

X-LASER

BUILT TO PERFORM™

SKYWRITER SERIES

CLASS III B & IV

EQUIPMENT MANUAL AND USER GUIDE

For Professional Indoor Use Only
FDA Variance Required

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Note: X-Laser strongly recommends keeping this manual with your new laser projector at all times both as a laser safety reference and as a field reference for proper operation.

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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 60-90 degrees F.
4. There are NO user serviceable parts inside of the fixture. For safety and to maintain the factory warranty this laser must be serviced by authorized personnel only. 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 or general wear. Return the fixture to the factory for service and/or maintenance immediately.
7. Sound Active and AUTO modes provided with this fixture via the LCD panel 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).
8. 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.
9. 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.
10. 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.***
11. 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 as well as removing the operation key when not in use to prevent unwanted activation.***

12. 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.

13. 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.

14. 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 care and caution.

**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 entertainment industry. Your new X-Laser is capable of producing absolutely stunning laser effects over audiences in nearly any performance application with the convenience and flexibility of full DMX and ILDA 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 so that we can best assist you!

UNPACKING

Your new X-Laser should contain the following items:

- 1) X-Laser projector
- 2) A grounded power cable
- 3) This user manual
- 4) “Black wrap” beam blocking foil
- 5) Key for laser interlock
- 6) A DVD containing letters, forms, and a wealth of other information about this product specifically and laser safety in general

QUALITY CONTROL MEASURES

All of the functions of your new laser including the DMX protocols have been checked in two separate 26 point quality assurance inspections to ensure excellent and safe performance. If you find any defects in one of our products, 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.
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 laser aperture with a dry tissue that does not pill. You may also use an alcohol prep wipe 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 black wrap foil to be used as 'beam blocks' to prevent the laser beam from accidentally being moved into an unsafe area. These are provided separate from the fixture so that they can be applied, adjusted, and removed easily for mobile production 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 and hard blocks are also available if preferred.

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.

8. Lasers work best at room temperature with colder and warmer temperatures resulting in inconsistent performance. Always ensure that the laser housing has excellent airflow around the case and that the air is no colder than 60 degrees and no warmer than 90 degrees. Failure to do so may result in weak output, overly strong output (this is also a safety issue!) which will diminish the life of the unit and/or large output power swings. All X-Lasers are thermostatically monitored so we can determine if a failure was temperature related. Such failures are NOT covered under our manufacturers warranty. Extreme cold and hot temperatures WILL cause a diode failure. Keep this unit climate controlled at ALL times.

GENERAL GUIDELINES FOR SAFE LASER USAGE

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 or ILDA mode in demonstration conditions. You can and should use the X and Y axis controls built into the DMX and ILDA protocols to confine 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 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 or ILDA programming and beam blocks are suitable for the new orientation and will result in safe operation.

GENERAL OPERATION

When the projector is powered on, the LCD on the rear panel indicates the current mode of operation; Auto Show, SD Show or DMX Master/Slave. Use the Function key to toggle between operating modes or to select the settings menu.

Auto Show - Press UP/DOWN to toggle between automatic shows and sound active shows. Press ENTER to select a show.

SD Show - Press UP/DOWN to toggle between shows on your SD card and ENTER to select a show, if there are no shows on your SD card this option will not be available. For more information see SD program files on page 9 of this manual.

DMX - Use the UP/DOWN buttons to set your starting DMX address, then press ENTER to set the address.

DMX Slave - Press the FUNCTION button until SLAVE is indicated on the screen, then press ENTER.

Settings - Press the UP/DOWN buttons to toggle which setting you wish to modify, then ENTER to select the specific setting menu and UP/DOWN to modify the settings. ENTER again will confirm the setting change. There are three settings menus, COLOR, MIRROR and MUSIC. COLOR and MUSIC are set at the factory and should not be changed. MIRROR allows you to mirror either the X or Y axis of your projection. NOTE: The mirror settings only affect DMX, Auto and SD shows and will not affect an ILDA projection.

SD CARD OPERATION

The ability to put custom graphics on an SD card and run them without a computer is a powerful but advanced feature of the Skywriter series lasers. It is important to follow all steps exactly, otherwise your content may not play properly.

- 1) Format your SD card to the FAT32 file system type. If using a Windows PC simply insert your SD card, navigate to “My Computer”, right click on the SD card and select “Format” and select “FAT32” as the File System type. Please note that the default is “FAT”, which is not compatible with the SD card reader in your laser projector.
- 2) Do not place any files on this card that are not used as part of your laser show.
- 3) Create a folder on the SD card with the name of your show, keep this name shorter than 10 characters. (there is a maximum of 100 folders with 255 files per folder)
- 4) Copy all of the .ILD files you want to be in this show into the directory. Only .ILD files are compatible with the SD card reader in your projector at this time.
- 5) Create a new text file and write in it the names of the files you want in your show, in order, followed by the scanrate at which you want it displayed in thousand points per second and the number of times you want the file to repeat.

EXAMPLE

Files football1.ILD, football2.ILD, baseball1.ILD and hometeam.ILD are in the SPORTS directory on the SD Card. A text file needs to be created EXACTLY like this:

```
football1.ILD,30,3  
football2.ILD,20,1  
baseball1.ILD,15,2  
hometeam.ILD,30,5
```

When this show plays, the football1 file will play at 30kpps and loop 3 times, the football2 file will play at 20kpps and play only once, the baseball1 file will play at 15kpps and loop twice, lastly the hometeam file will play at 30kpps and loop 5 times.

The text file needs to have it's extension changed from TXT to PRG to function.

For further details, examples and sample files, consult the DVD that came with your laser projector.

DMX OPERATION

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 LCD panels or DIP switches to set the DMX address of each fixture in the chain.

DMX ATTRIBUTES

Channel	Value	Function
1	000-073	Projector black out
	074-110	SD card program file (PRG) mode
	111-147	SD card ILDA (ILD) file mode
	148-165	AUTO SHOW 1
	166-184	AUTO SHOW 2
	185-202	MUSIC SHOW 1
	203-221	MUSIC SHOW 2
	222-225	Full Manual mode (Other channels activated)

PRG or ILD mode

Channel	Value	Function
2	000-255	Folders
3	000-255	Shows (PRG or ILD)

DMX PATTERN MODE

Channel	Value	Function
2	000-255	Patterns
3	000-010	NO strobing
Strobe	011-199	Strobing from slow to fast
	200-255	Strobing to microphone input

Channel	Value	Function
4 X Axis	000-125	X position
	126-185	Moving from slow to fast
	186-225	Moving with random speed
	226-245	Random position
	246-255	Unused
5 Y Axis	000-125	Y position
	126-185	Moving from slow to fast
	186-225	Moving with random speed
	226-245	Random position
	246-255	Unused
6 Zooming	000-010	Original size
	011-100	Fixed zoom
	101-150	Zooming in
	151-200	Zooming out
	201-255	Zooming out and in
7 Y Axis Rotation	000-010	No rotation
	011-110	Fixed rotated position
	111-255	Rotate from slow to fast
8 X Axis Rotation	000-010	No rotation
	011-110	Fixed rotated position
	111-255	Rotating from slow to fast
9 Z Axis Rotation	000-010	No rotation
	011-180	Fixed rotated position
	181-217	Rotating counter-clockwise
	218-255	Rotating clockwise
10 Clipping	000-010	Original pattern
	011-074	Fixed clipping
	075-104	Clipping out
	105-144	Clipping in
	145-184	Clipping out and in
	185-224	Clipping on
	225-255	Clipping off

Channel	Value	Function
11 Wave	000-009	Original pattern
	010-199	Wave effect in pattern with speed control
	200-255	Wave effect in pattern with amplitude control
12 Color	000-016	White
	018-033	Red
	034-050	Green
	051-067	Blue
	068-084	Yellow
	085-101	Purple
	102-118	Cyan
	119-135	White, red, green, blue 4 fixed colors
	136-152	Blue, yellow, purple, cyan 4 fixed colors
	153-169	Seven Colors
	170-186	White, red, green, blue 4 colors looping
	187-203	Blue, yellow, purple, cyan 4 colors looping
	204-220	Seven colors looping
	221-237	Random color
	238-255	Unused
13 Visible Points	000-063	Original pattern
	064-127	Pattern with break points
	128-191	Pattern with blanking
	192-255	Points to make pattern

ILDA OPERATION

Connecting an ILDA compatible software package such as Quickshow or Beyond will activate the interlock and the laser will automatically only accept ILDA commands through the DB25 port on the rear panel of the laser projector.

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 or ILDA 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 projector 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 <10% 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 4 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 4 laser light show performance variance.

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

Wavelength: 405-650nm

Laser Power: <1000 mW

Laser Type: DPSS and Direct Diode

Testing Modes: AUTO and Sound Active

Working Modes: DMX or ILDA

Rated Power Consumption: 100W MAX, 60W Common

Control Input: 3 Pin XLR or DB25 ILDA

Voltage: AC 110/220V; 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 six months 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.