



LC-1X

1-CH LIGHTING CONTROLLER



USER MANUAL

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WARNING



For your own safety, please read this manual to learn how to safely use, store and maintain the LC-1X prior to use.

WHAT'S INCLUDED

- LC-1X
- DC12V 2A 90~240VAC Power Supply
- User Manual
- 40" RGB LED Strip
- 25' USB Type A to Type B Cable

SAFETY INSTRUCTIONS



CAUTION! Please keep this unit stored in an area with no moisture.

- Do not operate this unit at temperatures above 113°F
- Only use the supplied power supply
- Make sure the power supply's cord is not pinched or damaged in any way
- Make sure the power supply is plugged into an appropriate voltage source
- Before making any changes to the DIP switches, turn off the power by unplugging the unit
- If any defects with the unit are discovered, please contact an authorized service technician for assistance

1.0 INTRODUCTION

1.1 Overview

The LC-1X is a single channel RGB LED and DMX lighting controller that has been specially designed by musicians for musicians. Treat your lighting like an instrument by using MIDI to create custom automated light shows. No additional hardware or software required. The LC-1X seamlessly integrates with any existing hardware or software set-up. Just plug and play to begin elevating your performances with synchronized lighting.

The LC-1X is controlled using 3 MIDI notes, which represent 1 RGB channel. An individual RGB colour is designated to a specific MIDI note. MIDI velocity is used to control the brightness/intensity of RGB colours. By combining MIDI notes within an RGB channel group and adjusting their velocities, you can create an array of colours within the RGB colour spectrum.

1.2 Features

1 - RGB Channel Output Connector: The 4-pin USB type B connector is used for driving any 12V common anode RGB LED strip. **DO NOT CONNECT TO A USB PORT ON A COMPUTER!**

2 - Indicator Light: Displays the colour output of the unit. This is the colour that will ultimately be displayed by any connected LED strip or DMX light. However, this light will display the colour output regardless of whether an LED strip or DMX light is connected.

3 - DMX Out: Outputs DMX 512 data to any connected DMX lights.

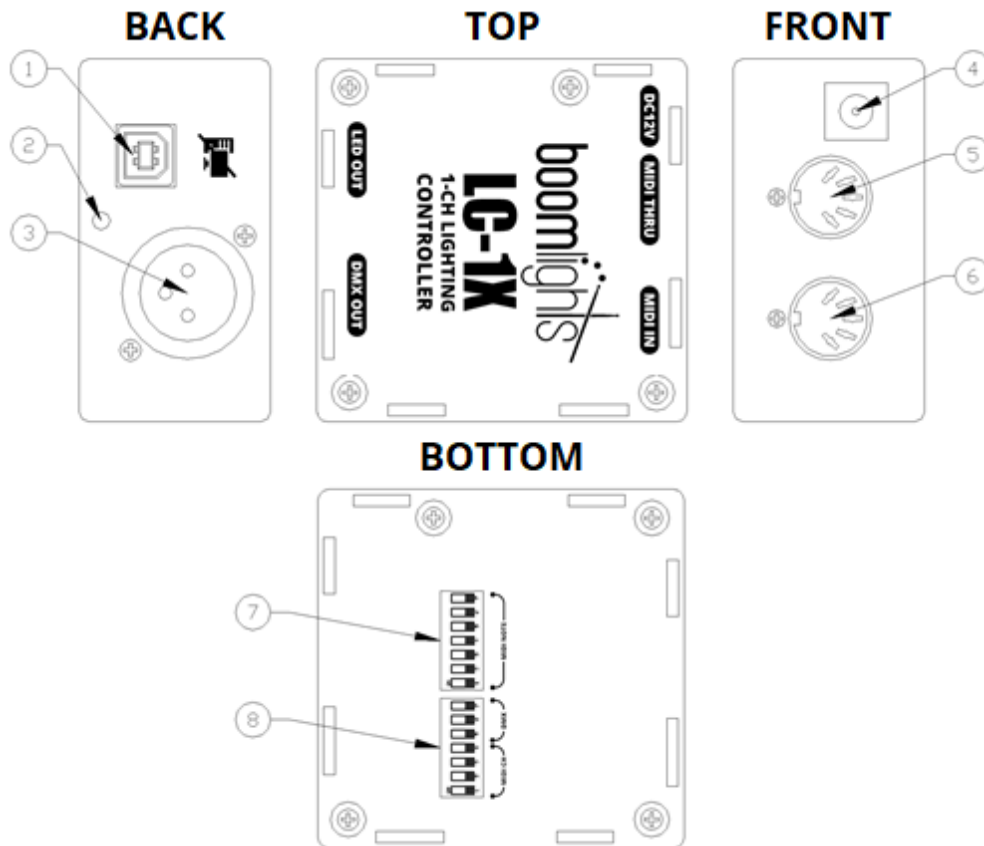
4 - DC12V Input: Main power connection for the unit used to connect the DC12V power supply.

5 - MIDI Thru: Passes through an exact copy of the MIDI input signal. This allows multiple units or other MIDI devices to be chained together and controlled by a common source.

6 - MIDI In: Transfers MIDI input signal from a connected source to the unit.

7 - MIDI Note DIP Switch: DIP switch used to set which MIDI notes the unit will respond to.

8 - MIDI Channel / DMX DIP Switch: DIP switch used to set which MIDI channel the unit will respond to and which DMX addresses the unit outputs to.

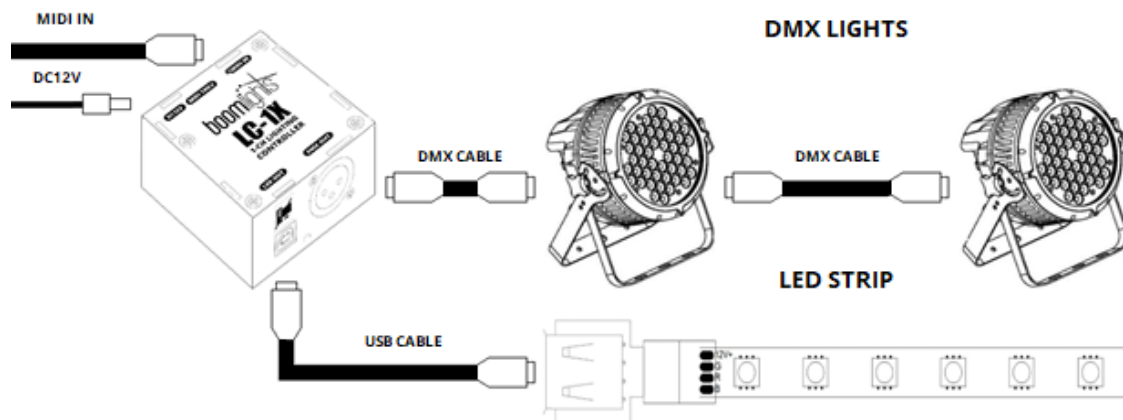


2.0 OPERATION

2.1 Default Set-Up

The unit comes set up with the following default settings: MIDI notes 0, 1 and 2 (C-2, C#-2 and D-2), control the colours green, red and blue respectively. The unit's default MIDI channel is set to be MIDI channel 1. Both the MIDI channel and MIDI note settings can be changed easily by adjusting the DIP switches on the bottom of the unit.

Below is a diagram that illustrates a typical set-up. You can control an LED strip and/or DMX lights. It is important to note that all of the LED strips and DMX lights connected to the unit will display the same colour. You cannot individually control LED strips and DMX lights and set them to different colours. All of the lights respond to the MIDI notes and MIDI channel set by the DIP switches on the bottom of the unit. The channel indicator light on the front of the unit previews the colour that the unit will output to any connected LED strips and/or DMX lights. This light will illuminate even if there are no LED strips or DMX lights connected to the unit. This useful feature can be used to program a light show without having to connect any LED strips and/or DMX lights.



2.2 Getting Started

Before plugging in the power supply, which will power the unit on, plug in an LED strip and/or DMX light(s) into the unit. LED strips should be plugged into the "LED Out" connector, while DMX lights should be plugged into the "DMX Out" connector. You can daisy-chain multiple DMX lights by connecting a DMX cable from the "DMX Out" of the DMX light that is directly connected to the LC-1X to the "DMX In" of another DMX light. You can repeat this sequence to daisy-chain up to a total of 16 DMX lights. See section 2.4 for more information about how the LC-1X transmits DMX signals.

Next connect the "MIDI Out" of your MIDI device to the "MIDI In" of the LC-1X via a MIDI cable. Ensure you are using the correct MIDI channel and MIDI notes on your MIDI device. See section 2.3.1 for more information about how to configure the MIDI channel and MIDI notes that the LC-1X will respond to.

Power on the LC-1X by plugging in the provided DC12V power supply to the "DC12V" jack on the unit. The unit will briefly cycle through the colours white, green, red and blue, which be displayed by the

unit's indicator light. You should see all of the colours from the start-up cycle illuminate on any connected LED strip and/or DMX light, otherwise there is an issue that requires troubleshooting.

2.3 Colour Combinations

You can create an array of different colours within the RGB colour spectrum by illuminating various combinations of green, red and blue. For example, if the green and red LEDs are simultaneously illuminated, the resultant colour will be yellow. MIDI velocity can be adjusted to change the overall brightness/intensity of the colour designated to the corresponding MIDI note. MIDI velocity changes can also be used to create additional colours and shades, particularly when the MIDI velocity value of multiple notes are unequal.

The following table shows the available fundamental colours and their corresponding RGB colour combinations.

COLOUR	RGB FORMULA
RED	R
GREEN	G
BLUE	B
YELLOW	R + G
MAGENTA	R + B
CYAN	G + B
WHITE	R + G + B

2.4 DMX Output

While conventional DMX consoles and software allow for individual control of daisy-chained DMX lights, configuring a DMX set-up and programming light shows via DMX is notoriously complicated and frustrating. To streamline and simplify this process, the LC-1X controls all daisy-chained DMX lights with the same signal output. For example, if you have several of the same DMX PAR lights daisy-chained together and you trigger the first light in the chain to illuminate red, all additional lights in the chain will receive the exact same signal and illuminate red as well. A single DMX signal chain is referred to as a "universe".

A single DMX universe can output 512 channels in which each channel can be set to a value between 0 and 255. Most DMX lights take up anywhere between 10 and 20 channels. You can find the specific channel designations for a particular DMX light within its user manual.

Each channel on any given RGB DMX light controls various parameters such as colour, strobe speed and brightness. To adhere to the same conventions as Boomlights' RGB LED MIDI control protocol, the only DMX channels the LC-1X will utilize will be the colours red, green and blue as well as the overall brightness. This allows for each colour of an RGB DMX light to be designated to and controlled by the corresponding MIDI note within a 3 MIDI note group.

Setting the address of a DMX light effectively sets the first address of the DMX universe signal it will respond to. For example, if you are using a 10 channel DMX light and set its address to "20", that

light will respond to DMX channels 20 through 29. It is also important to note that you can have multiple DMX lights within that universe set to the same channel.

While DMX lights have a variety of different channel configurations, the LC-1X is designed to accommodate a variety of standard configurations of DMX lights. As shown on the table in section 2.4.1, a number of DMX lights will require the base address to be set to channel 20 due to the fact that the LC-1X is designed to transmit DMX data to that specific address. However, the LC-1X is configured to transmit DMX data at additional addresses, which allows it to control a variety of different DMX lights.

Example:

Below is an example of the DMX address configuration for an RGB DMX PAR64 light. The LC-1X only controls the red, green and blue values of the light. Therefore, the remaining channels will be set to a value of zero. If using a Talent DMX light purchased from the official Boomlights online store, refer to the “Base Address” column on the table in section 2.4.1 to determine the channel to set the starting address of the corresponding DMX light to. In order for the LC-1X to control the RGB colour parameters of the light, the light’s DMX address should be set to “20”. To change the address of a particular DMX light, refer to its user manual.

Channel	Value	Function
1	0 - 255	RED 0% - 100%
2	0 - 255	GREEN 0% - 100%
3	0 - 255	BLUE 0% - 100%
4	8 - 255	COLOUR MACRO
5	0 - 10	NO FUNCTION
	16 - 255	STROBING
6	0 - 31	NO FUNCTION
		DIMMING CONTROL
	32 - 63	DIM TO BRIGHT
	64 - 95	BRIGHT TO DIM
	96 - 127	DIM TO BRIGHT TO DIM
	128 - 159	COLOUR MIXING
160 - 191	3 COLOUR CHANGE	
192 - 223	7 COLOUR CHANGE	
224 - 255	SOUND ACTIVE	

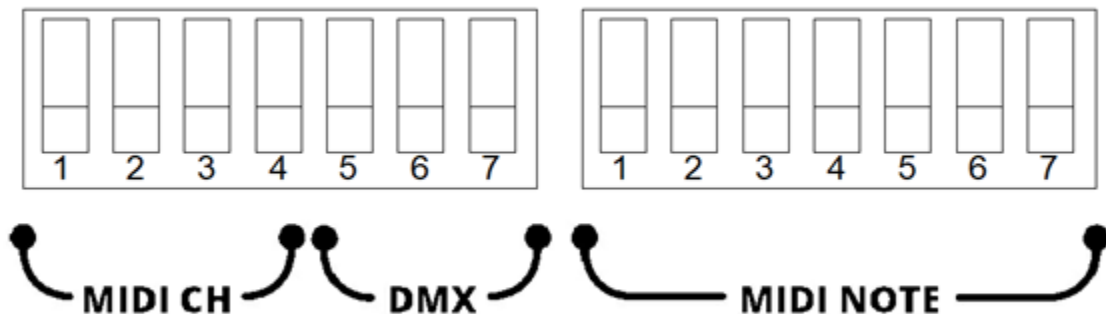
2.4.1 DMX Address Table

Model	Channel Mode	Base Address	Red	Green	Blue	Master	Strobe
Talent RGB LED Baby Bar (BL63)	3	Channel 20	0 - 255	0 - 255	0 - 255	N / A	N / A
Talent RGB LED Slim PAR 64 (LP64LED-FLAT)	3	Channel 20	0 - 255	0 - 255	0 - 255	N / A	N / A
Talent RGB LED Mini PAR 36 (LP12 LED)	5	Channel 20	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255

2.5 Changing the Default Settings

2.5.1 Changing the MIDI Note DIP Switches

On the bottom of the LC-1X, you will find a pair of DIP switch arrays. Switches 1 to 4 of the first DIP switch array control the MIDI channel the unit responds to while switches 5 to 7 control the DMX address the unit transmits, which are reserved for custom configurations. The second DIP switch array controls which MIDI notes the unit responds to.



By setting the DIP switches, you are effectively setting the MIDI note that will control the colour green. The colours red and blue will always be the following 2 MIDI notes. For example, setting the DIP switches to the binary value 0 (all switches in the down position), means that the unit will respond to MIDI notes 0, 1 and 2 (C-2, C#-2 and D-2), which will be green, red and blue respectively.

To set the DIP switches correctly to the desired MIDI note, refer to the “Binary” column on the table in section 2.5.2. These 7 number sequences represent the individual DIP switch positions. When a DIP switch is in the up position, it is considered “1” and, when it is in the down position, it is considered “0”. These binary codes are used to configure the unit to respond to specific MIDI notes. For example, if only DIP switch 1 is in the up position while the 6 remaining DIP switches are in the down position (resulting in the binary code 1000000), MIDI note 64 (E3) will control the colour green. Therefore, MIDI note 65 (F3) and 66 (F#3) will control the colours red and blue respectively.

It is important to note that any changes to the DIP switches must be done while the unit is powered off, as the unit only checks the DIP switch settings during start-up.

2.5.2 MIDI Note DIP Switch Table

Note	Octave	Number	Binary
C	-2	0	0000000
C#	-2	1	0000001
D	-2	2	0000010
D#	-2	3	0000011
E	-2	4	0000100
F	-2	5	0000101
F#	-2	6	0000110
G	-2	7	0000111
G#	-2	8	0001000
A	-2	9	0001001
A#	-2	10	0001010
B	-2	11	0001011
C	-1	12	0001100
C#	-1	13	0001101
D	-1	14	0001110
D#	-1	15	0001111
E	-1	16	0010000
F	-1	17	0010001
F#	-1	18	0010010
G	-1	19	0010011
G#	-1	20	0010100
A	-1	21	0010101
A#	-1	22	0010110
B	-1	23	0010111
C	0	24	0011000
C#	0	25	0011001
D	0	26	0011010
D#	0	27	0011011
E	0	28	0011100
F	0	29	0011101
F#	0	30	0011110
G	0	31	0011111
G#	0	32	0100000
A	0	33	0100001
A#	0	34	0100010
B	0	35	0100011

Note	Octave	Number	Binary
C	1	36	0100100
C#	1	37	0100101
D	1	38	0100110
D#	1	39	0100111
E	1	40	0101000
F	1	41	0101001
F#	1	42	0101010
G	1	43	0101011
G#	1	44	0101100
A	1	45	0101101
A#	1	46	0101110
B	1	47	0101111
C	2	48	0110000
C#	2	49	0110001
D	2	50	0110010
D#	2	51	0110011
E	2	52	0110100
F	2	53	0110101
F#	2	54	0110110
G	2	55	0110111
G#	2	56	0111000
A	2	57	0111001
A#	2	58	0111010
B	2	59	0111011
C	3	60	0111100
C#	3	61	0111101
D	3	62	0111110
D#	3	63	0111111
E	3	64	1000000
F	3	65	1000001
F#	3	66	1000010
G	3	67	1000011
G#	3	68	1000100
A	3	69	1000101
A#	3	70	1000110
B	3	71	1000111

Note	Octave	Number	Binary
C	4	72	1001000
C#	4	73	1001001
D	4	74	1001010
D#	4	75	1001011
E	4	76	1001100
F	4	77	1001101
F#	4	78	1001110
G	4	79	1001111
G#	4	80	1010000
A	4	81	1010001
A#	4	82	1010010
B	4	83	1010011
C	5	84	1010100
C#	5	85	1010101
D	5	86	1010110
D#	5	87	1010111
E	5	88	1011000
F	5	89	1011001
F#	5	90	1011010
G	5	91	1011011
G#	5	92	1011100
A	5	93	1011101
A#	5	94	1011110
B	5	95	1011111
C	6	96	1100000
C#	6	97	1100001
D	6	98	1100010
D#	6	99	1100011
E	6	100	1100100
F	6	101	1100101
F#	6	102	1100110
G	6	103	1100111
G#	6	104	1101000
A	6	105	1101001
A#	6	106	1101010
B	6	107	1101011

Note	Octave	Number	Binary
C	7	108	1101100
C#	7	109	1101101
D	7	110	1101110
D#	7	111	1101111
E	7	112	1110000
F	7	113	1110001
F#	7	114	1110010
G	7	115	1110011
G#	7	116	1110100
A	7	117	1110101
A#	7	118	1110110
B	7	119	1110111
C	8	120	1111000
C#	8	121	1111001
D	8	122	1111010
D#	8	123	1111011
E	8	124	1111100
F	8	125	1111101
F#	8	126	1111110
G	8	127	1111111
G#	8	-	-
A	8	-	-
A#	8	-	-
B	8	-	-

2.5.3 Changing the MIDI Channel DIP Switches

Setting switches 1 to 4 on the first DIP switch array determines which MIDI channel the unit will respond to. These DIP switches are set the same way in which the MIDI note DIP switches are set. That is, when a DIP switch is in the up position, it is considered “1” and, when it is in the down position, it is considered “0”. These binary codes are used to configure the MIDI channel in which the unit will respond to. For example, if only DIP switch 4 is in the up position while the other 3 are in the down position (resulting in the binary code 0001), the unit will respond to MIDI channel 2. Refer to the “Binary” column on the table in section 2.5.4 for the DIP switch positions required to change the unit’s designated MIDI channel. The default DIP switch setting is highlighted in grey.

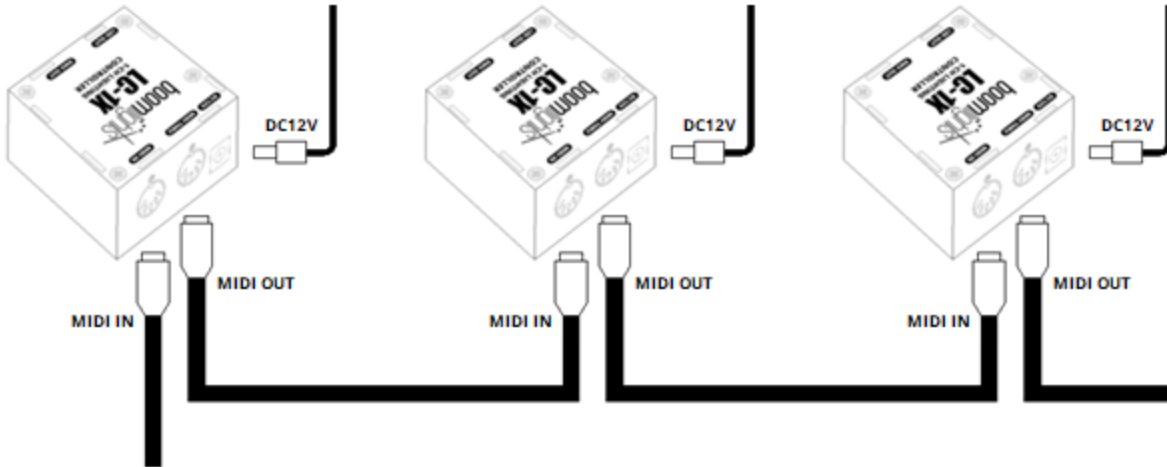
Again, it is important to note that any changes to the DIP switches must be done while the unit is powered off, as the unit only checks the DIP switch settings during start-up.

2.5.4 MIDI Channel DIP Switch Table

MIDI Channel	Binary
1	0000
2	0001
3	0010
4	0011
5	0100
6	0101
7	0110
8	0111
9	1000
10	1001
11	1010
12	1011
13	1100
14	1101
15	1110
16	1111

2.6 Linking Multiple Units Together

Multiple units can be linked together using the “MIDI In” and “MIDI Thru” connectors found on the side of each unit. Using a standard MIDI cable, you can connect the “MIDI Thru” of the unit that is receiving incoming MIDI data with the “MIDI In” of the other unit that you want to link. This same process can be applied to link additional units as displayed in the diagram on the next page.



You can assign each unit to different MIDI note ranges and control them via the same MIDI channel by adjusting the MIDI note DIP switches accordingly. If you refer to the table in section 2.5.2, there are 8 cells that are shaded grey, which represent the values you would set the DIP switches to if you were to link 8 LC-1X units together with the intention of controlling them independently. More specifically, this would allow you to separately control a combination of 8 sets of LED strips and/or 8 DMX universes. The following table depicts the specific MIDI note assignments of each LC-1X unit and their corresponding colours. Of course, you can assign each unit to whichever MIDI notes you desire. This is simply an example of a possible configuration in which the first 24 MIDI notes are assigned concurrently to 8 units. Ultimately, you can use as many LC-1X units as the MIDI scale will allow.

4 / 4	1	1.2	1.3	1.4	2
B-1					NOTE 23 B
A#-1					NOTE 22 R } 8
A-1					NOTE 21 G
G#-1				NOTE 20 B	} 7
G-1				NOTE 19 R	
F#-1				NOTE 18 G	
F-1			NOTE 17	B	} 6
E-1			NOTE 16	R	
D#-1			NOTE 15	G	
D-1			NOTE 14	B	} 5
C#-1			NOTE 13	R	
C-1			NOTE 12	G	
B-2		NOTE 11	B		} 4
A#-2		NOTE 10	R		
A-2		NOTE 9	G		
G#-2		NOTE 8	B		} 3
G-2		NOTE 7	R		
F#-2		NOTE 6	G		
F-2		NOTE 5	B		} 2
E-2		NOTE 4	R		
D#-2		NOTE 3	G		
D-2	NOTE 2	B			} 1
C#-2	NOTE 1	R			
C-2	NOTE 0	G			

3.0 CURRENT LIMIT

Each LC-1X has a current limit of 2A for a connected LED strip. This works out to a maximum LED strip length of 96". If this length is exceeded, the unit may power off due to the internal resettable fuse. In this case, the unit will power back up once the LED strip exceeding 96" in length is removed. This current limit does not apply to DMX lights since each DMX light will have its own power supply.

4.0 TROUBLESHOOTING

Issue: Changed the DIP switches to use other MIDI notes or to use another MIDI channel, but the unit is not responding to the new changes and is continuing to use the original note and channel assignments.

Solution: Make sure the unit is powered off when changing the MIDI notes or MIDI channel DIP switches, as the unit only checks for new DIP switch settings during start-up.

Issue: Changed the MIDI notes or MIDI channel DIP switches while the unit was powered off, but, after start-up, the unit is still not responding to the new MIDI notes or MIDI channel selected.

Solution: Power off the unit and check to make sure the DIP switches are fully set in their intended positions. Sometimes, if you do not press hard enough when moving a DIP switch, it can get stuck in a middle position, which will result in the wrong MIDI notes or MIDI channel being selected.

Issue: DMX light is connected to the unit and the indicator light is displaying the intended colour, but the DMX light is not illuminating.

Solution: Ensure that the DMX cable connected to the unit's "DMX Out" is connected to the DMX light's "DMX In". If the DMX cable is connected correctly, double check to make sure that the base address of the DMX light is set to "20". Most RGB DMX lights will comply to the LC-1X's default 3-channel configuration. However, if you are using another type of DMX light, please contact Boomlights for support as the LC-1X is also equipped to accommodate other DMX channel configurations. They will simply require the DMX DIP switches to be set to a different binary code.

5.0 SPECIFICATIONS

LC-1X: 1-CH LIGHTING CONTROLLER

Controls: 2x DIP Switch Arrays (MIDI Channel / DMX, MIDI Note)

Indicators: Power / Output Colour Indicator Light

Connectors: DC12V Input, MIDI Thru, MIDI Input, LED Output, DMX Output,

Power Supply: DC12V 2A 90~240VAC

Maximum Current Draw: 2A

Dimensions: 2.5" x 2.5" x 1.625" (64 mm x 64 mm x 41 mm)

Weight: 0.23 lbs (0.1 kg)