Cush Light
High Frequency Dimmer

This unit is designed to vary the light intensity of LED lights via a film safe Pulse Width Modulation.
The unit is rated to carry a total of **15 amps** current across three channels.
Each channel is rated to carry **7 amps** of current continuosly.
Unit should be powered with **12 or 24 volts DC ONLY**
This unit is equipped with the following saftey features:

Short circuit protection
Over Current Protection

Upon powering up your device there are three diffent modes that can be accesed via the switch located on the bottom of the faceplate.

The modes on this switch are as follow:
RX- Receive DMX information. (DMX mode)
TX- Local control of the channels static level
FX- Local control of the various effects across the three channels

Saving:

Menu adjustments are stored with the following actions
A change on the mode switch, locking the device, and exiting a menu

Jog dial functions:

- Red – Holding down engages or disengages lock
  Levels can be viewed by rotating the jog dial.
  - turning adjusts red channel static brightness level
- Green – Holding down enters configuration menu
  - turning adjusts green channel static brightness level
- Blue – Holding down enters/exits effect menu for all 3 channels
  - turning adjusts blue channel static brightness level
- Depressing any channel cycles between off and current static level

In TX mode turning a jog dial one click at a time allows the user to alter the static level in one click intervals.

Rotating the jog dial quickly allows the user to quickly reach 0 or 100 within one 270 degree rotation.

=== DISPLAY LEGEND ===
Each menu option and display mode has a unique identifying character. This character is always the first (left most) character shown on the seven segment display.

--- **Normal view** ---
'r' -- current RED channel value
'g' -- current GREEN channel value
'b' -- current BLUE channel value
'd' -- first DMX channel for this unit

--- **Configuration menu** ---
Access the configuration menu by pressing the **Green Jog Dial** and holding. To cycle through the variables simply press the green jog dial.

'd' -- First DMX channel for this unit
'A' -- Display mode for DMX (RX) mode
when 'on' display shows DMX starting address.
when 'off' display shows value received on selected channel
't' -- timer duration, in seconds, until unit goes to "sleep" when locked
'U' -- timer duration, in seconds, until unit goes to "sleep" when unlocked
'F' -- Fade timer interval (8 ms units)
'C' -- Per-click adjust amount for quickly rotated rotary encoder
'Z' -- DMX channel mode (3,7,14,or 28 channels)
'y' -- Displayed range normalization --
When 'on' displayed values range [0,100],
When 'off' displayed values range [0,255] (more resolution)
'o' -- Manual adjustment rollover --
When 'on' rollovers are allowed.
The jog dial will go past 100 and back to 0.
When 'off' rollovers are not allowed and unit stops at 0 and 100(255)

--- **Effect menu** ---
Enter the effect menu by depressing the **Blue Jog Dial** and holding.
Upon entering the effect menu rotating the red, green, or blue jog dials will affect the variable selected for that channel.
To cycle through the variables simply press the blue jog dial.

'E' -- Effect type selection. See appendix A for an explanation of effects.
'L' -- Low (minimum) effect value
'H' -- High (maximum) effect value
'S' -- Effect speed -- timer duration between adjustments (in 8 ms units)
'n' -- Base effect increment amount per interval
'P' -- Effect starting phase, in degrees (0-360)

=== **DMX Channel Modes** ===
There are four DMX channel modes:

3 Channel Mode:

Channel	Purpose
1	RED channel intensity
2	GREEN channel intensity
3	BLUE channel intensity

7-Channel Mode:

Channel	Purpose	Range
1	RED channel high	[0,255]
2	GREEN channel high	[0,255]
3	BLUE channel high	[0,255]
4	RED channel low	[0,255]
5	GREEN channel low	[0,255]
6	BLUE channel low	[0,255]
7	Common Effect control:	[0,255]

Value	Effect
000-025	none (direct DMX control)
026-050	linear
051-075	logarithmic
076-100	exponential
101-125	BLIP
126-150	PILB
151-175	lightning
176-200	random
201-255	none (direct DMX control)

When selecting any effect other than none, the HIGH and LOW values constrain the range of the effect. When selecting no effect (direct DMX control), the channels are each set to the higher of the HIGH and LOW values for that channel (Highest Takes Precedent).

14-Channel Mode:

Channel	Purpose	Range
1	RED channel high	[0,255]
2	GREEN channel high	[0,255]
3	BLUE channel high	[0,255]
4	RED channel low	[0,255]
5	GREEN channel low	[0,255]
6	BLUE channel low	[0,255]
7	RED Effect control:	[0,255]

Value	Effect
000-025	none (direct DMX control)
026-050	linear
051-075	logarithmic
076-100	exponential
101-125	BLIP
126-150	PILB
151-175	lightning
176-200	random
201-255	none (direct DMX control)

8	GREEN Effect control:	[0,255]

Value	Effect
000-025	none (direct DMX control)
026-050	linear
051-075	logarithmic
076-100	exponential
101-125	BLIP
126-150	PILB
151-175	lightning
176-200	random
201-255	none (direct DMX control)

9	BLUE Effect control:	[0,255]

Value	Effect
000-025	none (direct DMX control)
026-050	linear
051-075	logarithmic
076-100	exponential
101-125	BLIP
126-150	PILB
151-175	lightning
176-200	random
201-255	none (direct DMX control)

10	Common Scale up	[0,255]
11	Common Scale down	[0,255]
12	Common Effect Interval	[0,255]
13	Common Effect Increment	[0,255]
14	Common Normalized Phase	[0,255]

When selecting any effect other than none, the HIGH and LOW values constrain the range of the effect. When selecting no effect (direct DMX control), that channel is each set to the higher of the HIGH and LOW values (Highest Takes Precedent). The common scale up/scale down values cause a proportional scaling to be applied across all channels. The scale up value starts at 0 (no change), and as it increases, all three output channels are increased by a proportional amount. Similarly, the scale down value starts at 255 (no change), and as it decreases, all three output channels are decreased by a proportional amount.

Example: the channels (r/g/b) are set to 20/40/50, scale up value is set to 32 (32 / 256 * 100% = +12.5%),
scale down value is set to 192 ((255 - 192) / 256 * 100% = -25%).
The net effect is that each output adjusted by -12.5% (+12.5 - 25 = -12.5), resulting in adjusted outputs of approximately 17.5/35/43.75.

The common increment, interval and phase values apply across all 3 channels when using an effect.
The common phase value has been normalized from the [0,359] range to [0,255] to fit into one Channel. A scaling factor of 360/256 is applied to the selected value to reconstitute it.
Example: 0->0°, 128->180°, 255->359°, etc.
Note: There is a minimum increment/interval value of 1; a 0 setting for these values is treated as 1 instead.

28-Channel Mode:

Channel	Purpose	Range
1	RED channel high	[0,255]
2	GREEN channel high	[0,255]
3	BLUE channel high	[0,255]
4	RED channel low	[0,255]
5	GREEN channel low	[0,255]
6	BLUE channel low	[0,255]
7	RED Effect control:	[0,255]
	Value Effect	
	000-025 none (direct DMX control)	
	026-050 linear	
	051-075 logarithmic	
	076-100 exponential	
	101-125 BLIP	
	126-150 PILB	
	151-175 lightning	
	176-200 random	
	201-255 none (direct DMX control)	
8	GREEN Effect control:	[0,255]
	Value Effect	
	000-025 none (direct DMX control)	
	026-050 linear	
	051-075 logarithmic	
	076-100 exponential	
	101-125 BLIP	
	126-150 PILB	
	151-175 lightning	
	176-200 random	
	201-255 none (direct DMX control)	
9	BLUE Effect control:	[0,255]
	Value Effect	
	000-025 none (direct DMX control)	
	026-050 linear	
	051-075 logarithmic	
	076-100 exponential	
	101-125 BLIP	
	126-150 PILB	
	151-175 lightning	
	176-200 random	
	201-255 none (direct DMX control)	
10	RED Scale up	[0,255]
11	GREEN Scale up	[0,255]
12	BLUE Scale up	[0,255]
13	RED Scale down	[0,255]
14	GREEN Scale down	[0,255]
15	BLUE Scale down	[0,255]
16	RED Effect Interval	[0,255]
17	GREEN Effect Interval	[0,255]
18	BLUE Effect Interval	[0,255]
19	RED Effect Increment	[0,255]
20	GREEN Effect Increment	[0,255]
21	BLUE Effect Increment	[0,255]
22-23	RED Phase	[0,359]
24-25	GREEN Phase	[0,359]
26-27	BLUE Phase	[0,359]
28	Restart Effects	[0,255]
	000-199 No reset	
	200-255 Restart all effects	

Troubleshooting Guide

This unit is designed to vary the light intensity of LED lights via a film safe Pulse Width Modulation.

It is also designed to keep you safe and provide years of worry free dimming. To ensure this several saftey measures have been taken. When an error occurs the display will flash and indicate what type of error you are experiencing. It measures and tests at the milisecond level. If you correct the error and then press one of the rotory knobs down the dimmer will allow you to carry on your function. If the error message is still displayed the problem still exists.

A current foldback feature has been built in to prevent overamping the main connector. Should you go beyond the ampacity rating the display will read Short. Simply reduce the load to continue using your device.

Short circuit protection is designed to help prevent you from shorting out your device and starting a fire. Should a short occur the display will read short.

Each channel is rated to carry **7 amps** of current continuosly.
Each Channel is fused accordingly. If you exceed this rating per channel a fuse will blow on the board. This is a factory servicable item; however it is not covered under your warranty. If you wish to return your device, you must do so with a postage paid return label.

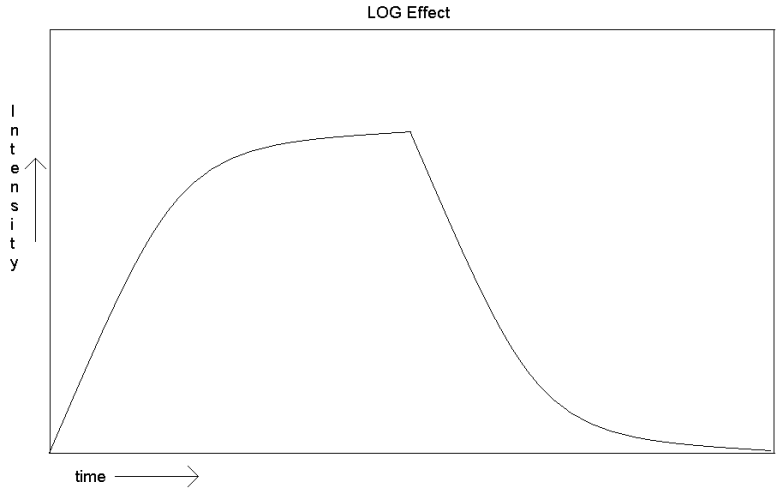
This dimmer should be powered with **12 or 24 volts DC ONLY.**
If you see a display that reads Lbat the voltage supply is below 10 Volts DC
If you see a display that reads Hbat the voltage supply is above 28 Volts DC

Appendix A:

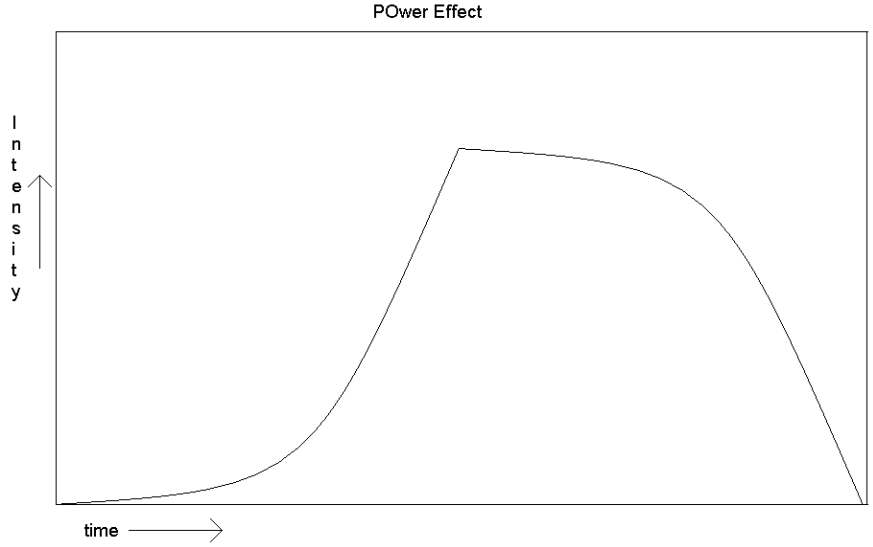
Explanation of effects:

LIN Linear rise, linear fall

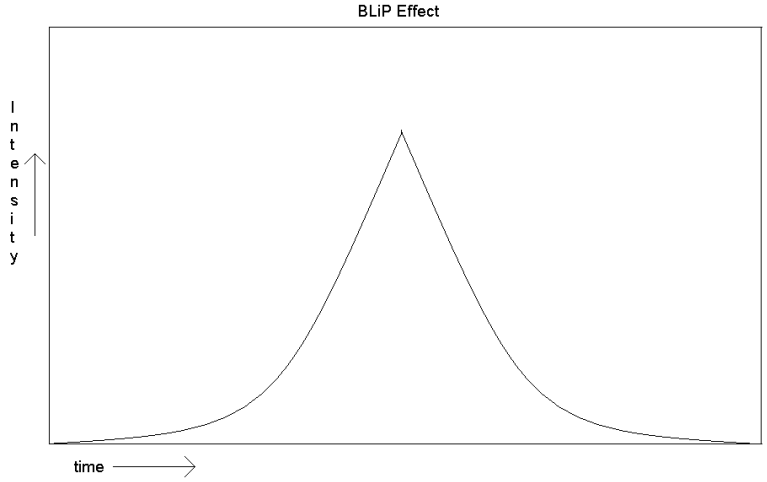
LOG Exponential rise, log fall



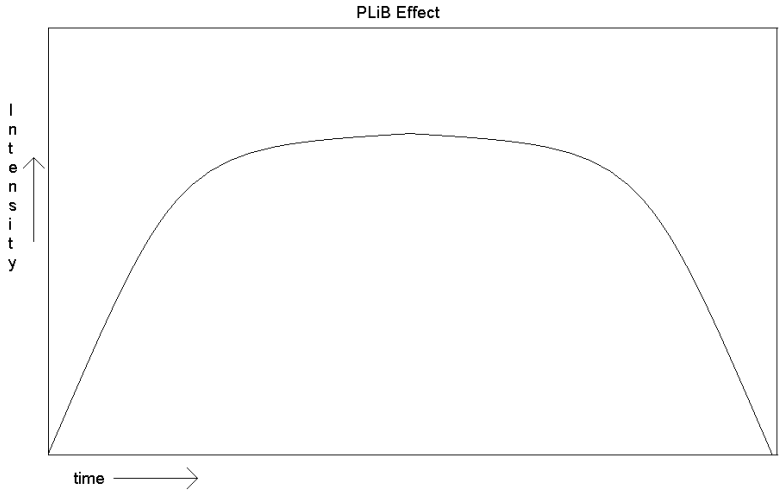
PO Log rise, exponential fall



BLP Exponential rise, exponential fall



PLB Exponential fall, exponential rise



LGT Lightning

RND Fully random (random intensity for random time)

Thank you for Choosing Cush Light for your LED Needs.

Your Cush Light *High Frequency Dimmer* carries a one year manufacturer's warranty against workmanship defects.

Should you experience a problem with your product please email us at CushLight@gmail.com