

LIGHT
APP

FEATURES

- ◆ DMX LED DIMMER
- ◆ Power Input: 12-24-48 Vdc
- ◆ Constant Current Output for dimmable spotlights and LED modules
- ◆ WHITE, SINGLE COLOR, TUNABLE WHITE, RGB, and RGB+W Light Control
- ◆ Remote control via BUS (DMX512-A+RDM)
- ◆ Device configuration via Dalcnet LightApp© mobile application
- ◆ Constant current outputs for R-L-C loads
- ◆ PWM modulation can be set from 300 to 3400 Hz
- ◆ Parameters can be set from mobile application and via RDM:
 - PWM Frequency
 - Dimming Curve
 - Power-ON Levels
 - DMX Personality
- ◆ Operating hours and ignition cycles parameters
- ◆ Input Protection
- ◆ Opto-Isolated DMX Input
- ◆ Soft ON/OFF
- ◆ Soft brightness dimming
- ◆ Extended temperature range
- ◆ 100% Functional test

PRODUCT DESCRIPTION

LINE-4CC-DMX is a PWM (Pulse With Modulation) Constant Current (CC) LED dimmer with 4 output channels and remotely controllable via DMX (Digital Multiplex) digital protocol. It can be connected to a constant voltage (12 ÷ 48) Vdc SELV power supply and is suitable for driving loads such as Spotlight and white, single-colour, Tunable White, RGB and RGB+W constant current LED modules.

LINE-4CC-DMX can deliver a maximum output current of 900 mA per channel and has the following protections: over-power protections, reverse polarity protection, and input fuse protection.

Through the Dalcnet LightApp© mobile application and smartphone equipped with Near Field Communication (NFC) technology, it is possible to configure multiple parameters including modulation frequency, adjustment curve and maximum/minimum brightness levels when the device is switched off. Dalcnet LightApp© can be downloaded free of charge from the Apple APP Store and Google Play Store.

→ For the up-to-date manual, please consult our website www.dalcnet.com or QR Code.



PRODUCT CODE

CODE	SUPPLY VOLTAGE	LED OUTPUT	N° OF CHANNELS	REMOTE CONTROL (BUS)	APP CONFIG.
LINE-4CC-DMX	12-24-48 VDC	4 x 0.9 A (tot. max 3.6 A) ¹	4	DMX512-RDM	LightApp®

Table 1: Product code

PROTECTIONS

The following table shows the types of incoming protections present on the device.

ACRONYM	DESCRIPTION	TERMINAL	PRESENT
IFP	Input Fuse Protection ²	DC IN	✓
OVP	Over Voltage Protection ²	DC IN	✓
UVP	Under Voltage Protection	DC IN	✓
RVP	Reverse Voltage Polarity ²	DC-IN	✓

Table 2: Protection & Detection Features

REFERENCE STANDARDS

LINE-4CC-DMX complies with the regulations shown in the table below.

STANDARD	TITLE
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 61547	Equipment for general lighting purposes – EMC immunity requirement
EN 61347-1	Lamp Controlgear – Part 1: General and safety requirement
EN 61347-2-13	Lamp controlgear - Part 2-13: Particular requirement for d.c. or a.c. supplied electronic Controlgear for LED modules
ANSI E1.11	Entertainment Technology - USITT DMX512-A - Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories
ANSI E1.20	Entertainment Technology-RDM-Remote Device Management over USITT DMX512 Networks

Table 3: Reference standards

¹ The maximum total output current depends on the operating conditions and ambient temperature of the system. For the correct configuration, check the maximum power that can be delivered in the §[Technical Specifications](#) section and in the §[Thermal Characterization](#).

² Protections refer to the control logic of the board.

TECHNICAL SPECIFICATIONS

Parameter	Symbol	Values			Unit of Measure	Note
		Min		Max		
INPUT (Power Supply DC IN)						
Nominal Supply Voltage	V _{IN}	12	24	48	Vdc	-
Supply Voltage range	V _{IN-RNG}	10.8	÷	52.8	Vdc	-
Efficiency at full load	E _{EFF}	> 95			%	-
Standby power absorption	P _{STBY}	< 0.5			W	-
Input Current (max)	I _{IN}	-	-	3.2	A	-
OUTPUT (Channels L1, L2, L3, L4)						
Output Current (per channel)	I _{OUT-CH}	150	÷	900	mA	Choice via Dalcnet LightApp®
Output Current (total)	I _{OUT-TOT}	-	-	3.6	A	-
Output Voltage	V _{OUT}	@12V 3÷11.1	@24V 6÷23.1	@48V 12÷43	V	-
Rated Power Output	P _{OUT}	See Table 5			W	Rated @T _A <35 °C
Load type	L _{TYPE}	R-L-C			-	Defined by design
DIMMING						
Dimming Curve	C _{DIM}	Linear, Quadratic, Exponential			-	Choice via Dalcnet LightApp®
Dimming Method	M _{DIM}	Pulse Width Modulation (PWM)			-	-
Dimming Frequency	f _{DIM}	307, 667, 1333, 2000, 3400			Hz	-
Dimming Resolution	Res _{DIM}	16			bit	Defined by design
Dimming Range ³	RNG _{DIM}	1	÷	100	%	-
ENVIRONMENTAL						
Storage temperature	T _{STORE}	-40	÷	+60	°C	Minimum values defined by design
Temp. ambiente di lavoro	T _A - I≤700mA	-10	÷	+60	°C	For output currents ≤ 700 mA
	T _A - I>700mA	-10	÷	+45	°C	For output currents > 700 mA
Max Temperature @T _c point	T _C	-	-	+80	°C	-
Connector Type	C _{TYPE}	Push-in terminals			-	-
Wiring Section	WS _{SOLID}	0.2	÷	1.5	mm ²	Defined by design
	WS _{STRAND}	24	÷	16	AWG	
Strip length	WS _{STRIP}	10			mm	-
Protection class	IP _{CODE}	IP20			-	-
Casing Material	MC	Plastic			-	-
Packaging units (piece/units)	PU	1			pc	-
Mechanical Dimensions	MD	L	H	D	mm	-
		186	29	21		
Packaging Dimensions	PD	197	34	29	mm	-
Weight	W	80			g	Packaging included

Table 4: Technical specifications

³ Measured on a 3.4 kHz linear dimming curve. Value dependent on the type of load connected.

Channel Rated Power Output (P _{OUT-CH})	Current [mA]±5%	150	200	250	300	350	400	450	500
	@12 Vdc	1.6 W	2.2 W	2.7 W	3.3 W	3.8 W	4.4 W	4.9 W	5.5 W
	@24 Vdc	3.4 W	4.6 W	5.7 W	6.9 W	8 W	9.2 W	10.3 W	11.5 W
	@48 Vdc	6.4 W	8.6 W	10.7 W	12.9 W	15 W	17.2 W	19.3 W	21.5 W
Total Rated Power Output (P _{OUT-TOT})	Current [mA]±5%	550	600	650	700	750	800	850	900
	@12 Vdc	6.1 W	6.6 W	7.2 W	7.7 W	8.3 W	8.8 W	9.4 W	9.9 W
	@24 Vdc	12.7 W	13.8 W	15 W	16.1 W	17.3 W	18.4 W	19.6 W	20.7 W
	@48 Vdc	23.6 W	25.8 W	27.9 W	30.1 W	32.2 W	34.4 W	36.5 W	38.7 W
Total Rated Power Output (P _{OUT-TOT})	Current [mA] ± 5%	150	200	250	300	350	400	450	500
	@12 Vdc	6.6 W	8.8 W	11.1 W	13.3 W	15.5 W	17.7 W	19.9 W	22.2 W
	@24 Vdc	13.8 W	18.4 W	23.1 W	27.7 W	32.3 W	36.9 W	41.5 W	46.2 W
	@48 Vdc	25.8 W	34.4 W	43 W	51.6 W	60.2 W	68.8 W	77.4 W	86 W
Total Rated Power Output (P _{OUT-TOT})	Current [mA] ± 5%	550	600	650	700	750	800	850	900
	@12 Vdc	24.4 W	26.6 W	28.8 W	31 W	33.3 W	35.5 W	37.7 W	39.9 W
	@24 Vdc	50.8 W	55.4 W	60 W	64.6 W	69.3 W	73.9 W	78.5 W	83.1 W
	@48 Vdc	94.6 W	103.2 W	111.8 W	120.4 W	129 W	137.6 W	146.2 W	154.8 W

Note: rated values at TA<35°C ambient working temperature.

Table 5: Power output as a function of set current

POSITIONING OF THE T_c POINT

The figure below shows the positioning of the maximum temperature point (*T_c point*, highlighted in red) reached by the electronics inside the enclosure. It is located on the front side (Top) near the LED output connector.

Figure 1: T_c point positioning

INSTALLATION



ATTENTION! Installation and maintenance must always be carried out in the absence of voltage.

Before proceeding with the connection of the device to the power supply, make sure that the voltage of the power source is disconnected from the system.



The device should only be connected and installed by qualified personnel. All applicable regulations, legislation, standards, and building codes must be adhered to. Incorrect installation of the device may cause irreparable damage to the device and connected loads.

The following paragraphs show the diagrams of the dimmer's connection to the remote control, the load and the supply voltage. It is recommended to follow these steps to install the product safely:

- Load Connection:** Connect the LED load positive to the "L" terminal with the "+" symbol, while the LED load negatives to the "L1", "L2", "L3" and "L4" terminals with the "-" symbol.
- Remote Control Connection:** Connect the DATA+, DATA- and COM data bus signals respectively to the "DMX" terminals with the "D+" "D-" "COM" symbols.
- Power connection:** Connect a 12-24-48 Vdc constant voltage SELV power supply (depending on the nameplate data of the LED load) to the "+" and "-" terminals of the DC IN terminal.



LOAD CONNECTION

LINE-4CC-DMX has 4 output channels that can be driven independently (e.g. for single-color LED spotlights) or depending on the RGB value or white light temperature (e.g. for RGB, RGB+W and Tunable-White LED modules).

The DMX protocol provides for different configurations called *Personality*⁴, depending on the type of LED load and the light characteristics to be obtained.

For each *Personality* there is therefore a dedicated connection diagram, depending on the type of LED load. LINE-4CC-DMX supports up to 9 *Personalities* distributed over 4 connection schemes, shown below.

DIAGRAM FOR WHITE OR SINGLE-COLOR LED LOADS

The following connection diagram (Figure 2) is suitable for the DMX Personalities §Dimmer and §Macro Dimmer and allows you to drive up to 4 white or single-color LED loads.

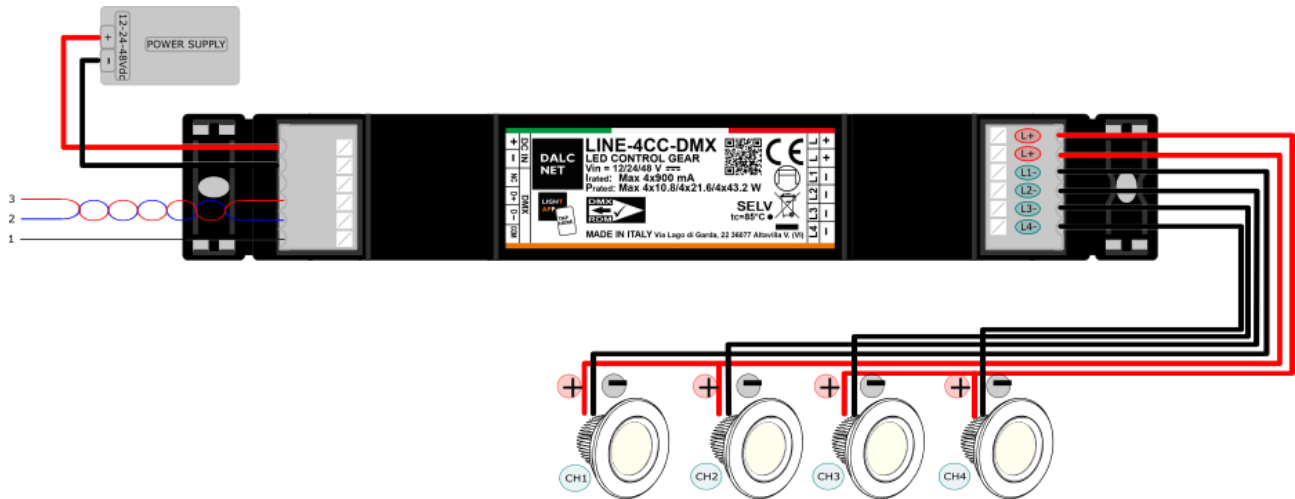


Figure 2: Wiring diagram for White or Monochrome LED loads

DIAGRAM FOR TUNABLE-WHITE + TUNABLE-WHITE LED LOADS

This connection diagram is suitable for driving up to 2 Tunable-White LED loads⁵, which can be configured using the DMX Personality §Tunable White.

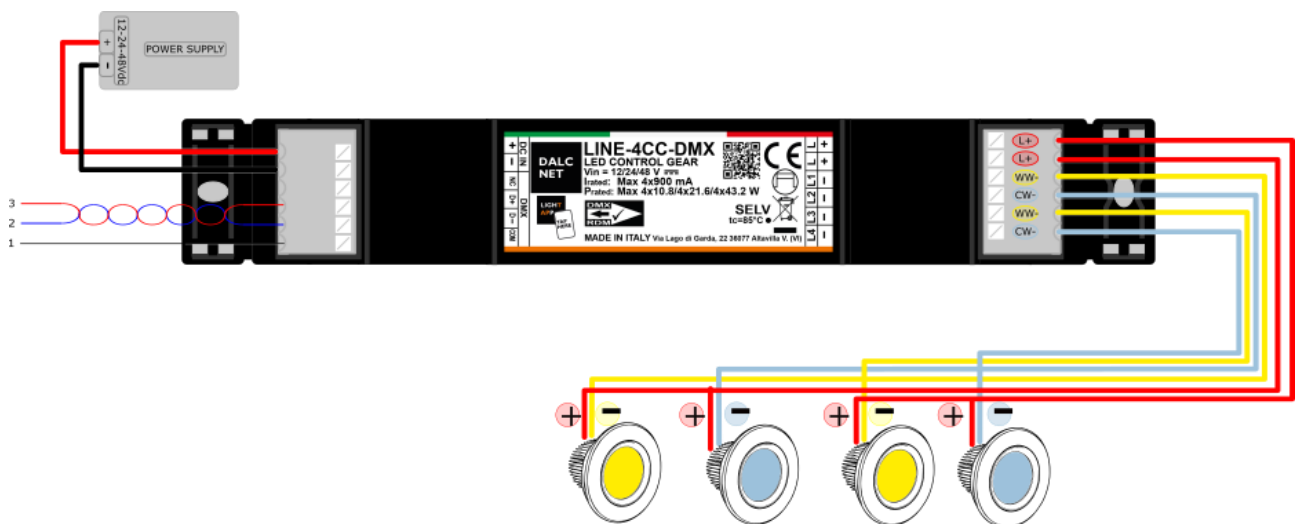


Figure 3: Wiring Diagram for Tunable-White LED Loads

⁴ In the context of the DMX protocol, the term "Personality" refers to a specific set of channels and functions that a DMX device may have. Each *Personality* defines a different configuration of channels and functions for the device (e.g. one *Personality* may include channels for controlling light intensity, color, or temperature, while another may only include channels for intensity and color). This allows light operators to select the configuration that best suits their needs.

⁵ "Tunable-White" refers to the ability of a lighting fixture to vary the color temperature of white independently of its light intensity.

DIAGRAM FOR RGB LED LOADS

Figure 4 shows the connection diagram suitable for driving a single RGB LED load, configurable through the DMX Personalities §RGB, §M+RGB+S, and §Smart HSI RGB and RGBW.

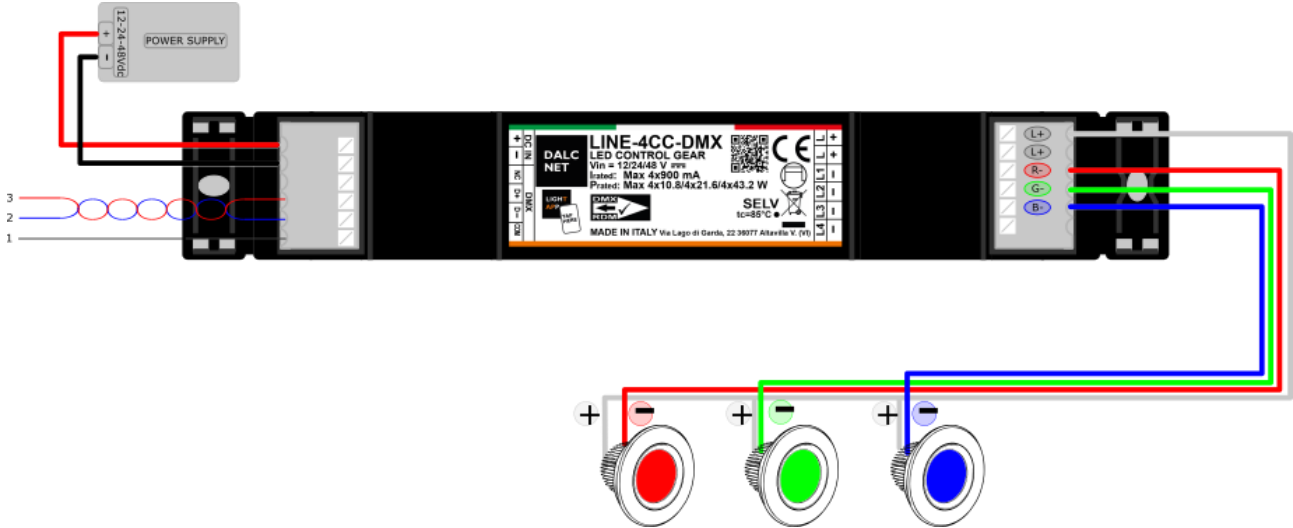


Figure 4: Wiring diagram for RGB load

DIAGRAM FOR RGBW LED LOADS

Figure 5 shows the connection diagram indicated to drive a single RGBW LED load, whose parameters are configurable through the Personality §RGBW, §M+RGBW+S, §Smart HSI RGB and RGBW

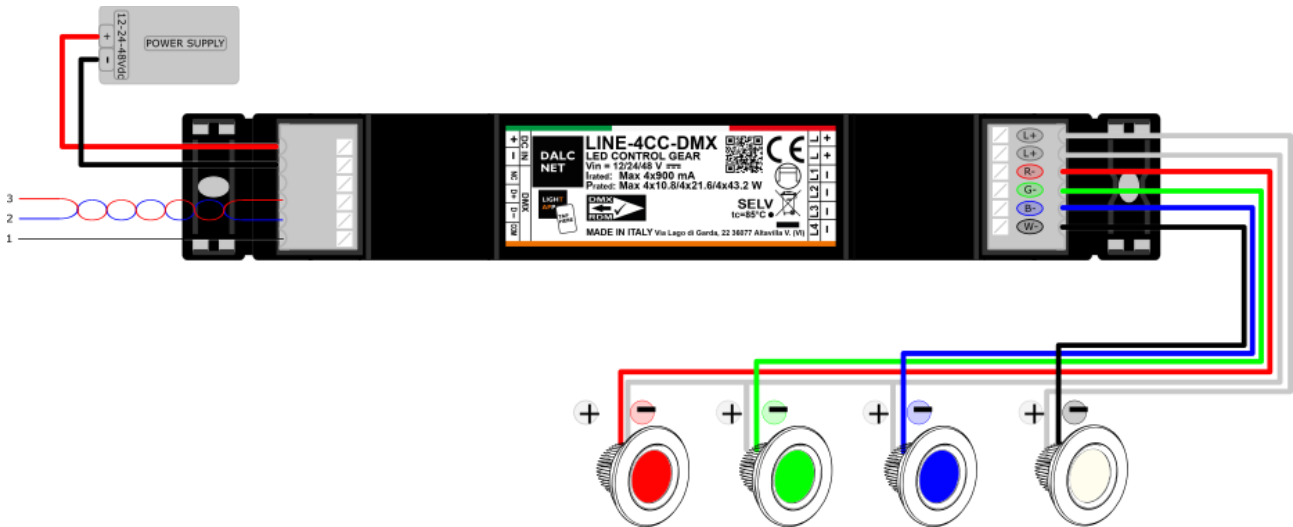



Figure 5: Wiring diagram for RGBW LED load

REMOTE CONTROL CONNECTION

LINE-4CC-DMX can be controlled remotely via DMX512-RDM digital bus by means of a two-wire cable, twisted and shielded, with a nominal impedance of 110 Ω. Control is done by means of a DMX512-RDM Master that provides commands to devices in the DMX network and receives response messages from Slave devices if they support RDM (Remote Device Management) functionality.

 To connect LINE-4CC-DMX to the DMX network, simply connect the bus cables to the terminals of the "DMX" terminal: since no other topologies are possible other than Bus-wiring, the polarity of the "COM", "D+" and "D-" signals must be respected during the connection.

The most commonly used connectors are 3-pole and 5-pole XLR, where one pin is the cable shield (ground) and 2 pins are used for DMX signal transmission. In the case of 5-pole XLR, the other 2 pins are reserved for a secondary DMX balanced line⁶.

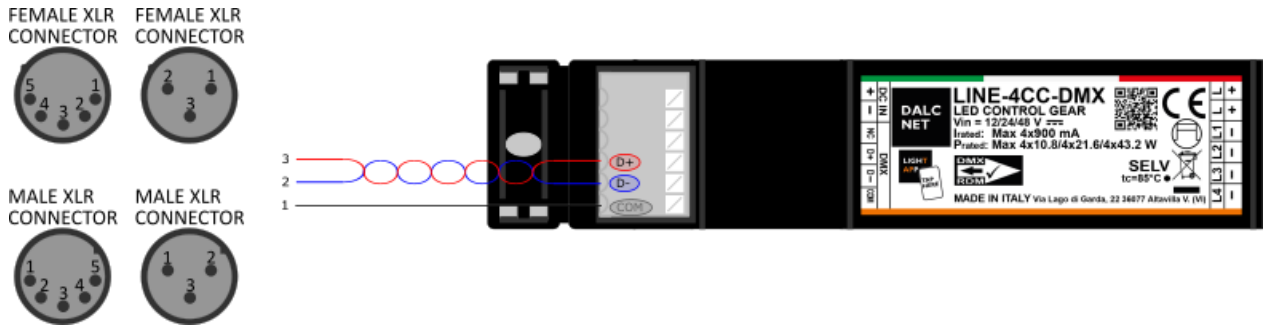


Figure 6: Remote Control connection pin-out and XLR connectors

Signal Description	Pin# (3-Pin XLR)	Pin# (5-Pin XLR)	DMX512 Function
Common Reference	1	1	Data-Link Common
Primary Data-Link	2	2	Data 1-
	3	3	Data 1+
Secondary Data-Link ⁶	-	4	Data 2-
	-	5	Data 2+

Table 6: Pin out 3-pin and 5-pin XLR connectors

DMX CABLING TOPOLOGIES

The DMX protocol requires a single wiring topology, namely Bus-wiring, shown as an example in Figure 7.

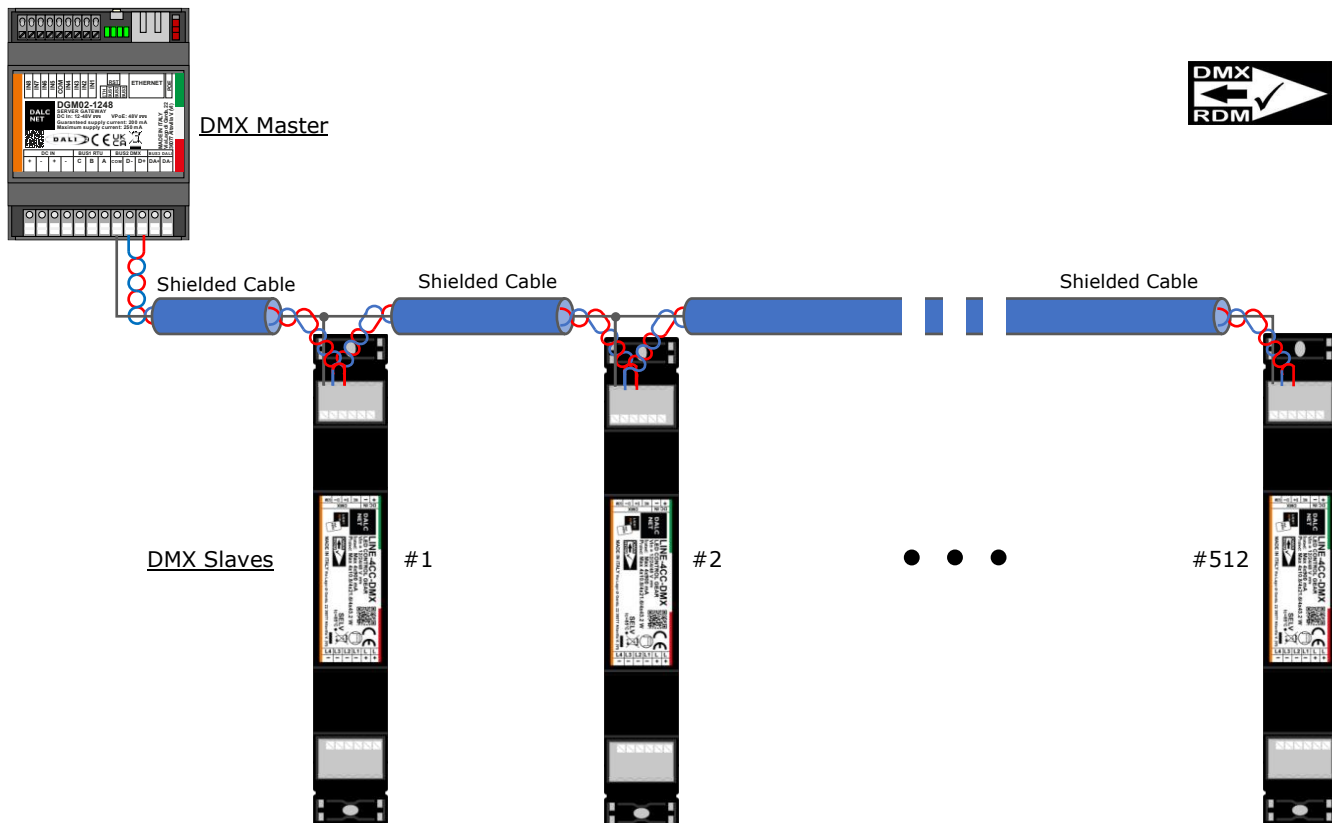


Figure 7: Remote Control Connection Topology, Bus-wiring

⁶ Optional, refer to chapter §4.8 of ANSI E1.11.

POWER SUPPLY CONNECTION



LINE-4CC-DMX can be powered by a constant voltage SELV power supply at 12 Vdc, 24 Vdc or 48 Vdc, depending on the operating voltage of the LED load. Once the load and remote control (DMX bus) are connected, connect the power supply to the "+" and "-" terminals of the DC IN terminal.

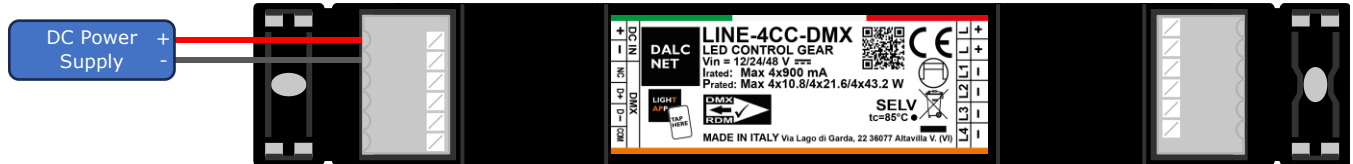


Figure 8: Power Supply Connection Diagram

REMOTE CONTROL: DMX512+RDM

The DMX512 protocol (or DMX), is a digital communication standard used primarily for controlling stage lighting in the entertainment industry and allows numerous lights and effects to be controlled from a control room. Recently, it has also been introduced in architectural lighting. The DMX512 is based on the physical RS-485 protocol: an RS485 industrial line, i.e. a shielded bipolar cable with a nominal impedance of 110Ω, is therefore used to connect a DMX512 controller to compatible equipment; data is transmitted in differential form at 3.3 V, with a transmission rate of 250 kb/s.

RDM FEATURES AND PARAMETERS

The Remote Device Management (RDM) extension offers a significant improvement by introducing two-way communication between lighting controllers and connected compatible RDM devices. It allows devices to be controlled and communicated in both directions, making it easy to install and configure the devices and enabling intelligent management from the control console through the information sent by the RDM devices. Some of the benefits of RDM include:

- Remote access to driver address settings from the command console (or DMX controller)
- Automatic device search: The controller can search the DMX universe for all connected devices and route them automatically
- Status communication, faults, temperature, etc.: RDM devices can send information about their operating status and any faults to the console

LINE-4CC-DMX natively supports the RDM functionality of the DMX protocol with the following commands.

Std.	RDM Parameter ID	Value	Required	Supported	Get/Set
E1.20	DISC_UNIQUE_BRANCH	0x0001	✓	✓	-
	DISC_MUTE	0x0002	✓	✓	-
	DISC_UN_MUTE	0x0003	✓	✓	-
	SUPPORTED_PARAMETERS	0x0050	✓	✓	G
	PARAMETER_DESCRIPTION	0x0051	✓	✓	G
	DEVICE_INFO	0x0060	✓	✓	G
	PRODUCT_DETAIL_ID_LIST	0x0070	-	✓	G
	DEVICE_MODEL_DESCRIPTION	0x0080	-	✓	G
	MANUFACTURER_LABEL	0x0081	-	✓	G
	DEVICE LABEL	0x0082	-	✓	G+S
	SOFTWARE_VERSION_LABEL	0x00C0	✓	✓	G
	BOOT_SOFTWARE_VERSION_ID	0x00C1	-	✓	G
	BOOT_SOFTWARE_VERSION_LABEL	0x00C2	-	✓	G
	DMX_PERSONALITY	0x00E0	-	✓	G+S
	DMX_PERSONALITY_DECEIPTION	0x00E1	-	✓	G
	DMX_START_ADDRESS	0x00F0	✓	✓	G+S
	SLOT_INFO	0x0120	-	✓	G
	SLOT_DESCRIPTION	0x0121	-	✓	G
	DEFAULT_SLOT_VALUE	0x0122	-	✓	G
	DEVICE_HOURS	0x0400	-	✓	G+S
LAMP_ON_MODE	0x0404	-	✓	G+S	
DEVICE_POWER_CYCLES	0x0405	-	✓	G ⁷	
IDENTIFY_DEVICE	0x1000	✓	✓	G+S	
E1.37-1	DIMMER_INFO	0x0340	-	✓	G
	MINIMUM_LEVEL	0x0341	-	✓	G+S
	MAXIMUM_LEVEL	0x0342	-	✓	G+S
	CURVE	0x0343	-	✓	G+S
	CURVE_DESCRIPTION	0x0344	-	✓	G
	MODULATION_FREQUENCY	0x0347	-	✓	G+S
	MODULATION_FREQUENCY_DESCRIPTION	0x0348	-	✓	G

Table 7: RDM Parameters

⁷ For this model, "Set" mode is not supported.

CHANNEL MAPPING: DMX PERSONALITIES

The DMX protocol provides for different configurations called *Personalities*, depending on the light characteristics to be obtained through the LED module connected to the outputs.

Each *Personality* is composed of a defined number of 8-bit channels, whose values can be set in the range (0 ÷ 255), each of which represents a light characteristic (e.g. brightness, color, saturation, etc.) to be modulated on the LED load.

DIMMER

The Personality "Dimmer" allows you to adjust the light intensity for each channel independently. For the permissible load type and the corresponding connection diagram, refer to the paragraph [§Diagram for White or Single-Color LED Loads](#).

DMX channel	Function	Level
1	DIMMER 1	DMX LEVEL 0...255
2	DIMMER 2	DMX LEVEL 0...255
3	DIMMER 3	DMX LEVEL 0...255
4	DIMMER 4	DMX LEVEL 0...255

MACRO DIMMER

The Personality "Macro Dimmer" allows a single intensity adjustment for all 5 channels. The connection diagram and the type of LED load that can be used with this configuration can be found in the paragraph [§Diagram for White or Single-Color LED Loads](#).

DMX channel	Function	Level
1	MACRO DIMMER	DMX LEVEL 0...255

TUNABLE WHITE

With Personality "Tunable White", the intensity and temperature values are adjusted via two independent DMX channels. The connection diagram and the type of LED load allowed for this Personality can be found in the paragraph [§Diagram for Tunable-White + Tunable-White LED Loads](#).

DMX channel	Function	Level
1	DIMMER 1	DMX LEVEL 0...255
2	COLOR TEMP. CORRECTION 1	DMX LEVEL 0...255
3	DIMMER 2	DMX LEVEL 0...255
4	COLOR TEMP. CORRECTION 2	DMX LEVEL 0...255

RGB

Through the Personality "RGB" it is possible to adjust the intensity of the Red-Green-Blue primary colors through three independent DMX channels. For the permissible load type and connection diagram, refer to the paragraph [§Diagram for RGB LED Load](#).

DMX channel	Function	Level
1	DIMMER RED	DMX LEVEL 0...255
2	DIMMER GREEN	DMX LEVEL 0...255
3	DIMMER BLUE	DMX LEVEL 0...255

M+RGB+S

The Personality "M+RGB+S" has 5 DMX channels, one of which is for adjusting the light intensity (Master dimmer), 3 channels for adjusting the three primary colors Red-Green-Blue and one channel for adjusting the Strobe effect. The permissible load type and connection diagram can be found in the paragraph §Diagram for RGB LED Load.

DMX channel	Function	Level																																
1	MASTER DIMMER	DMX LEVEL 0...255																																
2	DIMMER RED	DMX LEVEL 0...255																																
3	DIMMER GREEN	DMX LEVEL 0...255																																
4	DIMMER BLUE	DMX LEVEL 0...255																																
5	STROBO RATE	<table border="1"> <tr> <td>Fix</td><td>Blackout</td><td>1fps</td><td>2fps</td><td>3fps</td><td>4fps</td><td>5fps</td><td>6fps</td><td>7fps</td><td>8fps</td><td>9fps</td><td>10fps</td><td>12fps</td><td>14fps</td><td>16 fps</td><td>Fix</td> </tr> <tr> <td>0...15</td><td>16...31</td><td>32...47</td><td>48...63</td><td>64...79</td><td>80...95</td><td>96...111</td><td>112...127</td><td>128...143</td><td>144...159</td><td>160...175</td><td>176...191</td><td>192...207</td><td>208...223</td><td>224...239</td><td>240...255</td> </tr> </table>	Fix	Blackout	1fps	2fps	3fps	4fps	5fps	6fps	7fps	8fps	9fps	10fps	12fps	14fps	16 fps	Fix	0...15	16...31	32...47	48...63	64...79	80...95	96...111	112...127	128...143	144...159	160...175	176...191	192...207	208...223	224...239	240...255
Fix	Blackout	1fps	2fps	3fps	4fps	5fps	6fps	7fps	8fps	9fps	10fps	12fps	14fps	16 fps	Fix																			
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RGBW

Similar to the "RGB" Personality, the "RGBW" allows the adjustment of the intensity of the Red-Green-Blue primary colors through three independent DMX channels and in addition the adjustment of the white light on a dedicated DMX channel. This configuration can be used with an RGBW LED load, the connection diagram of which is defined in the paragraph §Diagram for RGBW LED Load.

DMX channel	Function	Level
1	DIMMER RED	DMX LEVEL 0...255
2	DIMMER GREEN	DMX LEVEL 0...255
3	DIMMER BLUE	DMX LEVEL 0...255
4	DIMMER WHITE	DMX LEVEL 0...255

M+RGBW+S

The Personality M+RGBW+S has 6 DMX channels, one of which is for adjusting the light intensity (Master dimmer), 3 channels for adjusting the three primary colors Red-Green-Blue, one channel for adjusting the amount of white light and one channel for adjusting the Strobe effect. This Personality can be used with an RGBW LED load, the connection diagram of which is defined in the paragraph §Diagram for RGBW LED Load.

DMX channel	Function	Level																																
1	MASTER DIMMER	DMX LEVEL 0...255																																
2	DIMMER RED	DMX LEVEL 0...255																																
3	DIMMER GREEN	DMX LEVEL 0...255																																
4	DIMMER BLUE	DMX LEVEL 0...255																																
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Fix	Blackout	1fps	2fps	3fps	4fps	5fps	6fps	7fps	8fps	9fps	10fps	12fps	14fps	16 fps	Fix																			
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SMART HSI RGB AND RGBW

The Personality "Smart HSI RGB" and "Smart HSI RGBW" allow, by means of 6 DMX channels, the adjustment of the light intensity (Master dimmer), the correction of the color temperature, the Hue value (Hue), the timing of the Hue Rotation Rainbow time, the Saturation (Saturation) and the adjustment of the Strobe effect. The connection diagrams and LED loads that can be used with these configurations can be found in the paragraphs §Diagram for RGB LED Load (for "Smart HSI RGB") and §Diagram for RGBW LED Load (for "Smart HSI RGBW").

DMX channel	Function	Level															
1	MASTER DIMMER	DMX LEVEL 0...255															
2	TEMP. COLOR CORRECTION	DMX LEVEL 0...255															
3	HUE	DMX LEVEL 0...255															
4	HUE ROTATION (RAINBOW) TIME	Hue Fine 0...15	Hold 16...25	30min 26...51	15min 52...76	6min 77...102	3min 103...127	1min 128...153	30s 154...179	15s 180...204	6s 205...230	3s 231...255					
5	SATURATION	DMX LEVEL 0...255															
6	STROBO RATE	Fix 0...15	Blackout 16...31	1fps 32...47	2fps 48...63	3fps 64...79	4fps 80...95	5fps 96...111	6fps 112...127	7fps 128...143	8fps 144...159	9fps 160...175	10fps 176...191	12fps 192...207	14fps 208...223	16 fps 224...239	Fix 240...255

FLICKER PERFORMANCE

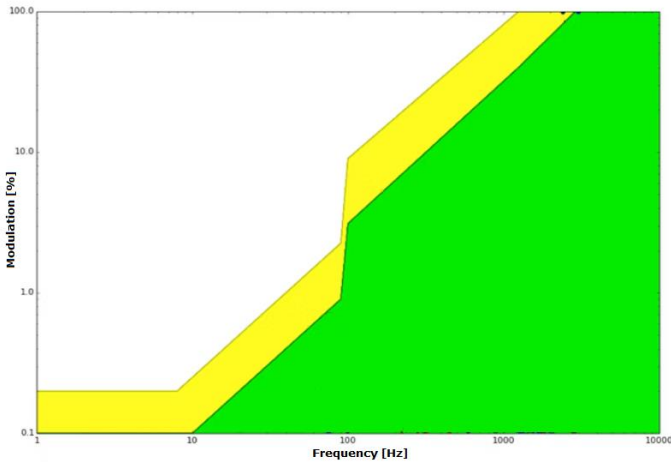


Figure 9: Flickering Perception Threshold

LINE-4CC-DMX, thanks to the dimming frequency of 3.4kHz, allows to reduce the phenomenon of flickering (Flicker).

Depending on eye sensitivity and the type of activity, flickering can affect a person's well-being even if the fluctuations in luminance are beyond the threshold perceptible to the human eye.

The graph shows the phenomenon of flickering as a function of frequency, measured over the entire dimming range.

The reported results highlight the low-risk zone (yellow) and the no-observable zone (green), defined by the IEEE 1789-2015 standard⁸.

THERMAL CHARACTERIZATION

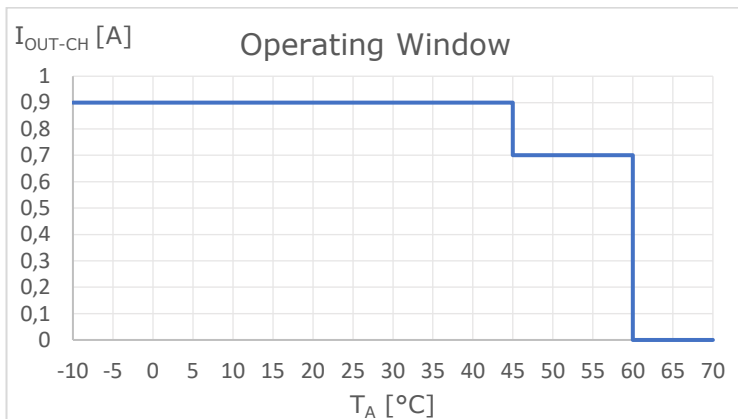


Figure 10: Operating Temperature Window

Figure 10 shows the maximum output current values that can be provided by the LINE-4CC-DMX as a function of the operating temperature⁹ (or ambient temperature, T_A) of the work, summarized below:

- ◆ $T_A = (-10 \div +60) \text{ } ^\circ\text{C} \rightarrow I_{\text{OUT-CH}} \leq 0.7 \text{ A}$
- ◆ $T_A = (-10 \div +45) \text{ } ^\circ\text{C} \rightarrow I_{\text{OUT-CH}} > 0.7 \text{ A}$

These maximum current values can only be applied under suitable ventilation conditions.

DIMMING CURVES

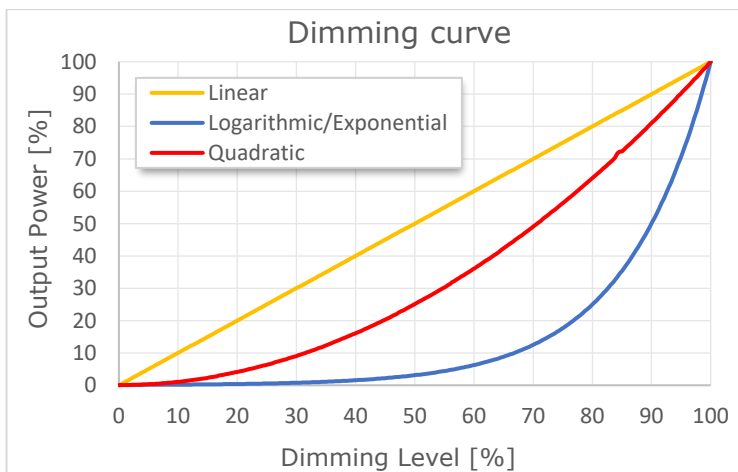


Figure 11: Dimming Curves

Figure 11 shows the dimming curves supported by the LINE-4CC-DMX dimmer. Curve selection can be done using the Dalcnet LightApp[®] (see §Control Settings section of this manual).

MECHANICAL DIMENSIONS

Figure Figure 12 details the mechanical measurements and the overall dimensions [mm] of the outer casing.

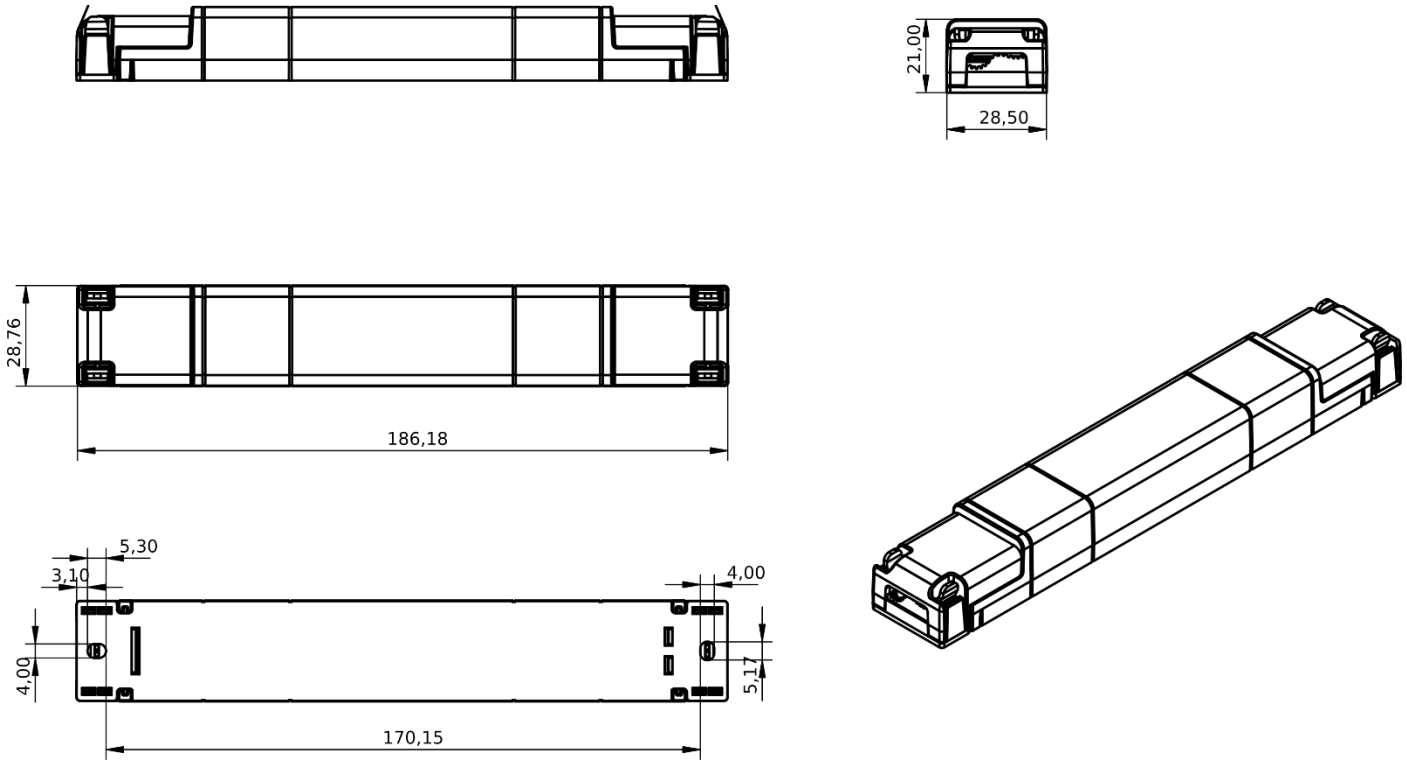


Figure 12: Dimensions and mechanical dimensions

⁸ Institute of Electrical and Electronics Engineers (IEEE). IEEE std 1789: Recommended Practices for Current Modulation in High-Brightness LEDs to Mitigate Spectator Health Risks.

⁹ In the event that the product is installed inside an electrical panel and/or junction box, TA refers to the temperature inside the panel/box.

TECHNICAL NOTES

INSTALLATION



WARNING! Installation and maintenance should always be carried out in the absence of DC voltage. Before proceeding with the installation, adjustment and connection of the device to the power supply, make sure that the voltage is disconnected from the system.



The device should only be connected and installed by qualified personnel. All applicable regulations, legislation, standards, and building codes in force in the respective countries must be adhered to. Incorrect installation of the device may cause irreparable damage to the device and connected loads.

Maintenance must only be carried out by qualified personnel in compliance with current regulations.

The product must be installed inside an electrical panel and/or junction box that is protected against overvoltage.

The external power supply must be protected. The product must be protected by a properly sized circuit breaker with overcurrent protection.

Keep 230Vac (LV) circuits and non-SELV circuits separate from SELV safety ultra-low voltage circuits and any product connections. It is absolutely forbidden to connect, for any reason, directly or indirectly, the 230Vac mains voltage to the product (BUS terminals included).

The product must be installed in a vertical or horizontal position, i.e. with the faceplate/label/top cover facing up or vertically. No other positions are allowed. The bottom position, i.e. with the faceplate/label/top cover facing downwards, is not allowed.

During installation, it is recommended to reserve adequate space around the device to facilitate its accessibility in case of future maintenance or updates (e.g. via smartphone, NFC).



Use in thermally harsh environments may limit the output power of the product.

For devices embedded within luminaires, the TA ambient temperature range is a guideline to be carefully observed for the optimal operating environment. However, the integration of the device within the luminaire must always ensure proper thermal management (e.g. correct mounting of the device, proper ventilation, etc.) so that the temperature at the T_c point does not exceed its maximum limit under any circumstances. Proper operation and durability are only guaranteed if the maximum temperature of the T_c point is not exceeded under the conditions of use.

POWER AND LOAD



The device must be powered only with SELV type power supplies with limited current at constant voltage, short-circuit protection and suitably sized power according to the specifications indicated in the product data sheet. No other types of power supply are permitted.

Size the power of the power supply with reference to the load connected to the device. If the power supply is oversized compared to the maximum current drawn, insert an overcurrent protection between the power supply and the device.

Connecting to an unsuitable power supply may cause the device to operate outside of the specified design limits, voiding its warranty.

In the case of power supplies equipped with earth terminals, it is mandatory to connect ALL the protection earth points (PE= Protection Earth) to a state-of-the-art and certified earthing system.

The power cables of the device must be correctly sized with reference to the connected load and must be isolated from any wiring or equal to non-SELV voltage. It is recommended not to exceed 10m of connection between the power source and the product. Use double-insulated cables. If you want to use connection cables between the power source and the product longer than 10m, the installer must ensure the correct operation of the system. In any case, the connection between the power supply and the product must not exceed 30m.



The device has been designed to work with LED loads only. Connecting and powering unsuitable loads may cause the device to operate outside of the specified design limits, voiding its warranty. In general, the operating conditions of the device should never exceed the specifications indicated in the product data sheet.

Observe the intended polarity between the LED module and the device. Any polarity reversal results in no light emission and can often damage the LED modules.

It is recommended that the connection cables between the product and the LED module be less than 3m long. Cables must be properly sized and should be insulated from any non-SELV wiring or parts. It is recommended to use double-insulated cables. If you want to use connection cables between the product and the LED module longer than 3m, the installer must ensure the correct operation of the system. In any case, the connection between the product and the LED module must not exceed 30m.

It is not allowed to connect different types of loads in the same output channel.

REMOTE CONTROL




The length and type of cables connecting to the buses must comply with the specifications of the respective protocols and current regulations. They must be isolated from any non-SELV wiring or live parts. It is recommended to use double-insulated cables.

All devices and control signals connected to the buses must be of the SELV type (the connected devices must be SELV or otherwise provide a SELV signal).

NFC (NEAR FIELD COMMUNICATION) WARNINGS



The NFC antenna is located inside the device, the contact surface of which is indicated with the symbol . Position your smartphone so that its NFC antenna is in contact with the symbol on the device.

The location of the NFC sensor on the smartphone is dependent on the make and model of the smartphone itself. Therefore, it is recommended to refer to your smartphone's manual or the manufacturer's website to accurately determine where the NFC sensor is located. In most cases, the NFC reader is located on the back side near the top of the smartphone.

NFC technology works optimally with non-metallic materials. Therefore, it is not recommended to place the device near metal objects or reflective surfaces when using NFC.

For reliable communication, make sure that the contact surface is not covered or that it is free of metal objects, wiring, or other electronic devices. Any impediments could affect the quality of communication.

NFC technology works at a short distance, generally within a few centimetres. Make sure your device and smartphone are close enough to allow communication.

During firmware update and configuration, you should maintain stable contact (possibly without movement) between your smartphone and the device for the entire duration of the process (typically between 3 and 60 seconds). This ensures that the update goes smoothly and that the device is ready to use after the process is complete.



LEGAL NOTES

TERMS OF USE






Dalcnet Srl (hereinafter referred to as "the Company") reserves the right to make changes to this device, in whole or in part, without prior notice to the customer. Such changes may affect technical aspects, functionality, design, or any other element of the device. The company is not required to notify you of such changes and that your continued use of the device will constitute your acceptance of the changes.

The company is committed to ensuring that any changes do not compromise the essential functionality of the device and that they comply with applicable laws and regulations. In the event of substantial changes, the company undertakes to provide clear and timely information on the same.

The customer is advised to periodically consult the www.dalcnet.com website or other official sources to check for any updates or changes to the device.

SYMBOLS

	All products are manufactured in compliance with European Regulations, as reported in the Declaration of Conformity.
	Independent Power Supply Unit: Lamp power supply unit, consisting of one or more separate elements, designed so that they can be mounted separately on the outside of a luminaire, with protection in accordance with the marking and without the use of additional enclosures.
SELV	"Very Low Safety Voltage" in a circuit isolated from the mains supply by insulation not less than that between the primary and secondary circuits of a safety isolation transformer according to IEC 61558-2-6.
	At the end of its useful life, the product described in this data sheet is classified as waste from electronic equipment and cannot be disposed of as unsorted municipal solid waste. Warning! Improper disposal of the product may cause serious harm to the environment and human health. For proper disposal, inquire about the collection and treatment methods provided by the local authorities.

LIGHTAPP

LIGHT
APP

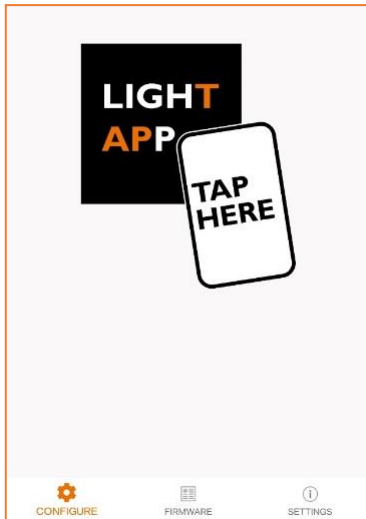
LightApp® is the official Dalcnet application through which it is possible to configure, in addition to the functions of the LINE-4CC-DMX, also all the different Dalcnet products equipped with NFC technology.

Dalcnet LightApp® can be downloaded free of charge from the Apple App Store and Google Play Store.



START-UP AND FIRST INSTALLATION

START SCREEN - CONFIGURE



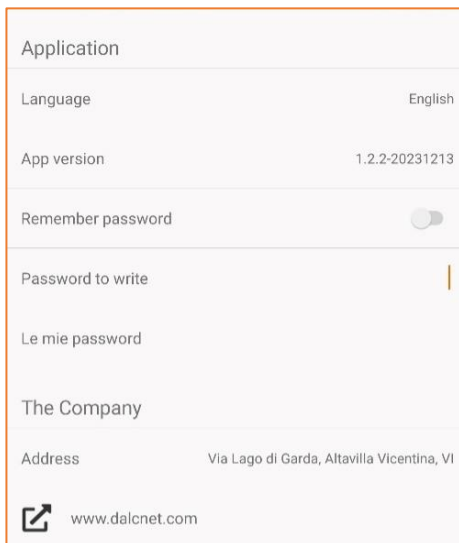
On this screen, the app waits for the device parameters to be read.

To read the parameters, simply bring the back of the smartphone close to the device's label. The read-sensitive zone of the smartphone may vary depending on the model.

Once the connection is established, a quick loading screen will appear. You must remain in position with your smartphone until the parameters are fully loaded.

iOS variant: To read the parameters, you need to press the SCAN button at the top right. A pop-up will appear indicating when your smartphone is ready to scan. Move the smartphone closer to the device and remain in place until the parameters are fully loaded.

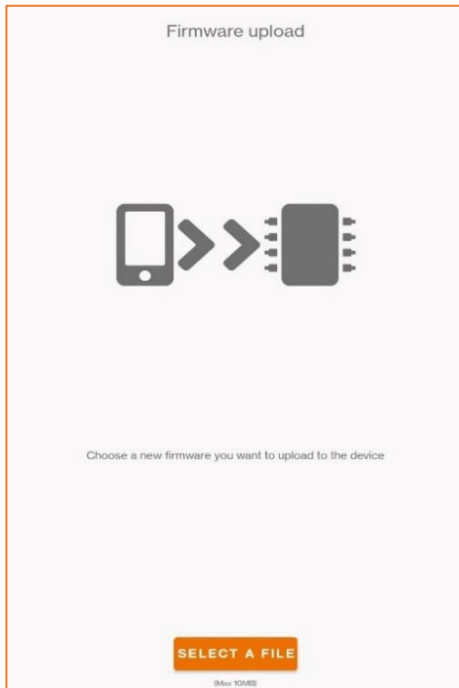
SETTINGS



On the Settings page, you can:

- ◆ Setting the language of the app (Italian or English)
- ◆ View the app version
- ◆ Enable password saving on your smartphone
- ◆ Setting the Password for Writing Parameters
- ◆ View your saved passwords
- ◆ View the references of the distribution company (Dalcnet Srl)

FIRMWARE



On the firmware page, you can update the firmware of your device.

The requested file must be of type *.bin*.

Once the file has been uploaded, simply follow the on-screen instructions.

ATTENTION:

- ◆ **The upload procedure is irrevocable. Once the upload has started, it will not be possible to pause it.**
- ◆ **If the procedure is interrupted, the firmware will be corrupted and you will need to repeat the loading procedure.**
- ◆ **At the end of the firmware load, all previously set parameters will be reset to factory defaults.**

If the update is successful and the loaded version is different from the previous one, the device will flash 10 times on the connected load.

LOADING PARAMETERS

IMPORTANT: The parameters must be written when the device is switched OFF (without input power).

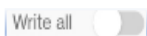
READ



With the app in READ mode, the smartphone will scan the device and show its current configuration on the screen.

WRITE

In WRITE mode, the smartphone will write the parameter configuration set on the screen to the device.



In normal mode (*Write All* switched OFF) the app writes only the parameters that have changed since the previous read. In this mode, the write will only be successful if the serial number of the device matches the one previously read.



In *Write All* mode, all parameters are written. In this mode, the write will only be successful if the device model matches the one previously read.

It is recommended to activate the *Write All* mode only when you need to replicate the same configuration on many examples of the same model.

WRITE PROTECTION



By means of the padlock button it is possible to set a lock when writing parameters. A screen will appear for entering a 4-character password. Once this password has been written into the device, all subsequent parameter changes can only be made if the correct password is written on the app's Settings page.

To remove the password lock, simply press the lock key and leave the Password field blank.

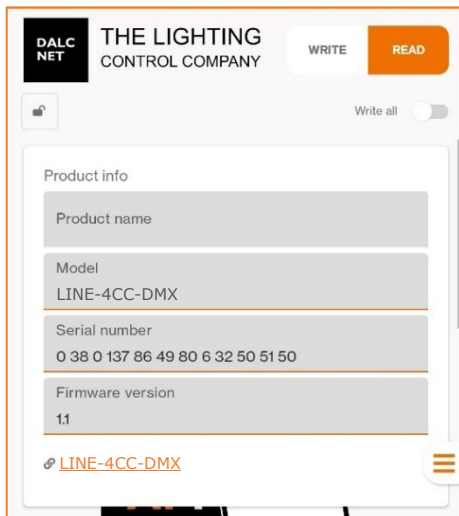
WRITE ERROR

After writing the parameters, if the load connected to the device flashes continuously at a frequency of 2 times per second when it is turned ON again, it means that the writing was not successful. Therefore, you will need to perform the following steps:

1. Turn OFF the device.
2. Perform a parameter rewrite.
3. Wait for the write to be successful or for no error messages to appear.
4. Turn the device back ON.

If that doesn't work, you can perform a factory reset by quickly turning the device OFF and ON 6 times.

PRODUCT INFORMATION



On the *Product Information* screen, you can view a variety of information about the product you are about to configure.

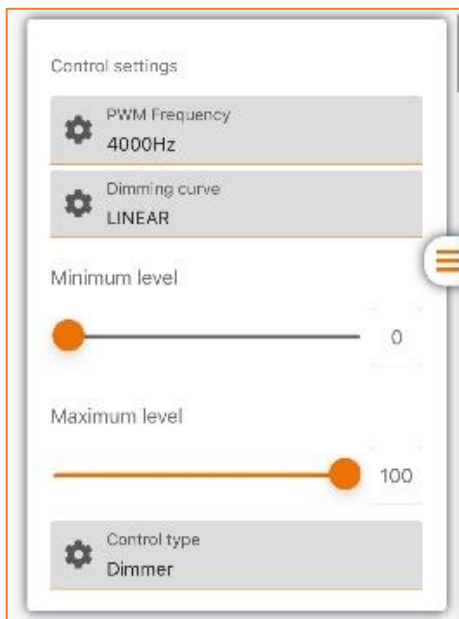
Product Name: User-settable field for easy identification (e.g. Office, Meeting Room, Lobby, etc.). By default, the product name is the same as the Model field.

Model: the model of the device (non-editable field).

Serial Number: uniquely identifies the device (non-editable field).

Firmware Version: identifies the firmware version currently loaded on the device (non-editable field).

CONTROL SETTINGS



On the *Control Settings* screen, you can configure the different parameters for the driver's operation mode.

PWM Frequency: Sets the frequency¹⁰ of the PWM modulation of the output.

Dimming Curve: Sets the adjustment curve of the device for operation with the local control. For details on the different curves that can be set, see the §[Dimming Curves](#) of this manual.

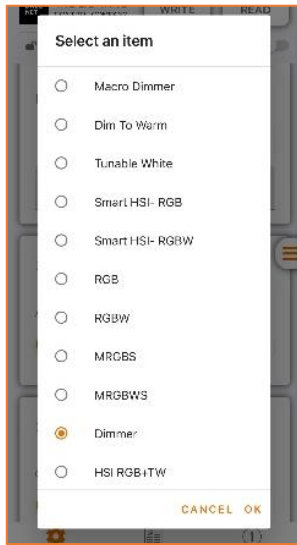
Minimum Level: sets the minimum level of light intensity that can be reached via DMX remote control.

Maximum Level: sets the maximum level of light intensity that can be reached via DMX remote control.

Control Type: allows you to select the DMX Control Map (see next paragraph).

¹⁰ In the case of applications under severe thermal conditions, it is advisable to lower the PWM frequency to a minimum (307 Hz).

CONTROL TYPES

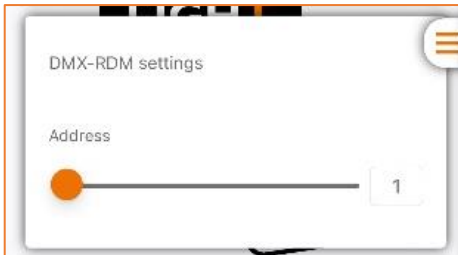


Within the "Control Type" configuration you can select the DMX512+RDM Channel Maps available for LINE-4CC-DMX:

- Macro Dimmer
- Tunable White
- Smart HSI RGB and RGBW
- RGB
- RGBW
- M+RGB+S
- M+RGBW+S
- Dimmer

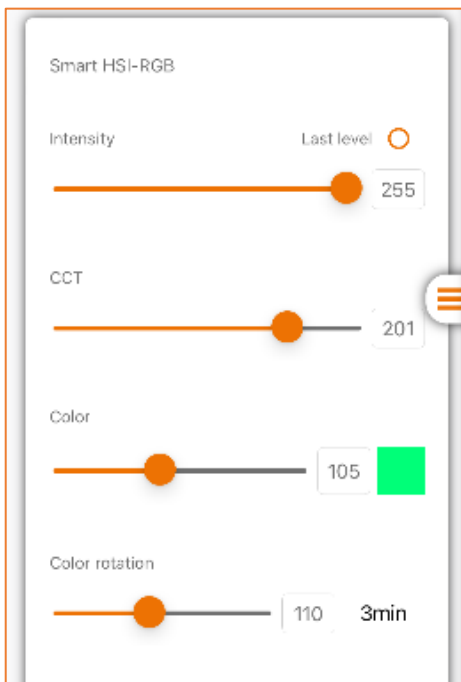
The parameters that can be set for each type of control are shown in the following paragraphs.

DMX ADDRESSING



For each type of control, the DMX address of the device can be defined within the range (0 ÷ 512).

POWER-ON SETTINGS



Depending on the type of control selected ("Smart HSI-RGB" in the example image) for each output channel it is possible to set the initial switch-on level: during power-up and in the absence of the DMX signal, the device will bring the outputs to the levels set in this section.

It is also possible to set the memorization of the last level available during the shutdown phase (e.g. in case of power failure), by selecting the "Last Level" option: in this case, during the switch-on and in the absence of the DMX signal, the device will bring the outputs to the levels stored during the shutdown phase.

For more information on output channel configurations and levels, refer to the "DMX512-RDM Channel Maps" section of this manual.