6 Channel Decoder

User Manual

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Better Way Lighting

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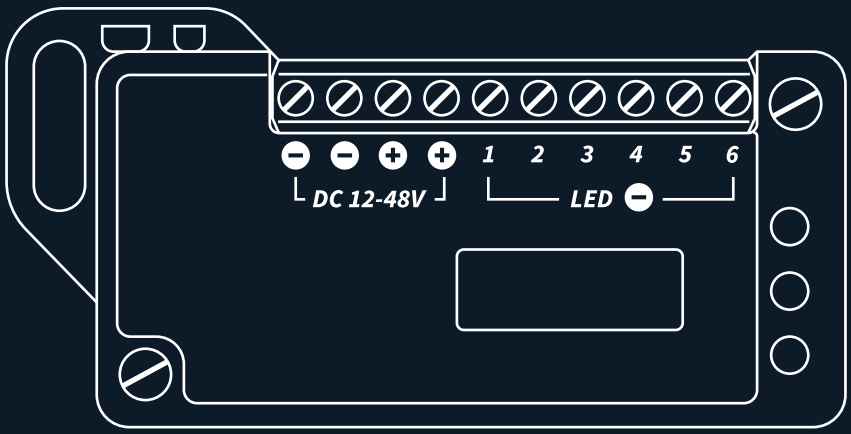
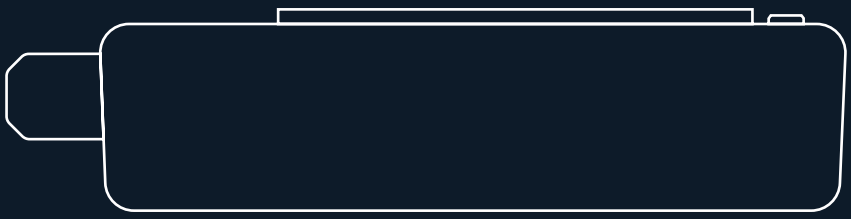
Introduction

The 6-Channel Decoder is a device with a small form factor designed for use in theatrical and film productions. It functions both as a wireless CRMX decoder and as a basic manual controller.





Specifications

Output	6 Channels
Input Voltage	12-48VDC
Load Type	12-48V LED, Constant Voltage
Current Rating	Up to 6A per channel, 16A total
Dimming Control	PWM
PWM Frequency	5, 10, 20kHz
Wire Gauge	16-26 AWG
Wireless Technology	LumenRadio CRMX
Wireless Range	Up to 150 m in free air
Bit Depth	8, 16
Ambient Temperature	0 - 45° C
Body Dimensions	H 44.9 mm x L 89.7 mm x W 20.1 mm
Weight	58 g

Safety

No user serviceable parts

Do not open the housing

Not intended for permanent installation

For use in dry location only

Store in a cool, dry environment

Do not operate outside of rated temperature

Do not operate if broken or deformed

Factory Settings

Listed below are the default values each parameter is set to when using the device for the first time.

CRMX Control

Basic

Linking	Unlinked
Start Address	1
Mode	Direct

Advanced

Bit Depth	8
Fade Value	1
PWM Frequency	5 kHz
Gamma Curve	5

Manual Control

Basic

Mode Direct

Mode Specific Settings

Direct

Ch1 Manual	0
Ch2 Manual	0

Bicolour

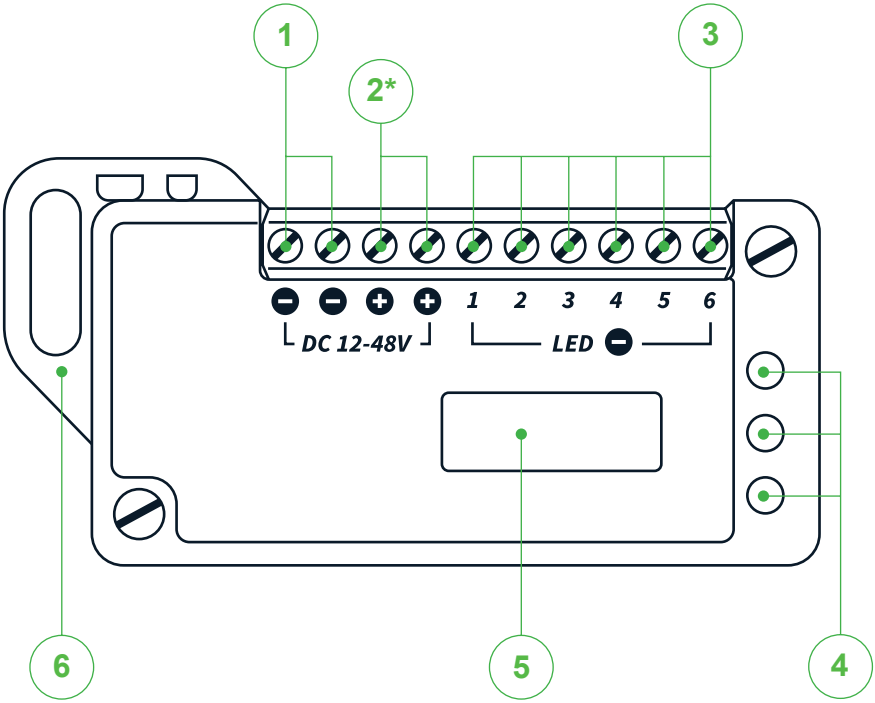
Manual Intensity	8
Manual Temp.	2800
Min. Temp.	2800
Max. Temp.	6900

Advanced

PWM Frequency	5 kHz
Gamma Curve	5

Device Overview

1		V- from Power Source
2	*	V+ to from power source and to LED
3		Channels 1 to 6 to LED
4		Navigation Buttons
5		Menu Display
6		Attachment points

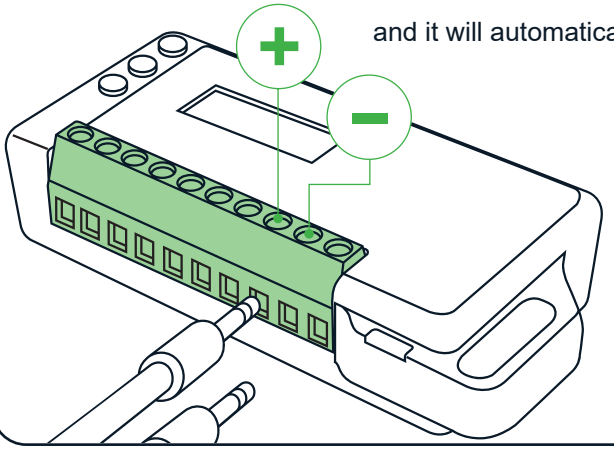


* + terminals are common between LED and Power Source

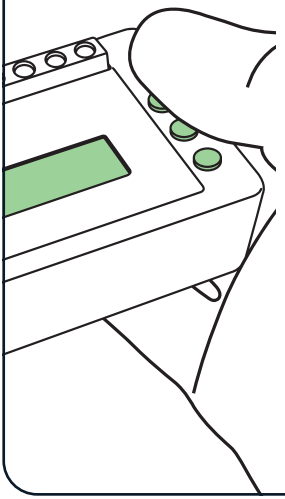
Device Startup

1

To begin, connect the device to a 12-48VDC Battery or Power Supply and it will automatically turn on.



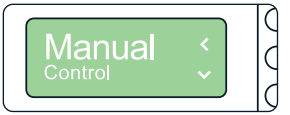
2



Select Control Type

CRMX Control

If a wireless CRMX transmitter is being used. For more information see **page 9**.



Manual Control

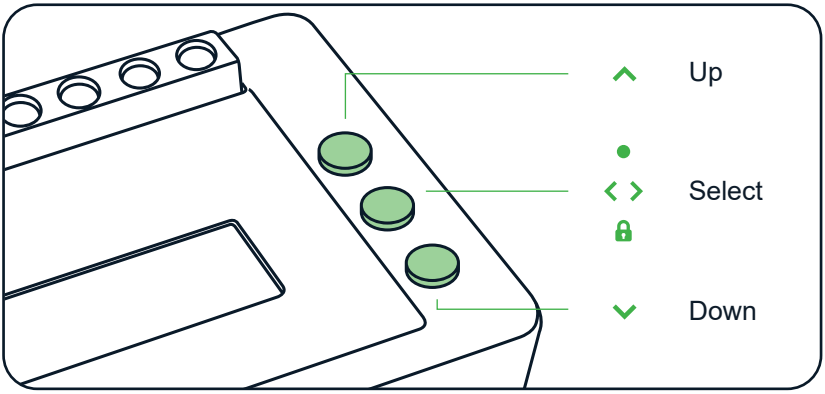
To use as a basic manual controller. For more information see **page 14**.

Menu Navigation

Navigation Buttons

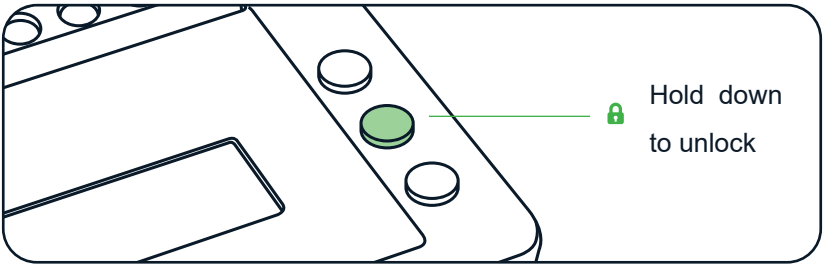
Use the three buttons for menu navigation and option selection.

Follow the navigation icons displayed on the screen.



Navigation Lockout

The device will lock after a period of inactivity.



Screen Sleep

The screen will sleep after several minutes of inactivity. Press any button to wake the screen.

CRMX Control • **Basic Settings**

Use CRMX Control Mode when using a wireless CRMX transmitter to send DMX data to the device. The device will function as a wireless 6 channel decoder.

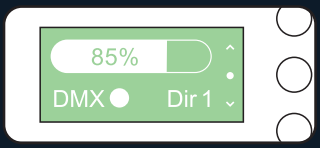
Linking

Prior to the linking procedure, ensure that the decoder is powered on and unlinked from any previously used CRMX transmitter.
Linking is initiated by the CRMX transmitter. Refer to your CRMX transmitter manual for the linking procedure.

Status Screen

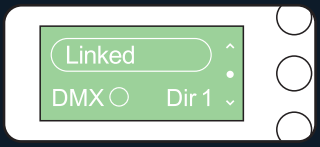
This screen is intended as a diagnostic tool to aid in troubleshooting performance issues. It displays information about the signal strength, whether or not DMX data is being received from the transmitter, the operating mode, and the assigned starting address.

Dir • Direct mode Bi • Bicolour Mode

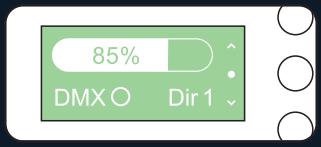


Decoder is operating in Direct Mode on Ch1 and receiving DMX.

Not linked to a transmitter. Proceed with linking procedure.



Linked to a Transmitter that is either not present or not sending a signal.



Linked to a Transmitter that is sending a signal but is not sending DMX data.

Unlinking

Can be initiated by the decoder. Once the decoder is unlinked, it is ready to link with a new CRMX transmitter.

Tip The decoder always remembers the previous transmitter that it was linked with and will not link with a new transmitter until unlinked.
Powering the device off and on will not unlink the decoder, you must go through the unlinking procedure on the decoder.

Starting Address

Select the DMX starting address for the LED light source(s).

Number of Used Addresses

Mode	**8 Bit**	**16 Bit**
Direct	6	12
Bicolour	2	4

Mode

Choose mode depending on your desired usage.

Direct: A general purpose mode for use with any light source. Channels 1 to 6 directly control dimming values on the output.

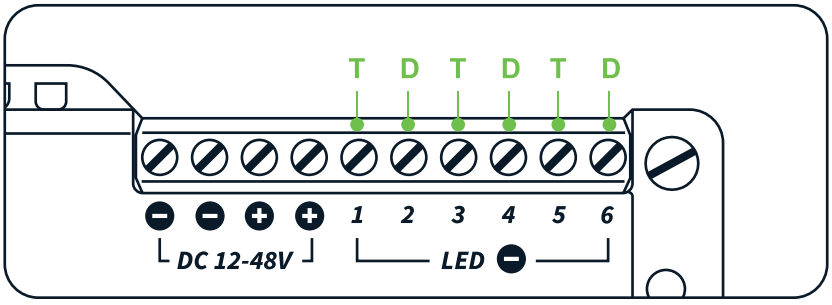
Bicolour: This mode is designed for use with tungsten-daylight fixtures. The device controls the colour temperature and light intensity of the output.

8 Bit		16 Bit	
Uses 2 addresses.		Uses 4 addresses:	
Ch. 1	Intensity	Ch. 1, 2	Intensity (course, fine)
Ch. 2	Colour Temp.	Ch. 3, 4	Colour Temp (course, fine)

"T" channels (1, 3, 5) can be wired in parallel, as can "D" channels (2, 4, 6) for increased output.

It is important that the tungsten and daylight channels on the light source are wired to the correct channels on the decoder.

Wiring Diagram for Tungsten-Daylight LED



CRMX Control • **Advanced Settings**

PWM Frequency

Adjust this setting to eliminate on-camera flicker caused by a mismatch between the speed of the LED's duty-cycle and the camera's frame rate and/or shutter speed.

Tip The highest frequency will eliminate visible flicker for most cameras. However, we recommend doing a camera test and setting the PWM frequency as low as possible. This is because lower PWM frequencies allow for finer intensity adjustments and decrease the device's operating temperature.

5 kHz	14 bit resolution
10 kHz	13 bit resolution
20 kHz	12 bit resolution

Bit Depth

Adjust this setting to change the resolution of control. More steps translates to finer control.

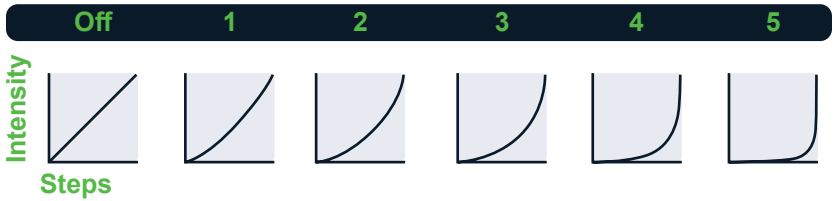
8 Bit	256 levels
16 Bit	65536 levels

Tip

- Some controllers do not support 16-bit mode. To improve dimming performance in 8-bit mode, add a gamma curve.
- When color-tuning with an RGB source, 16-Bit mode helps fine adjustments.

Gamma Curve

Adjust this setting to manipulate the size of the dimming steps and optimize the usage of bits. The more aggressive the gamma curve, the more resolution you have at the lower end of light intensity where the human eye is most perceptive to change. The trade-off is the loss in granularity of control on the upper end of light intensity.



Tip **8 Bit Mode** We suggest using #5 as a starting point. It is the most aggressive gamma curve, providing the maximum bit resolution on the low end of light intensity. If less low-end granularity is required, use one of the less aggressive gamma curve settings.

16 Bit Mode We suggest using the “Off” setting, as the starting point when in 16-bit mode. This is because 16-bit mode allows a transmitter to select every available intensity level, without the device manipulating the data.

Fade

Adjust this setting to increase the time between dimming steps and create the perception of smoothness as the light intensity changes.

Transition time in miliseconds

0	Instantaneous jump (No fade)	3	100 ms	7	500 ms
1	20 ms	4	170 ms	8	640 ms
2	50 ms	5	260 ms	9	810 ms
		6	370 ms	10	1000 ms

Manual Control • **Basic Settings**

Use Manual control when there are no CRMX transmitters to send DMX data to the LED light source. The device functions as a basic 6 channel decoder.

Mode

Choose mode depending on your desired usage

Direct: A general purpose mode for use with any light source. Channels 1 to 6 directly control intensity values on the output channels.

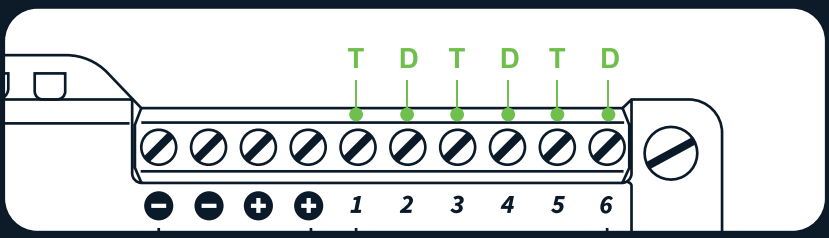
Bicolour: This mode is designed for use with tungsten-daylight fixtures. The device controls the colour temperature and light intensity of the output.

8 Bit Uses 2 addresses.		**16 Bit** Uses 4 addresses.	
Ch. 1	Intensity	**Ch. 1, 2**	Intensity (course, fine)
Ch. 2	Colour Temp.	**Ch. 3, 4**	Colour Temp (course, fine)

“T” channels (1, 3, 5) can be wired in parallel, as can “D” channels (2, 4, 6) for higher current loads.

It is important that the tungsten and daylight channels on the light source are wired to the correct channels on the decoder.

Wiring Diagram for Tungsten-Daylight LED



CCT Range (Manual Bicolour Mode only)

CCT, or Correlated Colour Temperature, is the measure of how “warm” or “cool” a light source is, measured in Kelvin (K). Daylight is very cool (usually around 6500K), while tungsten lightbulbs are warm (typically around 3000K).

Set the CCT Range to match the tunable range of the bicolour LED light source. There are two settings to establish the range: Temp Lower and Temp Upper.

Temp. Lower	Warmest end of the CCT range.
Temp. Upper	Coolest end of the CCT range

Note Setting CCT range is only neccessary when specific colour temperatures are required.

It is not essential if adjusting by eye.

Manual Control • **Advanced Settings**

PWM Frequency

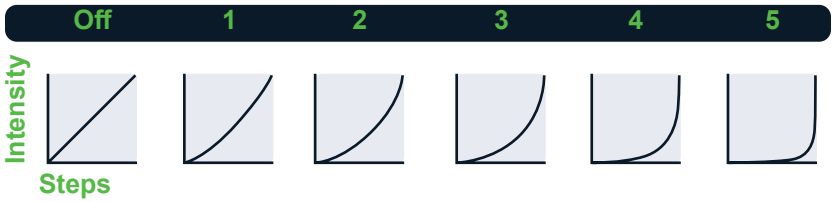
Adjust this setting to eliminate on-camera flicker caused by a mismatch between the speed of the LED's duty-cycle and the camera's frame rate and/or shutter speed.

Tip The highest frequency will eliminate visible flicker for most cameras. However, we recommend doing a camera test and setting the PWM frequency as low as possible. This is because lower PWM frequencies allow for finer intensity adjustments and decrease the device's operating temperature.

5 kHz	14 bit resolution max
10 kHz	13 bit resolution max
20 kHz	12 bit resolution max

Gamma Curve

Adjust this setting to manipulate the size of the dimming steps and optimize the usage of bits. The more aggressive the gamma curve, the more resolution you have at the lower end of light intensity where the human eye is most perceptive to change. The trade-off is the loss in granularity of control on the upper end of light intensity.



Tip In Manual Control, we suggest using the #5 setting as a starting point. It's the most aggressive gamma curve, providing the maximum resolution on the low end of light intensity.

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