

# **X-LASER**

**BUILT TO PERFORM™**

**X SERIES  
CLASS IIIB**

## **USER INFORMATION**

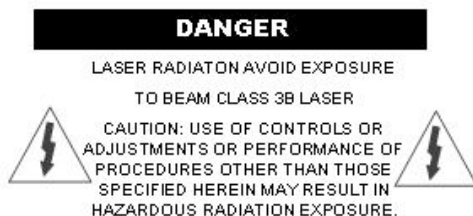
For Professional Indoor Use Only

X-Laser, LLC  
PO BOX 353  
Laurel, MD 20725

FDA VARIANCE REQUIRED PRIOR TO SALE

Note: X-Laser strongly recommends keeping this manual with your new laser fixture at all times both as a laser safety reference and a field reference for DMX operation. DMX charts are included for your convenience.

# **BEFORE USING THIS PRODUCT, READ AND FOLLOW ALL NOTICES AND SAFETY INFORMATION THROUGHOUT THIS GUIDE.**



## **SAFETY NOTICES:**

1. Do not expose the human eye directly or indirectly to focused or scattered laser radiation as loss of vision, complete blindness, and/or other serious injuries may result.\*
2. This fixture is NOT intended for audience scanning effects. Operators must ensure that the primary laser beam and any reflected beams remain at least 3.0 meters in lateral and vertical separation from any person or persons.
3. This unit is intended for indoor use only and should be at all times be protected from fluids and humidity. Do not expose this fixture to temperatures outside of its' normal working range of 60-85 degrees F.
4. There are NO user serviceable parts inside of the fixture. Opening the outer casing will void the warranty and could result in radiation exposure. Any modifications to the fixture are prohibited, may be dangerous, and will immediately void the factory warranty.\*\*
5. Always ensure that the power supply is properly grounded before use.
6. DO NOT USE this fixture if you suspect that it contains a defect of any kind either from manufacturing, damage, general wear or has a broken manufacturer's seal. Return the fixture to the factory for service and/or maintenance immediately.
7. Sound Active and AUTO modes provided with this fixture via the rear dip switches are provided as a convenience for testing only. This unit should ALWAYS be used in DMX mode during any demonstration, performance, or road use unless being used in conjunction with an X-laser ESSD (available separately). See the dip Switch explanation later in this manual for more information.

8. Lasers are capable of starting fires at great distances. Do not use this product around or in a path to any combustible or otherwise flammable materials.

9. Before using this product in any capacity, ensure that the unit properly secured to prevent accidental beam shifts and that a safety cable is used for any aerial rigging.

10. Blue color lasers must be used with special care because the wavelength is in the hazard zone for photo-toxicity also known as the 'blue effect'. This wavelength can cause injury well below the thermal MPE levels.

11. This product is not a toy and should be kept inaccessible to unauthorized persons before, during, and after use. Authorized persons should only be employees of an FDA variance holder. Keep away from minors.\*\*\*

12. This unit should never be left unattended while operational and should always be unplugged from both DMX and power while being transported, rigged, de-rigged, cleaned as described below, or when a qualified operator is not present. We also recommend keeping your DMX controller separate from the laser at all times to prevent unwanted activation.\*\*\*

13. Before using this product, it is the responsibility of the user to be familiar with all Federal and State reporting and usage requirements. Laws vary by state. An FDA variance is required to operate this product. Refer to the included user DVD for more information.

14. Keep all body parts and clothing away from the laser, and particularly the aperture mirrors at ALL times. The mirrors move EXTREMELY fast and will cause serious injury.

15. Do not stand in front of the laser while active. All persons should wear protective eyewear while rigging, maintaining, or otherwise working with the laser.

\*Failure to follow the above precautions and other precautions contained in this user manual, particularly with regard to human exposure to laser radiation and electrical safety, may result in serious injury, loss of vision, electric shock, skin damage, and death. Please refer to the section on laser safety later in this manual for more detailed operation guidelines. Always be mindful that Class 3B and 4 lasers shoot potentially hazardous radiation at the speed of light. They should be handled and operated with the same care and caution that you would use if you were using a loaded firearm.

\*\*Any service and/or maintenance to the fixtures is to be performed by factory authorized technicians only except as specifically described in this manual.

\*\*\*This product should not be operated by persons who are not trained in proper laser safety procedures and/or do not know how to use all components of a DMX system properly.

## **Introduction:**

Thank you for purchasing an X-Laser product! You now own one of the most powerful and best crafted aerial laser display systems ever created for the mobile entertainment industry. Your new X-Laser is capable of producing absolutely stunning aerial laser effects over audiences in nearly any performance application with the convenience and flexibility of full DMX control. With the power of the X-Laser fixtures also comes a responsibility for safety so we strongly encourage you to read and follow all of the notices throughout this manual. If you have any questions about proper use of these laser systems, laser safety, troubleshooting, or anything else, visit us on the web 24/7 at [www.x-laser.com](http://www.x-laser.com) so that we can best assist you!

## **Unpacking:**

Your new X-Laser should contain the following items:

- 1) One professional laser light show fixture;
- 2) A grounded power cable;
- 3) This user manual;
- 4) Several pieces of "black wrap" foil;
- 5) A DVD containing letters, forms, and a wealth of other information about this product specifically and laser safety in general.

## **Quality Control Measures:**

When you open your new X-Laser, you will notice that the laser unit and components have already been opened and re-sealed. Each laser that is delivered from the factory is tested and given a 26-point safety inspection before it is sent to you. All of the functions of your new laser including the DMX protocols have been checked to ensure excellent and safe performance. If you find any defects in one of our products or see a broken factory seal on the unit itself, please contact your authorized X-Laser dealer immediately for warranty service.

## **General Guidelines For Proper Usage:**

1. Always treat your laser with great care as some components are very fragile. This is not a standard "DJ" light that can bounce around in the back of a van for years and work just fine. Care for it as you would an intelligent mirror scanner. See also "Warm-Up" on page 12 of this manual for more usage information.

2. Avoid turning the laser on and off frequently as it will reduce the diode life. Also, this fixture does not have a set duty cycle but we do not recommend using it for more than four hours continuously.
3. From time to time be sure to clean the mirrors or laser aperture with a dry tissue that does not pill. You may also use an alcohol prep wipe to clean the mirrors and compressed air to blow dust from the vents. BE SURE the alcohol has dried fully before activating the laser This is the only user allowed maintenance.
4. Always keep all factory supplied labels on the unit and visible. These are all required for legal compliance.
5. The unit is supplied with several pieces of black wrap foil to be used as 'beam blocks' to prevent the laser from accidentally being moved into a danger area. These are provided separate from the fixture so that they can be applied, adjusted, and removed easily for mobile entertainment applications. If this unit is to be permanently installed, you may permanently apply the foil to the outside of the unit. To apply, simply use thin strips of gaffers tape or a heat safe glue for permanent installation. Using this foil is required for maximum safety and we recommend replacing the foil and/or tape at the first signs of wear. Replacement foil strips can be obtained very inexpensively through your X-Laser dealer.
6. During any use of your X-Laser product, be sure to leave an open space around all sides of the laser to facilitate airflow through the unit. Do not obstruct the holes in the casing as these permit air to enter and cycle through the unit.
7. Always allow the laser 10 minutes of warm up time to reach full power. The unit will stay "warm" for some time even if off.

### **General Guidelines For Safe Laser Usage:**

Your X-Laser product is a powerful laser device intended for aerial indoor lighting displays operated by professionals. The major concern with professional laser systems is to avoid human contact with the laser beam and to create a safe area where patrons and staff can enjoy your light show. Please observe the following guidelines when using your X-Laser product.

1. For all venues you must designate safe and restricted areas of the venue where persons are or are not allowed to be respectively. The "safe areas" should not be subject to any laser radiation either directly or indirectly. By protocol, there must be at least a 3 meter buffer between safe and restricted areas on all sides. In other words, all laser beams must terminate (ie. not be reflected away) in the restricted areas to avoid human contact.
2. As a laser light show operator you have a responsibility to reasonably foresee circumstances where conditions could present a safety risk to patrons

or staff. This means that making sure all laser units are properly aimed via the onboard DMX, physically blocked to prevent radiation spill or reflection into safe areas, and securely mounted are all "musts." Also, to be sure that these conditions are met properly, trained employees should be the only ones using these products.

3. Because the AUTO and SOUND ACTIVE modes of the laser do not allow for manual X/Y scanning control, this unit should ONLY ever be operated in DMX mode in demonstration conditions. You can and should use the X and Y axis controls built into the DMX protocol to properly focus the laser into the restricted areas of your venue only.

4. Because there are no user serviceable parts inside of X-Laser products, the outer case should never be opened by the user. To ensure proper safe operation in demonstrations and performances, please immediately discontinue use of your X-Laser product if you notice or suspect that any part of the laser is not functioning properly. In such a case, call us or your dealer for an RMA number and we will repair the unit to bring it back into compliance.

5. As a reminder, Class 3B and 4 laser products may only be used by a person or employees of an organization which holds a Laser Light Show Variance. All such persons must have adequate and appropriate laser operation and safety training, keep a copy of their variance with them at all performances, and keep appropriate safety logs and checklists. The variance holder must also file annual reports as required by the CDRH (FDA) and ensure that their variance is renewed prior to expiration. Copies of these forms, introductory training materials, and more may be found on the DVD enclosed with this product.

6. We strongly recommend that each user of an X-Laser Product read "Safe Laser Display" literature published as ANSI Z136.1 and Z136.10. These and a wealth of laser safety information is available from [www.rli.com](http://www.rli.com) and the Laser Institute of America. We also strongly recommend that proper safety equipment such as wavelength specific laser safety glasses be used during any times which a technician or others could be exposed to laser radiation.

7. Excellent laser training is available from a number of private institutions such as RLI above and we recommend that all of our users undertake it. Basic safety training is provided with this product but is NOT meant to be comprehensive. Please follow the enclosed instructions on the user DVD.

We want you to have a wonderful experience with our products so that you can bring the thrill of professional laser light shows to your audiences. The common sense safety procedures outlined in this manual should be easy to successfully implement in your shows and provide you with years of safe and profitable laser displays. Please contact us or your X-Laser dealer if you have any questions about how to safely and effectively use our products!

## **Installation:**

Using the safety requirements above and included on the user DVD as a preliminary but not exhaustive guide, you may hang or otherwise mount your new X-Laser product in any suitable orientation EXCEPT upside down. The writing on the sides or front of the fixture should always be right side up or at no more than a 90 degree angle to level. Use great care if you change the orientation of your laser from show to show to make sure that your DMX programming and beam blocks are suitable for the new orientation and will result in safe operation.

## **Operating Modes:**

Locate the dip switch bank on the rear of the laser which consists of a series of 10 white switches or “pins.” Pushing these pins up and down in different combinations will allow you to access different working modes and DMX addresses as described below. Be sure pins are fully engaged to achieve the desired effect. Up is “ON,” down is “OFF.”

**SOUND ACTIVE:** Unit responds to low frequency notes in music and runs through available laser patterns. Sensitivity to sound may be adjusted using the knob on the rear of the unit.

*Access Sound Active Mode by pushing pin # 10 UP/ON and leaving all other pins down/off. Should only be used for testing unless with an X-Laser ESSD.*

**AUTO MODE:** Unit replays all available laser sequences in order.

*Access Auto Mode by pushing up pins 9 & 10 to the ON/UP position leaving all other pins down/off. Should only be used for testing unless with an X-Laser ESSD.*

**DMX:** Unit responds only to DMX control inputs from an external DMX controller. SOUND ACTIVE and AUTO modes are also accessible via DMX Channel #1 on all fixtures.

*Access DMX Mode by making sure that pins 9 & 10 are DOWN/OFF and use pins 1-8 to set the DMX address as show below.*

PIN	1	2	3	4	5	6	7	8
DMX Value	+1	+2	+4	+8	+16	+32	+64	+128

Note: Dip switches 9 and 10 are used for special functions and thus the laser is not DMX addressable above address 256. To reach a DMX address of 49 for example, turn switches 1, 5 & 6 to “On,” ( $1+16+32=49$ ).

**Master/Slave:** Multiple lasers in a DMX daisy-chained (explained below) circuit NOT controlled by a DMX controller can be controlled instead by a single laser of the same model. Set the “Master” laser to either Sound Active or Auto modes and then turn all dip switches on all “Slave” units DOWN/OFF. All units may require a power cycle to send/receive the control signal.

### **Creating a DMX Circuit:**

Your X-Laser product can be linked to other X-Laser fixtures or other DMX compatible fixtures. To create this link, it is recommended that true DMX cable be used for best operation and that the DMX chain be terminated at the end of the link. Please follow these steps:

- 1) From your DMX controller, connect a 3 pin DMX cable to the “DMX IN” port on the back of your X-Laser Product. For any additional fixtures, continue to daisy chain the DMX cable from the “DMX OUT” port on the first fixture to the “DMX IN” port on the next fixture and so forth down the line. Your total length of DMX cable should not exceed 300’.
- 2) At the end of the DMX link, place a DMX terminator in the “DMX OUT” port of the last fixture in the link.
- 3) Use the dip switches (explained above) to set the DMX address of each fixture in the chain.

# **STOP**

**-Before powering on the laser, be sure that you have a minimum of 3 meters clearance from any safe area and that all operators are out of the laser path.**

**-Be sure that the laser is properly and safely rigged.**

**-Be sure that you have a reliable method of attenuating the laser beam or powering down the fixture in case of emergency and have used the enclosed checklist for additional safety.**

**-Read the safety information again. Thanks!**

## **X-Laser Safety Labels:**

Please see the last page of this manual for label copies and placement.

## **Introduction To Laser Effects:**

Each X-Laser unit contains one or more laser diodes in one or more colors. Our laser systems are capable of producing amazing aerial lighting displays by using a combination of static and dynamic laser patterns in each of these colors. Each laser comes with more than 100 patterns programmed into the unit and these can all be used in any sequence or combination via DMX programming.

Static patterns generally mean that the laser will make one kind of shape that will stay constant in size and location. Dynamic patterns take that shape and manipulate it by making it bigger, smaller, skinnier, fatter, higher, lower, etc. For instance in a static pattern you may have a circle projected through the air. In a dynamic pattern, the circle could increase and decrease diameter, loose and gain cohesion, or move around through the air. To gain impact with your laser shows, we recommend constructing your DMX programming with a combination of static and dynamic patterns which flow and increase in speed and movement as time progresses.

For maximum effect with our laser products, we strongly recommend that they be used in a darkened environment with some type of scattering medium such as fog or haze. A haze machine will add IMMESURABLY to the effect of your new laser unit and we strongly recommend that you consider incorporating one in your shows.

X-Laser specializes in producing high quality lasers of a sufficient power that they can be seen and enjoyed in almost any lighting environment. Unlike weaker Class 3A (4.95mW) lasers, some X-Lasers can be seen even in afternoon sunlight but we recommend that they be used in as much darkness as you can manage.

All X-Lasers (except fireworks lasers) are capable of producing a "liquid sky" effect (though it is done best with galvo motors in the XA Series) which is perfect for slow songs and other "mood moments." To achieve this most popular effect, you will want to use a static pattern that creates a wide line with a high rate of scan speed. This is one of the least bright patterns that any laser can create due to its' very nature, but it will still show very well in most environments and even better as you move to higher power lasers.

## **X-Laser DMX Traits:**

All X-Series Models Including Legacy

Channel	Function	Value	Description
CH1	Mode	0-49 50-99 100-149 150-199 200-255	Closed, Laser OFF Static DMX Patterns Dynamic DMX Patterns Sound Sync Mode Auto Mode
CH2*	Pattern Selection	0-255	52 Static, 52 Dynamic
CH3	Position X Axis	0-255	Adjust X Position
CH4	Position Y Axis	0-255	Adjust Y Position
CH5	Scanning Speed	0-255	0 is FAST, 255 is SLOWEST
CH6	Dynamic Pattern Play Speed	0-255	0 is FAST, 255 is SLOWEST 10 Speeds Available
CH7	Static Pattern Size	0-255	0 is SMALL, 255 is BIG

\* Channel 2 static patterns have an adjustable size up to DMX value 140. Patterns occurring after 140 are fixed. Static and dynamic patterns change every 5th value point. Example: 170-174 may be horizontal lines and 175-179 may then be vertical lines.

X-Laser models in the XA series, have a different user manual. If you inadvertently received this manual, please contact us and we will send the correct manual to you by e-mail immediately!

## **Cleaning and Maintenance:**

1. Units are only to be serviced by factory authorized service personnel. DO NOT open the laser unit under any circumstances.
2. Please see Page 5 for limited maintenance suggestions.
3. ALWAYS be sure that the unit is disconnected from power and DMX signals before beginning any cleaning.
4. The use of wavelength specific safety glasses are very strongly recommended during any testing, or cleaning.

## **Troubleshooting:**

Problem:	Solutions:
Power supply indicator does not light up.	<ul style="list-style-type: none"><li>-Check power cable to be sure it is fully inserted. Then check power supply to the unit.</li><li>-Check input voltage.</li><li>-<b>Check unit fuse and change if needed. Be sure to replace with correct fuse type.</b></li><li>- If the unit works but the indicator does not light up, return to factory for service.</li></ul>
Unit powers on but does not produce laser in Sound Active Mode (TEST MODE ONLY).	<ul style="list-style-type: none"><li>- Turn up music and adjust the audio sensitivity on the rear of the unit to "Max."</li><li>- Be sure that your audio source contains sufficient bass.</li><li>- Be sure that dip switch #10 is in the "ON" position. (also for AUTO mode)</li></ul>
Unit powers on but does not produce a laser in DMX mode.	<ul style="list-style-type: none"><li>- Be sure that your DMX console is connected and configured properly.</li><li>- Check that the DMX addressing on the rear of the fixture corresponds to DMX programming.</li><li>- Be sure that dip switch #10 is in the "OFF" position.</li><li>- Be sure that DMX channel 1 is not set to "Laser OFF" or "Sound Active Mode."</li><li>- Check DMX indicator light to see if the unit is receiving a DMX signal.</li></ul>
Unit powers on and accepts DMX signal, but responds erratically or improperly.	<ul style="list-style-type: none"><li>- Check the DMX addressing on the rear of the unit to be sure that it matches with your DMX programming.</li><li>- Install a terminator in the DMX OUT port of the last fixture in the chain.</li><li>-Be sure that you are using high quality DMX cable.</li><li>-Unit may be too warm or too cold.</li></ul>
Unit has a loud grinding or clicking noise during startup or during some patterns.	<ul style="list-style-type: none"><li>- This is not a product defect. The laser will "home" each time it is turned on and may exhibit some similar noises during high speed scanning patterns. Usually the pattern noises fade with time as the stepper motors get worked in.</li></ul>
Light output is low or the beam is not sharp.	<ul style="list-style-type: none"><li>- Clean the mirrors with a lint free cloth and a little window cleaner. <b>Allow to dry fully before use.</b></li><li>- Laser may need a few minutes to warm up from a "cold start" or the diode may be damaged/worn.</li></ul>

If none of these solutions are successful, perform two power cycles allowing the unit to rest completely off for at least five minutes each time. If you still have difficulties, please contact your dealer or X-Laser immediately for service.

**DO NOT attempt to use this product if it is not performing optimally.**

## **Warm-Up:**

From a "cold" start, it may take your X-Laser system as much as 15 minutes to reach full power. More commonly, warm-up time is less than 10 minutes. However, this time will be greatly increased if the unit is too hot or too cold. Excessive temperatures, especially cold, will reduce the laser power output by as much as 90% and may damage the laser. **DO NOT LEAVE THIS FIXTURE IN A VEHICLE FOR LONG PERIODS OR IN DIRECT SUNLIGHT.**

Once the laser reaches full power, the diode may be turned off via DMX and then back on at a later time. If this is done within approximately thirty minutes, the laser will still project at nearly full power. Avoid turning the laser on and off repeatedly in short intervals or leaving it on for more than three to four hours continuously. This fixture does not have a duty cycle and unlike most intelligent lighting systems with discharge lamps, the laser will perform a "hot re-strike," but it is not recommended as this may shorten the life of the laser.

## **Power Variations:**

X-Lasers are hand built laser light show products produced from scratch and built to order. Because lasers are made with such small power levels variances from fixture to fixture do and will exist. This can be influenced by a dozen factors from temperature and diode age to normal voltage fluctuations and initial cold start power. We make all lasers within very small 1/200ths of a watt tolerances but under some conditions differences can be noticeable. If you require precisely matched diodes please contact your dealer and request a power match before ordering as variances within tolerance are not considered a defect.

## **Technical Specifications:**

This laser product is designated as Class 3B during all procedures of operation, maintenance, and service and may only be sold, rented to, or used by organizations which already hold a valid class 3B or 4 laser light show performance variance.

**Refer to X-Laser.com for the most up-to-date model specifications.**

Wavelength: 405-650nm

Laser Power: <500 mW

Laser Type: DPSS Blue & Green & Direct Diode Red

Testing Modes: AUTO and Sound Active

Working Modes: DMX ONLY

Rated Power Consumption: 100W MAX, 30-50W Common

Control Input: 3 Pin XLR

Voltage: AC 110V; 50HZ-60HZ, Fuse: 3A/250V

## **Manufacturer's Limited Warranty:**

X-Laser warrants that this product will be free from defects of materials or workmanship for 12 months for the mechanical components of the laser system and 90 days for the laser diode from the date of end user purchase. This warranty will only apply to laser systems purchased from an authorized X-Laser dealer. This limited, non-transferable, warranty does not cover product abuse, exposure to the elements, accidental damage, shipping damage, improper usage, liquid or smoke damage (including fog juice), or units which have a broken factory seal, have been modified, rented, transferred to a third party, or are more than 12 months old.

## **Limitation of Liability:**

By using this product, the end user certifies that he/she is familiar with and agrees to practice all industry standard laser safety procedures and such procedures contained herein. The purchaser of this product acknowledges that they have been advised that an FDA variance is required prior to use of any Class 3B or 4 laser system and the purchaser certifies that this product will only be operated by employees of the variance holder and in accordance with the terms of the variance. X-Laser specifically disclaims any liability arising from improper or unsafe usage of this product, usage without an active variance, or usage of this product in any manner other than intended. By using this product, the end user agrees to indemnify and hold harmless X-Laser LLC, its' dealers and distributors, employees and staff, subsidiaries, and partners in any action arising from use of this product. Finally, the end user also agrees that prior to any use of this product, he/she shall have in effect a liability insurance policy with a sufficient per incident limit to cover any claims arising from the use of this product. Any purchaser who does not agree to these terms may return their X-Laser product within 7 days of purchase for a full and unconditional refund.

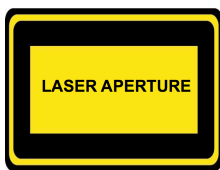
## **Location and Placement Of Caution and Explanatory Labels:**

Labels may vary slightly from those shown here.

### **LASER Light – Avoid Exposure To Beam**

**New products labels as shown here will be effective for new products produced after August 1 2009. If you have purchased an older laser with several smaller labels, rest assured that those will remain legally compliant.**

### **Front Of Laser Housing Where Laser Originates:**



**Side Panel Of Fixture: Unified Label**



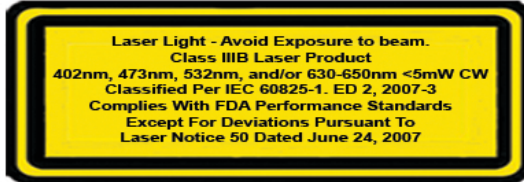
**X-LASER LLC**

***Built to Perform***

P.O. Box 353

Laurel, MD 20725

[www.x-laser.com](http://www.x-laser.com)



**Warranty Void If Case Is Opened. Read All Instructions  
Prior To Use. For Indoor Use Only.  
User Variance Required Prior To Sale,  
Operation, or Transfer.**

**Model:**

**Caution:**

**Mfg. Date:**

**Class IIIB Laser Light When Open.  
AVOID EXPOSURE TO BEAM(S).**

**SN:**

For a complete product listing along with accessories, performance ideas, local dealers, product videos, and so much more, please visit [www.X-Laser.com](http://www.X-Laser.com). While you are there, please register your product with us so that we can keep you up to date with the latest information regarding your X-Laser product and future releases.

**We thank you for purchasing an X-Laser product and  
wish you many happy shows!**