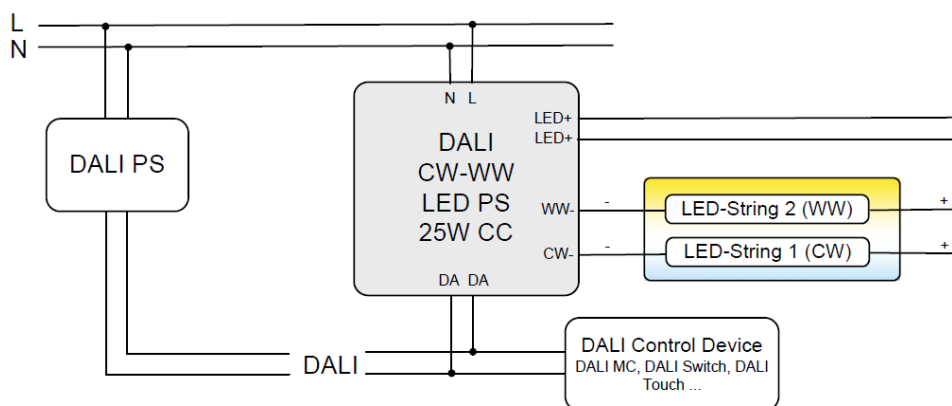


dimensions CC

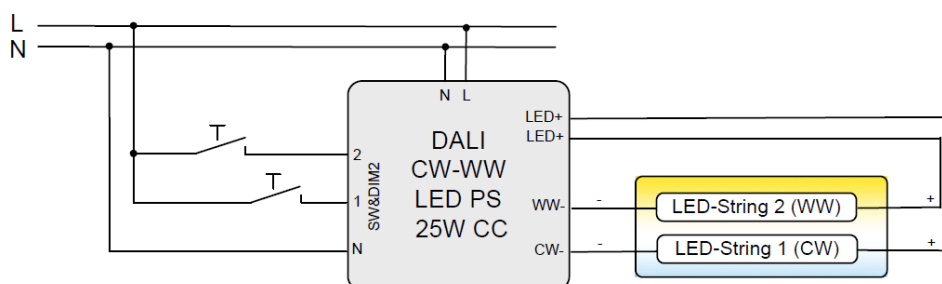
connection plan CC

Typical Application – Constant Current

DALI:



SwitchDim2:



Installation

- The DALI-2 LED PS is an independent control gear, it is suitable for remote ceiling and integration in luminaires
- Ensure proper working cable relief for installation in protection class II equipment
- 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 power supply terminals L and N to mains voltage according to the labelling.
- 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
- 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)



Attention: Do not connect or disconnect the LED when voltage is applied



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).

Commissioning

- After connection the LED PS is ready to use. Delivery default settings see page 14.
- The device 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 LED PS 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 DALI Cockpit: General Settings page 9 and following.

Operating Modes

The device offers several operating modes:

DT8 (factory default)

Default when connected to DALI in this operating mode one DALI-address for the independent control of light level and colour temperature is used (Device Type 8 Mode Tc).

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

SW&DIM2-1: light level

short press: On/Off

long press: dimming

SW&DIM2-2: colour temperature

long press: change colour temperature

Balance&Dim

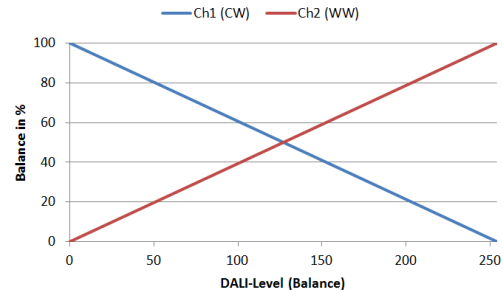
This operating mode is also suitable for operating tuneable white luminaires using two DALI-addresses. The first controls the light level and the second is used for changing the distribution on the output channels (e.g. for tuneable white applications or balancing direct/indirect lighting).

The Balance&Dim mode allows colour temperature adjustments without affecting the light level and vice versa. For each channel only, DALI-standard commands like dim up/down but also DAP are used. Thus, the device can be used with all common controls and gateways (e.g. KNX). The Balance&Dim mode provides an alternative to the DT8-Tc mode.

Can be operated via DALI or SwitchDim2:

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

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



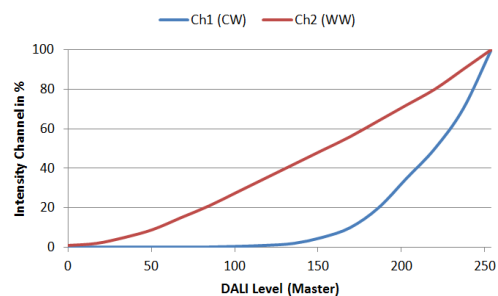
Dim2Warm

Both output channels are controlled by one DALI-address or SwitchDim2-input. The balance is coupled directly to the DALI dim level – the smaller the dim level the warmer the light.

DALI-address / SW&DIM2-1: Dim2Warm (Master)

short press: On/Off

long press: dimming

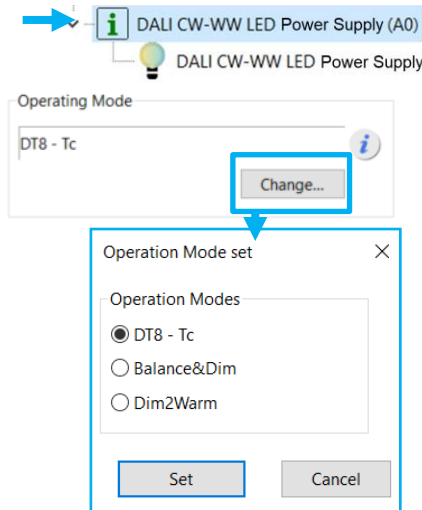


SW&DIM2-2: scene selector

The dim2warm table can be edited in the DALI Cockpit Software, see section DALI Cockpit: General Settings page 9 (Overview operating mode Dim2Warm).

Selection of operating mode

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



Switching between operating modes can also be done with the help of the DALI-command SET OPERATING MODE (IEC 62386-102 Ed.2). When changing the operating mode, the number of used DALI-addresses can change as well, and this requires a new addressing procedure. In the DALI-Cockpit this address assignment is performed automatically.

Operating Mode:

Number	Operating Mode
0x0	DT8 (factory default)
0x92	DT8
0x94	Balance&Dim
0x95	Dim2Warm

DALI Cockpit: General Settings

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

- *DT8*: 2 sliders, one for level and one for colour temperature
- *Balance&Dim*: 2 sliders, one for level and one for balance
- *Dim2Warm*: 1 slider for input value adaption and an Edit-Function for the Dim2Warm-table.

Additionally, the following configurations can be made:

PWM Frequency

The PWM frequency can be selected:

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

From FW version 5 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 5. 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 5 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

Overview operating mode DT8

Overview operating mode Balance&Dim

Overview operating mode Dim2Warm

Edit Dim2Warm table values

Master %	CW %	WW %
0.1	0.05	0.50
0.155	0.05	1.00
0.246	0.05	2.50
0.392	0.05	4.50
0.623	0.05	7.50
0.991	0.10	10.50
1.576	0.25	14.00
2.51	0.50	17.50
3.88	1.00	21.00
6.17	2.50	24.50
9.82	5.00	28.00
15.7	10.00	30.00

Cold: 0.05 % Warm: 0.50 %

Read from device Close

*change of the Dim2Warm table are being saved via "Save" to the device as other device parameters

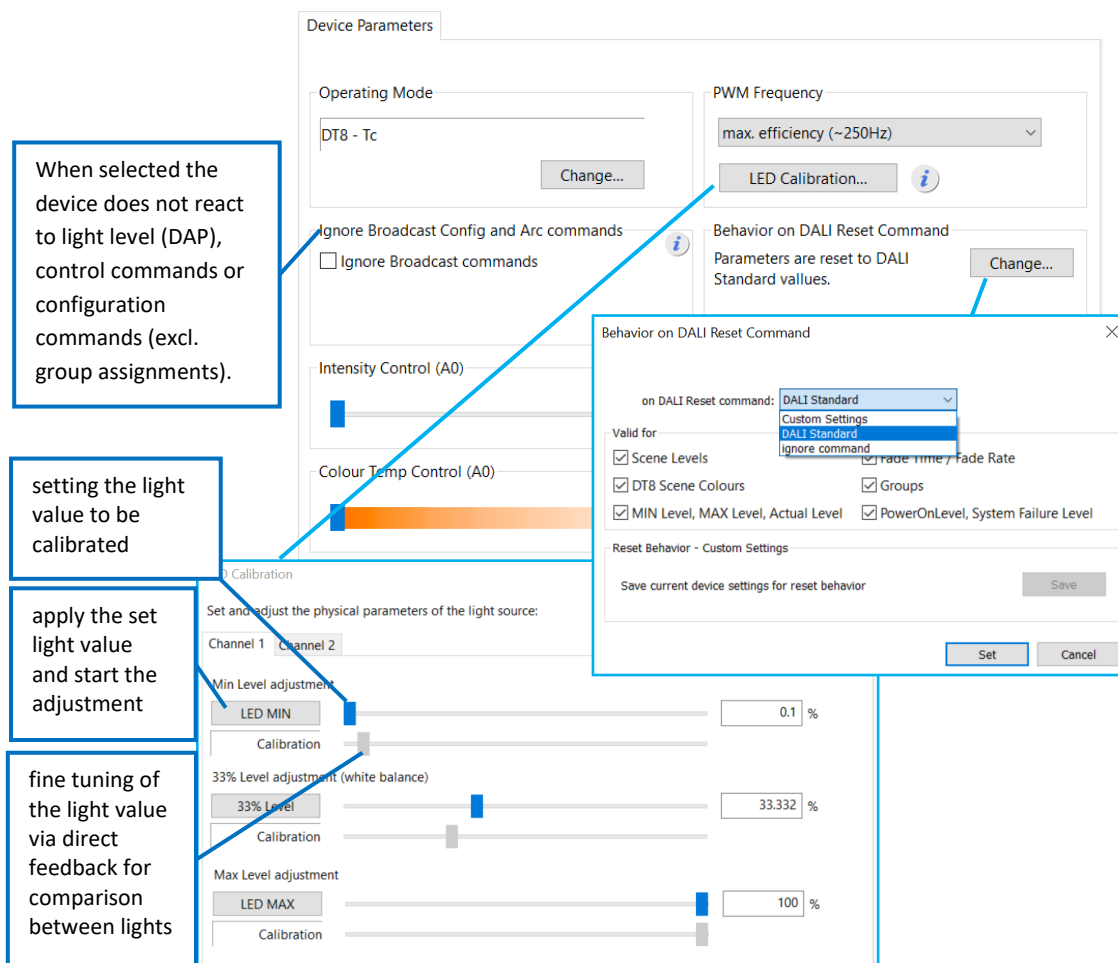


Figure 1 Cockpit overview page – LED calibration and settable RESET behaviour

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 Balance&Dim operating mode all values assigned to channel 2 are representing the balance.

Figure 2 on page 13 shows the setting options for operating mode DT8.

Figure 3 on page 13 shows the settings for each channel for operating modes Balance&Dim and Dim2Warm.

DT8 – Tc Limits and Colour Temperature step size

The Tc step size can be increased (instead of the DT8 Tc DALI standard value: 1), to speed up colour temperature changes when using the commands TC STEP COOLER/WARMER.



The values “Physical Warmest”/”LED Warmest” and “Physical coolest”/”LED coolest” capture the range the connected LED allows.

“Tc warmest” and “Tc coolest” colour temperatures represent the limit values for colour temperature like the Min and Max level do for the brightness. These values can be

adjusted to compensate for colour differences between different light sources.

Tc Limits

Physical Warmest	<input type="range"/>	1501 K
Physical Coolest	<input type="range"/>	7518 K
Tc Warmest	<input type="range"/>	1501 K
Tc Coolest	<input type="range"/>	7518 K

Scene settings

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

Preferences... 

Import from file
Export to file
All Scenes >

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

Preferences...

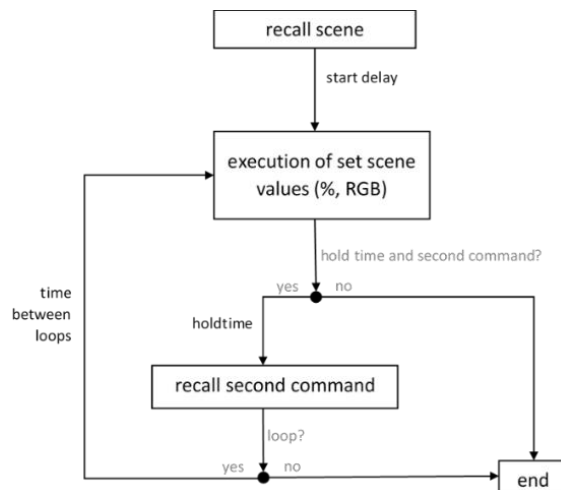
Scene preset selection

Scene set:
Default

0 MASK % 6535K	8 MASK % 4016K
1 MASK % 6060K	9 MASK % 3831K
2 MASK % 5649K	10 MASK % 3663K
3 MASK % 5291K	11 MASK % 3508K
4 MASK % 4975K	12 MASK % 3367K
5 MASK % 4694K	13 MASK % 3236K
6 MASK % 4444K	14 MASK % 3115K
7 MASK % 4219K	15 MASK % 3003K

OK Cancel

From FW 6 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.



☒ MASK % Tc: 6493 K

Scene Fade Time [0] fastest

start delay 0H 0min 0.0s

hold time

second command Dimm Off % RGB

second Fade Time [0] fastest

loop

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

Device Parameters Extended Scenes

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

☒ extended scene functionality 

Import/Export settings

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

DALI CW-WW LED Power Supply (A0)

DALI CW-WW LED Power Supply (A0)

Rename F2
Hide
Delete address DEL
Reset
Reset and delete address
Export device settings...
Import device settings...

Import Device Settings

Select Imported values

☐ Groups
☒ Scenes
☒ Min and Max Levels
☒ Power On Level
☒ System Fail Level
☒ Fade Rate/Time
☒ Disable Broadcast commands
☒ Reset behavior
☒ Colour settings (DT8)

OK Cancel

Device Parameters

Groups

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

DALI Parameter

MIN Level: 0.1 %

MAX Level: 100 %

Power On Level: 100 %

Power On Colour Tc: MASK K

System Fail Level: 100 %

System Fail Color Tc: MASK K

Fade time ext fade s

Ext Fade Time fastest

Fade rate 11.2 step/s

Scenes

Preferences...

0	☒		MASK %	Tc: 6535 K
1	☒		MASK %	Tc: 6060 K
2	☒		MASK %	Tc: 5649 K
3	☒		MASK %	Tc: 5291 K
4	☒		MASK %	Tc: 4975 K
5	☒		MASK %	Tc: 4694 K
6	☒		MASK %	Tc: 4444 K
7	☒		MASK %	Tc: 4219 K
8	☒		MASK %	Tc: 4016 K
9	☒		MASK %	Tc: 3831 K
10	☒		MASK %	Tc: 3663 K
11	☒		MASK %	Tc: 3508 K
12	☒		MASK %	Tc: 3367 K
13	☒		MASK %	Tc: 3236 K
14	☒		MASK %	Tc: 3115 K
15	☒		MASK %	Tc: 3003 K

Tc Limits

Physical Warmest 1501 K

Physical Coolest 7518 K

Tc Warmest 1501 K

Tc Coolest 7518 K

Tc StepSize 5

Figure 2 Cockpit settings for DT8

Device Parameters

Groups

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

DALI Parameter

MIN Level: 0.1 %

MAX Level: 100 %

Power On Level: 100 %

System Fail Level: 100 %

Fade time ext fade s

Ext Fade Time fastest

Fade rate 44.7 step/s

Scenes

Preferences...

0	☒		100 %
1	☒		0 %
2	☒		100 %
3	☒		0 %
4	☒		100 %
5	☒		0 %
6	☒		100 %
7	☒		0 %
8	☒		100 %
9	☒		0 %
10	☒		100 %
11	☒		0 %
12	☒		100 %
13	☒		0 %
14	☒		100 %
15	☒		0 %

Figure 3 Cockpit settings for each channel - Balance&Dim and Dim2Warm

Factory Default Settings

Before the initial addressing is performed, the device can already be controlled by a group address. This predefined grouping will be deleted during the first addressing procedure. Afterwards groups can be assigned as usual (e.g. with the help of 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	DT8	N/A (remains unchanged)																																																			
SwitchDim2	SW&DIM2-1: light level SW&DIM2-2: colour temperature	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																																																			
Tc-step size	3	N/A (remains unchanged)																																																			
PWM-Frequency	CV: 1kHz CC: 250Hz	N/A (remains unchanged)																																																			
Control before initial addressing	G0 (G0 and G1 in operating mode Balance&Dim)	None																																																			
Scene values	<table> <tr> <th>Scene</th><th>light level</th><th>colour temperature</th></tr> <tr><td>0</td><td>MASK</td><td>6535 K</td></tr> <tr><td>1</td><td>MASK</td><td>6060 K</td></tr> <tr><td>2</td><td>MASK</td><td>5649 K</td></tr> <tr><td>3</td><td>MASK</td><td>5291 K</td></tr> <tr><td>4</td><td>MASK</td><td>4975 K</td></tr> <tr><td>5</td><td>MASK</td><td>4694 K</td></tr> <tr><td>6</td><td>MASK</td><td>4444 K</td></tr> <tr><td>7</td><td>MASK</td><td>4219 K</td></tr> <tr><td>8</td><td>MASK</td><td>4016 K</td></tr> <tr><td>9</td><td>MASK</td><td>3831 K</td></tr> <tr><td>10</td><td>MASK</td><td>3663 K</td></tr> <tr><td>11</td><td>MASK</td><td>3508 K</td></tr> <tr><td>12</td><td>MASK</td><td>3367 K</td></tr> <tr><td>13</td><td>MASK</td><td>3236 K</td></tr> <tr><td>14</td><td>MASK</td><td>3115 K</td></tr> <tr><td>15</td><td>MASK</td><td>3003 K</td></tr> </table>	Scene	light level	colour temperature	0	MASK	6535 K	1	MASK	6060 K	2	MASK	5649 K	3	MASK	5291 K	4	MASK	4975 K	5	MASK	4694 K	6	MASK	4444 K	7	MASK	4219 K	8	MASK	4016 K	9	MASK	3831 K	10	MASK	3663 K	11	MASK	3508 K	12	MASK	3367 K	13	MASK	3236 K	14	MASK	3115 K	15	MASK	3003 K	All scene values MASK
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13	MASK	3236 K																																																			
14	MASK	3115 K																																																			
15	MASK	3003 K																																																			
Behaviour on DALI RESET command	set DALI Standard values, see column 2	N/A (remains unchanged)																																																			

Purchase Order Information

Art. Nr. 89453849-CWW-24V: DALI-2 CW-WW LED Power Supply 24V, constant voltage (CV), 24V, 25W, I_{max}=1A, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-350: DALI-2 CW-WW LED Power Supply 350mA, constant current (CC) 350mA, U_{out}=12V-44V, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-500: DALI-2 CW-WW LED Power Supply 500mA, constant current (CC) 500mA, U_{out}=12V-36V, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-700: DALI-2 CW-WW LED Power Supply 700mA, constant current (CC) 700mA, U_{out}=12V-26V, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-800: DALI-2 CW-WW LED Power Supply 800mA, constant current (CC) 800mA, U_{out}=12V-26V, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-1000: DALI-2 CW-WW LED Power Supply 1000mA, constant current (CC) 1000mA, U_{out}=12V-17V, SwitchDim2, remote ceiling

Art. Nr. 89453849-CWW-1050: DALI-2 CW-WW LED Power Supply 1050mA, constant current (CC) 1050mA, U_{out}=12V-17V, SwitchDim2, remote ceiling

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
<http://www.lunatone.at/en/>

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

Contact

Technical Support: support@lunatone.com

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.