

POCKET  
COSMOS™



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Waukesha, WI USA  
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# 1. GETTING STARTED

## What's In The Box?

- 1 x Pocket Cosmos™
- An Ever-So-Handy Power Cord
- This Lovely User Manual

## Getting It Out Of The Box

Congratulations on purchasing one way cool, way original fat beam green laser! Now that you've got your Pocket Cosmos™, you should carefully unpack the box and check the contents to ensure that all parts are present and in good condition. If anything looks as if it has been damaged in transit, notify the shipper immediately and keep the packing material for inspection. Again, please save the carton and all packing materials. If a fixture must be returned to the factory, it is important that the fixture be returned in the original factory box and packing.

## Powering Up!

All fixtures must be powered directly off a switched circuit and **cannot be run off a rheostat (variable resistor) or dimmer circuit, even if the rheostat or dimmer channel is used solely for a 0% to 100% switch.**

*AC Voltage Switch* - Not all fixtures have a voltage select switch, so please verify that the fixture you receive is suitable for your local power supply. See the label on the fixture or refer to the fixture's specifications chart for more information. A fixture's listed current rating is its average current draw under normal conditions. Check the fixture or device carefully to make sure that if a voltage selection switch exists that it is set to the correct line voltage you will use.

**Warning! Verify that the voltage select switch on your unit matches the line voltage applied. Damage to your fixture may result if the line voltage applied does not match the voltage indicated on the voltage selector switch. All fixtures must be connected to circuits with a suitable Ground (Earthing).**

## Getting A Hold Of Us

**If something happens goes wrong, please visit [www.blizzardpro.com/support](http://www.blizzardpro.com/support) and open a support ticket. We'll be happy to help, honest.**

**Disclaimer:** The information and specifications contained in this document are subject to change without notice. Blizzard Lighting™ assumes no responsibility or liability for any errors or omissions that may appear in this user manual. Blizzard Lighting™ reserves the right to update the existing document or to create a new document to correct any errors or omissions at any time. You can download the latest version of this document from [www.blizzardpro.com](http://www.blizzardpro.com).

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# LASER SAFETY REQUIREMENTS

Lasers are one of the coolest effects available, and when they are used appropriately, they will be fun, legal and harmless. To make sure that is the case...

- Always set up and install all laser effects so that all laser light is at least 3 meters (9.8 feet) above the floor on which people can stand.
- After setting up, and before public use, test laser to ensure proper function. Do not use if any defect is detected. Do not use if laser emits only one or two laser beams rather than dozens/hundreds, as this could indicate damage to the diffraction grating optic, and could allow emission of higher laser levels above Class 3R.
- **NEVER** point lasers at people or animals. Never look into the laser aperture or laser beams.
- **NEVER** point lasers in areas in which people can potentially get exposed, such as uncontrolled balconies, etc.
- **NEVER** point lasers at highly reflective surfaces, such as windows, mirrors and shiny metal. Even laser reflections can be hazardous.
- **NEVER** point a laser at aircraft, **this is a federal offense!**
- **NEVER** point un-terminated laser beams into the sky.
- **NEVER** expose the output optic (aperture) to cleaning chemicals.
- **NEVER** use laser if the laser appears to emit only one or two beams.
- **NEVER** use the laser if the housing is damaged, the housing is open, or if the optics appear damaged in any way.
- **NEVER** open the laser housing. The high laser power levels inside of the protective housing can start fires, burn skin and will cause instant eye injury.
- **NEVER** leave this device running unattended.

The operation of a class 3R laser show is only allowed if the show is controlled by a skilled and well-trained operator, familiar with the data from this manual. The legal requirements for using laser entertainment products vary from country to country. The user is responsible for the legal requirements at the location/ country of use.



## 2. MEET THE POCKET COSMOS™

### MAIN FEATURES

- 50mW, 532nm fat beam green laser
- Built-in automatic & sound active programs
- Micro-step wide angle scanning motor
- 3-pin DMX in/out
- Microphone sensitivity adjustment knob
- Durable blue aluminum casing w/mounting bracket
- Fully FDA compliant, variance-free
- Class 3R laser product, use with caution!

### CONTROL:

- Protocol: USITT DMX-512
- DMX Channels: 7-channels
- Dip switch controlled function settings
- Operating modes: DMX512, master/slave, auto, sound active

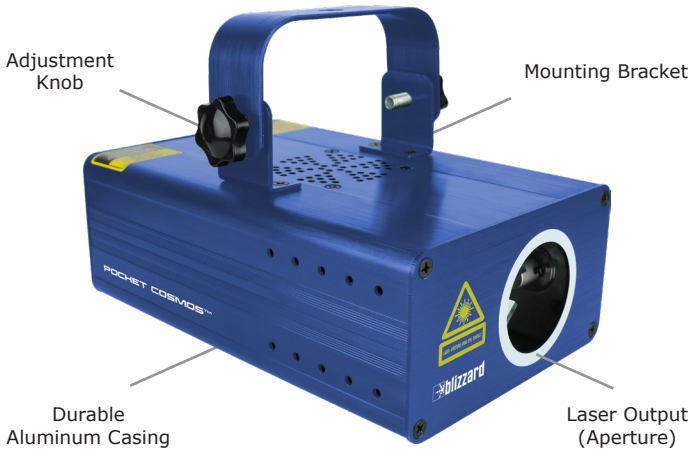
### Laser Specifications

Color	Wavelength	Power Output
Green	532nm	50mW

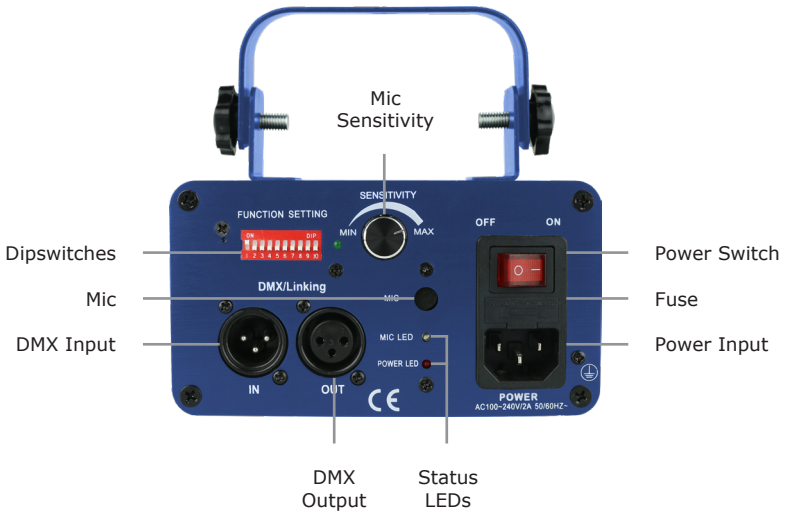
### DMX Quick Reference: 7-Channel Mode

Channel	What it does
1	Mode
2	Pattern Selection
3	Moving-X
4	Moving-Y
5	Scanning Speed
6	Dynamic Pattern Speed
7	Static Pattern Size

**Figure 1: The Pocket Cosmos™ Pin-Up Picture**



**Figure 2: The Rear Connections**



### 3. SETUP



Before replacing the fuse, disconnect the power cord.  
ALWAYS replace it with the same type and rating.

#### Fuse Replacement

Remove the fuse holder from of its housing. Then take out the damaged fuse from its holder and replace with exact same type of fuse. Reattach the fuse holder, and then reconnect power.

#### Connecting A Bunch of Pocket Cosmos™ Fixtures

You will need a serial data link to run light shows using a DMX-512 controller or to run shows on two or more fixtures set to sync in master/slave operating mode. The combined number of channels required by all the fixtures on a serial data link determines the number of fixtures the data link can support.

Fixtures on a serial data link must be daisy chained in one single line. Also, connecting more than 32 fixtures on one serial data link without the use of a DMX optically-isolated splitter may result in deterioration of the digital DMX signal. The maximum recommended cable-run distance is 500 meters (1640 ft). The maximum recommended number of fixtures on a serial data link is 32 fixtures.

#### Data/DMX Cabling

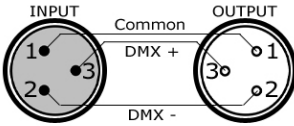
To link fixtures together you'll need data cables. You should use data-grade cables that can carry a high quality signal and are less prone to electromagnetic interference.

For instance, Belden© 9841 meets the specifications for EIA RS-485 applications. Standard microphone cables will "probably" be OK, but note that they cannot transmit DMX data as reliably over long distances. In any event, the cable should have the following characteristics:

*2-conductor twisted pair plus a shield*  
*Maximum capacitance between conductors – 30 pF/ft.*  
*Maximum capacitance between conductor & shield – 55 pF/ft.*  
*Maximum resistance of 20 ohms / 1000 ft.*  
*Nominal impedance 100 – 140 ohms*

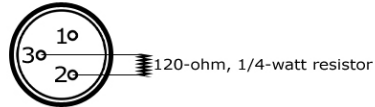
## Cable Connectors

Cables must have a male XLR connector on one end and a female XLR connector on the other end. (Duh!)



**A Word on Termination:** DMX is a resilient communication protocol, however errors still occasionally occur. Termination reduces signal errors, and therefore best practices include use of a terminator in all circumstances. If you are experiencing problems with erratic fixture behavior, especially over long signal cable runs, a terminator may help improve performance.

**To build your own DMX Terminator:**  
Obtain a 120-ohm, 1/4-watt resistor, and wire it between pins 2 & 3 of the last fixture. They are also readily available from specialty retailers.



**CAUTION:** Do not allow contact between the common and the fixture's chassis ground. Grounding the common can cause a ground loop, and your fixture may perform erratically. Test cables with an ohm meter to verify correct polarity and to make sure the pins are not grounded or shorted to the shield or each other.

### 3-Pin??? 5-Pin??? Huh?!?

If you use a controller with a 5-pin DMX output connector, it's no problem! You can simply use the installed 5-pin DMX input and/or output connections found on the back of your fixture(s).

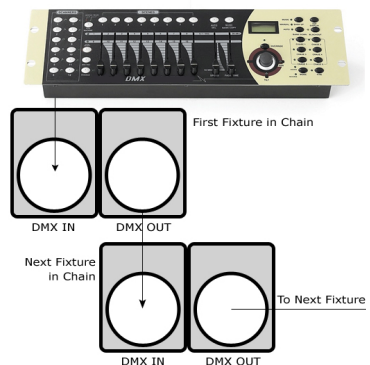
Conductor	3-Pin Female (Output)	5-Pin Male (Input)
Ground/Shield	Pin 1	Pin 1
Data 1- (Primary Data Link)	Pin 2	Pin 2
Data 1+ (Primary Data Link)	Pin 3	Pin 3
Data 2- (Optional Secondary Data Link)	Pin 4	Pin 4
Data 2+ (Optional Secondary Data Link)	Pin 5	Pin 5

## Take It To The Next Level: Setting Up DMX Control

**Step 1:** Connect the male connector of the DMX cable to the female connector (output) on the controller.

**Step 2:** Connect the female connector of the DMX cable to the first fixture's male connector (input). *Note:* It doesn't matter which fixture address is the first one connected. We recommend connecting the fixtures in terms of their proximity to the controller, rather than connecting the lowest fixture number first, and so on.

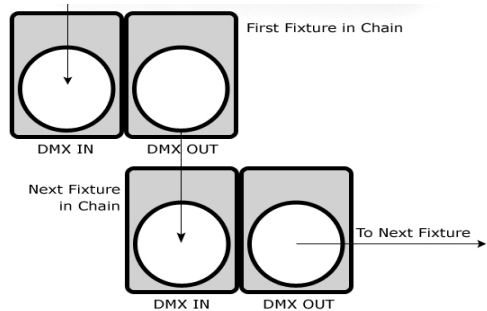
**Step 3:** Connect other fixtures in the chain from output to input as above. Place a DMX terminator on the output of the final fixture to ensure best communication.





## Fixture Linking (Master/Slave Mode)

1. Connect the (male) 3-pin connector side of the DMX cable to the output (female) 3-pin connector of the first fixture.



2. Connect the end of the cable coming from the first fixture which will have a (female) 3-pin connector to the input connector of the next fixture consisting

of a (male) 3-pin connector. Then, proceed to connect from the output as stated above to the input of the following fixture and so on.

**A quick note:** Often, the setup for Master-Slave and Standalone operation requires that the first fixture in the chain be initialized for this purpose via either settings in the control panel or DIP-switches. Secondly, the fixtures that follow may also require a slave setting.

## Mounting & Rigging

This fixture may be mounted in any SAFE position provided there is enough room for ventilation.

It is important never to obstruct the fan or vents pathway. Mount the fixture using a suitable "C" or "O" type clamp. The clamp should be rated to hold at least 10x the fixture's weight to ensure structural stability. Do not mount to surfaces with unknown strength, and ensure properly "rated" rigging is used when mounting fixtures overhead.

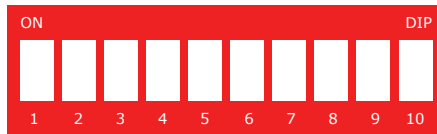
Adjust the angle of the fixture by loosening both knobs and tilting the fixture. After finding the desired position, retighten both knobs.

- When selecting installation location, take into consideration lamp replacement access (if applicable) and routine maintenance.
- Safety cables MUST ALWAYS be used.
- Never mount in places where the fixture will be exposed to rain, high humidity, extreme temperature changes or restricted ventilation.

# 4. OPERATING ADJUSTMENTS

## DIP Switch Settings

All of the various functions of the Pocket Cosmos™ are set up using the 10-position DIP switch located on the rear of the unit. Using this set of switches, you can set the starting DMX address for use in DMX mode, set to auto mode, or sound active mode. The chart below describes the various operating modes and their respective DIP switch settings.



X = OFF or ON

DIPSWITCH CHART										Function
#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	
X	X	X	X	X	X	X	X	OFF	<b>ON</b>	Auto Mode
X	X	X	X	X	X	X	X	<b>ON</b>	<b>ON</b>	Sound Active Mode
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Slave
SET DMX ADDRESS									OFF	DMX / Master

### Auto Mode

- 1.) Switch #1 through #8 and be either ON or OFF.
- 2.) Turn switch #9 OFF, and switch #10 ON.

### Sound Active Mode

- 1.) Switch #1 through #8 and be either ON or OFF.
- 2.) Turn switch #9 ON, and turn switch #10 ON.
- 3.) Adjust the sensitivity knob to your desired level.

### Slave Mode

- 1.) Set all switches to OFF.

### DMX Mode

- 1.) Set dipswitch 10 to OFF.
- 2.) Connect DMX OUT of controller to DMX IN of 1st fixture. Daisy chain DMX OUT to DMX IN for any additional fixtures.
- 3.) Use dipswitches 1 – 9 to set the fixtures *Starting DMX Address*. Each dipswitch represents a binary value in which the sum would equal the set address.

*Example:* To set the fixtures starting DMX address to 12, dipswitch #10 would be OFF (DMX Mode), plus dipswitch #3 and #4 would be ON. (4+8=12).

Dipswitch	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Value	1	2	4	8	16	32	64	128	256	OFF

## DMX Values In-Depth (7-Channel Modes)

7CH	Value	What It Does
1	000 <-> 049 050 <-> 099 100 <-> 149 150 <-> 199 200 <-> 255	<b>Mode</b> No Function Static Patterns Dynamic Patterns Sound Active Mode Auto Mode
2	000 <-> 255	Pattern Selection ( <i>see Static &amp; Dynamic Patterns table below</i> )
3	000 <-> 255	Adjust Position-X
4	000 <-> 255	Adjust Position-Y
5	000 <-> 255	Scanning Speed (fast <-> slow)
6	000 <-> 255	Dynamic Pattern Speed (fast <-> slow)
7	000 <-> 255	Static Pattern Size (small <-> large)

## Static & Dynamic Patterns (Channel-2 DMX Values)

Value	Static Pattern	Dynamic Pattern	Value	Static Pattern	Dynamic Pattern
000 <-> 004	Circle	Circle To Big	130 <-> 134	Cross	Diag. Dot Move
005 <-> 009	Dot Circle 1	Circle Dot 2 Big	135 <-> 139	Chiasma Line	H. Line Flex
010 <-> 014	Dot Circle 2	Scan Circle 2 Big	140 <-> 144	H. Ext. Line	H. Dot Line Flex
015 <-> 019	Scan Circle	Circle Flash	145 <-> 149	H. Shrink Line	H. Line Move
020 <-> 024	H. Line	Circle Dot Flash	150 <-> 154	H. Flex Line	H. Dot Line Move
025 <-> 029	H. Dot Line	Circle Roll	155 <-> 159	H. Flex Dot Line	V. Line Move
030 <-> 034	V. Line	Dot Circle Roll	160 <-> 164	V. Ext. Line	V. Dot Line Move
035 <-> 039	V. Dot Line	Circle Turn	165 <-> 169	V. Shrink Line	Rectangle Ext.
040 <-> 044	45° Diag.	Dot Circle Turn	170 <-> 174	V. Flex Line	Dot Rectangle Ext.
045 <-> 049	Dot Diag.	Dot Circle Add	175 <-> 179	V. Flex Dot Line	Square Ext.
050 <-> 054	135° Diag.	Scan Circle Ext.	180 <-> 184	Ladder Line 1	Dot Square Ext.
055 <-> 059	Dot Diag.	Circle Jump	185 <-> 189	Ladder Line 2	Rectangle Turn
060 <-> 064	V. Line 1	Dot Circle Jump	190 <-> 194	Ladder Line 3	Dot Rectangle Turn
065 <-> 069	V. Dot Line 1	H. Line Jump	195 <-> 199	Ladder Line 4	Square Turn
070 <-> 074	V. Line 2	H. Dot Line Jump	200 <-> 204	Tetragon 1	Dot Square Turn
075 <-> 079	V. Dot Line 2	V. Line Jump	205 <-> 209	Tetragon 2	Pentagon Turn
080 <-> 084	Triangle 1	V. Dot Line Jump	210 <-> 214	Pentagon 1	Dot Pentagon Turn
085 <-> 089	Dot Triangle 1	Diag. Jump	215 <-> 219	Pentagon 2	Tetragon Turn
090 <-> 094	Triangle 2	Diag. Dot Jump	220 <-> 224	Pentagon 3	Pentagon Turn
095 <-> 099	Dot Triangle 2	S. Sector Round 1	225 <-> 229	Pentagon 4	Bird Fly
100 <-> 104	Square	S. Sector Round 2	230 <-> 234	Wave Line	Dot Bird Fly
105 <-> 109	Dot Square	L. Sector Round 1	235 <-> 239	Wave Dot Line	Wave Flowing
110 <-> 114	Rectangle 1	L. Sector Round 2	240 <-> 244	Spiral Line	Dot Wave Flowing
115 <-> 119	Dot Rectangle 1	Line Scan	245 <-> 249	Many Dot 1	Many Dot Jump 1
120 <-> 124	Rectangle 2	Dot Line Scan	250 <-> 254	Many Dot 2	Square Dot Jump
125 <-> 129	Dot Rectangle 2	45° Diag. Move	255	Square Dot	Many Dot Jump 2

## Troubleshooting

Symptom	Solution
Beam is Dim	Check optical system and clean excess dust/grime. Also ensure that the 220V/110V switch is in the correct position, if applicable.
No Light Output	Check to ensure fixture is operating under correct mode, IE sound active/auto/DMX/Etc., if applicable. Contact service for more information.
Chase Speed Too Fast/Slow	Check to ensure proper setup of speed adjustment.
No Power	Check fuse, AC cord and circuit for malfunction.
Blown Fuse	Check AC cord and circuit for damage, verify that moving parts are not restricted and that unit's ventilation is not obstructed
Slow Movement	Check that speed channels are set appropriately.
No Response to Audio	Verify that the fixture is in "Sound Active" mode. Increase the music volume or increase audio sensitivity with sensitivity knob.
Fixture Not Responding / Responding Erratically	Make sure all connectors are seated properly and securely. Use Only DMX Cables. Install a Terminator. Check all cables for defects. Reset fixture(s).
Fixture Not Responding in M/S Mode	Make sure to there is only one master in the chain, and the others are set in slave mode.

**If your problem persists or isn't listed, please open a support ticket online at: [www.blizzardpro.com/support](http://www.blizzardpro.com/support).**

# 5. APPENDIX

## A Quick Lesson On DMX

DMX (aka DMX-512) was created in 1986 by the United States Institute for Theatre Technology (USITT) as a standardized method for connecting lighting consoles to lighting dimmer modules. It was revised in 1990 and again in 2000 to allow more flexibility. The Entertainment Services and Technology Association (ESTA) has since assumed control over the DMX512 standard. It has also been approved and recognized for ANSI standard classification.

DMX covers (and is an abbreviation for) Digital MultipleXed signals. It is the most common communications standard used by lighting and related stage equipment.

DMX provides up to 512 control "channels" per data link. Each of these channels was originally intended to control lamp dimmer levels. You can think of it as 512 faders on a lighting console, connected to 512 light bulbs. Each slider's position is sent over the data link as an 8-bit number having a value between 0 and 255. The value 0 corresponds to the light bulb being completely off while 255 corresponds to the light bulb being fully on.

DMX data is transmitted at 250,000 bits per second using the RS-485 transmission standard over two wires. As with microphone cables, a grounded cable shield is used to prevent interference with other signals.

There are five pins on a DMX connector: a wire for ground (cable shield), two wires for "Primary" communication which goes from a DMX source to a DMX receiver, and two wires for a "Secondary" communication which goes from a DMX receiver back to a DMX source. Generally, the "Secondary" channel is not used so data flows only from sources to receivers. Hence, most of us are most familiar with DMX-512 as being employer over typical 3-pin "mic cables," although this does not conform to the defined standard.

DMX is connected using a daisy-chain configuration where the source connects to the input of the first device, the output of the first device connects to the input of the next device, and so on. The standard allows for up to 32 devices on a single DMX link.

Each receiving device typically has a means for setting the "starting channel number" that it will respond to. For example, if two 6-channel fixtures are used, the first fixture might be set to start at channel 1 so it would respond to DMX channels 1 through 6, and the next fixture would be set to start at channel 7 so it would respond to channels 7 through 12.

The greatest strength of the DMX communications protocol is that it is very simple and robust. It involves transmitting a reset condition (indicating the start of a new "packet"), a start code, and up to 512 bytes of data. Data packets are transmitted continuously. As soon as one packet is finished, another can begin with no delay if desired (usually another follows within 1 ms). If nothing is changing (i.e. no lamp levels change) the same data will be sent out over and over again. This is a great feature of DMX -- if for some reason the data is not interpreted the first time around, it will be re-sent shortly.

Not all 512 channels need to be output per packet, and in fact, it is very uncommon to find all 512 used. The fewer channels are used, the higher the "refresh" rate. It is possible to get DMX refreshes at around 1000 times per second if only 24 channels are being transmitted. If all 512 channels are being transmitted, the refresh rate is around 44 times per second.

In summary, since its design and evolution in the 1980's DMX has become the standard for lighting control. It is flexible, robust, and scalable, and its ability to control everything from dimmer packs to moving lights to foggers to lasers makes it an indispensable tool for any lighting designer or lighting performer.

## Keeping Your Pocket Cosmos™ As Good As New

The fixture you've received is a rugged, tough piece of pro lighting equipment, and as long as you take care of it, it will take care of you. That said, like anything, you'll need to take care of it if you want it to operate as designed. You should absolutely keep the fixture clean, especially if you are using it in an environment with a lot of dust, fog, haze, wild animals, wild teenagers or spilled drinks.

Cleaning the optics routinely with a suitable glass cleaner will greatly improve the quality of light output. Keeping the fans free of dust and debris will keep the fixture running cool and prevent damage from overheating.

In transit, keep the fixtures in cases. You wouldn't throw a prized guitar, drumset, or other piece of expensive gear into a gear trailer without a case, and similarly, you shouldn't even think about doing it with your shiny new light fixtures.

Common sense and taking care of your fixtures will be the single biggest thing you can do to keep them running at peak performance and let you worry about designing a great light show, putting on a great concert, or maximizing your client's satisfaction and "wow factor." That's what it's all about, after all!

### Returns (Gasp!)

We've taken a lot of precautions to make sure you never even have to worry about sending a defective unit back, or sending a unit in for service. But, like any complex piece of equipment designed and built by humans, once in a while, something doesn't go as planned. If you find yourself with a fixture that isn't behaving like a good little fixture should, you'll need to obtain a Return Authorization (RA).

Don't worry, this is easy. Just visit [www.blizzardpro.com/support](http://www.blizzardpro.com/support) and open a support ticket, and we'll issue you an RA. Then, you'll need to send the unit to us using a trackable, pre-paid freight method. We suggest using USPS Priority or UPS. Make sure you carefully pack the fixture for transit, and whenever possible, use the original box & packing for shipping.

When returning your fixture for service, be sure to include the following:

- 1.) Your contact information (Name, Address, Phone Number, Email address).
- 2.) The RA# issued to you
- 3.) A brief description of the problem/symptoms.

We will, at our discretion, repair or replace the fixture. Please remember that any shipping damage which occurs in transit to us is the customer's responsibility, so pack it well!

### Shipping Issues

**Damage incurred in shipping is the responsibility of the shipper, and must be reported to the carrier immediately upon receipt of the items. Claims must be made within seven (7) days of receipt.**

## Tech Specs!

<b>Weight &amp; Dimensions</b>			
Length	8.9 inches (225 mm)		
Width	5.8 inches (146 mm)		
Height	3.1 inches (78 mm)		
Weight	3.3 lbs (1.46 kg)		
<b>Power</b>			
Operating Voltage	100-240VAC, 50-60 Hertz		
Fuse	2A, 250V		
Power Consumption	10W, 1A		
<b>Light Source</b>			
Laser	Color	Wavelength	Power Output
	Green	532nm	50mW
Laser Class	Class 3R		
<b>Thermal</b>			
Max. Operating Temp.	104 degrees F (40 degrees C) ambient		
<b>Control</b>			
Protocol	USITT DMX-512		
DMX Channels	7-channels		
Input/Output	3-pin XLR Male/Female		
Other Operating Modes	DMX512, Master/Slave, Auto, Sound Active		
Warranty	2-year limited warranty		



**Enjoy your product!  
Our sincerest thanks for your purchase!  
--The team @ Blizzard Lighting**